Challenges of the 21st Century: Social Media and E-Government

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1 Introduction

With the turn of the millennium approaching, many concepts of the future arose. Soon after the World War II, George Orwell (1949) was already imagining what the pre-millennial world would look like in his book *Nineteen Eighty-Four*. Researchers and scientists also shared their (non-fictional) visions of the upcoming societies and cities they would live in. For example, Castells (1989) introduced the "Informational City," which is the "prototypical city" of this new knowledge society emerging in the 21st century (Stock, 2011; Yigitcanlar, 2010). To a certain degree, some of the predictions came true. "With the advent of the 21st century, information, communications, and computer technologies have undergone rapid innovation and popularization, profoundly altering human lifestyles and economic structures" (Hsu, Lin, & Wei, 2008, p. 826). Although information science has been studying digitalization, digital information and (tacit as well as explicit) knowledge since the 1950s, due to the transition of the 21st century societies into knowledge society, information science topics gain even more in importance (Stock & Stock, 2013).

Information and communication technologies (ICTs) have emerged "from the fast technological developments in the semiconductor industry, in the telecommunication sector and, more recently, in a wide range of new services linked to multimedia and the Internet" (Castellacci, 2006, p. 841f.; Dalum, Freeman, Somonetti, Von Tunzelmann, & Verspagen, 1999). This development constitutes the rise of a new "technological paradigm" (Castellacci, 2006, p. 842; Freeman & Loucua, 2001). "Currently, there is little doubt that the development of technology is one of the most important factors in the development of society" (Grinin, Grinin, & Korotayev, 2017, p. 52). Furthermore, the so-called "knowledge-based economy has become the major trend in international society" (Hsu, Lin, & Wei, 2008, p. 826). Exploring the characteristics of this economy and building appropriate ICT-driven fundaments for the new society is an important task for governments (Hsu, Lin, & Wei, 2008).

The current scientific-technological revolution brings to mind Nikolai Kondratiev's theory about cyclical nature of economic development. The long waves of growth in the economy start with a paradigm shift coming from an innovation that could prevail itself and gain enough investment. Rising investment in this new technology will increase and boost economic recovery. Once the innovation is implemented, the investments will decrease leading to a downward swing (end of the cycle). In the meantime, there will be new innovations and paradigm shifts in progress (Kondratiev, 1926; Stock, 2011). Joseph Schumpeter elaborated Kondratiev's wave theory and ascertained that the bases for the long waves are the fundamental technical innovations that change the way of production and organization (so-called "basic innovations"), currently the basic innovation being ICT. Schumpeter regarded technological innovation as the most recognizable appearance of innovation not continuously distributed in time (Fietkiewicz & Lins, 2016, p. 286; Schumpeter, 1939). Schumpeter defined the process of "creative destruction" as transformations of firms and industries through destruction of the old, which enables creation of the new (Schumpeter, 1942). The development of Internet technology is an example of

such a shift, where "soon after the economic potential of the Internet was revealed, a large number of Internet companies (….) emerged and began to conduct business via the new electronic medium" (Fietkiewicz & Lins, 2016, p. 287; Wang, 2007). This is the 5th Kondratiev wave (Nefiodov, 2017) starting about the Millennium.

There are some domains that gained special interest of many stakeholders, from researchers, through local and national governments and legislature, to the broad community of Web users. One of these domains is the so-called e-government, emerging while the shift from analogue red-tape towards a time-efficient, accessible and usable government administration is unstoppably progressing. Another, very broad domain are social media. They encompass sharing services (e.g., for images or videos like Flickr or YouTube), social bookmarking (e.g., Delicious) or knowledge base services (e.g., Wikipedia), Social Live Streaming Services (e.g., Twitch or YouNow), as well as Social Network Services (e.g., Instagram, Twitter or Facebook) (Baran, Fietkiewicz, & Stock, 2015). As for April 2017, there were 3,811 million active Internet users and 2,907 million active social media users (Statista, 2017). Given the importance of ICT in shaping the knowledge society and the increasing application of the new technology, especially the trend towards mobile internet (3,394 million unique mobile internet users and 2,698 million active mobile social media users; Statista, 2017), the potential of as well as the challenges related to e-government and social media are timely appropriate research topic. In the following, both topic domains will be introduced in more detail.

1.1 E-Government Research

Since our (knowledge) society is becoming increasingly mobile and demanding of a "spatial and temporal unrestricted access to information and transactions" (Gisler, 2001; Fietkiewicz & Stock, 2014, p. 51), public administration faces the challenge of fundamentally changing its traditional, red-tape driven practices. Given the increasing implementation of ICTs in every possible domain of our daily life, it is not surprising that in many areas of the world municipalities are adopting e-government. This way they try to improve their public service delivery by providing a "one-stop" government access for the citizens (Holzer, Manoharan, & Van Ryzin, 2010; Fietkiewicz & Stock, 2014).

E-government is an "initiative of government agencies and departments to use ICT tools and applications, the Internet and mobile devices to support good governance, strengthen existing relationship and build new partnerships within civil society" (Ndou, 2004, p. 1). The literature reveals many advantages of e-government, e.g., according to Horan (2001, p. 17), new technologies enable local governments to make the land-use and the related decision process more interactive. Ndou (2004, p. 16) emphasizes e-government's potential of reshaping the public-sector activities, enhancing the transparency and increasing the government's capacity. The government services are becoming more cost-effective and a better relationship with the citizens is being built (Ndou, 2004). Furthermore, the transparency of governmental actions leads to anti-corruption and accountability, the quality of decision making is improved and, last but not least, the ICT is being promoted in other sectors of the society (Ndou, 2004, p. 8).

There are also several challenges for successful e-government as well as important issues to consider before the implementation. According to Gisler (2001), one of the most urgent aspects is the proper infrastructure in which all citizens have an equal, space- and time-independent access to the ICT facilities. Other factors are education (technical skills how to deal with ICT, or in general, the information literacy; Beutelspacher, Henkel, & Schlögl, 2015), research and development (R&D), and promotion of the ICT-usage through convenient, legal, technical and organizational framework conditions. Ndou (2004, p. 12) names, besides the ICT infrastructure, human capital development and life-long learning, such main challenges as change management (culture and resistance to change), partnership and collaboration (network creation), strategy (vision and mission), leadership role (to motivate, involve and influence the stakeholders) and policy issues. The opportunities of e-government cannot be fully exploited as long as there is no strong and visible political will to provide appropriate legal, regulatory and competition base as well as a private sector applying ICT innovatively (Lanvin & Lewin, 2006, p. 54).

The new technology encourages the transformation from the traditional bureaucratic paradigm to the so-called e-government paradigm (Ho, 2002, p. 434). The first one is characterized by functional rationality, departmentalization, hierarchical control, rule-based management, standardization, and operational cost-efficiency. The latter one, the e-government paradigm, is based on competitive, knowledge-based economy and is characterized by flexibility, coordinated network building, vertical and horizontal integration, innovative entrepreneurship, organizational learning, external collaboration and customer service (Ho, 2002; Ndou, 2004; Holzer, Manoharan, & Van Ryzin, 2010). The bureaucratic model is being criticized for its rigidity, inefficiency, and "incapability to serve human clients, who have preferences and feelings" (Ho, 2002, p. 435). The citizens favour the idea of "one-stop shopping" over the functional departmentalization, because it gives them the ability to obtain a variety of services from a single source (Ho, 2002).

The shift between these two paradigms is also reflected in the orientation of city websites. According to Ho (2002), cities following the bureaucratic paradigm have merely administratively-oriented websites, i.e. the content is organized "according to the administrative structure of the government." This approach was commonly adopted in the 1990s. In contrast, cities following the e-government paradigm use the so-called "portal designs," either with "information-oriented" or with "user-oriented" design. The first one relates to the already mentioned "one-stop shopping" service, because it offers a great amount of information from diverse departments on the home page. The latter design categorizes information and services according to the needs of different user groups. The "information-oriented" approach aims at a direct and extensive presentation of information, which can lead to information overload. The problem of such "information explosion" was mentioned by Rose (2005), who explains that in a free society (i.e., with free flow of information and without censorship) with founded ICT infrastructure there is a lot of political information that needs to be somehow processed by the citizens. Because of the Internet, there is an increased quantity of accessible information and increased speed with which it is

being disseminated. The problem is that the available time to absorb this information does not increase. Therefore, the user-oriented solutions are more convenient.

In view of the increased popularity of e-government as an important aspect of the development of knowledge society and the cities it lives in, the so-called Informational Cities (Mainka et al., 2013; Mainka, Hartmann, Stock, & Peters, 2014; Fietkiewicz, Mainka, & Stock, 2017), the beginning of this information science research focuses on three questions. First one concerns the overall state of e-government, or its "maturity," in selected 31 Informational Cities. This also required the development of a suitable method to measure the maturity of an e-government website. Furthermore, it is not enough for an e-government to offer a broad spectrum of services. In order to properly serve the citizens, it needs to be understandable and usable. Therefore, the second research question concerns the usability of e-government in Informational Cities. Finally, e-government portals are supposed to serve many different stakeholders. Due to its (potential) suitability to be understood and used by all the different user groups, it can be seen as a so-called boundary object (Star & Griesemer, 1989). The final research question addresses this subject in more detail, that is, "How do e-government websites handle boundary documents?" To answer these research questions, an extended criteria model for the quantification of e-government maturity was formulated. Furthermore, the average quality of the information architecture (usability) of the investigated 31 official websites was analysed. Finally, the processing of boundary documents, which are documents that serve different user groups, was investigated in more detail. The outcomes show that the maturity and usability levels of the chosen cities vary, whereas the implementation of boundary documents in form of detailed information is similar in 30 out of 31 cities, namely non-existent. Considering the maturity of investigated e-governments, there is still potential for improvement (Fietkiewicz, Mainka, & Stock, 2017).

1.2 Social Media Research

The rapid technological development leads to the digitalization of our everyday life. There is a visible shift from the real to a digital world, be it such daily routines like shopping and banking, or communication with family and friends. A distinctive fruit of this digitalization are the social media. Social media, especially social networking sites (SNSs) "have infiltrated people's daily life with amazing rapidity to become an important social platform for computer-mediated communication" (Powell, 2009; Tapscott, 2009; Correa, Hinsley, & de Zuniga, 2010; Lin & Lu, 2011, p. 1152). These networks enable people to "present themselves, connect to a social network, and develop and maintain relationships with others" (Ellison, Steinfield, & Lampe, 2007; Kane, Fichman, Gallaugher, & Glaser, 2009; Lin & Lu, 2011, p. 1152).

Social media became the main part of this research compendium. What is the status quo of social media usage? What are the age- or gender-dependent differences in the application of these services? What are the newest trends on the social media market and what is the information behaviour of their users? The consumption of information and news also changes. Web users increasingly reach for social media platforms like Facebook or Twitter to retrieve news. Especially for breaking news consumption and dissemination, Twitter appears to have established itself as the one medium to go to. How does the breaking news

dissemination on Twitter take place? Are there any inter-country differences in news dissemination and commentary?

The digital shift is also prevalent in the entrepreneurial domain. There are not only more and more companies active in the digital economy. The way they are brought into being changes as well. The financing of new firms partly comes from the people, "crowd," and not necessarily from business angels, ventures or banks in form of loans, as it was common before. Now, a more convenient and less risky financing way is facilitated through crowdfunding platforms. Furthermore, the marketing of new entrepreneurial endeavours also occurs online, through diverse social media channels. What is the best social media strategy to reach and persuade potential backers of an entrepreneurial idea?

Finally, social media do not only increasingly interfere in our everyday life and economy, but also the legislature. Many legal issues may arise when more and more activities are conducted in a new (at least for the legislature) environment—the Web. What are the potential law infringements while using new social media channels like, for example, social live streaming platforms? From an economic perspective, is the social media market properly regulated?

The presented social media research can be summarized into five topic blocks: general social media usage, the advent of social live streaming services, Twitter and the new online journalism, crowdfunding and social media marketing, and competition on social media markets. All of them are further elaborated in the following subchapters.

1.2.1 General social media use

Nowadays, many of our everyday tasks can be comfortable managed from our homes with the help of the Internet. One of the most booming Internet offerings are the social media (Fietkiewicz, Lins, Baran, & Stock, 2016). In the first study about the general social media use, the differences in its usage between the generations are investigated. The outcomes might be of value for stakeholders active in the areas of online marketing, social shopping, or e-commerce in general. "Once the businesses identified services mostly used by their target customers, they can focus on building a relationship with them through the social network, committing them to the brand and, hence, influencing their decision-making" (Fietkiewicz, Lins, Baran, & Stock, 2016, p. 3829).

In the second general social media study the focus shifts to older generations. "For a long time, a digital divide was given between young Web users and older population, which, out of anxiety or incapability, restrained from using the new technologies" (Fietkiewicz, 2017, p. 5). Now, the so-called Silver Surfers and Digital Immigrants use the Web not only for sending emails but also for socializing on several social media services. Is it possible that there is no more digital divide between different age groups? This development creates a great opportunity to investigate the social media behaviour of elder users. The outcomes might be valuable for marketing strategies aiming at so-called grey or silver market. There may be inter-generational differences in social media usage as well as intra-generational gender-dependent divergences. These were also in focus of the second study (Fietkiewicz, 2017).

Both investigations included several social media platforms popular at that time and concerned general usage characteristics, like the frequency of use and motivation to adopt a service. Studies that followed focused on concrete platforms and in-depth investigation of users' information behaviour.

1.2.2 Twitter and online journalism

The popularity of social media has also changed the way how we consume news. With the time, the micro-blogging service Twitter "proved to be a suitable platform for (breaking) news dissemination and commentary" (Fietkiewicz & Ilhan, 2017a, p. 317). It has an "immediate penetration and strong ability to spread such news" (Adamic & Adar, 2005; Armstrong & Gao, 2010; Bruns, 2005, 2006, 2008; Fietkiewicz & Ilhan, 2017a, p. 317). Breaking news itself also plays an important role in the "24-hour news culture" (Bruns, 2006) we live in today. "In the last few years several terrorist attacks stroke Europe and Twitter was one of the live reporting tools that kept people from all over the world in the loop on the attacks as well as on the proceeding investigations" (Fietkiewicz & Ilhan, 2017a, p. 317). In the first study on Twitter and the (new) online journalism, there were investigated the following questions: whether news agencies from different countries report in a similar manner on terrorist attacks, whether their followers disseminate the breaking news through re-tweets on the same scale, and, whether the tweets on terrorist attacks are more likely to be retweeted (Fietkiewicz & Ilhan, 2017a).

Nowadays, "the users become citizen journalists, as in some cases they are the first ones to report on breaking events" (Fietkiewicz & Ilhan, 2017b, p. 428). The second study on Twitter and online journalism focused on user's reaction to terrorist attacks—the attacks on Charlie Hebdo in January 2015, in Paris in November 2015, and in Brussels in March 2016. These attacks were triggering events for a wave of tweets showing support (#PrayForParis, #PrayForBelgium), solidarity (#JeSuisCharlie, #JeSuisBruxelles) or promotion of values like freedom of speech and press (#FreedomofSpeech). This study is supposed to shed light on the basic information behaviour of English-speaking Twitter users participating in the information exchange that followed after these three triggering events (Fietkiewicz & Ilhan, 2017b).

1.2.3 Social Live Streaming Services (SLSSs)

Live broadcasting is nothing new, neither is the human attraction to uncensored "live" shows. Now, a new type of social media is emerging to satisfy this specific "information need"—social live streaming services like YouNow. On YouNow, every Web user can become a reality-show star and entertain their viewers with a live performance. In the case study of the social live streaming service YouNow, we investigated its adoption, usage and the impact it has on the users. The study was based on an online-survey among YouNow's users (Fietkiewicz & Scheibe, 2017).

New social media platforms, like YouNow, may have many advantages. However, apart from benefits "there are many dangers that come along with them, such as treatment of sensitive data or potential law infringements" (Honka, Frommelius, Mehlem, Tolles, & Fietkiewicz, 2015, p. 1). In the second study on live streaming services, YouNow was investigated regarding possible violations of law (limited to German and US-American

streams). The study was based on observations of the streams. The outcomes showed that major issues are violation of copyright and the right in one's own picture. Hence, YouNow (and potentially other SLSSs) holds certain dangers, "especially for underage youths not being aware of the risks" (Honka, Frommelius, Mehlem, Tolles, & Fietkiewicz, 2015, p. 1).

1.2.4 Crowdfunding and social media marketing

Also in the entrepreneurial domain, we can find more and more applications of social media. Since the emergence of crowdfunding as a "new funding channel for entrepreneurial projects, researchers focused on investigating factors that lead to crowdfunding campaign's success" (Fietkiewicz, Hoffmann, & Lins, in press). One of the tools for promotion of new entrepreneurial endeavours are social media. The study on crowdfunding and social media marketing focused on the question: How does the social media activity affect the crowdfunder's decision to pledge money for someone's entrepreneurial endeavours? For this purpose, the influence of electronic word of mouth (eWoM) via Facebook and YouTube, as well as the impact of social capital on the business oriented service LinkedIn on the success of a crowdfunding campaign were investigated. The examination concerned the interplay between these different platforms and led to a proposal of social media marketing strategies for entrepreneurs, which may increase their chances for being funded (Fietkiewicz, Hoffmann, & Lins, in press).

1.2.5 Competition on social media markets

Finally, not only Web users need to obey the law in the digital age. The commercial law finds increasingly application on the new markets, like the one for social media. From the corporate perspective, the growth potential in the digital economy is very attractive. The question is, whether the legal system is in keeping with the digital times, or still needs to adopt the traditional economic law regulations to the fast developments of the 21st century.

The last presented study concerns the competition on social media markets. Competition law all around the world is supposed to maintain open competition on the economic markets through a series of national or international regulations and their enforcement by authorities. The focus of this study is on social networking services (SNSs), as an example of a new medium. The legal perspective on this matter was complemented with an analysis in view of information science and economic theories. "Here, such aspects as direct and indirect network effects, or standards established on the relevant markets are significant. It is possible these network effects will have a noticeable influence on the development of monopolies or oligopolies in the SNSs market. Furthermore, SNSs that in recent years became standards appear to have strengthened their position by broadening their offerings spectrum through internal enhancements and acquisitions of other companies" (Fietkiewicz & Lins, 2016, p. 285). This actions and the respective reactions by the authorities will be critically evaluated.

1.3 Synopsis

This synopsis lists publications that are included in this thesis. For each study my respective work share/contribution is listed. The publications have been slightly altered for this work. The alterations include correction of grammatical errors or typing mistakes, formatting, design of the figures and tables (to ensure consistency), and standardising the language (to British English).

Research contribution(s) regarding the state of e-government in cities of the Knowledge Society:

> **Study 1:** Fietkiewicz, K. J., Mainka, A., & Stock, W. G. (2017). E-Government in cities of Knowledge Society: An empirical investigation of Smart Cities' governmental websites. Published in peer-reviewed journal *Government Information Quarterly*.

For Study 1, the work share amounted to 80% and included partially the data collection, the data analysis, and partially writing.

General social media use:

> **Study 2:** Fietkiewicz, K. J., Lins, E., Baran, K. S., & Stock, W. G. (2016). Inter-generational comparison of social media use: Investigating the online behavior of different generational cohorts. Presented at the HICSS 2016 in Kauai, HI and AHSE 2016 in Honolulu, HI and published in the respective peer-reviewed conference proceedings.

For Study 2, the work share amounted to 70% and included partially the data collection, partially the data analysis, and writing.

> **Study 3:** Fietkiewicz, K. J. (2017). Jumping the digital divide: How do "silver surfer" and "digital immigrants" use social media? Published in peer-reviewed journal *Networking Knowledge.*

Study 3 was an independent work (100%).

Twitter and online journalism:

> **Study 4:** Fietkiewicz, K. J., & Ilhan, A., (2017). Breaking news commentary: Users' reactions to terrorist attacks in English-speaking Twittersphere. Presented as a poster at the HCII 2017 in Vancouver and published in peer-reviewed proceedings (Springer's Lecture Notes in Computer Science).

For Study 4, the work share amounted to 60% and included partially the data collection, partially the data analysis, and writing.

> **Study 5:** Fietkiewicz, K. J., & Aylin, I. (2017). Inter-country differences in breaking news coverage via microblogging: Reporting on terrorist attacks in Europe from the USA, Germany and UK. Presented at the HCII 2017 in Vancouver and published in peer-reviewed proceedings (Springer's Lecture Notes in Computer Science).

For Study 5, the work share amounted to 70% and included partially the data collection, data analysis, and writing.

Social Live Streaming Services, the case of YouNow:

> **Study 6:** Fietkiewicz, K. J., & Scheibe, K. (2017). Good morning… Good afternoon, good evening and good night: Adoption, usage and impact of the social live streaming platform YouNow. Presented at the LIS 2017 in Sapporo, Japan and published in peer-reviewed proceedings.

For Study 6, the work share amounted to 80% and included data analysis and writing.

> **Study 7:** Honka, A., Frommelius, N., Melhem, A., Tolles, J. N., & Fietkiewicz, K. J. (2015). How safe is YouNow? An empirical study on possible law infringements in Germany and the United States. Published in the peer-reviewed *Journal of MacroTrends in Social Science.*

For Study 7, the work share amounted to 20% and included supervisory work and partially writing.

Crowdfunding and social media marketing:

> **Study 8:** Fietkiewicz, K. J., Hoffmann, C., & Lins, E. (*in press*). Find the perfect match: The interplay among Facebook, YouTube and LinkedIn on crowdfunding success. In press in the peer-reviewed Journal *International Journal of Entrepreneurship and Small Business.*

For Study 8, the work share amounted to 80% and included partially the data analysis and writing.

Competition law and social media markets:

> **Study 9:** Fietkiewicz, K. J., & Lins, E. (2016). New media and new territories for European law: Competition in the market for social networking services. Published in the peer-reviewed anthology *Facets of Facebook: Use and Users*.

For Study 9, the work share amounted to 90% and included literature research and writing (the presentation of economic theories excluded).

1.4 All publications (2013-2017)

Publications marked with **(*)** are part of this dissertation.

Gremm, J., Barth, J., Fietkiewicz, K.J., & Stock, W.G. (in press). *Transitioning Towards a Knowledge Society: Qatar as a Case Study*. Cham, Switzerland: Springer Nature.

Scheibe, K., Zimmer, F., & Fietkiewicz, K.J. (2017). Das Informationsverhalten von Streamern und Zuschauern bei Social Live-Streaming Diensten am Fallbeispiel YouNow. *Information - Wissenschaft & Praxis, 68*(5-6), 352-364.

Stock, W., Barth, J., Fietkiewicz, K.J., et al. (2017). Informationswissenschaft in der Urbanistik. *Information - Wissenschaft & Praxis, 68*(5-6), 365-377.

Ilhan, A., & Fietkiewicz, K. J. (2017). Think green - bike! The bicycle sharing system in the smart city Barcelona. In *Proceedings of the 3rd International Conference on Library and*

Information Science (pp. 309–326). Taipei, Taiwan: International Business Academics Consortium.

(*) Fietkiewicz, K. J., & Scheibe K. (2017). Good morning...Good afternoon, good evening and good night: Adoption, usage and impact of the social live streaming platform YouNow. In *Proceedings of the 3rd International Conference on Library and Information Science* (pp. 92–115). Taipei, Taiwan: International Business Academics Consortium.

Ilhan, A., & Fietkiewicz, K. J. (2017). User behavior in the Twittersphere: Content analysis of tweets on Charlie Hebdo attacks. In *iConference 2017 Proceedings* (pp. 190–202). University of Illinois at Urbana-Champaign: IDEALS.

(*) Fietkiewicz, K. J., & Ilhan, A. (2017). Inter-country differences in breaking news coverage via microblogging: Reporting on terrorist attacks in Europe from the USA, Germany and UK. In G. Meiselwitz (Ed.), *Social Computing and Social Media. Human Behavior* (pp. 317-336). Cham, Switzerland: Springer (Lecture Notes in Computer Science; 10282).

(*) Fietkiewicz, K. J., & Ilhan, A. (2017). Breaking news commentary: Users' reactions to terrorist attacks in English-speaking Twittersphere. In C. Stephanidis (Ed.), *HCI International 2017 - Posters' Extended Abstracts. Part I* (pp. 428-434). Cham, Switzerland: Springer (Communications in Computer and Information Science; 713).

Lins, E., Fietkiewicz, K. J., & Lutz, E. (in press). Effects of impression management tactics on crowdfunding success. *International Journal of Entrepreneurial Venturing*, in press.

(*) Fietkiewicz, K. J., Hoffmann, C., & Lins, E. (in press). Find the perfect match: The interplay among Facebook, YouTube and LinkedIn on crowdfunding success. *International Journal of Entrepreneurship and Small Business*, in press.

Zimmer, F., Fietkiewicz, K. J., & Stock, W. G. (2017). Law infringements in social live streaming services. In T. Tryfonas (Ed.), *Human Aspects of Information Security, Privacy and Trust.* 5th International Conference, HAS 2017, Held as Part of HCI International 2017, Proceedings (pp. 567-585). Cham, Switzerland: Springer. (Lecture Notes in Computer Science; 10286).

Ilhan, A., Fietkiewicz, K. J., & Stock, W. G. (2017). Do car drivers really need mobile parking payment? A critical evaluation of the smart services apparkB in Barcelona. In A. Marcus, & W. Wang (Eds.), *Design, User Experience, and Usability: Designing Pleasurable Experiences*. 6th International Conference, DUXU 2017, Held as Part of HCI International 2017, Proceedings, Part II (pp. 241-254). Cham, Switzerland: Springer. (Lecture Notes in Computer Science; 10289).

(*) Fietkiewicz, K. J. (2017). Jumping the digital divide: How do silver surfers and digital immigrants use social media. *Networking Knowledge, 10*(1), 5-26.

(*) Fietkiewicz, K. J., Mainka, A., & Stock, W. G. (2017). eGovernment in cities of the knowledge society. An empirical investigation of Smart Cities' governmental websites. *Government Information Quarterly, 34*(1), 75-83.

Barth, J., Fietkiewicz, K. J., Gremm, J., Hartmann, S., Ilhan, A., Mainka, A., Meschede, C., & Stock, W. G. (2017). Informational urbanism. A conceptual framework of smart cities. In *Proceedings of the 50th Hawaii International Conference on System Sciences,* January 4 – 7, 2017, Waikoloa Village (pp. 2814-2823). Washington, DC: IEEE Computer Society.

(*) Fietkiewicz, K. J., & Lins, E. (2016). New media and new territories for European law: Competition in the market for social networking services. In K. Knautz & K. S. Baran (Eds.), *Facets of Facebook: Use and Users* (pp. 285-324). Berlin, Germany, Boston, MA: De Gruyter Saur. (Knowledge & Information. Studies in Information Science).

Scheibe, K., Fietkiewicz, K. J., & Stock, W.G. (2016). Information behavior on social live streaming services. *Journal of Information Science Theory and Practice, 4*(2), 6-20.

Fietkiewicz, K. J., Baran, K. S., Lins, E., & Stock, W. G. (2016). Other times, other manners: How do different generations use social media? In *2016 Hawaii University International Conferences. Arts, Humanities, Social Sciences & Education*, January 8-11, 2016, Honolulu, Hawaii, Proceedings (pp. 1-17). Honolulu, HI: Hawaii University.

Lins, E., Fietkiewicz, K. J., & Lutz, E. (2016). How to convince the crowd: An impression management approach. In *Proceedings of the 49th Hawaii International Conference on System Sciences* (pp. 3505-3514). Washington, DC: IEEE Computer Society.

(*) Fietkiewicz, K. J., Lins, E., Baran, K. S., & Stock, W. S. (2016). Inter-generational comparison of social media use: Investigating the online behavior of different generational cohorts. In *Proceedings of the 49th Hawaii International Conference on System Sciences* (pp. 3829-3838). Washington, DC: IEEE Computer Society.

(*) Honka, A., Frommelius, N., Mehlem, A., Tolles, J. N., & Fietkiewicz, K. J. (2015). How safe is YouNow? An empirical study on possible law infringements in Germany and the United States. *The Journal of MacroTrends in Social Science, 1*(1), 1-17.

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2 E-Government in Cities of Knowledge Society. An Empirical Investigation of Smart Cities' Governmental Websites

With increasing digitalization, regional and national governments need to shift from their old bureaucracy-driven ways towards new, faster and more efficient ones. One of the modern developments in the age of knowledge society is the electronic government (e-government). The first investigation presented in this work deals with the status quo of e-government in selected 31 informational cities as case studies.

In view of the increased popularity of e-government as an important aspect of the development of Smart or Informational World Cities, we outline three research questions: (1) What is the state of maturity of e-governments in Informational World Cities? (2) How good (or poor) is their usability? (3) How do they handle boundary documents? In order to clear up these issues empirically, we formulated an extended criteria model for the quantification of e-government maturity, analysed the average quality of the information architecture of 31 identified Informational World Cities' official websites, and studied the processing of boundary documents, i.e. documents that serve different user groups. Our outcomes indicate that the maturity and usability levels of investigated cities are much differentiated, whereas the implementation of boundary documents in form of detailed information sheets is rather scarce. Considering the maturity of investigated e-governments, there is still potential for improvement, especially regarding the aspects of communication and transaction services. The differences between the e-governments' usability standards are substantial and the results are partially suboptimal. Our outcomes indicate that the usability levels retrieved from task-based evaluation are not directly linked to integration of boundary documents into the governmental websites.

2.1 Introduction

In the research on Smart or Informational Cities, e-government and e-governance are one of the most important aspects to consider (Castells, 1989; Fietkiewicz & Stock, 2015; Linde & Stock, 2011; Mainka, Fietkiewicz, Kosior, Pyka, & Stock, 2013a). In such cities, e-governance is one of the bases for innovation (Yigitcanlar, 2010) insofar as political programs for developing an information society impact the development of ICT infrastructures and information services. The increased use of ICT and knowledge management between authorities and citizens or businesses optimizes services in e-government and call on citizens and companies to actively engage in political debate and decision-making processes (Sharma & Palvia, 2010). "E-government is a generic term for web-based services from agencies of local, state and federal governments" (Sharma & Palvia, 2010, p. 1). The concept of e-government includes governmental websites, governmental social media channels, and other digital governmental services. In this article, we focus on governmental websites.

According to Moon (2002), e-government includes the interaction levels information, communication, transaction, integration, and participation (Linde & Stock, 2011, p. 106). "Many of the primary e-government functions towards citizens involve the web-based

provision of government information and services" (Manoharan & Carrizales, 2011, p. 284). Additionally, governmental websites should serve different user groups (citizens, companies, tourists, etc.) and, therefore, can be regarded as boundary objects (Star & Griesemer, 1989).

The basis of our investigation are Informational World Cities as defined by Mainka et al. (2013b). According to this definition, Informational World Cities are prototypical cities of the knowledge society characterized as knowledge-, creative-, digital-, smart-, and world cities. Our article reports about three information science research studies on e-government in prototypical cities of the knowledge society and empirically answers three research questions:

> RQ1: What is the state of maturity of e-governments in such cities?
>
> RQ2: How good (or poor) is their usability?
>
> RQ3: How do they handle boundary documents (i.e., documents serving different user groups)?

There already are some empirical studies on governmental websites at the municipal level (e.g., Norris & Moon, 2005; Scott, 2006), but our study is one of the first quantitative empirical analyses of e-government maturity at the city level focusing on the Informational World Cities of the knowledge society.

Considering the latest research by Holzer et al. (2014), the study's methods mirror their previous research (since 2003) and are complex e-government maturity and usability analyses of 100 cities. Holzer et al.'s model consists of five components: (1) privacy and security, (2) usability, (3) content, (4) services, and (5) citizen and social engagement. In terms of usability, Holzer et al. focus on formal indicators for a "usable" website. Our approach is more practically oriented, as it examines the websites' usability while typical tasks are being fulfilled. The remaining aspects investigated by Holzer et al.—content, service and citizen participation—partially correspond with our approach. However, we consider some of their applied indicators as not comparable, e.g., within the dimension of citizen participation, such aspects as newsletters or feedback are put together with more sophisticated utilities as synchronous video or chat capabilities. Our model distinguishes between more challenging utilities from the simple ones that are nowadays very common. Therefore, we define the five pillars of e-government differing from each other by the level of development and sophistication (which is also reflected in the quantification of these aspects). Some of their investigated cities overlap with municipalities in the focus of our study, therefore, in the course of our results' analysis, we will compare our outcomes with the ones by Holzer et al. (2014). This way we will be able to see to what extent the investigated aspects correlate.

Hence, our results of the municipal e-governments' maturity may shed light on a new aspect as well as give a new perspective on the development of Informational World Cities. Our comparative usability analysis is consequently based on task-based user tests of the governmental websites' information architecture (for previous research, see e.g. Choudrie and Ghinea (2005)). To our knowledge, our analysis of governmental websites as boundary documents is the first approach in this research area. All our research questions are globally

oriented and focus on cities of the knowledge society. In the following, theories on e-government will be shortly outlined.

2.2 Theory

2.2.1 Models for measuring e-government

A number of stage models and indexes has been already developed in order to measure and to compare the e-government's advancement (Lee, 2010). One popular e-government index has been created by the United Nations' Division for Public Economics and Public Administration: "The Global E-Government Development Index". It presents the state of development of e-government for the UN Member States and is a composite measurement of the ICT infrastructures, education, information, technologies, government internet use, products, services, the level of telecommunication and human capital infrastructure in the respective countries (UN, 2012). For this investigation, four stages of online service development were defined: (1) the emerging information services; (2) enhanced information services (one-way or simple two-way communication like downloadable forms); (3) transactional services (like two-way communication, non-financial transaction, filling taxes online), and finally, (4) connected services (citizen-centric, tailor-made services including e-services and e-solutions). Besides the stages of online services, in the investigation, there are included the telecommunication infrastructure (e.g., internet lines) and human capital (e.g., literacy rate or education) index. In contrast, our study focuses on the advancement of the e-government in the municipalities disregarding the human capital. We believe that every citizen (no matter of what education) deserves and is able to use advanced e-government offerings. We also do not see a direct connection between the education obtained by the citizens and the ability of their government to offer them an appropriate and modern service. As our investigation concerns Informational World Cities (meaning that these cities are equipped with an advanced digital technology), we do not include indicators for digital city infrastructure. Finally, UN-index includes investigation only at a country-level; therefore, a direct comparison with the outcomes of our study is not possible.

Another stage model has been developed by Layne and Lee (2001), who classified the development of e-government into four measurable stages: (1) catalogue, (2) transaction, (3) vertical integration, and (4) horizontal integration. The first stage represents the one-way communication between the government and users. Transaction facilitates online transactions with government agencies. Vertical integration refers to local, state and federal governments connected for different functions or services. Horizontal integration is defined as integration across different functions and services (creating the "one-stop-shopping" opportunity for the citizens). Layne and Lee (2001) propose a stage-based growth model for e-government suggesting that this is an evolutionary phenomenon. Therefore, it opposes our idea of separate e-government pillars as further elaborated in the following paragraph.

Contrary to the four-stage model by Layne and Lee (2001), Hiller and Bélanger (2001) introduced an extended five-stage model. The additional stage is participation (i.e. voting, registration or posting comments online). This could be seen as a sub-set of the stage of two-way communication, but the authors intended to emphasize its importance by using a separate category. Moon (2002) examined the state of municipal e-government

implementation and assessed its effectiveness. Moon (2002) explored two institutional factors that contribute to the adoption of e-government, namely the size and the type of government. He adopted the e-government stage model by Hiller and Bélanger (2001) in order to map the e-government framework and examine the rhetoric and reality of e-government at the municipal level. His study shows that many municipal governments are still at either stage one or two of their development and merely post and disseminate information or provide channels for two-way communication (public service requests).

Coursey and Norris (2008) investigated some of these models to see whether they are accurate or useful in understanding the actual development of e-government. The authors' criticism is based on empirical evidence from three surveys of local e-government in the United States. Their outcomes show that the local governments were mainly informational, with just a few transactional functions. Therefore, the authors point out that the models proposed by Layne and Lee (2001) as well as Hiller and Bélanger (2001) do not describe the development process of e-government accurately, at least not among American local governments. According to Coursey and Norris (2008), these models are purely speculative and have been developed without any link to the literature about government. Finally, Coursey and Norris (2008) argue that there are no recognizable steps or stages in e-government. Rather, governments adopt e-government slowly and incrementally after an initial e-government presence, so that organizational and political factors are likely to significantly affect the development, performance and adoption of e-government application.

Following Lee (2010), the e-government stage models seem to be incongruent with each other, because they take different perspectives or use different metaphors. He reviewed and analysed twelve stage models found in the literature between 2000 and 2009. Accordingly, he defined the underpinning perspectives and concepts in order to identify the common frame of reference across the different models. The resulting common frame can be presented as a diagram and includes stages from the citizens/services' perspective (y-axe) and the operation/technology perspective (x-axe); the connecting points of these two perspectives are the government services (presenting, assimilation, reforming, morphing, e-governance). The stages from citizens' perspective are interaction, transaction, participation and involvement (Lee, 2010). Hence, the model we have chosen for our research is consistent with the common framework for stage models identified by Lee (2010).

The barriers identified by Coursey and Norris (2008) are not as significant for the development of Informational World Cities since such cities either have or aim to build up an advanced ICT infrastructure in the future. Those cities have launched projects to become a digital city, ubiquitous city, or smart city with the goal of better supporting their knowledge society. This implies that Informational World Cities have a very high penetration of ICT in all areas (government, business, and citizens) and, therefore, we do not analyse the cities' ICT infrastructures. We base our study on a modification of the five-stage model of e-government following Hiller and Bélanger (2001) and Moon (2002), which is consistent with the common framework for different stage models identified by Lee (2010).

2.2.2 Five pillars of e-government

In contrast to the assumption that e-governments must complete a certain stage before the next one can be achieved, we perceive those steps as almost individual challenges, which can be solved separately from each other or in parallel. Our approach supports Coursey and Norris (2008) arguments that there are no recognizable steps or stages in e-government development. Therefore, an e-government will not be deadlocked at stage one or stage two, but may skip, for example, the transaction stage and develop its vertical and horizontal integration first. According to this interpretation, the stages will be seen as pillars of e-government. It is obvious that the first step of this model, aiming to support a website with information, must be established before any other function can be implemented. For this reason, the aspects of usability and the existence of boundary documents will be analysed additionally for the pillar of information (also labelled catalogue). The remaining pillars do not necessarily have to be accomplished in a strict order. Some e-governments may be very advanced in terms of participation or transaction but still have the potential for improvement regarding the communication and social media aspects.

Pillar 1: Information dissemination (catalogue)

Of importance at this point is the content published online, usability, and accessibility. The latter one is an important factor on any website. Poor accessibility can exclude many disabled people from the provided services. Existing investigations of the accessibility of local government websites by the U.K. Cabinet Office (2005), Chen, Chen and Shao (2006), Shi (2007), Choi and Kim (2007) or Al-Khalifa (2010) have revealed some major accessibility issues. Moreover, the authors emphasize the need for accessibility standards in order to provide equal access to every citizen.

Pillar 2: Communication

The second pillar concerns the (two-way) communication, which nowadays revolves more and more around social media (Hartmann, Mainka, & Peters, 2013). Social media has become an acceptable information and communication channel in the public sector (Mergel, 2013). The use of online social networking services, such as Facebook, YouTube, Twitter, blogs or other digital media sharing sites entered the practices in the public sector (Mergel, 2013). For instance, Bonsón et al. (2012) conducted a study aiming to create an overview of the use of Web 2.0 and social media tools in local governments of the EU. There are also other studies comparing the use of social media between different countries (e.g. Yi, Oh, Gyun, & Kim, 2013), or analysing the adoption and use of social media in general (e.g. Mergel, 2013).

Pillar 3: Transaction

This pillar consists of financial and non-financial transactional e-government services such as renewing a driver's license, voter registration, state park information, and reservation, paying taxes and penalties etc. (Cook, 2000). A critical success factor for all transactional services is the users' trust (OECD, 2009). Kumar, Mukerji, and Persaud (2007) investigated the factors for successful e-government in Canada. Important website design variables are "perceived usefulness" and "perceived ease of use" (i.e., the classical dimensions of the Technology Acceptance Model; Davis, 1989); in other words, how easy and useful it is for the user to access, navigate, and consume the relevant information. Another study on

satisfaction with e-government was conducted by Reddick and Roy (2013) and focused on the businesses as the stakeholder (G2B). Nam (2011) studied Open Government and Government 2.0 as a new goal of the U.S. e-government. Nam learned that citizens who use e-government and who value the potential benefits of already existing services are supportive of the next development stages. Venkatesch, Chang and Thong (2012) identified that the most important attributes for transactional services are usability and security provision. There are also further studies on building Open Government (e.g. McDermott, 2010) or measuring its maturity (e.g. Lee & Kwak, 2012).

Pillar 4: Interoperability (Integration)
Pardo, Nam and Burke (2011) claim that the key component of e-government initiatives is the ability of multiple governmental and non-governmental organizations to share and integrate information across their organizational boundaries. Interoperability refers to a property of diverse systems and organizations, enabling them to work together (Gottschalk, 2009). However, it is still difficult for most governments to achieve interoperability among multiple governmental organizations (Klischewski & Askar, 2012). The importance of interoperability was also stressed by Gascó (2010), who claims that there is a need to design more sophisticated and complex e-government services. She points out many obstacles to meeting the newly emerging demands of the citizens, which cannot be covered by just one organization. Furthermore, public libraries should be considered as a provider of public technology access, training and support (Jaeger et al., 2012).

Pillar 5: Participation
E-Participation focuses on democracy and includes services such as political surveys, political discussion forums or online voting. Contributions in online participation could be divided into three groups: actors and activities, contextual factors and effects, evaluations and methods (Medaglia, 2012). It should be mentioned that the research in e-participation is limited by the immaturity of the research field, by topical gaps and by biased assumptions (Susha & Grönlund, 2012). However, there are some specifications on the ways in which governments should handle e-participation. For example, an investigation into political discussion forums by Saebo, Rose, and Molka-Danielsen (2009) identified some key design challenges for governments, e.g. the identification of major user groups and the need for addressing them during development. Another challenge is the involvement of certain politicians and administrators in the participation process in clearly defined roles. Finally, there is the development of user competencies (including technological literacy, but also information literacy and the competency of political participation).

Founded by the Five-Pillars-Model, our instrument for evaluating Informational World Cities' government websites consists of three components: (1) Maturity, (2) Usability, and (3) Handling of Boundary Documents. We applied three different methods during the empirical analysis of these components. In the following, we will explain these methods and present the results for the three research questions.

2.3 Methods

In the following, we introduce our methodology to measure the maturity of e-government, the usability of the navigation systems, and finally, to investigate the boundary documents

available on the governmental websites. We focused our research on the 31 Informational World Cities identified by Mainka et al. (2013b) (Figure 2.1).

Figure 2.1. Investigated 31 informational world cities. Source: Mainka et al., 2013b.

2.3.1 Maturity of e-government

To quantify the maturity of e-government, based on the five pillars model, we formulated a criteria model (Table 2.1). Each e-government pillar is divided into several sections based on Hiller and Bélanger's (2001) as well as Moon's (2002) model, and on several surveys analysing the user's information need regarding the e-government (Friedrichs, Hart, & Schmidt, 2002; Cook, 2000; Mainka et al., 2013a). Each pillar is valued at 100 points, leading to a maximum score of 500 points. The investigation is based on the official governmental websites of each of the 31 Informational World Cities in their native language or in English, translated with Google Translate. In addition, we sent emails to the official email contacts and asked about the horizontal and vertical integration in their cities. Further information was conducted using e-government programs, the press and the official websites of the Informational World Cities. The evaluation was conducted between December 2012 and January 2013.

Table 2.1. *The applied e-government maturity criteria catalogue.*

Pillar	Question	Points	Total
(I)	Are press releases available?	8.3	**100**
	Is basic information available?	8.3	
	Is information on healthcare available?	8.3	
	Is information on politics available?	8.3	
	Is information on services available?	8.3	
	Are forms for services available?	8.3	
	Is information for various user-groups available?	8.3	
	Is the website accessible via smartphones?	8.3	
	Are applications for smartphones available?	8.3	
	Are push services available?	8.3	
	Is the website available in English?	8.3	
	Is the website available in the languages of three biggest immigrant groups?	8.3	
(II)	Are social media services used?	20	**100**
	Is it possible to make appointments with an authority via the web?	20	
	Do I get answers to email requests?	20	
	Is emailing possible instead of written (snail) mail?	20	
	Is it possible to leave feedback or complaints?	20	
(III)	Is it possible to fill out forms online?	16.6	**100**
	Is it possible to pay taxes online?	16.6	
	Is it possible to pay penalties online?	16.6	
	Is it possible to pay fees online?	16.6	
	Are services for libraries available?	16.6	
	Is a personalized portal available?	16.6	
(IV)	Is an entry homepage available?	50	**100**
	Is there cooperation between authorities?	50	
(V)	Are online questionnaires available?	25	**100**
	Do forums and platforms for asking questions exist?	25	
	Is it possible to participate in a community meeting via the WWW?	25	
	Is it possible to vote online?	25	

2.3.2 Usability of the navigation systems

In order to evaluate the usability of the 31 e-governments a usability test was performed. For evaluation, we chose the method introduced by Röttger and Stock (2003), where the mean quality of information architecture is used as the indicator for a comparative analysis of websites. The quality measure is based upon click rates and break-off rates in task-based user tests. The users' click rates allow us to calculate the mean quality of navigation systems for each governmental website. Röttger and Stock (2003) created a parameter that involves three values: the minimum number of clicks (starting from the homepage and arriving at the

target site while using the optimal, i.e. the shortest, path), the number of break-offs (dropping the search after not finding the target site), and finally the number of clicks required by the test users to solve a task.

We formulated ten search and navigation tasks to check if users were able to access the core information or core services on the websites without any problems. We designed ten typical tasks, e.g. "Who is the head of government?" or "Find information about the Public Library", and presented them to our test persons. All in all, 44 test users took part in this study. Each website was evaluated by 10 to 16 users, except for the Chinese websites, which were evaluated by 4 native speakers. Additionally, a pre-test with 5 users was conducted.

Starting from the homepage, the test users had to record the required number of clicks to arrive at the target site. For each task, the target website was specified by the examiner. A handling time of three minutes was set for each task. After exceeding this maximum time, a "break-off" was recorded. The usability tests were performed in November and December 2012.

2.3.3 Boundary documents

Documents are never an end in themselves but act as means of asynchronous knowledge sharing for the benefit of an audience. This audience consists of factual or (in future situations) of hypothetical users. Like the documents' creators, the documents' users may have different intellectual backgrounds and speak different jargons. Where an author and a user share the same background, Østerlund and Crowston (2011) speak of "symmetric knowledge", where they do not, of "asymmetric knowledge". The asymmetric knowledge of heterogeneous communities leads to the conception of "boundary objects", a term coined by Star and Griesemer (1989). Boundary objects inhabit several intersecting social worlds and satisfy the informational requirements of each of them (Star & Griesemer , 1989). Boundary objects form bridges between different user groups (Fong, Valerdi, & Srinivasan, 2007) so that users can work together without a consensus (Star, 2010). Boundary objects are "infrastructures" that have arisen due to certain "information needs" and "information and work requirements" of different groups (Star, 2010, p. 602).

Some websites include such standardized forms (Fong, Valerdi, & Srinivasan, 2007), which they use to serve different communities of users. Boundary documents "seem to explicate their own use in more detail" (Østerlund & Crowston, 2011, p. 7). Thus, a boundary website will consist of an instruction sheet detailing its use. We searched for such instructions on the entry page of governmental websites. Since boundary documents serve different communities of users, boundary websites may have different tabs on their homepage, each leading to user-specific information. We thus analysed the e-governments' entry pages with regard to flags representing different user groups.

2.4 Results

In this chapter, we present our results, answering the three research questions: (1) What is the state of maturity of e-governments in Informational World Cities? (2) How good (or poor) is their usability? (3) How do they handle boundary documents? In order to better elaborate the results, we present the outcomes of a statistical analysis and evaluate the means,

standard deviations and correlation coefficients of the five pillars and e-governments' total scores for their maturity and usability.

Table 2.2. *Maturity levels of e-government for 31 Informational World Cities.*

Cities	(I) Information	(II) Communication	(III) Transaction	(IV) Integration	(V) Participation
Barcelona	70.91	57.16	94.00	100.00	50.00
Vienna	71.85	60.72	83.37	100.00	50.00
Singapore	82.92	54.30	86.14	87.50	50.00
Seoul	74.23	49.30	83.00	100.00	50.00
New York	91.85	52.16	83.00	87.50	40.00
Melbourne	68.70	50.02	77.40	100.00	50.00
Helsinki	89.64	66.00	66.39	81.00	40.00
Hong Kong	81.54	44.30	82.99	100.00	25.00
Stockholm	66.40	53.30	80.23	87.50	40.00
Milano	70.25	58.58	94.06	62.50	40.00
Sao Paulo	69.80	57.16	83.00	62.50	50.00
Shanghai	73.43	55.72	77.46	62.50	50.00
Montreal	66.32	34.30	66.30	100.00	50.00
Toronto	68.89	49.30	82.99	75.00	40.00
Berlin	89.36	49.58	44.26	87.50	40.00
Tokyo	59.60	34.30	83.00	100.00	25.00
Frankfurt	63.08	64.30	25.01	87.50	50.00
Munich	73.12	33.58	22.10	100.00	50.00
Amsterdam	76.08	67.14	44.26	50.00	40.00
Sydney	56.91	47.16	77.81	62.50	25.00
Chicago	61.42	27.16	55.30	100.00	25.00
Shenzhen	61.89	40.72	49.79	75.00	25.00
Vancouver	57.21	54.30	80.51	25.00	25.00
Beijing	54.69	35.72	44.46	50.00	50.00
San Francisco	70.02	41.44	44.46	75.00	0.00
Paris	72.39	35.02	33.20	50.00	40.00
Dubai	56.66	18.58	66.61	87.50	0.00
Los Angeles	48.80	24.30	55.30	50.00	50.00
Boston	75.09	21.44	47.24	75.00	0.00
London	39.41	49.30	16.60	62.50	40.00
Kuala Lumpur	58.78	18.58	16.67	50.00	0.00

2.4.1 Maturity of the e-government

Our results (Table 2.2) indicate that Barcelona (Spain), Vienna (Austria) and Singapore are the top-ranked Informational World Cities with regard to the maturity of their e-government.

Table 2.2 shows the maturity scores of Informational Word Cities' e-governments divided into the five pillars. All Informational World Cities' e-governments obtained a score of about 50 points in the first pillar (except for London). This shows that the most e-governments provide their residents with basic information. For the second pillar (two-way communication) the scores differ from each other. Amsterdam, Frankfurt and Vienna's e-governments are ahead with about 60 points, whereas Dubai and Kuala Lumpur get less than 20 points. The points' allocation for the third pillar (transaction), where we analysed the financial and non-financial transactions, is similar to the allocation of points for the second one. Barcelona and Milan's e-governments exceed 90 points, while London and Kuala Lumpur's e-governments acquire less than 20 points. The fourth pillar contains horizontal and vertical integration. As seen in Table 2.2, all Informational Word Cities' e-governments, except for Vancouver, score about 50 points. Only 9 out of 31 e-governments obtain the maximum amount of points (100). For the fifth pillar (participation), which gives citizens the opportunity of leaving feedback, making a complaint, or participating in an opinion survey, the diversity is greater than for the other pillars. Some e-governments (Kuala Lumpur, Boston, and Dubai) get zero points, while e-governments in such cities as Beijing, Paris, and Melbourne score a total of 50 points.

The results show that the e-governments of the Informational World Cities achieve different levels of maturity across the different pillars. Most e-governments make basic data publicly available, but regarding other pillars, such as transaction and participation, some of them could enhance their services.

Barcelona's e-government is very mature since all important aspects—a personalized portal, vertical integration—are accessible via the homepage. The website offers the possibility of taking part in political and social decision surveys and provides access to a variety of cultural (libraries, museums), educational, environmental and civil services. It is a good example of "one-stop-Government", where different tasks can be carried out and where information from different institutions is available. The aspects of transaction and citizens' participation are also important. A counter-example is an e-government focusing solely on information dissemination and non-transactional services, hence, maintaining the original bureaucratically charged image of official agencies.

2.4.2 Usability of the navigation systems

The results indicate that Vienna (Austria), Seoul (South Korea) and Shanghai (China) are the top-ranked Informational World Cities concerning the usability of their government websites (Table 2.3). The level of usability differs between the different websites. Vienna's e-government is very user-friendly and all the important aspects tested in the usability test are accessible via the homepage. The good mixture of text and images gives the website a simple but comprehensible design. Basic tasks can be accomplished easily even while browsing the website for the first time. The elaborate and comprehensible information architecture and the breadcrumbs permanently show the users where they are or where they were on the website. A counter-example is a website with information overload on the home page, making a quick orientation almost impossible. The lack of categorization of the information by its types or by user groups makes it even more difficult.

Table 2.3. *Usability results for investigated e-government websites.*

Rank	City	Points
1.	Vienna	927
2.	Seoul	876
3.	Shanghai	860
4.	Stockholm	822
5.	Munich	811
6.	Berlin	809
7.	Boston	783
8.	Helsinki	781
9.	Frankfurt	779
10.	San Francisco	775
11.	Vancouver	762
12.	Los Angeles	759
13.	Toronto	745
14.	Chicago	726
15.	Montreal	723
16.	New York	715
17.	Melbourne	706
18.	Amsterdam	700
19.	Paris	696
20.	Shenzhen	687.5
21.	Barcelona	687
22.	Beijing	680
23.	Milan	669
24.	Sydney	668
25.	Hong Kong	662.5
26.	Dubai	631
27.	London	629
28.	Sao Paulo	600
29.	Singapore	587
30.	Tokyo (English)	580
31.	Kuala Lumpur	504

2.4.3 Statistical analysis

The maturity and usability results for the investigated e-governments were statistically analysed in order to better elaborate the outcomes (Table 2.4 and Table 2.5). Considering the mean values for each investigated pillar, the e-governments were most advanced in terms of the integration (mean 77.21 out of 100 points) and information (mean 68.43 points). The

biggest potential for improvement lies in the communication (mean 45.32 points). The most coherent results were given for the information pillar with a standard deviation of 11.77 points. The biggest divergence between the e-governments was given for the transaction pillar with a standard deviation of 23.65 points. The overall maturity of investigated e-governments was rather sub-optimal, reaching the mean 289.57 (out of 500), with a standard deviation of 56.59 points.

Considering the usability of investigated websites, the span between the most and least usable e-governments was mediocre, reaching from 504 to 927 (out of 1000 points). The mean usability of 720.65 (around 72%) is rather suboptimal.

Table 2.4. *Descriptive statistics of the e-government's maturity and usability outcomes.*

VARIABLES	Descriptive statistics			
	Mean	**S.D.**	**Min**	**Max**
(1) Information	68.43	11.77	39.41	91.85
(2) Communication	45.32	13.92	18.58	67.14
(3) Transaction	62.80	23.65	16.60	94.06
(4) Integration	77.21	20.70	25.00	100.00
(5) Participation	35.81	16.74	0.00	50.00
(6) Maturity	289.57	56.59	144.03	372.07
(7) Usability	720.65	93.03	504.00	927.00

Table 2.5. *Correlations between e-government's maturity and usability outcomes.*

VARIABLES	Correlations (Spearman)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
(1) Information	1.00						
(2) Communication	0.42*	1.00					
(3) Transaction	0.24	0.39*	1.00				
(4) Integration	0.29	-0.02	0.33	1.00			
(5) Participation	0.17	0.43*	0.20	0.20	1.00		
(6) Maturity	0.59**	0.64**	0.74**	0.59**	0.53**	1.00	
(7) Usability	0.35	0.21	-0.08	0.21	0.27	0.21	1.00
The symbols * and ** denote statistical significance at the 5% and 1% levels.							

We have applied Spearman's rank correlation coefficient to measure the nonparametric statistical dependencies between the results for investigated pillars and usability of governmental websites. There is a positive correlation at 1%-level between the different pillars and overall maturity. This correlation was expected since the maturity level displays the sum of the respective pillars' results. However, there is a correlation at 5%-level between the pillars information and communication, communication and transaction, as well as communication and participation, meaning that e-governments with advanced information pillar also lead in terms of the communication pillar, whereas advanced communication pillar indicates more progressed transaction and participation pillars. Only integration remains with no correlation, indicating that this pillar is being developed separately from other aspects and there is no connection between more or less progressed integration and the development of investigated aspects. We, therefore, conclude that the consideration of

different e-government aspects as separate pillars instead of consecutive steps is justified, especially regarding more advanced domains like integration.

Table 2.6. *Comparison of our outcomes with results by Holzer et al. (2014).*

VARIABLES	Correlations (Spearman)						
	(1)	(1a)	(2)	(2a)	(3)	(3a)	(4)
(1) Information	1						
(1a) Content (Holzer)	0.10	1					
(2) Transaction	0.26	0.55*	1				
(2a) Services (Holzer)	0.16	0.49*	0.28	1			
(3) Usability	0.38	0.24	0.12	0.28	1		
(3a) Usability (Holzer)	-0.18	0.35	0.53*	0.50*	0.11	1	
(4) Maturity	0.65**	0.49*	0.79**	0.40	0.50*	0.35	1
(4a) Digital Governance	0.25	0.64**	0.54*	0.87**	0.25	0.69**	0.60**

The symbols * and ** denote statistical significance at the 5% and 1% levels.

In order to analyse our outcomes from a more holistic view, we conducted a comparison with the results of e-government maturity and usability investigation undertook by Holzer et al. (2014). Since only a fraction of the investigated cities overlapped (16 out of 31), and because of the differences in the distribution of indicators and their quantifiers, only an approximate comparison of the results was possible. Partially comparable aspects are the outcomes for information (or, according to Holzer et al., content), transaction (or services), usability, and the overall maturity (or digital governance) since they encompass similar domains. Interestingly, the overall results for digital governance and maturity correlate positively at a 1%-level, meaning that even though two different models were applied, the resulting rankings are displaying significant similarities (Table 2.6). There are some further positive correlations between these two models at a 5%-level, namely our transaction pillar with the outcomes for digital governance, usability, and content domain by Holzer et al., as well as our maturity outcome with Holzer's content domain. At first sight, there are no correlations between similar domains or pillars, but instead, between (supposedly) different aspects. The possible explanation could be the different allocation of indicators between the investigated dimensions, which makes the dimensions themselves rather not comparable, but eventually, the overall outcomes are similar.

Interestingly, when considering only a fraction of investigated cities, our outcomes for maturity and usability also correlate significantly at a 5%-level. Apparently, some of the very mature websites (not included in the comparison) unfortunately showed poor levels of usability or vice versa. Here, the necessity to provide a usable website comes to light—no matter how mature the contents and applications offered on a website are, they also have to be accessible and retrievable.

2.4.4 Boundary documents

Having analysed all government websites of the defined cities, only Tokyo's government website provides an instruction sheet. All other websites provide exclusively remarks on

accessibility or general information but contain no page which explains how different user groups can interact with the website.

On the other hand, the flagging of different user-specific information areas seems to be typical for e-government. In total 84% of our analysed websites (i.e., 26 out of 31) apply links to user-specific information on their entry pages. Most homepages address residents, businesses, and visitors. A good example for targeting different user groups is found on the website of the City of Chicago.

Even though boundary documents are supposed to improve the navigation on a website, when considering our usability results, there is no direct link between boundary documents, or at least classification of user-specific information areas, and the resulting usability score. The only website with an instruction sheet as a boundary document (Tokyo) did not perform well in our task-based usability evaluation (rank 30 out of 31). When considering the flagging of user-specific information sections, the five cities without any separated sections have performed much differentiated (Vienna had the most usable website, Munich took 4th rank, Vancouver was 11th, Milan 23rd, and Sao Paulo 28th). Apparently, the test persons evaluating the municipal websites did not need the boundary documents. The boundary documents solutions were either not necessary due to well-structured websites (Vienna, Munich, Vancouver), or they were insufficient to help to navigate on less structured ones (Milan, Sao Paulo, Tokyo). The investigation of boundary documents, the task-based usability evaluation, and maturity investigation had to be conducted separately not to distort the results.

2.5 Discussion

All 31 analysed Informational World Cities provide online services for governmental purposes. In this article, we investigated the maturity of e-government in the sense of a five-pillar model as well as the usability of the government websites' information architecture and checked whether these websites cater for different user groups.

The maturity of the 31 analysed e-governments is more or less suboptimal. Even the class-best website, of the city of Barcelona, fulfilled only 74% of all scrutinized aspects. The average of all maturity values were 289 points (out of 500). This means that nearly half of the described aspects are lacking. Many of the evaluated municipal governments still focus on information dissemination. Our assumption that there are rather independent pillars of e-government than interdependent stages has been validated. The top cities succeeding (nearly) 100% in the fourth or third pillar did not necessarily perform as well regarding pillars one or two.

The usability of e-governments' information architecture is varying between 504 and 927 (out of 1,000) points. The top-ranked Informational World City, Vienna, scored 927 points, which means that almost all information can be retrieved without any problems. When considering all investigated cities, there is no correlation significant at a 1%- or 5%-level between the maturity and usability of e-governments. Even though some governmental websites offer mature contents and utilities, without appropriate accessibility and retrievable information, they cannot satisfy the needs of their citizens. When planning the advancement of their websites, the governments should focus on both aspects—mature content fulfilling

the expectations of the users and usable navigation system enabling citizens to actually access these contents.

Governmental websites are boundary documents and address different user groups. Nearly all websites apply tabs to support navigation to user-specific content, however, only one e-government included a more detailed support in the form of an instruction sheet. Nevertheless, when applying task-based evaluation of the superficial navigation system, the supporting boundary documents do not seem to play a significant role.

In conclusion, there is a great potential for improvement regarding the maturity levels of governmental websites. For some municipalities, the usability standards of their e-governments should be improved. However, in this context, the sole implementation of boundary documents does not seem to necessarily improve the usability of the (at least superficial) navigation system of the websites.

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3 Inter-Generational Comparison of Social Media Use: Investigating the Online Behaviour of Different Generational Cohorts

After our investigation of the e-government websites in 31 informational cities, focus of the following studies will be shifted to other fruits of modern digitalized world—the social media. Firstly, the emphasis is set on the users and their information behaviour on several social media platforms that have reached certain popularity in the last few years.

Today we cannot imagine our everyday life without the Internet. Some of us do not even remember the times when we actually had to get outside to buy new clothes or book a vacation. Now, all these tasks can be managed with the help of the Internet, comfortably from our homes. One of the most booming Internet offerings are the so-called social media. In our study, we investigate the divergences in social media usage between different generations. The outcomes of our investigation might be a valuable guide for businesses focusing on online marketing, social shopping, or e-commerce in general, and desiring to reach the right target groups. Once the businesses identified services mostly used by their target customers, they can focus on building a relationship with them through the social network, committing them to the brand and, hence, influencing their decision-making.

3.1 Introduction

Social media, or social software, are internet-based applications founded on the Web 2.0 allowing the creation and exchange of user generated content, as well as providing the possibility of creating micro-content focusing on social connections between people (Alexander, 2008; Kilian, Hennings, & Langner, 2012; Leung, 2013; Shuen, 2008). It differs from traditional mass media focused on the one-to-many distribution of content from professionals to passive audience. Social software is based on many-to-many networks of active users sharing content among them, which fundamentally changes media user behaviour (Kilian, Hennings, & Langner, 2012, p. 114). Facing these developments, businesses must adapt their products and services to the changing needs of the consumers, especially because the shifts in media behaviour are likely to be more profound in the future (Kilian, Hennings, & Langner, 2012, p. 114). Also, considering the increasing amount of available online social media, businesses should focus on the ones involving their target groups in order to build up a high-quality customer relationship.

Despite the names “social networks” or “social media”, much of the user activity on social network services (SNSs) appears to be “self-focused” (Gentie, Twenge, Freeman, & Campbell, 2012, p. 1929). It appears that the younger generations of online media users exhibit narcissistic features that are either strengthened with (or first evolved due to) the new media like SNSs (Bergman, Fearrington, Davenport, & Bergman, 2011; Kwon & Wen, 2010; Twenge, Konrath, Foster, Campbell, & Bushman, 2008a; 2008b), or the online providers recognize the needs of the youngest users and offer services more and more self-centred. Also, generations growing up with the now ubiquitous communication technologies rely, to a great extent, on their mobile devices and the Internet to cultivate their social

contacts, as well as for educational and professional purposes (Salajan, Schönwetter, & Cleghorn, 2010, p. 1393). This dependence, and in some cases even problematic social media use nearing an "addiction" (Cabral, 2011), differs from the older generation's attitude towards digitalization, whose members partially integrated the new media in the later and more advanced stages of their lives.

Different generations, diversely labelled and defined by researchers, have different motivation for and manner of using the online media. These new digital tools are slowly replacing the known, traditional means of communication. For example, key motivation for Generation Y (adolescent in the 1990s and 2000s) to use social media is the need for interaction with others. Apparently, users between 17 and 34 years old are more likely to prefer social media for interaction with friends and family than older age groups (Boltin et al. 2013; Palfrey & Gasser, 2008). Hence, considering the younger generations, social media replace (and/or complement) the communication by letter, phone, or even email. Their use of text messaging is up while their email usage is down (Williams, Crittende, Keo, & McCarty, 2012, p. 128).

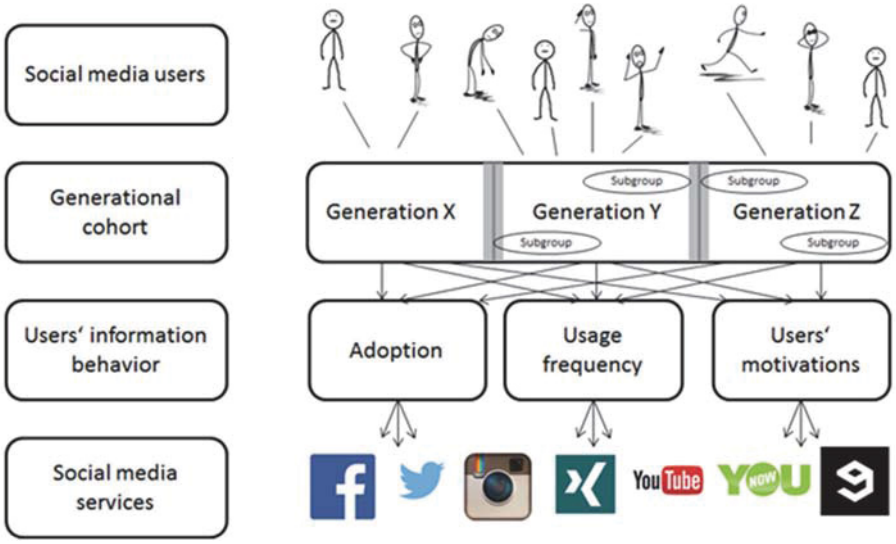

Figure 3.1. Our research model.

This is our research model (Figure 3.1): There are several theories on inter-generational differences as well as research on user behaviour characteristics for specific generational groups. In our study, we conduct a broad analysis of social media usage, concerning as many generational cohorts as possible, as well as taking into account the influence of different life stages on user behaviour. We theorize that there are three cohorts (Generation X, Y, and Z), but the borders between the generations may be fuzzy (marked grey in the Figure 3.1). We class every social media user into one generational cohort by his or her year of birth. Then we examine the users' information behaviour in terms of the adoption of social media (amount of social media subscribed), the usage frequency, and the motivations. Finally, based on our findings, we define whether there are distinct subgroups within the Generation Y and the Generation Z.

We defined three working hypotheses that we tested through our study:

H1: There are inter-generational differences in social media use concerning the amount of social media adopted, the frequency of use, and the motivation.

H2: There are intra-generational differences in social media use dependent on specific stage of life.

H3: There is a new generation currently reaching legal age that fundamentally differs from previous generations (including Generation Y) concerning the social media use.

3.2 Defining Generational Cohorts

3.2.1 Changes in technology and user behaviour

According to Prensky (2001), the arrival and dissemination of digital technology at the end of the 20th century have "changed everything so fundamentally that there is no going back." This discontinuity is so severe that he describes it as "singularity." Prensky calls the newest generation born and raised in this time the Digital Natives. They spend their entire lives surrounded by computers, cell phones, and all other "toys and tools of the digital age." This terminology is based on his notion that the members of this generation are "native speakers" of the "digital language." He also turns to the basic approach of cultural migration—kids "born into any new culture learn the new language easily, and forcefully resist using the old." The older generations, the "adult immigrants," either accept the changes letting their descendants help them to learn and integrate or "spend most of their time grousing about how good things were in the old country" (Prensky, 2001, p. 3).

In the last decades, not only the technology has changed, but also the attitude and motivation of its users. The consumers transformed from passive by-standers (traditional media is controlled by the advertiser in a B2C-monologue) to hunters (consumer controls the interactivity), and further to active participants in the media process (consumers create, consume, and share messages) (Hanna, Rohm, & Crittenden, 2011; Williams, Crittende, Keo, & McCarty, 2012, p. 131). Li and Bernoff (2008) investigated the ecosystem of social media and recognized five different types of behaviours among the active participants. There are *Creators* focused on publishing, maintaining, and uploading, *Critics* (commenting and rating), *Collectors* (saving and sharing), *Joiners* (connecting, uniting), and *Spectators* (reading) (Hanna, Rohm, & Crittenden, 2011, p. 268 f.).

During research on social media, it is important to consider the uses and gratifications approach suggesting that the users actively choose the media that best fulfil their needs, and their choices are further based on past media experiences (Blumer & Katz, 1974). There are several factors influencing the choice of social media, like functional, situational and personal ones (Groebel, 1997; Kilian, Hennings, & Langner, 2012). McQuail (2010) distinguishes four main motives for using media and communication technologies, namely information, personal identity, entertainment, and integration/social interaction (Kilian, Hennings, & Langner, 2012, p. 116). It is possible that these motivational factors are to some extent shared by the members of a distinct generational cohort. Hence, the motivation is an important aspect in our investigation to differentiate the generations.

3.2.2 From the Silent to the Net Generation

The generational cohorts occur around shared experiences or events "interpreted through a common lens based on life stage," rather than being based on social class and geography, hence, each generation shares a common perspective (Bolton et al., 2013, p. 247; Mannheim, 1952; Sessa, Kabacoff, Deal, & Brown, 2007; Simirenko, 1966). There are many definitions of generational cohorts as well as estimations on the years their members were born in. According to Tapscott (2009), the generations should be categorized as follows: Baby Boomer, Baby Bust, and Echo Boomer (also called Net Generation or the Generation Y). Baby Boomers are people born between 1946 and 1964. Following that period of time, the birth rates fell dramatically in the next decade. This generation, born between 1965 and 1976, was called the Baby Bust (Generation X or Gen Xers). Apparently, "X" stands for the feeling of exclusion from society and of being less competitive in the job market. The Echo Boomers (labelled by other authors as Millennials or Generation Y) were born between 1977 and 1997 and can be best described as the "first generation bathed in bits" (Leung, 2013, p. 99; Tapscott, 2009).

Brosdahl and Carpenter (2011) categorized the generations using the following birth dates: Silent Generation (1925-1945), Baby Boomers (1946-1960), Generation X (1961-1981), and Generation Y born after 1981. Bolton et al. (2013) defined the Generation Y as people born between 1981 and 1999, regardless their circumstances (i.e., geographical or socio-economic factors etc.). Freestone and Mitchell (2004) describe the cohorts as Matures (1929-1945), Baby Boomers (1946-1964), Generation X (1965-1976), and Generation Y (1977-1993). McIntosh, McRitchie and Scoones (2007) pursued a little different categorization: Silent Generation (pre-WWII), Baby Boom generation (1946-1962), Generation X (1963-1977), and Generation Y (1978-1986).

As we can see, some of the timespans correspond, whereas other are fuzzier concepts—especially the deliberations on Generation Y, which is why, in our study, we will try to shed light on the very Generation Y and its (possible) successors.

3.2.3 The Digital Natives or Generation Y

The most mysterious generation is the Generation Y, also being in focus of our research. The labels for this generation as well as the timeframe for the years of birth of the members differ from researcher to researcher.

The Generation Y is also called the Digital Natives (Prensky, 2001), Net Generation (Oblinger & Oblinger, 2005; Tapscott, 1998), Echo Boomers, Net Kids (Tapscott, 1998), Gen Y (McIntosh-Elkins, McRitchie, & Scoones, 2007), or Millennials (Howe & Strauss, 2000). The years of birth of this generation proposed in the literature vary between 1977 (Leung, 2013; Tapscott, 2009), 1978 (Martin, 2005; McIntosh-Elkins, McRitchie, & Scoones, 2007), 1980 (Weiler, 2004), and after 1981 (Bolton et al., 2013; Brosdahl & Carpenter, 2011; Williams, Crittende, Keo, & McCarty, 2012). The upper limit of the years of birth is also not definite—from 1986 (McIntosh-Elkins, McRitchie, & Scoones, 2007) and 1988 (Martin, 2005), through 1993 (Gentile, Twenge, Freeman, & Campbell, 2012), 1994 (Weiler, 2004), 1997 (Leung, 2013; Tapscott, 2009), up to 2000 (Williams, Crittende, Keo, & McCarty, 2012).

This Net Generation is very techno-savvy and contradicts the children of Baby Boomers who believed that education is the key to success. For them, the technology is "as transparent as the air, diversity is given, and social responsibility is a business imperative" (Martin, 2005, p. 39). They are also described as the most visually sophisticated of any generation (Williams, Crittende, Keo, & McCarty, 2012, p. 127). The Millennials, or Digital Natives, embrace the new media more comprehensively than the older generations (Howe & Strauss, 2000; Kilian, Hennings, & Langner, 2012; Prensky, 2001). They are often described as self-confident, self-reliant, independent, and goal-oriented (McIntosh-Elkins, McRitchie, & Scoones, 2007, p. 242). For the Generation Y, it is characteristic to be early and frequently exposed to technology, which may have advantages as well as disadvantages in terms of cognitive, emotional and social outcomes, for example, when they rely heavily on technology for entertainment, to interact with others or even to regulate their emotions (Bolton et al., 2013, p. 247).

Digital Natives are considered to be more open to change, better learners, more tolerant to diversity and efficient multi-taskers, because of their exposure to rapidly changing technology, accessible education and supportive families (Bolton et al., 2013, p. 252). They were born "right around the time of a qualitative leap in the nature of communications technologies which brought about the mass-consumer level usage of email, the Internet and the WWW" (Salajan, Schönwetter, & Cleghorn, 2010, p. 1393). Therefore, they feel comfortable with computers and they are more likely to be online consumers and users of social media rather than their parents or grandparents. They are conversant with a "communications revolution transforming business, education, health care, social relations, entertainment, government, and every other institution" (Lenhart, Madden, Macgill, & Smith, 2007; Leung, 2013, p. 998).

An interesting diversification was proposed by Palfrey and Gasser (2008), who suggested the existence of a third group between the Digital Immigrants and Digital Natives—the Digital Settlers, who adopted the new technology from its beginning. Digital Settlers are not "native" to the digital environment, since they grew up in an analogue-only world, however, helped to shape the digital one and are quite sophisticated in their use of these technologies (Palfrey & Gasser, 2008, p. 4). The Digital Immigrants might have learned how to use email and even joined social networks, but since this occurred in their later stages of life, the digital world remained foreign to them. In contrast, the Digital Natives were born into digital world, and do not remember the analogue-only world in which "letters were printed and sent, much less hand-written, or where people met up at formal dances rather than on Facebook" (Palfrey & Gasser, 2008, p. 4; Williams, Crittende, Keo, & McCarty, 2012).

Kilian, Hennigs and Langner (2012) contradicted the notion of Millennials being a homogenous group, as they identified three different clusters within this cohort: (i) the *Restrained Millennials* showing lowest ratings for social media use in both active and passive behaviour; (ii) the *Entertainment-Seeking Millennials* showing the highest mean ratings with regard to the passive use of social networks and file-sharing communities, and (iii) the *Highly Connected Millennials*, who are more likely than the representatives of the other groups to actively use social media in order to build social networks (Kilian, Hennings, & Langner, 2012, p. 117 f.).

Another interesting finding is that the Millennials generation is apparently more narcissistic than the previous ones, which occurred alongside increased usage of social network services (Bergman, Fearrington, Davenport, & Bergman, 2011; Kwon & Wen, 2010; Twenge, Konrath, Foster, Campbell, & Bushman, 2008a; 2008b). The question arises, whether there is a connection between these two aspects (Bergman, Fearrington, Davenport, & Bergman, 2011, p. 706). SNSs appear to provide narcissistic individuals with the opportunity to display vanity, for self-promotion, to gain approval and attention as well as to manipulate their public image (Bergman, Fearrington, Davenport, & Bergman, 2011, p. 709). Still, according to Bergmann, Fearrington, Davenport and Bergmann (2011), the usage of SNSs by the Millennials is not solely about attention seeking or maintaining self-esteem. It is rather a medium supporting communication with peers and family. The new generation simply prefers to connect and communicate via SNSs instead of letter, telephone or email, hence, "this may not be a sign of pathology, but a product of the times" (Bergman, Fearrington, Davenport, & Bergman, 2011, p. 709). Narcissists strongly desire social contact, which is their source for admiration, attention, and approval, even though they lack empathy and have only few close relationships (Bergman, Fearrington, Davenport, & Bergman, 2011, p. 706; Morf & Rhodewalt, 2001). The motivation for using the social media, i.e. either communication with peers or outlet for narcissistic needs, may therefore be an important aspect to mark the inter- and intra-generational differences.

3.2.4 Generation Z?

Even though the media have existed from the birth of Generation Y (assuming it to be since the year 1981), they were widely adopted over two decades later (after 2003) (Bolton et al., 2013; boyd & Ellison, 2008). Hence, there are possibly significant differences between members of the generation born in the 1970s, 1980s or even early 1990s, and these born in the late 1990s and 2000s. Assuming that the members of Generation Y were born already in 1970s and 1980s, their children, born in the late 1990s and 2000s, were raised in a totally different environment—not only considering the ubiquitous technology, but also the frequent use of technology at home by their parents (being more familiar with digital gadgets as compared to Generation X).

Therefore, voices in the literature suggest the emergence of a subgroup within the Millennials cohort, namely Generation C born after 1990 (Booz&Company, 2010; Wiliams, Crittende, Keo, & McCarty, 2012, p. 128). The members of Generation C are fond of content creating and mashing (mash up, i.e., combining content material from several sources in order to create a new content), they have a tendency to form active communities rather than remain passive, they desire to be in control of their own lives, they are content with complexity, desire to work in more creative industries and to be less restricted by rigid social structures (Booz&Company, 2010; Wiliams, Crittende, Keo, & McCarty, 2012, p. 128).

According to Booz&Company (2010), by the year 2020 an entire generation will have grown in primarily digital world and it will be called Generation C (for connect, communicate, change, content-centric, community-oriented, computerized). The members of this generation are realists and materialists; they will be culturally liberal and politically progressive; the most social interactions will occur on the Internet. Since they were born

after 1990 and lived their adolescent years after 2000, they have owned digital devices all their lives.

The most research on generational disparities is focusing on distinct subgroups (like high school students, college students etc.) that diverge in age and lifecycle stage, which in turn may lead to distinguished social media use as well. People born after 1994 are not always considered as a part of Generation Y, because teenagers use social media unlike the adults (Bolton et al., 2013, p. 257). The changes in user behaviour occur more slowly than technological developments, since the usage patterns are partially habitual and sticky. Hence, the upbringing and education (i.e. socialization) have a profound influence on the future behaviour (i.e. media use) as well (Kilian, Hennings, & Langner, 2012, p. 114). It is possible, that the Millennials are not a homogenous group, and consists of subgroups with different social media user behaviour (Kilian, Hennings, & Langner, 2012, p. 115). There is also evidence of intra-generational differences regarding social media users, based on environmental factors (including economic, cultural, technological, and political or legal factors) as well as individual factors, i.e. stable factors (socio-economic status, age, and lifecycle stage) and dynamic or endogenous ones (goals, emotions, social norms) (Bolton et al., 2013, p. 245).

Even though our primary aim is to investigate the possible divergences of social media usage between generations, especially the Generation Y and its potential successor—Generation Z or Generation C, we did not fully refrain from including some socio-demographical factors that may also influence the outcomes.

3.3 Methods

3.3.1 Questionnaire

Dominant means of investigating information systems' usage and users' motivations to apply such systems are surveys. For our study, we created an online questionnaire, which was distributed through several online channels (like social networks or newsletters) as well as "offline" through word-of-mouth advertising. There were two language versions of this questionnaire—English and German. Despite the overall inter-generational discrepancies, the nature and intensity of social media usage can be also shaped by cultural context, like the collective or individualistic one (Bolton et al., 2013, p. 250; Hofstede, 2001). However, due to globalization the use of social media by the Generation Y may become more homogenous despite the different cultural roots (Bolton et al., 2013, p. 251). Therefore, we did not set any geographical or socio-economic restrictions regarding our test subjects.

In the questionnaire, we asked about the use of 13 social media services. We did not include further services to avoid frustration of the participants and breaking off the survey due to too many questions. We included the popular social network services Facebook, Google+, Twitter and Instagram, as well as the business social network services LinkedIn and Xing. In addition, we asked about further photo and video sharing services like Flickr, Pinterest, Tumblr or YouTube. Finally, we added a service characterized by a high amount of gamification elements—Foursquare, as well as some newcomers to the Web 2.0—the live video-streaming platform YouNow and service for sharing of the so-called "memes" 9gag.

Due to the limited space of this article, here we report on 7 (out of 13) social media services: Facebook, Twitter, Instagram, Xing, YouTube, YouNow, and 9gag.

We did not include the typical consumer communication services like WhatsApp, Skype, Viber, or LINE, as it would go beyond the scope of this study (and require integration of too many possible services and, hence, questions about them). We included social network customized for business networking, LinkedIn and Xing, as we assume they will be utilized by most interviewees at a certain life stage (most probably after the graduation), however, we excluded more specialized services for smaller target groups dependent on their career rather than age (like ResearchGate for researchers etc.).

Regarding the use of social media, we formulated 3 types of questions. The first one was a polar question about the use of certain services, e.g. 'Do you use Facebook?' Dependent on the answer, two follow-up questions about the concerned service succeeded—about the frequency with which the service is used (e.g. 'How often do you use Facebook?') and about the motivation for using the service (e.g. 'In reference to Facebook, it is important to me that…'). The inquiry about the motivation was adjusted to each service and included three sub-questions, for example, in case of Facebook, 'it is important to me that (i) I have a lot of friends, (ii) I get a lot of "likes," (iii) my personal data is treated as confidential.' The answers for frequency of usage and motivation questions could be marked on a 7-point Likert scale, where "1" meant fully disagree (or in case of frequency—"almost never") and "7" meant fully agree (or "I am always online"). Through these two questions we tried to investigate the different types of users introduced by Kilian, Hennigs and Langner (2012), including restrained users (rarely using few social media services), passive users (often utilizing several services, however, staying in the background), and finally the "highly connected" users that are active on many services (and seeking for high amounts of "likes" and "followers"). The motivation for using a social media service, for example, the need for sharing personal photos and receiving many "likes", may indicate some level of narcissistic behaviour that could be also a characteristic aspect for certain generational cohorts. Technically, the quasi interval/metric characteristics of the (7-point) Likert scale render it appropriate for hypothesis testing of mean responses and cluster approaches. This procedure is a common practice for a scale, since numerical values are assigned to the response categories and, thus, modelling equidistant intervals (Ary, Jacobs, & Razavieh, 1996).

At the end of the questionnaire we included an open question—What other services do you use? This way we were able to partially include other services in our survey. The socio-demographic questions regarded gender, year of birth, country, and education (namely: still at school, university student, bachelor's degree, master's degree, doctoral degree, or others).

3.3.2 Statistical analysis

We consider two complementary analytic approaches. First, we use descriptive statistics to examine inter-generational differences in social media use and motivation for selected social media platforms. Therefore, we calculate two-sided t-tests for generations X and Y by adapting relevant literature—for Generation X, we adapted the birth years approx. between 1960 and 1980 (Bolton et al., 2013; Brosdahl & Carpenter, 2011; Freestons & Mitchell, 2004; McIntosh-Elkins, McRitchie, & Scoones, 2007; Tapscott, 2009), for Generation Y

approx. between 1980 and 1996 (Bolton et al., 2013; Brosdahl & Carpenter, 2011; Freestons & Mitchell, 2004; Leung, 2013; Tapscott, 2009), and for Generation Z, based on our estimation, we defined the earliest year of birth to be 1996. Our t-tests assessed whether the mean of a certain generation is statistically different from other generations. For instance, our analytic approach examines the differences of the means between Generation X and the pooled observations for Generation Y and Z. We determined the significance of the differences between those three generations in terms of their usage of social media and motivation, followed by a conclusive inter-generational comparison. Furthermore, t-tests are used for testing the mean of two populations when the population variance is unknown, which is almost always the case in practice.

Second, we propose a cluster solution to identify intra-generational differences for social media use, since the cluster analysis is an effective tool in scientific or managerial inquiry. For this study, the K-means clustering algorithm is applied. This method is widely used and it seeks for a nearly optimal partition with a fixed number of clusters. The K-means algorithm has been popular because of its easiness and simplicity for application (Kim & Ahn, 2008). Its iterative algorithm searches for a local solution that minimizes the Euclidean distance between our observations and the cluster centres. Furthermore, this approach is less sensitive to outliers than other hierarchical models and the most frequently used segmentation technique among the clustering techniques in the literature.

We can implement the cluster analysis for a segmentation of Generation Y and Z. We do not use this approach for Generation X due to its relatively small number of observations. We believe that this might be a promising opportunity for further research.

3.4 Results

Our survey on social media usage was conducted from 13th of March to 23rd of May 2015 with the help of the tool: UmfrageOnline. From total 430 participants, 373 completed the study (30.3% were male and 69.7% female). We identified 47 persons representing Generation X, 221 representing Generation Y, and 90 representing Generation Z. The test persons came from Germany (60%), Poland (21%), Switzerland (4%), United States (4%), Russia (1.3%), Austria (1%), United Kingdom (0.8%) and from other countries (7.9%). 22% of our test persons are still at school, 35% are university students, 17% hold a bachelor's, 17% a master's and 5% a doctorate degree (4% claimed "other" course of education).

3.4.1 Inter-generational differences between Generations X, Y, and Z

Table 3.1 shows inter-generational differences in social media use and sheds light on the motivation for and frequency of using them. By implementing two-sided t-tests that allow comparing different generations with each other, we find that Generation X is on average less likely to use Facebook compared to younger generations. The negative value of –0.084 indicates the difference between the means of Generation X and the means of pooled Generation Y and Z towards their response to the use of Facebook. The difference is statistically significant at the 5%-level. Similar results can be observed for Instagram and 9gag. These results are in line with our expectations, since people born before 1980 can be described as digital immigrants, who lag behind with the usage of social media compared to younger generations.

Table 3.1. *Inter-generational comparison of social media use.*

	Generation X (N = 47)	Generation Y (N = 221)	Generation Z (N = 90)
Variable	Mean Diff.	Mean Diff.	Mean Diff.
Facebook			
Use of Facebook	-0.084*	+0.118**	-0.106**
Facebook frequency	-0.794**	+0.774**	-0.514*
Facebook motive: Friends	+0.389	-0.349	-0.336
Facebook motive: Likes	-0.173	+0.190	+0.426
Twitter			
Use of Twitter	+0.226**	-0.018	-0.165**
Twitter frequency	+1.355**	-0.248	-0.688**
Twitter motive: Followers	+0.967*	-0.343*	-0.315
Twitter motive: Likes/Retweet	+0.845**	-0.237	-0.332
Instagram			
Use of Instagram	-0.186**	-0.110*	+0.325**
Instagram frequency	-1.167**	-0.614*	+1.898**
Instagram motive: Followers	-0.762*	-0.581**	+1.449**
Instagram motive: Likes	-0.657*	-0.525*	+1.334**
Xing			
Use of Xing	+0.105	+0.101*	-0.229**
Xing frequency	+0.442*	+0.292	-0.795**
Xing motive: Contacts	+0.302	+0.408*	-0.815**
Xing motive: Visitors	+0.271	+0.395*	-0.710**
YouTube			
Use of YouTube	+0.013	+0.031	+0.051
YouTube frequency	-0,229	-0.120	+0.376
YouTube motive: Subscribers	-0,176	-0.196	+0.319*
YouTube motive: Comments	-0,021	-0.173	+0.287
YouNow			
Use of YouNow	-0,025	+0.174	+0.015
YouNow frequency	-0,095	+0.003	+0.051
YouNow motive: Fans	-0,053	+0.030	+0.071*
YouNow motive: Likes	-0,053	-0.036	+0.071
9gag			
Use of 9gag	-0,172	+0.226**	-0.166**
9gag frequency	-0.778**	+1.107**	-0.810**
9gag motive: New friends	-0.200*	+0.306**	-0.240**
9gag motive: Up-votes	-0.240*	+0.306**	-0.213*
The symbols * and ** denote statistical significance at the 5% and 1% levels			

Surprisingly, Generation X is statistically more likely to use Twitter than younger generations (Table 3.1). We can explain these results with the more practical purpose of this short message service: Users of Twitter aim to share news or opinions about current events with little effort and efficiency (Wochnik, 2015). Younger generations might be more likely to use the full scope of more elaborated technical capacities to share information, e.g. via

Facebook or YouNow. Also, Twitter is increasingly used for sharing political information, news, or research updates, which means that the user mostly follow and/or share with strangers, whereas the younger generations prefer to use social media to stay in touch with friends and peers (Wochnik, 2015). Furthermore, results for Generation X's motive for using Twitter indicate that users born before 1980 are particularly interested in gathering followers and being retweeted. All results are significant at the 1%- or 5%-level.

When considering the results for Generation Y, we can show that individuals born between 1980 and 1995 are more likely to use Facebook. This is in line with our expectations, as Facebook appeared in the mid 2000's and became the first mainstream social media instrument for digital natives (Ellison, Steinfield, & Lampe, 2007). An explanation therefore could be that other generations either deliberately remain aloof to find their own and separate online platforms to communicate (e.g. Generation Z, see Wochnik (2015)), or are reluctant due to Facebook's complexity or the associated privacy issues (e.g. Generation X, see Prensky (2001, p. 3). Additionally, we find that Generation Y is statistically more likely to use Xing. This result is significant at the 5%-level and, respectively, at the 10%-level for the frequency of use. A high number of subjects born between 1980 and 1995 might already be employed or actively seeking work. Given this background, the use of a business-oriented social network site appears comprehensible for digital natives. Further, the main motivation of Generation Y users seems to be both to enlarge the number of business contacts and the number of profile visitors. This motivation is more pronounced, in particular when compared to Generation Z.

When now considering the results for Generation Z, we can show the most significant differences for the use of Instagram and Xing. Individuals born after 1995 are statistically more likely to use Instagram, an online mobile photo- and video-sharing platform, than older generations. Generation Z not only perceives the Internet as a natural element in everyday life (similarly to Generation Y), but also the use of digital mobile devices. Therefore, the latest generation can be described as mobile natives and significantly differs from former ones with regard to mobile social networking (Muminova, 2015). Moreover, individuals born after 1995 are on average statistically less likely to use Xing, which is a logical consequence of the fact that most of them are still at school.

In sum, we verified the H1, as our statistical analysis has revealed inter-generational differences in social media use and motives. Hence, our results serve to better understand the user's intention to share and acquire content on social networking websites, particularly with regard to age-specific user preferences and behaviour.

3.4.2 Intra-generational groups within Generation Y

When adapting the cluster approach for Generation Y, we find three intra-generational groups with regard to different ages interpreted as different stages of life. The results are summarized in Table 3.2. The first cluster is on average the youngest (born around 1991). It exhibits, on the one hand, the highest frequencies of usage for Facebook, Instagram, 9gag and YouTube. On the other hand, this cluster uses Twitter less frequently. Overall, this group is highly connected and uses various kinds of social media channels regularly. Kilian, Hennigs and Langner (2012) called this type Highly Connected Millennials, who are the

most active users of social media with the purpose to build social networks. Furthermore, this cluster exhibits similar traits to Generation C, which is born after 1990 and fond of content creating and actively forming communities (Booz&Company, 2010; Wiliams, Crittende, Keo, & McCarty, 2012).

The second cluster is the mid-aged group of Generation Y and on average born in 1988. This cluster shows medium frequency-levels of use for all social media channels except for YouNow, which is a live streaming video website. According to Kilian, Hennigs and Langner (2012), we might classify this cluster as the Entertainment-Seeking Millennials. This group is present on social media platforms, however, remains rather passive. Still, they exhibit high usage rates of various kinds of social media.

The third cluster exhibits on average the oldest birth dates (born on average in 1986). Moreover, Table 3.2 shows the smallest frequency of use for Facebook, Instagram, 9gag and YouTube, and the highest frequency for Twitter. Again, according to Kilian, Hennigs and Langner (2012), this cluster shows similarities with the Restrained Millennials, who tend to exhibit the lowest ratings for social media use. It also appears that this cluster bears a certain resemblance to the findings for Generation X highlighted in the Table 3.1. Hence, our findings might indicate that different ages interpreted as different stages of life affect the social media use, and a higher on-average age for Generation Y clusters incrementally increases the similarities with Generation X. Overall, we can conclude that the cluster solution indicates considerable intra-generational discrepancies in social media use.

Table 3.2 *Cluster solution for Generation Y.*

	Cluster 1 N = 119				**Cluster 2** N = 66				**Cluster 3** N = 36			
Year of birth	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
	1991	2.58	1981	1995	1988	3.36	1980	1995	1986	2.91	1980	1991
Usage freq.												
Facebook	5.83	1.11	0	7	5.48	1.44	0	7	4.94	1.97	0	7
Twitter	1.01	1.90	0	6	0.98	1.92	0	6	1.33	2.01	0	7
Instagram	1.79	2.55	0	7	1.39	2.31	0	7	1.61	2.57	0	6
Xing	0.29	1.00	0	6	0.89	1.58	0	7	1.89	2.05	0	5
YouNow	0.03	0.26	0	2	0.24	1.15	0	7	0.00	0.00	0	0
9GAG	1.66	2.35	0	6	1.09	2.13	0	7	0.75	1.92	0	6
YouTube	4.58	1.75	0	7	4.14	2.02	0	7	3.81	2.11	0	6

3.4.3 Intra-generational groups within Generation Z

It might not only be of interest whether the heterogeneous Generation Y can be clustered, but also whether initial tendencies towards a segmentation of Generation Z can be observed as well. When adapting the cluster approach for Generation Z (Table 3.3), we are able to distinguish between two groups that have similar traits as Generation C (i.e. content creating and forming new communities). The first cluster is on average one year older compared to the second cluster and uses Facebook, Twitter, 9gag and YouTube less frequently.

Differences in the use of YouNow and Xing are negligible. However, the first cluster exhibits higher frequency rates of using Instagram. This might be due to the growing trend towards mobile networking. This technological development occurred at the time when Generation Z distinguished themselves from the previous generations considering the Internet use. The higher the frequency of using Instagram, the younger are its users, which indicates the procedural phenomenon to strive for inter-generational differentiation (Wochnik, 2015).

Table 3.3 *Cluster solution for Generation Z.*

	Cluster 1 N = 79				**Cluster 2** N = 11			
Year of birth	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
	1998	2.17	1996	2006	1997	2.68	1996	1996
Usage freq.								
Facebook	4.71	2.55	0	7	6.09	0.83	4	7
Twitter	0.48	1.44	0	7	1.73	2.61	0	6
Instagram	3.43	2.78	0	7	2.64	3.11	0	7
Xing	0.01	0.11	0	1	0.00	0.00	0	0
YouNow	0.14	0.81	0	6	0.00	0.00	0	0
9GAG	0.13	0.76	0	6	1.36	2.46	0	6
YouTube	4.52	2.28	0	7	5.64	1.21	4	7

3.5 Implications for Social Commerce

In this paper, we examined whether differences occur for the motivation and frequency of social media usage from both inter- and intra-generational perspectives with regard to the heterogeneity of users' life stages. Our examination contributes to previous literature in two main ways. First, we shed light on the developmental process of social media usage for different age groups and we are able to contribute to sociological theories of generational change. And second, our outcomes enrich the theories of Internet development and social media usage, which might be particularly relevant for marketing insights and social shopping to better assess online target groups and to improve online products.

We conducted a broad analysis to compare social media usage for Generations X, Y, and Z. The results indicate that social media users born between 1980 and 1995 and, also, before 1980 are more likely to use business-oriented networking services, which might be due to the facts that they found employment and are familiar with online networking. Their main motive to increase their contact numbers emphasizes their capability and willingness to use platforms such as Xing. Particularly for Generation X, older users are more likely to use social media for sharing business and political information, news, or research updates with strangers. Generation Y, on the other hand, is more likely to use a traditional networking platform, such as Facebook, in order to communicate and share information with friends. The youngest generation born in 1996 and later tries to find its own individual path in social media use when turning back on Facebook and moving towards more recently appeared

social media platforms and channels, in particular the mobile photo-sharing network Instagram.

The differences in the tendencies of social media use from an inter-generational perspective are also observable on a smaller intra-generational scale, indicating evidence for an incremental development of social media use. When clustering Generation X and Y into subgroups, we cannot only see a heterogeneous overall picture, but also a diverse insight into the development of intra-generational changes. Strong similarities between the early Generation Y and Generation X are observable. Further, a slow and incremental shift away from Facebook towards Instagram can be seen for the late Generation Y and Generation Z.

Additionally, our results show a tendency of how the youngest generation of social media users might develop in the upcoming years and are able to point out the relevance of mobile networking. We suggest that this trend is gaining momentum and will further increase for the very youngest Internet users that will soon discover mobile social media.

Our findings are particularly interesting for businesses that use the popularity of certain social media platforms to support online transactions and user contributions to enhance the purchase of products or services. The determination of the correct target group for age-specific products or services is crucial for the success of a business. Players in the social commerce sector can focus on services mostly used by their (future) consumers. Knowing the frequency and motivation of their social media usage, they can prepare more suitable incentives for their products. This knowledge refers to the important marketing concept of relationship quality, indicating that an increase of relationship strength has a positive long-term impact on the business relation between service/product provider and customers.

3.6 Limitations and Future Work

After the online survey had been completed, it came to our attention that the demographical aspects might indeed significantly influence the outcomes, especially, when the use of social media based on concrete services (like Facebook) is being investigated. Many participants indicated their use of further services being only popular in their respective countries or regions. This does not distort the results when the usage of a specific service, like Facebook, is intended. However, when assessing the usage of certain kind of services (e.g. social network services or video-sharing platforms in general), the regional differences and the possibly resulting standard-dependent user blindness (Baran & Stock, 2015a, 2015b) should be considered. Since the social network services market is full of imitators (Baran, Fietkiewicz, & Stock, 2015), some regionally prevalent standards can be easily clustered into groups of similar services, e.g., Facebook and its Russian equivalent VKontakte are objectively very similar, however, due to the standard-dependent user blindness they are used alternatively rather than cumulatively (Baran & Stock, 2015a; 2015b).

Hence, the limitation of our study is that given the broad demographical range of our investigation, we did not consider the regional standard services. For further studies of this kind we would advise to cluster services that objectively offer substitutable contents, e.g. Do you use Facebook and/or VKontakte? As for social commerce sector, we would advise not to underestimate “local” social network standards as platforms for exchange and consumer acquisition.

Since our empirical examination pursues the objective to holistically investigate different generations and various social media platform, we believe that a more focused investigation of a certain generation, a social media platform or a motivation might be a promising opportunity for further research. Additionally, an examination of the interdependencies between applications of different social network services might also add to previous literature.

In our future studies, we will include these lessons learned as well as pursue a more in-depth analysis of online behaviour or Generations Y and Z.

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4 Jumping the Digital Divide: How do "Silver Surfers" and "Digital Immigrants" Use Social Media?

For a long time, a digital divide was given between young Web users and older population, which out of anxiety or incapability restrained from using the new technologies. Recently, the so-called "Silver Surfers" and "Digital Immigrants" tend to use the Web not only for sending emails but also increasingly for socializing on social media services (e.g., Kübler, 2009; Frees & Koch, 2015). This paper aims to discuss the differences in adoption and use of social media platforms between different generations. An online questionnaire was created and distributed among social media users of all ages. The results indicate that the older generations represented a not insignificant part of social media community. They often use Facebook to keep in touch with friends and family, some apply Twitter and are fond of new followers and many re-tweets, and others just enjoy new videos on YouTube. There indeed appear to exist inter-generational differences in social media usage. In addition, data analysis leads to the conclusion that there are intra-generational gender-dependent particularities as well. This study deepens the general social media usage investigation with focus on inter-generational differences. Outcomes of both studies (chapters 3 and 4) contribute to the social media research, especially related to development of marketing strategies.

4.1 Introduction

The rapid changes in technology and extensive digitalization laid a foundation for broad research on the so-called digital divide, i.e., the individual's (specific groups' or entire societies') lacking facility or lacking skills to make use of this new advancement. In general, we can distinguish different types of divisions: (a) the global divide between industrialised and developing countries based on the Internet access; (b) the social divide between the "information rich" and "information poor" within a nation; and (c) the democratic divide between people who choose to use digital resources and the ones who do not (Choudrie, Grey, & Tsitsianis, 2010; Norris, 2001). Indeed, the focus lies in the skills and adaptation rather than the physical access. The questions that arise are: In what ways can we make the technology usable and accessible, especially for older people, who are labelled as 'Digital Immigrants' (Prensky, 2001), with the purpose of bridging the gap between different generations? And, what happens after the digital divide is actually overcome by some individuals from this generation, who now regularly surf the Web?

Social media services have taken human interaction to the next level. The exchange between users and their communication is almost as real as in the analogue world. The focus of current research lies primarily on younger users already growing up with (mobile) Internet, Facebook and Google, the so-called "Digital Natives" (Prensky, 2001). Their (presumed, but not really verified) highly developed information literacy often comes with the cost of actual social interaction without the Internet as an intermediary. Apparently, they are always online and have nothing to hide; some are (becoming) narcissists, whose social media profiles do not really reflect their real lives and personalities (Bergman et al., 2011; Carpenter, 2012; Ong et al., 2011). In this research, we turn from these 'Digital Natives' and take a closer

look at the 'Digital Immigrants', especially the so-called 'Silver Surfers' (born before the 1960s). These populations grew up without the Internet and faced the rapid development of new technologies in their teenage and adult lives. Some of them did not bypass the digital divide—either because of the lacking information literacy, maybe out of fear, or just out of scepticism (Smith, 2014). However, more and more Internet users over 50 do not only use the Internet in everyday life, but even sign on to several social media services, which initially appeared to be rather a domain for the teenage surfers and young adults (see Figure 4.1).

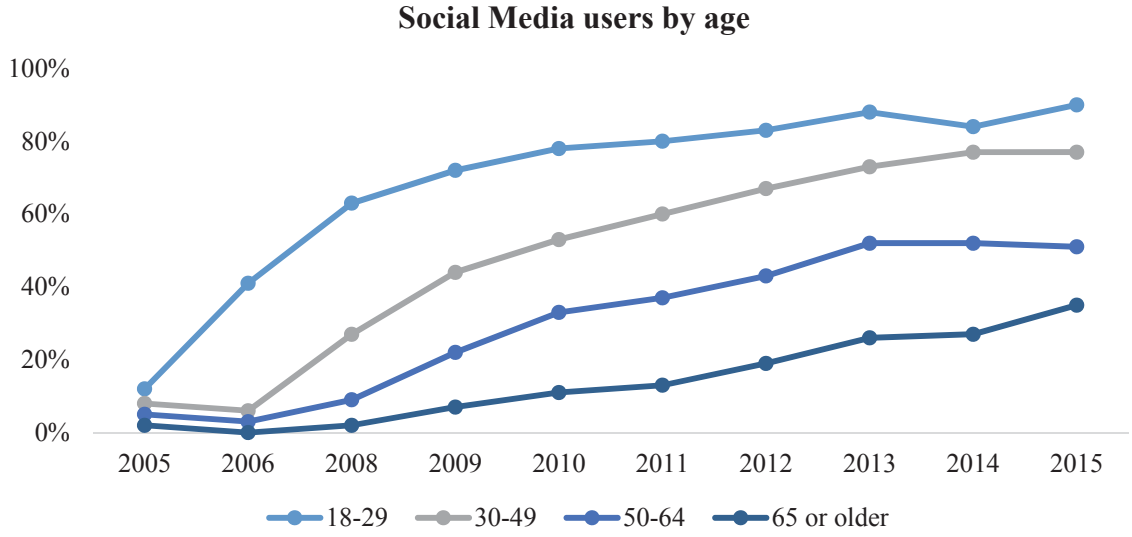

Figure 4.1 Social Media users in the USA by age since 2015. Source: Perrin, 2015.

The current study is based on a survey conducted among social media users. An online questionnaire was designed to investigate: (1) the use of different social media services; (2) the frequency of social media use; and (3) the motivation for using social media, all for diverse age groups and additionally differentiated by gender. Overall, the results highlight the different uses of social media amongst 'Silver Surfers' (those born between the 1930s to 1950s) and 'Digital Immigrants' (1960s and 1970s), and offer an area for comparison with the usage by the 'Digital Natives' (the so-called 'Generation Y', 1980s and 1990s) and the youngest generation sampled (those born in the mid to late 1990s, also called 'Gen Z' or 'Generation C' or the 'Millennial Generation'). The focus of this study lies in the following social media services: Facebook, Twitter, Instagram, Pinterest and YouTube. For some interviewees, the digital divide is already in the past as social media like Facebook or YouTube appear to be very popular in all age groups, including the 'Silver Surfers'. Interestingly, Twitter is more popular among the older Web users rather than the younger generations, who prefer Instagram. Further outcomes from this study show differences between investigated age groups regarding the motivation for applying social media and their expectations from them, as well as the gender-dependent differences in social media usage frequency.

4.1.1 Age as a dividing factor

The Internet and other technological innovations replace, or at least complement the traditional means of human interaction (Killian, Hennings, & Langner, 2012). However, not

everyone keeps up with the newest trends. Some groups of people, or even whole countries, are "marginalized from these benefits and are regarded as being digitally divided or excluded" (Choudrie, Ghinea, & Songonuga, 2013, p. 419). In the 90s, the digital divide was characterized as a gap in technology access that led to inequalities in "educational, economic, social and civic opportunities among sectors of the population" (NECRL, 2012, p. 17). The access to the Internet alone does not necessarily have to be enough to ensure bridging the divide. In particular the access itself is not beneficial when the individual is not computer literate or simply hesitates to use it (Choudrie, Ghinea, & Songonuga, 2013, p. 419). One of the decisive aspects influencing the willingness to use the Web and its applications is the usability, "an important factor for the quality of web-based projects" (Choudrie, Ghinea, & Songonuga, 2013, p. 420). Further conditions fostering the acceptance of new technologies are the perceived ease of use as well as perceived usefulness of the services (Davis, 1989).

The access to the Internet is thus only the first step necessary to bridge the divide. Equally important are "the readiness of individuals to use technology, communication networks, and information efficiently, effectively, and productively" (NECRL, 2012, p. 7) and the individuals' motivation to use an Internet service (Linde & Stock, 2011). Recent surveys have shown a growth in accessibility and usage of the Internet by people of all ages, including older adults, until now rather excluded from web communities (Statista, 2016; Choudrie, Ghinea, & Songonuga, 2013, p. 419). Thus, as opposed to stereotypes of older people being unable to adapt to the technological changes, "many seniors have embraced the Internet revolution" (Wood, 2003; Choudrie, Ghinea, & Songonuga, 2013, p. 418). The older group that does take advantage of the new technology has been labelled 'Silver Surfers' (Choudrie, Ghinea, & Songonuga 2013, p. 418). The market segment for 'Silver Surfers', also referred to as "grey netters", is called the "grey market" (Graeupl, 2006, p. 238).

'Silver Surfers' are Internet users aged 50 and older (Bitterman & Shalev, 2004; Oppenauer, 2009; Stallman, 2012). According to Kübler, they can navigate through the Internet, send and read emails, some of them also share pictures via the Internet, participate in chat rooms and forums, or do online shopping, online banking and information retrieval (Kübler, 2009, p. 105f.; Stallmann, 2012, p. 218). Frees and Koch (2015) sum up the results of an online study conducted by ARD/ZDF in Germany in 2015, which showed that there are considerable changes in the Internet usage among older people— especially considering the user behaviour of 70-year-olds. There is a notable increase of daily usage in this age group (by 0.8 million people, which constitutes 44%). When comparing the age structure of the Web community with the general population, the most daily active user groups are the ones aged 20-29 and 40-49. However, the biggest age groups within the general population are the 40-49 and 50-59 year-olds, so the biggest growth potential for Internet usage is given for the Silver Surfers (Frees & Koch, 2015, p. 366).

Regarding the situation in Germany, the significance of the Internet is rising, also among the users over 60 years old. Around 26% of over 60-year-old people access the Web daily (Frees & Koch, 2015, p. 370). In terms of their online activities, communication with other people via the Internet is mostly limited to sending and receiving e-mails (around 73% do it at least once a week). Only 15% of them use instant messaging services (like WhatsApp) regularly, and 11% visit a social network service at least once a week. According to Frees and Koch

(2015, p. 373), micro-blogging services like Twitter or picture sharing websites are not as popular amongst older adult users.

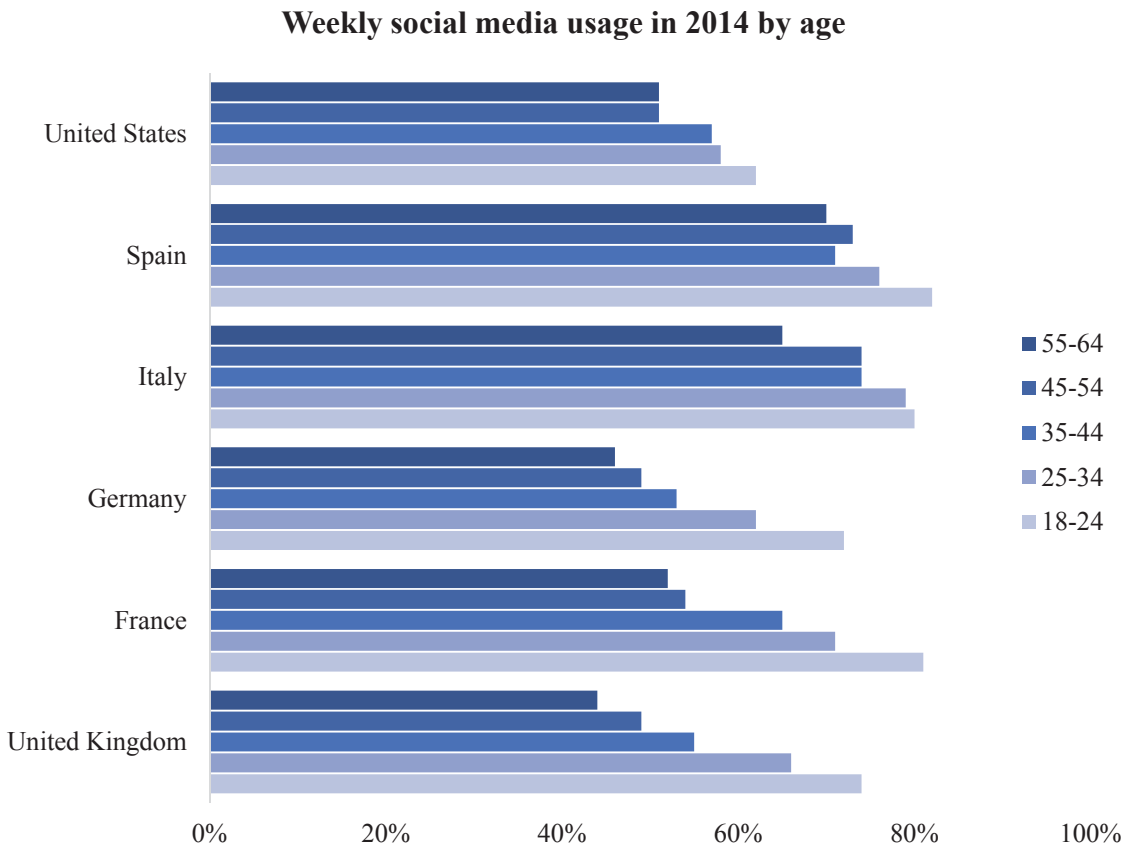

Figure 4.2. Weekly social media site access in selected countries as of October 2014, by age. Source: Statista, 2016.

According to Statista (2016), the social media usage is lower in older age groups when comparing with other age groups. As we can see in Figure 4.2, in the investigated countries (Spain, Italy, Germany, UK, France, and the USA), the most active social media users are the ones aged between 18-24, followed by those aged between 25 and 34. The third most active group is the one of 35-44–year-olds, except for Spain, where the 45- 54-year-olds are more represented. The oldest group of 55-64-year-olds constitutes the smallest community of social media users in all the investigated countries. The smallest share of active social media users from the group of 55+ is given in the UK (44%) and Germany (46%), followed by the USA (51%) and France (52%). Italy and Spain exhibit higher shares of silver surfers active on social media platforms—65% and 70%, respectively.

Given that the access to the Internet is socioeconomically ensured in those countries, the differences between younger and older generations considering social media usage can be explained either with lacking suitable accessibility and/or usability of the contents and services for older adults, or simply with different information behaviour. Due to the aging process, the human motor functions, sensor and cognitive skills, may be impaired, leading

to problems with usage of the new technologies (Oppenauer, 2009, p. 39). Hence, with the increasing share of older social media users, the accessibility and usability of the contents have to be ensured. Further steps are the detection of the information seeking and production behaviour, or the motivation to use certain social media services by different age groups, also partially covered by this study. The conducted comparison of social media usage in this investigation is based on inter-generational differences— between the so-called 'Digital Immigrants', 'Digital Natives', as well as the youngest generation often called 'Gen Z.' In the following section, theories on defining and classification of the different generations will be presented.

4.1.2 The different generations

The new technologies could be seen as a divide between younger and older generations. For the former, it is much easier to learn how to adopt the newest trends, one of them being social media services. Generations growing up with the new communication technologies rely to a great extent on their mobile devices and the Web in order to cultivate their social contacts, as well as for educational or professional purposes (Salajan, Schönwetter, & Cleghorn, 2010). This dependence, and in some cases even problematic social media use (Cabral, 2011), differs from the older generation's attitude towards digitalization, whose members partially integrated the new media in the later or more advanced stages of their lives (Fietkiewicz et al., 2016). It stands to reason, therefore, that different generations have different motivations for using social media as well as a different manner of doing so.

Generations, or generational cohorts, are created around shared experiences or events "interpreted through a common lens based on life stage," rather than being based on social class and geography (Bolton et al., 2013; Mannheim, 1952; Sessa et al., 2007; Simirenko, 1966). According to Tapscott (1998), the generations should be categorized as the 'Baby Boomers' (born between 1946 and 1964), 'Baby Busters' (between 1965 and 1976, also called 'Generation X'), and 'Echo Boomers' (also called 'Net Generation', 'Generation Y', or 'Millennials'; born between 1977 and 1997), which can be best described as the "first generation bathed in bits" (Leung, 2013; Tapscott, 2009). Freestone and Mitchell (2004) describe the cohorts as 'Matures' (1929-1945), 'Baby Boomers' (1946-1964), 'Generation X' (1965-1976), and 'Generation Y' (1977-1993). McIntosh et al. (2007) pursued a little different categorization: 'Silent Generation' (pre WWII), 'Baby Boomer generation' (1946-1962), 'Generation X' (1963-1977), and 'Generation Y' (1978-1986).

All in all, there are more or less congruent definitions of the generational cohorts. In this study, the focus lies in the differences between the 'Digital Immigrants' and 'Digital Natives'. Digital Immigrants or Generation X "grew up in an information and technology revolution affecting entertainment, communications, education, and home life" (McIntosh-Elkins, McRitchie, & Scoones, 2007, p. 240). According to McIntosh-Elkins, McRitchie and Scoones (2007, p. 242), this is a generation of cynicism and scepticism, the "Gen Xers are pragmatic," they are "flexible adaptable, and have lived a life of changes." This generation has witnessed great technological advances and was the first one to experience home computers.

Prensky (2001) made a clear distinction between 'Digital Immigrants' and the 'Digital Natives.' He explained that Digital Immigrants learn to adapt to their environment; however, they "still retain some degree of their accent" (Prensky, 2001, p. 3). This Digital Immigrant "accent" is certain information behaviour that cannot be identified among Digital Natives, for example, "turning to the Internet for information second rather than first, or in reading the manual for a program rather than assuming that the program itself will teach us to use it". Other examples of this "accent" include printing out emails, or needing to print out a document written on the computer in order to edit it. There are many factors that differentiate the information behaviour, and possibly the usage of social media, by the 'Digital Immigrants' from the 'Digital Natives', who speak this new language fluently.

The main objective of this study is, therefore, the investigation of differences in social media use between the Digital Natives and the Digital Immigrants or even older generations (i.e. which social media channels do they prefer? How often do they use them? Which aspects are most important for them while applying these platforms? Is it important to stay in touch with friends and family, or is it more in their favour to share their own content? Are they concerned with data privacy?). The aforementioned questions could be answered with the help of an online questionnaire distributed within the social media community, specified in the following methods paragraph.

4.2 Methods

The online questionnaire created for this study was distributed through different online channels (e.g., Facebook, Twitter, Instagram, or diverse online forums) as well as "offline" through word-of-mouth advertising. There were two language versions of this questionnaire—English and German. The questionnaire featured questions about the popular social network services Facebook, Google+, Twitter and Instagram, as well as the business social network services LinkedIn and Xing. In addition, participants were asked about further photo and video sharing services like Flickr, Pinterest, Tumblr and YouTube. The typical consumer communication services like WhatsApp, Skype, Viber, or LINE were not included. The scope of the study had to be limited to a set of social media channels, otherwise there would be too many questions leading to higher break-off rates of the participants. Usage of communication tools like Skype or WhatsApp is, however, an interesting topic for further investigations.

Studies of online population, like in this case of the social media users, have led to an increase in the use of online surveys (Wright, 2005). There are many advantages of online surveys, including access to individuals from distant locations, automated data collection and analysis (Wright, 2005) as well as flexibility for the respondents to answer the question when and where they want to, question diversity, control of question order, and required completion of answers (Evans & Mathur, 2005). Even though the internet penetration is greater in industrialized countries and, therefore, in some regions the potential for online surveys is greater (Evans & Mathur, 2005), this problem does not affect the recruiting of social media users, since social media use itself requires access to the Web.

For this study the nonprobability sampling was applied, in form of purposive or judgment sampling (social media users), continued as snowball sampling (sharing on social media by

participants). Judgment sampling is one of the most common sample techniques where the researcher actively selects the most productive sample to answer the research question, whereas the subjects may recommend useful potential candidates for study (Marshall, 1996). Since this is an exploratory study on potentially limitless population, which makes it difficult to pursue probability sample, no statistical generalization is possible. However, in this case, an analytical analysis can be pursued. One problem of online surveys in general is the self-selection bias, since in any given internet community there are some individuals who are more likely to complete an online survey (Wright, 2005). This leads to a limited ability to estimate populations, however, for this study the nonprobability sampling was applied.

Facebook seems to be one of many convenient tools for recruitment of participants (Ramo & Prochaska, 2012). Also, thanks to distribution of the survey link through channels like forums or chatrooms, it was possible to reach older web users. According to Wright (2005), researchers can find a concentrated number of older individuals who use computers in the Internet-based community SeniorNet. In contrast, with traditional survey research methods, it may be more difficult to reach a large number of older people who are interested in computers.

Some disadvantages of online surveys are the tendency that it can be perceived as junk mail, especially when distributed via mailing lists, the skewed attributes of internet population, privacy and security issues (Evans & Mathur, 2005). Unwanted emails, security and privacy, are seen as the most problematic ethical issues when conducting online survey (Cho & LaRose, 1999). According to Cho and LaRose (1999), the so-called informational and psychological privacy are most sensitive and mostly jeopardized by online surveys. The psychological privacy concerns the content of the information and the degree to which it betrays the psychological or emotional state of the participant. However, the danger of violating psychological privacy is mostly given by surveys dealing with very sensitive topics (which is not the case in current study). The information privacy concerns the desire to control the movement of personal information. Volunteer samples using anonymous replies through webpages, as conducted for this investigation, mostly maintain all four forms of privacy (apart from the informational and psychological, the physical and interactional one). The promotion of the survey through different channels could be seen as a mild violation of physical privacy, however, it is not as severe as receipt of unsolicited email (Cho & LaRose, 1999).

In the questionnaire, 3 types of questions were formulated. The first one was a polar question about the use of a certain service, e.g., ‘Do you use Facebook?’ Dependent on the answer, two follow-up questions about the concerned service succeeded—about the frequency with which the service is used (e.g., ‘How often do you use Facebook?’) and about the motivation for using the service (e.g., ‘In reference to Facebook, it is important to me that...’). The inquiry about the motivation was adjusted to each service and included three sub-questions, for example, in case of Facebook, ‘It is important to me that (i) I have a lot of friends, (ii) I get a lot of “likes,” (iii) my personal data is treated as confidential.’ The answers for frequency of usage and motivation questions could be marked on a 7-point Likert scale, where “1” meant fully disagree (or in case of frequency—“almost never”) and “7” meant fully agree (or “I am always online”). Technically, the quasi interval characteristics of the

Likert scale render it appropriate for hypothesis testing of mean responses and cluster approaches. This procedure is a common practice for a scale, since numerical values are assigned to the response categories and, thus, modelling equidistant intervals (Ary et al., 2009). The socio-demographic questions regarded gender, year of birth, country, and education.

The data gathered was statistically analysed. The first part of the investigation regarded the social media usage by the oldest generations that participated in the survey—born between the 1930s and the 1970s. Afterwards, the differences between the Digital Immigrants, Digital Natives and the youngest generation, Gen Z, were analysed. In what follows below, we have included analyses of average social media use frequencies and the probabilities of using certain services, as well as two-sided t-tests for the three generations. The t-tests assess whether the mean of a certain generation is statistically different from other generations. For instance, the differences of the means (of usage frequency or importance of certain motivational aspects) between 'Digital Immigrants' and the pooled observations for 'Digital Natives' and 'Gen Z'. Finally, intra-generational gender-dependent differences are included for the three generations (regarding the probability and frequency of social media usage in relation to gender).

Table 4.1 *Demographic and social media use characteristic of participants who completed the survey (N=372).*

General characteristics	
Gender	
male	30.1%
female	69.9%
Age in years (mean)	28.4
Education	
still at school	22.3%
student	35.3%
Bachelor's degree	17.5%
Master's degree	17%
Doctoral degree	4.9%
Country	
Germany	59.9%
Poland	21%
Switzerland	4%
USA	4%
Austria	1.1%
Social media users	
Facebook	92.5%
YouTube	86%
Instagram	37.6%
Twitter	29.3%
Pinterest	13.2%

4.3 Results

From total 430 participants, 372 completed the study (112 were male, and 260 female). Table 4.1 presents the general characteristics of the participants. Most of them were from Germany (nearly 60%), followed by Poland (21%), Switzerland and the USA (each 4%). Most of the participants were university students (35.3%) followed by school students (22.3%) and graduates with Bachelor's (17.5%) and Master's degree (17%). Among the participants, Facebook and YouTube are the most popular platforms (92.5% and 86% respectively). Instagram and Twitter seem to be less common, but still adopted by total 37.6% and 29.3% respectively. Pinterest is applied by 13.2% of the respondents.

Table 4.2. *Distribution of the participants by year of birth.*

	Year of birth	**N**
Decade-wise aggregation for older generations	1930s	1
	1940s	2
	1950s	9
	1960s	18
	1970s	29
Digital Immigrants/Gen X	1960-1980	47
Digital Natives/Gen Y	1980-1996	221
Gen Z	since 1996	90

As Table 4.2 highlights, most of the participants are Digital Natives born between 1980 and 1996 (total 221). The second biggest generational cohort was the youngest one—Gen Z born after 1996 (total 90 participants). Digital Immigrants, born between 1960 and 1980, are represented by 47 test subjects.

First, probable differences in social media use between 'Silver Surfers', 'Baby Boomers' and younger generations will be analysed. However, there is no distinction between the generational cohorts as the older participants are grouped by year of birth decade-wise (from 1930s to 1970s). This should give us an impression on probable social media use by 'Silver Surfers' when these 'generations' are thus grouped together. Next, this paper focuses on exploring the differences between 'Digital Immigrants (Gen X)', 'Digital Natives (Gen Y)' and the youngest generation (Gen Z). These outcomes are more significant and give a more accurate picture of inter-generational differences, since the investigated sample was larger.

Figure 4.3 illustrates that Facebook is the one social media service used most frequently by all generations. Only users born in the 1960s apply Twitter slightly more frequently than Facebook. On average, the representatives of the oldest generations use Facebook most frequently. One participant, born in the 1930s, reported using only Facebook (from all the inquired social media services) every day. Participants born in the 1940s also use Facebook most frequently, followed by YouTube, Pinterest and Twitter, whereas Instagram is visited rather seldom. Users from the 1950s visit Twitter, YouTube and Pinterest similarly often (around once a week), but not Instagram. The participants born in the 1960s use Facebook and Twitter most frequently, followed by Pinterest (most frequently of all generations) and

Instagram. From all the investigated generations, they reported using YouTube the least often. The users born in the 1970s reported using Pinterest least frequently, whereas they stated they used other services at least once a week. The digital natives (or Gen Y) visit Facebook, YouTube and Instagram most frequently, whereas Twitter and Pinterest are visited less often, rarer than once a week. Finally, the Gen Z participants used Facebook, YouTube and Instagram most frequently (Instagram most frequent from all the generations), whereas Twitter and Pinterest rather seldom.

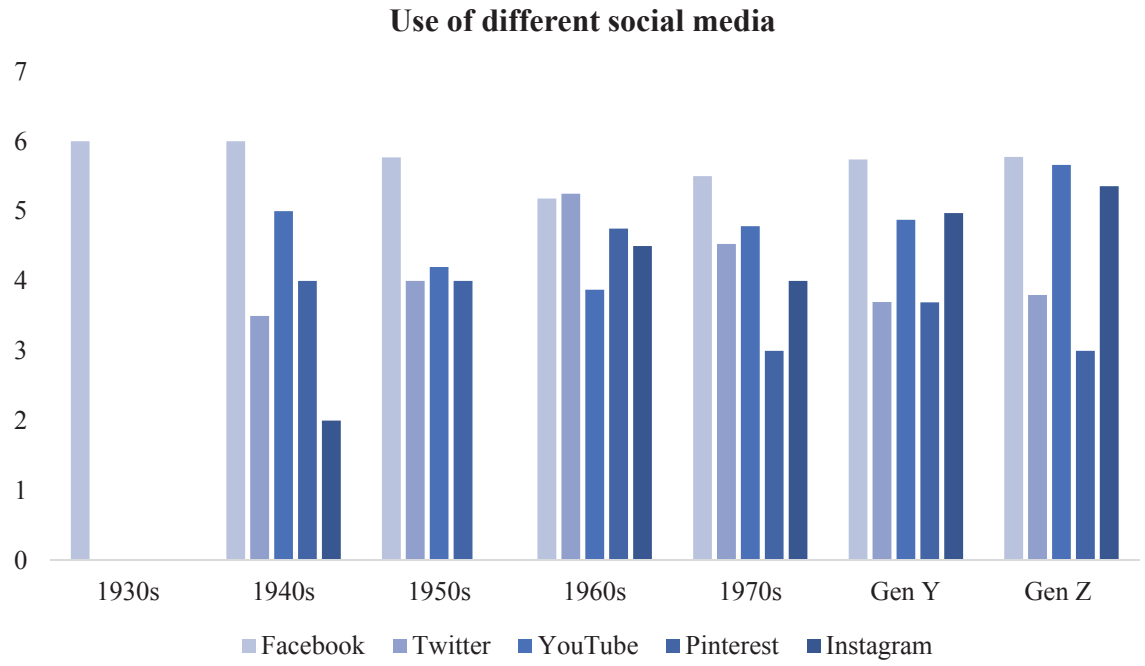

Figure 4.3. Frequency of use of different social media services by different generations.

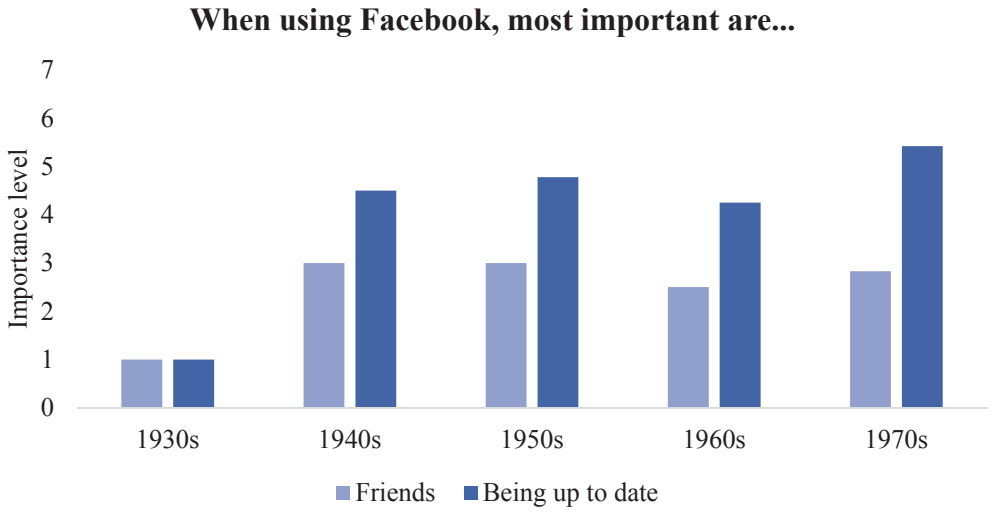

Figure 4.4. Important factors while applying Facebook.

Since Facebook appears to be the most popular social media service (not only among the 'Silver Surfers'), let us take a closer look at factors significant for using the service. Figure 4.4 shows the importance of two factors while using Facebook—having a lot of friends and being up to date—both factors which were indicated by participants in the oldest generations. Both factors are rather of moderate importance for most of the participants from other age ranges (3-4), whereas for representatives of the oldest generation, they are not important at all (1). Still, being up to date appears to be of higher significance than having a lot of Facebook-friends, especially for users born in the 1970s.

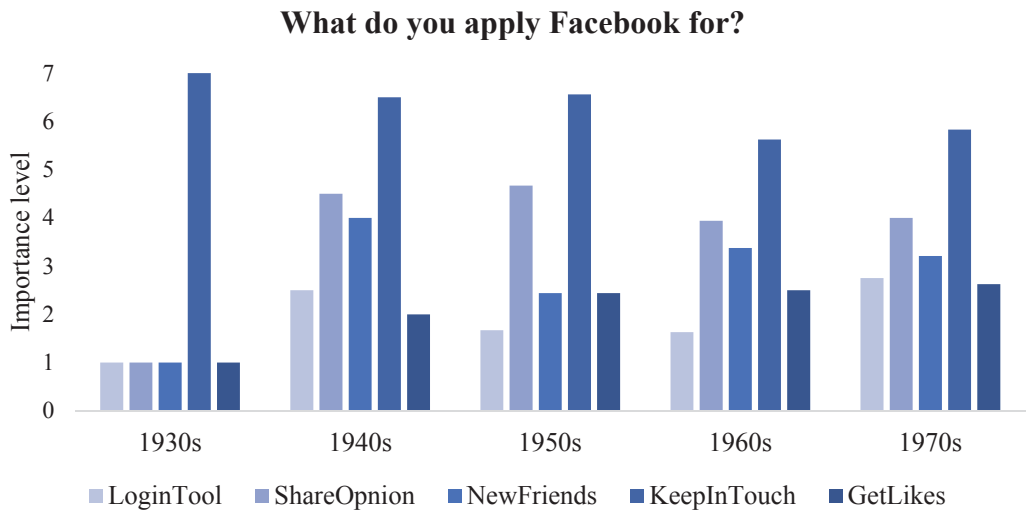

Figure 4.5. Older generations' motives to apply Facebook.

When asked for more concrete motivational reasons for using Facebook (Figure 4.5), we recognize that "being in touch" with friends or family is the most important aspect (especially, for the 1930s user for whom this is the only reason to utilize this service). The second most important aspect appears to be the possibility to share one's own opinion with the community (especially for users born in the 1950s). There is rather neutral attitude evidenced towards "finding new friends" on Facebook, whereas getting a lot of likes or using the services just as a login tool, is not important (1-3) for all the 'Silver Surfers'.

Next, we turn to investigate the differences between 'Digital Immigrants', 'Digital Natives' and the youngest generation—'Gen Z'. Figure 4.6 shows the probability of social media usage by these three generational cohorts. All groups are likely to use Facebook (especially the 'Digital Natives') and YouTube ('Digital Natives' and 'Digital Immigrants'). The most substantial differences can be seen for Twitter and Instagram. Twitter is more likely to be used by Digital Immigrants, followed by 'Digital Natives.' The distribution for Instagram is quite the opposite— 'Gen Z users' will probably use Instagram. The probability is much lower for Digital Natives and even scarcer for Digital Immigrants. Pinterest is not that popular among all three groups, but the usage probability is still the highest for 'Digital Natives' followed by 'Digital Immigrants', whereas for 'Gen Z users' reported usage is closer to zero.

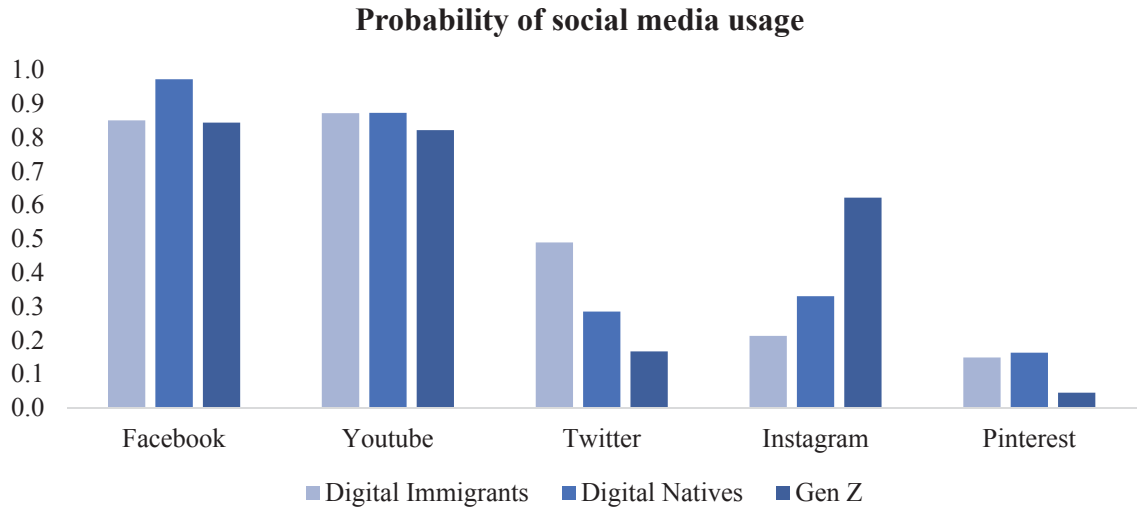

Figure 4.6. Probability of social media usage for Digital Immigrants, Digital Natives and Gen Z.

Figure 4.7, compares the average usage frequencies for the five social media services and the three investigated generational groups. Facebook is used most frequently by all three groups, whereas YouTube and Instagram are used most frequently by the youngest generation—Gen Z, followed by Digital Natives and Digital Immigrants (however, they still use the services on average few times a week). Digital Immigrants use Twitter most frequently (several times a week), when compared to Gen Z and Digital Natives (between once a month and once a week). Pinterest is, once adopted, used more frequently by the oldest generation. Indeed, digital Immigrants use it nearly once a week, whereas Digital Natives and Gen Z once a month.

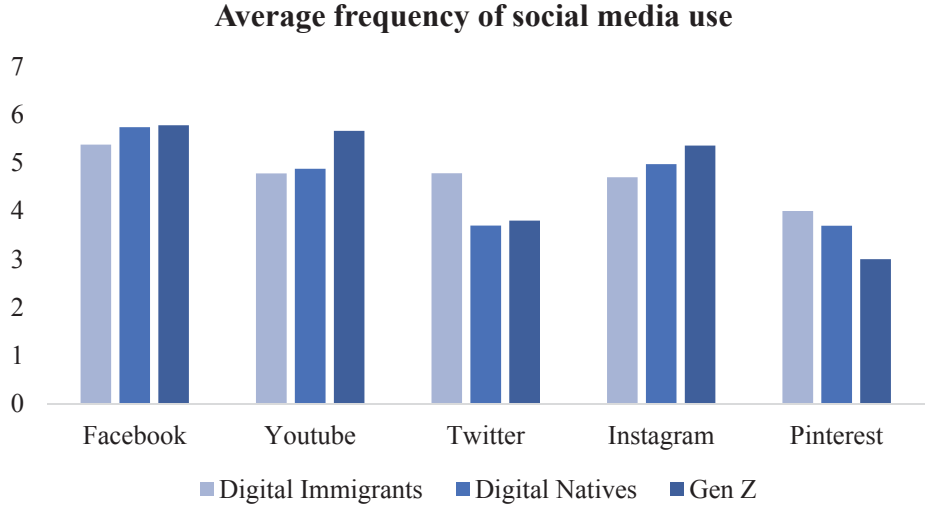

Figure 4.7. Average usage frequencies of social media services by Digital Immigrants, Digital Natives and Gen Z.

Figures 4.8 to 4.11 depict the outcomes of t-tests conducted for usage frequencies and two motivational factors when using Facebook, Twitter, Instagram and YouTube. The values for each generation show the average difference from the pooled mean values for other

generational groups. Regarding Facebook (Figure 4.8), the biggest difference is given for the usage frequency. Compared to the average usage frequency, 'Digital Natives' are the ones using Facebook more frequently, whereas 'Digital Immigrants' followed by 'Gen Z' use it less frequently. There is also a clear divergence in the motivation. For Digital Immigrants, it is on average more important to keep in touch with friends and family, whereas getting likes is more important for Digital Natives and especially for Gen Z.

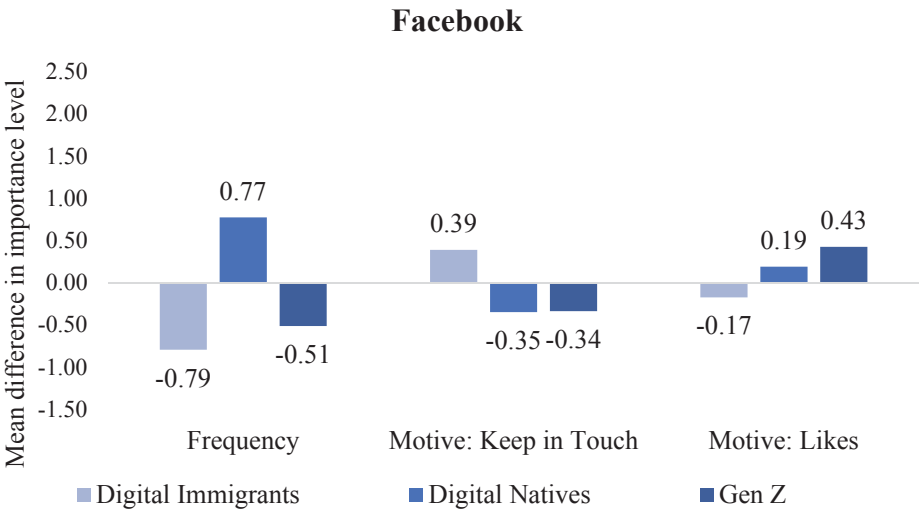

Figure 4.8. T-test outcomes for Facebook usage frequency and motivational factors.

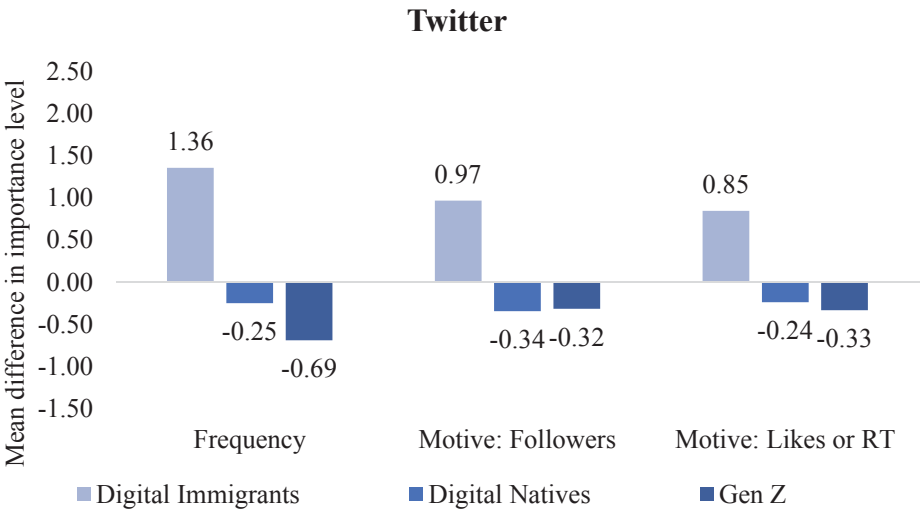

Figure 4.9. T-test outcomes for twitter usage frequency and motivational factors.

In Figure 4.9, the t-test outcomes for Twitter are indicated. We can see that this service is definitely more favoured by Digital Immigrants than Digital Natives and Gen Z. Digital Immigrants apply the services more frequently. For them, it is important to have many followers and to get a lot of likes and re-tweets. The younger generations seem to care on average much less about these aspects.

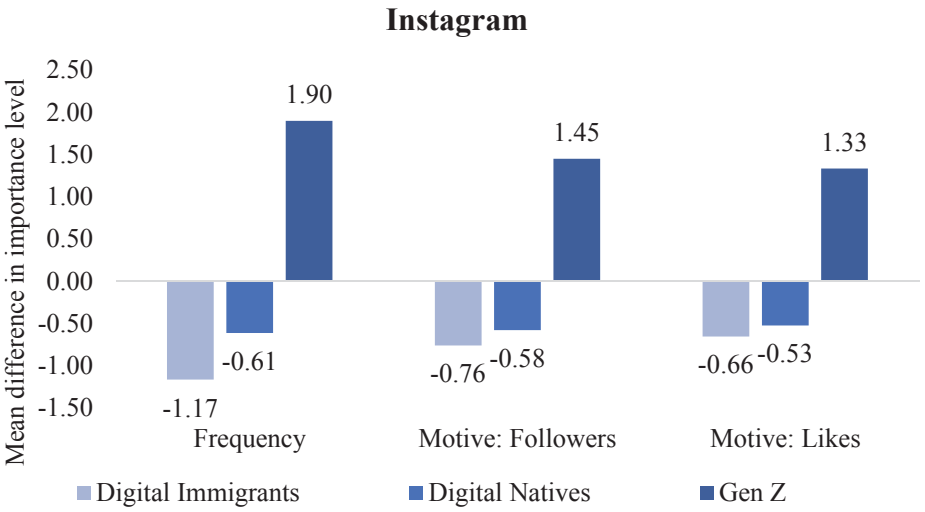

Figure 4.10. T-test outcomes for Instagram usage frequency and motivational factors.

There is a similar tendency for Instagram (Figure 4.10) and YouTube (Figure 4.11), however, the current youngest generation (Gen Z) is the one standing out. The representatives of Gen Z use the service far more frequently than the other two. For them, a high number of followers, as well as getting likes, are more important aspects than they are for Digital Immigrants and Digital Natives. From both older generations, 'Digital Immigrants' are the ones using the service even less frequently than the 'Natives'. They also care less about the attention and rewards in form of followers and likes.

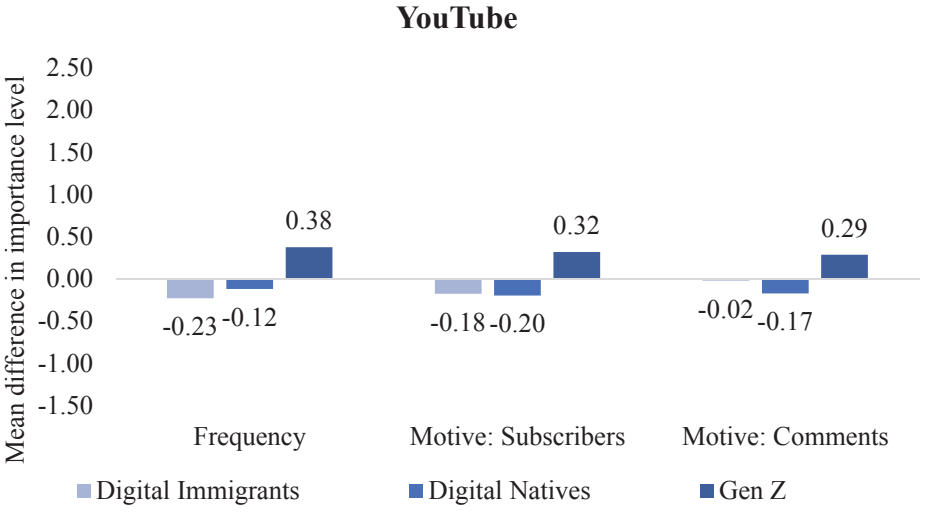

Figure 4.11. T-test outcomes for YouTube usage frequency and motivational factors.

Similar results are found for the service YouTube (Figure 4.11). However, here the mean differences are not as profound as for Instagram. On average, users from the Gen Z use YouTube slightly more frequently. Furthermore, they care a little more about subscribers and getting comments and up votes. Digital Natives are the ones caring least about comments,

up votes and subscribers. Then again, Digital Immigrants are the ones using the service less frequently than the remaining average.

There are also gender-dependent intra-generational differences in social media usage. Figure 4.12 shows the probability of social media use for five services and the three generational groups divided by gender. When analysing the probability of social media usage within the Digital Immigrants, we can see that the male users are more likely to use YouTube than Facebook, whereas female participants reported a preference for Facebook and YouTube. Still, both user groups are likely to use Twitter and less likely to visit Instagram or Pinterest. When analysing the Digital Natives, male and female users are very likely to use Facebook, followed by YouTube. Both groups are far less likely to use Twitter compared to the older generation. Also, female users would choose Instagram over Twitter. For both groups the least likely service to engage with is Pinterest (however, female users are still more likely than male ones to use it). Finally, the gender-dependent inter-generational differences are also reported for Gen Z. In this study, the male users prefer YouTube to Facebook. These are the two services they are most likely to use. Far behind, but still quite likely to be used, is Instagram. For Twitter and Pinterest the probability is closer to zero. The female users choose Facebook over YouTube and they are also very likely to apply Instagram. Similar to the male users from this generation, they are much less likely to use Twitter and Pinterest.

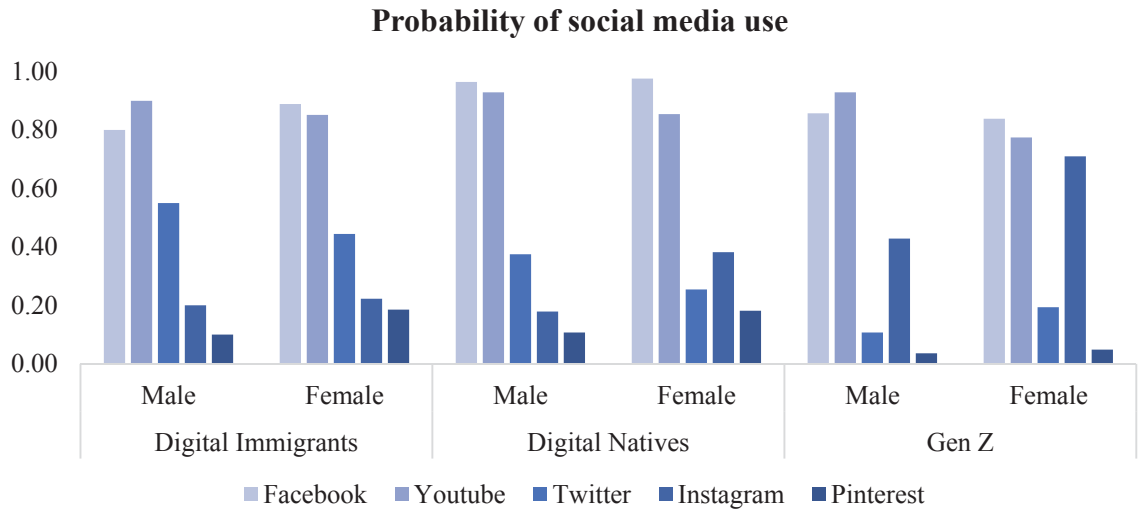

Figure 4.12. Probability of social media use and gender-dependent differences between Digital Immigrants, Digital Natives and Gen Z.

Figure 4.13 shows the average frequency of social media use of the five services for the investigated three generations divided by gender. For the Digital Immigrants, male and female users use Facebook almost every day. Female users also use Twitter and Instagram very often, whereas YouTube and Pinterest are reportedly visited around once a week. Male users use YouTube and Twitter quite often (once to several times a week). However, they use Pinterest only around once a month and Instagram even less often. The male Digital Natives use Facebook, YouTube and Instagram several times a week or even every day, whereas Twitter and Pinterest were visited far less often. Female Digital Natives use

Facebook on average every day, Instagram and YouTube several times a week, whereas Twitter and Pinterest were reportedly visited approximately once a week.

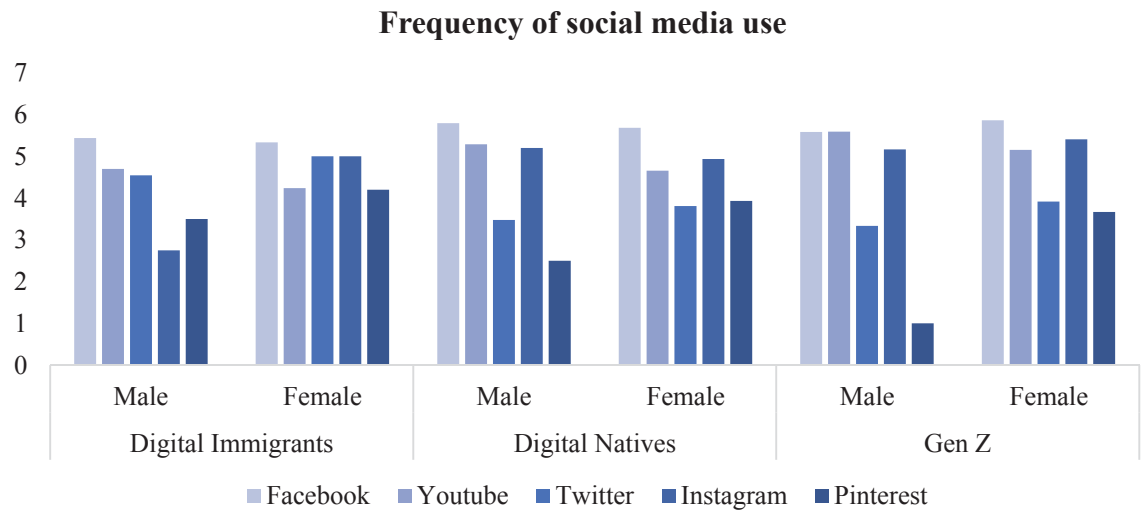

Figure 4.13. Frequency of social media use and gender-dependent differences between Digital Immigrants, Digital Natives and Gen Z.

Finally, the male representatives of Gen Z apply Facebook and YouTube equally frequently—several times a week to every day, and Instagram only several times a week. They use Twitter less frequently—less than once a week, and Pinterest even more seldom than every month. The female users from Gen Z use Facebook and Instagram most frequently (between several times a week and every day), followed by YouTube (several times a week). They use Twitter and Pinterest more frequently than male users—between once a week and once a month. In general, female users seem to apply all services more frequently than the male ones. Hence, once a female user (from whichever generation) decides to use a social media service, she uses it quite regularly. Male users, on the other hand, use some services very seldom, instead of completely opting out.

4.4 Discussion

In many developed countries, the digital divide based on technological accessibility has been already bridged. For a long time, age was assumed to be one of the issues restraining some portions of the population from using the Web. With time, older people started regularly using Web and its applications—not only the basics like emails or search engines, but also the Web 2.0 applications like social media services. The Web 2.0 is not anymore solely young people's domain. Now, how do the Silver Surfers and so-called Digital Immigrants apply social media? In order to determine the probability and frequency of social media usage by older generations, an online survey was conducted. The outcomes show inter-generational differences in social media use—the probability of social media usage, its frequency as well as some motivational factors regarding which services were being used. Furthermore, gender-dependent intra-generational differences were detected.

The results showed that there are indeed inter- and intra-generational differences. While the older generation, for example, Digital Immigrants, prefer services like Facebook for keeping

in touch with friends and family, they also engaged in Twitter and reportedly enjoy getting many followers. Digital Natives prefer Facebook and YouTube, and reported to enjoy the likes they get on Facebook. The youngest generation, Gen Z, prefers YouTube and Instagram. The users from Gen Z, as indicated by our study, do not use Twitter often; they also use Facebook less often than the other older generations. Finally, there are intra-generational differences between male and female users. Female users are most likely to visit Facebook, followed by YouTube (in turn, male users from the oldest and youngest generation prefer YouTube over Facebook). Furthermore, female users from all generations are much more likely than the male users to apply Instagram. Finally, female users seem to use all services more frequently than the male participants. Hence, once a female user decides to use a social media service, she tends to use it quite regularly. Male users, on the other hand, use some services very seldom instead of opting-out.

In conclusion, Silver Surfers and Digital Immigrants apply some of the popular social media, especially Facebook, Twitter and YouTube. While Facebook and YouTube are popular among all investigated generations, the most interesting inter-generational divergence is given for Twitter and Instagram. The micro-blogging platform Twitter is mostly applied by older users and gets less and less popular with the younger generations. Instagram, on the other hand, is the least applied by the oldest generations and gets more and more favoured with the younger ones. Twitter is a text-based platform often applied for news dissemination (Hornik, Satchi, Cesareo, & Pastore, 2015; Kwak, Lee, Park, & Moon, 2010), which is why it might be preferred by older age-groups to image-based platforms like Instagram, often associated with narcissism and self-promotion (Moon, Lee, Lee, Choi, & Sung, 2016). "An Instagram picture may be worth more than a thousand twitter words" (Pittman & Reich, 2016, p. 155), however, this thought applies only to the young adults and not the Silver Surfers or Digital Immigrants. The most striking gender-dependent difference in social media usage is the preference of the picture-sharing networks Instagram and Pinterest by females of all generations as well as more frequent usage of the platforms they once adopted. It appears that men are fonder of the text-based networks.

The main limitation of the study is its rather superficial, exploratory character. More in-depth questions and possibly a number of quantitative interviews could lead to more complex motivational reasoning for adapting a social media platform or not. A bigger sample of Silver Surfers, especially born between 1930s and 1950s would lead to a more founded conclusion. Finally, since this is a cross-country study, the incorporation of country-specific social media platforms (e.g., vk for Russia, nk for Poland), could result in a bigger sample.

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5 Breaking News Commentary: Users' Reactions to Terrorist Attacks in English-speaking Twittersphere

Two previous studies (chapters 3 and 4) on general social media use showed that the platform Twitter enjoys great popularity, especially among adult and elderly social media users. The following two studies pick up on this popularity in context of news consumption. First, user information production (breaking news commentary and dissemination) will be investigated. The second study will cover the information retrieval and dissemination with focus on official news services' Twitter accounts.

The micro-blogging platform Twitter is increasingly applied for breaking news dissemination and commentary. The users become so-called citizen journalists, as in some cases they are the first ones to report on breaking events. This paper investigates the tweeting behaviour of Twitter users in view of three terrorists' attacks that stroke Europe in 2015 and 2016, the attacks on Charlie Hebdo in January 2015, in Paris in November 2015, and in Brussels in March 2016. These attacks were triggering events for a wave of tweets showing support (#PrayForParis, #PrayForBelgium), solidarity (#JeSuisCharlie, #JeSuisBruxelles) or promotion of values like freedom of speech and press (#FreedomofSpeech). This study sheds light on the basic information behaviour of English-speaking Twitter users participating in the information exchange on these three events.

5.1 Introduction

Social media have become an important channel for people to share information (Lerman & Ghosh, 2010). Especially since 2006, when the social media platform Twitter got online (Fahri, 2009) and the users started answering the question on Twitter's interface: "What are you doing right now?" (Ilhan & Fietkiewicz, 2017). With time, it became a "microphone"-platform, where millions of users constantly post their opinions, comments and thoughts. "Users literally post everything going through their minds in an almost unconscious manner, making the [social media] stream facts-reach but also feelings-intensive at the same time" (Herrera-Viedma, Bernabé-Moreno, Porcel-Gallego, & Martínez-Sánchez, 2015). Twitter users have exactly 140 characters to express what they feel, what they do and what they think about. They are not limited to posting the so-called "tweets," but due to Twitter's hybrid nature, can make use of the push and pull service. They can search for tweets, they are interested in by using hashtag (#) or user accounts, they can also follow other users and news channels (Kaplan & Haenlein, 2011). Furthermore, they can include diverse multimedia (pictures, videos), links to external websites (outside the Twittersphere) and linkages to other Twitter accounts through the so-called "@"-mentions (hence, links within the Twittersphere) in their tweets (Ilhan & Fietkiewicz, 2017). Letierce, Passant, Decker, and Breslin (2010) categorized Twitter user into subcategories "from experts to amateurs by participants, media and so on" there are no limits – everyone can use Twitter.

People do not only want to consume content provided by others, but rather to produce own tweets. Java, Song, Finin and Tseng (2007) investigated reasons for which interactions on Twitter take place. They categorized these reasons into "daily chatter", "conversations",

"sharing information/URLs" and "reporting news". According to Mano and Milton (2016), the user-generated content on breaking news or events is a key factor of the so-called citizen journalism. Niekamp (2009) defines the citizen journalism as "the involvement of non-journalists in gathering, writing and disseminating information." It could be understood as "an active role in the process of collecting reporting, analysing and disseminating news and information" (Bowman & Willis, 2003).

This was also the case during the Charlie Hebdo attacks. All over the world, people sorrowed for victims and their family members by using Twitter. After the first tweet with the hashtag #JeSuisCharlie, reports by news agencies, YouTube videos and, in general, global reactions of the community followed (Ilhan & Fietkiewicz, 2017; Salovaara-Moring, 2015). In a very short time, the introduced hashtag became a symbol for solidarity with the victims and unity against terror. Salovaara-Moring (2015) explains the #JeSuisCharlie as follows: "These three words became a metaphor for organizing news flows, opinions, affects and participatory events in the digital media ecosystem. It became a global slogan adopted by supporters of the freedom of expression." According to An, Kwak, Mejova, De Oger and Fortes (2016), the "hashtags #CharlieHebdo and #JeSuisCharlie ('I am Charlie') became an explicit endorsement of freedom of expression and freedom of the press, and travelled fast and wide in Twitter." In this study, we will investigate the tweeting (or information) behaviour of Twitter users in view of these terrorist attacks and two subsequent attacks that took place in Paris and Brussels.

The first triggering event chosen for the investigation is the already mentioned terrorist attack on the editorial office of Charlie Hebdo in Paris in January 2015. The second triggering event are the attacks in Paris in November 2015, and the third one are the attacks in Brussels in March 2016. We aim to investigate how the Twitter community tweeted about these events. Are there recognizable differences in user behaviour between the three investigated attacks? And, are there changes in user behaviour during the seven days after the attack? This investigation is based on the following research questions:

> RQ1: What is the dissemination and impact level (number of RTs and likes) of the tweets on the three triggering events and how does it change over the period of one week?
>
> RQ2: How often do the users include external links (normal links) and links within the Twittersphere (@) in the tweets on the three triggering events and how does this information behaviour change over the period of one week?
>
> RQ3: Is there an association between embedding links (external and internal) and the dissemination and impact level (number of RTs and likes) of the tweets on the three triggering events and how does it change over the period of one week?
>
> RQ4: Is there an association between embedding external and internal links in the tweets on the three triggering events and how does it change over the period of one week?

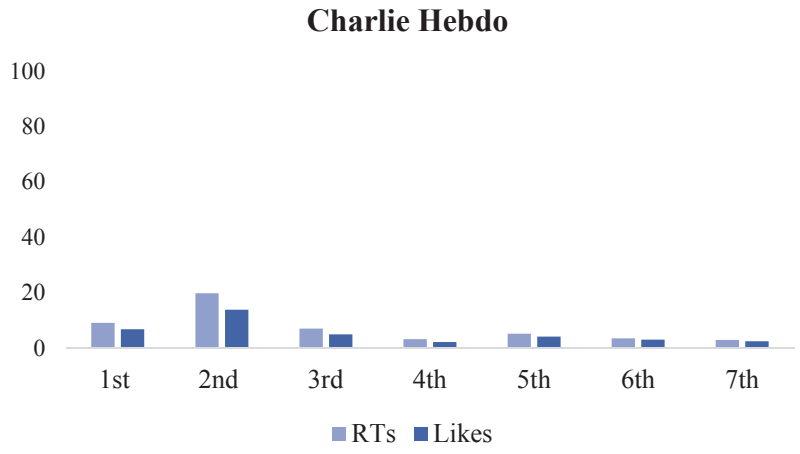
5.2 Methods

With the help of the Python application *Tweepy* and partially manually via Twitter advanced search interface, we have collected 21,000 tweets from English-speaking Twittersphere. From all "top" tweets for each day of the week after the attack we randomly selected 1,000 tweets. We have chosen only the "top" tweets since they are the most popular ones with the potentially highest impact and dissemination level. We searched for the tweets by using the most trending hashtags. For the first terrorist attack in Paris, we selected tweets posted from 7th to 13th of January 2015 which included the hashtags #JeSuisCharlie or #CharlieHebdo. For the second investigated attack, which also took place in Paris and involved suicide bombers and several mass shootings across the city, we selected tweets posted from 13th to 19th of November 2015 which included hashtags #PrayforParis, #PeaceforParis or #NousSommesParis. The last investigated terrorist attack was the one in Brussels that occurred at the Brussels airport and the Maalbeek metro station in the city centre, here, the gathered tweets were posted from 22nd to 28th of November 2016 and included hashtags #PrayForBelgium, #JeSuisBruxelles, or #BrusselAttacks.

The gathered Twitter data was saved into a database and further processed with Excel and Python. All external links (starting with http://) and all internal links, mentions (marked with "@"), were automatically extracted with Python. After the data was prepared, we conducted statistical analysis with SPSS. Besides the descriptive statistics, we applied Pearson's point-biserial correlation to investigate potential correlations between embedding external or internal links and the number of retrieved likes and RTs. We also computed the chi-squared values for the association between embedding external and internal links in one tweet.

5.3 Results

The first research question concerns the dissemination and impact level (number of RTs and likes) of the tweets about the three triggering events and its change over a period of one week. As we can see in the Figure 5.1, the tweets on triggering event got the most likes and RTs on the second day after the first triggering event (Charlie Hebdo). For the other two triggering events the tendency is different. The tweets got in average the most tweets on the 1st day, followed by an abrupt drop on the second day and low levels of dissemination throughout the whole week.



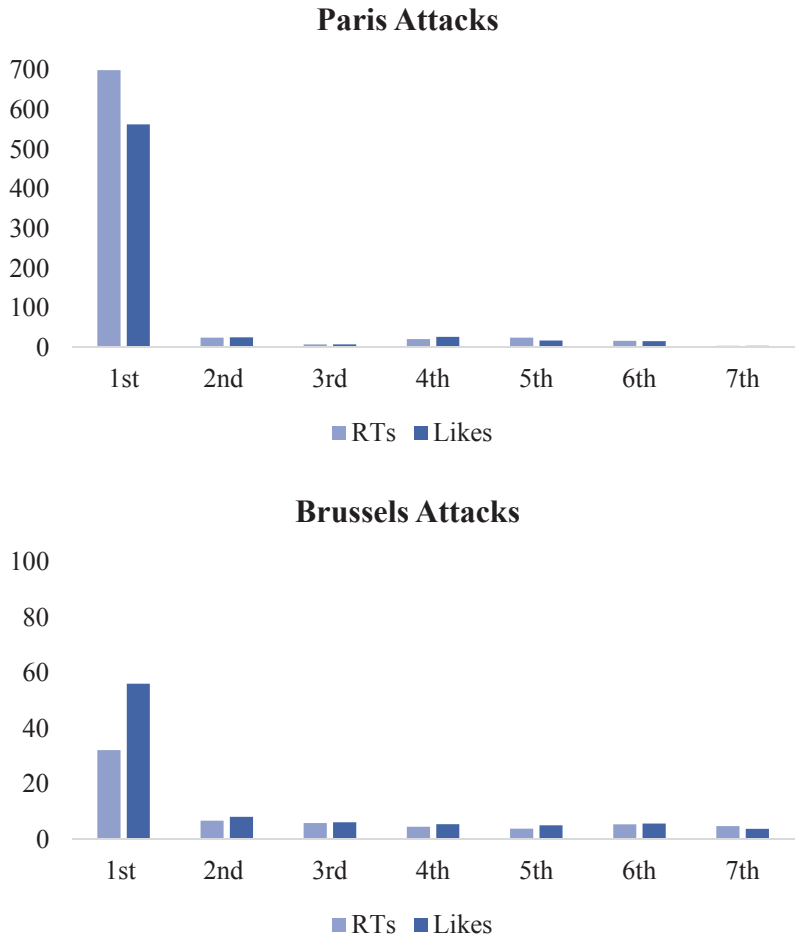


Figure 5.1. The dissemination and impact level of tweets represented by the average number of likes and retweets per day.

The second research question concerned the embedding of external links ("link") and links within the Twittersphere ("@") in the tweets on the three triggering events. As we can see in Figure 5.2, there were more internal links on the first two days considering the first triggering event. From the 3rd day, the tweets included more external links (34%-46% of the tweets) than internal ones (31%-33%). Looking at the second triggering event, only on the first day there were slightly more internal (7.4%) than external links (6.9%). On the remaining days, 31% to 45% of the tweets included external and 22.9% to 33.4% internal links. As for the last triggering event, there were more external (30.9%-52.1%) than internal links (18.6%-29.4%) included in the tweets on all seven days.

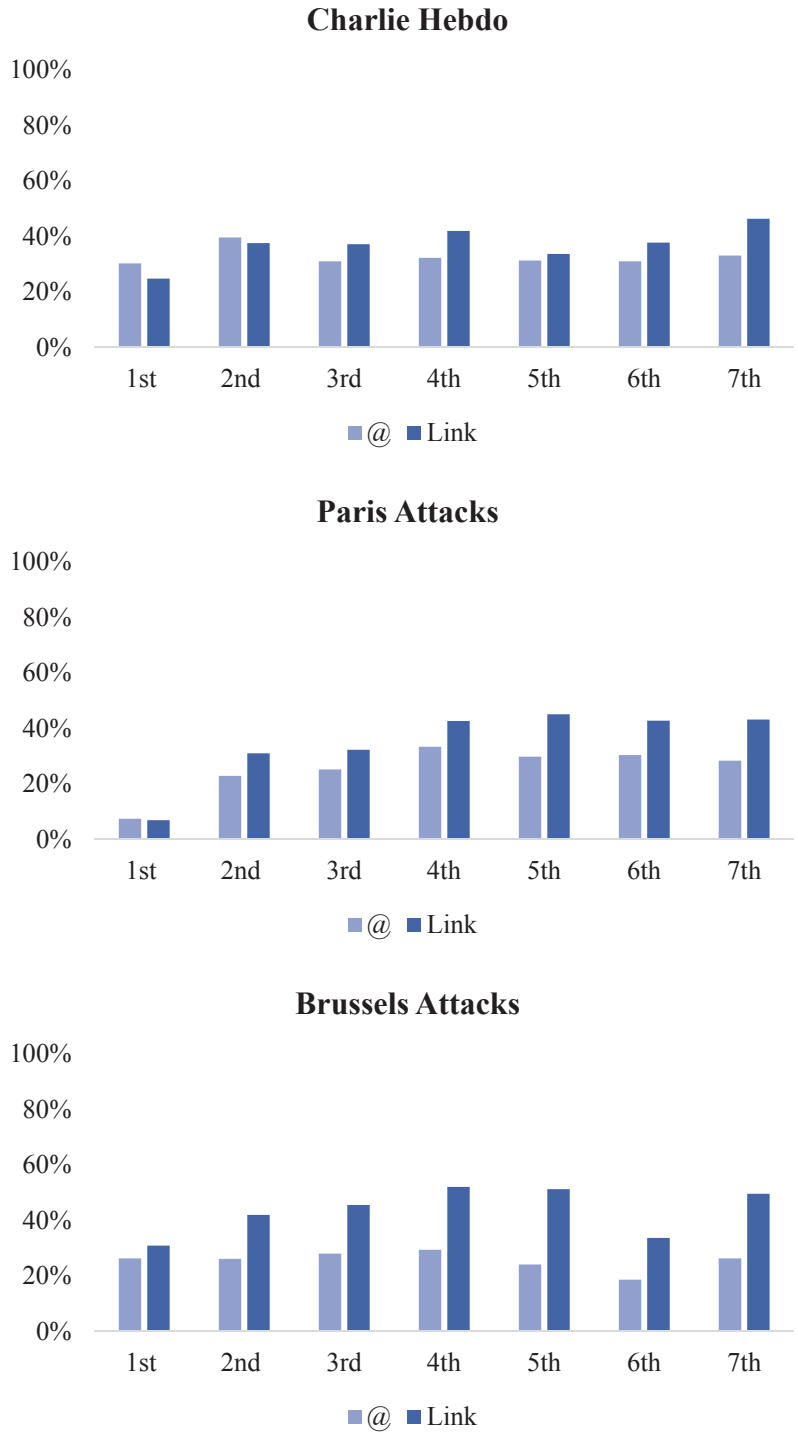


Figure 5.2. The percentage of tweets including external and internal (@) links.

The third research question regards the association between embedding links (external and internal ones) and the dissemination and impact level (number of RTs and likes) of the tweets. Table 5.1 shows the overall correlation values between these variables for all three triggering events. The only significant correlations are given for the second triggering event, the Paris terrorist attacks. There appear to be weak and negative correlations between embedding internal and external links and the number of retrieved likes and retweets. This means that

tweets with links are more likely to receive fewer likes or retweets. There were no significant correlations for the other two triggering events.

Table 5.1. *Correlation values between embedding external or internal links ("link" and "@") and the level of impact and dissemination ("like" and "RT").*

	Charlie Hebdo	**Paris Attacks**	**Brussels Attacks**
@ x like	-0.011	-0.03*	-0.005
@ x RT	-0.011	-0.031**	-0.008
link x like	0.005	-0.032**	-0.015
link x RT	0.008	-0.035**	-0.014

The symbols *, **, *** denote statistical significance at the 5%, 1%, and 0.1% levels.

Table 5.2 presents the correlation values between embedding internal links ("@") and the number of retrieved likes for all three triggering events (TE1-TE3) and each of the seven days. When investigating the association for each day separately, the only significant correlations appear to be given for the third triggering event on the 5th (positive correlation) and 7th day (negative correlation). However, both are very weak.

Table 5.2. *Correlation between embedding internal links (@) and the number of retrieved "likes" for each triggering event ("TE") and each of the seven days.*

@ x like	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**
TE1	0.003	-0.021	-0.04	-0.02	-0.035	-0.036	-0.017
TE2	-0.033	-0.022	-0.029	-0.037	-0.024	-0.027	0.037
TE3	-0.015	0.019	-0.007	-0.041	0.073*	-0.004	-0.07*

The symbols *, **, *** denote statistical significance at the 5%, 1%, and 0.1% levels.

When considering the association between internal links and the number of RTs (Table 5.3), the only significant correlation is given for the third triggering event on the 7th day. This correlation is negative and weak.

Table 5.3. *Correlation between embedding internal links (@) and the number of retrieved "RTs" for each triggering event ("TE") and each of the seven days.*

@ x RT	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**
TE1	0.02	-0.021	-0.037	-0.022	-0.047	-0.032	-0.008
TE2	-0.034	-0.02	-0.043	-0.036	-0.024	-0.032	-0.009
TE3	-0.015	-0.01	-0.031	-0.049	0.039	-0.013	-0.069*

The symbols *, **, *** denote statistical significance at the 5%, 1%, and 0.1% levels.

The correlations between embedding external links and the number of retrieved likes are shown in Table 5.4. Here, again, the only significant values are given for the third event on the 7th day. The correlation is negative and weak. There were no significant correlations

between embedding external links and the number of RTs (Table 5.5) for any of the triggering events.

Table 5.4. *Correlation between embedding external links and the number of retrieved "likes" for each triggering event ("TE") and each of the seven days.*

link x like	1st	2nd	3rd	4th	5th	6th	7th
TE1	-0.62	0.034	-0.042	-0.052	0.008	-0.032	-0.009
TE2	-0.01	-0.01	0.023	-0.034	-0.03	-0.034	-0.006
TE3	-0.022	-0.061	0.019	0.032	-0.06	-0.041	-0.078*

The symbols *, **, *** denote statistical significance at the 5%, 1%, and 0.1% levels.

Table 5.5. *Correlation between embedding external links and the number of retrieved "RTs" for each triggering event ("TE") and each of the seven days.*

link x RT	1st	2nd	3rd	4th	5th	6th	7th
TE1	-0.038	0.037	-0.033	-0.046	0.015	0.009	0.033
TE2	-0.017	-0.017	0.055	-0.028	-0.031	-0.039	0.039
TE3	-0.018	-0.053	-0.003	0.043	-0.056	-0.043	-0.054

The symbols *, **, *** denote statistical significance at the 5%, 1%, and 0.1% levels.

The fourth research question concerned the association between embedding external and internal links simultaneously in the tweets. As we can see in Table 5.6, for all investigated triggering events the most tweets including external links did not include internal "mentions" at the same time (60.9%, 70.9% and 72.4% respectively).

Table 5.6. *Chi-squared table for association between embedding external links and embedding internal links for all three triggering events (TE1-TE3).*

link x @	@ not included	@ included	Sig.
TE1	60.92%	39.10%	0.000
TE2	70.90%	29.10%	0.000
TE3	72.41%	27.59%	0.001

5.4 Discussion

In this study, we investigated the tweeting behaviour of users in English-speaking Twittersphere in view of three triggering events being terrorist attacks. The analysis of average number of RTs and likes that the analysed tweets included showed a tendency of higher impact and dissemination on the day of the triggering events, followed by an abrupt drop on the following six days.

Regarding the embedding of links, the users include more external links than internal ones (links to other Twitter accounts). Also, there are more users who only include one type of link in the tweet. There were only few weak correlations between embedding links (either

internal or external) and the number of received likes or RTs. This confirms our previous findings that including links in tweets in the context of such triggering events does not necessarily affect the number of received RTs or likes (Ilhan & Fietkiewicz, 2017).

Interesting aspects to investigate in future research would be a content analysis of tweets, which is another possible factor influencing the number of likes and RTs. Furthermore, a more detailed characterization of the link types included in the tweets could explain the higher or lower dissemination levels. Finally, an analysis of hashtags and the context words included in the tweets could shed light on the attitudes and emotions of the users towards the breaking news.

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5.5 References

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6 Inter-country Differences in Breaking News Coverage via Microblogging: Reporting on Terrorist Attacks in Europe from the USA, Germany and UK

This second study on online journalism and breaking news distribution via Twitter complements the findings on previous (news) information production behaviour. Now, the focus is set on Twitter activity of official news services and the information (breaking news) consumption behaviour of the users. The investigated topic—online news, especially instant breaking news dissemination, is very timely. Nowadays, when problems like "fake news," information overload, or, in contrary, censorship are prevalent, investigation of news production and consumption behaviour is of highest importance.

The micro-blogging service Twitter proved to be a suitable social media platform for (breaking) news dissemination and commentary. Its immediate penetration and strong ability to spread such news was already investigated by several researchers. Breaking news themselves play an important role in the "24-hour news culture" we live in today. In less than two years several terrorist attacks stroke Europe. Twitter was one of the live reporting tools that kept people from all over the world in the loop on the attacks as well as on the proceeding investigations. Did news agencies from three different countries report in a similar manner on all these attacks? Did their followers disseminate the breaking news through re-tweets on the same scale? Are tweets on terrorist attacks more likely to be retweeted?

6.1 Introduction

In less than two years, several terrorist attacks stroke the European society. Each time Twitter was one of the live reporting tools that kept the public in loop. How did news agencies from different countries report on these breaking events on Twitter? How did users react to such news?

Twitter is a micro-blogging service that allows its users to share tweets, messages of no more than 140 characters, with each other. After its launch on July 13, 2006, Twitter quickly became popular worldwide (Jansen, Zhang, Sobel, & Chowdury, 2009), also among older social media users (Fietkiewicz, Lins, Baran, & Stock, 2016). The messages (tweets) are available to the public and included in the tweet lists of the followers, who have subscribed to someone's Twitter stream (Armstrong & Gao, 2010; Lenhart & Fox, 2009; Palser, 2009). With time, Twitter has become an instrument for dissemination and subsequent debate on news stories (Bruns & Burgees, 2012) as well as one of the top services used by semantic web researchers to spread information (Letierce, Passant, Decker, & Breslin, 2010). Bruns and Burgees (2012) emphasize the dual nature of Twitter as a social networking site and an "ambient information stream."

Twitter's development from everyday communication and life-sharing towards a news dissemination and commentary tool is similar to the one of older social media platforms like, e.g. blogs, which has been established as first-hand reporting and follow-on commentary or discussion platforms (Bruns, 2006; Bruns & Burgees, 2012). Now, they are widely applied

for journalistic and quasi-journalistic activities (Bruns & Burgees, 2012; Kwak, Lee, Park, & Moon, 2010; Subašić & Berendt, 2011) as well as follow-on discussion and, according to Bruns (2005), the "gatewatching." Gatewatching is the "highlighting, sharing and evaluating relevant material released by other sources in order to develop a more comprehensive understanding" (Bruns & Burgees, 2012, p. 2). The "sharing" occurs through tweeting links to further sources or retweeting posts of other users. Ettema (2009) identified Twitter and blogging as journalistic tools for the 21st century.

Twitter can be also considered as an awareness system, "intended to help people construct and maintain awareness of each other's activities, context or status, even when the participants are not co-located" (Hermida, 2010; Markopoulos, De Ruyter, & Mackay, 2009). Twitter became "part of an ambient media system where users receive a flow of information from both established media and from each other" (Hermida, 2010). This "ambient" function of Twitter (Bruns, 2008; Hermida, 2010) is best recognizable when a broad commentary on current events is being carried out. After breaking news spreads across Twitter, the "topical focus of incoming tweets" may make the user pay attention to this breaking story (Bruns & Burgees, 2012, p. 2). For example, Mendoza, Poblete and Castillo (2010) investigated the behaviour of Twitter users under an emergency situation, namely the 2010 earthquake in Chile. They analysed the Twitter activity in the hours and days following the disaster as well as certain social phenomena like the dissemination of false rumours and confirmed news.

Studies suggest that citizens are increasingly participating in the "observation, selection, filtering, distribution and interpretation of events" and that digital technologies increase the presence of ambient news (Hermida, 2010). Domingo et al. (2008) speak of "participatory journalism." A study by PewInternet in 2010 showed that news is becoming a social experience and "participatory activity" since users increasingly post their own stories as well as experiences and reaction to current events (Hermida, 2010; Purcell, Rainie, Mitchell, Rosenstiel, & Olmstead, 2010).

In this study, Twitter activity by news services from Germany, the USA and the UK, one week before and one week after the selected triggering events—the terrorist attacks in Paris on 7th of January 2015, in Paris on 13th of November 2015, and in Brussels on 22nd of March 2016, is being investigated. The aim of this investigation is to identify the differences between top news services from the different countries in breaking news coverage via Twitter as well as its further dissemination by users through retweets.

6.2 Methods

For the purpose of this study, methods known from similar investigations on Twitter activity were applied. The importance of social networks was recognized by social scientists long time ago (Granovetter, 1973). The modern communication, especially social media, enhanced the role of networks in marketing (Farhi, 2009; Kempe, Kleinberg, & Tardos, 2003), information dissemination (Gruhl, Guha, Liben-Nowell, & Tomkins, 2004; Wu, Huberman, Adamic, & Tyler, 2004), search (Adamic & Adar, 2005), and expertise discovery (Davitz, Yu, Basu, Gutelius, & Harris, 2007; Lerman & Ghosh, 2010). Twitter has already proved to be a suitable social medium for investigation of news dissemination and commentary on breaking news. Gahran (2008) emphasized Twitter's immediate penetration

and strong ability to spread such news. According to Farhi (2009), Twitter is a "tool with speed and brevity that are ideal for pushing scoops and breaking news to readers" (Armstrong & Gao, 2010, p. 223). Breaking news play an important role in the "24-hour news culture" (Lewis & Cushion, 2009) and Twitter can provide users with this kind of news without them having to search for them on news' websites (Palser, 2009). The breaking news that were chosen as triggering events for the current study are the terrorist attacks in January 2015 in Paris aimed primarily at the offices of the satirical weekly newspaper Charlie Hebdo, the series of coordinated terrorist attacks in November 2015 in Paris including suicide bombings and mass shootings outside the Stade de France, in Bataclan Theatre and several Cafes, and the terrorist attacks in March 2016 in Brussels that occurred at the Brussels airport and the Maalbeek metro station in the city centre.

6.2.1 Applied indicators

Despite sending messages, or "tweeting," Twitter enables users to "like" and "retweet" messages of (other) users. If users consider a tweet as interesting, they can forward it to their own followers by "retweeting" the original message (Boyd, Golder, & Lotan, 2010). The meaning of retweets (RTs) can vary (Boyd et al., 2010). Without RTs the original message would only reach limited number of users (namely, one's own followers). Despite spreading the original message through the network, a RT can be interpreted as an "endorsement for message and sender," or, when additional commentary is retweeted, more a commentary of current news rather than its dissemination (Bruns & Burgees, 2012, p. 3). Any retweeted tweet can be expected to reach an average of 1,000 Twitter users (Kwak et al., 2010; Naveed, Gottron, Kunegis, & Alhadi, 2011). Messages are usually retweeted when users find a message particularly interesting and worth sharing with others, therefore, RTs may reflect what "the Twitter community considers interesting on a global scale" (Naveed et al., 2011, p. 4).

Furthermore, a well-connected user with active followers is more likely to be retweeted (Hong, Dan, & Davison, 2011; Kwak et al., 2010; Naveed et al., 2011; Suh, Hong, Pirolli, & Chi, 2010). Other factors that may influence the amount of retweets (retweetability) are besides the number of followers and followees, the age of the account, the number of favourite tweets as well as the number and frequency of tweets (Naveed et al., 2011; Suh et al., 2010). However, other studies contradicted the assumption that popular users with large numbers of followers have more influence on Twitter (Cha, Haddai, Benevenuto, & Gummadi, 2010; Romero, Galuba, Asur, & Huberman, 2011). According to Zhao et al. (2011), Twitter users tweet less on world events, however, they do actively retweet such news. In this study, the retweetability of tweets on the triggering events posted by different news accounts is analysed as an indicator of attention from the community ('retweetability').

While tweeting, an author can include links directed at other users by typing "@" and the respective user name. These directed links might represent "anything from intimate friendships to common interests, or even a passion for breaking news or celebrity gossip" (Cha et al., 2010, p. 10). During analysis of collected data, indicators were found that some of news agencies include directed links in their tweets. Some of these mentions are directed at accounts of celebrities that the news is about; others are directed at followers with whom

the news agency is communicating. For this study, mentions indicating a "conversation" between the news accounts and users were included as variable.

6.2.2 News accounts

Armstrong and Gao (2010) examined how Twitter is used as a content dissemination tool by news agencies. In their study, they looked at tweets of nine news organizations during a 4-month period in order to determine how individuals, links, news headlines and subject areas were employed within the 140-character limits. In this study the tweeting-activity of 15 news services accounts from three different countries during a 2-week period was investigated. The focus is set on information dissemination of concrete breaking news and not on general characteristics of news distribution, therefore, a shorter observation time of 2 weeks appears sufficient.

The main Twitter accounts of most popular online news agencies from Germany (Statista, 2014), the USA (PewResearchCenter, 2015) and UK (Newspapers, 2016) were investigated. The included German news services are Bild, Frankfurter Allgemeine Zeitung, Süddeutsche Zeitung, Die Welt, and Zeit Online. The investigated British news services are Daily Express, Daily Mirror, The Guardian, Daily Mail and Telegraph News. Finally, the investigated online news services from the USA are CBS, CNN, NBC, USA Today, and Yahoo.

The Twitter accounts were found either on the news organization's website or through a search on the Twitter website for the official account. From the respective news accounts, all tweets from the week preceding the investigated event ("triggering event") and all tweets from the week after the event, as well as from the day of the event, were retrieved. Hence, for Charlie Hebdo terrorist attacks (7th of January) there were retrieved tweets posted from 31st of December 2014 until 15th of January 2015. An example for an advanced Twitter search for the British news agency Daily Mail Online is: from:MailOnline since:2014-12-30 until:2015-01-16. For the second triggering event, the terrorist attacks in Paris (13th of November) the timespan was set from 6th to 20th of November 2015. For the last triggering event, the terrorist attacks in Brussels (22nd of March), the timespan was set from 15th to 29th of March 2016. For this study, all "live" tweets were retrieved, which are all published tweets in real-time order, and not only the "top" tweets limited to the most popular ones.

6.2.3 Research questions

Based on the retrieved tweets with focus on the three triggering events, this study aims at answering four main research questions:

> RQ1: What are the differences between news services' accounts from Germany, the USA, and UK regarding (a) the number of tweets posted per day, (b) the average number of RTs per tweet, and (c) their distribution over the two weeks around the terrorist attacks?
>
> RQ2: What are the differences between news services' accounts from Germany, the USA, and UK regarding (a) the ratio of tweets reporting on the terrorist attacks, (b) the average number of RTs that the news on terrorist attacks received, and (c) their distribution over the week after the terrorist attacks?

RQ3: What are the differences between news services' accounts from Germany, the USA, and UK regarding (a) the relationship between the topic of tweet being the terrorist attack and the number of RTs it gets, and (b) potential changes in this relationship during the week after the attack?

RQ4: Regarding all previous research questions, is there a noticeable difference in outcomes between the three investigated triggering events, i.e. is the breaking news coverage and its dissemination constant for all three attacks or is there a tendency of increasing or decreasing attention that they get?

6.2.4 Data processing

All tweets were retrieved using the python application *tweepy* and the Twitter-API, as well as manually using Twitter's advanced search interface. The database structure included a unique ID, the tweet itself, the news service, publication date, country, number of likes, number of RTs, whether the tweet is topically related to the triggering event ("topic of interest"), and whether the tweet is only an interaction with users. The tweets were topic-coded by two independent researchers. After processing with SPSS, the consolidated database included average counts for each news agency and for each one of the 15 days per event—the average number of tweets and RTs (RQ1) as well as the ratio of tweets on the topic of interest (RQ2). Furthermore, for the week after the attacks, there was calculated the difference between daily average of RTs of tweets on the "topic of interest" and for tweets on different, non-related topics. This difference was normalized by setting it in relation to the mean number of RTs for all tweets (on topic of interest and on others). This way it was possible to compare all three countries, which are characterized by different amounts of tweets and RTs per Tweet. This RT-ratio shows whether there is a positive or a negative tendency in retweeting news services' tweets reporting on the triggering event compared to tweets on other topics (RQ2):

$$RT\_ratio_{topic} = \frac{\emptyset RT_{topic} - \emptyset RT_{others}}{\emptyset RT_{all}} \times 100\%$$

The significance of the difference in retweetability between tweets on topic of interest and tweets on other topics was further examined with the Mann-Whitney U-test and the median RT-values (in contrast to the mean values, medians are not skewed by extreme values) for the both topic groups ("topic of interest" and "other topics"). The Mann-Whitney U-test was developed as a test of stochastic equality (Mann & Whitney, 1947). It is a rank-based nonparametric test that can be used to determine if there are differences between two groups on a continuous dependent variable (Laerd Statistics, 2015), in this case the number of RTs.

For the analysis of the influence that the topic of a tweet ("topic of interest") can have on its further dissemination by users through RTs (RQ3), Person's point-biserial correlation coefficient (r_{pb}) was computed. This coefficient is used to determine the strength of a linear relationship between one continuous variable and one nominal dichotomous variable. The effect sizes of Person's correlation coefficient were defined by Cohen (1988) as small, medium, and large and are reflected by the values 0.1, 0.3, and 0.5, respectively. These estimations were included in the analysis of the size of the effect that the topic of interest

potentially has on the retweetability. Furthermore, the coefficient of determination (r_{pb}^2) was calculated in order to determine the proportion of variance in one variable that can be explained by the other variable (Laerd Statistics, 2016; Sheskin, 2003). The coefficient of determination was calculated as the percentage of variance in the number of RTs that can be explained by the variance in the topic of the tweet ($r_{pb}^2 \times 100$).

6.3 Results

The dataset included 55,944 Tweets posted by 15 news services' Twitter accounts from three countries. There were 13,580 tweets from two weeks around the Charlie Hebdo terrorist attacks, 21,379 tweets from the period around the Paris terrorist attacks, and 20,987 tweets from the period around the terrorist attacks in Brussels. In general, there were 13,819 tweets from German, 30,801 from British, and 11,326 tweets from US-American news services' Twitter accounts. The differences between the accounts from different countries will be investigated while analysing the data in context of the four research questions.

6.3.1 General differences between news services' Twitter activity

The first research question concerns the general differences between the news services' Twitter activity from the three investigated countries and for the three investigated triggering events. The observed Twitter activity enfold seven days before and seven days after each triggering event.

The first investigated triggering event are the Charlie Hebdo terrorist attacks, Figure 6.1. As for the German news services, the average number of tweets per day ranged between 123 and 284 tweets, with a peak on the day of triggering event (7-Jan). Regarding the average retweetability, the number of RTs oscillated between 7.3 and 14.4 RTs/tweet with the highest value on the day after triggering event (8-Jan) and the day of triggering event with 14.4 and 14.3 RTs/tweet respectively. As for the news services from the USA, they posted the fewest tweets. The average number of tweets per day ranged between 92 and 242 with a peak on 12-Jan (242 tweets) and on the day after the triggering event (235 tweets). The lowest number of published tweets was given on Saturdays (3-Jan and 10-Jan) with 99 and 92 tweets respectively. However, the US-account have in average the highest number of RTs/tweet ranging between 63.6 and 143.33 RTs/tweet with a peak on the day of triggering event (7-Jan) with 143.3 RTs/tweet and two days after (9-Jan) with 138.8 RTs/tweet. The news account from UK published the highest average number of tweets per day, ranging between 305 and 724. There was a peak in number of published tweets on the two days following the triggering event (8-Jan and 9-Jan) with 724 and 704 tweets respectively. The number of RTs/tweet ranged between 25 and 55.8, with a peak on the day of the triggering event (7-Jan).

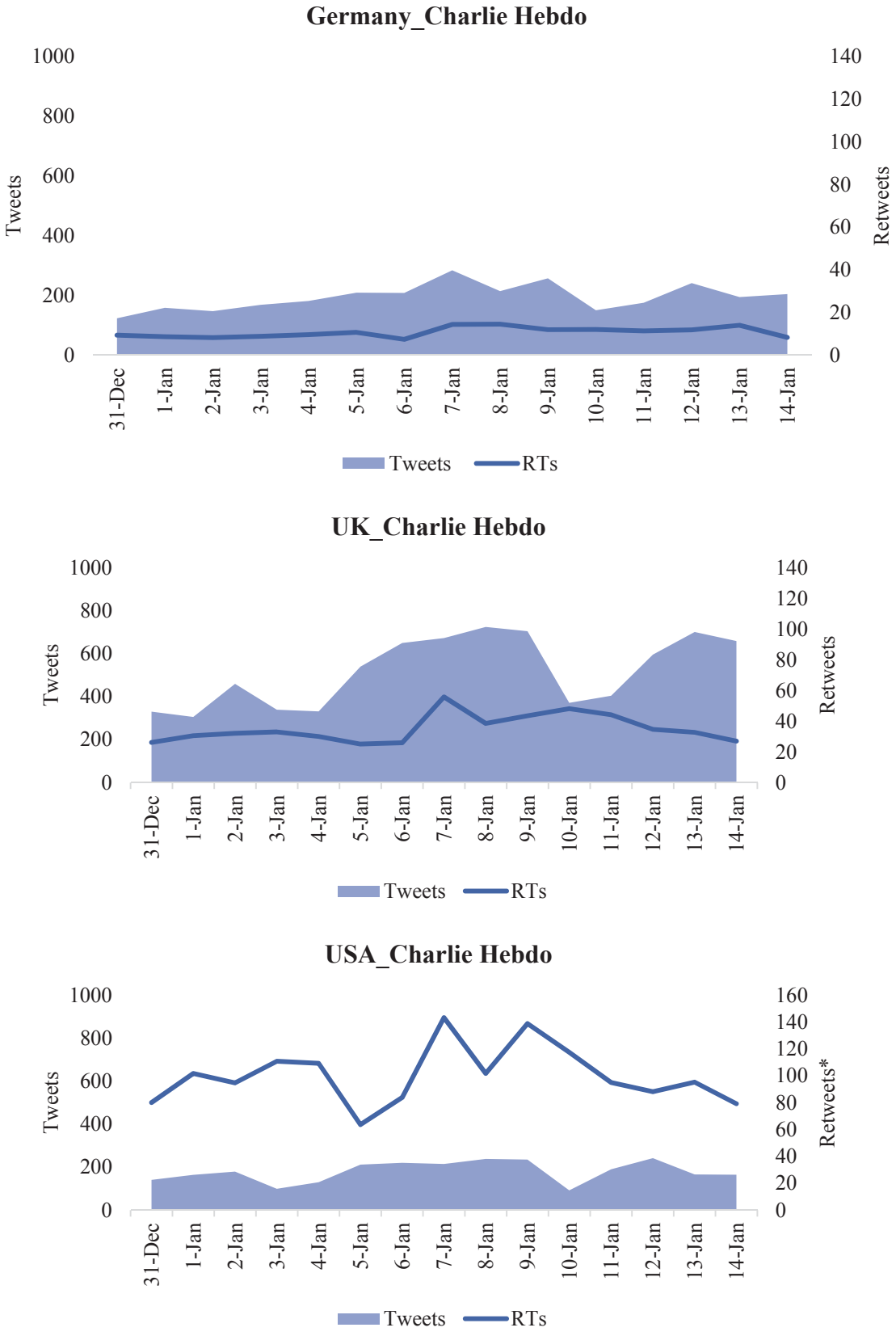


Figure 6.1. Average number of tweets and RTs per tweet over two weeks around the investigated triggering event Charlie Hebdo.

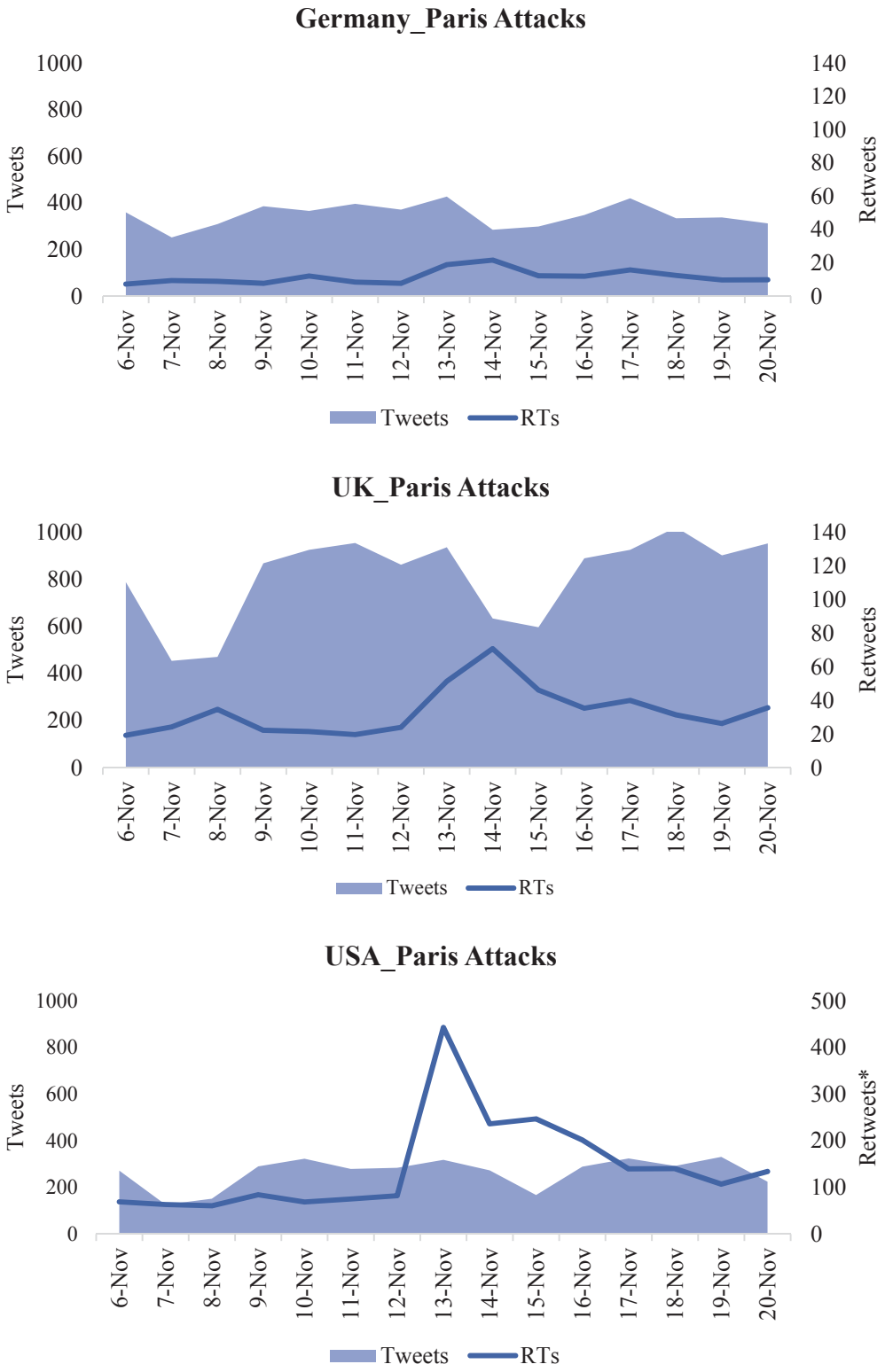


Figure 6.2. Average number of tweets and RTs per tweet over two weeks around the investigated triggering event Paris attacks.

The Twitter activity and retweetability of news services around the time of Paris terrorist attacks is shown in Figure 6.2. As for the news services from Germany, the average number of tweets per day increased when compared to the first triggering event, and ranged between 252 and 427 tweets per day. There was a peak in activity on the day of triggering event (13-Nov) and four days later (17-Nov) with 427 and 420 tweets respectively. The lowest numbers of tweets are given on 7-Jan and 14-Jan, which were Saturdays. The average number of RTs per tweet ranged between 7.24 and 21.7 with most RTs on the day after the triggering event (14-Nov). Regarding the news services from the USA, the average number of tweets per day was between 126 and 331, which as well indicates an increase when compared to the first triggering event, with a peak on 19-Nov with 331 tweets, and lowest values on 7-Nov and 15-Nov (Saturday and Sunday). The numbers of RTs varied between 60.6 and 442.9 RTs/tweet with a very distinctive peak on the day of triggering event (13-Nov). Considering the news services from the UK, the average number of tweets per day was between 453 and 1020 tweets, which is the highest from all investigated countries, with a peak on 18-Nov, and lowest values on 7-Nov and 8-Nov (Saturday and Sunday). The average number of RTs per tweet ranged between 19.2 and 70.7, with a peak on the day after the triggering event (14-Nov) and the day of the triggering event (13-Nov) with 70.7 and 51.4 RTs/tweets respectively.

Figure 6.3 depictures the Twitter activity and retweetability of news services' accounts around the time of Brussels terrorist attacks. As for the German news services, the average number of tweets was between 237 and 455, with peaks on 18-Mar and one day after the triggering event (23-Mar) with 455 and 437 tweets respectively. The lowest average number of tweets per day was given on 27-Mar and 26-Mar (Saturday and Sunday). The average number of RTs ranged between 8.3 and 19.9 RTs/tweet, with a distinctive peak on the day of triggering event (22-Mar). The news services from the USA posted in average between 182 and 465 tweets per day, with a peak on 16-Mar and lowest values on 19-Mar, 20-Mar and 26-Mar, 27-Mar, which were the weekends. The average number of RTs ranged between 91.8 and 217.4 RTs/tweet, with a distinctive peak on the day of triggering event (22-Mar). As for the news services from the UK, they published in average between 465 and 1028 tweets/day, which is the highest number of all investigated countries and all three time periods. There was a peak in Twitter activity on the day of the triggering event (22-Mar), whereas the lowest numbers of tweets were given for 19-Mar, 20-Mar and 26-Mar, 27-Mar. These were the weekends as well. The average number of retweetability was between 20.8 and 44.4 RTs/tweet with a distinctive peak on the day of the triggering event (22-Mar).

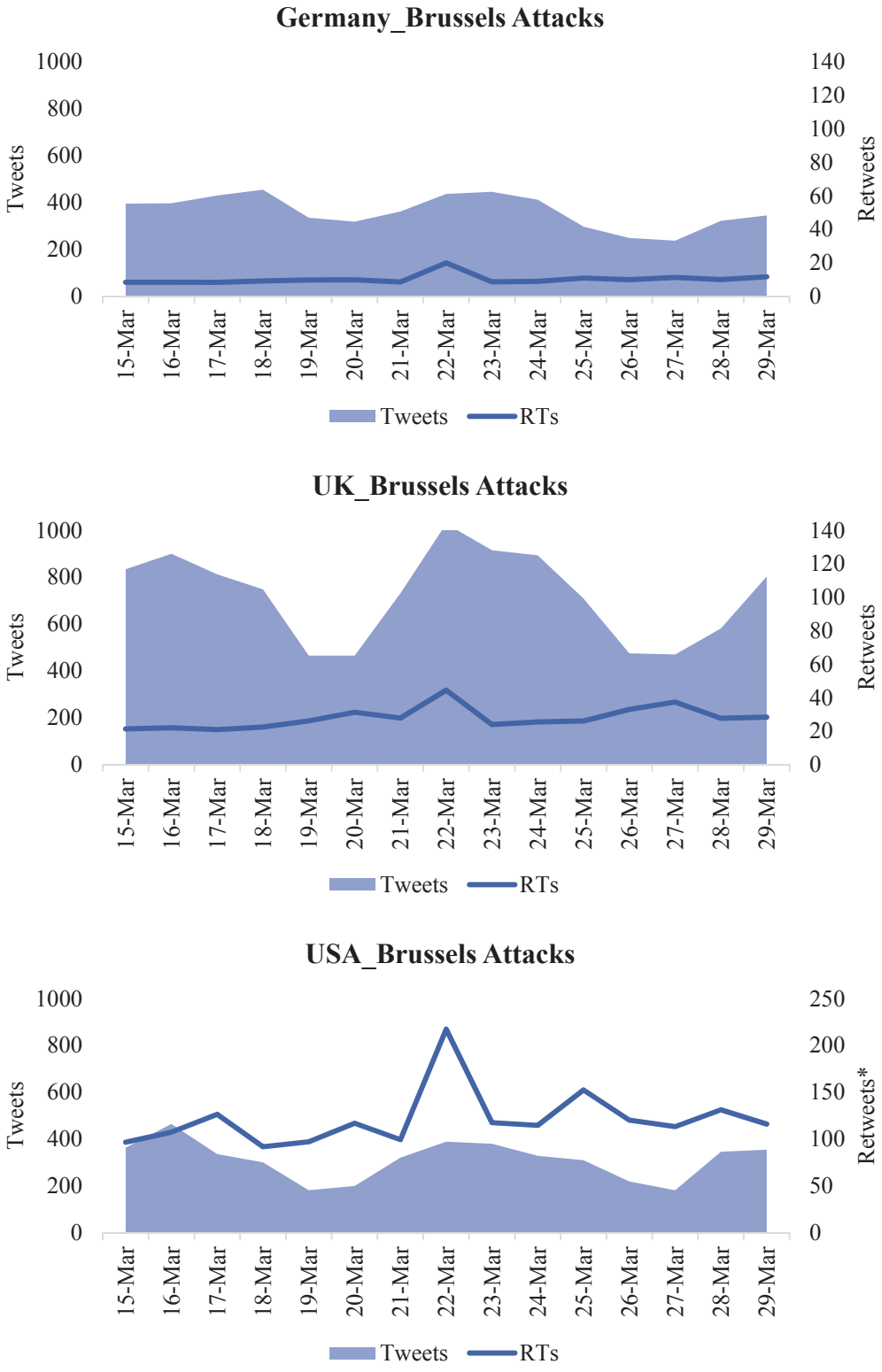
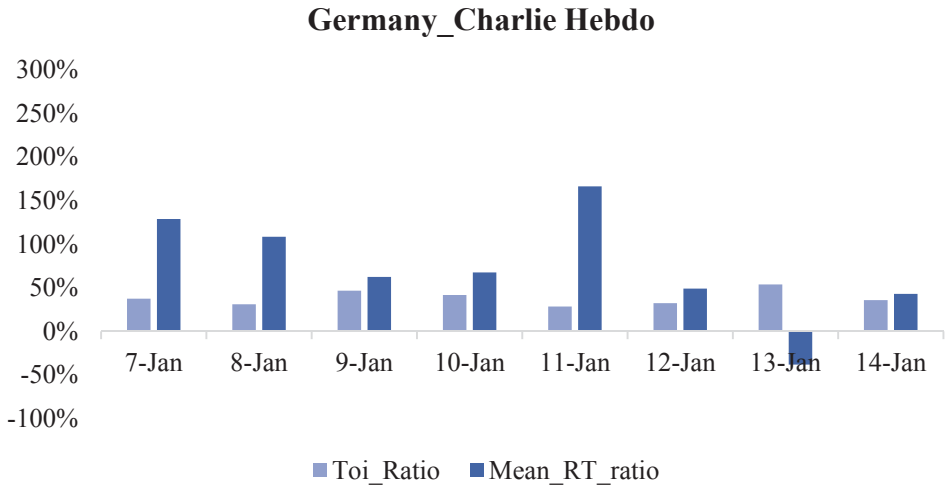


Figure 6.3. Average number of tweets and RTs per tweet over two weeks around the investigated triggering event Brussels attacks.

6.3.2 Differences between news services regarding the reporting on the triggering event and the retweetability levels

The second research question regards the differences between the investigated news services' accounts considering the ratio of tweets on the topic of interest as well as the differences in retweetability of tweets on topic and tweets on other topics. Figure 6.4 shows the differences for the first investigated triggering event, the Charlie Hebdo terrorist attacks.

As for the news services from Germany (Figure 6.4), the ratio of tweets on topic of interest ('toi-ratio') during the week after the triggering event ranged between 53.7% and 28.45% of all tweets. The highest value was given on the 6th day after triggering event (13-Jan) followed by the 2nd and 3rd day (9-Jan and 10-Jan). On the day of triggering event the ratio of tweets on topic amounted to 37.32%. The lowest ratio was given on the 4th day (11-Jan, with 28.45%). The average difference in retweetability of tweets on topic oscillated between +166.44% and -38.42%, with the highest positive difference on 11-Jan, followed by the day of the triggering event with +128.9%. The lowest and the only one negative value was given on 13-Jan (-38.2%). Regarding the news services from the USA, the topic of interest ratio ranged between 20.66% and 8.81% and was the lowest one of the three countries. There were peaks in the number of tweets on topic on two days after the triggering event (8-Jan and 9-Jan) and on the 4th day (11-Jan), with slightly over 20%. The lowest ratio was given on the 13-Jan. The mean difference in retweetability ranged between +177.8% and -8.54%. The highest positive difference in retweetability of tweets on topic of interest was given on the 4th day (11-Jan) and the day of triggering event (7-Jan), with +177.8% and +121.5% respectively. The lowest and only one negative value was given on 14-Jan (-8.5%). As for the news services from the UK, the topic of interest-ratio was between 55.32% and 17.4%, with the highest ratio on the day of triggering event (7-Jan), which then decreased over the week. The mean retweetability difference ranged between +179.4% and +26.1%, meaning that each day the tweets on topic got over-average number of RTs. The highest difference in retweetability was given on the day of triggering event (7-Jan) and on the 4th day (11-Jan) with +179.4% and +128.3% respectively.



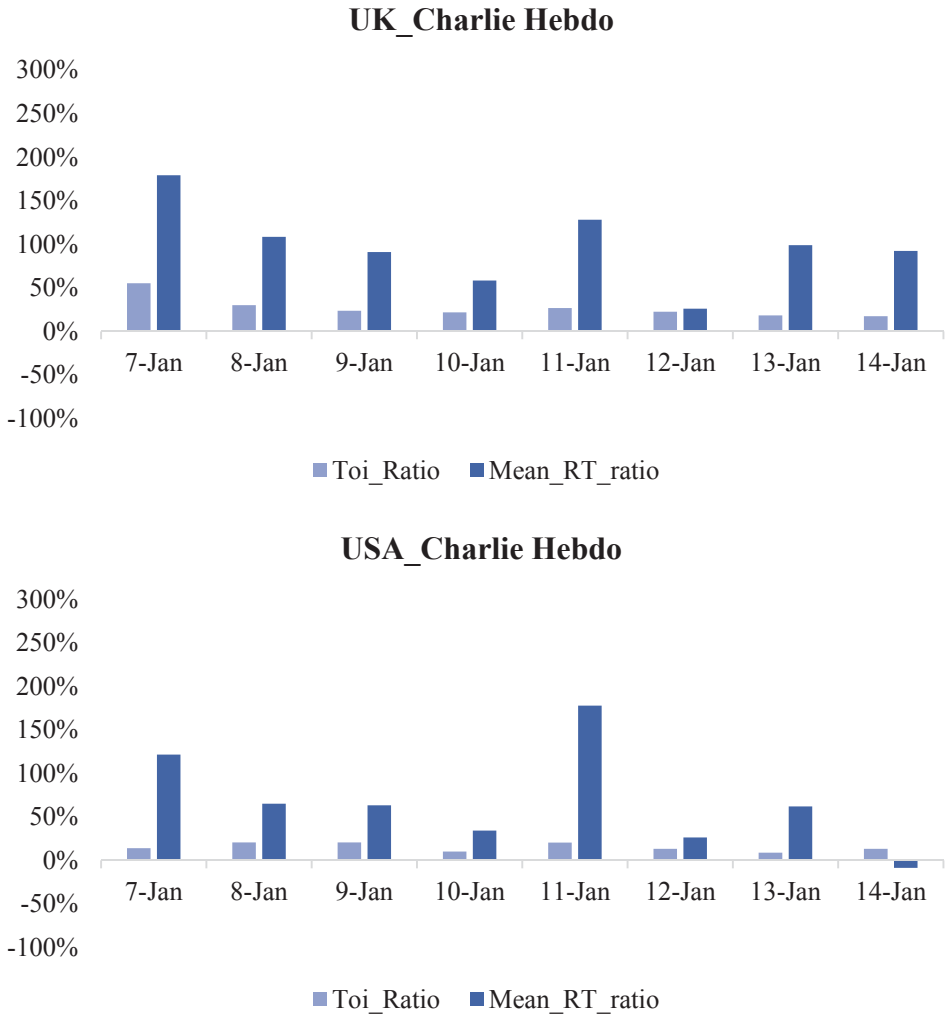


Figure 6.4. The ratio of tweets on the triggering event ("toi") and the mean difference in re-tweeting tweets on topic of interest relative to the overall average number of RTs per tweet for the investigated triggering event Charlie Hebdo.

Figure 6.5 shows the ratio of tweets on topic of interest and their retweetability for the second investigated triggering event, the Paris terrorist attacks. The German news services tweeted on this topic in around 66.7% to 20.2% of their tweets, with a peak between 3rd and 5th day after the triggering event (16-Nov through 18-Nov). Surprisingly, the lowest ratio with 20.2% of tweets on topic was given on the first day after the triggering event (14-Nov) and followed by the day of triggering event (13-Nov) with 32.1%. The mean difference in retweetability of these tweets ranged between +181.8% and -18.5%, with highest positive difference on the day of triggering event (13-Nov) with +181.8% and two lowest, negative values on 17-Nov and 20-Nov with -18.5% and -1.42% respectively.

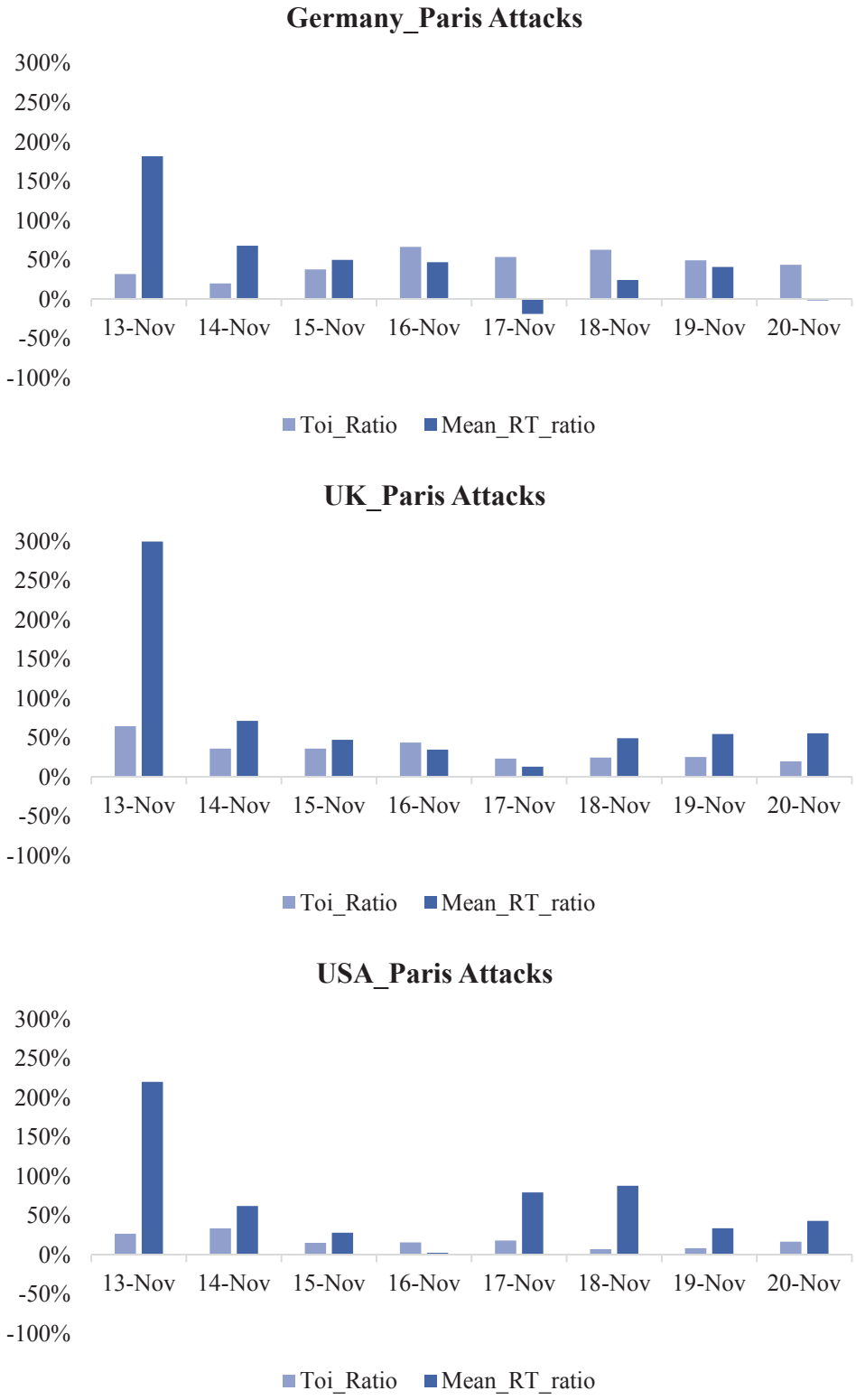


Figure 6.5. The ratio of tweets on the triggering event ("toi") and the mean difference in re-tweeting tweets on topic of interest relative to the overall average number of RTs per tweet for the investigated triggering event Paris attacks for German, USA and UK news services.

As for the news services from the USA (Figure 6.5), the ratio of tweets on topic of interest was between 33.9% and 7.4%, with highest values on the first day after the triggering event

(14-Nov) and the day of triggering event (13-Nov), with 33.9% and 27.1% respectively, and lowest values on 5th and 6th day (18-Nov and 19-Nov) with 7.4% and 8.6% respectively. The mean retweetability difference lied between +220.1% and +2.7%, meaning that the retweetability of tweets on topic was over-average the whole week after the triggering event. The highest values were given on the day of triggering event (13-Nov) with +220.1% over average and on the 5th day after triggering event (18-Nov) with +87.9%. The lowest difference in retweetability was given on the 3rd day after triggering event (16-Nov), with +2.7%.

Regarding the news services from the UK (Figure 6.5), the topic of interest ratio ranged between 64.7% and 20.1% with the highest value on the day of triggering event (13-Nov) and the 3rd day after triggering event (16-Nov) with the ratios reaching 64.7% and 43.9% respectively. The lowest ratio was given on the 7th day after triggering event (20-Nov) and reached 20.1%. The mean difference in retweetability ranged between +299.5% and +13.4%. Again, all the values were over-average. The highest retweetability values were given on the first two days (13-Nov and 14-Nov) with +299.5% and +71.6% respectively. The lowest difference was given on the 4th day after the triggering event (17-Nov) and reached 13.4%.

Figure 6.6 depictures the ratios of tweets on topic of interest and the mean difference in their retweetability for the last investigated triggering event, the Brussels terrorist attacks. The German news services tweeted on the topic of interest in between 62.2% and 1.16% of their tweets, with the highest value on the day of triggering event (22-Mar), which decreased steadily over the week and reached the lowest ratio on the 7th day after the triggering event (29-Mar). The mean difference in retweetability ranged between +80% and -9.9%, with the highest values on the first two days (22-Mar and 23-Mar) with 80% and 42.6% respectively, and the lowest, only one negative, value of -9.9% on the 6th day after triggering event (28-Mar).

As for the news services from the USA (Figure 6.6), the ratio of tweets on topic of interest ranged between 58.1% and 0.9%, with the highest value on the day of triggering event (22-Mar), decreasing over the weak and reaching the lowest one on 29-Mar. The mean difference in retweetability ranged between +86.1% and -67.9%. The only over-average retweetability was given on the first two days (22-Mar and 23-Mar) with +86.1% and +14.2%. On the remaining days, the retweetability of tweets on topic was under-average.

Considering the news services from the UK (Figure 6.6), the ratio of tweets on topic ranged between 37.8% and 1.4%, with the highest value during the first two days (22-Mar and 23-Mar), 37.8% and 25% respectively. The ratio decreased over the week after the triggering event reaching the lowest value on 29-Mar. The mean difference in retweetability ranged between +142% and 47.9%. The highest value was given on the day of triggering event (22-Mar), steadily decreasing over the week and reaching negative values on 28-Mar (-16.6%) and 29-Mar (-47.9%).

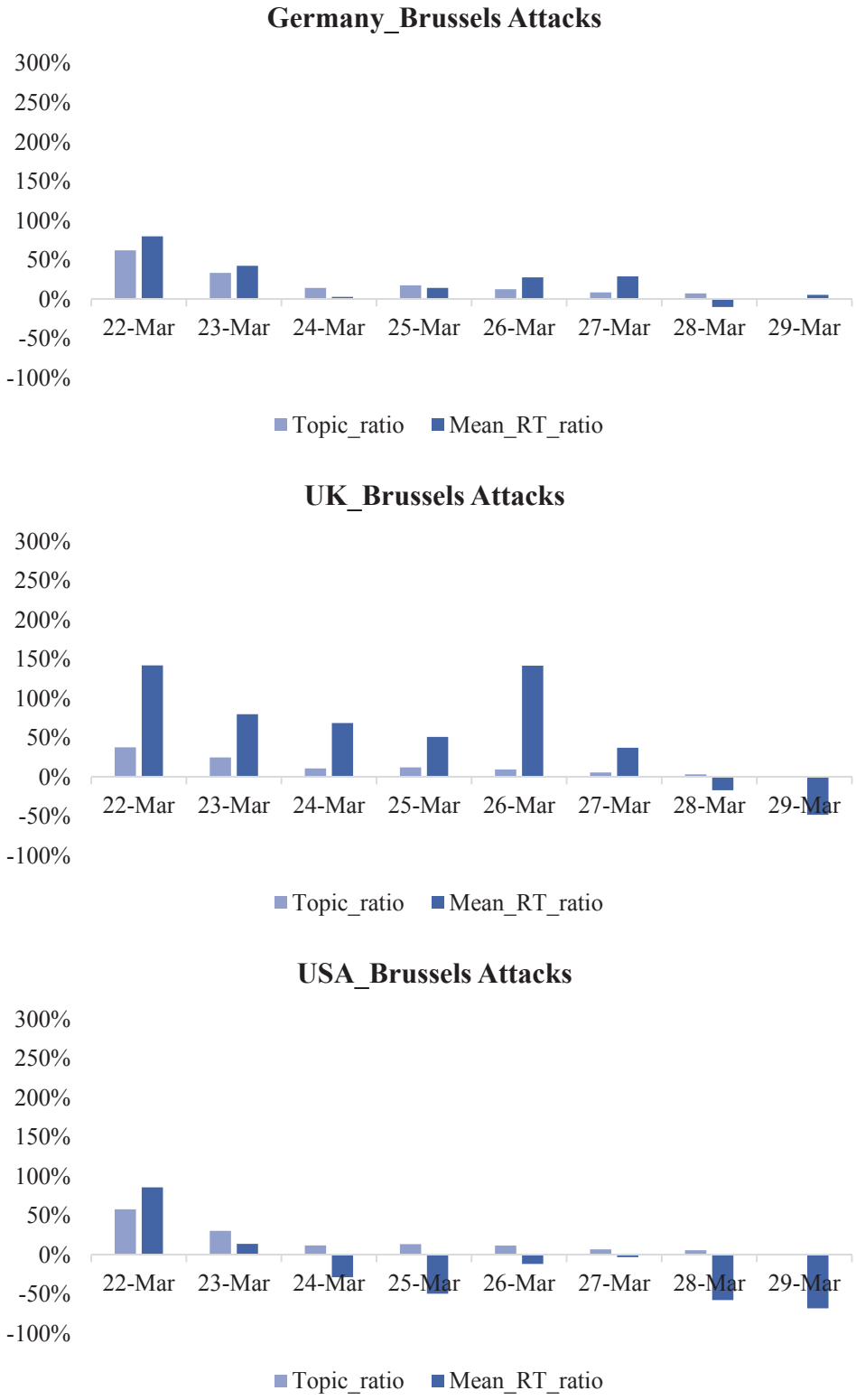


Figure 6.6. The ratio of tweets on the triggering event ("toi") and the mean difference in re-tweeting tweets on topic of interest relative to the overall average number of RTs per tweet for the investigated triggering event Brussels attacks for German, USA and UK news services.

The differences in retweetability of tweets on topic were further examined with the Mann-Whitney U-test (MWU). Tables 6.1 through 6.3 show the median number of RTs of tweets

on topic of interest and of tweets on other non-related topics, as well as the significance of these differences as computed with the MWU-test.

Table 6.1 presents the medians for each country and topic group as well as the significance outputs of the MWU-test for the first investigated triggering event, Charlie Hebdo terrorist attacks. Regarding the German news services' accounts, for all investigated days, except for the 7th day, the differences in retweetability between tweets on topic of interest and of tweets on other topics were significant. The median of tweets on other topics oscillates between 4 and 6 RTs, whereas the medians of tweets on topic were the highest on the 1st and 5th day (16 RTs), and decreased on other days to 10-12 RTs. As for the news services from the USA, the differences were significant for the first three days and then again for the 5th and 6th day. For both topic groups the medians were the highest when compared to the other countries. The median number of tweets on other topics was around 27 to 43 RTs, whereas for tweets on topic of interest between 28 and 90 RTs. Regarding news services from the UK, all differences between the both topic groups were significant, the medians of RTs for tweets on other topics were between 14 and 22 RTs, whereas for tweets on topic of interest between 30 and 64 RTs. For all countries, the medians for tweets on topic of interest were higher than for tweets on other topics through the whole week after the triggering event, however, they decreased at the end of the week.

Table 6.1. *Difference in median retweetability of tweets on topic of interest and on other topics and their significance according to Mann-Whitney U-test for the triggering event Charlie Hebdo.*

Charlie Hebdo	**DE**			**USA**			**UK**		
	toi_0	**toi_1**	**sig.**	**toi_0**	**toi_1**	**sig.**	**toi_0**	**toi_1**	**sig.**
1st day	4	16	**	43	90	**	14	64	**
2nd day	4	12	**	32	67	**	15	43	**
3rd day	5	12	**	47	66	**	15	41	**
4th day	6	11	**	46	75.5	ns	22	41.5	**
5th day	4	16	**	27	77	*	20	50	**
6th day	6	10.5	**	34	48	**	17	30.5	**
7th day	5.5	8.5	ns	36	38.5	ns	15	30	**
8th day	4	10	**	37	55	ns	14	33.5	**

Table 6.2 shows the outcomes for the second investigated triggering event, the Paris terrorist attacks. Regarding the German news services, the differences in retweetability between the two topic-groups were highly significant, except for the 5th and 8th day. Again, the retweetability medians of tweets on other topics were lower (between 5 and 9 RTs) than for tweets on topic of interest (between 7 and 34 RTs), however, they decreased to the end of the week. As for the USA, all differences were significant and the medians for tweets on topic of interest were even higher than for the first triggering event (between 73 and 388 RTs), tweets on other topics exhibited retweetability medians between 37 and 76 RTs. Regarding the news services from the UK, all differences were significant as well. The medians for tweets on topic of interest were between 110 and 21 RTs, whereas for tweets on other topics between 11 and 21 RTs.

Table 6.2. *Difference in median retweetability of tweets on topic of interest and on other topics and their significance according to Mann-Whitney U-test for the triggering event Paris attacks.*

Paris attacks	DE			USA			UK		
	toi_0	**toi_1**	**sig.**	**toi_0**	**toi_1**	**sig.**	**toi_0**	**toi_1**	**sig.**
1st day	05	34	**	37	388	**	11	110	**
2nd day	08	16	**	48	144	**	21	46.5	**
3rd day	06	10	**	76	110	*	20	38	**
4th day	06	09	**	53	93	**	15.5	21.5	**
5th day	09	11	ns	44	106	**	19.5	23.5	*
6th day	08	12	**	44	73	**	14.5	23	**
7th day	07	11	**	53.5	73	*	12	21	**
8th day	07	07	ns	53.5	122.5	**	15	27.5	**

Table 6.3. *Difference in median retweetability of tweets on topic of interest and on other topics and their significance according to Mann-Whitney U-test for the triggering event Brussels attacks.*

Brussels attacks	DE			USA			UK		
	toi_0	**toi_1**	**sig.**	**toi_0**	**toi_1**	**sig.**	**toi_0**	**toi_1**	**sig.**
1st day	05	18	**	49	155.5	**	08	35	**
2nd day	05	08	**	60	60	ns	09	17	**
3rd day	06	07	ns	57	52	ns	09	23	**
4th day	07	09	*	66	53	ns	08	20.5	**
5th day	07	10.5	*	45	63	*	13	29	**
6th day	08	13	*	58	67	ns	18	17.5	ns
7th day	06.5	08	ns	60	32	*	12	12	ns
8th day	07	11.5	ns	52	32	ns	13	09	ns

Table 6.3 presents the retweetability medians and significance outcomes for the last investigated triggering event, the Brussels terrorist attacks. Here, the outcomes of MWU-test are way less significant than for other investigated triggering events. For Germany, there were significant differences on the first two days and on the 4th through 6th day. Furthermore, the differences were less distinctive when compared to the other triggering events. Tweets on topic of interest achieved the median retweetability score between 8 and 18 RTs, whereas the tweets on other topics between 5 and 8 RTs. As for the USA, the differences in retweetability were only significant for the 1st, 5th and 7th day. The first difference was very distinctive, with a median retweetability score of 155.5 for tweets on topic and of 49 for tweets on other topics. On the 5th day this difference got less noticeable (63 and 45 RTs respectively). On the 7th day, with the least significant difference, the tweets on topic achieved less RTs than tweets on different topics (32 and 60 RTs respectively). As for the UK, the differences in retweetability for the first five days were significant. However, a decrease in median scores is recognizable when compared to the previous two investigated events. The median retweetability scores for tweets on topic of interest were between 9 and 35 RTs, whereas for tweets on other topics between 8 and 18 RTs.

6.3.3 Inter-country differences and differences between all triggering events regarding correlation between tweet's topic and its retweetability

The third research question regards the differences between the investigated news services' accounts considering the correlation between the topic of the tweet and its retweetability. The focus of the analysis is also set on the comparison of the three triggering events (fourth research question). Regarding the first triggering event, Charlie Hebdo terrorist attacks, and the German news services, all values of point-biserial correlation between topic of the tweet and its retweetability are significant, except for the last two days (Table 6.4). The effect sizes are medium on the 1st and 5th day, and small otherwise. As for the news services from the UK, the correlation is significant for all days except for the 6th day. The effect sizes are medium on the first two days and otherwise small. Regarding the news services from the USA, two significant correlations are given for the first three days and then for the 5th day. The effect sizes are medium only on the 5th day, and otherwise small.

Table 6.4. *Correlation between RTs and "topic of interest" computed with Pearson's point-biserial correlation coefficient (r_{pb}) for the three triggering events. The thresholds for effect sizes: small (0.1), medium (0.3), and large (0.5), are colour-coded.*

	Charlie Hebdo			**Paris Attacks**			**Brussels Attacks**		
	DE	**UK**	**USA**	**DE**	**UK**	**USA**	**DE**	**UK**	**USA**
1st day	.364**	.353**	.292**	.578**	.509**	.433**	.299**	.310**	.239**
2nd day	.225**	.319**	.155*	.211**	.161**	.176**	.184**	.214**	.047
3rd day	.282**	.228**	.159*	.234**	.177**	.073	.011	.123**	-.068
4th day	.215**	.111*	.089	.129*	.103**	.004	.050	.085*	-.050
5th day	.384**	.366**	.311**	-.048	.033	.166**	.101	.251**	-.019
6th day	.132*	.048	.037	.099	.148**	.148*	.080	.049	-.005
7th day	-.074	.119**	.098	.169**	.153**	.086	-.023	-.015	-.090
8th day	.101	.187**	-.021	-.004	.045	.114	.004	-.021	-.037

For the second investigated triggering event, the Paris terrorist attacks, there are less significant values than for the first triggering event. As for the German news accounts, the correlation outcomes are significant for the first four days and for the 7th day. The correlation on the first day is of a large effect size. However, the correlations on the remaining days have only small effects. There is a very similar tendency for the news services from the UK. There is a significant correlation with a large effect size on the first day and, after, there are significant correlations until the 4th day as well as on the 6th and 7th day with a small effect size. Regarding the news services from the USA, the correlations are significant on the first two days and on the 5th and 6th day. The correlation on the first day has a medium effect size, whereas on the remaining days only a small one.

The last investigated triggering event, the Brussels terrorist attacks, exhibits the least significant correlations. For German accounts, the only significant correlations are given on the first two days, both of small effect sizes. As for the news services from the UK, the significant correlations are given for the first five days. The correlation on the first day is of a medium effect size, whereas on the remaining days of small one. The correlation on the

4th day does not even fall within the threshold of a small effect size (coefficient smaller than 0.1). Regarding the news services from the USA, there is only one significant correlation on the first day, with a small effect size.

Table 6.5 summarizes only the significant outcomes of the point-biserial correlations and includes the coefficients of determination (r_{pb}^2). These are the percentage values (square of the correlation r_{pb} multiplied by 100) that show what variance in the number of RTs can be explained by the variance in the topic of the tweet. For the first investigated event, the coefficient of determination was the highest on the 5th day with 14.75% (Germany), 13.40% (UK) and 9.67% (USA), and on the first day with 13.25% (Germany), 12.46% (UK) and 8.52% (USA). As for the second investigated triggering event, there were fewer values with significance level under 0.05. The coefficient of determination was the highest for all three countries on the first day: 33.41% (Germany), 25.91% (UK) and 18.75% (USA). These values are also the highest for all three investigated triggering events. As for the third triggering event, the most significant values are given for UK, followed by Germany with two significant values, and USA with only one. Here, the first day was marked with the highest coefficients of determination as well: 8.94% (Germany), 9.61% (UK) and 5.71% (the only one for the USA). These were, however, the lowest values compared to the other investigated triggering events.

Table 6.5. *Coefficients of determination (rpb2) expressed as percentage values. Only significant values (p<.05) were used for the calculation (see Table 6.4).*

	Charlie Hebdo			**Paris Attacks**			**Brussels Attacks**		
	DE	**UK**	**USA**	**DE**	**UK**	**USA**	**DE**	**UK**	**USA**
1st day	13.25%	12.46%	8.53%	33.41%	25.91%	18.75%	8.94%	9.61%	5.71%
2nd day	5.06%	10.18%	2.40%	4.45%	2.59%	3.10%	3.39%	4.58%	
3rd day	7.95%	5.20%	2.53%	5.48%	3.13%			1.51%	
4th day	4.62%	1.23%		1.66%	1.06%			0.72%	
5th day	14.75%	13.40%	9.67%			2.76%		6.30%	
6th day	1.74%				2.19%	2.19%			
7th day		1.42%		2.86%	2.34%				
8th day		3.50%							

6.4 Results in a Nutshell

The first research question concerned the general differences in Twitter activity between news services from Germany, UK and the USA. Indeed, it appears that the news services from the UK tweet the most, however, the most RTs per tweet are received by news services from the USA. As for Germany, the number of tweets per day was similar to the one by news accounts from the USA, but with a much lower number of RTs/tweet. In general, there was mostly a peak in twitter activity on the day of the triggering event or on the day after, and a peak in RTs/tweet on the day of the triggering event for all countries. The lowest twitter activity was usually observed at the weekends.

The second research question concerned the difference between countries in the amount of tweets on topic of interest as well as in their retweetability. From the three investigated countries, the news services from the USA posted in average the least tweets on the triggering event. The chronologically last triggering event, the Brussels terrorist attacks, got the lowest coverage when compared to the other two events. Regarding the retweetability of tweets on topic, it was again the lowest for the Brussels attacks. The differences in median retweetability were the highest and most significant after the Charlie Hebdo attacks, decreased after the Paris attacks, and were the lowest for the Brussels attacks. This indicates that with the time the differences in retweetability of tweets on topic of interest got minor and less significant.

The third research question regarded the correlation between the topic of the tweet and its retweetability as compared between different countries. This was also a further indicator for differences between the three triggering events (fourth research question). The observed tendency was similar to the analyses for the second research question. For the first triggering event, Charlie Hebdo terrorist attacks, the coefficients of variance were high on two separate days for all three countries. It was marked with significant correlations over several days with a medium or small effect sizes. For the second triggering event, the Paris terrorist attacks, there were fewer significant correlations with smaller effect sizes. The highest significant difference in retweetability was given on the day of the attacks. The last triggering event, the Brussels terrorist attacks, was marked with the least correlations and relevant effect sizes only on the day of the attacks. For the USA, the only significant correlation was given on the day of the attack and the coefficient of determination was smaller than after the other two triggering events. This tendency was recognizable for all three countries, but especially distinct for the news services from the USA. There appears to be a tendency of decreasing retweetability of tweets on triggering events being terrorist attacks. This is especially given for non-European news services (USA), but also recognizable for European news services (Germany and UK). The retweeting tendency moved from medium effects of tweet's topic on its retweetability over several days (first triggering event), to medium effects only on the day of the event followed by small effects on other days (second triggering event), and lastly, to small effects on the first day or first few days only (third triggering event).

6.5 Conclusion and Limitations

In this study, there were investigated news services' Twitter accounts from three countries and their Twitter activity around three terrorist attacks in Europe. Although there are differences in Twitter activity between the three countries regarding the average tweets posted per day and average number of RTs per tweet, there are some similarities regarding reporting on terrorist attacks and the reaction of the users. The relative number of tweets reporting on the terrorist attacks gets smaller with the time, it is especially distinctive for the last investigated event (Brussels attacks). The retweetability of such tweets gets lower with the time as well. The difference between tweets on concerned topic and other tweets fades. Event tough there was a strong correlation between tweets on terrorist attacks for Charlie Hebdo over several days, there is almost no correlation for the last investigated event, Brussels attacks. This could indicate not only declining volume of reporting on such events, but also the lessening attention they get from the Twitter community.

In this study, there were considered only few variables (number of tweets, their categorization, and the number of RTs). Further research should consider other factors possibly influencing the Twitter activity, like the number of followers or the time since when the accounts are active. A multi-factor analysis could reveal further aspects influencing the retweetability of certain tweets. Furthermore, are more detailed topic analysis of tweets could reveal further differences between the countries as well as the investigated triggering events. The fact that the news accounts from the USA tweeted (relatively) the fewest tweets about the triggering event, however, that these tweets were mostly retweeted compared to other countries, requires a deeper analysis. Furthermore, the results indicate a deadening of the (Twitter) society towards news on terrorist attacks, which could by analysed from a psychological perspective. Even though for the first terrorist attacks there was a continual attention in form of RTs over several days, for the latest ones there was just a minor reaction. After 24 h these were, in fact, no more than yesterday's news.

6.6 References

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7 Good Morning… Good Afternoon, Good Evening and Good Night: Adoption, Usage and Impact of the Social Live Streaming Platform YouNow

After investigation of online journalism and news consumption on Twitter, the focus will be put on newer social media players, just starting to establish themselves on the market. This study sheds more light on the information behaviour of the YouNowers—their motivation to adopt, use or quit using the service. Furthermore, it investigates their information production, which also may include problematic behaviour when, for example, copyrighted material is being streamed.

Live broadcasting is nothing new, neither is human weakness for reality shows and "Big Brother"-like series. The attraction to uncensored "live" shows has been critically portrayed in the American movie "The Truman Show," where the unaware headliner was entertaining millions of viewers with his life, every day, for 30 years. Today, with a new type of information services emerging—the social live streaming services like younow.com, every Web user can become "Truman" and entertain his viewers with a live performance. Will he take advantage of it? And, will YouNow-like services become the future of reality shows and human interaction? In this study we investigate the adoption, usage and impact of the social live streaming service YouNow. We base our study on an online-survey among YouNow's users as well as observations of the streams. Let the show begin.

7.1 Introduction

In the last few years a new type of information services emerged—the social live streaming services (SLSSs). On SLSSs, information scientists are able to study new kinds of information behaviour. This social media type allows its users to broadcast their own program in real-time. This reminds us of The Truman Show, an American film from 1998, presenting the life of its protagonist, Truman Burbank (played by Jim Carrey), in a constructed television reality show, which is a live broadcast to its audience. Burbank is initially unaware of being part of a TV show. Today, with social live streaming services everyone has the possibility to publicly broadcast, now aware of doing so, their own life.

Social media allow users to act as producers and as consumers ("prosumers") of information. Prosumers form virtual communities and are characterized by shared goals (Linde & Stock, 2011). Social networking services are social media platforms for self-presentation and communication with other members of the community (boyd & Ellison, 2007). We can distinguish between asynchronous services (with alternating user activities), like Facebook (Khoo, 2014), or synchronous platforms (user activities are happening simultaneously), like social live streaming services (SLSSs).

In case of YouNow, the active broadcasters (or "streamers") act as information producers. While streaming, they exhibit certain information production behaviour. In some cases, this behaviour might be problematic and, for example, violate copyright or other laws. The passive (non-streaming) users might exhibit certain information search behaviours, while

looking for streams to watch. Of course, most users will probably embody both behaviour types. Finally, the services themselves can have impact on all their users.

In contrast to many other social media, SLSSs are synchronous, meaning that all user-activities happen at the same time. In order to actively or passively participate in the service, users employ their own devices (e.g., smartphones, tablets) or their PCs and webcams for broadcasting. In most cases, the audience is able to interact with the broadcaster via chats as well as reward them with points, badges, or (virtual) payments. We can differentiate between general SLSSs without any thematic restrictions (e.g., YouNow, Periscope, Nico Douga, Ustream), and topic-specific SLSSs (e.g., Twitch for games or Picarto for art).

There is limited research on live streaming services. We could identify a general paper on YouNow (Stohr, Li, Wilk, Santini, & Effelsberg, 2015), one about its users' information behaviour (Scheibe, Fietkiewicz, & Stock, 2016), an article on technical issues of such services (LeSure, 2015), one about ethical problems (Henning, 2015), a study on possible law infringements of YouNow users while streaming (Honka, Frommelius, Mehlem, Tolles, & Fietkiewicz, 2015), and an evaluation of YouNow (Friedländer, 2017). Fietkiewicz, Lins, Baran and Stock (2016) found out that especially users from Generation Y (born between 1980 and 1996) and from Generation Z (born 1996 and later) apply YouNow. Therefore, our study is the first empirical analysis of the adoption, usage and impact of the general social live streaming platform YouNow.

YouNow was initially meant for YouTubers to get in contact with fans, to chat with them and to answer their questions. Many teenagers enjoyed the functions of the live streaming service, shared their experiences with friends and started to build their own community—the YouNowers. Most YouNowers come from the United States (31.7%), followed by Germany (11.3%), Turkey (8.4%), Saudi Arabia (5.4%) and United Kingdom (4.6%) (Alexa, 2017). In this study, we will look at why and how YouNowers adopt and use the service, and what impact it has on their lives.

7.2 Methods

For our investigation, we apply the Information Service Evaluation (ISE) model (Schumann & Stock, 2014). It is a comprehensive heuristic model and a theoretical framework for all aspects of the description, analysis and evaluation of all kinds of information services (Stock & Stock, 2013, p. 481 ff.). It consists of five dimensions of the information service (dimension 1: quality of service, system, and content), the service's users (dimension 2: information need and information behaviour), the acceptance of the service by users and the community (dimension 3: adoption, use, impact on users' information behaviour, diffusion into the community, and opting out), the environment of the service (dimension 4: competition, culture, governance, and marketing) and, finally, the development of the service and the community over time (dimension 5). Since we are going to focus on a critical evaluation of the adoption of the service and its role in the users' community (YouNowers), we only consider dimensions 2 (user) and 3 (acceptance and diffusion into community) in this article (Figure 7.1).

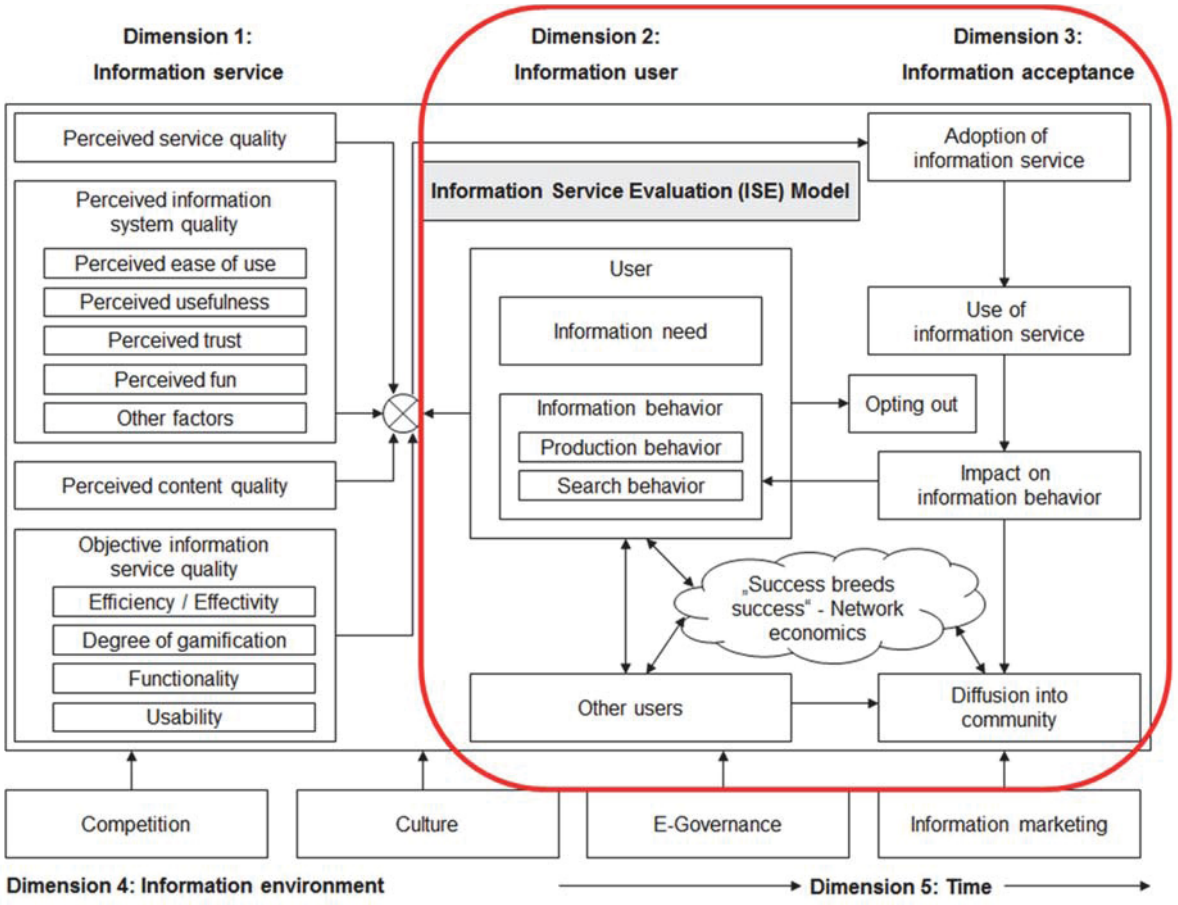

Figure 7.1. The Information Service Evaluation (ISE) model. Source: Schumann and Stock, 2014 (modified).

A central point for using or not-using an information service is the information need of a person. The information need of an individual is the starting point of any information behaviour (information production as well as information search and reception behaviour). In his or her information production behaviour, the user might get in trouble with the law (e.g., by violating copyright law).

If the 'right' user meets the 'right' information service, they will adopt and use it. Adoption does not mean 'use'. One can adopt a service and stop using it. And one can adopt it and use it permanently. Hence, only when the continuance of the service usage is given, we speak of "use" and not "adoption" (Bhattacherjee, 2001). In the case of use, it is possible that the user's information behaviour or their general behaviour will change (impact of the service).

Finally, an information service can diffuse into a community when many people use it and it has an impact on their information behaviour. Diffusion is a typical phenomenon of network economics (Greenwood, 2013) following the principle of "success breeds success." The more users an information service is able to attract, the more the value of the service will increase. More valuable services will attract further users. If an information service passes the critical mass of users, network effects will start. This leads to positive feedback loops for direct network effects (more users—more valuable service—many more users) and indirect network effects (more complementary products—more valuable service—any more complementary products) and—when indicated—in the end to a standard (Baran,

Fietkiewicz, & Stock, 2015). Diffusion is a social process depending on the extent to which friends, family members, peers, colleagues, club members, etc. influence a user's information behaviour. Finally, we may not forget the aspect of quitting an information service. Opting-out is motivated by (altered) information behaviour of the user and by his or her position in the community.

In line with dimensions 2 and 3 of the ISE model, we are going to answer three research questions:

> RQ1: What leads to the adoption of YouNow (i.e., how did the users get to know the service? What is their primary motivation to use it)?
>
> RQ2: How do the YouNowers use the service (e.g., how often, for how long, what is their information production behaviour)? Is there possibly a problematic use of the service (e.g., potential law infringements while broadcasting)?
>
> RQ3: What impact does YouNow have on its users (e.g., what is its influence on their leisure time? What would be a reason for opting-out)?

Figure 7.2 shows our research model and focus on the three aspects: adoption, continuance leading to the usage, and impact of the social live streaming service.

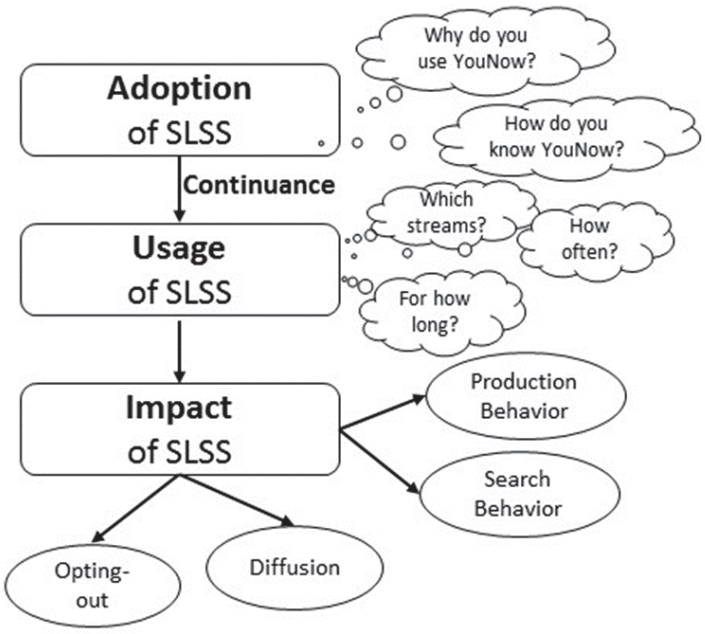

Figure 7.2. Research model: adoption, usage and impact of SLSS.

In order to answer our research questions, we (1) conducted an online survey and (2) observed streams for potential law infringements. The first empirical survey-based investigation took place from June 3rd till June 28th 2015 on umfrageonline.com and had 123 YouNow users as participants. In the survey, the users were asked questions about the service, their behaviour concerning YouNow, and the acceptance of the service in the

community. The majority of questions had pre-formulated answers that could be rated on a 7-point Likert-scale (from “highly disagree” to “highly agree”). The questions about usage frequencies could be answered with one out of four values: never, rarely, sometimes, and often. Additionally, we formulated open questions (e.g., “Besides YouNow, what other live streaming platforms do you use?”).

Apart from the socio-demographic data, in this study we evaluated answers to the following online-survey questions about the adoption of the service:

How did you come across YouNow?

Why are you using YouNow?

Is it important to you to become famous on YouNow?

Is it important to you to get accepted by the YouNow community?

Do you think YouNow is easy to use?

Do you think YouNow is useful?

Do you have experience with other streaming platforms?

Questions about the usage of the service:

How often do you use YouNow?

Which streamers do you usually watch?

How are you preparing for a stream?

Have you read and understood the terms and conditions of YouNow?

Do you use music from TV, radio or other media in your streams?

Do you use pictures (like photos from Tumblr, Facebook or Instagram) in your streams?

Do you use videos in your streams (e.g. from TV or mobile phone)?

And finally, questions about the impact of the service:

How big is YouNow’s influence on your leisure time?

Would you recommend YouNow?

What could be a reason to quit YouNow?

The second part of our empirical study concerns potential law violations by YouNow users (Honka et al., 2015). Here, the data was obtained through an observation of a significant number of streams. A similar approach was applied by Casselman and Heinrich (2011), who analysed YouTube videos and the behaviour of their participants. The results of the

observations are enriched with data gathered from the online survey (e.g., regarding streaming music or reading the terms and conditions prescribed by YouNow).

The streams were observed during June 2015 and limited to the ones from Germany and the USA. The socio-demographic data was obtained either from the streamer's profile or by asking the streamer during his or her broadcast. The observation period was divided into four parts where different groups of streamers were in focus—females from Germany, males from Germany, females from the USA, and males from the USA. Each group was observed for an entire week. Each day of the observation was divided into four time slots (12 p.m. - 6 a.m., 6 a.m. - 12 a.m., 12 a.m. - 6 p.m. and 6 p.m. - 12 p.m.). In each slot, four streams had been investigated for 15 minutes respectively (i.e., total 16 streams or 4 hours per day). The gathered data was stored in a database and statistically analysed.

The streams were studied for legally concerning actions. The points of reference were law infringements frequently observed in social networks (or the Web in general) according to the German law, which is stricter than the U.S. law regarding, for example, copyrights or personal rights. This way we gain a broader range of possible legally concerning actions. Demeanours being in the focus of this observation were: copyright infringements (concerning music pieces protected by intellectual property rights), youth protection (regarding sexual content or underage use of alcohol or drugs), personality rights (right in one's own picture, spoken or written word), and defamation.

The classification of a stream as one with potential law infringements was based on a rough assessment by the observer (Is music being played in the background, or, are other people being filmed without their explicit consent?) and did not include a complex legal examination or consideration of exception regulations. Therefore, it is to emphasize that the results include only potential illegal actions. The outcomes of the observation are included in the results section concerning the usage of the services. First, we will present the general data we have gathered from the online survey and analyse the adoption of YouNow.

7.3 Results

There were total 123 respondents to the online survey, and total 443 observed streams. From the survey participants, 60.6% were male and 39.4% were female. The median age of our participants was 20 years, and the most frequent age group was the one of 16 year-old adolescents. As for the observed streams, they were almost evenly distributed by gender of the broadcaster (111 "girls" and 100 "boys" from Germany, 112 "girls" and 111 "guys" from the USA). The most of the observed streamers were 13-16 (43%) and 17-18 (23%) year-olds; the average age was 16.9 years.

7.3.1 Adoption of YouNow

The first research question concerned the adoption of the service YouNow. How did the users get to know the service? As we can see in Figure 7.3, total 48% of our respondents heard about YouNow from the Internet, especially from other social media platforms, and 35% from their friends. Only 4.1% of the users knew it from the television, 0.8% from the family, and 12.1% from other sources.

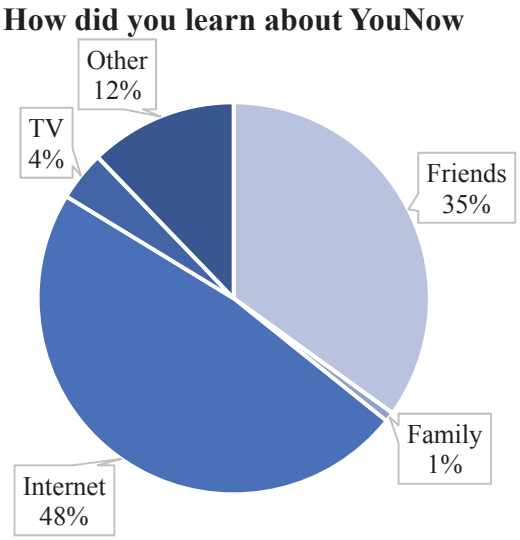

Figure 7.3. Sources from which users learned about YouNow (N=123).

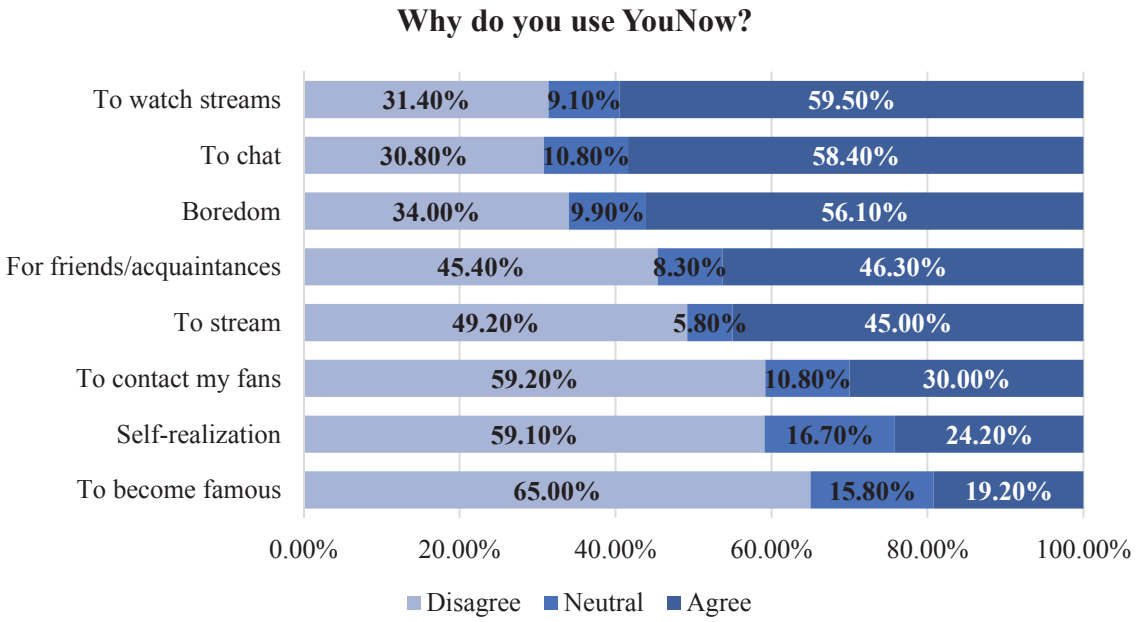

Figure 7.4. Reasons for adopting YouNow, multiple answers allowed (N=122).

The participants were asked about their motivation to adopt YouNow, hence, the reasons why they use this service (Figure 7.4). The two mostly chosen answers were typical site activities—watching streams (59.5%) and chatting (58.4%). Over the half of the participants (56.1%) use the service out of boredom, and 46.3% for (new) friends and acquaintances. Total 45% of the participants apply YouNow to broadcast their own streams. Further possible answers concerned contacting fans (30%), self-realization (24.2%), or becoming famous (19.2%). These are aggregated values for users' answers that could be classified as positive (from 5 to 7 on the 7-point Likert scale). The "neutral" answers oscillated around

10%, with exception for 16.7% for "self-realization" and 15.8% for becoming famous. The negative attitude towards the individual reasons for using YouNow was inferred from the aggregated values 1 to 3. Here, total 65% were indifferent about becoming famous, approx. 59% did not care much about self-realization or contacting fans, and 49.2% did not use the service for broadcasting their own stream.

Watching streams out of boredom, or to chat and meet new people appear to be the most important factors to adopt YouNow. Only 45% express positive attitude towards active information production behaviour—streaming, from which 30% appear to already have a fan-base (with whom the steamer wants to maintain contact). The biggest "uncertainty" (neutral answers) was given for the motivational factors: self-realization and becoming famous (16.7% and 15.8% respectively). This means that even though for some users these activities are not the primary reason to adopt the service, they do not fully rule them out for the future. Interestingly, only 5.8% remain "uncertain" about adopting YouNow to stream (whereas, 45% are positive about it). Hence, when adopting YouNow, the users are relatively certain about whether they will broadcast their own streams or not; and the ones decisive about it are open to the idea of becoming a micro-celebrity.

7.3.2 Motivations to use YouNow

During the online survey we considered two motivational factors to be of potentially high importance for adoption and continuance of using the service, namely fame (becoming a "micro-celebrity") (Marwick & Boyd, 2011) and feeling of belonging (becoming part of the community) (Nadkarni & Hofmann, 2012). As we have already seen in Figure 7.4, 19.2% of the respondents considered becoming famous as an important aspect of using the service. When explicitly asked, how important it is to the participants to become famous on YouNow (Figure 7.5), 51% responded negatively (as a comparison, to the question why do you use YouNow, total 65% spoke against fame), whereas 16% considered it to be important (compared to 19.2% in previous question, see Figure 7.4).

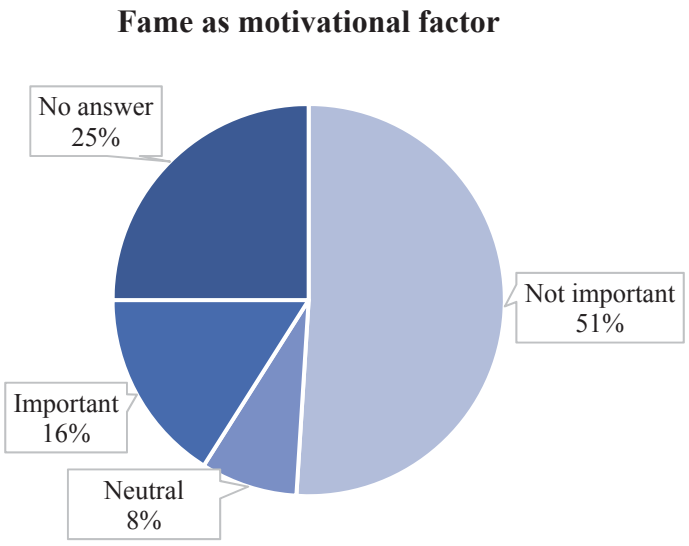

Figure 7.5. "Becoming famous" as motivational factor to adopt YouNow (N=123).

Regarding the general question for motivation to adopt YouNow, almost 16% were neutral about the aspect of fame; however, when directly asked about its importance, only 8% of the respondents remained undecided. Furthermore, total 25% restrained from answering this question. It can be only speculated where this reservation came from and to which group (positive/indecisive/negative) these participants actually belong.

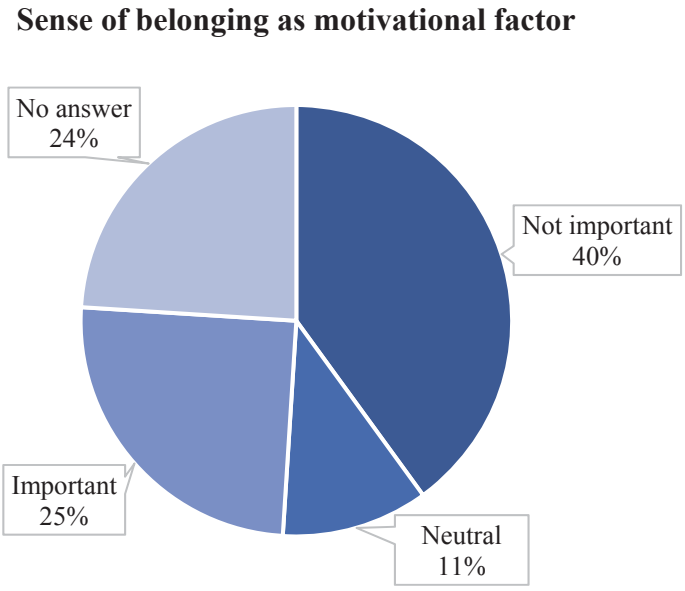

Figure 7.6. "Sense of belonging" as motivational factor to adopt YouNow (N=123).

When considering sense of belonging as a motivational factor (Figure 7.6), it is of higher importance (for 40% of the respondents) than fame (16%). Still, 11% of the respondents remained neutral about this aspect, and 25% explicitly claimed it to be less or even not important at all. Total 24% did not provide any answer to this question.

We have further investigated these two motivational aspects by examining the age-dependent differences as well as differences between male and female users. For this examination only complete records were included. The differentiation was conducted for male (n=56) and female users (n=36), and for the age groups of 14-17 (n=33), 18-21 (n=28), 22-29 (n=21), and over 30 (n=11) year olds. Regarding the chance for becoming famous (Table 7.1), most female and male users had rather negative attitude (63.9% and 71.4% respectively), whereas similar ratios were motivated by the opportunity to become micro-celebrity (22.2% of female and 21.4% of male users). A higher ratio of female (13.9%) than the male users (7.1%) was indecisive about this factor.

As for the different age groups, the biggest share of negative attitude towards becoming famous can be found within the oldest one, with total 90.9%, and with no users attuned positively. They were followed by the group of 18-21 year olds with 78.6% of negative attitude. The age group with biggest share of positive attitude towards becoming micro-celebrity was the youngest one, 14-17 year olds with total 30.3%, followed by the group of 22-29 year olds with total 23.8%. However, these two groups were also the ones with highest ratios of indecisive users (15.2% and 14.3% respectively).

Table 7.1. *Fame and sense of belonging as motivational factors to adopt and use YouNow, by gender and by age.*

User Group	N	Fame			Sense of Belonging		
		No	Neutral	Yes	No	Neutral	Yes
Men	56	71.4%	7.1%	21.4%	41.1%	12.5%	46.4%
Women	36	63.9%	13.9%	22.2%	22.2%	13.9%	63.9%
14-17 y/o	33	54.6%	15.2%	30.3%	21.2%	9,1%	69.7%
18-21 y/o	28	78.6%	3.6%	17.9%	39.3%	14.3%	46.4%
22-29 y/o	21	61.9%	14.3%	23.8%	47.6%	9.5%	42.9%
30 ≤ y/o	11	90.9%	9.1%	0%	27.3%	36.4%	36.4%

When considering the sense of belonging as a motivational factor, the difference by gender is more distinctive. Total 63.9% of female users, whereas only 46.4% of male users see this aspect as important. A similar ratio of both groups is rather neutral in this respect (13.9% and 12.5% respectively). For 41.1% of male users, and for 22.2% of female users, the sense of belonging is not important. Considering the different age groups, the most of 22-29 year olds are not interested in becoming a part of the community; the biggest ratio of indecisive users (36.4%) is given in the oldest group (30 and over), whereas the most users seeking for the sense of belonging can be found in the youngest one (69.7% of the 14-17 year olds).

YouNow is not the only streaming service and its competition is getting bigger. The participants were asked if they had ever used any other video or social live streaming service and if so, which ones (Figure 7.7). The mostly used service for video sharing is YouTube—total 69.2% of the respondents use this platform. The second and third most popular services are Google Hangouts (41.8%) and Twitch (39.6%). The following services are Ustream with only 14.3%, Paltalk with 4.4%, Picarto and Periscope with 3.3%. 8.27% of the participants also use other services, whereas total 16.5% of the respondents do not use any other SLSSs despite YouNow.

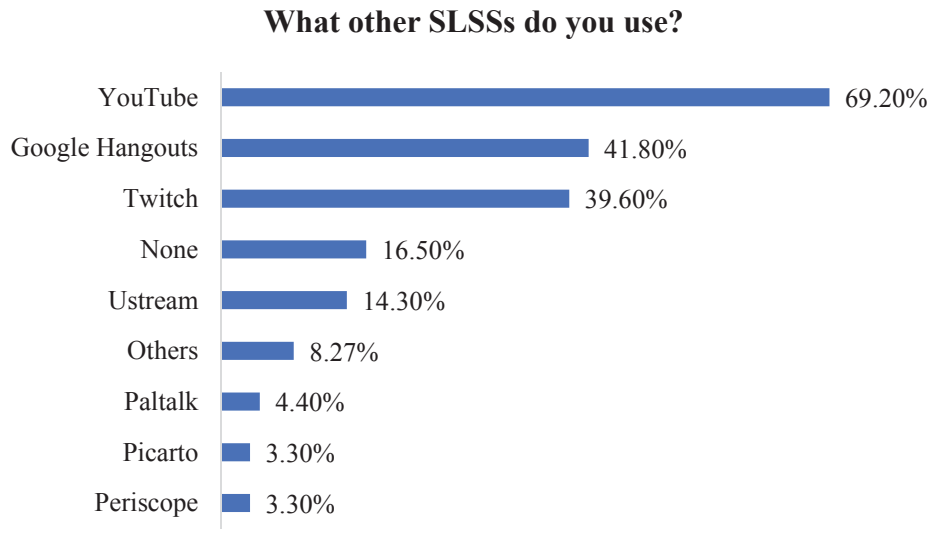

Figure 7.7. Usage of other social live streaming services.

The relatively high ratio of participants not using any other SLSSs gave us the opportunity to investigate whether the experience with other similar platforms makes the adoption of YouNow easier. The participants were asked if the service YouNow is easy to use (perceived ease of use) and if it is useful (perceived usefulness). They could mark their impressions on a 7-point Likert scale. The perceived usefulness and ease of use of an information service influence user's acceptance of it (Davis, 1989) (the adoption and continued usage).

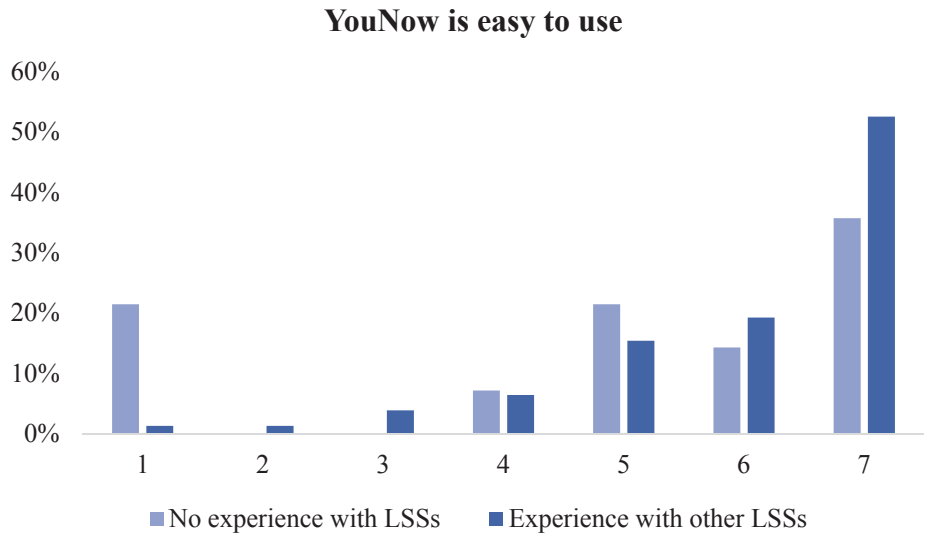

Figure 7.8. Experience with other SLSSs and the perceived "ease of use" of YouNow (1="not at all" 7="easy to use"), (experienced users N=78; inexperienced users N=14).

First, we investigated the influence of experience with other SLSSs on the perceived ease of use of YouNow (Figure 7.8). Indeed, the perceived ease of use is very high for users with SLSS-experience (approx. 87%), with only few (approx. 13%) users who marked the values 1-4 ("not at all" to "neutral"). However, not all inexperienced users have necessarily problems with the service, as a great share of them regarded platform as easy to use. Still, the share of inexperienced users who find YouNow not easy to use (or neutral) is higher than share of experienced ones (28.6% vs. 13%). Therefore, we can assume that experience with other social live streaming services makes the adoption of new services, like YouNow, easier.

Furthermore, we examined whether the experience with other SLSSs influences the perceived usefulness of YouNow (Figure 7.9). Indeed, 57.1% of the inexperienced users did not perceive the services as useful, as opposed to 24.4% of the users that already apply other live streaming platforms. Total 57.7% of experienced users were positive regarding their perceived usefulness of YouNow, against only 28.6% of the inexperienced users. Hence, we assume that the experience with other SLSSs might influence the adoption and usage of YouNow, since in this case, the ease of use as well as the perceived usefulness of the service are higher.

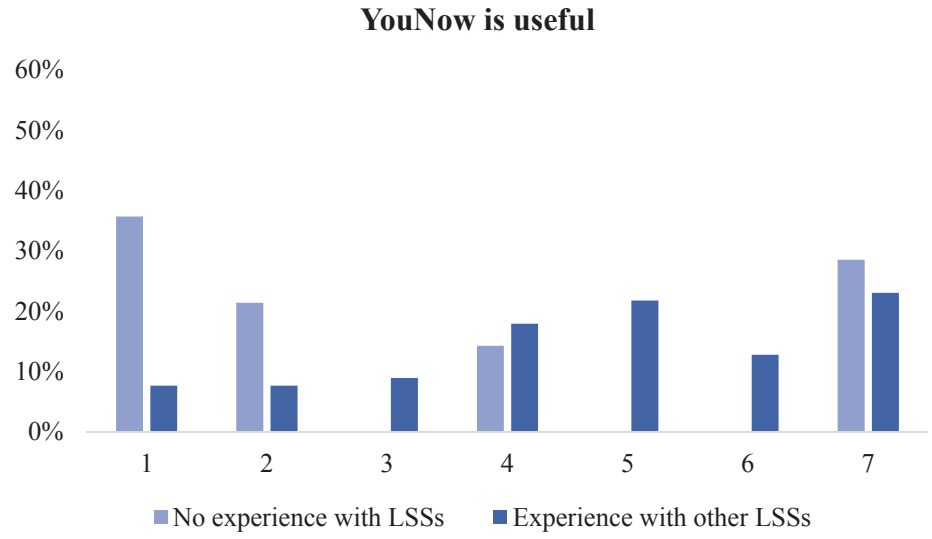

Figure 7.9. Experience with other SLSSs and the perceived "usefulness" of YouNow (1="not at all", 7="useful"), (experienced user N=78; inexperienced user N=14).

We have seen possible factors influencing the adoption of the service YouNow, partially distinguished by gender and age of the users. In the following, we will take a better look at what happens after the service is already adopted and regularly used by YouNowers.

7.3.3 Usage of the service

The second investigated dimension was the usage of the service. For this purpose, the participants were asked how often they use YouNow. More than half (51.6%) disclosed that they often used the live streaming service, only a few (11.5%) admitted to using it sometimes and more than one-third (36.9%) rarely.

Further, we examined the information search behaviour of the users by asking the participants which streams they chose to watch and whether they used hashtags during their search. Figure 7.10 depicts the streams the participants usually choose to watch. The answers can be split into four categories: status of the person, similarity, gender, and age. Regarding the first category, the status, 58.2% of the users watch streams of their friends, and 37.7% (each) watch YouTubers or new broadcasters. In the similarity category, the most participants watch streams of people in the same age (34.4%), followed by same interests (33.6%) and same country (30.3%). If distinguished by gender, the female streamers (39.3%) are watched slightly more often than the male ones (35.2%). To compare the age groups, a total of 42.6% watches streams from users aged 16 to 20, 37.7% from users aged over 20, and 20.5% from users aged 13 to 15.

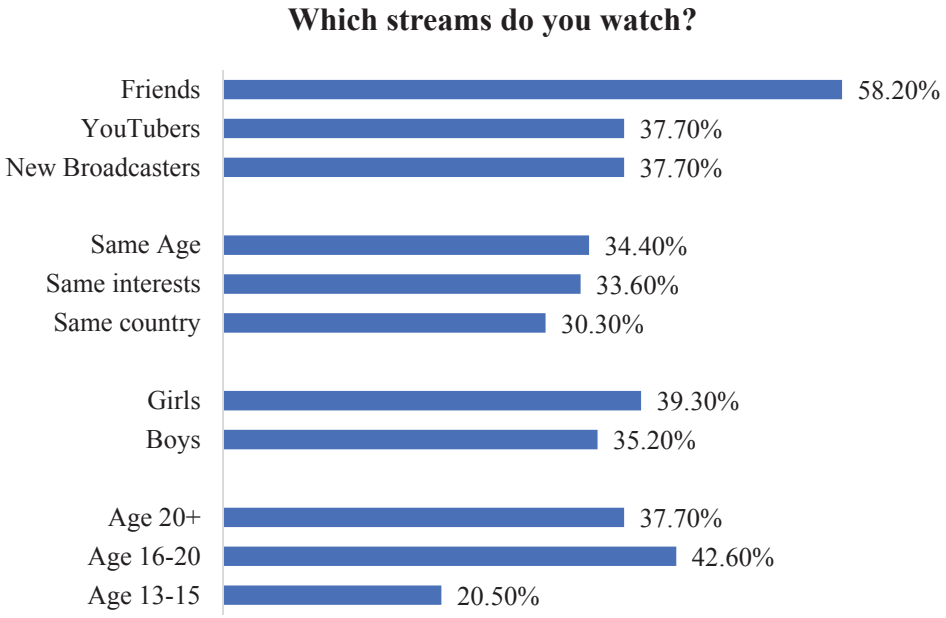

Figure 7.10. Watched streams by status of the person, similarities with the streamers, by their gender, and by their **age** (N=122).

Regarding the information search behaviour, we also asked whether the users search for streams with the help of hashtags. Apparently, 34.5% of the participants (N=110) do not apply hashtags during a search, whereas 44.5% do. Approximately 21% of the participants sometimes use hashtags. Hence, most of them (more or less) regularly use hashtags during a search for streams on YouNow.

The next investigated aspect was the information production behaviour of the users, which can be described, for example, by their (pre-)streaming routine. The participants were asked if they prepare themselves for the stream (Figure 7.11). We analysed only the answers from participants who stated to use the service for streaming. More than half of the (streaming) respondents check the camera and/or micro (57.4%) and inform their friends and fans about upcoming broadcast. Fewer broadcasters style themselves (31.1%) or prepare topics for the stream (23.0%). Only 6.6% of the respondents, probably, do vocal exercise. Total 32.8% do not prepare for the stream at all.

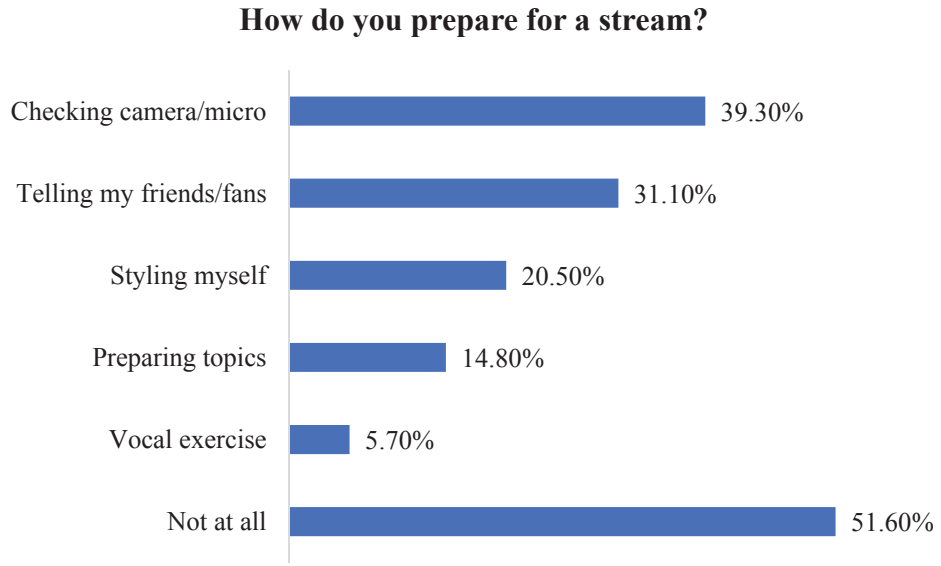

Figure 7.11. Preparation for a live stream (N=61).

Furthermore, our investigation of usage encompasses the problematic (mis)use of YouNow. For this purpose, the streams were observed for potential law infringements and the participants were asked about using additional multimedia during streaming (hence, this question targeted only potential copyrights violations). In course of the investigation by Honka et al. (2015), total 434 different streams were observed, whereof 211 were German and 223 were US-American. Altogether 248 potential law violations were noted, which makes a total 57.7% of all observed streamers. Regarding the gender, 143 of the observed female streamers (65.6%) and 112 of the male streamers (50%) took a potential legally concerning action. The major part of this behaviour considered possible copyright infringements of music pieces. In total 177 (40.7%) of all observed streamers had music playing in the background during their stream, whereof 92 streamers (52%) were female and 85 (48%) were male.

There are minor differences between streamers from Germany and the U.S. As we can see in the Figure 7.12, 56.9% of German and 58.4% of US-American streamers potentially violated the (German) law. In both countries, the most common potential violation was the copyright infringement of music—total 37.0% of German and 44.3% of U.S. streams. The second most observed concerning behaviour was possible violation of personality rights. The actions chosen for this category were: filming third parties, showing pictures of third parties, reading aloud chat-conversations (or similar) with third parties, or putting phone conversation with third parties on speaker during a stream, all without consent of these parties or even their awareness, their pictures or their words being brought to the public. Here, total 11.9% of German streams and 8.7% of the U.S. streams included potential violations of personality rights. The category of defamation includes insulting remarks made by the streamer or by the audience, and were observed in 5.7% of German and 1.4% of U.S. streams. Regarding the youth protection, two aspects were elaborated—the underage use of alcohol or drugs, and sexual content (revealing appearance of the streamer, or pressuring requests from the viewers to the streamer to undress etc.). Total 3.3% of German and 2.3%

of U.S. streams included underage drinking or drug use, whereas 0.9% of German and 4.1% of U.S. streams had sexual content.

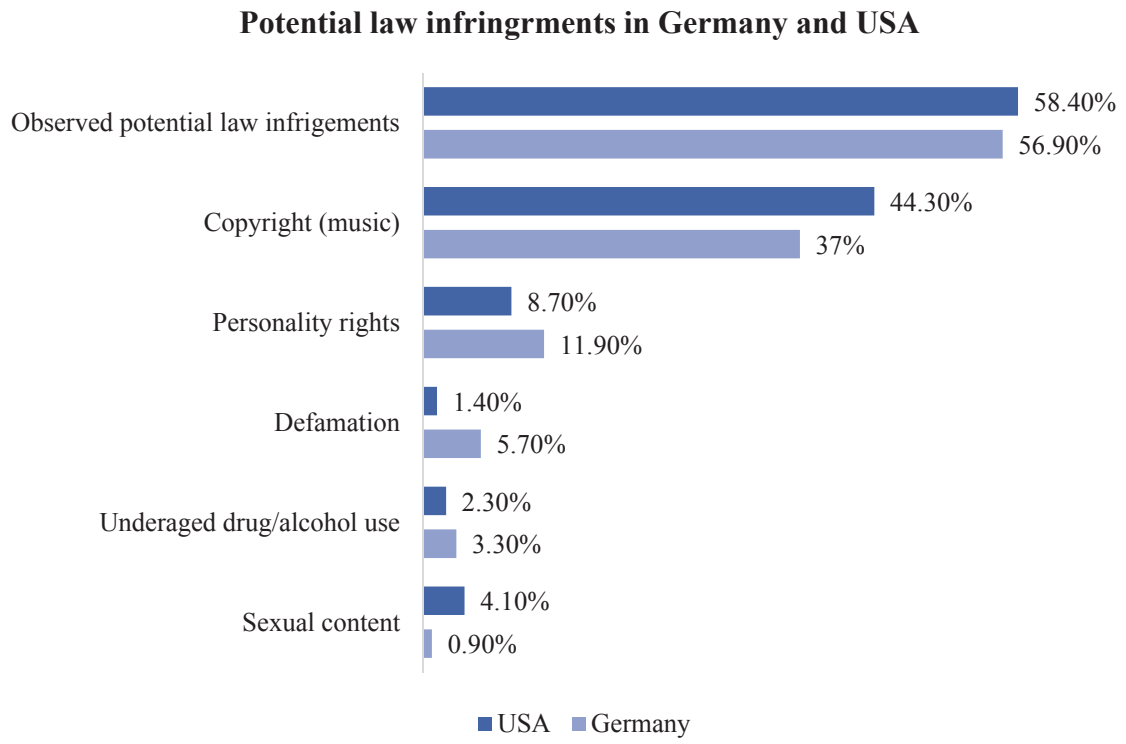

Figure 7.12. Potential law infringements in Germany (N=211) and the USA (N=223).

All the observed potential law infringements are explicitly forbidden by YouNow's terms of use, which every user has to agree with in order to use the platform. In particular, we read: "You further expressly agree that any Content, including Sponsored Content you submit will not be: (1) defamatory, libellous, abusive, or obscene, including, without limitation, include material which encourages conduct that would constitute a criminal offense, give rise to civil liability or otherwise violate any applicable local, state, federal, or international law; (2) infringe on the copyright or any other proprietary right of any third-party; (3) invade the privacy of any other person" (younow.com/terms.php).

In our survey, we asked the participants whether they read and understood the terms and conditions of the service, as well as if they use additional media like music, pictures or videos during their streams (implication for potential copyright violations). We created a cross-table with these two variables as well as analysed the usage of additional multimedia by gender, and age to further investigate the problematic use of the service. Only 24% of the participants (N=123) read and understood the terms of use dictated by YouNow. Total 48% admitted not to have read and/or understood the terms, whereas 28% restrained from answering the question (which in turn might indicate not reading the terms).

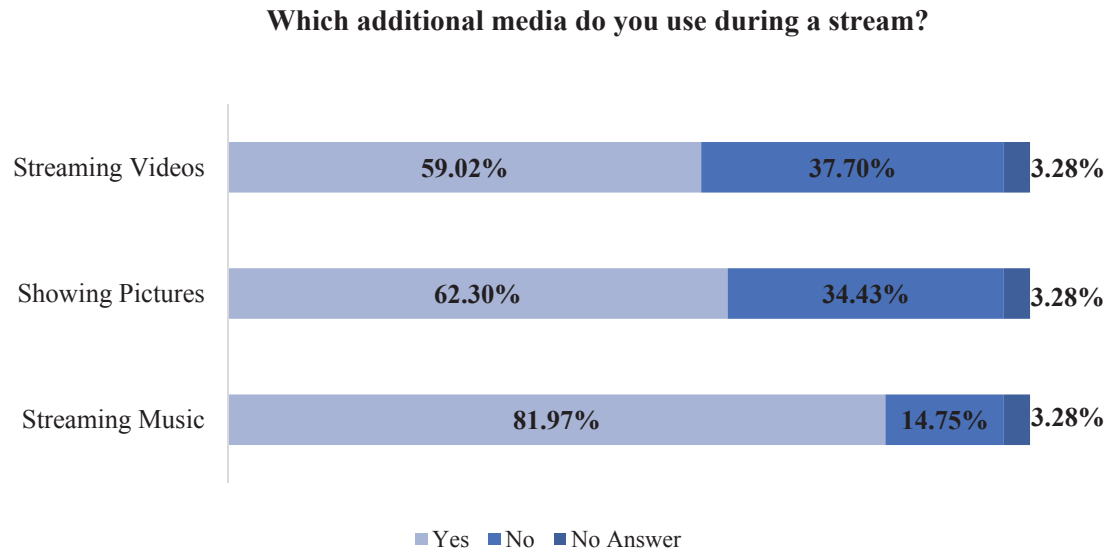

Figure 7.13. Usage of additional media during a stream (N=61).

The number of live-streaming users including additional multimedia in their broadcasts is rather high. As we can see in Figure 7.13, most of the participants admitted including additional multimedia in their streams. Total 82.0% stream music, 62.3% show pictures (which, in turn, could also indicate possible violations of personality rights), and 59.0% stream videos during their broadcast. Only few participants do not stream music (14.7%), whereas 34.4% claim they do not show pictures and 37.7% do not stream videos. Only 3.3% restrained from answering this question. These results show that most streamers on YouNow are very likely to violate at least the copyright law.

To see if there is a possible connection between not reading the terms and conditions and potential copyright violations, we created a cross-table (Table 7.2) including the discussed variables. Only active "streamers" are considered in this analysis and we have excluded all cases that stated not to use YouNow "to stream."

Table 7.2. *Acknowledgement of T&C and usage of additional multimedia (N=61).*

		Did you read and understand YouNow's T&C?		
		yes	**no**	**n/a**
Do you use music during stream?	**yes**	49.18%	21.31%	11.48%
	no	8.2%	6.56%	0%
	n/a	0%	0%	3.28%
Do you show pictures during your stream?	**yes**	39.34%	16.39%	6.56%
	no	18.03%	11.48%	4.92%
	n/a	0%	0%	3.28%
Do you show videos during your stream?	**yes**	37.7%	18.03%	6.56%
	no	19.67%	13.11%	4.92%
	n/a	0%	0%	3.28%

Apparently, the acceptance of YouNow's terms of use does not necessarily reduce the number of potential copyright violations. As we can see in Table 7.2, 49.2% of the (streaming) participants have read the terms and conditions, but still stream music. Furthermore, 39.3% show pictures and 37.7% stream videos during their broadcast. The amount of music- (21.3%) and video-streaming (18.0%) as well as picture-showing (16.4%) users that did not read the terms is actually lower. In turn, when considering the number of users that do not use additional multimedia, the ratio of the ones that acknowledge the terms of use is slightly higher—for streaming music 8.2% against 6.56% who did not read the conditions, for showing pictures 18.0% against 11.3%, and for streaming videos 19.7% against 13.1%.

Table 7.3. *Usage of additional multimedia by gender (N=61.)*

		Men	Women	n/a
Streaming music	**yes**	42.62%	27.87%	11.48%
	no	11.48%	1.64%	1.64%
	n/a	0%	0%	3.28%
Showing pictures	**yes**	34.43%	21.31%	6.56%
	no	19.67%	8.2%	6.56%
	n/a	0%	0%	3.28%
Streaming videos	**yes**	32.79%	19.67%	6.56%
	no	21.31%	9.84%	6.56%
	n/a	0%	0%	3.28%

In Table 7.3 we can see the classification of streamers using additional multimedia by their gender. When considering all users streaming music, there are more male (42.6%) than female ones (27.9%). The same holds for other media—showing pictures (34.4% are male and 21.3% are female) and streaming videos (32.8% are male and 19.7% are female). However, we have to consider that some streamers did not disclose their gender (e.g., 11.5% of the music-streaming users).

Table 7.4. *Age groups divided by usage of additional media.*

Age group	N	Streaming music	Showing pictures	Streaming videos
14-17 y/o	N=22	90.9%	91.7%	72.7%
18-21 y/o	N=12	68.2%	66.7%	63.6%
22-29 y/o	N=11	68.2%	50%	63.6%
30 ≤ y/o	N=7	57.1%	57.1%	57.1%

Finally, we have investigated how different age groups apply additional media. Due to uneven distribution of the users by their age (there are three times as many participants aged between 14 and 17 as there are 30 and over year olds), we only analysed which media are used by each age group the most. As we can see in Table 7.4, the biggest shares of users

streaming music are from the youngest age groups—the 14 to 17 year olds (90.9%) and the 18 to 21 year olds (91.7/%). Considering the older groups, 72.7% of the 22 to 29 year olds stream music and over the half of 30 and older participants (57.1%) use all additional media. Pictures and videos are applied by smaller shares of the users, both by 68.2% of the 14 to 17 year olds and by 63.3% of the 22 to 29 year olds. Considering the 18 to 21 year olds, 66.7% show pictures and exactly half of them stream videos during their broadcast. All in all, we have learned about the habits of YouNow users. Over the half of the participants use the services often, most of them prefer to watch streams of their friends or streamers aged 16 to 20 years. Regarding their search behaviour, less than a half of the users apply hashtags to find a stream. The participants using YouNow to actively stream prepare themselves before the broadcast by checking the micro and camera as well as informing their friends and fans. The extent of problematic service use appears to be in no small measure. The observations of the streamers lead us to conclusion that the most probable violations are the copyright infringement. The legally significant user behaviours are explicitly forbidden by YouNow, however, reading the service's terms and conditions (even if only by 24% of the participants), does not necessarily reduce the potential violations. Still, over 80% of the broadcasters stream music, and over half of them stream videos and show pictures. Streaming music as enrichment for the stream is the first choice for both, male and female users. This is the (problematic) use of the service. Now, what is the impact of YouNow on its users?

7.3.4 Impact on the users and their information behavior

In order to establish what impact YouNow has on its users, the participants of our survey were asked what influence this service has on their leisure time. Total 41.8% of all respondents confessed that YouNow had a high influence on their leisure time, 13.9% thought that it had a medium influence and 44.3% answered that there was only a low impact on the leisure time. Hence, YouNow appears to have a strong impact on almost half of its users.

When investigating the information search behaviour (section 7.3.3), the users were asked whether they apply hashtags while searching for streams. In order to examine if the service had any influence on this search behaviour, we asked the participants whether they use hashtags while searching on other social media platforms. Even though 44.5% of the participants use hashtags while searching on YouNow, only 36.4% use hashtags on other social media platforms. Total 34.5% use hashtags for stream-search rarely or not at all, whereas 47.3% claim not to use hashtags in other social media channels. There is a slight positive correlation between these two measures significant at a 0.01-level. Hence, there might be a slight change in the information search behaviour regarding the usage of hashtags, while using YouNow.

Total 93 participants of our survey responded to the question whether they would recommend YouNow and 65.6% of them would do that. Apparently, 34.4% of the users are not as much impressed by the service to make a recommendation. This outcome is not surprising, since a rather big share of participants (45.9%) is not convinced of the system's usefulness; also many of them apply it out of boredom (56.1%).

Finally, the respondents were asked about reasons that would make them quit using the platform (Figure 7.14). About half of the users would stop using YouNow, should the usage get boring (54.8%) or should YouNow abuse users' personal data (51.6%). About one-third (35.5%) stated that if they were getting too old for the information service, they would stop using it; more than one-quarter (28.8%) would quit the service if their friends would stop using it.

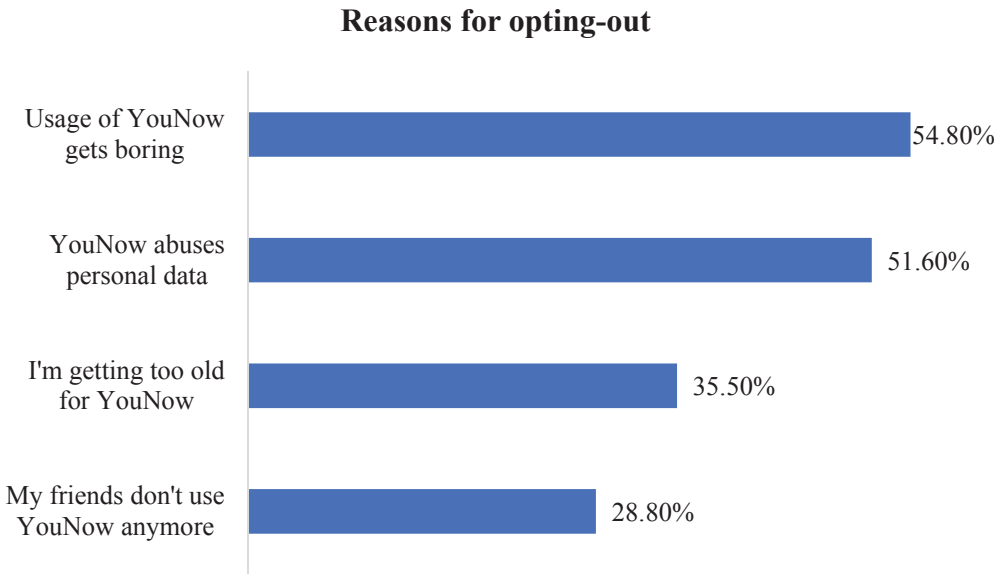

Figure 7.14. Potential reasons to stop using the service (N=93).

The impact of YouNow appears to be high on almost half of its users, at least when their leisure time is concerned. There is only a slight change in information search behaviour (using hashtags). Finally, for the most of the users, YouNow will stop being useful when they get bored or when their friends stop using it. These reasons for opting-out were expectable, since 58.2% of the respondents watch streams of their friends, whereas for many of the participants' boredom (56.1%) and contact with (new) friends (46.3%) were the reasons to adopt the service in first place.

7.4 Conclusion

Social live streaming services are a new type of social media. In this study we investigated the adoption, usage and impact of social live streaming services with YouNow as an example. We based our investigation on the ISE-Model by Schumann and Stock (2014). We have retrieved required data by conducting an online-survey among YouNowers (N=123) and by observing streams for potential law infringements (N=434).

Our examination of YouNow's adoption shows that most users learn about the service from the Internet and their friends. Afterwards, they adopt the service in order to watch streams and chat with other users, or simply out of boredom. Only 45% start using the service with the intention to actually broadcast their own streams. An important motivational factor to adopt and continue using YouNow appears to be the willingness to become part of the community (the sense of belonging), especially for the female and the youngest users (14-

17 year olds). Finally, we found evidence that experience with other streaming services leads to higher perceived usefulness and ease of use of YouNow, which in turn might also positively influence the adoption and usage of the service.

The investigation of usage of the service shows that most of the YouNowers watch streams of their friends, of female users, or of users aged 16 to 20 years. Regarding the information search behaviour, over the half of participants use hashtags to find streams they want to watch. The information production behaviour of the streaming users included such pre-streaming activities like checking the microphone and camera, as well as informing friends and fans about upcoming broadcast. Our study also covered the problematic usage of the service that potentially violates copyright laws (on music, videos, or pictures). It appears to be an important issue, since from the observed 434 streams, 44.3% in the USA and 37% in Germany potentially violated copyrights on music pieces. It is questionable if this problem can be solved with appropriate clarification, for example, in terms and conditions. Apparently, not many participants read the terms of use of YouNow, and users that claimed to actually read and understand the terms, were not less likely to use music, videos or pictures in their streams. The mostly used media type was music, especially favoured by female users and 14 to 17 year olds.

YouNow appears to have moderate impact on its users, at least concerning their leisure time. There might also be a slight influence on information search behaviour regarding the use of hashtags. Total 65.6 % of the participants would recommend the service. However, most would stop using it when YouNow should abuse their personal data or simply when it gets boring.

With this investigation we shed light on the live streaming service YouNow—its adoption, usage and impact. For further research on this topic we would recommend more detailed investigation, possibly with a bigger sample. We have not examined the usability of the service; neither did we observe the streams for aspects different from potential law infringements. These could be interesting issues to investigate in the future.

YouNow and other SLSSs remind us of The Truman Show, which is an American film from 1998, presenting the life of its protagonist, Truman Burbank, in a constructed television reality show. Truman's life is monitored 24/7 from his birth until his escape from the studio, when he was 30 years old. When applying YouNow, users can stream wherever they want, without any time limit–and produce their own Truman Show. As the film was supposed to be a critical discourse on audience's and media's interest in monitoring private and most intimate aspects of a person's life, more reaching research on YouNow could lead to critical discourse on another aspect—why some people actually want to reveal private and most intimate aspects of their own lives to the public? Why do they stream from the morning through the day and even at night while being asleep? On that note, as Truman Burbank would say "Good morning, and in case I don't see ya, good afternoon, good evening, and good night!"

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8 How Safe is YouNow? An Empirical Study on Possible Law Infringements in Germany and the United States

After studying the general use of Social Live Streaming Services like YouNow and the information behaviour of theirs users, we take a closer look at problematic use of such social media platforms. In the following study potential law infringements by YouNow users are investigated.

Connecting people, sharing common interests, communicating with each other and building up social relations are positive aspects of social networking services. Apart from these benefits there are many dangers that come along with them, such as treatment of sensitive data or law infringement. In our study, we have investigated the live streaming platform YouNow regarding violations of law, limiting it to the legal situation in Germany and in the USA and comparing them with each other. We have found out that major issues are violation of both copyright and the right in one's own picture. Based on our observation we can conclude that YouNow, as a representative of many social networking services, holds certain dangers, especially for underage youths not being aware of the risks.

8.1 Introduction

The rapid development of online social networks brings new benefits as well as new dangers to our society. One of the benefits associated with typical Social Network Services (SNSs), like e.g. Facebook, is strengthening of social ties, however, tempered by concerns about privacy and information disclosure (Wilson, Gosling, & Graham, 2012, p. 204). A certain SNS is only as appealing as the content shared by its users, therefore, in order to improve the overall user experience, it has to be designed in a way that encourages user contribution (Burke, Marlow, & Leno, 2009). Here, the conflicting nature of the users in regard to their privacy, the information disclosure-privacy dilemma (Wilson, Gosling, & Graham, 2012, p. 212), comes to light. It is not a secret that sharing of personal information on SNSs comes with potential privacy risks, including unintentional disclosure of personal information, damaged reputation, unwanted contact and harassment, vulnerability to stalkers or paedophiles, use of private data by third parties, hacking, or identity theft (Boyd, 2008; Debatin, Lovejoy, Horn, & Hughes, 2009; Taraszow, Arsoy, Shitta, & Laoris, 2008; Wilson, Gosling, & Graham, 2012). Still, research showed that despite these risks, many people allow themselves to be convinced to share their personal information. There is a disparity between reported privacy concerns and observed privacy behaviours (Acquisti & Gross, 2006; Stutzman & Kramer-Duffield, 2010; Tufecki, 2008). According to Acquisti and Gross (2006), 16% of respondents of their study on privacy issues on Facebook, who reported being "very worried" about the possibility that a stranger knew where they lived and the location of their classes, still revealed both pieces of information on their profile.

One of the mostly addressed SNS by the media as well as investigated by scientists SNS is Facebook. According to Wilson, Gosling and Graham (2012, p. 204), Facebook is of relevance to social scientists and gives new opportunities for studying human behaviour. It can be seen as an "ongoing database of social activity with information being added in real-

time" (Wilson, Gosling, & Graham, 2012, p. 204). Its popularity and brand recognition make it worth mentioning and exploring. "As Facebook becomes more integrated into everyday life, it becomes necessary to monitor and examine the platform's positive and negative impacts on society" (Wilson, Gosling & Graham, 2012, p. 204). Even though, Facebook is not the only popular online social network, and with all the attention from users, press, politicians, and legal institutions, it is less "dangerous" than other services not as hyped as this one.

Lately, a newcomer to the world of the online social networks made a great stir in the press—the live streaming platform YouNow (see Figure 8.1). Apparently, this service met the demand of the younger Internet users, as in a relatively short period of time it became very popular, especially among teenagers. However, the news reports do not express solely appreciation and price, but rather warnings and some concerns. This kind of online service enables an in-depth look into the private sphere (Pachner, 2015). Many express their concerns about the safety of the young streamers as well as the possible violation of the personality rights of third parties often shown in a stream without their consent (Görmann, 2015). The problem appears to be the lacking information literacy of the teenagers and children (often under 13 years old) as well as their unaware parents rather than the platform itself (Pechner, 2015). Not only the behaviour of streamers, but also the one of their viewers (or "fans") may be subject to prosecution. A possible criminal offence may be, e.g., child abuse, when a viewer encourages the younger streamers to sexual activities (Solmecke, 2015). "As an adult in polite society, it's hard to watch. And as a parent, it might just be the most terrifying thing your child is doing while you're not looking, and everyone else is" (Schupak, 2015).

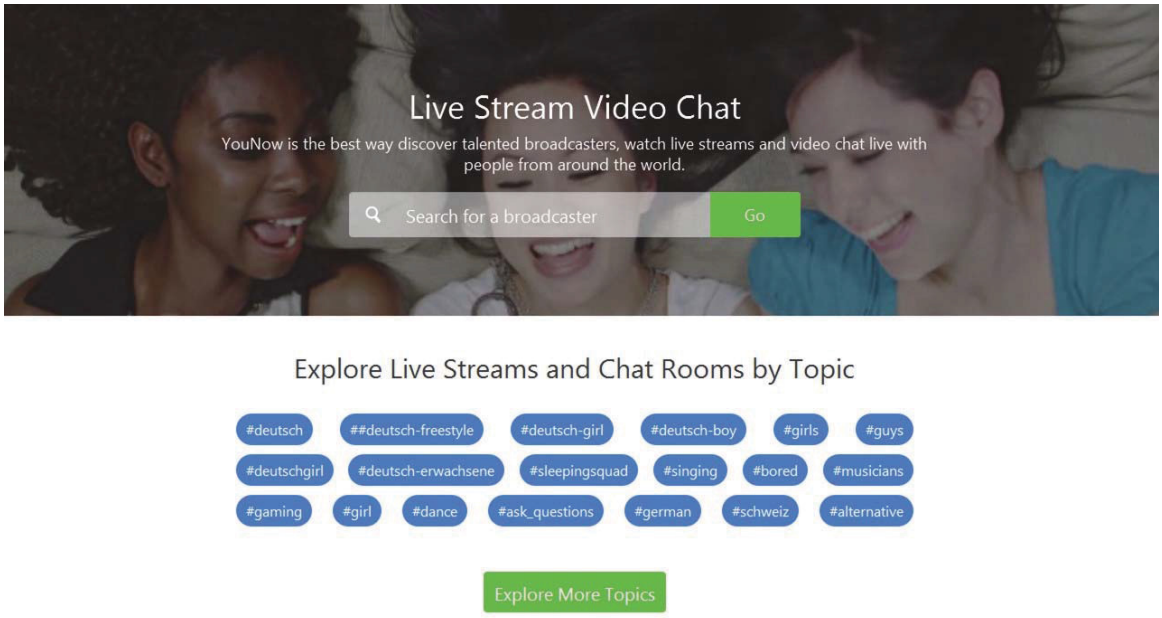

Figure 8.1. YouNow entry page. Source: www.younow.com

YouNow is also a stage for Internet celebrities, who make money by streaming different kinds of performances (Brustein, 2015; Pachner, 2015). It created a tip-based economy

without any advertising, drawing payments from their users only (Brustein, 2015). The fans can purchase points to tip their favourite streamers, who in turn split their profits with YouNow (Schupak, 2015). Consequently, this concept encourages long-form streaming (Schupak, 2015). The motivation of teenagers and younger users may be different from the economic one, however, there are no studies on YouNow regarding the psychological or sociological aspects of its usage.

In our study, we investigate the platform YouNow in order to validate the solicitude regarding youth protection and possible offences. We will limit our investigation to the legal situation in Germany (being rather strict) and in the USA (being less strict regarding the investigated aspects). The focus of the investigation lies on teenagers and children, apparently making a major part of the user community, and encompasses the streamers in Germany and the USA.

8.2 Social Networks and Law

In order to evaluate potential infringements on YouNow, it is important to know more about what is allowed and what is prohibited during streaming. In consideration of what we have experienced during the empirical phase of our research, we chose legal issues that appeared to be most relevant. In the following paragraph, we give an overview of the legal situation in Germany and the United States regarding regulations that may be important during streaming on YouNow.

8.2.1 German law

One of the focal points in the debate about the Internet and law is copyright. Here, most commonly the streaming and broadcasting of music and other multimedia (especially cinematographic works) are problematized. These infringements are regulated by the German Act on Copyright and Related Rights (Copyright Act). This act requires to compensate the author of a certain work for any reproduction, distribution, exhibition, or, in case of a non-material form, presentation, performance or broadcasting of their work. This includes not only the distribution through the World Wide Web itself but also, and more specifically, the communication of the copyrighted material to the public through (live) multimedia streams. In case such legally protected content is perceivable in the background without the copyright owner's permission, their right of communicating the work to the public (Copyright Act § 15(II) (2), § 20) may be violated. In some cases, an exemption is granted for incidental works, meaning that the communication of works to the public is permissible as long as they are regarded as incidental to the actual subject-matter being reproduced, distributed or communicated (Copyright Act § 57). To some extent, this exception could apply to the live-streams on YouNow. For this purpose, however, an assessment of every individual case would be necessary. Due to lacking clear provisions and concretization of the "incidental works" within the live-streaming sector, we analysed all potential violations of copyright (without the assessment with respect to this legal exemption). Hence, regardless of the intention to broadcast protected material, potential copyright infringements take place when the public is provided with access to any copyrighted multimedia content without the copyright owner's permission. This also includes underage broadcasters, whose parents can be held responsible (since they figure as

the holder of the Internet connection). In Germany, the collective society GEMA (Gesellschaft für musikalische Aufführungs- und mechanische Vervielfältigungsrechte; Society for musical performing and mechanical reproduction rights) represents a great number of authors and exercises their copyrights by managing the single usage rights. In case of a copyright infringement, either GEMA or other holders of the copyrights may initiate a civil or even criminal pursuit (which can lead to monetary penalty or prison sentence).

Another acute problem in the Internet law debate is the right in one's own picture and right in one's spoken word (for example, distributed in form of audio or video). The distribution of pictures taken of other persons without their permission is prohibited by the German personality rights. The basic right of personality is constitutionally guaranteed (see Arts 1 and 2 of the Basic Law) and protected under the German Civil Code (see § 823 (I) of the German Civil Code). One manifestation of the general right of personality is the right to one's own picture regulated in § 22 of the German Art Copyright Act (KUG), see e.g. the Marlene Dietrich Case. Another manifestation of the personality right is the protection of the spoken word; hence, the distribution of recorded voice is forbidden as long as the utterances were not expressed openly (open to the public). The violation of the privacy of the spoken word is protected by the German Criminal Code (see § 201 of the German Criminal Code). All in all, based on the personality rights and their several manifestations, the German law does not allow sharing of neither pictures nor videos or audio files containing images or voice of third parties without their permission. This holds also for showing such content during a live streaming session.

A further problematic aspect of the Internet in need of better legislation is the youth protection, which is also in focus of our investigation. In general, consumption of alcoholic beverages such as spirits and other high-proof alcohols is prohibited for minors under the age of 18, see the German Protection of Young Persons Act. Alcoholic beverages that are produced by means of alcoholic fermentation such as beer and wine are prohibited for minors under 16 (§9 (I)(1),(2) of the Protection of Young Persons Act). Smoking is not allowed for persons under the age of 18 (§ 10 (I) of the Protection of Young Persons Act). Furthermore, the Act regulates the distribution and sale of youth-endangering multimedia material and aims to protect the youth from unsuitable content. In addition to the Protection of Young Persons Act, the Interstate Treaty on the Protection of Minors protects children and minors from unsuitable content that is distributed through electronic media, such as radio, television and the Internet.

It has been observed that under the "invisibility cloak" of anonymity, one of the traits of the Internet usage, many users become more fearless to say what they really think. It may have some advantages, however, the gained courage regards mostly contemptuous thoughts. The act of insulting other people is prohibited by § 185 of the German Criminal Code. This includes not only offensive utterances or those containing value judgements towards third parties but also showing certain offensive gestures. However, each case should be assessed individually, as the act of insult depends more on the intent to cause offence to another person rather than exclusively on the used vocabulary.

Finally, the aspect most frequently addressed in the press—data privacy. The private data is protected by the Federal Data Protection Act and the personal information may be only distributed, disclosed or published with the explicit permission of the person concerned (§ 4 of the Federal Protection Act). Primarily the Federal Data Protection Act aims at public authorities and corporate entities, and not directly at private individuals. A natural person collecting and storing data for private purposes is not governed by the Federal Protection Act, as he or she underlies the exemption for personal and household activities. However, it is questionable whether the distribution of private information of third parties to the public via the Internet, e.g. during a live-stream session, can be categorized as personal activity. Hopefully, this problematic gap will be closed with the introduction of the General Data Protection Regulation (Piltz, 2013). Regardless the lacking regulation, we will include the distribution of personal data by private persons during a live-stream as potential violation of data privacy.

8.2.2 American law

The legal situation in the USA is partially different from the one in Germany. The U.S. Copyright Act generally protects the author's rights to display, perform, distribute, licence or reproduce their work including sound recordings, motion pictures, graphic arts and others (17 U.S.C. § 106). Although any tangible piece of work falls within the Copyright Act protecting the author and their work, the doctrine of "fair use" (§ 107) regulates the use of protected material in cases of criticism, teaching, news reporting or commenting. In those cases, using such material is not considered copyright infringement. It should be noted that German copyright law also allows the reproduction or distribution of copyrighted material for private purposes (e.g. for backup copies) or in teaching. However, broadcasting is understood as the mean to make any protected work accessible to the public, which includes playing music in the background, for example, during a streaming session on YouNow. Since the U.S. Copyright Act also protects other multimedia content, this also applies to showing protected video material such as movies or television broadcasts.

In US-American jurisdiction the protection of one's own picture is not regulated in the same way as in Germany. "A special protection of one's images does not exist in the USA" (Maaßen, 2006). It is possible to prevent one's own images from being published, however, this requires the plaintiff to prove that the publication of such an image violates his right of privacy. This is only the case if the image was taken without the permission of the pictured person and if "it is being used for commercial purposes" (Maaßen, 2006). In contrast, making audio or video recordings of oral speech without the permission of the person concerned is prohibited by the 18. U.S. Code § 2511 (interception and disclosure of wire, oral, or electronic communications is prohibited). This could also apply to disclosing sound or video recordings of other persons during a YouNow session. The legal situation concerning recordings of a person is not only regulated by federal law, but has different manifestations on a state-level basis, causing the state of affairs to vary from state to state.

Considering the youth protection, the minimum age for consuming alcoholic beverages in the USA is 21. When the National Minimum Drinking Age Act was passed in July 1984, all states were obliged to change the drinking age according to the law (National Institute on Alcohol Abuse and Alcoholism, 2015). The smoking age is not consistently regulated and

varies from state to state between the age of 18 and 21. Furthermore, the consumption of cannabis has been legalized for medical and recreational purposes in certain states. Amongst those states that permit the latter are Washington, Colorado, Oregon and Alaska. However, the consumption of marijuana is still illegal at the federal level (NORML, 2015).

In comparison to the legal situation in Germany, in the USA the act of defamation or insult is not prosecuted in the same way (Media Law Resource Center, 2015). At the federal level, there are no "criminal defamation or insult laws of any kind. At the state level, 17 states and two territories continue to have criminal defamation laws 'on the books'" (Organization for Security and Co-operation in Europe, 2005). However, the US American jurisdiction does not act as strictly in favour of the plaintiff as, for example, jurisdictions in certain European countries. The free utterance of one's own opinion is not necessarily considered a defamation of another person. This also affects social interaction on the Internet, since the expression of one's opinion, even if being devaluing or offensive, does not have to automatically lead to a lawsuit (Kelly/Warner Internet Law, 2015). Furthermore, Communications Decency Act protects internet providers from being hold responsible for infringements committed by third parties (47 U.S.C. § 230).

Regarding the data privacy, instead of regulating the disclosure of personal data by federal or state-based law alone, the United States rather follows a concept of combining "legislation, regulation and self-regulation" (HG Legal Resources 2015). In addition to the legal basis consisting for the most part of the United States Privacy Act and the Safe Harbor law, it is intended that companies develop their own policies for data privacy and ensure their compliance. Since there is no absolute legislation that dictates the procedure of handling data protection, it is obliged that YouNow itself ensures the preservation of its users' personal privacy. In their conditions of use it is explicitly stated that the disclosure of other users' private information is not permitted.

8.3 Methods

In this paragraph we will introduce the live streaming platform YouNow and explain the general idea behind this SNS in detail, e.g. how to get started or important features for streamers and their viewers. Afterwards, we will present our procedure of data mining and its evaluation for determining general statistics and qualitative analysis such as violations of law. The data acquisition is based on the observation of streamers on YouNow. Casselman and Heinrich (2011) used a similar approach as a part of their methodology while they observed YouTube videos and analysed the participants' behaviour, e.g. their actions, facial expressions and dialogues. We opted for this approach since it would, most likely, deliver the most accurate information concerning potential abuse of law. Another possible approach could be an online survey, but there are a lot of problems going along with it such as incomplete or false responses and multiple submissions (Schmidt, 1997). Furthermore, we decided against an online survey because it is questionable whether participants would admit any contravention.

8.3.1 What is YouNow?

The live streaming platform YouNow allows people all over the world to broadcast themselves in real time. Everyone owning a webcam or having the YouNow app installed

on their mobile phone can go live and let other people watch them doing whatever they do right then. Before starting to stream, it is necessary to log in to the site, while it is possible to watch the streams without being logged in. Users do not create a separate YouNow account, instead they have to link their existing Facebook, Twitter or Google+ account. By signing in, you have to accept the site rules as well as terms of use of the website.

When a user starts a stream, he or she has to assign a tag to his or her channel. The most popular ones are suggested, but it is possible to create a new one. The tags help other viewers to find new channels to watch. For each tag, there is a ranking of the channels assigned to it and ordered by the number of current viewers.

While streaming, a chat window appears for each channel. Other users who are logged in, can write messages to communicate with the streamer and others that can be seen by everyone watching the channel. Furthermore, it is possible to send certain "gifts" through the chat window to the broadcaster, e.g. pictures of hearts and rings. The gifts have to be bought with YouNow's own currency called coins. These coins are earned by various activities, like logging in, going live, watching other users, and chatting. There is also another currency for mobile app users—the bars. These have to be purchased with real money. With bars, some new activities are possible, like marriage proposal and fan mail.

Each user, whether an active streamer or just a viewer, has a level assigned. This level increases by broadcasting (getting fans, receiving gifts and likes), chatting, liking and giving gifts in other users' channels, sharing YouNow on other social networks and connecting social network accounts to their YouNow profile. With a higher level, new features on the website become available and it shows other participants how experienced the concerned user is on YouNow. After stopping streaming, a statistic of the stream is shown to the user, which says how many new fans, gifts, likes and coins have been received, how long the stream has lasted and how many viewers watched it. Additionally, the progress to the next level is displayed.

8.3.2 Our approach

Our coverage of data is composed of users that were streaming during June 2015. This data has been obtained either via the streamer's profile or by asking the streamer themselves during broadcasting. Our observations were limited to streamers from Germany and the USA.

The amount of male and female as well as German and American streamers needed to be balanced in order to get a representative result regarding the comparison of potential violations of the American and German Law, hence, our coverage was divided into four parts. Each group of streamers has been observed for an entire week. Furthermore, each day has been divided into four time slots (12pm-6am, 6am-12am, 12am-6pm and 6pm-12pm). In each of these time spans, four streams have been separately investigated for 15 minutes (altogether, 16 streams per day). Female and male German streamers were investigated during the first two weeks of June, equally streams of female and male American's were observed during the second half of June.

In the run-up to the research we had to weigh up possible correlations between several factors. For example: What does the gender have to do with the violation of specific laws like

copyright or youth protection? What is the arithmetic mean of streamers' age on YouNow? Each stream along with several information has been stored in a database. During research, our diversified factors narrowed down to those resulting in useful outcomes and neglecting factors that turned out to be futile, such as the level of streamers, received gifts, or fans.

8.3.3 Statistical analysis

After collecting all relevant data according to the previously explained methodology, we could evaluate all information. First of all, our database had to be revised regarding standardization of notations in order to cluster identical data. An important aspect to clarify is how to treat streams where two or more persons have been actively interacting regarding the distribution of streamer's age. In our evaluation, these streams have been handled separately resulting in a higher number of persons than the number of investigated streams in total. The handling of streams showing more than one person also plays an important role in gender-specific evaluation, e.g. the arithmetic mean of female streamers' age. These streams have been excluded from evaluation because the person-age-assignment was non-distinctive.

After these adjustments, the data was evaluated. The evaluation was split into two parts. The first part deals with general statistics of streamers on YouNow. The second part focuses on qualitative analysis of our data regarding legal aspects and possible violation of law, a comparison of German and American streamers (regarding potential infringements) as well as the response to the streams by the audience. For this part of the evaluation we have determined frequencies of occurrence in order to compute the correlation between different factors based on our empirical data. This has been done with the IBM SPSS Software.

8.4 Results

In the following, the observed results of the study are presented, including: general information, potential law infringements (copyright infringements, violations of the right in one's own picture and spoken or written word, legal protection for children and young persons), comparison between YouNow streams from the USA and Germany, and the responses by the audience to the streams.

8.4.1 General data

All in all, 434 different streams were observed, from which 211 were German (111 with the hashtag "deutsch-girl" and 100 with the hashtag "deutsch-boy") and 223 were US-American (112 with the hashtag "girls" and 111 with the hashtag "guys"). The average age of the observed streamers is 16.90 years. Female streamers are at an average age of 16.03 years whereas male ones are on average 17.80 years old.

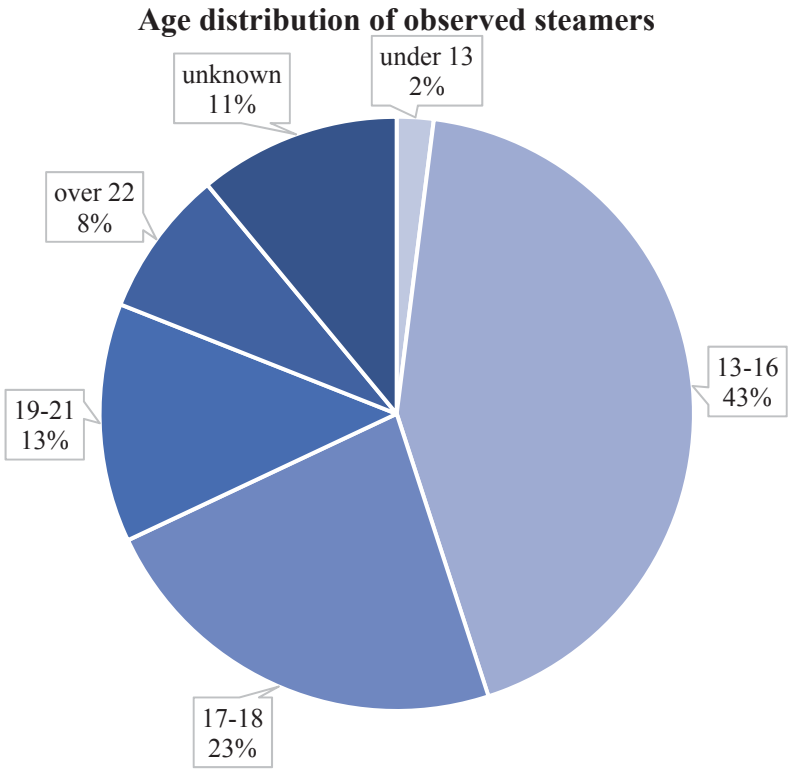

Figure 8.2. Age distribution among observed YouNow streamers.

The majority of the observed streamers were between 13-16 years old (43%), followed by the 17-18 year olds (23%). Even though the platform is meant for users over 13, 2% of the observed streamers stated to be under 13 years old, seven of them were female and three were male. However, the dark figure of, according to YouNow's terms of use, too young streamers may be higher, since 11% did not state their age. Figure 8.2 summarizes the age distribution of all observed streamers.

It was noticeable that female streamers in general seem to be younger than male streamers. If one leaves out the unknown streamers, 58% of the females were between 13-16 years old, whereas only 36% of the male streamers belonged to this age group. In contrast, 11% of the female streamers were at the age of 19-21, while the percentage of this age group for the male streamers is twice as high.

8.4.2 Potential infringements of the law

An overall of 248 potential violations of the law were observed. That makes a total 57.7% of observed streamers whose online behaviour could be legally relevant. Regarding the gender, 143 of the observed female streamers (65.6% of all female streamers) and 112 of the male streamers (50% of all male streamers) potentially violated some legal regulation. Figure 8.3 shows the distribution of the single infringed laws, which are further examined in the following paragraphs.

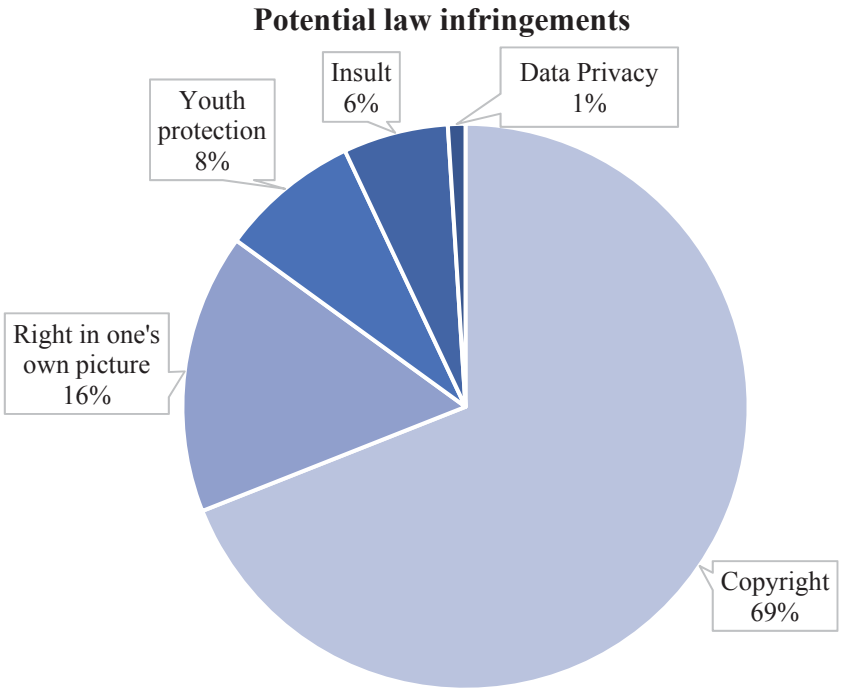

Figure 8.3. Distribution of potential law infringements.

Copyright infringements

Most of the legally problematic behaviour concerned the copyright. Total 177 (40.7%) of all observed streamers had music playing in the background during their stream, of which 92 streamers (52 %) were female and 85 (48%) were male. Compared to this number, only 3.3% of the streamers had their TV on during the streaming.

Right in one's own picture and spoken or written word

Regarding the protection of personal rights, 24 cases of filming other people without their explicit permission were observed. This also includes screening pictures of other people (which may constitute a violation of the right in one's own picture), reading from chat histories and calling third parties on speaker (protection of the spoken word as well as exposure and naming and shaming of the unaware telephonee) during the stream. By way of example, some streamers filmed third parties outside or in school. Regarding the gender, 15 female and 11 male streamers potentially violated some kind of personal rights. The reason why the absolute numbers differ (26 vs. 24) is because in some streams both genders occurred. In six cases streamer's family members were filmed. In seven cases the streamer showed private pictures of third parties (e.g. friends), in some of the cases with partly sexual content such as bikini shots or nudity. Mobile apps connecting the user with other random people who used it were popular amongst the streamers and their viewers. These apps were Flinc (the connected users were shown the content of the other's mobile phone's front camera, which usually showed the face of the users) and Base Chat or Parlor. Both apps connected random users for telephone calls, but without camera.

Legal protection for children and young persons
The following paragraph refers only to actions of streamers who were, according to the law, too young for the concerned content. All in all, 329 of the observed streams had under 18-year-old streamers. In 23 cases (7%) violations against the Protection of Young Persons Act were detected. These violations included sexual content and drug use. In 11 streams, several kinds of sexual content were observed, of which eight streamers were female and three were male. Nine of the eleven cases took place in the USA, only two occurred in Germany. Examples of sexual content are revealing clothes (bikini only, shirtless), provocative dancing, asking for sexual acts or showing revealing pictures. Furthermore, in 12 cases alcohol or drugs were consumed by under aged streamers, from which six persons were female and six were male. Total 25% of these streamers were either drunk or consumed alcohol while streaming, 33% were smoking cigarettes, 25% were under the influence of marijuana and 8% were smoking shisha pipe.

Defamation
Furthermore, 15 cases of defamation (insulting) were observed. These were either the streamers insulting their viewers who wrote in the chat room or people in their proximity, or the viewers insulting the streamer. Here, ten of the concerned streamers were female and five were male.

Data Privacy
Finally, in some cases streamers disclosed personal information of a third party (full name or telephone number) or themselves by showing the street name and house number to the viewers.

8.4.3 Audience Response

The majority of the observed streams (about 40%) had between 1,000 – 10,000 likes. Whether a stream had potential law infringements or not, it did not influence the amount of likes it would have on average. However, 63.6% of the streams in the range of 100-1,000 likes had some kind of sexual content. Streams with music had approximately 1,700 likes on average, whereas streams without music had an average of approx. 1,300 likes. Streamers who called third parties on speaker had an average of over 5,000 likes, which is 3 times as many as streams without calling a third party on speaker.

Streams with sexual content as well as streams with calling a third party on speaker, had, on average, 3 times as many viewers as streams without sexual content or prank calls. Regarding streams with violations of the right in one´s own picture, on average 5 times more viewers could be observed than in streams without the possible violation.

8.4.4 USA vs Germany

There is no major difference between the observed streamers regarding their country of origin (Germany or the USA). 120 German streamers potentially violated the law, which makes about 57% of all German streamers, while there were 128 possible violations in the US streams, which is a total of 58.4% (Figure 8.4). Sexual content could be found in nine US streams, which is 4.1% of the observed US streams and in two German streams, which is 0.9% of the observed German streams. All six of the German streams were moderated by streamers under 13 years old (2.8% of the observed German streams), whereas only three

(1.4%) of the US streams had under 13 years old streamers. Underage drug and alcohol use were found in five (2.3%) of the US streams and in seven (3.3%) of the German streams. The US streamers played more often music in the background - namely 44.3%, compared to 37% of the German streamers. Violations against the right in one's own picture and word took place in 13 German streams (6.2%) and 11 US streams (5.0%).

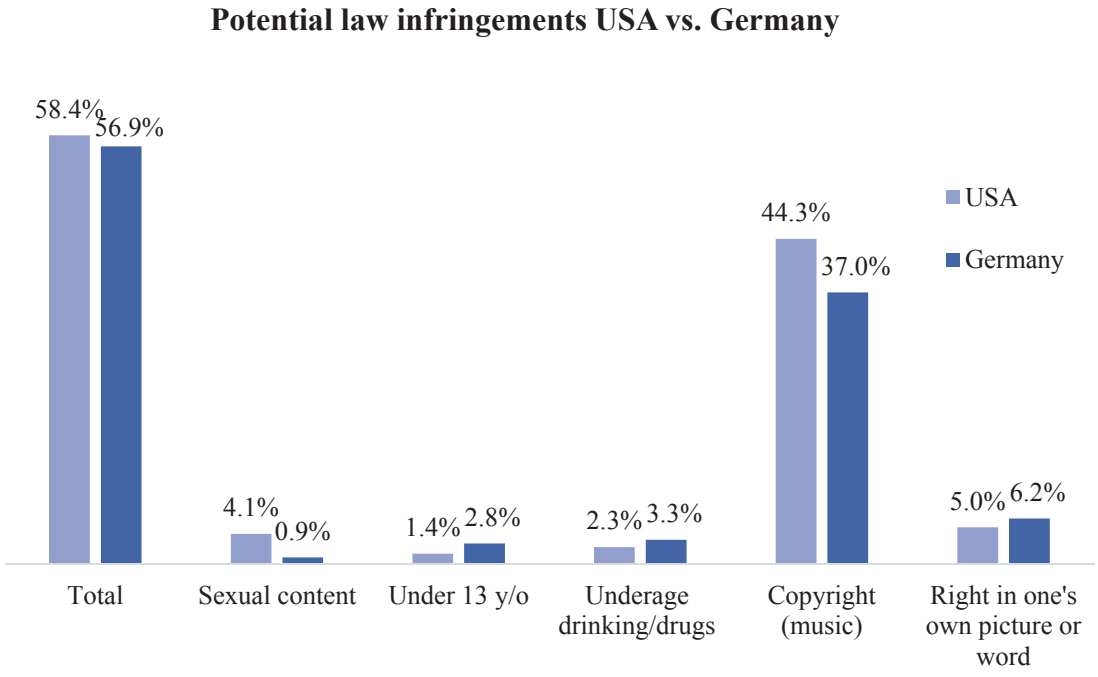

Figure 8.4. Potential law infringements of observed streamers. A comparison between the USA and Germany.

8.5 Conclusion

Our observations showed that the concerns expressed in the press are to some extend justified. The biggest issue appears to be the potential violation of copyright by both German and US-American streamers (69% of all observed potential infringements). However, the most troubling issues are the lacking child protection and possible violations of personality rights. Total 68% of observed streamers were under 18 years old, from which 2% openly admitted to being under the permitted age limit of 13 (the correct figure can be even higher). The differences between Germany and the USA are rather minimal, whereas the gender dependent differentiation showed that female streamers predominate regarding potential law infringements. The connection between legally questionable behaviour of the streamer and the received likes or the amount of viewers is rather small, if any. A correlation between these aspects based on a bigger data set and completed by an inquiry of the viewers (for example, in form of an online survey) would be more informative (and is an interesting aspect for further research).

Regardless the regulations in Germany as well as in the USA, the users conduct legally questionable actions during their streams. The question remains, what role does the platform YouNow play in it? In our investigation YouNow is regarded as a representative of other

similar platforms that are either not as popular or are about to rise in the near future. We point at a general problem of lacking legal obedience on the Internet, which can have dangerous consequences when, for example, children are involved. The explicit warnings and restraints in YouNow's terms and conditions do not seem to convince all users to act legally. Also, the age limit appears to be more of a suggestion rather than strict requirement for using the service. Another question is, whether these potential violations are indeed substantial enough to be prosecuted and do not fall under some legal exemptions, e.g. "fair use" or incidental works regarding the copyright, or private and household activities exemption regarding the data privacy. Here, a concretization of the existing legislature or even amendments, facilitating the legal situation to be compatible with our increasingly digitalized society, are long overdue. Which way should it go—free and open digital society based on unrestricted creative commons, or rather more rigid and better protected works and private data—stands open. Taking into consideration our outcomes, the streamers' sense of justice does not necessarily agree with current legal situation.

Possible solutions for the most dangerous problems—data privacy and youth protection—could be the improvement of information competency of children and their parents, better monitoring of the streams and possible violations by the platform operators, and finally, an improved registration system to the service ensuring certain age of the user as well as his or her full understanding of the terms and conditions as well as commitment to them. These solutions can only become reality, when the legal situation is accordingly adjusted and requires these actions. It is very likely that facing probable financial costs many platform operators would not implement any changes as long as they are not mandatory. Besides the additional expenses, another problem would be the unequal "security" level between different platform operators (accompanied by users' preference of platforms that are less concerned about their online behaviour rather than the ones limiting their online freedom).

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9 Find the Perfect Match: The Interplay among Facebook, YouTube and LinkedIn on Crowdfunding Success

In previous studies the information behaviour of (diverse) social media users was investigated. The outcomes can, for example, give interesting insights for marketing strategists, where to look for certain user groups and how to approach them. The following study also deals with social media marketing, however, in slightly different context. Here, not the information behaviour of social media users is being studied, but how different social media strategies might lead to successful crowdfunding campaign. Crowdfunding is a quite new development of the digitalized world and, therefore, fits into the topic spectrum of this work.

Since crowdfunding emerged as a new funding channel for entrepreneurial projects, researchers focused on investigating factors that actually lead to crowdfunding campaign's success. Such tools for promotion of a campaign are, for example, social media. Like crowdfunding platforms, they are also Web 2.0 applications, which changed our cultural norms and business praxes by creating the world where country borders became invisible and communication immediate. But, how does the activity on social media affect the crowdfunder's decision to pledge money for someone's entrepreneurial endeavours? In this study we take a look at the influence of electronic word of mouth (eWoM) via Facebook and YouTube, as well as the impact of social capital on the business oriented service LinkedIn, on the success of a crowdfunding campaign. We examine the interplay between these different platforms and propose social media strategies for entrepreneurs, which may increase their chances for being funded.

9.1 Introduction

Crowdfunding has emerged as a new funding channel for entrepreneurial projects and it serves as an alternative financing source besides traditional financial instruments (Mollick, 2014). Crowdfunders are able to directly pledge capital, even with small amounts, often in return for equity stakes, interest, or a non-monetary reward (Belleflamme et al., 2014) via online platforms. While success factors have received increasing attention from previous studies, recent research is inclusive of network benefits coming from crowdfunders (Bayus, 2013; Cumming et al., 2015). The aim of this study is to provide a new theory and evidence for the impact of social media activity on crowdfunding success by analysing the crowdfunding platform Kickstarter.

Kickstarter is a reward-based crowdfunding platform, whereby individuals pledge money in exchange for a reward chosen from various ones offered by the entrepreneur (Kuppuswamy & Bayus, 2014). It is a large and well-known crowdfunding platform that operates worldwide and, with over 2 billion USD in pledges as of April 2016, is currently the largest platform in terms of money raised (Lins et al., 2016; Wu et al., 2015). Recent empirical investigations on crowdfunding focus on the question why someone pledges money for barely known founders and their entrepreneurial endeavours. Mollick (2014) uses data from Kickstarter platform to examine and confirm the effects of network connections and quality

signals of the project on the crowd's funding decision. Additionally, Giudici et al. (2013) extracted information from 11 Italian crowdfunding platforms and showed that the success of a crowdfunding campaign is positively correlated with individual social capital, for which they use the number of contacts in social networking services (SNSs) as a proxy. It appears that SNSs, and potentially the interplay between various social media instruments, might trigger crowdfunding success.

Previous literature shows that social media generated new ways of interaction (Hansen et al., 2011), not only between individuals but also between corporations and consumers. Indeed, companies communicate increasingly with their customers via social media (Bortree & Seltzer, 2009). The consumers use social media as tools for learning about corporations, entrepreneurial and charitable projects, getting updated and interacting with the company like with any other user, whereas this interaction may influence their approval of the brand or company (e.g. Chun & Lee, 2016). Chun and Lee (2016) investigated the effects of content type in companies' SNSs on users' willingness to subscribe to the page as well as on their word-of-mouth (WoM), i.e. to learn more about the products and to recommend them on social media channels. Crowdfunding platforms are also instruments based on the idea of online communication between crowdfunders and campaign creators (Mollick, 2014). Here, social media facilitate communication that signals the quality of a crowdfunding campaign (Moritz et al., 2014). This way the campaign creator can reduce the uncertainty and mitigate information asymmetries. Furthermore, the web and social media enable the founder to reach potential funders from all over the world. Hence, the promotion through these channels is not geographically limited to one city or country, since borders have become invisible and communication immediate (Berthon et al., 2012; Etemad et al., 2010).

For our investigation we use data of 221 Kickstarter projects closed between January and March 2015 retrieved from the Kickspy and Kickstarter websites. We expand this sample with information from secondary sources, particularly entrepreneur-specific information from LinkedIn, Facebook, YouTube and company websites. The results of our study indicate that funding strategies for crowdfunding campaigns rely on an ideal coordination of various social media channels. A combination of different activities on various social media channels also affects the crowdfunding amount. A possible explanation might be that SNSs like Facebook and LinkedIn are primarily used for self-promoting and self-branding purposes (Kietzmann et al., 2011), whereas YouTube, a video sharing service, is more likely to be used to share content rather than for self-promotion. Our study contributes to the literature in two main ways: First, our study adds to the entrepreneurial finance literature by examining the behaviour of crowdfunders. A promising research strand has begun to examine the success factors of crowdfunding campaigns, but there has been no holistic discussion on the interplay among different social media instruments on crowdfunding success. Therewith, we help to gain a better understanding of why individuals decide to pledge money for crowdfunding initiatives. Second, this study contributes to the previous literature on information and communication technology by testing the effect of combinations of social media channels. Thus, we use a three-way interaction term to better understand the interplay

among Facebook, YouTube and LinkedIn, and shed light on their functionality to spread information and reduce information asymmetries.

9.2 Influence of social media

The fast development of information and communication technology (ICT) changed the way people live and interact. ICT is an umbrella concept for devices and applications enabling storage and exchange of information as well as communication between individuals. It encompasses the "traditional" media like radio and television, computers and networks, soft- and hardware, as well as the newest trends like smartphones or smart watches. These devices are complemented with diverse application possibilities like videoconferencing, online learning (e-learning), or one of the most popular fruits of development of the web (2.0), the social media.

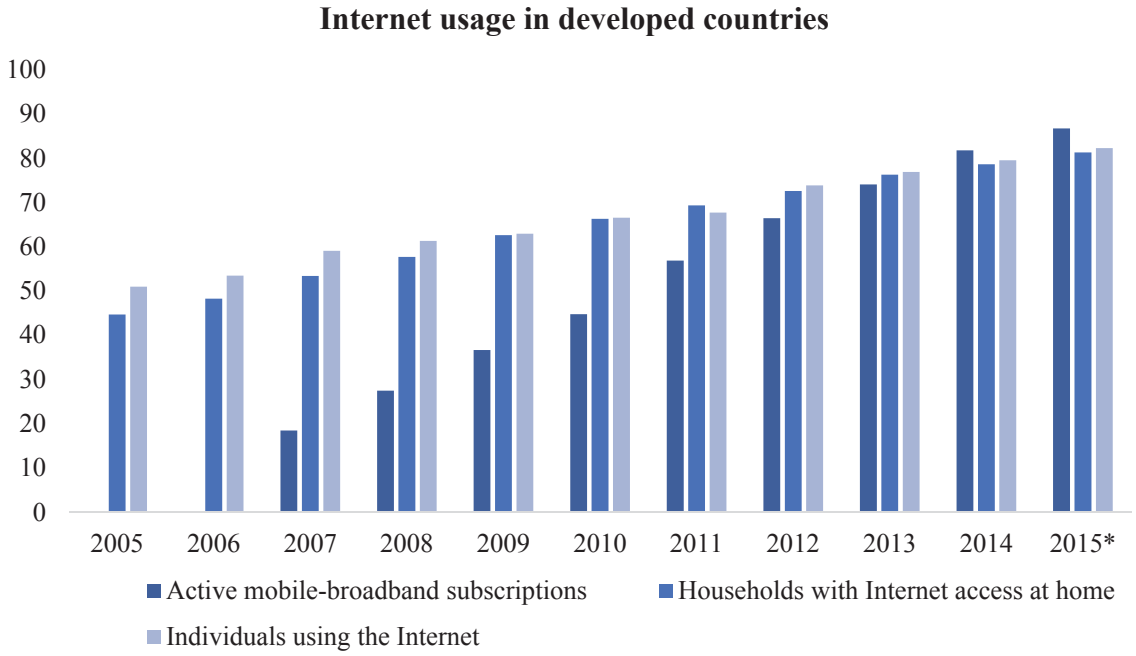


Figure 9.1. Internet usage in developed countries per 100 inhabitants. Source: ITU, 2016.

Most households in developed countries have access to the Internet and the use of mobile Internet is continually rising (see Figure 1). The amount of individuals using the Internet is estimated to be approx. 82%, whereas the amount of mobile broadband subscriptions rose from 18.5 in 2007 to (estimated) 86.7 per 100 inhabitants in 2015. According to Statista (2016), the social network penetration rate based on population size is the highest in North America (59%), followed by South America (50%), Western Europe (48%) and East Asia (48%). The global average lies by 31%. Hence, with increasing (mobile) broadband access, and a high social network penetration, the web and social networking sites (or social media in general), appear to be the easiest and fastest way to reach wide sections of the population in developed countries.

Up until now we have used several terms interchangeably—web 2.0, social media, social networks, and social networking sites. Before further exploring their relevance during crowdfunding campaigns, we will define what exactly "social media" mean and distinguish the differentiated terminologies. Here, we need to start with the web 2.0 and User Generated Content (UGC). The term web 2.0 was first used in 2003 by Eric Knorr (and further popularized by O'Reilly in 2005) to describe a new manner to utilize the world wide web, namely its "content and application are no longer created and published by individuals, but instead are continuously modified by all users in a participatory and collaborative fashion" (Kaplan & Haenlein, 2010, p. 60), for example, in form of blogs or wikis. Kaplan and Haenlein (2010) consider the Web 2.0 to be the ideological foundation for social media, whereas the term UGC sums all the ways in which users actively make use of them.

With the time, the term social media started encompassing more and more new applications and, therefore, it needs a systematic classification. Here, we turn to the research by Kaplan and Haenlein (2010), who classified social media based on theories from media research (social presence and media richness), and social processes (self-presentation and self-disclosure). According to the social presence theory (Short et al., 1976), media are differentiated by the acoustic, visual, and physical contact that can be achieved between two communicating individuals. The higher the social presence, the larger the social influence that the individuals have on each other's behaviour (Kaplan & Haenlein, 2010). Based on the media richness theory (Daft & Lengel, 1986), we can classify media based on the amount of information they allow to be transmitted (degree of richness) and, therefore, by how effectively they can resolve the ambiguity and uncertainty (Kaplan & Haenlein, 2010; Ratten & Ratten, 2007). The concept of self-presentation states that people desire to control the impressions others form of them in any type of social interaction (Goffman, 1978), either with the objective to gain rewards (e.g., getting funded), or in order to create an image consistent with one's personal identity (Kaplan & Haenlein, 2010). Based on this classification, social media with low levels of social-presence and media richness are blogs or collaborative projects like Wikipedia, whereas social networking sites (e.g., Facebook or LinkedIn), or content communities (e.g., YouTube or SlideShare) have medium to high level of social presence. These types of social media—content community (YouTube), social networking services (Facebook) and business-oriented SNSs (LinkedIn), are in focus of our study.

Social media have generated new ways of interaction (Hansen et al., 2011), not only between individuals, but also between firms and their clients. Indeed, companies communicate increasingly with their customers via SNSs (Bortree & Seltzer, 2009). Social media enable individuals to create, share, and recommend information, which extends their spheres of marketing influence (from oral one-to-one communication to a broad one-to-many promotion), and "a wide variety of social media platforms are providing the tools necessary for these influential and meaningful firm-customer exchanges" (Hanna et al., 2011, p. 266). The Internet, as infrastructure of service economy, is also an important aspect of social and regional development. With increasing usage of social media, crowdsourcing and crowdfunding, both based on the contributions of large masses of people, will be important resources for innovation and funding (Roth, 2010; Roth et al., 2013; Young et al., 2003).

Many users follow companies' SNSs' sites, for example their Facebook page (Chun & Lee, 2016). The consumers use the SNSs as tools for learning about the company and its products or services, getting updated and interacting with the company like with any other user, whereas this interaction may influence their purchase intentions (Chun & Lee, 2016). According to Nielsen (2011), 70% of users want to hear about others' experience with the company, 65% want to learn more about the brands, products or services, 53% compliment the brands, and 50% express complaints. Chun and Lee (2016) investigated the effects of content type in companies' SNSs' sites on users' willingness to subscribe to the page as well as on their WoM, i.e. the intention to learn more about the products, to recommend or promote them on Facebook. Their results show that the perceived usefulness and perceived enjoyment are significant predictors of individuals' use of company's Facebook page (Chun & Lee, 2016).

The electronic element of the WoM, while occurring in social media (or other platforms on the web) changed WoM's traditional form to the so-called electronic word-of-mouth (eWoM) (King et al., 2014). eWoM can be described as any statement made by potential or actual customers about a product or company, and available to a multitude of people via the Internet (Hennig-Thurau et al., 2004), since consumers' time zones and regional boundaries disappeared (Berthon et al., 2012). It allows consumers to exchange product-related information world-wide, and make informed purchase (Aksoy et al., 2013; King et al., 2014). The access to information enables the consumer to determine which products or brands meet their needs better (Dellarocas, 2003). The advantages for the consumers are reduced uncertainty and lower search costs, which lead to their greater willingness to pay for the product (Brynjolfsson & Smith, 2000; King et al., 2014).

Eisingerich et al. (2015) distinct the promotion on social media from the general eWoM and call it sWoM. They name Facebook as the most influential social networking site that replaces the traditional personal WoM, and Internet platforms as the "future" of customer relationship management (Eisingerich et al., 2015). The distinction between sWoM and other forms of WoM matters, because in this case the consumer decisions are made in the context of relationships that the consumers already have with others (Eisingerich et al., 2015; Simpson et al., 2012). Eisingerich et al. (2015) showed that consumers are less willing to offer (positive) sWoM than WoM, which is driven by different levels of social risks associated with these two types of communication. In contrast to the one-to-one oral communication, sWoM is written and broadcast one-to-many, namely to the own social network. Consumers restrain from broadcasting their opinion to a larger group of recipients, since they feel more vulnerable to the judgment of others (Eisingerich et al., 2015). We presume that the level of restraint from eWoM on social media will depend on the type of social medium in consideration and the respective level of self-presentation and disclosure (with rising anonymity on a service this reluctance might decrease).

In consideration of the fact that social media became an important marketing tool (Nakara et al., 2012), is it possible that they might positively influence the success of a crowdfunding campaign? Crowdfunding platforms are also tools based on the idea of web 2.0 (Fisk et al.,

2011) and the communication between the crowd and the entrepreneur occurs mainly, if not exclusively, via online communities (Mollick, 2014). Here, social media facilitate this communication as well as the signalling the crowd, for example, about the quality of the project. This way the entrepreneur can reduce the uncertainty and mitigate information asymmetries.

Furthermore, social media are not only important for the communication between the crowd and the entrepreneur but also for the borderless communication and promotion among the crowd or online community itself. Different studies showed that the crowd might be influenced by other individuals' behaviour observed online (Moritz et al., 2014). Hence, the crowds are affected by investors similar to them or by superior groups, like professional or experienced financiers (Moritz et al., 2014).

Finally, the online social capital has been proven to also have a positive influence on the outcome of a crowdfunding project (Saxton & Wang, 2013; Zheng et al., 2014), meaning that the bigger the number of Facebook friends or Facebook fans, the more positive is its influence on the project's success (Mollick, 2014). Furthermore, Saxton and Wang (2013) assume that cross-channel-synergies, i.e. promotion of the project on several social media channels, would increase the probability of positive outcome. Indeed, Lu et al. (2014) confirmed in their study on Kickstarter that a multi-channel promotion of crowdfunding project increases and retains the attention given to the project.

9.3 Hypotheses Development

9.3.1 Social networking services

The aim of social networking services is to connect people with similar interest and give them the opportunity to expand their private or business network (Weinberg et al., 2012; Zauner et al., 2012). With 1.59 billion monthly active users (December 2015; Facebook, 2016) Facebook is the largest social networking service and one of the most popular websites in the world, besides Google and YouTube (Alexa, 2016).

According to boyd & Ellison (2007), social networking services (or in their wording, social network sites), are web-based services allowing 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, 2007, p. 211). Some of the most common features provided by social networking services despite the opportunity to create a profile and connect with friends are comment sections, private messaging as well as photo- and video-sharing capabilities. Over time, applications for mobile usage became more popular, for example, sharing one's current location or instant messaging (e.g., the additional mobile app Messenger for Facebook). As for Facebook, the "like"-button enables the user to publicly express his or her approval, support or, in general, interest for something. With the "share"-button the user can spread content inside the (own) network.

It has been already proven that the amount of friends on Facebook has a positive impact on crowdfunding success. Here, the research was mostly limited to the social capital theory and

focused on the influence of the number of connections that the founder has on Facebook. A large network of Facebook friends proved to be beneficial to the project's success (Mollick, 2014; Saxton & Wang, 2013). In the current study, the influence of Facebook on the crowdfunding success will be examined on the basis of "like"-distributions. Lu et al. (2014) examined the connection between advertising on Twitter with tweets about the project and its success, and were able to identify a strong positive effect. We expect that liking a crowdfunding project's fan page on Facebook also triggers an advertising (eWoM) effect and leads to similar results. It is believed that liking a company's profile on Facebook can be understood not only as a public support of the user for this company, but also as a recommendation addressed to the own network (Rauschnabel et al., 2013).

The influencing power of the eWOM effects could become particularly strong on SNSs like Facebook, since friends in a Facebook network tend to have similar interests and inclinations (Li & Wu, 2013), and because users usually put more trust in their own network rather than in recommendations made by strangers (Leinemann, 2013; Veland et al., 2014). Hence, ties between the network members are stronger than on other social media platforms. A study by Li & Wu (2013) about the buying behaviour of coupon vouchers showed that a single Facebook like leads to a sale of 4.5 additional coupons.

Due to the fact that the recommendations are made by the own (familiar) network, the confidence problem caused by the non-existing face-to-face communication between a lender and a borrower, the principal-agent theory (Moritz et al., 2014), can be mitigated (Li & Wu, 2013). In addition, it is assumed that conclusions about the success of a product or service can be drawn based on the pursuit of eWOM. Therefore, the number of "likes" can be perceived by the crowd as a signal indicating a promising project (Liu, 2006).

In the light of these considerations the first hypothesis is formulated as follows:

> H1: The more like-indications are generated on a project's Facebook page, the higher the probability that this project will be successfully implemented.

9.3.2 Content sharing services

The social media platform YouTube (YouTube.com) founded in May 2005 is a video-sharing portal with a community character (Cheng et al., 2008). YouTube allows users to upload and view self-created videos and to share these with others. It has established itself over the years as the worldwide most successful video-sharing portal. In December 2014 on average 300 hours of video footage were uploaded per minute on the platform (Statista, 2016). The website YouTube is the world's third most visited website (Alexa, 2016).

The platform offers its users a variety of features. Registered profiles can comment on videos and mark them as favourites. These videos are being saved in a so-called favourites list, which is visible to other users. In addition, registered members can create their own channels to upload videos. By marking the videos with keywords, they can be easily found by other users (Cheng et al., 2008). The ability to subscribe channels and be informed about newly

uploaded videos allows private individuals as well as companies to build up their own network, which can be strategically supplied with videos and targeted information. In the category trends, new and most often viewed videos are easily and quickly accessible for platform users. This promotion increases their popularity even more. The videos can be rated with a like or dislike button. YouTube registers these ratings as well as the number of video views. This information is displayed under the respective video (Hettler, 2012).

Similar to Facebook, the emergence of eWoM effect is expected for content sharing services. In case of YouTube, the eWoM manifests itself above all in the amount of video views. Another possible eWoM effect is sharing the video-link with friends on Twitter, Facebook, via email or private messages (all these, however, could not be traced for current study). The relevance of video sharing for the crowdfunding success could be confirmed by several studies (e.g. Mollick, 2014, Moritz et al., 2014). According to these results, the crowd sees a video as a signal reflecting the good preparedness of the founder. Thus, a professional video allows the crowd to conclude the projects probability of a success (Mollick, 2014).

It is believed that the attention to crowdfunding projects can be increased by YouTube videos and consequently more potential backers can be reached (Saxton & Wang, 2013). A high number of YouTube video views can be understood as a signal for an increased public interest in the project, which indicates an increased probability of success (Liu, 2006). We assume that video views, similar to the previously considered Facebook likes, act for the crowd as a quality signal and, thus, can reduce their uncertainties. Against this background, the next hypothesis is formulated as follows:

> H2: The more video views a crowdfunding project has on YouTube, the higher is the probability of its success.

9.3.3 Business-oriented social networking services

LinkedIn is an internationally oriented social networking service, which focuses on professional connections (Weinberg et al., 2012). It numbers more than 400 million people from 200 different countries to its members (LinkedIn, 2016). The positive impact of social capital on the crowdfunding success could be already detected by investigating the number of entrepreneur's Facebook friends (Mollick, 2014; Saxton & Wang, 2013). In contrast to Facebook, the focus of LinkedIn lies on the development of professional relations (Papacharissi, 2009). This manifests itself in a differentiated network expansion. In the early financing stages entrepreneurs can benefit from their networks by using them to obtain important information and useful knowledge on how to build up an enterprise (Stuart & Sorenson, 2007). Various studies demonstrate that connections exist between an expertly and experienced network, and the probability of an individual to start his or her own company. Burt and Raider (2002) made the conclusion that female graduates with a comprehensive and well-educated network often tend to professional self-employment. Stuart and Ding (2006) also found that researchers with an academic degree and corresponding network are more likely to start a company.

A network in form of LinkedIn contacts consists of working people and industry members (Weinberg et al., 2012). Hence, this service is a good prerequisite for reaching beneficial and know-how transferring individuals. Therefore, we assume that LinkedIn contacts act as a strategic network for founders in crowdfunding and, thus, can provide them with useful and specific information. In addition to the transmission of useful information, a strategic network can also help to attract key and financial resources (Dana, 2001; Stuart & Sorenson, 2007).

Against the background of the literature about certification and reputation, the contacts of a founder on LinkedIn, which act as a strategic network for efficient information and capital procurement, could be used as a quality signal for potential investors (Podolny & Page, 1998). Social relationships have an impact on how an actor is perceived by others. Connections with persons having a high status lead to the enrichment of one's own perceived public image (Podolny, 1993). Thus, the influence of prestigious investors could be detected in crowdfunding. The transparent design of the platforms allows all users to exactly track the investment history of crowdfunding projects. Moritz et al. (2014) find that funders are guided by the behaviour of experienced investors in equity-based crowdfunding. Kim and Viswanathan (2014) were able to confirm these results by investigating the investment decisions of crowd investors in mobile applications. According to their findings, the crowd is influenced by investors with professional expertise in the pre-release stage and by experienced financiers when the product has already been developed and is being sold on the market.

Due to its transparency and professional orientation (Weinberg et al., 2012), LinkedIn is a good source to identify a founder's network. Through the detailed profiles and career descriptions, a potential investor can acquire an overview of the strategic network of the project founders. Many contacts can signal a long career and a lot of experience (Burton et al., 2002) as well as plenty of potential sources, which can provide the founders with performance-enhancing information and knowledge (Stuart and Sorenson, 2007). Against this background, the next hypothesis is formulated as follows:

> H3: A large strategic network of a founder in the form of many LinkedIn contacts has a positive effect on the success of a crowdfunding campaign.

9.3.4 Multi-channel effects

Saxton and Wang (2013) assume that cross-channel-synergies, i.e. promotion of the project on several social media channels, would increase the probability of positive outcome for a crowdfunding campaign. In this context, they refer to the "chamber echo effect" resulting from delivering the same message on multiple media channels, like Facebook, LinkedIn, or Twitter (Saxton & Wang, 2013, p. 14). Indeed, Lu et al. (2014) confirmed in their study on Kickstarter that a multi-channel promotion of crowdfunding project increases and retains the attention given to the project.

Marketing research showed that marketers profit from monitoring, as well as engaging in several social media channels simultaneously. Smith et al. (2012) claim that marketers

should use Facebook for collaboration with consumers in order to "circulate positive sentiment about…brands," Twitter for providing information and quick response to problematic posts/tweets, and YouTube for "subtle life-world placement and association with a particular constellation of brands" (Smith et al., 2012, p. 111). Summers et al. (2016) point out that not all social media "buzz" has the same effect on venture signals and "understanding these differences across different types of social media can impact more than level of interest generated in a crowdfunding project."

Considering all the above, we will investigate the synergy effects that two or three social media channels might have on the crowdfunding project's success. First, we will focus on the consolidated effects of two social media channels. As already pointed out, likes of Facebook page may trigger positive eWoM effects and draw attention to the project, as well as signal its quality and potential for success. Similar effects may be deduced from the amount of video views on YouTube—the attention to the project can be increased with these additional visual media, and a high number of video views can be seen as a signal of public interest in the project and, hence, the increased probability of its success. Finally, a big network on LinkedIn consisting of industry members and professionals is not only a good source of support and know-how transfer for the founder, but also a signalling source about the founders' experience and strategic connections, which mitigates the uncertainty of potential backers. We assume that higher activity or promotion on two social media channels simultaneously will increase the chances for success of a crowdfunding project and formulate further three hypotheses:

> H4a: The more likes on the projects' Facebook page and the more views of project's video on YouTube, the higher the probability of its success.
>
> H4b: The more likes on the projects' Facebook page and the bigger the founder's strategic network on LinkedIn, the higher the probability of its success.
>
> H4c: The more views of project's video on YouTube and the bigger the founder's strategic network on LinkedIn, the higher the probability of its success.

Given the differences between the investigated social media channels—different reach and varying degree of anonymity, we assume that there is a positive synergy effect when all channels are actively involved. This way a broader audience and, hence, greater amount of backers can be reached and given signals about the crowdfunding project's potential. Therefore, we formulate our last hypothesis as follows:

> H5: The more likes on the projects' Facebook page, the more views of project's video on YouTube, and the bigger the founder's strategic network on LinkedIn, the higher the probability of its success.

We create a model based on posed questions and our hypotheses (see Figure 9.2), which depicts the effects on crowdfunding success ensuing from the different social media platforms, as well as from the synergy effects from consolidated two or three services.

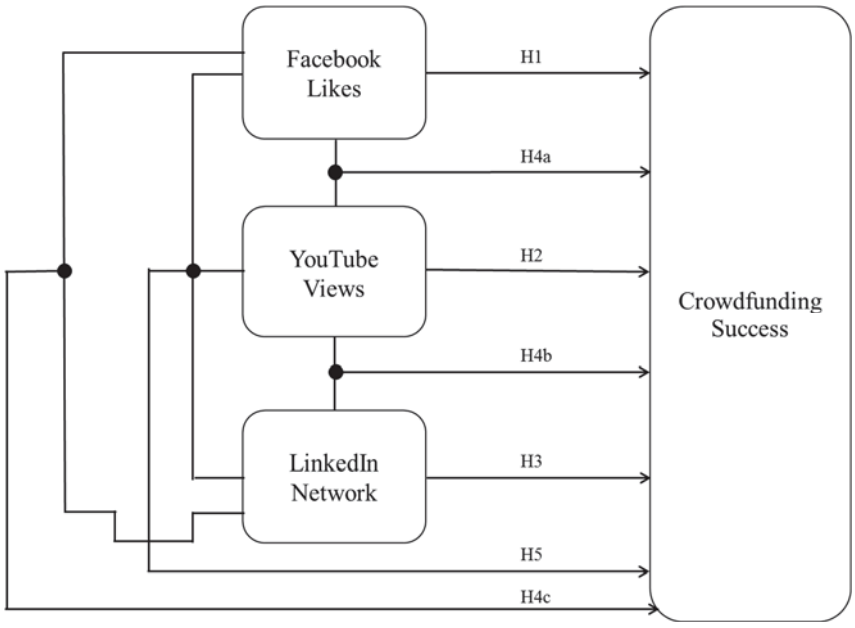


Figure 9.2. Our research model based on the stated hypotheses H1-H5.

9.4 Data

For our study we use data retrieved from Kickstarter.com and Kickspy.com, until Kickspy was shut down in March 2015. Kickspy was a website that collected all available information about Kickstarter projects and publicly provided data for both successful and failed crowdfunding projects. Our data set contains information about 264 Kickstarter campaigns that reached their end date of funding between January and March 2015. Since we use data from a certain period, economic or legal changes of the market situation during the narrow observation time are unlikely, so that we suggest having avoided severe bias, as Colombo et al. (2015) do for their Kickstarter data observed between October 2012 and January 2013. Furthermore, we enrich our sample with data from secondary sources, particularly personal information from social media websites, such as LinkedIn and Facebook profiles. After the elimination of incomplete records and outliers, our final sample contains information about 221 crowdfunding campaigns. Our sample is relatively small, e.g. in comparison to other studies on Kickstarter data (e.g. Colombo et al., 2015; Kuppuswamy & Bayus, 2014, Mollick, 2014), but our partly manual multi-step data collection procedure, which is necessary to conduct a holistic examination of success determinants (particularly social media) on crowdfunding, did not allow us to automatically collect large amounts of campaign information. Collecting individual and specific social media information makes it neither expedient nor feasible to collect data for large amounts of Kickstarter campaigns with automatized web scraping programs.

The main goal for an entrepreneur is to raise money from project backers. Therefore, most studies focus on whether a project has reached its funding goal or the total amount has been received during a crowdfunding campaign (Mollick, 2014; Xu et al., 2014). Similarly, we

use the variable Funding as our main dependent variable, which indicates the natural logarithm of received money in USD.

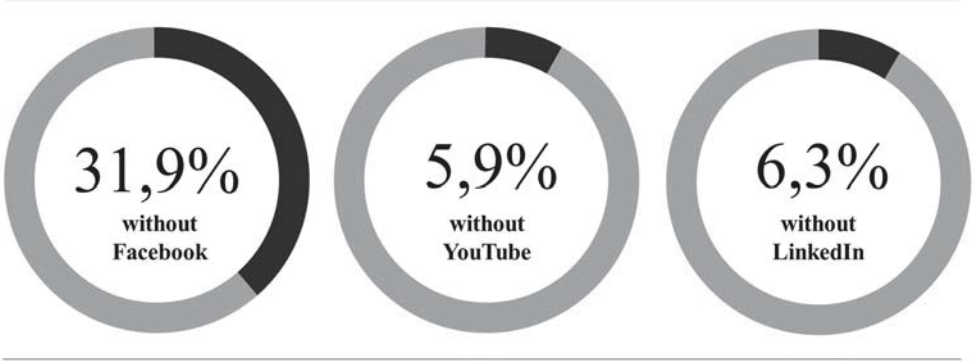
Table 9.1. *Variables of the econometric models.*

Variable	Description	Mean	S.D.	Min	Max
Dependent variable					
Funding	Logarithm of received funding amount in kUSD	7.49	3.04	0.69	15.25
Main variables					
Facebook	Number Facebook "likes"	52.62	146.46	0.00	934.00
YouTube	Number of YouTube clicks	27,599.60	210,847.70	0.00	2,549,283.00
LinkedIn	Number of LinkedIn contacts	150.60	188.62	0.00	500.00
Control variables					
Pictures	One for at least one picture	0.80	0.40	0.00	1.00
Video	One for at least one video	0.68	0.47	0.00	1.00
Male	One for now women involved in project	0.77	0.42	0.00	1.00
Team	One for team project	0.48	0.50	0.00	1.00
WorkExp	One for work experience for at least one person	0.91	0.28	0.00	1.00
University	One for at least one graduated person	0.70	0.46	0.00	1.00
Targetkusd	Logarithm of funding target in kUSD	8.46	2.15	1.79	14.00
Category dummies					
DCat_Art	One for an art project	0.21	0.41	0.00	1.00
DCat_Comis	One for a comic project	0.02	0.13	0.00	1.00
DCat_Cooking	One for a cooking project	0.04	0.19	0.00	1.00
DCat_Crafts	One for a crafts project	0.14	0.35	0.00	1.00
DCat_Design	One for a design project	0.00	0.07	0.00	1.00
DCat_Fashion	One for a fashion project	0.08	0.27	0.00	1.00
DCat_Film	One for a film project	0.03	0.17	0.00	1.00
DCat_Food	One for a food project	0.01	0.11	0.00	1.00
DCat_Games	One for a games project	0.11	0.32	0.00	1.00
DCat_Journalism	One for a journalism project	0.03	0.17	0.00	1.00
DCat_Music	One for a music project	0.17	0.37	0.00	1.00
DCat_Publishing	One for a publishing project	0.05	0.21	0.00	1.00
DCat_Tech	One for a technology project	0.09	0.28	0.00	1.00
DCat_Theater	One for a theatre project	0.02	0.15	0.00	1.00

To examine social media as our main explanatory effects, we manually collected data from Facebook.com, YouTube.com and Linkedin.com. First, we have verified whether each crowdfunding campaign has a Facebook page. For this purpose, we initially looked for information on Kickstarter, and afterwards directly on Facebook. To measure social media activity for a crowdfunding campaign on Facebook, we used the variable Facebook as a proxy since it indicates the number of "likes" for a corresponding campaign's fan page. Second, our study aims to examine the role played by online video platforms for the success of a crowdfunding campaign. We looked for promotional crowdfunding campaign videos on

YouTube and counted the number of their views. The variable YouTube exhibits on average 27.599 video views. Third, we have taken into account social media activity on business social networking services by collecting data from LinkedIn. We focus on the number of LinkedIn contacts of the crowdfunding campaign creator, since a larger business network increases success probabilities for entrepreneurial endeavours due to higher perceived reputation and trust (Burton et al., 2002). On average, campaign creators have 150 business contacts in LinkedIn.

We descriptively examined our three main explanatory variables by conducting t-test statistics (Figure 3). Crowdfunding initiatives, which use Facebook fan pages, are able to raise 392.688 USD on average, whereas non-active campaigns receive only 125.424 USD. Conclusively, crowdfunding initiatives without Facebook fan pages receive only approx. 32% of the average amount with social media activity on Facebook. Similar outcomes can be observed for YouTube activity (618.059 USD vs. 36.292 USD, approx. 6%) and LinkedIn (311.714 USD vs. 19.634 USD, approx. 6%). The differences are significant on the 1%-level.



Results are drawn from two-sided t-test. Differences are significant at the 1%-level.

Figure 9.3. Average crowdfunding amount raised with (=100%) and without social media activity.

We also included a wide set of control variables to account for both campaign creator-specific variables and project-related characteristics. Previous studies have indeed emphasized that campaign creator-specific variables, such as gender (Lins & Lutz, 2016), the number of campaign creators (Hakens & Schlegel, 2014), relevant work experience (Fried & Hisrich, 1988) and the educational background (Cooper et al., 1994), have an effect on funding probability. Furthermore, we also controlled for relevant project-related characteristics, such as the use of pictures, videos (Moritz et al., 2014), and the funding target (Cumming et al., 2015). An overview of all variables can be seen in Table 9.1.

Furthermore, we tested for multicollinearity issues by calculating the correlations between all variables and the explanatory variables in particular (see Table 9.2). No correlation between explanatory variables exceeds the threshold of 0.7, which indicates that there is no multicollinearity (Anderson et al., 2002). In line with this finding, we calculate the variance inflation factors and all values are below the threshold of 10, which is why we suggest that there is no multicollinearity problem in our study.

Table 9.2. *Correlation matrix.*

VARIABLE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
(1) Funding	1.00																								
(2) Facebook	0.54	1.00																							
(3) YouTube	0.13	0.09	1.00																						
(4) LinkedIn	0.28	0.24	0.00	1.00																					
(5) Pictures	0.49	0.30	0.07	0.23	1.00																				
(6) Video	0.16	0.11	-0.17	0.06	0.11	1.00																			
(7) Male	0.19	0.12	-0.09	0.07	0.18	0.05	1.00																		
(8) Team	0.40	0.21	0.06	0.13	0.35	0.07	0.37	1.00																	
(9) WorkExp	0.26	0.07	0.09	0.04	0.22	-0.06	0.00	0.11	1.00																
(10) University	0.23	0.13	0.01	0.04	0.25	0.17	0.06	0.19	0.18	1.00															
(11) Targetkusd	0.70	0.44	0.13	0.20	0.44	0.00	0.20	0.42	0.27	0.20	1.00														
(12) DCat_Art	-0.20	-0.10	-0.14	-0.07	-0.13	0.04	-0.16	-0.19	-0.06	0.16	-0.20	1.00													
(13) DCat_Comis	0.04	0.03	-0.04	-0.02	-0.09	0.06	0.06	-0.04	0.03	0.07	0.03	-0.06	1.00												
(14) DCat_Cooking	0.16	0.01	-0.02	-0.02	0.08	0.09	-0.03	0.02	0.05	0.11	0.13	-0.09	-0.02	1.00											
(15) DCat_Crafts	-0.18	-0.09	-0.03	-0.05	-0.23	-0.05	-0.25	-0.13	-0.13	-0.17	-0.32	-0.19	-0.05	-0.07	1.00										
(16) DCat_Design	-0.05	-0.02	-0.02	-0.01	-0.01	0.03	0.04	0.07	0.02	0.04	-0.05	-0.03	-0.01	-0.01	-0.03	1.00									
(17) DCat_Fashion	0.13	-0.05	0.02	-0.04	0.09	0.08	-0.04	0.10	0.08	0.04	0.10	-0.13	-0.03	-0.05	-0.10	-0.02	1.00								
(18) DCat_Film	-0.02	-0.04	-0.06	-0.02	-0.02	0.08	0.02	0.11	0.05	0.04	-0.11	-0.08	-0.02	-0.03	-0.06	-0.01	-0.04	1.00							
(19) DCat_Food	0.02	-0.03	-0.04	-0.02	0.02	0.06	0.06	0.04	-0.11	-0.01	-0.01	-0.06	-0.01	-0.02	-0.05	-0.01	-0.03	-0.02	1.00						
(20) DCat_Games	0.13	0.35	-0.02	0.04	0.11	0.17	0.22	0.13	0.08	0.15	0.26	-0.21	-0.05	-0.08	-0.16	-0.03	-0.11	-0.07	-0.05	1.00					
(21) DCat_Journalism	-0.08	-0.04	-0.06	-0.02	-0.01	0.09	0.10	0.02	-0.04	0.06	-0.11	-0.09	-0.02	-0.03	-0.07	-0.01	-0.05	-0.03	-0.02	-0.08	1.00				
(22) DCat_Music	-0.13	-0.10	0.25	-0.06	-0.14	-0.58	0.01	-0.09	0.08	-0.40	-0.02	-0.21	-0.05	-0.08	-0.17	-0.03	-0.11	-0.07	-0.05	-0.18	-0.08	1.00			
(23) DCat_Publishing	0.00	-0.05	0.05	-0.03	0.02	0.10	0.00	-0.08	-0.02	-0.07	-0.02	-0.10	-0.02	-0.04	-0.08	-0.01	-0.05	-0.03	-0.02	-0.09	-0.04	-0.09	1.00		
(24) DCat_Tech	0.26	0.04	0.02	0.25	0.36	0.13	0.11	0.17	-0.03	0.10	0.27	-0.19	-0.05	-0.07	-0.15	-0.03	-0.10	-0.07	-0.05	-0.17	-0.07	-0.17	-0.08	1.00	
(25) DCat_Theater	0.03	-0.02	0.00	-0.01	-0.07	0.05	0.05	0.09	0.03	0.06	0.02	-0.05	-0.01	-0.02	-0.04	-0.01	-0.02	-0.02	-0.01	-0.04	-0.02	-0.04	-0.02	-0.04	1.00

9.5 Results

For our econometric analysis, we use three OLS regression models and include a three-way-interaction effect between the social media variables. The results of our econometric approach can be observed in Table 9.3.

Table 9.3 *OLS regression results.*

VARIABLES	Model 1 Funding	Model 2 Funding	Model 3 Funding
Pictures	1.910***	1.781***	1.561***
	(0.504)	(0.491)	(0.484)
Video	1.478***	1.319***	1.193***
	(0.445)	(0.437)	(0.423)
Male	0.338	0.374	0.485
	(0.389)	(0.384)	(0.370)
Team	0.303	0.162	0.0826
	(0.351)	(0.345)	(0.334)
Workexp	0.646	0.494	0.483
	(0.544)	(0.552)	(0.532)
University	0.413	0.273	0.376
	(0.371)	(0.366)	(0.357)
Targetkusd	0.805***	0.737***	0.741***
	(0.087)	(0.086)	(0.083)
Facebook		0.001	0.004**
		(0.001)	(0.001)
Youtube		<0.000***	<0.000**
		<(0.000)	<(0.000)
Linkedin		0.002**	0.002***
		(0.001)	(0.001)
Facebook x YouTube			<-0.000***
			<(0.000)
Facebook x LinkedIn			<-0.000**
			<(0.000)
YouTube x LinkedIn			<-0.000*
			<(0.000)
Facebook x YouTube x LinkedIn			<0.000***
			<(0.000)
Constant	-3.045*	-1.934	-1.925
	(1.813)	(1.799)	(1.735)
Observations	221	221	221
R-squared	0.580	0.612	0.648

This table presents the results of our OLS regression to examine determinants of crowdfunding success. In Model 1, we only include the control variables to shed light on relevant factors for crowdfunding. In Model 2, we add the main explanatory variables of interest Facebook, YouTube and LinkedIn. Model 3 contains a three-way interaction term between our main variables. Results for category dummies are not reported and available upon request Standard errors are in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Model 1 of Table 9.3 exhibits the effects of the control variables on the amount raised. The results show that the variables Pictures and Video are significant at the 1%-level. This is in line with the results of Moritz et al. (2014), who show that the perceived sympathy and trustworthiness by crowdfunders is able to reduce information asymmetries between the project creator and outsiders, and, thus, affect the crowds' funding decision. In particular, they highlight that pseudo-personal communication by the entrepreneur, e.g. via video presentation and chats, is important to convince the crowd. Furthermore, we find that the funding goal set by project creators influences the received amount of funding, which is in line with Hakenes and Schlegel (2014) and Cumming et al. (2015).

Model 2 of Table 9.3 examines our three main explanatory variables. Surprisingly, we do not find a significant effect for Facebook on the dependent variable, but highly significant effects for YouTube and LinkedIn. However, when considering the interactions between the social media variables in Model 3 of Table 9.3, we find also a positive and significant effect for the variable Facebook. YouTube and LinkedIn remain also significant in this full model, in which all hypothesized model specifications have been applied. As we have expected, Facebook users trigger a positive eWOM effect in their networks by liking a Facebook fan page of a crowdfunding project. The users not only draw attention to the crowdfunding project, but also recommend the campaign to their own network (Li & Wu, 2013). Furthermore, due to the fact that the recommendations are made by one's own (familiar) network, the confidence problem caused by the non-existing face-to-face communication between a lender and a borrower (the principal-agent theory, Moritz et al., 2014) can be mitigated (Li & Wu, 2013). Similarly to Facebook, eWoM effects also emerge for content sharing services like YouTube. This is in line with previous studies, as the relevance of video sharing for the crowdfunding success was confirmed in the past (e.g. Mollick, 2014). Lastly, the number of contacts on the professional networking service platform LinkedIn is also able to positively affect the funding amount. Again, this is in line with our expectations, since the information displayed on LinkedIn and recognized by crowdfunders might be perceived as a quality signal (Podolny & Page, 1998). Social relationships have impact on how an actor is perceived by others. Connections with persons having a high status lead to the enrichment of one's own perceived public image (Podolny, 1993). To sum up, we confirm our hypotheses H1 to H3 but have to be cautious when interpreting H1 due to the insignificance of the Facebook variable in Model 2.

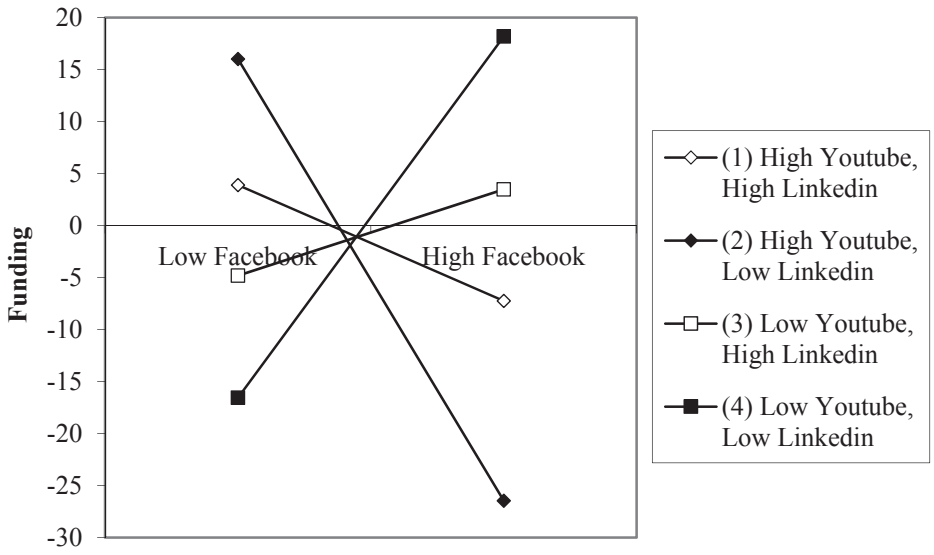


Figure 9.4. Plot of the three-way interaction term

Furthermore, when considering our three-way interaction term, we see that a high and simultaneous activity on Facebook, YouTube and LinkedIn does not positively influence the funding amount. To gain a better understanding of their relationship, we plotted this result in Figure 9.4. Surprisingly, we find that the higher the activity on Facebook (i.e. clicks on the campaign's fan page) and the lower, both, YouTube video views and LinkedIn contact numbers, the higher the funding amount. We also find that a high activity on both Facebook and LinkedIn and low numbers of YouTube video views exhibit as well a positive effect on the funding amount, even if less pronounced when compared to our last finding. On the contrary, a high YouTube activity and low activity on Facebook and LinkedIn increase the received funding amount for crowdfunding campaigns. Thus, we suggest that the promotion of crowdfunding initiatives on several social media channels does not necessarily increase the funding amount in general. Instead, we find that certain social media channels indeed affect the funding amount to the benefit of the campaign creator, whereas other combinations have a negative effect. To be more precise, large numbers of YouTube video views and a high Facebook activity decrease the funding amount. A possible explanation might be that crowdfunding creators might use funding strategies that have to be adapted to one another, e.g. self-promotion on Facebook and self-branding on LinkedIn (Kietzmann et al., 2011). YouTube, on the other hand, is used to share content rather than for self-promotion, which is why on content sharing services the relationships between the users hardly matter. Thus, if funding strategies with regard to social media use are not correctly adapted to one another, less capital might be provided by crowdfunders. Overall, we cannot verify H5, since the principle "the more, the better" is not applicable for Facebook, YouTube and LinkedIn. Furthermore, we do not find evidence for H4a and H4c, but we are able to confirm H4b.

9.6 Discussion

Crowdfunding platforms are new funding channels for entrepreneurial projects and an alternative financing source. Factors influencing the success of a crowdfunding campaign receive an increasing attention. Our aim was to provide evidence for impact of social media activity on the crowdfunding success. We assumed that SNSs, CSSs (Content Sharing Services), and potentially the interplay between various social media instruments, might trigger the crowdfunding success.

Our results showed that additional visual tools, like pictures or videos, are indeed important to convince the crowd as they may serve as a pseudo-personal communication with the entrepreneur. Considering the three investigated social media platforms separately, we primarily did not find a general effect of Facebook activity on the dependent variable, however, we observed a significant effect of YouTube and LinkedIn. Afterwards, we took a closer look at the interplay between these three platforms and found interesting outcomes. When considering all three social media channels, Facebook alone has a great impact on the crowdfunding success. Hence, Facebook user triggers a positive eWoM effect among his or her friends by liking the Facebook fan page of a project. The users not only draw attention to it, but also recommends it to their own network. Since there are stronger ties between the members of a Facebook network than, for example, on YouTube, the level of trust might also be higher. For this reason, Facebook alone appears to be a good eWoM tool leading to crowdfunding success, even with little or no activity on YouTube or LinkedIn.

This eWoM effect also emerges for services like YouTube. Here, we again emphasize the importance of videos and video sharing for the crowdfunding success. Thus, YouTube alone is also a good marketing tool, since visual effects may increase attention to and interest in the project. In this case, where we find rather weak ties between the community members, the trust levels in the network, as well as the social capital (e.g., on LinkedIn), do not matter. Lastly, the social capital in form of the number of contacts on the professional networking service like LinkedIn, does not matter when there is no activity on Facebook or YouTube. This means that even though the social capital might be perceived as an important quality signal, the information about the project has to be first spread on Facebook or YouTube. After more people are reached via these channels, LinkedIn acts as an additional signalling tool that convinces the potential backer to invest (due to mitigated uncertainty and information asymmetry). Therefore, the founder has to catch the attention of potential investors on either Facebook or YouTube, and convince them about his or her experienced social capital with the help of LinkedIn.

However, the positive consolidated effects will not increase indefinitely with the number of applied social media channels. When considering our three-way interaction term, we see that a high and simultaneous activity on Facebook, YouTube and LinkedIn does not positively influence the funding amount. Therefore, the principle “the more, the better” is not applicable for these three social media channels. Hence, an optimal solution for founders appears to be the focus on the connection of two social media platforms, e.g. Facebook or YouTube for eWoM, and LinkedIn for social capital. A great business oriented network

might be the decisive point for many investors. However, “if nobody sees it, it didn’t happen.” As a result, we have to turn either to our own network and start the domino effect of eWoM on Facebook, or make appealing and informative video that will be distributed by not necessarily familiar but truly interested network on YouTube.

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10 New Media and New Territories for European Law: Competition in the Market for Social Networking Services

The final study turns away from the user and his information behaviour and focuses on the other side of the table—the companies behind social media platforms. Here also certain laws and regulations apply, at least in theory. Given the enormous power of the Internet giants that established themselves in the last decade as strong market players, monopolists or oligopolists, is there need for a revision of the current legal system and practices? Does it fit the digital age? Can the legislature keep pace with technological developments of knowledge society?

Competition (or antitrust) law regulations around the world are supposed to maintain open competition on the economic markets through a series of national or international regulations and their enforcement by authorities. In the digital age, new (online) markets emerge and some stakeholders may be concerned whether present regulations and practices of national cartel offices, i.e. the national competition regulators, are still suitable. The focus of this chapter is on social networking services (SNSs) as an example of a new medium, and the question whether the current European competition law is sufficient to control these new and rapid developments. The market for consumer communication services (CCS) as well as aspects of data privacy are also addressed. The legal perspective on this matter will be complemented with an analysis in view of information science and economic theories. Here, such aspects as direct and indirect network effects, or standards established on the relevant markets are significant. It is possible these network effects will have a noticeable influence on the development of monopolies or oligopolies in the SNSs market. Furthermore, SNSs that in recent years became more or less standards appear to have strengthened their position by broadening their offerings spectrum through internal enhancements and acquisitions of other companies.

These practices may be also relevant in the legal debate. In terms of the competition law, the first step is determining if there are potential monopolies or oligopolies within the SNSs market, how they emerge, and how persistent they are. For this purpose, the relevant market must be defined. Should one company have a monopoly position and abuse this power in any way, consequences under the cartel law, particularly under Article 102 from the Treaty on the Functioning of the European Union (TFEU) will follow. The second step is investigating if another aspect of the competition law—merger control—should become more relevant (and more rigid) for the SNSs market now and in the future. For this purpose, the recent agreement between Facebook and WhatsApp will be discussed and the (approving) decision of the European Commission (EC) analysed. Moreover, the most important aspects of the European merger regulation and its lack of compatibility with data privacy protection will be addressed. Finally, a conclusion regarding the compatibility of (European and German) cartel offices' current practices with the new market for SNSs will be offered.

10.1 Introduction to Social Media Markets

In the last decade, social media rapidly became an inevitable part of the Internet and, hence, of everyday life. Their variety and capabilities continue increasing at an incredible pace. Following Linde and Stock (2011, p. 261), we observe four submarkets of social media: 1) sharing services allowing for the depositing of certain types of resources to share with other users; 2) social bookmarking services for managing resources; 3) knowledge bases for collecting documents and making them available to others; and 4) social networking services (SNSs) for communicating with other members of the community. It also appears in each social media (product and geographic) submarket, for the most part, one service dominates in either a European economic area (EEA) or at the global level. Some examples are YouTube as a video sharing service, Delicious as a social bookmarking service, Wikipedia as a collaborative online encyclopaedia (knowledge-based submarket), or Twitter as a microblogging-oriented SNS.

Facebook is the leader for SNSs at almost a global level (some national SNSs are similar to Facebook, e.g., Renren in China or VKontakte in Russia and several other East European countries) (Baran, Fietkiewicz, & Stock, 2015). Other important players on the (global) digital market are Google for search engines (or Yahoo, e.g., in Japan), eBay for auctioning platforms, and Amazon for online bookselling. Considering the above, a question suggests itself: Does the Internet drive market monopolization and, respectively, is the digital economy characterized by high market concentration (Baran, Fietkiewicz, & Stock, 2015; Haucap & Heimshoff, 2014)? How do monopolies emerge on an information market, and can current competition law keep up with the new challenges (Baran, Fietkiewicz, & Stock, 2015; Graef, 2013; Waller, 2012)? This chapter will focus on the SNSs market, in particular, on Facebook. It will also address the customer communication services (CCS) market, in particular, WhatsApp, as part of the Facebook/WhatsApp transaction analysis.

With reference to boyd and Ellison (2007), we define SNSs as "web-based services that 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" (p. 211). Facebook was founded by Mark Zuckerberg in 2004. It employs about 9,200 people and has around 890 million daily active users all over the world (average for December 2014) (Facebook, 2015). Facebook is also an online advertisement provider, realizing high revenues that continue to increase (see Table10.1).

Table 10.1. *Facebook ad revenues in Billions USD. Source: Statista, 2015a.*

Year	Revenue
2012	4.30
2013	6.99
2014	11.35
2015*	14.93
2016*	18.18

Since its launch, Facebook has gained a powerful, if not monopolistic, position in the social media market. The range of Facebook users is far broader than observed on other online services, including SNSs and communication applications (e.g., WhatsApp, Skype, or Line) (see Figure 10.1). The distribution of power, or rather its concentration in one market player, may be explained with network effects applicable to this kind of online service, explained in the following section. A high concentration of market power can lead to its abuse as well as to a distortion of competition in individual cases. Due to so-called multihoming effects (i.e., use of numerous online services simultaneously), which are also characteristic in this sector, such monopolistic tendencies are not perceived to be as detrimental as they would be in other industries. In addition, we will examine economic rules applicable to the digital economy in the following section. Afterwards, we will turn to the European competition law and its compatibility with the social media industry, especially SNSs such as Facebook.

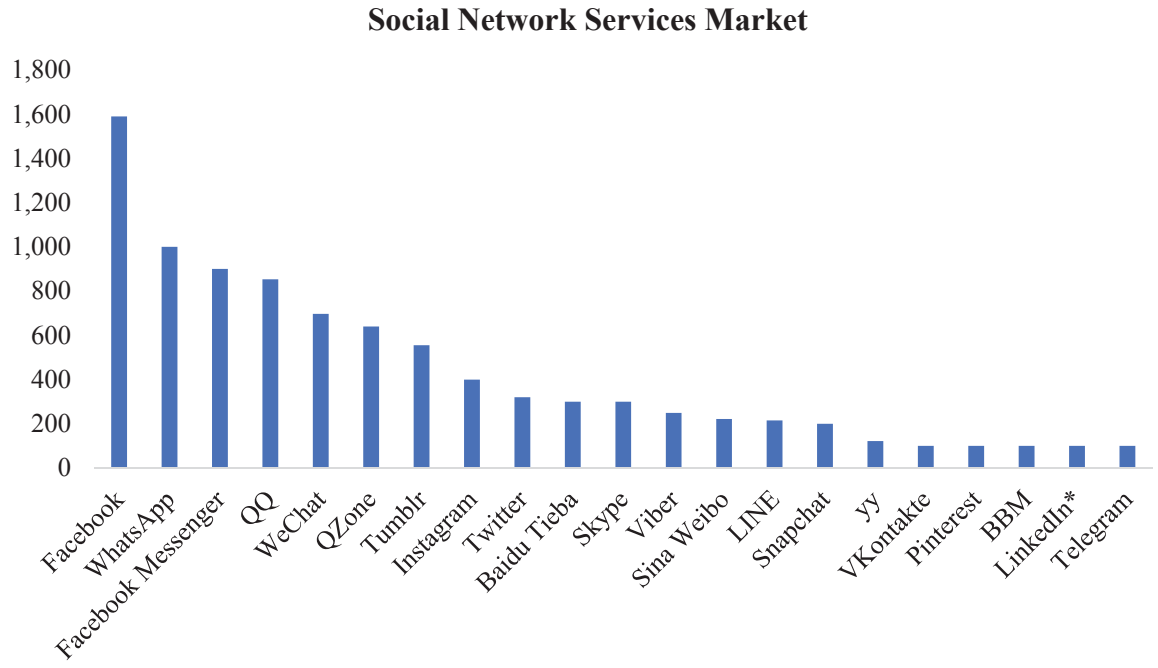

Figure 10.1. SNSs ranked by number of users (in Millions) as of March 2015. Source: Statista, 2015.

10.2 Economic Perspective on Competition for SNSs

10.2.1 Schumpeterian economics of innovation

In each social media submarket, we generally can identify one service occupying a nearly monopolistic market position, leaving only limited space for competitors to grow. A crucial twofold question arises from the competition policy perspective: Why, in particular, do these Internet-based companies have such a huge market share, and is this phenomenon temporary? In the following, we will highlight the theoretical background of the emergence of monopolies from the Schumpeterian perspective in the context of SNSs to better distinguish between the economic life cycle of innovative firms and anticompetitive behaviour.

Schumpeter regarded technological innovations as the most recognizable appearance of innovation that is not continuously distributed in time, defining it as "the setting up of a new production function" (Schumpeter, 1939, p. 84). Yet in contrast, innovations occur by leaps that disturb and upend the existing equilibrium and generate erratic growth (Kuznets, 1940). Schumpeter's theory of economic business cycles is based on a waveform process of economic developments under capitalism. Furthermore, he does not consider technological uncertainty as a necessary factor for the evolutionary process of economic business life cycles, but instead theorizes those waveform developments are caused by supply changes based on irregular technological changes. Such life cycles are the major catalysts of economic growth, but they vary in terms of industry, content, and time span, such as the short Kitchin inventory cycle (3–4 years), the Juglar fixed investment cycle (6–8 years), and the Kondratieff long wave cycle (45–60 years) (Korotayev & Tsirel, 2010; Kuznets, 1940).

Early in the life cycle of an industry—when technology is changing rapidly, uncertainty is high, and entry barriers are low—new, young firms are the major drivers of innovation and a key element of industrial dynamics (Wiklund et al., 2010). They create economic discontinuities and an entrepreneurial environment conducive to introducing innovation and monopoly developments (Kuznets, 1940). If an entrepreneur or a small company aims to innovate to earn monopoly profits, it must identify unexplored markets in which low entry barriers are prevalent, so it can constantly drive the process of internal and external innovations. The growth of internal resources and knowledge stock enables firms to operate globally, to use economies of scale and a monopoly position to create high entry barriers (Scherer & Ross, 1990), as well as to further influence industry life cycles (Klepper, 1996; Schumpeter, [1954] 1994, p. 897f.) and market structure (Agarwal, Sarkar, & Echambadi, 2002).

Firm development differs with respect to sector and industry specifics, which are particularly obvious when comparing the manufacturing sector with that of the service. Firms operating in manufacturing industries usually rely more on tangible assets, such as raw materials, machines, automobiles, and production plants. Economies of scale are limited for manufacturing firms, meaning the average total costs rise at relatively modest output levels (Posner, 2001). Further, those industries can be characterized by a modest rate of innovative activities due to the necessity of heavy capital investments, and slow and infrequent entry barriers (Posner, 2001). In comparison, service industries and particularly online services lack these characteristics to a considerable extent. Instead, they can be characterized by falling average costs at the product level, modest capital requirements to develop business operations, high innovative activities with a faster market entry, and economies of scale in consumption, which are so-called network effects (Posner, 2001).

In economics, the process known as "creative destruction" was defined by Schumpeter as the transformations of firms and industries through a destruction of the old, which allows for a creation of the new (Schumpeter, 1942, ch. 7). The development of Internet technology, which became publicly and commercially available in the 1990s, can be seen as an example of such a dramatic shift. Soon after the economic potential of the Internet was revealed, a large number of Internet companies, the so-called dotcoms, emerged and began to conduct business via the new electronic medium (Wang, 2007). When considering the development

of information technology and, in particular, the online market in the late 1990s, we can observe rapid changes that reached their first peak at the end of the 1990s; these also were characterized by enormous stock price increases, followed by a turning point in spring 2000. An abrupt decline occurred, which was marked by the bursting of what was termed the dotcom bubble. Stocks in the dotcom sector began to fall, bottoming out in mid-2001, when 384 dotcom companies closed their doors or declared bankruptcy (Florian et al., 2001). One reason for the crash was the immaturity of technology, in terms of slow Internet connections and restricted Internet access. However, only a few years later, both the number of Internet users and Internet speed had increased significantly, which is one potential reason Internet companies, such as Google, could see their stock double in price within a few short months. Amid this period, Facebook emerged in 2004 and soon achieved its dominant position in the SNSs market.

Such dominancy is typically observed in winner-take-all markets, whereby a company can achieve a quasi-monopolistic position (Fjell, Foros, & Steen, 2010). Besides gaining a monopoly by implementing radical improvements in performance dimensions, if a company introduces innovative products or services, this entails even greater disruption. Such a change can occur, for example, when a company offers consumers more than they actually need or thought themselves willing to pay for (Dietl & Royer, 2000). As a result, for example, consumers who once might have bought laptops based solely on the machines' processing power, become moved to consider entirely different functional capabilities, such as battery life, design, or weight (Galvan et al., 2008, p. 59). Entire product categories can thus be shaped, developed, launched, and established when companies can change consumer perceptions of value and price for the product offered.

Changing the basis of competition is not the only factor necessary to create a winner-take-all situation. Other factors, such as the presence of a consumer lock-in, are necessary to establish a profitable winner-take-all situation (Dietl & Royer, 2000; Liebowitz & Margolis, 1995). A lock-in can be described as a situation in which a consumer is not willing to change to another product due to high switching costs (Shy, 2000). Switching costs occur when many complementary parts of a network must be substituted. In the case of network specific and limited complementary parts, switching costs are relatively high, as the user perceives a high value loss when turning to another network. Besides this economic explanation, a behavioural-scientific explanation also serves to interpret the lock-in effect. From this cognitive theory perspective, consumer learning costs increase switching costs and thus, exit barriers. As a result, the consumer is bound in a position of dependence and limited freedom of decision. Therefore, the lock-in effect serves as a consumer loyalty instrument (Zauberman, 2003).

Not only can the adaptation of products or services lead to a lock-in and thus, to a strategic advantage, but also the timing of a product or service launch plays a role. This aspect is particularly relevant when considering innovations. A market pioneer's position, clearly observed when launching an innovative product or service, offers both advantages and disadvantages (Lieberman & Montgomery, 1998). When examining so-called first-mover advantages, benefits derived from being the first to enter the market exceed the costs of being the first to explore new market areas. A first-mover must deal with significant uncertainty

regarding consumer response and technological developments. Second-movers or early followers can learn from the market pioneer and avoid mistakes by entering the market with improved products or services. However, early followers must offer improved products or services to lure away the first-mover's consumers. Additionally, a first-mover usually enjoys consumer loyalty, a distribution network, and an established product line (Robinson & Min, 2002). Therefore, the period between the entries of a first- and a second-mover are particularly important from a Schumpeterian perspective, because the longer a market pioneer can dominate a relevant market in a monopoly position before the entry of followers, the greater its advantage.

MySpace.com, the pioneer in SNS platforms, was able to reach a temporarily dominant position in SNSs market with more than 50 million unique U.S. visitors in May 2006 (comScore, 2006). With regard to Schumpeter, the online environment in the 2000s was characterized by rapid changes, and the raw concept of an SNS did not fit neatly into this development of online social networking and users expectations. However, Facebook—an early follower—was able to adapt quickly to rapid changes, when expanding from its inception at Harvard University to colleges around the world and ultimately to open its services to everyone. Facebook's site design was clear, uniform, and standardized across all users, which provided a satisfying user experience (Safar & Mahdi, 2011, p. 112). By 2008, Facebook had overtaken MySpace, and as the dominant SNS, has grown increasingly relevant to become one of the largest SNS platforms worldwide (comScore, 2008).

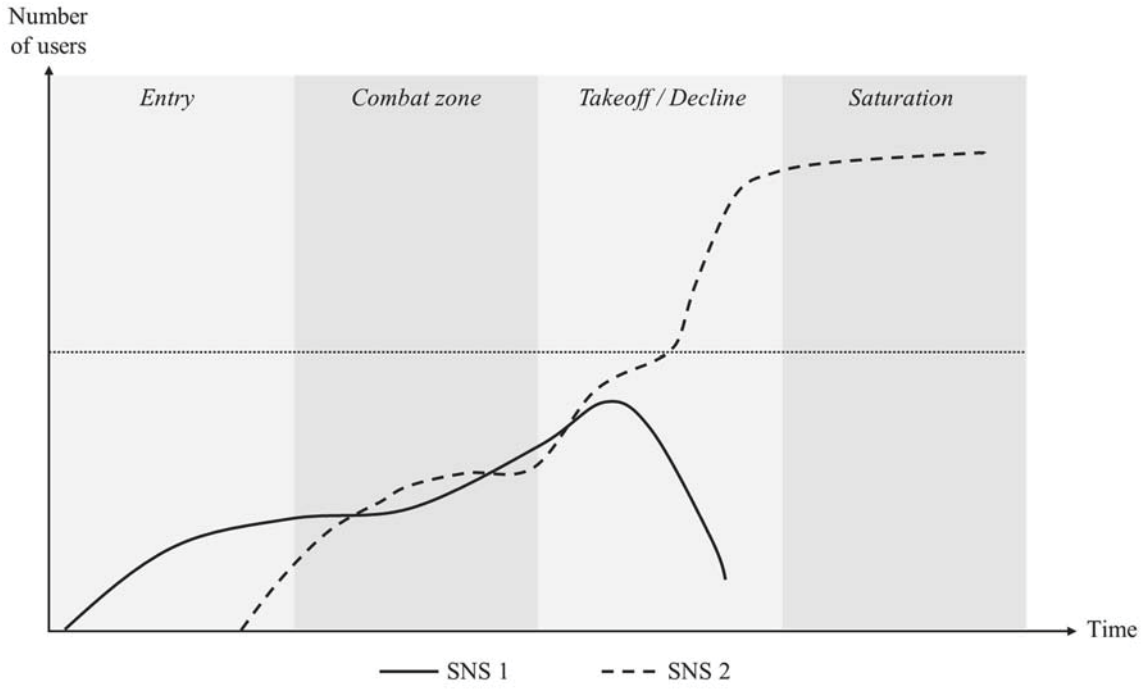

Figure 10.2. Typical development on SNS markets. Adopted from Dietl and Royer, 2000.

Considering several SNSs after their market entry, we observe a successful network trespass the critical mass of users within a winner-take-all market after some point (see Figure 10.2). At this position, network effects are particularly relevant. Direct network effects (Linde & Stock, 2011, pp. 53–57) can be derived from the number of consumers, or users for an SNS,

respectively, since an increase in the number of users is associated with an increase in the network's value. Indirect network effects (Linde & Stock, 2011, pp. 57–60) occur as consumer- or user-independent effects, such as the number of complementary products. Both direct and indirect network effects support the development of a quasi-monopoly and the establishment of the superior network as an industry standard.

10.2.2 Importance of network effects for SNS

In the context of SNSs, indirect network effects occur when products or services with more complementary products or services create higher benefits and greater demand (Lin & Bhattacherjee, 2008). Hence, the more complementary products an SNS offers, such as supporting tools, the more and better users are able to express themselves and maintain interactions with others, thereby giving users greater benefits (Lin & Lu, 2011). For instance, users of SNSs profit from the service functions of photos, videos, and message sharing to present and express themselves, share information, and interact with other users of the network in various ways. While it can be difficult to determine the impact of indirect network effects on certain SNS, we believe indirect network effects are particularly strong for Facebook due to the large number of user applications, such as games developed by Zynga, a provider of social games for social networking platforms (Schiesel, 2011). Complementary social gaming providers have become increasingly important for Facebook as they generate a large share of the company's revenue (Raice, 2012). For instance, 66 million Facebook users played Zynga's game Sims Social in September 2011 and shared gaming results with their friends (Schiesel, 2011).

Previous studies have analysed network effects for SNSs to examine and explain information technology users' behaviour as consumers (Gupta & Mela, 2008; Kim & Lee, 2007). Direct network effects originally were observed in a physical communications network (e.g., telecommunication networks between two parties) (Rohlfs, 1974). Users of the network receive increasing returns in consumption, which expands with the number of consumers who can communicate over a certain two-way communication network. Thereof, network providers might receive increasing returns to scale in their production. The extension of network size appears to attract additional new consumers due to an increase of perceived value: the larger the expected network size, the more valuable the network (David, 1985), which is in line with Metcalfe's law suggesting that a network's overall value can be increased with the square of the number of users (Shapiro & Varian, 1998). However, positive network effects are only prevalent as long as network overcrowding is avoided.

Nonetheless, network effects and Facebook's adaptability will not necessarily protect it—even as the present dominant SNS—from competitors. Arguing against the perception of Facebook monopolizing social networking, Facebook was able to overtake MySpace. The former, a start-up founded by students, ultimately came to dominate the latter, which up to that moment, had been the world's most popular SNS with a large number of users in 2008–2011, along with a contract to provide $900 million of advertising space to Google (Potter, 2013, p. 111). In addition, MySpace had dominated the market for SNSs between 2005 and 2007, at an even greater rate than Facebook does today (comScore, 2006). Breaking through the barrier of network effects, as Facebook did with MySpace, is a difficult task but—with regard to Schumpeter—apparently only a matter of time.

10.2.3 Economics of information

Particular online platforms tend to dominate their relevant market and leave only limited space for competitors to operate and grow. Such platforms are able to gather large numbers of users on their websites and retain their personal information. If an SNS has a dominant or even quasi-monopolistic position, it can monetize user data, thereby increasing its revenues and enforcing entry barriers against competitors. The monopolist might have too little incentive to concern itself with users' privacy demands, and it could further erode privacy practices in exchange for greater income by directly reselling user's personal information and contact data (Levmore et al., 2010, p. 247). As a result, users might choose to switch to an alternative SNS, but would do so only once the costs/value of their privacy outweigh the perceived benefits offered by the original SNS.

In addition, it is interesting to consider to whom information might be made available. Information a user shares is obviously available within an SNS itself. The user may not fully know or comprehend the extension time of data or their durability, as well as their membership extension (Gross & Acquisti, 2005). Furthermore, ease of joining and extending a user's network and the lack of adequate security policies make it easy to access users' information with the collaboration of the SNS (Gross & Acquisti, 2005). In the case of Facebook, the company has already used its market dominance to impair user privacy. In December 2009, Facebook deprived user control over pictures, contact information, and friend lists, and made these data publicly available (Levmore et al., 2010, p. 255). However, the numbers of users continued to climb to new heights, reflecting the general trend for SNS users to cede control over their private information (comScore, 2011; Levmore et al., 2010, p. 255).

Even if privacy concerns may constitute a risk in an SNS, users provide the information willingly. Different aspects affect users' willingness to reveal their data in SNS. The most important ones include signalling, which reflects the perceived benefit of selectively revealing personal information to strangers that may outweigh any perceived costs of possible privacy invasions (Gross & Acquisti, 2005). Other reasons might be peer pressure or herding behaviour, a lack of interest in SNS privacy issues, incomplete information about the usage of the revealed data, or even trust in the SNS and its users to use the information appropriately (Gross & Acquisti, 2005).

When considering the possibility of a regulatory regime applying specific privacy protections for SNS users, government-mandated protection might be either too great or too little. It might be difficult for a regulatory regime to assess which information to protect and how much data users are willing to reveal, and which parts they want to retain control over (Levmore et al. 2010, p. 247). A regulator cannot accurately predict user demands, and must weigh the costs and benefits of various privacy policies and seek to develop an efficient economic approach to maximize the welfare gain. Another problem for a regulator might be the opportunity for a dominating SNS with a quasi-monopoly position to charge monopoly "fees" in a number of areas in addition to privacy issues, for instance, providing suboptimal SNS features or prices above competitive levels when selling user information, which would require additional regulatory solutions (Levmore et al. 2010, p. 247). Furthermore, government-mandated protection for SNSs faces the problem of rapid changes in this

particular sector. New technologies or adaptations of business models are implemented both to and for SNSs on a frequent basis, which is why such a regime would need to constantly scrutinize its protection schemes in terms of effectiveness and usefulness, adjust its policies accordingly.

10.3 Social Media and Competition Law

10.3.1 Introduction to European Competition Law

The tendency for monopolies to dominate on information markets is very provocative, particularly as it concerns the European Union's (EU) competition law (Fatur, 2012). Reference is made to Article 102 of the TFEU, which states: "Any abuse by one or more undertakings of a dominant position within the internal market or in a substantial part of it shall be prohibited as incompatible with the internal market in so far as it may affect trade between Member States" (EC, 2008a, Article 102). Another central rule the European antitrust policy is based on is Article 101 of the TFEU prohibiting "agreements between companies which prevent, restrict, or distort competition in the EU and which may affect trade between Member States" (EC, 2008a, Article 101). The language encompasses two kinds of agreements—horizontal (between actual or potential competitors) and vertical (between firms operating at different levels) (EU, 2013a). For the present, anticompetitive agreements do not appear to be urgent issues in information market areas. The abuse of dominance by monopolistic online service providers may be a more relevant problem. Regarding our study, we mainly focus on merger control as it relates to the agreement between Facebook and WhatsApp reached in February 2014.

Moreover, Article 102 of the TFEU states the law "prohibits abusive conduct by companies that have a dominant position on a particular market" (EU, 2013b). Hence, to fall within the scope of this article, the concerned company must hold a dominant position in a specific market. The European Commission (EC) must first assess whether this prevails and define the relevant product market ("made of all products/services which the consumer considers to be a substitute for each other due to their characteristics, prices, and their intended use") as well as the relevant geographic market (as an "area in which the conditions of competition for a given product are homogenous") (EU, 2013b). A critical indicator for a company's dominant position is its share of the predefined market. If the share is less than 40%, then dominance is rather unlikely (EU, 2013b). In addition to market share, other factors are considered, such as market entry barriers (for new companies), the existence of countervailing buyer power, or the company's overall size and strength (EU, 2013b).

A dominant position per se is not illegal, and a company must "abuse" its power by, for example, forcing buyers into exclusive purchasing agreements, setting prices at a loss-making level (to eliminate competition), or, in contrast, charging excessive prices (EU, 2013b). Recent cases concerning the digital market/web portals in general handled by the EC regarding the abuse of dominant position, for example, have been proceedings taken against Google. The investigation followed complaints about unfavourable treatment of search service providers in Google's unpaid and sponsored search results as well as preferential placement of Google's own services (EC press release IP/10/1624).

In this chapter, we examine the acquisition of WhatsApp by Facebook, which is a case for EU merger control with its legal basis in Council Regulation (EC) No. 139/2004 (EC, 2010). Uncontrolled mergers and acquisitions of companies can change a distinct market into a monopoly (or oligopoly) and limit competition. However, not all mergers are controlled by the EC, since they have to be characterized by the EU dimension; namely, a planned merger must reach a certain turnover threshold in at least three member states. Involved companies must notify the EC about any pending merger with an EU dimension before the process can be finalized. In the first phase, the EC has 25 working days to analyse the agreement and can either clear the merger (unconditionally or subject to accepted remedies) or, when the proposed merger raises competition concerns, open the second phase of the investigation (EU, 2013c). The second phase requires more time to process as it involves more extensive information gathering, more detailed questionnaires to market participants, and so forth. The EC has 90 working days to make a final decision about the merger, a period that may be extended by an additional 15 working days, and subsequently, by up to 20 working days (on request or approval by the notifying parties). Finally, the EC may either unconditionally clear the merger (or approve it as subject to remedies) or prohibit it (EU, 2013c).

10.3.2 The Internet Economy's challenges for the current legal system

In the Internet economy, many business models are based on the use of personal data, with the most popular being Google and Facebook (Monopolkommission, 2014, p. 52). It is characteristic for the digital economy that "(…) for many online offerings which are presented or perceived as being 'free,' personal information operates as a sort of indispensable currency used to pay for those services. As well as benefits, therefore, these growing markets pose specific risks to consumer welfare and to rights to privacy and data protection" (European Data Protection Supervisor, 2014, p. 6). From the information economy's inception, "personal data has been its most valuable asset" and, therefore, "an open conflict [has arisen] between [the] business demand for data and [the personal] desire for privacy" (Spiekermann & Novotny, 2015, p. 181). The relationship between SNS providers and platform users can be seen as a civil contract based on the providers supplying information technology performance (the social network) and consumers agreeing to the use of their private data for commercial purposes (advertising) (Bräutigam, 2012, p. 635). Bräutigam (2012, p. 640) compares this "licensing"-like granting of the use of private information to the type of licensing known from copyright law. Bräutigam (2012) thus views recent developments as a commercialization of the right to informational self-determination (in the German legal system, a fundamental right to the free disposition of one's private data). He even anticipates the idea of collective societies managing compensation interests (for use of private information), as is commonly done for managing copyright and related rights (Bräutigam, 2012, p. 641).

10.3.3 Data privacy and competition law

Many legal concerns exist referring to the issue of data privacy on the digital market. One is the extent of the Internet's impact and its illimitability; hence, the need has arisen for a global uniform regulation of privacy issues in order to ensure its effectiveness. The German Monopolies Commission defined three main problematic issues in terms of (Internet) companies' excessive personal data access: (1) data security (i.e., unlawful elicitation,

storage, and use of personal data); (2) competition (i.e., the abusive exploitation of a databased economic position of power), and (3) consumer protection (i.e., the exploitation of a corporate entity's powerful position vis-à-vis consumers) (Monopolkommission, 2014, p. 60).

One of the most important competitive factors in the Internet-based industry is information about consumers. With the help of collected and analysed data, such companies may provide better and more suitable services. Big market players, such as Google or Facebook, extend their range of activity and strengthen their market position by acquiring further online services (not necessarily directly related to their original field of activity). This increasing diversification of important service providers and takeovers of adjacent (online) services may lead to portfolio or conglomerate effects and, as a result, to increasing market power of the discussed market players (Monopolkommission, 2014, p. 63). Portfolio effects are typically meant as synergies on the demand side, when diverse products are purchased from only one provider (Monopolkommission, 2014, p. 63). Such integration of diverse products and services may offer positive as well as negative effects (negative, mostly, regarding market entry barriers). Additionally, existent network effects and economies of scale may hinder competition and market development (Monopolkommission, 2014, p. 63).

It is difficult to identify ex ante all possible competition problems in the Internet-based industry, since this is a relatively new field. Facing dynamic technology development, it is unclear what size a provider must be to develop a new (and competitive) product, and also, it remains uncertain what consequences network effects will have (Monopolkommission, 2014, p. 69). Despite this uncertainty, the practice of the competition authorities deserves a critical review. It appears the administrative bodies only focus on competition problems to the detriment of other online service providers (i.e., the primary market level), and do not at all address problems of data access or data security of consumers (i.e., the secondary market level) (Monopolkommission, 2014, p. 69). The German Monopolies Commission sees this selective regulation of competition as insufficient to solve current problems or resolve customer concerns. Even though the competition law primarily focuses on market structure and actions against competitors, consumer welfare is an important component as well. Consumer welfare encompasses the protection of personal data—"the ultimate purpose of competition law is to ensure that the internal market will satisfy all reasonable wishes of consumers for competition, including not only the wish for competitive prices but also the wish for variety, innovation, quality, and other nonprice benefits, including privacy protection" (European Data Protection Supervisor, 2014, p. 17).

Concerning the problem of extensive access to user data, the German Monopolies Commission analysed the existing competition regulations regarding their suitability for preventing these security issues (Monopolkommission, 2014, p. 69). As for merger control, it regulates market structure by supervising transactions between companies (i.e., mergers or acquisitions), which may have a significant impact on it. In recent years, several transactions between online service providers involving extensive data and user portfolios have been subject to merger control. One of them is the agreement between Facebook and WhatsApp discussed in the following section. Due to turnover thresholds that must be reached in individual countries, German authorities did not have the opportunity to assess

the announced transaction. During the determination of the merger control jurisdiction, the data-related turnovers were not taken into consideration by the European competition authorities. The German Monopolies Commission views this matter as problematic and considers transaction volume or market shares as better jurisdiction criteria for German authorities (Monopolkommission, 2014, p. 70). However, it is already questionable if merger control is appropriate to use in regulating data security matters, and if there is a need to extend its application domain. The German Monopolies Commission explains that data security instead is a question of abusive exploitation of market power rather than the subject of merger control. The main focus of merger control lies in market structure and thus is only partially suitable to secure the competition against dynamically changing markets, such as the Internet (Monopolkommission, 2014, p. 70).

The German Monopolies Commission recognizes the current handling of personal data as a serious challenge for government and society, and the current competition law enables only limited interference against abusive personal data exploitation. One solution would be extensive data security regulation; however, it is uncertain if such would be compatible with competition law (Monopolkommission, 2014, p. 72). There are already several regulations addressing data protection and respect for privacy existing side by side with the competition law. Regarding regulations beyond the competition law, we find Article 7 of the Charter of Fundamental Rights (the Charter), which governs the right to respect for private and family life, home, and communications against the state (EU, 2012, Article 7), and in Article 8 of the Charter, the protection of personal data (EU, 2012, Article 8). According to the Charter, personal data can only be processed when several essential requirements are fulfilled, namely, when the processing is fair and lawful, when it occurs for specified purposes, when it is transparent to the individual, and when this individual can access the collected data (European Data Protection Supervisor, 2014, p. 12). Another relevant regulation is the Data Protection Directive 95/46/EC (EC, 1995), in which, according to Article 12, individuals have the right to access data relating to them as well as to rectify, erase, or block data that is incomplete or inaccurate (European Data Protection Supervisor, 2014, p. 15).

In 2012, the EC proposed a comprehensive reform of data protection rules including, for example, the "right to be forgotten" (EC Press Release IP/12/46). The aim of the planned General Data Protection Regulation is to harmonize the current data protection laws across the EU. In contrast to the (Data Protection) Directive, this regulation will be directly applicable in all EU member states without the need for nationally implementing legislation (Computer Weekly, 2015). Consumer welfare in general is not defined in the EU competition law, and its relationship with market efficiency (as the main issue of the competition law) is not commonly understood (European Data Protection Supervisor, 2014, p. 19). In the holdings concerning competition cases by the European Court of Justice (ECJ), we rarely find references to consumer welfare. However, even if not explicitly referenced (and then only at a conceptual level), consumer interests are taken into account in each major branch of the competition law—prohibition of anticompetitive behaviour, abuse of dominant market position through exclusionary conduct or exploitation, control of mergers, and control of state aid (European Data Protection Supervisor, 2014, p. 19).

In the digital economy, personal data is a significant intangible asset in the value creation of online services, and it may have further implications for defining key concepts in competition law, such as transparency, market dominance, or consumer welfare and harm (European Data Protection Supervisor, 2014, p. 37). Even though there is heightened risk for personal data, "the market for privacy-enhancing services (…) remains weak. While many consumers may be becoming more and more 'tech savvy,' most appear unaware of or unconcerned by the degree of intrusiveness into their searches and emails as information on their online activities is logged, analysed, and converted into revenue by services providers" (European Data Protection Supervisor, 2014, p. 11). A new concept of consumer welfare protection for competition enforcement could be based on the abuse of market dominance and consumer harm through a refusal of access to personal information and misleading privacy policies, which could further lead to the promotion of privacy-enhancing services and better control over one's own personal data (European Data Protection Supervisor, 2014, p. 26).

A greater need exists for rigid merger control when considering the amount of data accumulated by companies to be one of the most important indications for (online) market dominance, as well as the need to assess a given transaction's impact not only on competitors but also on users. The lack of effective policymaking interaction among competition, consumer protection, and data protection efforts "may have reduced both the effectiveness of competition rules' enforcement and the incentive for developing services which enhance privacy and minimize potential for harm to the consumer" (European Data Protection Supervisor, 2014, p. 37). To better understand the current praxis of the EC during a merger control, in this chapter, we examine the transaction between Facebook and WhatsApp conducted in 2014.

10.3.4 Newest trends

The digital market is developing rapidly. Again and again, new and alarming trends concerning data privacy emerge, for example, big data analyses, which are useful for optimizing products, processes, or business decisions, and involve analytic association of vast amounts of data (retrieved from different sources) in order to attain economic, social, or scientific insights (Ohrtmann & Schwering, 2014, p. 2984). However, the concept of big data entirely contradicts the basic principles of data protection—data minimization (only to utilize as much information as necessary) and appropriation (only to collect or analyse data for specific and explicit purpose) (Ohrtmann & Schwering, 2014, p. 2984ff.). The increasing use of personal information for marketing aims may be explained by economic efficiency, which arises when complete information and transparency are provided (see Posner's neoclassical economic theory, Posner, 1978; Spiekermann & Novotny, 2015, p. 181).

It appears the basic principles of data minimization and appropriation are not fully compatible with the requirements of the digital information society (Hackenberg, 2014, recital 17). As for Germany, the basic decision of the Federal Constitutional Court from 1984 (the so-called "census verdict") led to the establishment of these two principles as grounds for the informational self-determination fundamental law. This law was based on the idea that each person has the right to know who owns what information about her/him, and for what purpose. However, it is questionable if today, a frequent Internet-user, even after proper

clarification by providers, can still maintain an accurate overview of all the information he/she once disclosed (Hackenberg, 2014, recital 17).

Another current privacy issue comes from the social media login, which allows users to create new accounts with further service providers by using already existing social media profile (i.e., Facebook, Google+, or Twitter). The (personal) information on the former social media profile is usually shared with the new service provider upon registration (Weber, 2015, p. 236). Besides the exchange of data and linking profiles or services originally meant to remain separate (such as a professional account on LinkedIn, meant to establish an individual's credibility and professionalism in the labour force, now linked to a Facebook-account, designed to showcase one's leisure activities and personal life beyond the workplace), a serious threat is posed by the possibility of criminal activities. Once login-data for one service is obtained, several other services can be easily accessed as well (Weber, 2015, p. 236).

Therefore, when it comes to the information market, huge amounts of personal data, and along with them, an uneasy feeling about their attendant data security, travel in tandem. We have observed the challenges that come from new developing sectors and the (un)suitability of current legislation to meet or if need be overcome them. In the following section, we will examine the current EC practice in a case concerning all the problems we have noted above—the agreement between Facebook and WhatsApp.

10.4 Agreement between Facebook and WhatsApp

During the last decade, Facebook has acquired over 50 companies. The most "controversial" transaction discussed by the media and feared by users was the 2014 acquisition of WhatsApp. In this section, we examine this agreement and the EC proceedings pertaining to it. The commentary is based upon the EC's decision Case No. COMP/M.7217 – FACEBOOK/WHATSAPP. On 29 August 2014, Facebook notified the EC about its planned acquisition of WhatsApp by means of a share deal (i.e., purchase of shares). Keep in mind the broad spectrum of services the company Facebook, Inc. currently offers and that the Facebook social networking platform is only one component in its product range. The EC described the notifying party (Facebook) as a provider of websites and applications for mobile devices offering SNSs (e.g., the platform Facebook), consumer communications (Facebook Messenger), and photo/video sharing functionalities (Instagram), as well as a provider of online advertising space. The other party, WhatsApp, has a much narrower field of activity. It only provides consumer communication services (CCS) via the mobile application WhatsApp and does not sell any advertisement space. The purchase price amounted to 19 billion USD, and the transaction resulted in Facebook gaining sole control over the entity into which WhatsApp was merged.

The transactions did not have a strict EU dimension, because given WhatsApp's limited revenue, it did not meet the required turnover threshold (EC, 2015, p. 2). However, the notifying party requested that the EC examines the case, and the transaction was deemed to have a EU dimension pursuant to Article 4 (5) of the Merger Regulation (EC, 2004b, Article 4). Again, the question arises: Is a current regulation of the EC's jurisdiction appropriate for new sectors, in this case, digital ones? As in the investigated transaction between Facebook

and WhatsApp, other cases may eventually arise offering free (or nearly so) products to consumers, and therefore fall outside the EC's jurisdiction (EC, 2015, p. 2). The merger control process can be pursued only when the required thresholds are reached, and in cases such as this, only when one or both parties operate in two-sided markets "where their free services are monetized through advertising, as in the case of online search or social networking services" (EC, 2015, p. 2). It could be beneficial to take an example from the United States and base identifying the EU dimension on the transactions' value, especially for the digital market, since "turnover-based thresholds do not properly reflect the future market potential of an IT company" (EC, 2015, p. 2). Furthermore, it should be considered that on the online market, personal data customers provide could be viewed as the "currency" they use to pay for the "free" service (EC, 2015, p. 2).

During its investigation, the EC worked to define the relevant product and geographic markets for both parties and conduct a competitive assessment for them all. With due regard to the assessment's outcome, the EC decided not to oppose the transaction and cleared the acquisition as being compatible with both the internal market and the EEA agreement. After a short summarization of the EC's conclusions regarding the relevant markets and competitive assessment, we offer a discussion/critical review of the decision, especially as it concerns data privacy and security.

10.4.1 Relevant markets

In the course of the investigation, the EC considered the three markets Facebook is active on to be relevant: 1) CCSs, 2) SNSs, and 3) online advertising services.

Consumer communication services. CCSs are "multimedia communications solutions that allow people to reach out to their friends, family members, and other contacts in real time" (EC, 2014, recital 13). These services can be further differentiated into stand-alone applications (e.g., WhatsApp, Viber, Threema, and Facebook Messenger) or functionality being part of a broader offering (e.g., Facebook, Xing, or LinkedIn). Despite the single functionalities of text, photo, video, or group chat, the distinction can be made regarding the operating system for which the applications are available. Here, the differentiation among applications (apps) is mostly made among "proprietary apps" available for only one operating system (e.g., FaceTime or iMessage) and "cross-platform apps" available for multiple operating systems (e.g., WhatsApp and Facebook Messenger) (EC, 2014, recital 17). The most important question is whether this differentiation between CCSs indicates the presence of separate product markets. The concrete definition of the relevant market is important, since a narrow market definition may lead to a certain company becoming dominant, whereas a broad definition would rank the same company as only one among many market players.

In the present case, the EC decided the relevant product market should encompass consumer communication apps for all operating systems and include all communication functionalities, since an investigation indicated that communication apps available for different operating systems are normally regarded as a single product (EC, 2014, recitals 23, 27). The EC assessed the effects of the transaction between Facebook and WhatsApp in the product

market of consumer communication apps for smartphones. Regarding the geographic market, the EC decided it is at least EEA-wide, if not worldwide.

Social networking services. The social networking platform is Facebook's core offering. The essential functionalities of such SNSs are to create public or semi-public profiles and lists of friends or contacts, followed by exchanging messages, sharing information (through posts, links, or videos), and commenting on other users' posts (EC, 2014, recital 51). Even though there are some overlaps between SNS and CCS (e.g., content-exchange), the differences between them remain crucial. As for SNSs, they "tend to offer [a] richer social experience," whereas "the functionalities of consumer communication apps (…) are more limited and focus on enabling basic communication between users rather than creating a richer experience around their digital identity" (EC, 2014, recital 54). The assessed differentiation by the EC can be further inferred from Table 10.2.

Table 10.2. *Differences between SNSs and CCSs. Source: EC, 2014, Recitals 51-56.*

Social Network Services	Consumer Communication Services
Rich social experience through disclosure of personal interests, activities or life events etc.	Focus on basic communication between users instead of creating a richer experience around one's digital identity
Messages (posts, comments) are normally not expected to be answered in real time	Instant, real-time communication, responses are normally sent promptly
Communication and information-sharing with broad audience (or even strangers)	Targeted and personal communication (mostly only on one-to-one basis)

The EC left open whether CCSs should fall within the scope of the SNS market since the transaction would not raise any concerns under any alternative market definition. As for the geographic market assessment, the scope for the relevant SNS market is, again, at least EEA-wide, if not worldwide.

Online advertising services. The last product market to define was the advertising sector. As for Facebook, it provides online (non-search) advertising on its SNS platform. However, there is no advertising on Facebook Messenger. As for WhatsApp, it "does not currently sell any form of advertising and does not store or collect data about its users that would be valuable for advertising purposes," nor are messages sent by users stored on WhatsApp's servers (EC, 2014, recital 71). Here, the question concerns whether the transaction may somehow change Facebook's position in the advertising market.

The EC distinguished between providing offline versus online advertising space. Further sub-segmentation may be offered for search and non-search advertising, as well as mobile and static online advertising. For the investigated case, the EC stood by its distinction between online and offline advertisement without further sub-segmentation, hence, a rather broad market definition. Regarding geographic reach, the "advertisers typically purchase online advertising space and conduct advertising campaigns on a national (or linguistic) basis" (EC, 2014, recital 82). Therefore, the EC concluded, "that the online advertising

market (…) should be defined as national in scope or alongside linguistic borders within the EEA" (EC, 2014, recital 83).

10.4.2 Competitive assessment

After defining relevant product and geographic markets, the EC next pursued a competitive assessment, investigating whether the transaction would have an impact on predefined markets and would raise concerns in terms of the competition law. The most important aspects the EC focused on were market shares, closeness of competition, consumers' ability to switch providers, and possible barriers to entry and expansion (for competitors).

Consumer Communication Services

Regarding the CCS industry, the transaction involved Facebook Messenger with approximately 250–350 million users worldwide and 100–200 million users in the EEA, and WhatsApp with approximately 600 million users worldwide and 50–150 million users in the EEA (EC, 2014, recital 84). Despite these two large players, there are other providers present in the EEA and worldwide markets. According to the EC's market investigation, the main drivers for competitive interaction between the different CCS providers are the functionalities offered and the underlying network (EC, 2014, recital 86). In addition, many customers use several CCS apps simultaneously, the so-called "multihoming" (EC, 2015, p. 5). Such apps are only useful when the people with whom the users want to communicate also employ that same concrete CCS, and a larger network makes this more likely to occur. Due to network effects, the value of a product or service increases with the number of users and, as for the Facebook/WhatsApp transaction, mainly, the primary direct network effects are affected (an increase of users directly benefits those same users) (EC, 2015, p. 5). The final two important aspects appear to be the "perceived trendiness and coolness amongst groups of users" and the price of the app (CCS consumers appear to be very price-sensitive) (EC, 2014, recitals 89–90).

Table 10.3 *Market shares. Source: EC, 2014.*

Provider	**Shares**
Facebook Messenger	20-30%
WhatsApp	10-20%
Android's messaging platform	5-10%
Skype	5-10%
Twitter	5-10%
Google Hangouts	5-10%
iMessage	5-10%
Viber	5-10%
Snapchat	0-5%
Other market players	0-5%

First, the EC targeted the market shares and concentration level of both parties. The estimated market shares (in the EEA) for the period between November 2013 and May 2014 are listed in Table 10.3. Even though the EC assessed that the data on market shares (provided by the parties) are probably underestimated, it concluded that in the present case, the market shares are not necessarily indicative of market power, and hence, are not a threat to competition. The EC based this reasoning on the concept that the CCS is "a recent and fast-growing sector (…) characterized by frequent market entry and short innovation cycles in which large market shares may turn out to be ephemeral" (EC, 2014, recital 99). This view has reference to Schumpeter's innovation cycles discussed in section above, this chapter.

Second, the EC examined whether both parties are close competitors on the CCS market. There are several important differences between Facebook Messenger and WhatsApp. One of them is the identification system used to gain access to the service, with the contact lists also coming from different sources. The user experience in Facebook Messenger is richer (given the integration with the SNS platform Facebook), but its privacy policy is less favourable (data collection about users for advertising activities) (EC, 2014, recital 102). Given a significant overlap between these two networks as well as the consumer tendency for multihoming, the EC concluded the two offerings complement rather than closely compete with each other.

Third, the EC investigated whether consumers can still take into account alternative services. Switching costs among different providers are relevant, and according to the EC, to date, are not significant. All CCS apps are either available free of charge or at a very low price, all are easily downloadable and can coexist on the same handset, switching time between different apps installed on one device is nearly non-existent, learning costs are minimal due to similar and simple user interfaces, and information about new apps is easily accessible (EC, 2014, recital 109). Also, due to "push" notifications, users are not required to actively launch each app (EC, 2015, p. 5) Another important aspect is the missing "status quo bias," since the considered apps are preinstalled on only a very small amount of handsets, whereas a software pre-installation can apparently make switching more difficult (EC, 2014, recital 111). The only issue of concern may be network effects that could lead to an increase of switching costs (EC, 2014, recitals 112–115), as they create value for the users and can make competition more difficult. When the number of users grows, more users are attracted to the service, which in turn leads to a positive feedback loop (which is why most online services are free of charge in order to generate a critical mass of users) (EC, 2015, p. 4).

Fourth, the EC checked the market entry and expansion barriers for (potential) competitors. Here, the CCS market "has been characterized by disruptive innovation" (EC, 2014, recital 116), which may be explained with Schumpeter's theory on innovation cycles. Hence, there are no particular "traditional barriers for new providers entering the market" of concern (EC, 2014, recital 117). This (new) market is dynamic and fast growing; in addition, there are no patents or other intellectual property rights hindering the entry of new competitors. The transaction itself would not increase the entry barriers since neither of the parties disposes of any control elements (EC, 2014, recitals 118–121). Finally, the only concerning aspects are again network effects. Many competitors see "the presence of established players with a

large user base and network effects in consumer communication apps" as a significant entry or expansion barrier (EC, 2014, recital 126).

The mechanics of network effects were explained in section above this chapter. Facebook Messenger and WhatsApp have a large user network. According to the EC, while network effects as such do not "a priori indicate a competition problem in the market affected by a merger," they may, however, in some cases allow involved parties to foreclose on competitors (EC, 2014, recital 130). The EC examined whether an acquisition may strengthen network effects, which would be possible only if the transaction somehow led to uniting the two networks into a single, larger one (EC, 2014, recital 136). According to Facebook, such an integration would cause significant technological difficulties and is not intended. Even if it were to take place, there is already a significant overlap between the user bases, so no significant strengthening of network effects would occur. In due consideration of the above-outlined aspects, the EC expressed no serious doubts regarding the compatibility of the transaction with the internal market (with respect to the CCS).

Social Networking Services

Facebook operates one of the largest SNS platforms worldwide. The important question here is whether WhatsApp is Facebook's (close) competitor in this sector (i.e., also perceived as an SNS). Taking into account the differentiation presented in Table 2, SNSs provide far richer social experiences. Therefore, providers such as Facebook, Google Plus, LinkedIn, Twitter, and MySpace ought to be qualified as SNSs (EC, 2014, recital 148). Should we enclose the consumer apps into the SNS market, the competition would be even greater and would include such services as WhatsApp, LINE, WeChat, iMessage, Skype, Snapchat, Viber, and Hangouts (EC, 2014, recital 150). This broad view on the SNS market would lessen the market shares of Facebook and make the agreement even less of a concern in terms of competition law. However, the differences among these groups of services are quite significant. The EC concluded that the diverse functionalities and focuses of Facebook and WhatsApp prevented these two providers from being seen as close competitors on the SNS market. Should a post-transactional integration of WhatsApp into Facebook occurred, its impact would be mitigated by the fact that a large share of WhatsApp users already utilize Facebook (approximately 70%–90%) (EC, 2014, recital 162). Considering all the above, the EC did not see any concerns regarding the transaction's compatibility with the competition law in terms of the SNSs market.

Online Advertising Services

The final assessed market was that of online advertising. Its importance should not be underestimated. Even though for users, the core service of Facebook appears to be a social network, the company's money is flowing in on the other side, thanks to its advertising service. For SNS users, the service appears to be free of charge, however, users pay with the currency of their time, attention, and personal data. How much Facebook actually collects with its online advertising program can be concluded from the information presented in Table 1. The EC has analysed the potential data concentration to investigate whether the transaction is likely to strengthen Facebook's position in the online advertising market. Apparently, the consumer protection and privacy-related concerns emanating from this transaction do not fall within the scope of EU competition law, but instead within the scope

of EU data protection rules (EC, 2014, recital 164). In general, there are two cases in which data may be relevant in the competition law assessment of mergers in the digital sector—"either as a competitive advantage of the merged entity, or, on the context of privacy, as a non-price parameter of competition in the market" (EC, 2015, p. 5).

There are no horizontal overlaps in the market for online advertising, since WhatsApp is not active in this area. Moreover, WhatsApp does not collect data about its users concerning age, verified name, gender, social groups, and so forth, nor does it store the messages (once they are delivered). Therefore, there is no user data beneficial for online advertising that Facebook could use (EC, 2014, recital 166). Facebook could only strengthen its position if (post-merger) advertising were introduced on WhatsApp or its user data were used for something other than their original purpose (EC, 2014, recital 167). It is important to keep in mind that in the digital economy, data can be construed as "assets" or offering a "competitive advantage." Large datasets thus are increasingly valuable and form a competitive advantage for companies active in targeted online advertising, online search, or SNSs (EC, 2015, p. 6).

Regarding the first possibility (introducing advertising on WhatsApp), Facebook's market shares in the sector of targeted advertising are around 20%–30% (EC, 2014, recital 171). Introducing advertisements on WhatsApp would renege on that firm's earlier "no ads" policy. Furthermore, there would be a need to abandon end-to-end message encryption, which would lead to broad discontent of users who value data privacy and security. Indeed, "privacy concerns also seem to have prompted a high number of German users to switch from WhatsApp to Threema in the 24 hours following the announcement of Facebook's acquisition of WhatsApp" (EC, 2014, recital 174). Given the circumstances, introducing ads on WhatsApp is very unlikely. Nevertheless, should such a change be implemented, there remained enough actual and potential competitors as strong as Facebook in the targeted ads sector (EC, 2014, recital 179).

Regarding the second possible scenario in which WhatsApp is used as a potential source of user data, the EC expressed no concerns. First, the collection and integration (or matching) of data from Facebook and WhatsApp would require complex technological changes and regulatory adjustments that are apparently not wanted by either party. Second, such changes would motivate many users to switch providers. Furthermore, even if these changes were pursued, a significant number of alternative providers of online advertising would remain. The EC decided that "there will continue to be a large amount of Internet user data that are valuable for advertising purposes and that are not within Facebook's exclusive control" (EC, 2014, recital 189).

While taking into account all addressed matters, the EC cleared the transaction as being compatible with the internal market and with the EEA Agreement. The aspect of privacy, however, was left open.

10.5 Critical Review and Data Privacy Concerns

In the end, the EC expressed no concerns regarding the agreement between Facebook and WhatsApp. Again, however, we witness the emergence of a lack of compatibility between competition law/merger control and consumer protection/data security. In two-sided markets, products are offered at no charge to users, but monetized through targeted advertising; hence,

private data comprise the "currency" with which the users pay (EC, 2015, p. 6). Accordingly, post-merger, if a provider starts to require "more personal data from users (…) as a condition for delivering its 'free' product [this change] could be seen as either increasing its price or as degrading the quality of its product" (EC, 2015, p. 6). Consequently, such behaviour could lead to competition or infringements of data protection law. Still, this "theory of harm" is only relevant in cases "where privacy is an important factor in the decision to purchase a product or services, that is, a key parameter of competition" (EC, 2015, p. 6), and was not applied to the Facebook/WhatsApp transaction. Even though consumer protection is indirectly included in the aims of the competition law, it does not really surface when it comes to data privacy issues, as apparently this is already a separate jurisdictional concern controlled by the data privacy regulations. Nonetheless, there are serious data privacy issues regarding such occurrences on the online market—concerning WhatsApp and Facebook separately, and especially after the acquisition process is complete.

10.5.1 Market entry barriers

Regarding market entry barriers, the EC presumed that even such a strong or dominant market position as Facebook enjoys would not raise any serious competition concerns. This presumption was based on the digital market being characterized by Schumpeter's innovation cycles, which posit dominant market players being quickly replaced by new ones. As explained in section above this chapter, however, the quasi-monopolistic position of Facebook may persist far longer than that of its predecessors, namely, due to its "immunization strategy," network effects, and, following Waller (2010), its stickiness. The term stickiness means that in some way, Facebook has become "mandatory" for millions of users to join for social reasons. A temporary account deactivation (or even worse, a permanent one) can be psychologically and socially difficult and damaging, because one is not reachable online anymore—to family members, friends, or colleagues. Facebook's stickiness also derives from the fact that the information gathered on Facebook cannot be easily exported to another SNS profile (Waller, 2010, p. 1789). Considering the strong network effects and stickiness (and possibly such aspects as brand loyalty, information gaps, and some switching costs), it is possible that current users of Facebook are (or feel) locked-in to the system, giving Facebook dominant market power (at least over current users) (Waller, 2010, p. 1791).

10.5.2 WhatsApp and privacy concerns

According to "Datenschutzbeauftragter" (2015), message content sent by WhatsApp is stored on its servers until the messages are delivered, but not longer than 30 days. Moreover, WhatsApp gains access to the user's address book and uses only the telephone numbers saved there. After an account is deactivated/deleted, all user data, except for payment information, is also erased (the deletion of the payment information occurs after 30 days) (Datenschutzbeauftragter, 2015). At first, this seems to be relatively good news for users concerned with privacy. However, during WhatsApp's growth period, every once in a while, serious data privacy objections arose. In 2012, it was learned that messages sent via WhatsApp were not encrypted (which in turn leads to a high risk of interference by unauthorized third parties), because even though the company had implemented encryption in its new version of the app, it was very simple and therefore easy to hack

(Datenschutzbeauftragter, 2015). Notwithstanding the issue of poor encryption, the amount of information users must allow WhatsApp to access upon its installation (microphone, pictures, location data, etc.), and that afterwards, are allegedly stored on servers located in the United States, was also criticized (Datenschutzbeauftragter, 2015, with further references). With the start of 2015, WhatsApp adopted end-to-end encryption (following the lead of other messenger apps more concerned with privacy, e.g., Threema), however, initially only for Android devices and excluding group-chats and media. Moreover, it became known that users' privacy settings can be easily circumvented (see Datenschutzbeauftragter, 2015, for further references). Finally, the straightforward functionality of direct association of a phone number with a user's identity is more problematic than it first appears. It is enough to save a phone number in an address book in order to access considerable information about the number's carrier. When this phone number is associated with a registered WhatsApp user, it automatically appears in the WhatsApp favourites' list (without any contact confirmation or related information). Next, we can easily observe the profile picture or status changes as well as the usage habits (by monitoring when and for how long the user is online) (see King (2014) with further references). Yet, apparently, all of these shortcomings failed to discourage millions of people from using WhatsApp (see Figure 10.3).

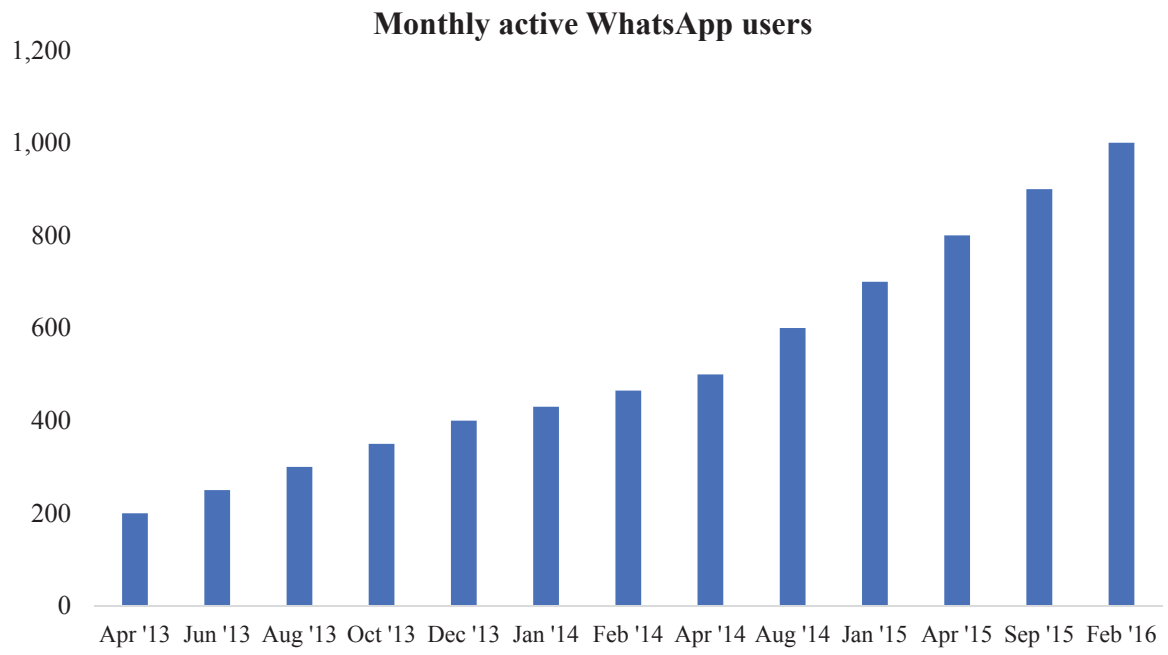

Figure 10.3. Monthly active WhatsApp users from April 2013 to January 2015 (in Millions). Source: Statista, 2015b.

10.5.3 Facebook and privacy concerns

It appears that Facebook causes even more privacy concerns than WhatsApp. Facebook has access to huge amounts of data, which is further analysed and used for online advertisement. Nonetheless, the count of Facebook users continues to increase (see Figure 10.4). Many users who broadly disclose aspects of their private life on Facebook (or other SNSs) either do not realize to what extent their personal data are being used or simply do not care. It is

not a vague notion to state that Facebook and other SSNs compete on the data markets, that is, the market for information about users. It would be a significant advantage for an SNS to be able to define privacy as an aspect of non-price competition, leading to SNS providers competing to offer the best form of privacy to users (Harbour & Koslov, 2010; Waller, 2012). Today, instead we recognize the opposite tendency, namely, "most social networking [web]sites compete in the opposite direction as to the acquisition, compilation, manipulation, exposure, and monetization (rather than protection) of personal information" (Waller, 2012, p. 1784). However, some users have acknowledged the potential endangerment of personal information and fight against excessive personal data (mis)use by the big online market players. In this regard, the safe harbor decision by the European Commission is emphasized as it enables U.S. companies to gain, relatively easily, access to European users' data.

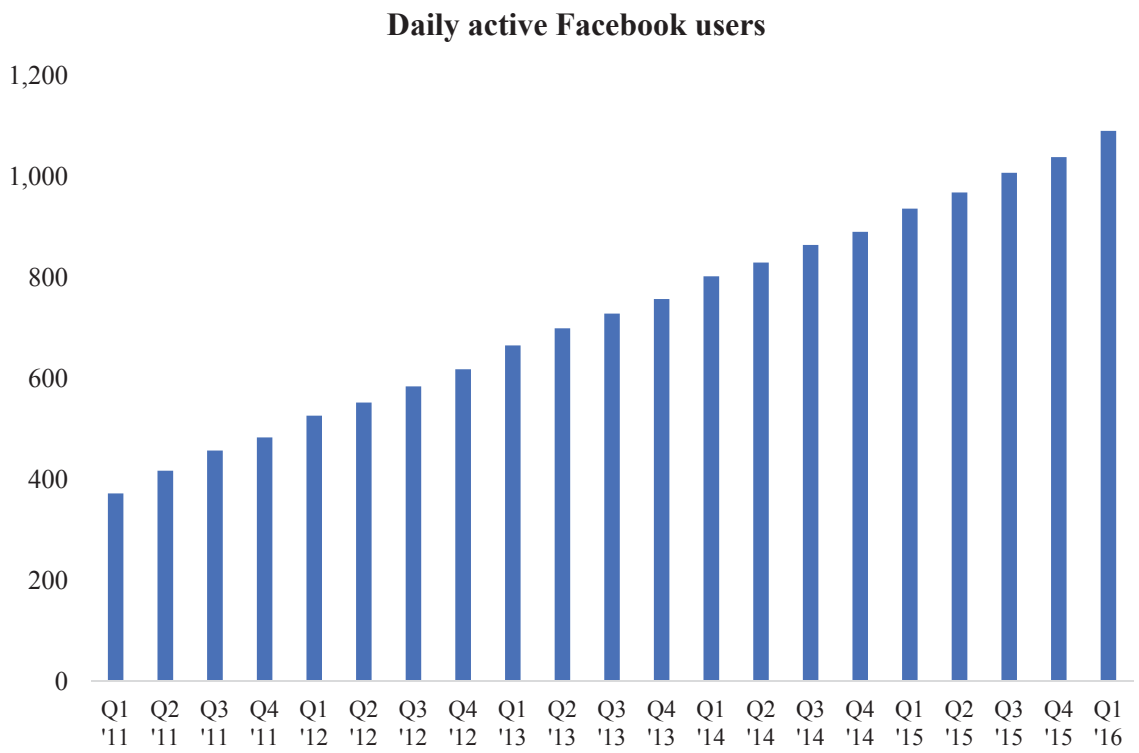

Figure 10.4. Daily active Facebook users in Millions, Worldwide from 2011 to 2014. Source: Statista, 2015c.

10.5.4 Data transfer outside the EU

Data transfer outside the EU on principle is only legal when the non-European country assures an adequate level of data security (see Article 25 of the Data Protection Directive 95/46/EC, EC, 1995; Jensen, 2014). The aim of this regulation is to ensure that the rights and interests of the person concerned are not endangered due to data export (Deutlmoser, 2014, recital 41). The agreement made between the EC and the U.S. Department of Commerce thus comprises the safe harbor principles (EC, 2000), enabling easier data transfer between the two regions. According to the agreement, the required privacy standard is maintained when data are transmitted to a U.S.-based company that complies with the safe harbor principles (Deutlmoser, 2014, recital 43; Spies, 2013, p. 535). However, the validity of this agreement was questioned after a lawsuit (in the form of a class-action) against

Facebook was filed by an Austrian privacy activist, Max Schrems (Privacy Association, 2015; SC Magazine, 2015). This case has already been in motion for a few years. Schrems started a citizens' initiative against Facebook (and indirectly other similar U.S. Internet giants that control enormous amount of private information), called Europe versus Facebook. The heavy critique about Facebook and the safe harbor decision started after Edward Snowden's affair exposing the practice of NSA and its program PRISM (Bräutigam, 2015).

Edward J. Snowden is a former U.S. Central Intelligence Agency (CIA) employee and former National Security Agency contractor, who in 2013, publicly revealed intelligence information concerning Internet surveillance programs, such as PRISM, Xkeystone and Tempora (Zhang & Schmidt, 2015, p. 201). After this disclosure, data privacy authorities started questioning the current regulations that pertain to data transmission to non-member countries. Foreign intelligence services were alleged to be accumulating vast amounts of private data, violating European data-privacy standards (Voigt, 2014). After Max Schrems filed his complaint against Facebook regarding Facebook's cooperation with NSA, the Irish High Court submitted questions to the ECJ concerning the continuity of the safe harbor agreement with the United States after this disclosure by the whistle-blower, that is, the compatibility of the agreement with the Charter (ZD-Aktuell, 2014). The Irish High Court wished to "ascertain whether that Commission decision [from 26 July 2000, the safe harbor scheme] has the effect of preventing a national supervisory authority from investigating a complaint alleging that the third country does not ensure an adequate level of protection and, where appropriate, from suspending the contested transfer of data" (ECJ, 2015). First, the Court of Justice held that the existence of a Commission decision "cannot eliminate or even reduce the powers available to the national supervisory authorities" and "the supervisory authorities (…) must be able to examine, with complete independence, whether the transfers of person's data to a third country complies with the requirements laid down by the directive" (ECJ, 2015). Second, the Court investigated whether the safe harbor decision itself is invalid. Here, the Court observed that "the scheme is applicable solely to the United States undertakings which adhere to it, and United States public authorities are not themselves subject to it," and furthermore, "national security, public interest and law enforcement requirements of the United States prevail over the safe harbor scheme, so that United States undertakings are bound to disregards, without limitation, the protective rules laid down by that scheme where they conflict with such requirements" (ECJ, 2015). All in all, the Court of Justice found that the Commission "did not have the competence to restrict the national supervisory authorities' powers" with the safe harbor scheme, and declared the safe harbor decision invalid (ECJ, 2015).

The Europe-versus-Facebook initiative offered a number of relevant objections about Facebook's monopolistic position and power, as well as several interesting proposals to resolve the situation. One of the proposed solutions, next to data minimization and more transparency, is an open social network: "Like with your email, you should be able to choose your provider and still be able to communicate with your friends [who] made another choice. This would mean that the market for social networks would be open to new business models or even non-profit concepts that would bring us innovation and choice." It is not necessary to determine whether the idea of an open social network would indeed solve current data privacy-related problems. There are other legal steps with much higher priority. Data privacy

regulations and competition law both need to be more compatible, especially regarding merger control in order to prevent uncontrolled data concentration. In the age of the Internet, people are overwhelmed with the flow of information, and it can be difficult to keep track of all the changes in agreements, general terms, and conditions imposed by the rising number of online service providers (this is also because due to possible "multihoming," we are accessing an increased number of online offers simultaneously). Furthermore, consumers might not realize how many services may be housed under one single corporate rooftop. Multicorporate enterprises are getting bigger by acquiring smaller, yet still powerful, popular companies. As a result, numerous personal data sources are becoming concentrated in the hands of very few entities. The leniency toward reckless and frivolous handling of personal data by U.S. companies can be addressed only by more rigid regulations. The nullification of the safe harbor decision is surely a good first step towards better data protection, however, we are in need for new agreement. The annulment of the decision does not mean that since that day, there is no data transfer in the US. The transfer is conducted based on other regulations. Finally, consumers do not have enough power to autonomously resist data abuse. A total "opting-out" from the Internet and its services is of course possible, but nowadays rather difficult and unattractive to pursue.

10.5.5 Do we need privacy?

We ought to keep in mind the speed of technological changes as well as the presence of significant intergenerational differences between digital natives (or the millennial generation) who have been born into an already digitalized world, and digital immigrants (or preceding generations) who still can remember life without Facebook and other social media (Bennett, Maton, & Kervin, 2008; Margaryan, Littlejohn, & Vojt, 2011; Kilian, Hennings, & Langner, 2012; Fietkiewicz, Lins, Baran, & Stock, 2016). The digital market is rapidly evolving, and it is more and more complicated to comprehend all the changes and technological trends that may prove to be available. On the one hand, it is not necessarily true that actions we take at this moment in time toward more rigid data privacy regulations and protections will indeed favour future generations. Times change. In a few short decades, we may no longer be concerned with data privacy. Instead, we might appreciate targeted advertisements showing us which products to buy before we even realize we actually want or need them. We can already recognize tendencies of the youngest generations toward exposing much of their private lives to the world with the help of new media, for example, the live-streaming platform YouNow (Honka, Frommelius, Mehlem, Tolles, & Fietkiewicz, 2015). On the other hand, many may expect different (and negative) outcomes to occur from such courses of action, similar to George Orwell's version of the future, where people are controlled and watched by "Big Brother" (Orwell, 1949). We cannot precisely estimate the impact of current developments, and it is too early to definitively resolve all competition issues related to this industry (see also Waller, 2012, p. 1772).

Still, society is recognizing that privacy is an "increasingly important dimension of competition" and, therefore, "modern antitrust analysis must take privacy into account. It makes no sense to maintain an artificial dichotomy between competition and consumer protection law, especially when their goals are complementary" (Harbour & Koslov, 2010, p. 773). Furthermore, even though the judicial system, to a certain extent, can sanction the

harmful or negative consequences of companies' actions toward consumers and other stakeholders, it is better to prevent these negative effects from happening in the first place since some of them cannot be readily undone. Even if we are challenged to maintain a golden mean among consumer protection, a free market economy and a developing digital information society, it seems more prudent to prevent troublesome outcomes rather than try to recover from the damage they may perpetrate on society. One must continuously work to find a balance and support the digitalization and development of technology and the information society, and refrain from entirely blocking out its progress by the aide of traditional legal means. Following Haucap (2015), instead of asking how to constrain new technologies and markets under old regulations, we should focus on new legal frameworks, enabling us to prevent undesirable developments or side effects of the digitalization process. At the same time, these regulations should not limit the development or suppress positive outcomes (Haucap, 2015, p. 1). It remains open whether an amendment of merger regulations would significantly enhance data protection. Still, progress would be easier if such aspects as consumer protection and data security were already included in premerger investigations by the EC, rather than later attempts to obtain demergers and decentralization, anonymization, or deletion of personal data. Also, requirements for the EC's jurisdiction (despite the turnover thresholds) for the digital sector should be expanded, so mergers and acquisitions conducted in this market setting (including services that often are free of charge) will not fall outside the scope of merger control.

10.6 Conclusion

A high concentration of market power can lead to its abuse and to distortion of competition. Especially in Internet submarkets, we can observe a tendency of such concentration, for example, Facebook among the SNSs. Here, the concentration of market shares in one dominant company may be explained by the presence of strong network effects and the creation of entry barriers. Hence, the question arises whether a dominant position in online markets is temporary or not. In line with this, we wanted to study whether the current European competition law is sufficient to adequately control dominating companies. For this purpose, we examined the acquisition of WhatsApp by Facebook and the assessment of it by the EC.

We found that Facebook uses its financial resources, acquired due to its dominant position on the SNS market, to take over innovative companies. In doing so, the company tries to spur the development of complementary products and services for the SNS, as well as to enter other emerging markets. With the acquisition of WhatsApp, one of the most popular messaging apps in the EEA, Facebook is able to enforce its attempt to gain a foothold in the growth market for mobile Internet communication. Further, it potentially marks the next innovative, developmental stage in Internet usage, with regard to the Schumpeterian view of economic business cycles and the inception of mobile Internet use. Facebook has grasped the potential of the mobile Internet market, and it has not been ruled out that the company will try to integrate WhatsApp into its Facebook app to strengthen network effects (see recent news about implementing the "WhatsApp button" into the Facebook app; Spiegel, 2015). In view of the above, and considering the additional revenues the company prospectively can generate by embedding personalized advertisements on its pages, or

collecting and redistributing consumer data, Facebook can move to enforce entry barriers in both SNS and CCS markets. In this way, it can accumulate significant knowledge stock to face down and even foreclose on emerging competitors. Thus, Facebook's acquisition of WhatsApp prospectively serves to bolster its dominant position, stickiness, and economic success.

When considering the Facebook/WhatsApp agreement solely from a merger control perspective, we are in agreement with the EC's assessment of the situation. Facebook and WhatsApp were active on different markets. Although WhatsApp takes a strong, leading role in the market of CCS (especially in the EEA), the application is far from being a monopoly. The CCS market is characterized by short innovation cycles and frequent market entry, both of which spur disruptive changes in competition. This is in line with Schumpeter's theory of innovative leaps followed by sweeping technological change. Another critical point is the user's opportunity for multihoming and perception of low switching costs, which could erode WhatsApp's market share in a short period. Consequently, the acquisition neither induced nor enforced a monopoly in the market for CCS, which is why no severe concerns about this agreement regarding competition law could be offered.

However, in contrast to stance taken by the EC, which expressed no concerns about the acquisition of WhatsApp by Facebook, we pointed out the problem of a lack of compatibility between competition law/merger control and consumer protection/data security. Even if competition law partially comprises consumer protection, this was not considered in the WhatsApp acquisition due to a separate jurisdiction of data privacy issues. Indeed, WhatsApp and Facebook both have recently been associated with privacy issues and, particularly, users' restricted control of personal information. The latest dispute around this matter is a case currently under consideration by the ECJ, which may regulate the handling of personal data with more attention to privacy. Meanwhile, in those markets concerned with communication, such information is the most valuable asset and should not be underestimated. Moreover, when considering the rapid changes and developments in the recent past as well as their outcomes in these innovative sectors, an immediate and definitive settlement of problematic issues appears to be long overdue.

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11 Final Remarks

Information science research introduced in this thesis focused on the 21st century's new developments that are characteristic for the knowledge society. On the one hand, the focus was set on e-government, which is a timely, digitalized kind of public administration services. The paradigm shift from the traditional red-tape to efficient, digital public services is still in progress and, therefore, requires constant investigation. On the other hand, focus of the investigation was redirected onto social media usage in different contexts. Social media also became typical tools applied by the knowledge society. Different social media areas investigated in this study address aspects of contemporary importance, from general social media users' characteristics, through online journalism and news dissemination on Twitter, usage of new live streaming services, also including problematic usage (law infringements), up to social media marketing and crowdfunding or competition (law) on social media markets.

The contribution to the field of information science that this research makes is manifold. First, the comprehensive analysis of e-government, its usability and maturity, is first such an extensive study focusing on informational cities. For the evaluation of this information system (e-government websites), a new adaptable model that can be easily applied in future research was developed. Furthermore, the evaluation included analysis of boundary documents, which is the first investigation of this kind. E-government is an inevitable development of the knowledge society and information science is one of the domains that has the tools to evaluate and improve it by ensuring mature, usable and accessible services.

Second, the holistic investigation of social media and its users' information behaviour in several contexts, each being timely and of high importance, does not only contribute to the field of information science but also to further scientific domains. These include entrepreneurial finance, law, economics and marketing. The analysis of user information behaviour with special focus on age and gender-dependent differences is to date of very high importance, since more and more transactions as well as many social interactions are occurring (exclusively) online with help of different platforms. Especially, the more in-depth age-dependent differentiation of user behaviour can be of great value for human-computer interaction as well as marketing research. The study on online journalism is one of the first human-computer interaction investigations on breaking news commentary and dissemination via Twitter focusing on the recent terrorist attacks and the progressing changes in users' information behaviour regarding such news. Furthermore, not only the studies on new aspects of user characteristics, but also on new platforms is a valuable contribution to the current state of research. The studies about the platform YouNow included in this work are first general research on social live streaming services analysing their adoption and usage as well as first empirical study on potential law infringements that can occur on these platforms. The interdisciplinary study on social media activity and its influence on a crowdfunding campaign's success contributes to research on entrepreneurial finance as well as social media marketing. Here, two important aspects—the electronic word of mouth via Facebook and YouTube and social capital on business networking site LinkedIn—and their joint influence on funding-probability of early entrepreneurial endeavours were investigated

with help of informetrics. Finally, an interdisciplinary study including information science, law and economics shed light on the social media markets, their characteristics, and potential risks. The variety of consulted fields emphasizes the interdisciplinarity of information science. An interdisciplinary approach is especially important when a holistic view on investigated aspects is desired. Studies incorporating different fields and, hence, different views of the investigated problems or aspects, are more suited to yield practical solutions, as they mirror the complexity of issues that are currently in need of investigation.

When considering the outcomes of the e-governments study, at least the e-government's state from few years ago, there is still potential for improvement. Even though informational world cities were compared, which are the prototypical cities of knowledge society and supposed to be very advanced in terms of ICT infrastructure and its implementation in everyday life, there appear to be severe differences in the maturity outcomes for different municipalities. In comparison, the usability outcomes were somewhat better. We could not find boundary documents in the strict sense, however, convenient topical clusters for different user groups. In retrospective, the e-government maturity model requires continuous updates, as new advances in this area occur at a very fast pace. Also, a regular investigation of e-government websites is necessary, since website updates can occur even daily and, hence, change the outcomes of our ranking. For example, the e-government evaluation was conducted in the year 2013. At that time, Tokyo's results were sub-optimal. By now, in year 2017, there were several important updates of the website. Despite different design and possible changes in website's usability, an electronic ID card system was introduced for Japan in January 2016. With this new application, all municipal websites (including Tokyo's) are able to offer more transaction and participation possibilities for the citizens. Hence, a new evaluation and correction of the model is necessary on at least annual basis.

After the investigation of e-government as one example of knowledge society's new digital developments, the focus of the conducted research was redirected to a broader domain, namely the social media. The general social media investigation showed several differences between users of different genders and age groups. The outcomes can be an asset for development of social media marketing strategies. Here, a regular investigation and more in-depth investigation in form of qualitative interviews could be of an advantage as well. Right now, we are experiencing an enormous paradigm shift, from (partially)-analogue way of life, to totally digitalized one. Considering the consumer site, on the one hand, we have the so-called Silver Surfers who experienced the Web and its applications for the first time at more advanced stages of life. However, more and more Silver Surfers apply (mobile) Internet. This way, they can stay in touch with family members from younger generations. The somewhat younger generation—Digital Immigrants—did not grow up with the Internet, however, they were the ones developing it and making first steps in the Web (probably as adults). Therefore, within this generation there will be groups of people that are very tech-savvy and up to date with the newest developments. On the other hand, we have the Digital Natives who applied the Internet already in the earlier stages of life. Depending on the definition of Digital Natives, they started using it as children or teenagers. Exposure to a new technology at such a young age might have more impact on these individuals when compared, for example, to Digital Immigrants who were confronted with it as adults. Finally, a new generation born into the digital world (Generation Z) is now attaining full age. Since

their birth, they have been surrounded by screens and "smart" devices. They do not remember the analogue-only world. In spite of these enormous differences in the prerequisites for different generations, an ongoing research on age-dependent social media usage is required. Especially for the older generations, Silver Surfers and Digital Immigrants, there is a great possibility of upcoming changes in user behaviour, since they are more and more confronted with the new technologies (sometimes without any alternative) and influenced by the younger generations being at home in the web.

The changes in information behaviour is already recognizable for the news consumption. There is a new kind of journalism—the digital one. News is spread online either by official news agencies and professional journalists or ordinary people. Therefore, an investigation of information/news production and consumption behaviour on Twitter was conducted. The focus was set on breaking news dissemination. The constant 24/7 flow of information all around the world is characteristic for our knowledge society. Triggering events for the breaking news investigation were several terrorist attacks, also more and more common in our days. After analysis of the outcomes, there is need for more in-depth investigation of (Twitter) user behaviour—what exactly do they tweet? What kinds of links or mentions do they include? Furthermore, a detailed topic, hashtag and network analysis would give better insights into the (amateur) online journalism. In this work, the official news services accounts were also investigated—how do they tweet about breaking news being terrorist attacks? How are these tweets further disseminated (through retweets etc.)? Here, an analysis considering psychological aspects could be interesting. The outcomes showed that with the time there are less and less news tweets reporting on terrorist attacks (most of the news is given on the first day, less on the remaining seven observed days). Moreover, the dissemination level of these tweets is decreasing—less RTs of such tweets after the day of the attack could indicate less interest about news on terrorist attacks. When comparing outcomes for triggering events in January 2015 and in March 2016, terrorist attacks become "only" yesterday's news, not getting any more attention on the day after.

Social media have been around for some time now and new platforms are continuously being established to satisfy the changing information demand of the web users. These platforms may have many potentials; however, they also pose some risks if the legal aspects are not clearly defined for this "new" environment. Besides, there is need to investigate information behaviour of the users of such platforms. This also includes law infringements committed online. Especially younger generations, children and teenagers, pose a risk (mostly to themselves), as they use social media without questioning the security of their personal data or without being aware of the consequences that their actions can have. The investigation of social live streaming service YouNow revealed that the mostly committed potential law infringement are copyright violations, followed by violation of personality rights. This shows that law violations on social media platforms should not be ignored in the future research but rather deepened by more detailed investigation. The study of YouNow's users—both, streamers and passive users—also lead to some interesting findings. Even though some of the users want to become micro-celebrities or just part of the community, most of the survey participants use the service out of boredom. Many YouNowers would stop using the service once it gets boring as well. Hence, "boredom" seems to be the keyword in the research on the social live streaming services. In the future, a more qualitative approach

would enable to gain more insights into the motivational background of the YouNow users. Furthermore, the legal aspects should be further investigated to report the status quo of problematic SLSSs use and give advice to the government and legislature.

The prevalent digitalization in the 21st century also changed the domain of entrepreneurship. Crowdfunding is a new way to finance and jump-start a new entrepreneurial idea. A right strategy to convince the crowd into donating money is interesting for many stakeholders, from researchers to the founders themselves. Social media marketing for crowdfunding projects was in focus of this investigation. The outcomes showed that right synergies between different social media platforms may indeed influence the outcomes of a campaign. Both, crowdfunding and social media marketing are very current topics. In the future, a broader analysis of factors influencing the success of a crowdfunding campaign should be conducted. For this purpose, a quantitative online survey and/or qualitative interviews with the backers and entrepreneurs would be appropriate to explore this topic in more detail.

The final research topic concerned the competition on social media markets, with focus on social networking services Facebook and Instagram. There are more and more mergers and acquisitions (M&A) of smaller, but very popular and successful digital companies by the big market players who, thus, get even stronger. For the digital market, there apply different rules than for traditional, not digital companies. This poses a threat that the competition law might fail the task of sustaining an open and fair competition on the social media market. The example in this study concerned the acquisition of the messaging application WhatsApp by the social networking service Facebook. The transaction was approved by the European Commission, which gave rise to some doubts about the suitability of the current legal system. One critical point was the insufficient consideration of the consumer protection. Afterwards, the buying company, Facebook, did indeed merge personal data between both platforms, which led to an outburst of protests and legal actions, especially in Germany. Now, the only thing European Commission can do is to impose a fine on Facebook. It is questionable what impact such fine can have on a corporation like Facebook. As for the data and consumer protection—each country will have to deal with the consequences of the merger by itself, most probably with legal actions taken by consumer advocates. It would be easier and safer to prevent or at least better control (with help of sanctions) this type of mergers in the future. After the "damage" has already been done, legislators are progressively implementing amendments of law to make it in keeping with the digital times that we live in. It is not an easy task, as it is necessary to maintain a balance between functional (digital) market, efficient and usable (online) services, and satisfied and secure consumers.

This thesis covered some of the most important and current topics that emerged with the development of the knowledge society. E-government and social media usage in diverse contexts (private, public, or legal), should be continuously investigated to be in the loop with current trends and status quo of user information behaviour. Today, the changes related to technology and the Web are occurring at a very fast pace. It requires constant control and adjustment of the surrounding circumstances (e.g., the legal system). Preventive actions are better than damage control. After all, it is in our hands how the future societies, cities, and world will look like, and which of the utopian visions by scientists or science-fiction authors forged decades ago will actually come true.

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Curriculum Vitae
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Higher Education

11/2014 – to date	**Doctoral Studies in Information Science** Heinrich Heine University Düsseldorf Majors: Social Media, E-Government, Information Law
10/2011 – to date	**Law Studies** Heinrich Heine University Düsseldorf Majors: Corporate Law, Intellectual Property Law, Antitrust Law
10/2011 – 07/2014	**Master Studies in Information Science and Language Technology** Heinrich Heine University Düsseldorf Majors: Informational Cities in Japan
10/2008 – 09/2011	**Bachelor Studies in Modern Japan, Information Science** Heinrich Heine University Düsseldorf Majors: Gender Studies, Demographic and Social Changes
10/2008 – 09/2013	Scholarship holder from DAAD.

Professional Experience

10/2013 – to date	**Scientific Assistant at Department of Information Science** Heinrich Heine University Düsseldorf Area: Social Media, Information Law, Smart City Development.
03/2015 – 08/2015	**Student Assistant at Bird&Bird LLP in Düsseldorf** Area: Competition Law, EU Law.
02/2014 – 03/2014	**Student Assistant at Clifford Chance LLP in Düsseldorf** Area: Corporate Law, M&A.
06/2011 – 07/2011	**Student Assistant at TIGGES Rechtsanwälte in Düsseldorf** Area: Employment Law, Transportation Law.

Workshare of co-authored publicatinos

Study 1: Fietkiewicz, K. J., Mainka, A., & Stock, W. G. (2017). E-Government in cities of Knowledge Society: An empirical investigation of Smart Cities' governmental websites. *Government Information Quarterly, 34*(1), 75-83.

Research idea: Mainka, Stock,

Data collection: Fietkiewicz, students

Data analysis: Fietkiewicz

Writing: Fietkiewicz (Sections: 2, 3.1, 3.2, 4, 5), Mainka (1), Stock (3.3).

Tables and figures: Fietkiewicz

Proof reading: Fietkiewicz, Mainka, Stock

Study 2: Fietkiewicz, K. J., Lins, E., Baran, K. S., & Stock, W. G. (2016). Inter-generational comparison of social media use: Investigating the online behavior of different generational cohorts. In *Proceedings of the 49th Hawaii International Conference on System Sciences* (pp. 3829-3838). Washington, DC: IEEE Computer Society.

Research idea: Baran, Fietkiewicz

Data collection: Baran, Fietkiewicz

Data analysis: Lins

Writing: Fietkiewicz

Tables and figures: Fietkiewicz, Lins

Proof reading: Baran, Fietkiewicz, Lins, Stock

Study 3: Fietkiewicz, K. J. (2017). Jumping the digital divide: How do "silver surfer" and "digital immigrants" use social media? *Networking Knowledge, 10*(1), 5-26.

Study 3 was an independent work (100%).

Study 4: Fietkiewicz, K. J., & Ilhan, A., (2017). Breaking news commentary: Users' reactions to terrorist attacks in English-speaking Twittersphere. In C. Stephanidis (Ed.), *HCI International 2017 - Posters' Extended Abstracts. Part I* (pp. 428–434). Cham, Switzerland: Springer (Communications in Computer and Information Science; 713).

Research idea: Fietkiewicz, Ilhan

Data collection: Fietkiewicz, Ilhan

Data analysis: Fietkiewicz, Ilhan

Writing: Fietkiewicz (Sections: 1, 2, 3, 4), Ilhan (1)

Tables and figures: Fietkiewicz

Proof reading: Fietkiewicz, Ilhan

Study 5: Fietkiewicz, K. J., & Aylin, I. (2017). Inter-country differences in breaking news coverage via microblogging: Reporting on terrorist attacks in Europe from the USA, Germany and UK. In G. Meiselwitz (Ed.), *Social Computing and Social Media. Human Behavior* (pp. 317-336). Cham, Switzerland: Springer (Lecture Notes in Computer Science; 10282).

Research idea: Fietkiewicz, Ilhan

Data collection: Fietkiewicz, Ilhan

Data analysis: Fietkiewicz, Ilhan

Writing: Fietkiewicz

Tables and figures: Fietkiewicz

Proof reading: Fietkiewicz, Ilhan

Study 6: Fietkiewicz, K. J., & Scheibe, K. (2017). Good morning… Good afternoon, good evening and good night: Adoption, usage and impact of the social live streaming platform YouNow. In *Proceedings of the 3rd International Conference on Library and Information Science* (pp. 92-115). Taipeh, Taiwan: International Business Academics Consortium.

Research idea: Fietkiewicz, Scheibe

Data collection: Scheibe

Data analysis: Fietkiewicz

Writing: Fietkiewicz

Tables and figures: Fietkiewicz

Proof reading: Fietkiewicz, Scheibe

Study 7: Honka, A., Frommelius, N., Melhem, A., Tolles, J. N., & Fietkiewicz, K. J. (2015). How safe is YouNow? An empirical study on possible law infringements in Germany and the United States. *The Journal of MacroTrends in Social Science, 1*(1), 1-17.

Research idea: Fietkiewicz

Data collection: Frommelius, Honka, Melhem, Tolles

Data analysis: Melhem

Writing: Fietkiewicz (Introduction, Discussion), Frommelius (Results), Honka (Methods), Melhem (Abstract), Tolles (Social Networks and Law)

Tables and figures: Melhem

Proof reading: Fietkiewicz, Frommelius, Honka, Melhem, Tolles

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Study 8: Fietkiewicz, K. J., Hoffmann, C., & Lins, E. (in press). Find the perfect match: The interplay among Facebook, YouTube and LinkedIn on crowdfunding success. *International Journal of Entrepreneurship and Small Business.*

Research idea: Lins

Data collection: Hoffmann

Data analysis: Fietkiewicz, Lins

Writing: Fietkiewicz

Tables and figures: Fietkiewicz, Lins

Proof reading: Fietkiewicz, Hoffmann, Lins

Study 9: Fietkiewicz, K. J., & Lins, E. (2016). New media and new territories for European law: Competition in the market for social networking services. . In K. Knautz & K. S. Baran (Eds.), *Facets of Facebook: Use and Users* (pp. 285-324). Berlin, Germany, Boston, MA: De Gruyter Saur. (Knowledge & Information. Studies in Information Science).

Research idea: Fietkiewicz

Data collection/Research: Fietkiewicz, Lins

Data analysis: -

Writing: Fietkiewicz (Abstract, Introduction, Social Media and Competition Law, Discussion), Lins (Economic Perspective on Competition for SNSs)

Tables and figures: Fietkiewicz, Lins

Proof reading: Fietkiewicz, Lins

Declaration of Academic Honesty

I affirm in lieu of oath that this dissertation has been written by me, independently and without any illegitimate external assistance, and in accordance with the "Ordinance on the principles of securing the good scientific practice of the Heinrich Heine University Düsseldorf".

Eidesstattliche Erklärung

Ich versichere an Eides Statt, dass die Dissertation von mir selbstständig und ohne unzulässige fremde Hilfe unter Beachtung der "Ordnung über die Grundsätze zur Sicherung guter wissenschaftlicher Praxis der Heinrich-Heine-Universität Düsseldorf" erstellt worden ist.