

3 Cross-Cutting Analysis

In our case studies, we observed how digital social networks emerge in the environments of various prominent web platforms and how this affects academia. In this chapter we will further analyze the observed developments from a broader perspective. We start out by critically approaching the category of interactivity, which is crucial for Web 2.0 applications and their impact (3.1). Then we focus on the newly emerging relationship between the public sphere and academia (3.2) and, partly related, on the changes in the academic quality control system (3.3). In section 3.4 we discuss the issues of a potential information overload with regard to the multiple channels of digital social networks. Furthermore we will analyze how Web 2.0 is challenging our traditional notions of privacy and transparency (3.5). Finally, we discuss whether cyberscience 2.0 will be more “democratic” than traditional science (3.6).

3.1 Interactivity as a Crucial Category

3.1.1 Utopian and dystopian perspectives

As outlined in the introductory chapter, interactivity is a crucial attribute of Web 2.0 applications. Their open participatory architecture has been the reason for optimistic utopian visions as well as pessimistic dystopian warnings, which we will discuss throughout chapter 3. Different as these scenarios are, both sides have one assumption in common: they largely base their argumentation on the concept of active users who heavily use the given technical infrastructure. Depending on the point of view, this can be regarded as good or bad, constructive or destructive, enlightening or stultifying, an opportunity or a threat. Although one can find more differentiated contributions as well, many of the highly-cited authors who shape the

contemporary discourse on Web 2.0 can be localized more or less clearly in these two parties.

On the utopian side, one finds authors stressing the positive potential of Web 2.0, starting with O'Reilly (2005) who coined the very term and referred to economic aspects, particularly the effect of "the collective power" of relatively small groups taken together, which has been described as the *long tail* by Chris Anderson in greater detail (2007). Clay Shirky (2008) claimed the new participatory architecture brings organizational benefits compared to traditional institutional structures, since, in his view supported by numerous examples, it allows easier and more effective interaction within social groups. In such optimistic perspectives, Web 2.0 contributors are conceptualized as forming a kind of collective intelligence, resulting in a "wisdom of crowds" (Surowiecki 2004). Needless to say, approaches of this kind also embrace many "Web 1.0" features, especially the possibility for wide, free and simple access to information. Enthusiasts hope this will bring societies and cultures closer together, often citing McLuhan's idea of a "global village".

Such discussions do not stay on a theoretical level, but can be found frequently in public discourses about the Internet's impact on society. Many key actors of present Internet applications share optimistic ideas of this sort—from the usually euphemistic Silicon Valley entrepreneurs such as Facebook's Mark Zuckerberg or Google's Eric Schmidt to non-profit actors such as Wikimedia's Jimmy Wales. On the user-end, one can observe a number of groups pushing utopian perspectives on the web, reaching from loosely-connected Internet-savvy bloggers to grass-rooted initiatives that might even turn into political parties, bringing their ideas to the agenda of policy-makers.¹¹⁴

Some of these views can also be identified in discourses regarding Internet usage in academia: open access advocates stress the advantages of widely-accessible publications free of charge, often favoring a reform of traditional copyright; innovative journals apply Web 2.0 elements believing they create benefits over traditional peer reviewing methods (we will come back to this issue in section 3.3); supporters of the "open science" movement promote the idea that academia should become more transparent to

114 Since 2006, especially in Europe, a number of *pirate parties* have emerged from the techno-enthusiastic hacker culture. Moreover, various NGOs push rather utopian visions of the Internet, e.g. the Electronic Frontier Foundation (EFF) or Germany's Chaos Computer Club.

the public (cf. sections 3.2, 3.6). For some scientists, professional blogging and other activities on the social web are even seen as an imperative for modern scholars. For obvious reasons, developers of academic Web 2.0 platforms also tend to come to rather enthusiastic assessments of their creations, overstressing positive aspects while underplaying negative ones.

On the opposite side of the spectrum, dystopians come to radically different conclusions. A common complaint is that we might suffer from a sort of “information overload”—a term that was already coined decades before the WWW was invented (Toffler 1970) but seems to be more relevant than ever today. Authors following this perspective argue that the sheer amount of information on the Internet and its fragmented and hyperlinked structure swamps our neuronal capacities and hinders deeper and coherent thoughts (Schirrmacher 2009; Carr 2010; see 3.4 below). Correspondingly, dystopian thinkers question the Web 2.0 crowd’s “wisdom” and sound alarms about the decline of expertise in exchange for a “cult of the amateur” (Keen 2007). Instead of promoting the idea of collective intelligence, skeptics argue “that a hive mind is a cruel idiot when it runs on autopilot”, fearing the emergence of a “digital Maoism” (Lanier 2006). Moreover, due to the digital structure of the Internet “code is law” (Lessig 1999), which means content can ultimately be regulated by algorithms that hierarchically order or even exclude its elements. As Zittrain (2008) points out, this becomes increasingly problematic as the Internet is more and more ruled by a few actors who control content through their data “clouds” and remotely controllable devices like Apple’s iPhone or Amazon’s Kindle. Already today, algorithms are powerfully structuring the way we perceive the Internet. According to Pariser, many of them function as “prediction engines” (2011, 9), trying to automatically assess what we want to buy, find etc. As he argues, this could lead us into a “filter bubble” with “invisible autopropaganda, indoctrinating us with our own ideas, amplifying our desire for things that are familiar” (ibid, 15). From this point of view, the Internet is not bridging societies as McLuhan’s metaphor of a “global village” would suggest, but rather separates us into “cyberbalkans” (van Alstyne and Brynjolfsson 1997; Putnam 2000, 177), whose information sources lack variety and diversity. This thought becomes even weightier when we consider research on the digital divide. This strand of research points to the socially unequal availability of ICT infrastructure and literacy for its effective use. At the same time, the new possibilities for user-generated content also open doors for political and economic surveillance.

Some even conclude “web 2.0 is largely a commercial, profit-oriented machine that exploits users by commodifying their personal data and usage behaviour” (Fuchs 2009).

Again, these rather dystopian perspectives go beyond academic discussions and are also part of the broader public discourse about the Internet. They can be found among the whole political spectrum, from conservatives fearing the new participatory liberty might lead to anarchic conditions, to left-wingers, criticizing the strong influence of governments and the private sector. Understandably, such views are not popular among the major Internet companies, but are shared by some startups, who try to establish themselves as ethically better alternatives to big players (e.g. Diaspora, a social network site that gives users more control over their data, or the search engine Ecosia that donates parts of its revenue to a rainforest project).

Although the web itself is very much a product of academia, it was always accompanied by skeptical voices. Even today print journals still seem to have more authority than e-journals and peer review systems which involve Web 2.0 technology are anything but common (see 3.3). At the same time, our case studies in chapter 2 show that popular Internet platforms from Wikipedia to Google, nevertheless significantly impact academia. Many scholars do not appreciate this interference and probably every academic can tell a story about bad practices of these technologies by students or colleagues. Brabazon criticizes in her book rooted in such experiences a “fetish for information” (2007, 12) with the effect that “[c]licking replaces thinking” (ibid., 16). Such concerns about a lack of scientific quality due to an overflow of (irrelevant) information are widespread and not without foundation (for a further discussion see 3.4). Some other issues brought up by dystopian thinkers can be found in discussions on the web’s impact on academia: the commercial bias is considered problematic (e.g. Vaidhyanathan 2011); the idea of open science represented in social media is discounted as a distraction; scholars would not want to share their data and thoughts at an early stage. The hope that the new participatory opportunities will help to “democratize” academia, is also questioned (see 3.6).

3.1.2 Insiders and outsiders: methodological issues

Admittedly, our picture of utopians versus dystopians is over-simplified and a little exaggerated. Of course, the reality is not that black and white,

and not all of the cited authors can be clearly categorized as one or the other. Moreover, we omit more balanced perspectives in this very pointed comparison. However, we do believe that there is indeed an overweight of literature which is either optimistically or pessimistically biased. One can easily find reasons for this. First, texts with bold statements sell better and often receive many citations. It is easy to refer to them and even if one completely disagrees, such statements come in handy to build up own arguments. At the same time, they provoke counter-arguments with contradictory conclusions. Thus, although one-sided literature might be imprecise, it significantly shapes debates. This is not necessarily a bad thing, since it helps to quickly identify major issues and points of view. But of course this does not happen in a vacuum. These debates are not only situated in socio-cultural realities, they also take part in *constructing* these realities. Well-known political controversies give an idea of how this can work: differences are constructed and fortified between left and right, communistic and capitalistic, conservative and progressive, etc. A similar picture can be observed in regard to the academic usage of the Internet: we find utopians and dystopians, proponents and opponents, enthusiasts and critics. In fact, the academic usage of the Internet is to a large extent politically loaded, since institutional decisions have to be made that affect the staff's daily work: Should academics and their institutions be active on social web platforms? Which infrastructure should be used? What are the "dos" and don'ts"? Should academics get institutional credit for activities such as academic blogging? Is it desirable to open peer review and other scholarly processes to a larger audience? Which content can be trusted, what can be cited? Answering these urgent questions requires persuasion. Decision-makers have to be convinced, decisions have to be justified and strong arguments can be helpful for these purposes, no matter from which perspective they come.

It goes without saying that this tendency to exaggerate hinders a realistic assessment. This is especially problematic as there is a lack of systematic and independent empirical studies which focus on the impact of emerging Internet platforms on scholarly communication. At the same time, the sheer number of platforms and the pace of new developments in this sector hardly allow to give a truly encompassing picture of the situation. Therefore, one often depends on information and data given by the providers themselves—simply because there is nothing else available. For obvious reasons, such material will often be biased to some extent: SNS try

to create an image of active and large communities; wikis want to appear like effective working environments with high quality outcome, etc. Moreover, a lot of relevant information regarding the functionality of the platforms will never be fully accessible, simply because it contains well-protected corporate secrets. For example, although research from the field of information retrieval and SEO give us a vague picture of how Google's algorithms work, the exact functionality remains unknown. Corporate Web 2.0 platforms also give only limited insights into the activities of their members because this information is a main source of their income; furthermore they are obliged to protect certain user data.

This results in a situation of *insiders and outsiders*. Even for experts, many functionalities are "black boxed" and only fully understood by the developers themselves. Needless to say, average users know even less about what is going on behind the curtain of their interface and there is an obvious gap between users and non-users. The mixture of a lack of reliable information and the specific social situation of insiders and outsiders opens the door for politically motivated arguments, misunderstandings, ignorance and arrogance. Many academics who actively involve Web 2.0 platforms in their work are frustrated because "outsider" colleagues denounce their engagement as not professionally meaningful and a waste of time. As a defensive consequence they might overestimate the benefits of their activities while underplaying related issues. At the same time, outsiders might be blind to the actual advantages of these activities.

We observed such contradictory approaches throughout all our case studies: students forced to contribute to Wikipedia, while others are forbidden to use it; academics praising their Second Life efforts which do not lead to any significant results, while others completely denounce the platform as a mere game; scientists virtually getting lost between their countless SNS representations or Twitter messages (see also 3.4), while others do not even want to try any of these services; scholars one-sidedly relying on information provided by Google, while others still consult a library for knowledge that could be retrieved more quickly and easily through a search engine.

The very divergent practices can be taken as an indicator for missing institutionalization of academic usage of the analyzed platforms. Although best practice guides and similar conventions exist for certain institutions and areas, the general handling of them is still extremely unregulated. This partly explains the formation of utopian and dystopian components. While

the former try to establish their engagement as an accepted scholarly activity, the latter hold on to well-known approved practices. In case of doubt, institutions and individual scientists have to decide whether and how platforms should be used for their purposes. This can be highly controversial because such decisions touch scholars' and students' work routines and lead to larger political questions: the usage of platforms can be forbidden or enforced, staff might have to accept questionable terms of use, etc.

All this can easily cause politically heated debates between proponents and opponents, whereas it hinders a clear vision on the factual opportunities and risks of the emerging platforms for scholarly communication. The pressing question is: How can we overcome the barriers between these utopian and dystopian perspectives?

3.1.3 Overcoming the barriers between utopians and dystopians

It should be obvious by now that we neither favor utopian nor dystopian perspectives, as each of them is one-sided and biased. As we outlined above, possible reasons for their diverging judgments might be economic and political influences and a lack of systematic independent empirical studies. Since the distinct feature of Web 2.0 is the users' possibility to participate, *interactivity* has to be seen as a crucial category for assessing its impact. Looking not only at the theoretical potential of the emerging platforms but also on the actual user practices avoids techno-determinism and reveals what is factually happening—beyond hypothetical fears and hypes. Our case studies show first of all that utopian and dystopian perspectives are both right *and* wrong. Depending on what exactly is emphasized, one can reach very different conclusions. Given the strongly varying levels of interactivity, this is understandable. This can be illustrated using the example of the Wikimedia projects: The mother project, Wikipedia, is maintained and expanded by a large and active community, resulting in the world's most extensive encyclopedia and a vast bulk of related interactions between its members. Correspondingly, one can indeed find remarkable manifestations of this high interactivity. Some of them support hopes expressed by utopians, some rather remind us of dystopian concerns. There are excellent articles as well as poorly conceived so-called "stubs"; effective co-operations as well as vandalism and so-called "edit wars"; people greatly benefiting from the free and easily accessible knowledge as well as those who too trustfully rely on it or misuse it for plagiarism. Therefore, the

reactions from society and academia towards the encyclopedia are equally diverse. Such a clear judgment can hardly be delivered for the sister projects Wikibooks and Wikiversity because their levels of interactivity are much lower. Although the technological architecture is almost identical, these platforms have attracted far fewer active participants, produced much less content and achieved relatively little impact. Here the crowd is neither wise nor “Maoist”, simply because there is no crowd. No matter how “good” or “bad” possible consequences could be, the overall impact is just rather low. Thus, neither utopian hopes nor dystopian fears really come true, at least so far.

Although Web 2.0 platforms are crucially shaped by interactivity, we must not forget that users normally browse through them individually. Thus, experiences also differ largely from user to user. As noted above, an “outsider” with only few “followers” or “friends” will hardly recognize the full (positive as well as negative) potential of Twitter et al. But it is not only the individual social networks that frame this experience. As we stress in the subtitle of our book, these networks are *digital*, meaning they are intermediated with specific hard- and software (see 1.2.2 for a further clarification of this term). Evidently, this generally structures the user’s perception as we discussed throughout our case studies. But this process can also differ largely from user to user. In recent years, we can observe a trend to track user behavior to create an indicator for relevance (Pariser 2011). This was mainly initiated by Google’s web search, which capitalized on hyperlinks by interpreting them as a sort of recommendation for a web page (see 2.5). The advantage here is that it can be done automatically with the help of an algorithm weighing the different factors from case to case. In this way, Google was able to bring some order into the exponentially growing number of websites in the early web era. Today, the heavy usage of Web 2.0 produces vast amount of data which can be utilized to create additional indicators for relevance. Facebook’s “like” button or Google’s “+1” and rating systems from YouTube to Amazon are the most obvious examples. Beneath the surface of the user interface, all kinds of user-generated data is collected and analyzed, e.g. which websites are visited and which keywords are entered. Consequently, users shape their own web experience. However, this is performed by sophisticated algorithms, which mostly do their work unnoticed by the average user.¹¹⁵

115 See also the related discussion on “implicit participation” (Schäfer 2011) in 3.2.3.

This means that it is not only user-to-user interactivity we must regard as a crucial category, but also interactivity between humans and machines. In particular, we need to focus on this wherever algorithms significantly determine the user's experience. This is less prominent in the case of platforms such as Wikipedia, but search engines and social network sites increasingly apply algorithms which individually and automatized select what a user will see and how. Combined with the strong influence of personal networks and individual choices of how to use services, it is hardly possible to give an overall reply to the question of how web platforms impact scholars and other Internet users. From this point of view, it is not surprising that generalizing approaches such as the dystopian and utopian perspectives discussed above come to contradictory conclusions.

Nevertheless, our case studies reveal a number of tendencies which we will further discuss in the remainder of chapter 3. We base our assessment on our case studies which tried to avoid one-sided perspectives. Instead, we unemotionally studied the theoretical potential and the actual practices of scholars and other users of the analyzed platforms. This is probably less entertaining than utopian or dystopian approaches, but we hope it provides an assessment which is more down-to-earth.

3.2 New Windows in the Ivory Tower

Scholarly communication always had two sides: an *internal* one relating to what scholars communicate among themselves with a view to organizing collaboration and discussing scientific results; and an *external* side regarding the exchange of researchers with journalists and the wider public focusing on the presentation of scientific results. The line between these two types of communication certainly differs according to thematic fields as well as regions. While this line could be drawn quite clearly until recently—mainly by focusing on the communication partners involved and the publisher—, this is not the case any more in the digital era. Already a decade ago one of us observed that the Internet creates a new interface between the world of science and the public (Nentwich 2003, 458). Although evidently large parts of academia are still more or less strictly closed for outsiders (e.g. traditional peer review and job positions), the boundary between internal and external scholarly communication is increasingly blurred: Scholars