



Social Computing: Study on the Use and Impacts of Collaborative Content

**IPTS Exploratory Research on the
Socio-economic Impact of Social Computing**

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Preface

The European Commission's Joint Research Centre runs an exploratory research scheme which aims to build competences in strategically relevant scientific fields. One of the chosen projects at IPTS,¹ following a call for proposals, was "Exploratory Research on Social Computing" (ERoSC). This was carried out by the Information Society Unit at IPTS during 2007 – 2008.

This project aims to explore (1) the socio-economic impact of social computing; (2) the sustainability of social computing applications (business models and viability); (3) the relative position of Europe in terms of creation, use and adoption; and (4) options for EU research and innovation policies. Such research is important and urgent because social computing is already impacting many aspects of society and the previously available evidence was largely anecdotal and not comparable. Also, the recent nature of social computing applications, their strong growth in terms of creation, use and adoption, and the continuous changes in technologies, applications and user behaviour, reinforce the need for continuous monitoring and scientific capacity building. Therefore, the ERoSC project undertook a systematic empirical assessment of the socio-economic impact of social computing applications.

The methodological framework for the assessment consisted of desk-based research using available studies, reports and statistics on social computing in general and on collaborative content and social networks in particular. In addition, interviews with experts and a validation and policy options workshop were undertaken to tackle the challenge that the domain of social computing applications is quite recent and moreover, changing rapidly.

The research was undertaken in-house by a number of key researchers, supported by a larger multidisciplinary team of people belonging to the different areas of activity of the IS Unit.

This is the fourth of five reports from the ERoSC project. It provides an assessment of the use, adoption and impact of collaborative content applications, giving an in-depth description of YouTube, Wikipedia and blogging, and discussing the socio-economic impacts and challenges of collaborative content phenomenon. All the ERoSC reports will be available at <http://is.jrc.ec.europa.eu/>.

While completing the ERoSC project, the IS Unit at IPTS is continuing its work on social computing, and is currently investigating the impacts of social computing on health, government, learning, inclusion, competitiveness and the ICT/media industries.

¹ IPTS (Institute for Prospective Technological Studies) is one of the seven research institutes of the European Commission's Joint Research Centre (JRC).

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Executive summary

Collaborative content, created with web2.0 technologies, is part of the social computing phenomenon. The key feature of collaborative content is that it is created, reviewed, refined, enhanced and shared by interactions and contributions of a number of people. Studies show that while many internet users view and use the content, only a few of them actively contribute to it. Research suggests that major initiatives grew exponentially for 3-4 years, both in terms of user numbers and content till 2007, when growth peaked. Since then, growth seems to be continuing at a more stable pace.

Diversity of collaborative content applications and communities

Different initiatives emphasize different types of content collaboration and different types of content, be it informative, creative or communicative. Wikipedia is an example of a highly popular collaboratively-created information resource, where anyone can create, modify, enhance or discuss its content pages. Collaboration and content quality management are steered by community guidelines, developed by the community itself. YouTube is one of the most visited websites of the moment. It allows users to upload their own content, and supports networking and discussion around the videos. Blogging is a tool for individuals and organizations to open a communication channel relating to the topics they are interested in. Blogs allow viewers to comment on and discuss issues, which sometimes leads to community formation around and between the blogs.

The variety and number of different content-based collaboration initiatives is growing rapidly. Content-based initiatives and communities can be created by users themselves or by companies and organizations. They can be used for sharing information and practical knowledge on preferences (e.g. Del.icio.us), for supporting professional communities of practice (e.g. Ganfyd for medical information), or for crowd sourcing by gathering the efforts of many for a common task (e.g. Peer-to-Patent). Collaborative content initiatives are also used for supporting users' content development skills, e.g. helping them to work on books (e.g. Lulu) or to compose music collaboratively (e.g. Song Community). YouTube, Wikipedia and blogging also provide a new means for participative journalism, where citizens can contribute to a news service with their pictures and stories, gaining visibility for the issues they are interested in.

There seems to be differentiation in how collaborative applications appeal to different groups of people. Media sharing applications seem to be especially appealing to younger audiences, though older people also participate. Studies suggest that older people participate more in text-based applications such as Wikipedia, blogs and discussion fora which allow the sharing of knowledge and the creation of content-based connections between people. Participation in collaborative content communities can be motivated by a desire for fame, self-expression and by the possibility to share one's knowledge and experiences. With knowledge sharing applications and wikis, users can both share their knowledge for the benefit of others and benefit themselves from online communities as information resources.

Studying free and open source software initiatives that have existed for many years helps us to understand the emerging nature of collaborative content developments and communities. These software communities vary in size from small to very large, and contain unpaid and paid contributors. Studies show that both professional and non-professional software

developers participate in those open source software initiatives that they find intellectually interesting and that they consider contribute to important goals. They are motivated to participate by their personal desire to learn, share the products of their work, improve the product for their own use, and also by financial gain, as there are several companies that base their business on open source software. These examples have shown that it is possible to create viable business models around collaboratively-developed products and communities. Learning from them might help to develop business models for collaborative content.

Impacts and challenges

Collaborative content applications have both economic and social impacts and challenges. These are due to the i) greater diversity and quantity of content and information that is easily available, ii) content-based connections with great reach, and iii) new forms of efficient collaboration. Collaboration around content is creating new connections between individuals and organizations, and different communities. Research suggests that collaborative content does not necessarily lead to disruptive changes in society, but the increased speed, scale and visibility do create opportunities to improve the functioning of the society and economy.

For companies and organizations, collaborative content gives rise to increased competition due to the wide diversity of content available from various sources. This particularly affects areas such as publishing. The fact that people are sharing their opinions and experiences of products online also leads customers to be better informed. As a result, companies have to develop efficient quality management strategies. Collaborative content changes the environment in which all industries operate, opening up opportunities for improved external relations and advertising, and for utilizing the knowledge and innovation of users in product and service development. Media industries are partnering with these initiatives to get visibility for their content and also to use the collaboratively-developed resources to improve their services. In addition to the changes in the relationship between producers and consumers, collaborative content has the potential to bring about transformative change inside organizations. Organizations can use collaborative content tools for intra-company content creation, collaboration and communication purposes, overcoming the difficulties of geographically-distributed teams. Furthermore, even if they do not use collaborative content tools internally, organizations must create policies for their employees as their personal profiles and interactions are increasingly online, and may cause security risks both for individuals and the organizations.

For individuals, collaborative content applications provide a new means of self-expression, individual creativity, development and communication with others. At the same time, these applications and opportunities also contribute to a change in people's mindsets, as they are now able to voice their needs, opinions and suggestions in public. Collaborative content applications and platforms provide new ways of forming connections and communities to share and support knowledge and experiences. Furthermore, they empower individuals to launch collective actions in socially relevant issues. Increasing usage of participative approaches on the Internet strengthens its importance as a media, and also raises people's expectations of similar approaches in traditional institutions, such as education or health. Hence, healthcare and education providers, and public services in general, need to prepare ways of handling better informed and more demanding clients.

The main challenges to collaborative content relate to the need for a responsible and critical Internet user culture, in which quality content could be created and used with awareness of privacy and security issues and respect for IPR rights. This requires that the importance of

digital competence, including critical media literacy skills, is emphasised for people in formal education and also for those who have already completed it. Furthermore, special attention should be paid to avoiding further divides between people who already use the Internet and those who do not. Those who have no access to the Internet are also excluded from collaborative content and the new participation possibilities provided with it. Finding successful and sustainable models for collaborative content production communities and business models relating to them remains a major challenge requiring further knowledge and experiments.

Conclusions

Due to the bottom-up nature of the phenomenon, it is suggested that policy should allow and support the best solutions, models, and innovations to emerge. Policies should support and enhance participation opportunities for all groups and set an example by experimenting with collaborative content models for developing the quality and models for public services. Therefore, it is suggested that policy should focus on:

- Awareness raising
- Improving digital competence
- Protecting minors
- Supporting local developments.
- Improving and maintaining internet access
- Supporting collaborative research and innovation
- Regulation and guidance on IPR
- Participative approaches in public services
- Supporting change in public institutions

The developments in this area need supporting research and especially experimentation, as collaborative processes and initiatives can find the best working models through practice. Research should concentrate on finding viable business models for collaborative content, best practices and examples for collaboration in communities of different sizes and features, technical solutions for managing content and information flows and rights, as well as models to utilize the power of ICT-based content communities and connections to share relevant knowledge and support personal learning of all individuals in a changing society.

1 Introduction

This case study is part of the exploratory research project carried out by IPTS. The project aims to explore the socio-economic impact of social computing by investigating the socio-economic impacts and business models of social computing applications and analysing its position in Europe. The research also aims to find and validate socio-economic theories that could support and explain current and further development, and analyse the implications for policy making. This case study aims to provide input to these general goals by exploring the present situation, apparent trends and the present and prospective impacts of collaborative content.

1.1 Scope of the report

Many forms of communication and Internet-based applications are often referred to as Web2.0 or social computing. The concept of Web2.0, as defined by O'Reilly,² includes all new web-based software that allows people to connect and interact more efficiently than before. This case study looks at collaborative content applications with Web2.0 technologies, i.e. applications for collaborative creating, sharing, evaluating and using content. Excluded from the scope of the study are collaborative Internet applications that do not aim to create resources (e.g. meeting management tools) or even large online publishing initiatives (e.g. online journals, MIT Open Courseware³), where participation in the content creation follows largely traditional hierarchical criteria. However, research relating to those may be referenced if it is also applicable to collaborative content (e.g. research regarding the impacts of the free availability of new resources).

This report aims to study social computing from the viewpoint of collaborative content, where new knowledge, content and value is created by interactions and contributions of a number of people, who participate in different ways. Figure 1 shows the perspective on collaborative content as developed in this report. Collaborative content can be of different types, but essentially it is a product of creative effort and is shared with tools and licenses that allow others to contribute. Contributions can modify the original content, enhance it with new additions, or provide value assessments. Furthermore, content-based comments and discussions can add value and information to the original content, help in content-related perception conflicts, and they are an essential social part of many collaborative content communities. As text and media content raise topics and show personal viewpoints, they can often work as tools that create new connections and facilitate social networking between people [14].

² <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>

³ <http://ocw.mit.edu/>

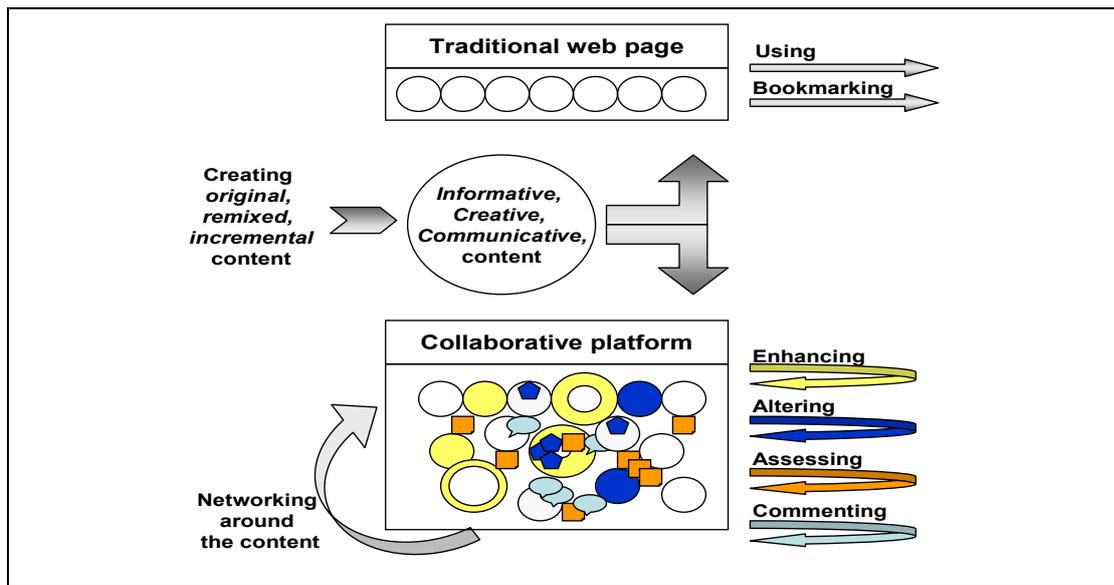


Figure 1: The perspective of collaborative content as developed in this report

1.2 Methodology

This report is based on inputs from a variety of sources and has been built by gathering contributions from several experts as follows:

1. Desk research, which gathered together information from Internet use measurements, research reports, books, academic articles, newspapers and directly from the websites of organisations and collaborative content projects. See section 1.3. for the description of sources used. Desk research was limited to those resources available in English.
2. Erosc team discussions and feedback throughout the different phases of the research. Furthermore, in the preliminary version of the report, team members provided specific contributions from their areas of expertise.
3. Expert validation workshop with 25 experts from different countries was organized on 26-27 February 2008 in order to discuss the preliminary results of the study [90].
4. External advisory board members commented on the first and intermediate versions of the report and participated in discussions of the progress and results of the study.
5. Six semi-structured face-to-face expert interviews were carried out for validating research results, and for enhancing the coverage of discussion.

1.3 Sources

Although similar approaches and supporting technologies have already existed for a long time, social computing in the wider scope has only developed over the last few years. Hence there is little agreement on measurement issues and tools, poor data availability, and the reliability and comparability of sources of data are still questionable. We therefore make two provisos, which would apply to any scientific analysis of emerging trends:

- The selection of Web 2.0 technologies and applications presented in the report relies on those which offer most of the publicly available – and sometimes verifiable – data and qualitative information.

- The use of data quoted from third parties should be taken as indicative but should never be considered as confirming the validity, reliability or comparability of this information.

In this report, sources for quantitative and qualitative data, studies and discussion come from the following categories:

- Scientific articles and studies published in journals, books and conferences, such as the International Journal of Knowledge and Learning, First Monday, The Journal of Systems and Software, Sociological Research Online, WikiSymposium, and ACM conferences;
- Reports and discussion papers from both non-commercial organizations such as FutureLab, OECD, OFCOM, ITU, OCLC and commercial organizations such as IBM, Edelman, McAfee Avert Labs, and Sophos;
- Internet traffic measurements, as published by companies such as Alexa, Compete, comScore, and Nielsen/Netratings;
- Survey studies of Internet usage among different users groups, from non-commercial providers such as Eurostat, Pew/Internet, and OCLC, and research companies such as Forrester Research, McKinsey & Company, IPSOS, Hitwise, and other companies such as King Research, Proofpoint, and IBM;
- Books discussing issues related to the phenomenon, such as Benkler's "Wealth of Networks", von Hippel's "Democratizing Innovation", Wenger's "Communities of Practice", and Keen's "Cult of the Amateur";
- Websites of the specific applications, such as Wikipedia, YouTube, and del.icio.us,
- And finally, examples of applications and their usage have been drawn from opinion pieces and articles in newspapers and magazines, such as The New York Times, The Economist, The Times, The McKinsey Quarterly, Information World Review, and The Independent.

It is clear that with non-neutral information providers, different traffic measurements and different survey methodologies, and sources of information need to be treated with caution. However, they are sometimes the only information available. The report aims to gather together data, different viewpoints and examples for a structured discussion. The report does not draw conclusions based on a single information source, but may provide conclusive suggestions if there are several information sources pointing in the same direction. And still, as the phenomenon is new and data sources are very varied, the future and real significance of these emerging applications may prove to be different from what was anticipated with the present knowledge.

1.4 Report structure

This report is structured as follows. Chapter 2 explores different types of collaborative content, discussing them generally and giving in-depth examples of applications. Chapter 3 discusses open source software development as the predecessor of the broader online content collaboration phenomena. Chapter 4 discusses the economic impacts and aspects of collaborative content and Chapter 5 studies the social impacts. Chapter 6 recognizes challenges brought forward by collaborative content. Chapter 7 suggests issues for policy and research. Additionally, the report contains an Annex that gives examples of different types of initiatives based on collaborative content approaches.

2 Collaborative content initiatives

Although there are no systematic measurement data available of the take up of collaborative content, available data show that platforms and communities for sharing and developing different types of content are attracting increasing numbers of users. Different types of content contributions accommodate different motivations and goals. The content can be an individually created new product that a user wants to share with others, or it can be a reaction to existing product/content, enhancing, altering, assessing or commenting on it. The most versatile collaborative content initiatives combine aspects of creating, enhancing, altering, commenting on and discussing content, creating a community for collaborative content elaboration and development.

This chapter first gives a brief introduction of the general take up of collaborative content, and then introduces examples of different initiatives: Wikipedia is an example of a highly collaborative information resource, in terms of its development and its model for ensuring neutral and fact-based content. Youtube is a very popular example of sharing individually-created content collaboratively, with discussion and networking supported by the platform. Blogs are highly used outlets for self expression and communication with the world, which support discussion and community formation. After these examples, some collaborative content initiatives for different application areas are introduced: Delicious for of preference sharing, Ganfyd for professional community of practice, and PeerToPatent for crowd sourcing for the purposes of public service. The chapter ends with a discussion on motivation, sharing, and trust in collaborative content development.

2.1 Overview of collaborative content

New technical tools (computers, digital video cameras, cameras in mobile phones) make it easy to create digital content and, at the same time, Internet platforms support sharing and publishing people's own creations. The commonly used definition of user-generated content (e.g. by OECD [80]) requires users to be "non-professional". However, increasingly content produced by professional and commercial actors, e.g. media companies, is also appearing on platforms (e.g. on YouTube), placed there either by the original producers or submitted (sometimes infringing copyrights) by users. As discussed in Chapter 4, it is sometimes possible to earn money with the platforms, which increases their attractiveness for professional and semi-professional content producers. Usage of collaborative content is increasing in all countries and all age groups, although it is more common among younger audiences. Figure 1 shows the usage of social media (visiting video and photo sharing applications), which is a visible part of the collaborative content phenomenon.

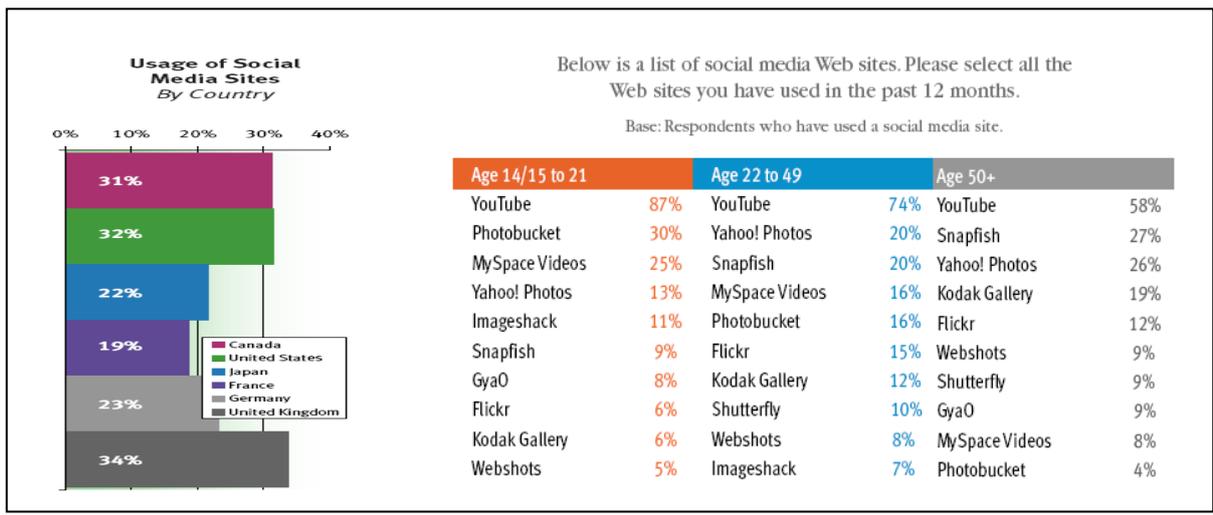


Figure 1: Social media usage by country and ages [77].⁴

Usage figures for social media sites have risen rapidly, not only because they attract large audiences, but because people also use these sites actively.

Figure 2 shows that half the people using social media sites use them frequently, and that content-related activities are already very common among all Internet activities. The most popular collaborative content applications, for example YouTube, Wikipedia sites, and blogging platforms, are among top traffic destinations in overall Internet traffic rankings. Collaborative content is also a type of social networking application activity, e.g. in the form of uploading user photos and videos. However, recent trends seem to show that although growth in usage and the amount of collaborative content is still continuing, the pace of growth is now slower than it has been over the last few years [84].

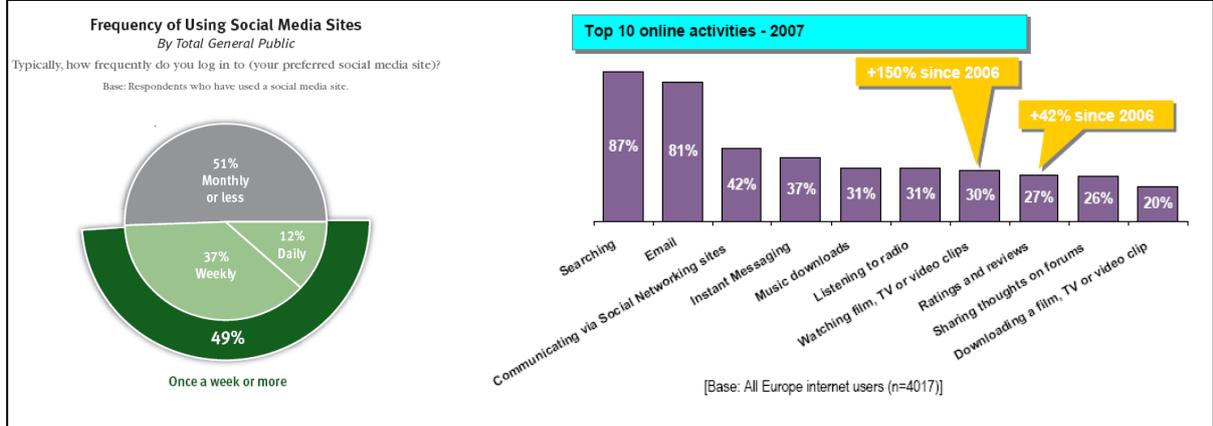


Figure 2: a) Frequency of social media use by OCLC study [77] b) Top 10 online activities in Europe by EIAA Mediascope Europe 2007⁵

⁴ OCLC study surveyed a total of 6163 respondents completed an online survey between December 7, 2006 and February 7, 2007. Respondents were between 14 and 84 years, 921 in Canada, 821 in France, 846 in Germany, 804 in Japan, 970 in the United Kingdom and 1801 in the United States. The collected general public survey data have an overall statistical margin of error of +/- 1.3% at the 95% confidence level for the online population in the countries surveyed.

⁵ The study involved 7,008 random telephone interviews with over 1,000 respondents in the UK, Germany, France, Spain, Italy and the Nordics respectively and 500 respondents in Belgium and the Netherlands respectively. Interviews were conducted throughout September 2007. <http://www.eiaa.net/news/eiaa-articles-details.asp?lang=1&id=154>

Media sharing platforms often provide users with the possibility to comment on the content, and to assess it by voting and tagging. With text content, posting comments and evaluations can be used to enhance the original information. For example, the Google News service for searching and accessing news allows people who have been quoted in a news story to comment on the article, with a view to correcting errors and improving the original article.⁶ A news story can be commented on only by the original authors, editors and the people mentioned in it. The experts see this as a possible new way of ensuring that comments are not taken out of context or misquoted. Google Maps allows users to enhance the original map service with their content contributions, which allows richer and more detailed information services related to locations.⁷

Sharing content, rating and tagging it or enhancing it with comments creates additional value to the content, but does not necessarily lead to changes in the original content. The most collaborative form of content-based interaction also allows modification of the original content. Wikis are the best known tools for collaborative authoring, but also tools for collaborative design (where the product is a model of, for example, an airplane) or collaborative movie making⁸ use the same idea. These collaboration platforms often support the content-based interaction with separate discussion facilities, to allow the exchange of opinions about content development.

There are different types of content-based communities, focussing on sharing individual content products, communicating around and about the content or active collaborative development of content. Furthermore, there are community participants with different roles and contributions. As a general rule, the more creative contributions have to be, the smaller the share of contributors. For example, Forrester Research suggested that of the European online public, 9% participates in publishing, 18% in commenting, and 49% in reading activities, with large differences between countries [55]. Figure 3 shows examples of study results which suggest that, typically, a small number of internet users are responsible for most of the contents. Also other studies have shown that this is true in many collaborative content initiatives, e.g. [76].

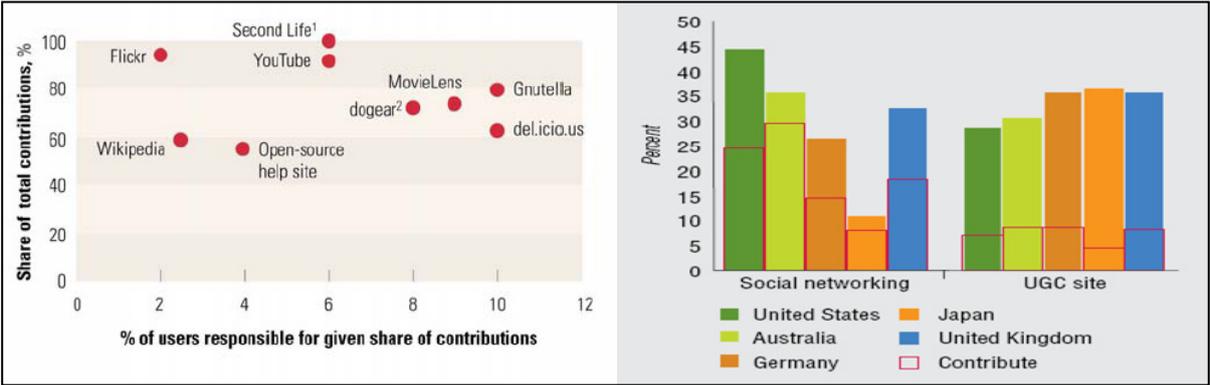


Figure 3: A small share of internet users contribute to collaborative content (Sources: [12], [10])

⁶ <http://media.guardian.co.uk/site/story/0,,2147345,00.html>

⁷ <http://maps.google.com/>

⁸ See e.g. <http://www.wreckamovie.com/>

2.2 Wikipedia, a collaboratively-created information resource

Wikipedia is an example of a collaborative content initiative that aims to create freely available information resources. Anyone can create, modify, enhance, delete and discuss existing or new content, but only a small number of administrators have higher level management rights for the content and the power to solve disputes and lock pages.

Wikipedia was launched on 15 January 2001 as a single English-language edition, as a complementary project to Nupodia⁹ which contained peer reviewed expert written articles. Wikipedia was an attempt to try something new, giving the power of editing to everyone and it soon surpassed the popularity of Nupodia, which was later incorporated into Wikipedia. As of December 2007, English Wikipedia had over 2 million articles, and is now said to be the largest encyclopaedia ever.¹⁰

Content

A snapshot of Wikipedia content in June 2008 shows that Wikipedia had 253 different language version, of which 236 were active. The English Wikipedia is the largest, with over 2,397,000 articles. In addition to article pages, all wikipedias contain a significant number of content-related discussion pages for the community (in June, the English Wikipedia contained 13.4 million pages in total). The five largest language editions in order of article count are the English, German, French, Polish and the Japanese Wikipedias. The speed of new article creation grew until 2007, after which it has remained at a more or less stable rate (based on Figure 4 and most recent statistics¹¹).

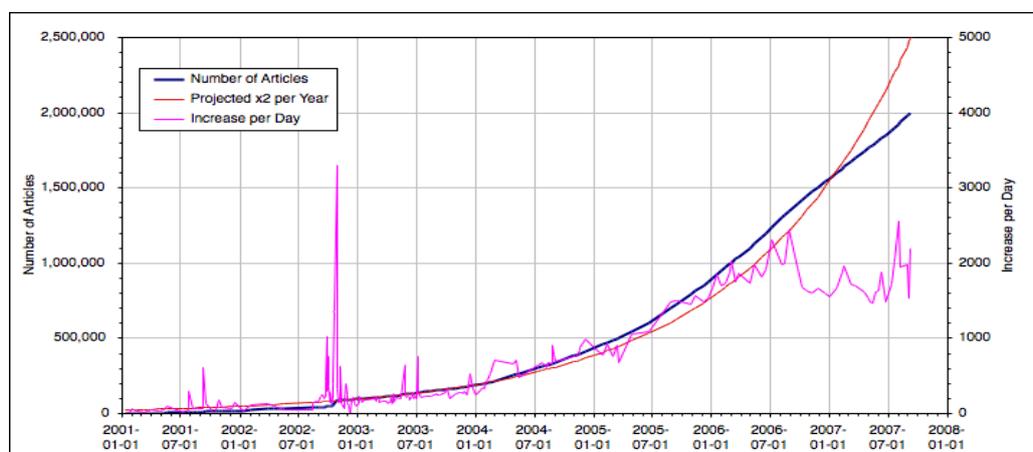


Figure 4: Wikipedia article development (source: Wikipedia)¹²

Wikipedia content is subject to the law in Florida, United States, where Wikipedia servers are hosted. Furthermore, Wikipedia has several community guidelines requiring, for example,

⁹ <http://en.wikipedia.org/wiki/Nupedia>

¹⁰ <http://en.wikipedia.org/wiki/Wikipedia>

¹¹ <http://wikisupport.martinkozak.net/~martinkozak/statistics/?family=wikipedias&project=en&subject=good&scanback=400>

¹² http://en.wikipedia.org/wiki/Image:EnglishWikipediaArticleCountGraph_linear.png

that the content is written from a “neutral point of view”,¹³ they need to be on “notable”¹⁴ topics, contain “no original research”¹⁵ and only “verifiable”¹⁶ material.

The quality of the Wikipedia content has been questioned, as the entries are based on coinciding viewpoints of all participating people, regardless of their background, and there is no information on the extent to which the entries are based on research and measurable facts.¹⁷ Studies show that the reliability of information in Wikipedia might be close to that of the well-established traditional encyclopaedias [40], but there are still errors (for example, 13% of articles were analysed as having errors in [16]). However, readers generally seem to consider it to be a credible source. For example, Edelman Trust Barometer 2008¹⁸ showed that in the US, Wikipedia is considered as the second most credible source (after business magazines) for information about a company, 55% of 25-34 year-olds consider it extremely or very credible, more than radio, newspaper, TV and company communications [27].

The use of scientific citations in Wikipedia articles is lower than it is in current scientific literature, although it has grown in recent years [75]. Furthermore, the neutrality of the entries may be questioned. Studying the IP addresses of the edits reveals that people from companies and organisations seem to modify entries concerning information relating to the company [106]. Cases have been published where companies try to pay contributors to edit articles for them.¹⁹ Article content does not stabilize over time, and is even subject to vandalism, such as mass deletions of pages (e.g. pages on "abortion") [107]. Research shows that malicious edits are typically corrected in 2-3 minutes (because editors also follow the changes with watchlists), but the probability of encountering a damaged article has been increasing in the last years [87]. On average, calculated from the overall number of edits and articles, there are 17 edits per article.²⁰

Citizendium²¹ is an example of a later project which aims to improve the credibility of articles with expert control, but allows public contributions by registered contributors (without real-time editing). From the time of its public launch in March 2007 to August 2008, 7,900 article pages have been created in this encyclopaedia, 74 of which have been approved as final versions.²² According to available statistics, the growth rate of articles has been stable and linear since the beginning. Recently, the German Wikipedia has also announced that it will pioneer a new model of gatekeeping, where anyone can edit, but only trusted contributors can make the edits visible on the web. This aims to fight vandalism by detecting it before showing

¹³ http://en.wikipedia.org/wiki/Wikipedia:Neutral_point_of_view

¹⁴ <http://en.wikipedia.org/wiki/Wikipedia:Notability>

¹⁵ http://en.wikipedia.org/wiki/Wikipedia:No_original_research

¹⁶ <http://en.wikipedia.org/wiki/Wikipedia:Verifiability>

¹⁷ Often used example is a dispute between professional climate modeller and an anonymous editor. Both were equal in terms of position in the community, and the dispute ended in a situation where both parties were permitted/prohibited to edit entries [40].

¹⁸ Edelman Trust Barometer 2008 interviewed in Oct–Nov 2007 (i) 25-34 year-olds in 12 countries: US 100, China 75, UK 50, Germany 50, France 50, Russia 50, Mexico 50, Brazil 50, Japan 50, South Korea 50, Canada 50, India 50, and (ii) 35-64 year-olds in 18 countries: 400 in the US, 300 in China, 150 each in the UK, Germany, France, Italy, Spain, the Netherlands, Sweden, Poland, Russia, Ireland, Mexico, Brazil, Canada, Japan, South Korea, India.

¹⁹ <http://www.msnbc.msn.com/id/16775981/>

²⁰ <http://en.wikipedia.org/wiki/Special:Statistics>, accessed 2nd June 2008

²¹ <http://en.citizendium.org/>

²² <http://en.wikipedia.org/wiki/Citizendium>

the vandalized page. The English Wikipedia has also announced plans to develop similar trust measures for defining whose edits can be visible immediately.²³

The English-language Wikipedia has introduced an assessment scale against which the quality of articles is judged,²⁴ and other editions have also adopted this. After passing a rigorous set of criteria to reach the highest rank, articles can obtain a "featured article" status. Such articles are intended to provide thorough, well-written coverage of their topic, supported by many references to peer-reviewed publications [108]. On 30 May 2008, the English Wikipedia contained 2,070 featured articles.

Usage

Users. According to Wikipedia, ComScore data shows that 244 million unique visitors viewed Wikipedia sites (25.7% of the total internet audience) in July 2008.²⁵ However, this counts for several different Wikimedia sites and initiatives. Alexa.com suggests in August 2008 that Wikipedia reached 9.2% of the global internet audience (average reach of three months), and that Wikipedia audiences were mainly from the US (26%), and then Japan (11%), Germany (8%), India (5%) and the UK (4%). Of the visitors, 52% go to the English version Wikipedia, 19% to the Spanish version and 5% to the French version.

Country	Global	US	Japan	UK	France	Germany	Italy	Spain
Traffic rank	8th	9 th	8 th	11th	13 th	6th	9th	10th

Table 1 : Alexa.com traffic rankings for www.wikipedia.org (30th August 2008)

English Wikipedia is the largest wikipedia. In August 2008, it has 7.7 million registered users²⁶ of which almost 1,600 have administrator tools. Altogether, wikipedias have 9.5 million registered users, and an unknown number of unregistered users. Based on its own statistics, Wikipedia claims to have 75,000 active contributors.²⁷ In the English wikipedia, unknown users create about a third of all edits, and both new user registrations and article edits grew until January 2007 and have stabilized since.²⁸

²³ See articles discussing the changes e.g. http://news.cnet.com/2100-1038_3-6108495.html, <http://technology.newscientist.com/article/mg19526226.200-wikipedia-20-%C3%A2-now-with-added-trust.html>

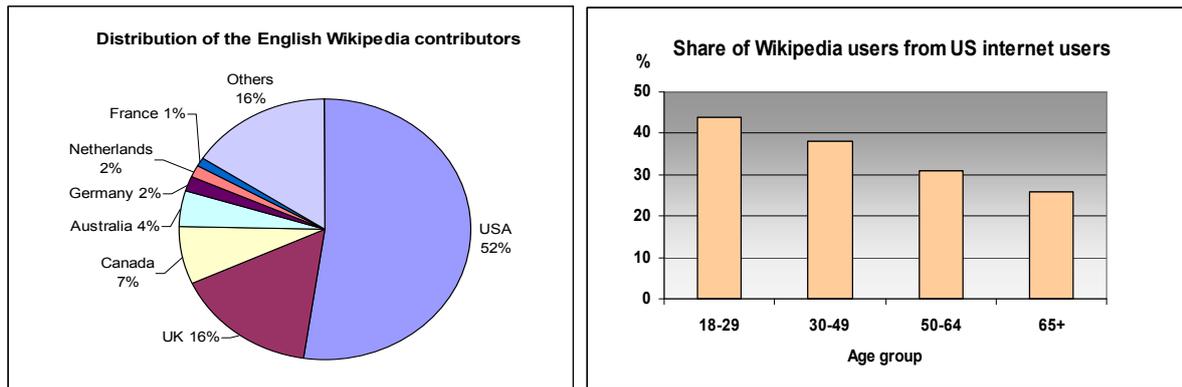
²⁴ http://en.wikipedia.org/wiki/Wikipedia:Version_1.0_Editorial_Team/Assessment

²⁵ http://meta.wikimedia.org/wiki/User:Stu/comScore_data_on_Wikimedia, accessed 30th August 2008.

²⁶ <http://en.wikipedia.org/wiki/Special:Statistics>, accessed 30th August 2008.

²⁷ <http://en.wikipedia.org/wiki/Wikipedia>

²⁸ http://en.wikipedia.org/wiki/User:Dragons_flight/Log_analysis and most recent statistics: <http://wikisupport.martinkozak.net/~martinkozak/statistics/?family=wikipedias&project=en&subject=edits&scanback=400> ; <http://wikisupport.martinkozak.net/~martinkozak/statistics/?family=wikipedias&project=en&subject=users&scanback=400>



**Figure 5: a) Geographical distribution of English Wikipedia contributors (source: Wikipedia²⁹)
b) Wikipedia users by age from US internet users (source Pew/Internet [93])**

Pew/Internet shows that, in 2007, 36% of US adult internet users looked for information in Wikipedia, and, on a typical day, 8% of them consulted Wikipedia.³⁰ Figure 5 demonstrates that Wikipedia is used by all adult age groups. However, usage increases with income and education (50% of Wikipedia users had a college degree or more) [93]. According to the Hitwise report in June 2007, 53.6% of people in the US who edit Wikipedia entries were over 45 and 47.7% of all visitors were below the age of 35 [103]. This suggests that Wikipedia provides a channel for older people to share their knowledge with younger people, and that retired people constitute a key editorial segment. The European Spire survey of educational users also show high activity for Wikipedia, as 54.8% of the respondents read Wikipedia and 14% contributed to it [112]. From these respondents, the majority (51.7%) used it for study, 36% for fun and 29% for work.

According to Hitwise, only 4.38% of all Wikipedia visits in the US result in content editing [103]. Academic studies also support that the small group of administrators form the most active contributors of the community. Furthermore, their contributions typically consist of changing and inserting content, whereas normal users are more likely to delete words than add words to content [57]. The contributions of participants are shown to follow the 'long tail' model, where the tail gets longer. This means that, originally, a very small number of people were responsible for most of the content, but now, there are more and more people, who contribute a little, but together have an increasing overall responsibility for content [57].³¹

Social aspects

Free information availability in many local languages gives new and actively updated information resources. News events appear very quickly on Wikipedia, for example, only few days after the start of the Iraq war, related pages were extensively created in the English Wikipedia [107]. Free availability of information especially supports those organisations and individuals with fewer financial resources (it also supports those without the internet, as they can use mobile or offline versions). However, some education institutes have banned

²⁹ http://en.wikipedia.org/wiki/Image:English_Wikipedia_contributors_by_country_%281%29.svg

³⁰ Pew Internet & American Life Project conducted the survey by telephone between Feb 15 and March 7, 2007, among a representative sample of 2,200 US adults, 18 and older. The Wikipedia usage was studied with N=1,492 internet users. For this sample, the margin of error is 2.8%.

³¹ <http://asc-parc.blogspot.com/2007/05/long-tail-and-power-law-graphs-of-user.html>

Wikipedia for coursework, since easy online access, may cause students to neglect the critical assessment of information.³² The Wikipedia developer himself has also stated that it should not be used for serious research.³³

As Wikipedia contains up-to-date information and rapidly developing articles, it can also be seen as a political media. For example, it has been said, in connection with the US presidential candidate selection, that you can “Type a candidate's name into Google, and among the first results is a Wikipedia page, making those entries arguably as important as any ad in defining a candidate. Already, the presidential entries are being edited, dissected and debated countless times each day.”³⁴

Participating in the Wikipedia community can improve the participant’s own knowledge and collaboration skills as informal learning. Furthermore, Wikipedia’s large publicity can also promote the creation of participative wiki communities in other areas for internet users - for example, Ganfyd for medical practitioners (see later in this chapter).

Economic aspects

Wikipedia is maintained by the Wikimedia Foundation. The Foundation is supported by donations, and by the voluntary work of the community participants. In 2007, the Wikimedia foundation declared revenues of USD 2,734,909³⁵ and in May 2008, it had 19 paid employee positions.³⁶ The employees work on administrative tasks and the articles are created by volunteer contributors. However, in Germany for example, the value of Wikipedia has been recognized by the government, which has published plans to support it with project funding.³⁷

All Wikipedia content is created under a GNU Free Documentation License, and the foundation is committed to keeping the project non-commercial. This, however, similarly to FLOSS, still allows business models based on packaging and additional services, e.g. printing and selling Wikipedia books or offline versions.³⁸ Hardware manufacturers can also bundle Wikipedia as additional value in their products.³⁹ An example of a problem relating to content usage is an ongoing copyright case with the Chinese Encyclopaedia Baike, which contains several entries directly taken from Wikipedia but does not take liability as it claims to only publish entries submitted and edited by its users.⁴⁰

³² See, for example, <http://www.insidehighered.com/news/2007/01/26/wiki>

³³ <http://chronicle.com/wiredcampus/article/1328/wikipedia-founder-discourages-academic-use-of-his-creation>

³⁴ http://www.washingtonpost.com/wp-dyn/content/article/2007/09/16/AR2007091601699_pf.html

³⁵ Audited financial statement of the Wikimedia Foundation, Inc. 2006-2007, available at http://upload.wikimedia.org/wikipedia/foundation/4/49/Wikimedia_2007_fs.pdf

³⁶ http://wikimediafoundation.org/wiki/Current_staff, accessed 30th May 2008.

³⁷ <http://www.heise.de/english/newsticker/news/91733%22>

³⁸ For example, German publisher has announced its plans to print the German Wikipedia, <http://edition.cnn.com/2008/TECH/04/23/wikipedia.germany.ap/index.html>

³⁹ It has been said that the One Laptop Per Child (OLPC) Laptop will have an offline version of Wikipedia in it (http://news.soft32.com/the-100-laptop-will-include-wikipedia_2063.html)

⁴⁰ <http://www.pacificepoch.com/newsstories?id=P103393>

A major economic impact of Wikipedia is its great popularity, large content and easy access, which disrupts the market for commercial encyclopedias, both online and offline.⁴¹ However, no studies of economic impacts on existing encyclopedia businesses are available.

2.3 YouTube, sharing individually-created content

YouTube is a collaborative platform for video sharing, where anybody can upload and view video content. Video creation itself is not necessarily collaborative but by uploading videos to the platform, they are shared with the community, where anyone can send comments, rate the videos and recommend them to others. Sometimes users react to a video by submitting their own video, hence contributing to a series of videos on a certain topic.

The YouTube site was founded on 15 February 2005, and gained a lot of users rapidly. It was then acquired by Google for 1.6 billion USD in November 2006. Now it has 200 million unique visitors monthly⁴² and 19 national interfaces with different languages. It has been announced that live video will be coming to YouTube in 2008.⁴³

Content

Official statistics are not available, but in August 2006, YouTube was said to host about 6.1 million videos and to have about 500,000 user accounts.⁴⁴ In October 2006, YouTube announced 65,000 uploads daily and ComScore measurements suggested more than 100 million video views every day.⁴⁵ In July 2007, measurements showed that viewers watched 2.4 billion videos on YouTube (source: comScore according to [77]).

The front page of YouTube shows which videos are being watched, and which are the most recent videos. However, the main contents of the front page are selected by the platform, and positioning on the front page has been shown to affect the popularity of the videos [43], hence the editorial team of YouTube has an effect on which videos become popular. It has been analysed that the number of uploaded videos to YouTube appears to have decreased since March 2007, after having increased steeply from 2005 [15].

OCLC analysis of the 100 most viewed YouTube videos on 2 September 2007 showed that 63% of the videos were professional, 37% amateur; and 49% of content were music, followed by comedy (17%) and sports/stunts (9%). 79% of the videos originated from the US, 6% from Canada, 4% from the UK and 20% were from 14 other countries, none having more than 2 videos on the list [77]. OFCOM research also shows that the most popular YouTube channels ever in November 2007 were contributed by professional American TV and music producers [82].

⁴¹ There is more than 500 times more traffic on Wikipedia than on the online version of the *Britannica*, based on the pageview statistics gathered by Alexa in August 2008.

⁴² as stated in <http://www.youtube.com/t/advertising>, 30th May 2008

⁴³ Schroeder, S. 2008. Live video is coming to YouTube in 2008. *Mashable*, February 29. <http://mashable.com/2008/02/29/youtube-live-video/> (accessed May 31, 2008).

⁴⁴ Gomes, Lee. "[Will All of Us Get Our 15 Minutes On a YouTube Video?](#)", *The Wall Street Journal Online*, 30th August 2006, accessed May 31, 2008.

⁴⁵ <http://www.comscore.com/press/release.asp?press=1023>

According to YouTube's terms of service,⁴⁶ users may upload videos only with permission of the copyright holder and the people depicted in the videos. Pornography, nudity, defamation, harassment, commercial advertisements and material encouraging criminal conduct are prohibited. The uploader grants YouTube a license to distribute and modify the uploaded material for any purpose; this license terminates when the uploader deletes the material from the site. Users may view videos on the site as long as they agree to the terms of service; downloading through one's own means or copying of the videos is not permitted.

Usage

Number of users. YouTube announced that in March 2008, it had 200 million unique users each month and had the 6th largest audience on the Internet (based on Nielsen/NetRatings, March 2008).⁴⁷ These large audience numbers are supported by ComScore, which announced that YouTube had more than 250 million visitors in January 2008.⁴⁸ According to Alexa.com, on 30 May 2008, YouTube reached 18.6% of global Internet traffic and that YouTube audiences were mainly from the US (27%), Japan (6%), Germany (4%), Brazil (4%) and the UK (4%). As shown in Table 1, YouTube ranks highly in internet traffic in various countries inside and outside Europe.

Country	Global	US	Japan	UK	France	Germany	Italy	Spain
Traffic rank	3 rd	4 th	4 th	6 th	4 th	2 nd	3 rd	3 rd

Table 2: Alexa.com traffic rankings for Youtube.com (30th May 2008)

Demographics. YouTube users come from all age groups, as shown by both the global OCLC 2007 survey study (Figure 4) [77] and Nielsen/Netratings results on US audience in March 2008.⁴⁹ It has been claimed that the US YouTube audience mirrors the demographics of the whole US online population.⁵⁰

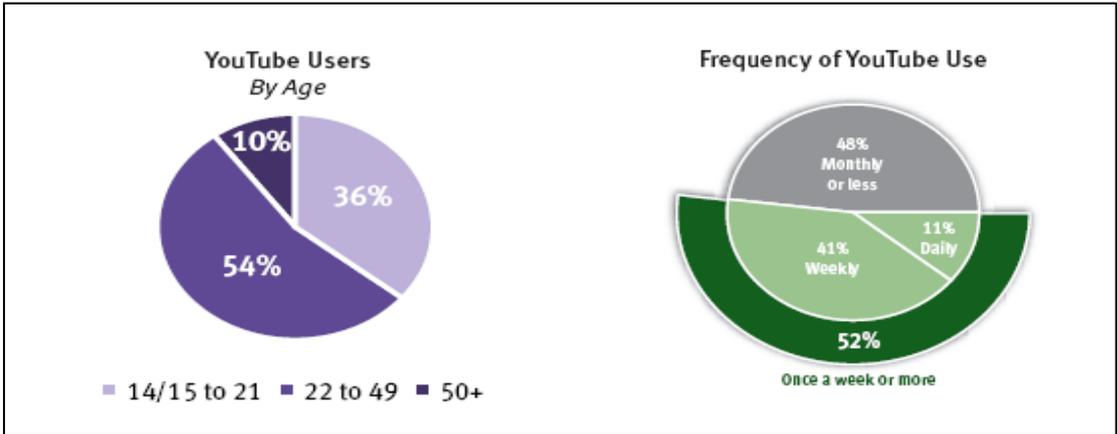


Figure 6: OCLC global study results for YouTube users a) by age b) by usage frequency [77].

⁴⁶ <http://youtube.com/t/terms>
⁴⁷ as stated in <http://www.youtube.com/t/advertising> , 30th May 2008
⁴⁸ comScore “Digital World: State Of The Internet” Report Highlights Growth in Emerging Internet Markets, <http://www.comscore.com/press/release.asp?press=2115>
⁴⁹ as stated in <http://www.youtube.com/t/advertising> , 30th May 2008
⁵⁰ <http://www.google.com/youtube/>

User profiles. The OCLC study showed that users visit YouTube frequently, 52% once a week or more [77]. According to Hitwise traffic measurements in April 2007, only a very small percentage (0.18%) of YouTube visits were video uploads, i.e. content creation [103]. However, in the Spire survey,⁵¹ as much as 8% of respondents declared contributing to YouTube, 41% viewing the videos and 51% never using it [112].

No surveys about the motivations of YouTube users were found, but in a McKinsey survey of German video-sharing sites,⁵² 65% of them upload for fame, 59% because it is fun, 41% to share experiences with friends, and 29% want others to benefit from their videos [12].

Social aspects

YouTube has shown the opportunities it offers as a channel to reveal and show almost any real time information. It contains citizen journalism videos documenting war scenes in Iraq, natural disasters, or local journalistic reporting.⁵³ It has been suggested that YouTube and similar approaches also provide potential for education, e.g. [25]. The University of California (UC) at Berkeley became the first university to make videos of full courses available through YouTube in October 2007 and other universities have followed this example.⁵⁴ There are YouTube communities such as the K12 Education Group,⁵⁵ and YouTube has also provided a model for a separate site concentrating on educational videos, called TeacherTube.⁵⁶

Users have also used their power to document everything by sending videos taken by mobile phones showing people in embarrassing or questionable situations, for example a teacher in an embarrassing situation [8] or politicians rubbing necks [48]. Among younger users, there are serious cases of cyber-bullying. The state of Victoria in Australia banned YouTube from schools after an online video about boys imposing a degrading attack on a schoolgirl was uploaded. Now, almost all Australian states and schools are systematically banning access to YouTube at schools, in order to fight cyber-bullying and loss of bandwidth.⁵⁷

In the European political scene, YouTube has served as a new channel for political communication or informing - for example, EuTube had over 1 million hits in less than three months.⁵⁸ In the US, YouTube was used to activate new audiences by organising with CNN a model for participation in the presidential TV debate through YouTube video questions in 2008. As a recent participative initiative, the OECD has opened a channel for inviting questions and comments for their "Future of the Internet" conference.⁵⁹

⁵¹ SPIRE Web 2.0 services survey was implemented online Dec 2006 – Feb 2007, receiving 1369 responses. It was advertised for students on online courses and on the homepage of university of Oxford. 51% of respondents were currently studying and 24% of respondents were from UK, 17% from other EU country and 59% outside the EU.

⁵² In October 2006 McKinsey survey of 575 users of 4 leading online video-sharing sites in Germany

⁵³ http://www.youtube.com/view_play_list?p=C281AA726C624F40

⁵⁴ http://www.gulf-times.com/site/topics/article.asp?cu_no=2&item_no=200494&version=1&template_id=46&parent_id=26

⁵⁵ <http://www.youtube.com/group/K12>

⁵⁶ <http://www.teachertube.com/>

⁵⁷ <http://www.australianit.news.com.au/story/0,24897,21330109-15306,00.html>

⁵⁸ <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1498&format=HTML&aged=1&language=EN&guiLanguage=en>

⁵⁹ <http://www.youtube.com/FutureInternet>

Economic aspects

When uploading videos, users have to agree to terms stating that their content is not violating copyrights. YouTube takes no responsibility of copyright infringements as it is only a platform, and removes all the content that copyright owners request it to. Many organizations have issued lawsuits against YouTube.⁶⁰ In Autumn 2007, YouTube introduced automatic filtering for uploads to recognize the content fingerprints of content media companies.⁶¹

YouTube has made a deal to pay royalties from the music that is played in the videos. The model is based on the top 5-10% videos and is expected to compensate some losses due to lower CD sales. The YouTube Partners Program⁶² offers (the most popular) independent video creators and media companies the opportunity of getting a share of the advertising revenues coming from their YouTube videos. YouTube has declared partnership deals with content providers such as CBS, BBC, Universal Music Group, Sony Music Group, Warner Music Group, NBA. It has been shown that YouTube can drive traffic to movie sites with previews and clips. For example, in October 2006, 3.5% of the traffic from YouTube went to television category sites and 1.1% to movie sites according to Hitwise measurements [86].

YouTube is pursuing advertising, including, for example, PVAs (participatory video ads) promotions, sponsorships, contextual-based advertising, banner advertising and video-embedded ads. A YouTube survey suggests that 73% of the audience do not mind advertising, because it keeps the site for free.⁶³ YouTube declared revenues from advertising of about 15 million / month before being purchased by Google. However, official evidence from Google financial statements points out that revenues realized through the Google Print Ads Program, Google Audio Ads, Google TV Ads, Google Checkout, YouTube and Postini have not been significant in any of the periods presented.⁶⁴

2.4 Blogs, communicating through online content

Blogging is not based on a single application platform. The global blogosphere is composed of different blogging platforms, hosting several blogs and individually hosted blogs from all over the world. The basic feature of blogging tools is that they provide an easy means of sharing text and media attachments for online audience, allowing others to comment on the content with their text and attachments. They are sometimes described as personal online journals, and their topics can range from scientific work to personal expression, from individual blogs to blogs of organizations. The ability to incrementally and collaboratively add blog content with comments and mutual blog linking can also lead to online communities around the blogs.

⁶⁰ For example, Viacom is demanding \$1 billion, saying that it had found more than 150,000 unauthorized clips of its material on YouTube that had been viewed "an astounding 1.5 billion times" (<http://news.bbc.co.uk/1/hi/technology/7420955.stm>)

⁶¹ <http://www.google.com/support/youtube/bin/answer.py?answer=83766&hl=en-uk>

⁶² <http://www.YouTube.com/partners/>

⁶³ <http://www.google.com/youtube/advertise/YouTubels.pdf>

⁶⁴ Google Inc. quarterly report

Content

In May 2008, Technorati announced that it was tracking 112.8 million blogs, with over 175,000 new blogs and 1.6 million blog posts per day.⁶⁵ In April 2007, Technorati documented 70 million blogs and that this number had doubled every 5-7 months over the previous 2 years.⁶⁶ Back in April 2007, it was already being said that the growth rate seemed to be slowing.⁶⁷ We now see that this has, in fact, happened, although an increase of 40 million blogs per year is still impressive. Typically after 3 months, only 20% of the blogs are still active and a large numbers of blogs are spam. For example, in December 2006, Technocrati detected 11,000 spamblogs created daily [98]. Elsewhere, it is estimated that up to 75% of blogs on Google's Blogspot are spam [110].

Figure 7 shows the language distribution of blogs tracked by Technocrati. However, it has been said that language does not necessarily reflect the location of the author [46]. Especially, there seem to be blog authors that choose to write in English although are not living in English speaking country.

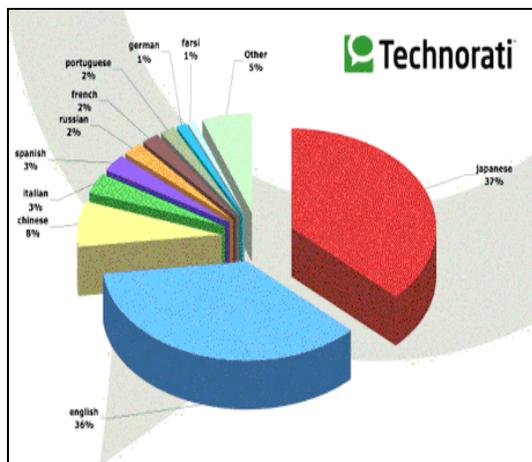


Figure 7 : Number of blog posts per language in March 2007 [98].

Usage

Blogging takes place on various platforms and sites. Taking just one of them, Blogger.com, as an example, shows considerable traffic. It alone competes with the traffic figures of YouTube and Wikipedia. In May 2008 according to alexa.com, Blogger.com reached 7.8% of global internet users and ranked as 9th in internet traffic.

Readers. In October 2006, the penetration of visitors to blogs was 58.5% in Canada, 51.4% in Spain, 45.6% in France, 45.1% in the UK, 44.3% in the Netherlands, 36.3% in the US, 30.7% in Italy, and 26.7% in Germany of internet users, according to ComScore measurements.⁶⁸ US blog reading figures for 2006 surveyed by Pew Internet also roughly match, showing that 39% of internet-using US adults (54% of them under 30 years old) read

⁶⁵ <http://technorati.com/about/>, accessed 28th May 2008

⁶⁶ Sifry, D. 2007. The State of the Live Web. <http://www.sifry.com/alerts/archives/000493.html>

⁶⁷ http://www.businessweek.com/the_thread/blogspotting/archives/2007/04/blogging_growth.html

⁶⁸ <http://www.imediaconnection.com/content/12750.asp>

blogs [61]. More recent measurements by the OCLC study in 2007 show similar but slightly higher numbers for the respective countries (see Figure 8), with 45% of the respondents reading blogs, and even 31% of the respondents aged 50+ [77]. Based on this study, in the last 12 months people have read blogs more (45% of total respondents) than they have used social networking sites (28%).

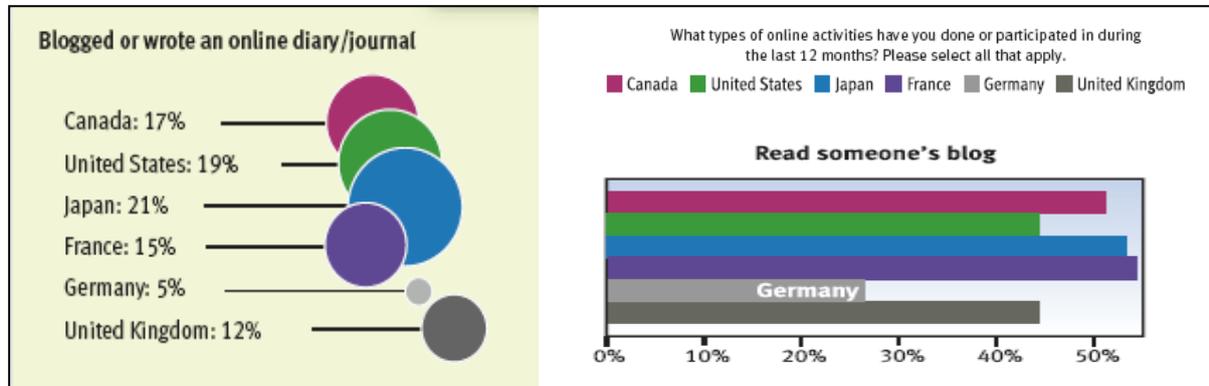


Figure 8 : OCLC study results on reading and contributing to blogs (OCLC 2007 [77]).

Writers. In the US in 2006, 8% of internet-using adults wrote their own blogs [61]. The OCLC survey in 2007 showed that 17% of the respondents had blogged or written an online diary/journal in the previous 12 months [77]. The Spire survey of respondents interested in education showed that as many as 20% contribute to blogs (when 39.1% said that they read blogs) [112].

Profiles. The reasons (either major or minor reasons) for blogging are creative expression (77%) and sharing personal experiences (76%), sharing practical knowledge (64%), according to Pew study on US bloggers in 2006 [61]. According to the same study, 52% of US bloggers blog for themselves and 32% write for an audience. For 84% of US bloggers it is a hobby and only 34% of bloggers see their work as online journalism. Only 56% of bloggers spend extra time trying to verify the facts and 57% include links to original sources “sometimes” of “often” [61]. The Spire survey showed that primary reason for blog usage was "for fun", for 46.4% of the readers and 18.6% of writers [112].

In the US, 59% of bloggers spend 1-2 hours per week on maintaining their blog and 10% more than 10 hours [61]. The Chimera study⁶⁹ reported that 40% of blog readers spend 0-3 hours, 29% 3-8 hours, and 29% more than 8 hours weekly on reading blogs. According to ComScore, 20% of bloggers are heavy bloggers who account for 86% of all the time spent (page visiting measured by traffic statistics) on blogging sites.⁷⁰

Companies. In May 2008, 11.6% of Fortune 500 companies have an active public blog by company employees about the company and/or its products.⁷¹ According to the Edelman

⁶⁹ Chimera study in 2006 used an online questionnaire with 167 responses, invited and distributed through blogosphere.

⁷⁰ ComScore Segment Metrix tool January 2008, press release at <http://www.comscore.com/press/release.asp?press=2102>

⁷¹ By Fortune 500 Business Blogging Wiki, <http://www.eu.socialtext.net/bizblogs/index.cgi>

study in 2006,⁷² 32% of companies aim their blogs internally, 19% externally, 49% for both [29]. Already in 2006, 32% of companies responded to "author, host or support blogs" and 99% of respondents knew about blogging. In McKinsey surveys, covering both internal and external company usage of web2.0,⁷³ 34% of the respondents said that they were currently using blogs in their company in 2008, as opposed to 21% in 2007 [71][68]. In these studies, the perceived importance of blogs for the company varies according to location, and seems to be considerably less in Europe (21%) than, for example, North America (37%) or China (35%), in 2008. IBM BlogCentral is an example of a company's internal blogging system with 30,000 users, 31,000 blogs, 4,000 active with 74,000 entries and 71,000 comments [47].

Social aspects

Several studies suggest that blogs have political relevance. For example Hitwise analysis showed that blogs direct traffic to online political sites more than news sites.⁷⁴ Research has also suggested that the strongly interlinked community of weblogs, which was advocating against the vote for the French EU referendum, contributed to addressing the bias of French mainstream media towards the "yes" vote.⁷⁵ According to ComScore report in August 2005, the most visited blogs (43% of blogs) were tagged as political and news blogs [19]. Also the recent ComScore report in March 2008 showed that heavy bloggers visit political and news sites more often than general internet audience.⁷⁶

Blogs inform readers quickly about current events, e.g. in the cases of the war in Iraq, terrorist bombings in Mumbai and London, and natural disasters such as Hurricane Katrina [48]. Blogs also provide a new tool to quickly set up a collective action [52]. According to the Pew study in 2006, 61% of bloggers want, to a greater or lesser extent, to motivate people to take action [61]. Edelman study⁷⁷ showed that in all the surveyed countries, blogs have the effect of spurring people to action, as demonstrated in Figure 9 [28]. Furthermore, the study showed that people who want to influence others, read blogs more often than general internet audiences.

⁷² Edelman survey 2006 of senior communicators from global companies and organizations, with 111 completed surveys.

⁷³ The McKinsey Quarterly conducted these worldwide surveys in January 2007 with responses from 2847 executives and in June 2008 with 1998 responses.

⁷⁴ http://weblogs.hitwise.com/bill-tancer/2006/09/blogs_increasing_influencer_in.html

⁷⁵ <http://www.observatoire-presidentielle.fr/?pageid=20>

⁷⁶ <http://www.comscore.com/press/release.asp?press=2102>

⁷⁷ The Edelman Omnibus blog Study was conducted with telephone interviewing, with following numbers of respondents: Belgium 937, China 1000, France 940, Germany 1000, Italy 1000, Japan 1000, Poland 1038, UK 1002, US 1000, South Korea 1000.

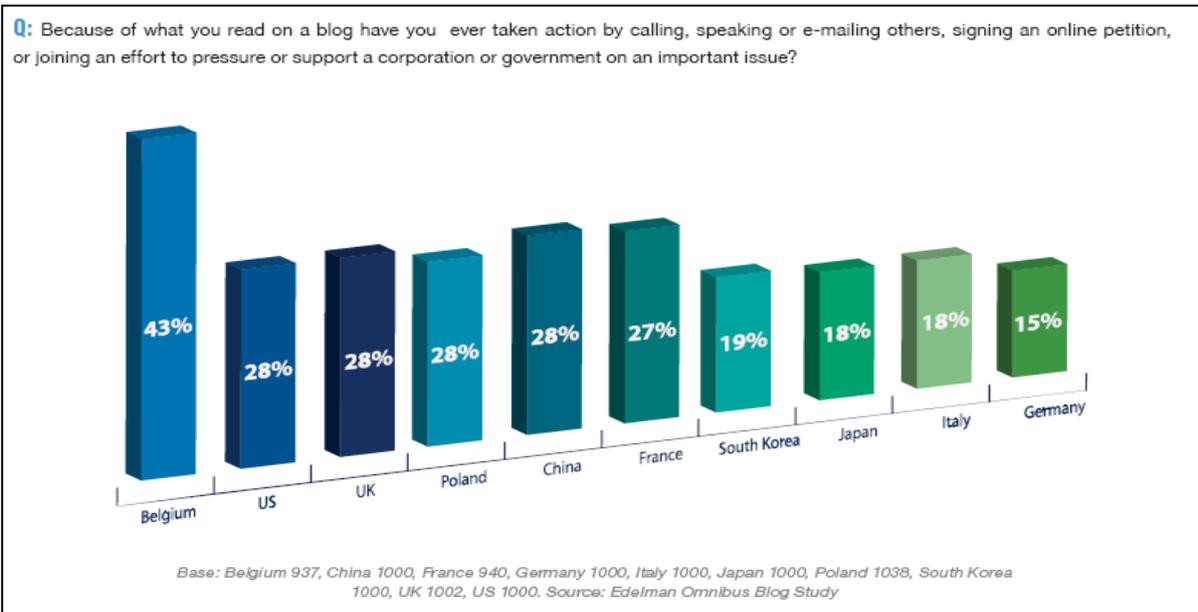


Figure 9 : Blogs spur people to action in different countries (Edelman Omnibus 2007 [28]).

As demonstrated in the surveys for blogging motivation, blogs provide new means of expressing oneself in writing. As creative expression in writing has proved to be beneficial in treating serious illnesses such as cancer, the potential of blogs is a topic for medical research.⁷⁸ Surveys have also shown that other major reasons for blogging are sharing experiences and practical knowledge [61], and 50% of heavy blog users use blogs to give and receive recommendations [44]. Hence, blogs provide new sources of information on everyday life, products and services, thus informing consumers and guiding their decisions.

Economic aspects

Surveys show that internet users who visit blogs spend more time and money online than people who do not visit blogs [19]. People who spend the most money on the Internet, trust blogs more than internet users who do not shop online much. 34% of internet users have decided, based on the information offered in a blog, not to buy a certain product [22]. The IPSOS study showed that 61% of internet users in Canada would be affected positively, and 66% negatively from information contained in a blog [49]. Hence, the fact that customers are sharing information through blogs with a widespread readership and fast updates creates an increased need for product quality and the recovery of faulty products. Companies are under pressure to follow the blogs and react to them themselves.⁷⁹

Blogs may reveal information that is sensitive to companies and employees have already lost their jobs for it. In Edelman study in 2006, 13% of companies were monitoring the blogging

⁷⁸ <http://www.sciam.com/article.cfm?id=the-healthy-type>

⁷⁹ See e.g. the case of “Dell sucks”, where the computer manufacturer got lots of bad visibility in the blogosphere about their maintenance services and as in the end, developed a new blog-based communication channel to better handle and respond to the feedback of the users [50].

of their employees [29]. According to Proofpoint research on US companies in 2007,⁸⁰ 21.4% of companies had investigated the exposure of sensitive information via blog or message board postings over the previous 12 months; as a result, 19.2% of the companies disciplined staff, and 9.1% terminated contracts of staff. 12.4% of US publicly-trading companies, according to the survey, investigated the exposure of material financial information (such as unannounced quarterly results) via a blog or message board posting in the past 12 months [88].

Blogging platforms often provide blogging facilities for free, but can charge for extra space or services.⁸¹ Platforms get revenues from advertising - for example, Weblog Inc has said that its advertisement revenue amounted to \$1,000 a day from Google AdSense alone [78]. Weblog Inc⁸² is also an example of a platform that pays for the bloggers. Hence, blogs provide a new means for self-employment, since bloggers can either sell their work to platforms or independently embed advertising to their blogs with by e.g. Google AdSense. However, the Pew Internet study of US bloggers in 2006 showed that only 15% of bloggers consider money-making as a motivation for blogging [61]. Furthermore, surveys suggest that blogging does not replace the day job, though it can bring in some extra money with small effort. Only 35-45% of bloggers get more than USD 100 per month with AdSense or similar systems.⁸³

2.5 Example initiatives with collaborative content

There is an increasing variety of applications and initiatives employing collaborative content creation by users. Internet users are enlisted to create information resources, share creative content and communicate personal reflections and assessments for different purposes. The annex of this report gives examples of initiatives categorized under preference sharing and management, communities of practices, crowd sourcing and supporting skills in content development. This section presents an example of each of the three first categories. Examples of initiatives supporting semi-professional content creation and making money with it, are given in Chapter 4 on the economic aspects of collaborative content.

2.5.1 Delicious, content preference sharing and management

Del.icio.us is a social bookmarking and tagging system that allows people to evaluate online content by storing bookmarks with tags of their own choosing (describing the meaning that the content has for them) and to access these bookmarks from any web browser. In this way, users a) indicate an interest/preference for a selected resource, b) can see and search each others bookmarks and tags, and in this way c) categorize resources in a bottom-up way. It is also possible to form networks for sharing and following bookmarks with other users. The service has an editing board, which, for example, removes copyright infringing links if requested to do so.

⁸⁰ Forrester implemented this study for Proofpoint by gathering 308 responses from US companies with 1,000 or more employees during March 2007. Respondents were qualified based on their knowledge of their company's email and messaging technologies.

⁸¹ For example, Typepad, Wordpress.

⁸² <http://www.weblogsinc.com/>

⁸³ See, for example, <http://www.csmonitor.com/2007/0205/p01s03-ussc.html>, <http://www.seroundtable.com/archives/016231.html>

Gathering together tags of different users and resources gives a new approach for organizing resources for later retrieval, i.e. personal or organization knowledge management. The result of this kind of system of user-generated tagging is called a folksonomy. A downside for searching purposes in a tagging system is that it does not provide uniquely understood cataloguing but a heterarchical system with multiple meanings. At the same time, the main benefit of a folksonomy is that it is dynamic and describes the present meaning and use of resources, instead of how the resources were planned to be used by expert-defined taxonomies. The consistency of the tagging system can be improved by complementing user tags with system-generated tags based on automatic content analysis. Del.icio.us informs the user of “recommended tags”, which are based on a cross analysis of the user's and other users' existing tags, and aim to reduce the diversity of tags. It is also possible to turn on the "Lazy sheep" option, so that the system selects the tags based on other users' tags. In November 2007, 40% of the bookmarks had one tag, 20% two tags, 15% three tags.

Usage. Del.icio.us announced in September 2007 that they had 3 million user accounts and 100 million unique URLs bookmarked.⁸⁴ Alexa.com shows that since end of 2006, this site's usage has been dropping (Figure 10). On 30 May 2008, its traffic rank was only 638th in the best ranking country UK, having dropped from 120th in October 2007. In the Spire survey, 9.4% of respondents had contributed to it, 12.3% had viewed the bookmarks and 78.4% had never used it. The main motivation for usage was study (5.3% of respondents), and "for fun" was second with 3.8% [112].

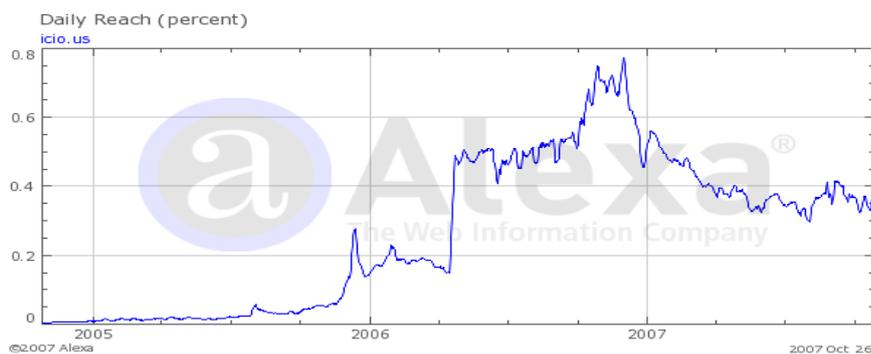


Figure 10 : Del.icio.us traffic development 2005-2007 (www.alexa.com)

Del.icio.us was bought by Yahoo! Inc. in 2005, before it had developed a solid business model. Even today, no information about the business model is available, however the front page of the service contains a ‘hotlist’ of links which have been selected by the platform maintainer, on the basis of real-time selection by users. Although no clear advertisements can be seen on the pages, it could be a future option for a business model. However, because of its textual content, the costs of running the service are very low: at the time it was bought by Yahoo!, the service was running on only two servers.

A competing bookmarking service studied the types of del.icio.us bookmarks and suggested that the majority are for news resources, and fewer for general interest resources.⁸⁵ This could

⁸⁴ <http://www.techcrunch.com/2007/09/06/exclusive-screen-shots-and-feature-overview-of-delicious-20-preview/>

⁸⁵ http://www.bookmarksync.com/press/041207_1

imply that the users are often adults, who use the service for staying up to date with events and information.

The possibility to organize resources with personal tags and to access the bookmarks from any environment improves the facilities for personal knowledge management, supporting and connecting resources, learning and working in new ways. Server-based bookmark sharing systems promote information sharing in projects and between people, improving work efficiency and collaboration facilities.⁸⁶ The benefits of tagging and bookmark sharing have been recognized by many organizations, and enterprise knowledge management platforms are integrating this feature in the software. This may partly be the reason for the decline in this separate application for bookmark sharing.

2.5.2 Ganfyd, content support for medical community

Ganfyd (<http://www.ganfyd.org>), is a collaborative medical knowledge base, launched in November 2005 by a group of medical doctors and students who had been using Doctors.net.uk.⁸⁷ Ganfyd uses MediaWiki FLOSS and has a variant Creative Commons content licence, which was specifically developed for this site. Content providers are not paid for their contributions. The site has no advertisements, and has announced that it may go for donations in the future.

On 30 May 2008, Ganfyd had a total of 12,688 pages in the database. These include "talk" pages, pages about Ganfyd, minimal "stub" pages, redirects, and others that do not qualify as content pages. Excluding those, there are 5,176 content pages. There have been a total of 2,331,384 page views, and 37,765 page edits since the wiki was setup. There are 92 registered users, of which 13 (or 14.13%) are administrators.⁸⁸ However, editors do not need to register, and Wikipedia suggests that in July 2007, Ganfyd had 380 editors from six countries: United Kingdom, Australia, New Zealand, Canada, Eire and USA.⁸⁹

Only medical professionals and invited non-medical experts can contribute and edit this wiki, but everyone can access the contents. The disclaimer informs users that the site is directed at health professionals. According to Alexa.com, on 30 May 2008, the Ganfyd audience came mostly from the US (32%), the UK (26%), India (9%), Egypt (2%), Malaysia (1%) and, in terms of Internet traffic, it ranked most highly in Estonia, the UK, Egypt, the Philippines, Malaysia, India, the Czech Republic and the US, in this order.

Because the initiative is so new, little impact has been detected so far, although it has been suggested that it has had some impact on medical practice already.⁹⁰ The key idea behind this initiative is the provision of free, up-to-date, un-biased, high quality medical theoretical and practical information to health professionals all around the world. As health professionals have raised concerns about the reliability of the medical information provided by internet

⁸⁶ For example, IBM uses this approach and although only 1% of employees is creating shared bookmarks, everybody can use the already existing 24000 shared bookmarks, which "often prove to be better match than the search engine" [47].

⁸⁷ <http://www.doctors.net.uk/> is a medical network in the United Kingdom with 149.716 doctor members.

⁸⁸ <http://www.ganfyd.org/index.php?title=Special:Statistics>

⁸⁹ <http://en.wikipedia.org/wiki/Ganfyd>

⁹⁰ "It is in use in a growing number of UK and Australian Medical Practices already as a general reference system", (<http://www.linuxmednews.com/1132341490/index.html>)

sources, the potential use of this professional wiki is high among this community (i.e. English speaking health professionals). There is also an initiative to create a Ganfyd version in Norway.⁹¹

2.5.3 US Peer-to-patent project, crowd sourcing for public service

Patent Offices worldwide are facing increasing challenges, because of the increasing number of patent requests they have to examine, and the difficulty of ensuring that the examiners have adequate knowledge. The result is a delay in examining the applications, and a very high rate of approval (more than 90%). This is a knowledge intensive part of government activities. The Patent Office is the paradigmatic example of the challenge faced by regulatory agencies: how to make complex decisions without the benefit of adequate information.

The Peer-To-Patent project⁹² was launched on 15 June 2007. Although it was originally expected to run until 15 June 2008, it has been decided to keep the project running. The project opens up the initial phases of the patent examination process. In particular, it aims to involve external experts in assessing the current state of the art on the theme addressed by the patent. Experts review the patent applications, propose relevant state of the art material, assess the proposed material and rank it, in order to enable the US Patent Office to examine only the most relevant information ("top 10") when deciding whether or not to grant the patent.

The New York Law School launched this project, which was then officially endorsed by the US Patent Office. It is now a partnership between Government, academia and the private sector (sponsors include IBM, Microsoft, HP etc.). The budget of approximately USD 1.5 million has been funded half by foundations, including the MacArthur Foundation and the Omidyar Network, and half by corporate sponsors, including IBM, Microsoft, HP etc. The reviewers are voluntary and not paid.

The project provides open information on patent applications, voluntary engagement of external experts to perform an internal government function and non-restricted participation - expertise is self-declared and valued ex-post by other participants. The idea is that the numerous participants in the process compensate the effect of bad apples or unconstructive participants. The community is self-regulating: 1) experts rank the claims of a patent application to identify the most relevant/representative ones, hence focusing community attention and labour where most needed; 2) experts rank prior art submitted by the community in response to a patent application, hence creating manageable and searchable output for patent examiners; 3) experts rate other participants to encourage the right kind of participation.

From the Peer-to-Patent launch on 15 June 2007 up until May 2008, there were 255,368 page views from 44,031 unique viewers in 137 different countries/territories. 2,060 people have signed up to be reviewers and have cited 192 instances of prior art on 42 applications.⁹³ On average, each posted application gathered a community of 14 reviewers who submitted five

⁹¹ <http://no.ganfyd.org/index.php?title=Hovedside>

⁹² <http://dotank.nyls.edu/communitypatent/>

⁹³ <http://cairns.typepad.com/peertopatent/2008/05/peer-to-paten-1.html>

instances of prior art per application.⁹⁴ In May 2008, there were 16 applications available for public review.⁹⁵

The expected benefits from the project are a faster and improved decision-making process in the patenting process, leading to better market opportunities and less uncertainty for companies. The anniversary report of the project states that the office has been very pleased with the initial outcome [4]. 73% of participating examiners want to see Peer-to-Patent implemented as regular office practice. 21% of participating examiners stated that the prior art submitted by the Peer-to-Patent community would have been “inaccessible” to them. A sign of attention is that patent offices in Europe have expressed their interest in transferring this project to Europe. The Japanese patent office has announced that it will launch a similar community patent project.⁹⁶ However, there are risks as well, such as low participation, low quality input, manipulation of input, and abuse of information contained in patent applications [83].

2.6 Aspects of participating in content communities

In its simplest form, content-based collaboration is about sharing one’s creations, assessment and ideas, on collaborative platforms, where others can do the same. In its most advanced form, all users can participate in creating new content, altering and enhancing content, or commenting, discussing, assessing existing content. In practice, a large number of community members only use and follow the content, without participating in the creation. They may, however, contribute by commenting, reporting errors and suggesting improvements, as well as by spreading the knowledge of the content to other users and taking it to the offline world.

This chapter has shown examples of large collaborative content applications, such as Wikipedia, YouTube and blogs, in which huge numbers of people participate. There is also a very large number of small collaborative content communities, of which some examples are given in the Annex. This section discusses some of the aspects affecting people's interest in the communities, with the viewpoints of motivation, trust, and privacy.

2.6.1 Motivation

Creating and publishing content is both self-expression and a form of communication. Personal motivations for content-based collaborations are related to self-expression, enjoyment and sharing personal experiences and knowledge [61][12][77]. Research has shown that in work environments, employees participate in wikis, because they want to enhance their reputations, help the organisation to improve its processes, and because they find it useful for themselves [66]. Participating in collaborative content production can also be experienced as a form of socialising with a community of common purpose [9].

⁹⁴ <http://cairns.typepad.com/peertopatent/2008/04/public-successf.html>

⁹⁵ <http://cairns.typepad.com/peertopatent/2008/01/peer-to-paten-2.html>

⁹⁶ <http://cairns.typepad.com/peertopatent/2008/05/japan-patent-of.html>

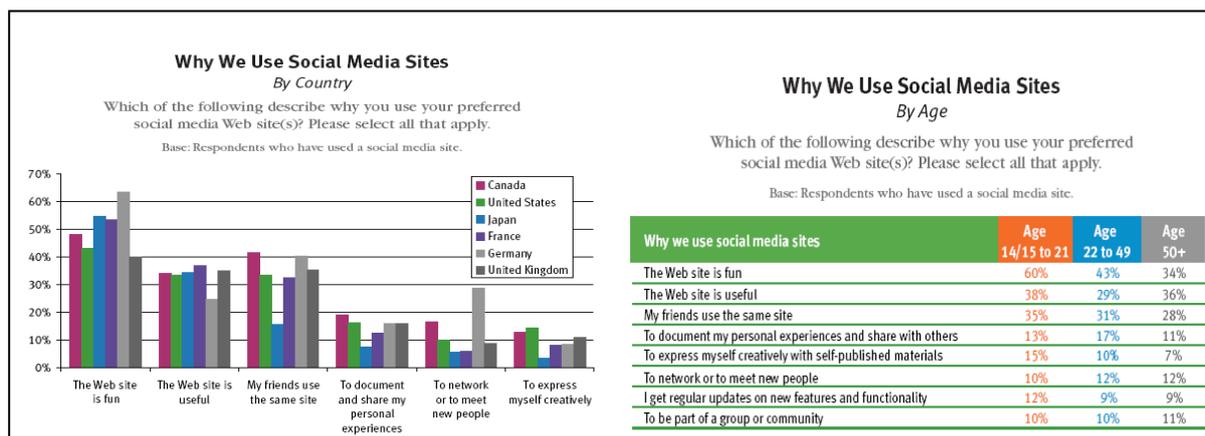


Figure 11 : Motivations for using social media sites by country and age (OCLC study [77]).

Individual creation, sharing, and then socializing through commenting and new creations with media sharing applications (such as YouTube) seem to be especially appealing to younger audiences. Older people appear to be participating more often in informative and communicative applications, such as Wikipedia and blogs, which allow sharing knowledge and creating content-based discussion. Also the Spire survey confirms that older people use Wikipedia, blogs, and discussion forums almost equally to young people, but they use social networking sites and YouTube clearly less [112]. Figure 11 shows that the enjoyment was an important motivation for participation, but older users, especially, also appreciate the usefulness of social media sites [77]. Communicating and networking through media was important for all.

Motivation for creating and sharing review content seems to be high in bottom-up communities close to consumers' interests, e.g. on travelling sites. However, organising initiatives based on crowd sourcing review work of content does not always prove to be successful.⁹⁷ It may be that the aspect of only providing reviews on content created by others does not attract as many people as the motivation for sharing personal experiences.

2.6.2 Trust

The Spire survey had notably smaller differences between the shares of content contributors and viewers than surveys of general internet audiences. This suggests that the collaborative content tools are perhaps considered more useful and interesting by people who have higher education or are interested in acquiring it. This is also supported by the Pew/Internet memo in 2007 showing that higher educated people use Wikipedia more [93]. However, this may also come from the fact that these people are better aware of the opportunities of these tools.

Many content platforms complement the content by providing users with the possibility to comment on, rate or categorize the content, which improves finding relevant content for the user's own purposes. Collaborative content provides new sources of trust by showing

⁹⁷ For example, Nature magazine arranged an experiment with open peer review, in which authors could choose the option of receiving public comments for their article submissions. Only 5% of authors took the option, and they received only few comments. Although the comments were considered to have some value by the authors, the editors did not think them to contribute significantly to decision making. http://blogs.nature.com/wp/nascent/2006/12/nature_open_peerreview_trial_c.html

information of how other users assess the resources with voting, tagging etc. and by publishing their specific reviewing content about the value and usefulness of offline products, services and concepts. Publicly-posted feedback messages, ratings and votes are forming internet-based reputation systems both for individual actors (e.g. on auctioning sites, or content providers on common platforms) or businesses (restaurants, computer manufacturers). Social networks are also important - for example, 32% of respondents in the IBM global study⁹⁸ said they found content on UCG sites, like YouTube, through recommendations from their friends [10].

Internet users trust the reviews of other users more than information from official sources, especially from commercial companies, as demonstrated in Figure 12 on the survey results of European online adults [22]). According to the Edelman Trust Barometer 2008,⁹⁹ 63/61% of the 25-34 year-olds are likely to share their opinion and experiences on the web about companies they trust/distrust [27]. This is statistically higher than the 56/54% of 35-64 year-old survey respondents who were willing to do so. Furthermore, 25-34 year-old respondents trust each collaborative content source strongly on the information they give about companies (44% trust free content encyclopaedia such as Wikipedia, 26% trust blogs, and 25% trust video-sharing sites such as Youtube).

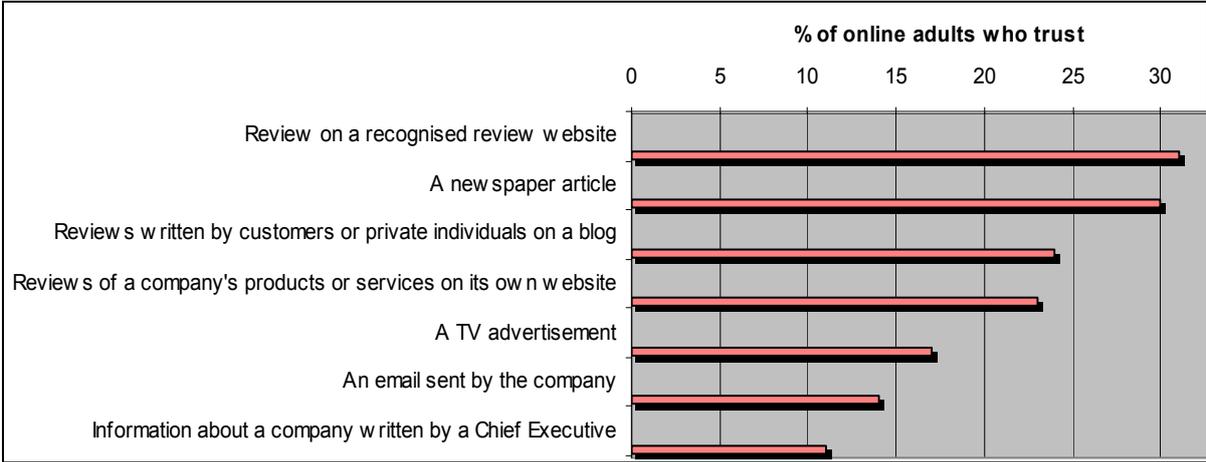


Figure 12 : Online user trust on information (Ipsos [22]).

The OCLC study also supports the perception that people trust social media sites, although not necessarily the people on these sites [77], as shown in Figure 13.

⁹⁸ IBM surveyed more than 2400 consumers across five countries: Australia, Germany, Japan, the United Kingdom and the United States.

⁹⁹ Edelman Trust Barometer 2008 interviewed in Oct –Nov 2007 (i) 25-34 year-olds in 12 countries: US 100, China 75, UK 50, Germany 50, France 50, Russia 50, Mexico 50, Brazil 50, Japan 50, South Korea 50, Canada 50, India 50, and (ii) 35-64 year-olds in 18 countries: 400 in the US, 300 in China, 150 each in the UK, Germany, France, Italy, Spain, the Netherlands, Sweden, Poland, Russia, Ireland, Mexico, Brazil, Canada, Japan, South Korea, India.

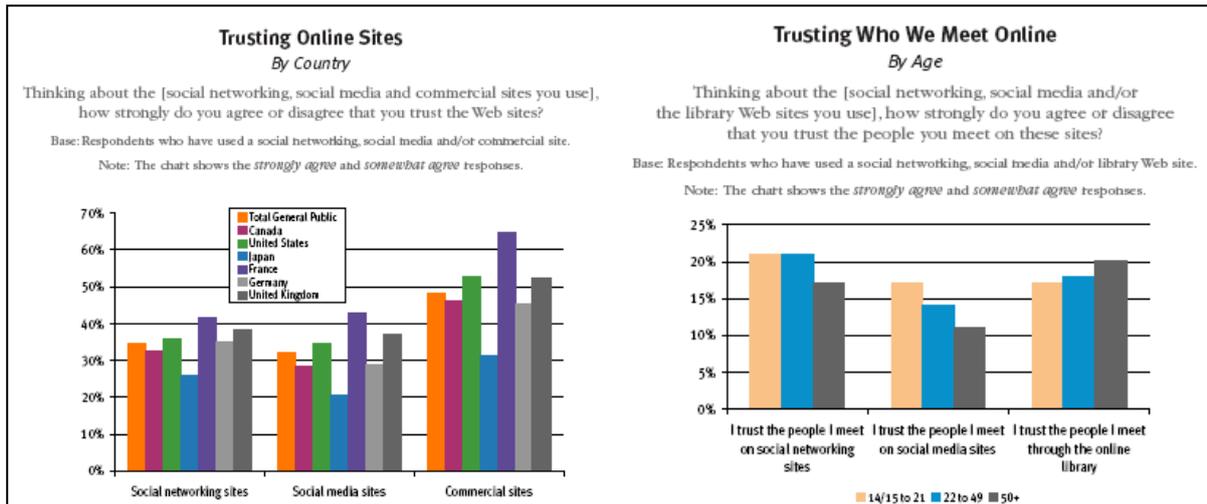


Figure 13 : Trust on online sites and on people met there (OCLC study [77]).

2.6.3 Private or public?

Studies show that although people are sharing their personal information and creations online, they do not necessarily always feel comfortable in doing so. A study on the photo-sharing site Flickr showed that people would like to share in excludable ways, by having dynamic groups for limiting the visibility of their photos. Users were especially concerned about revealing the metadata related to the photos, such as tags which reflect names and relationships of the people in the photos [99]. Conflicts may also rise when originally private content is released into public distribution (for example videos of an ex-girlfriend) or intended niche content gets the attention of a larger audience as it is hosted on an open platform [62].

The OLCOS study surveyed how cautious people are in giving their personal details to websites, and found that a large group of people would like to remain anonymous (Figure 12). Only 34% of respondents believed that social media sites would keep their personal information secure, while 65% of respondents trusted in commercial sites in this respect. Many of the respondents would not provide their real contact details, but would reveal their real age in the profile. However, most of the respondents would trade their contact information for more personalized services or for connecting with similar people. Older respondents were especially willing to give their contact information for connecting with others. [77]

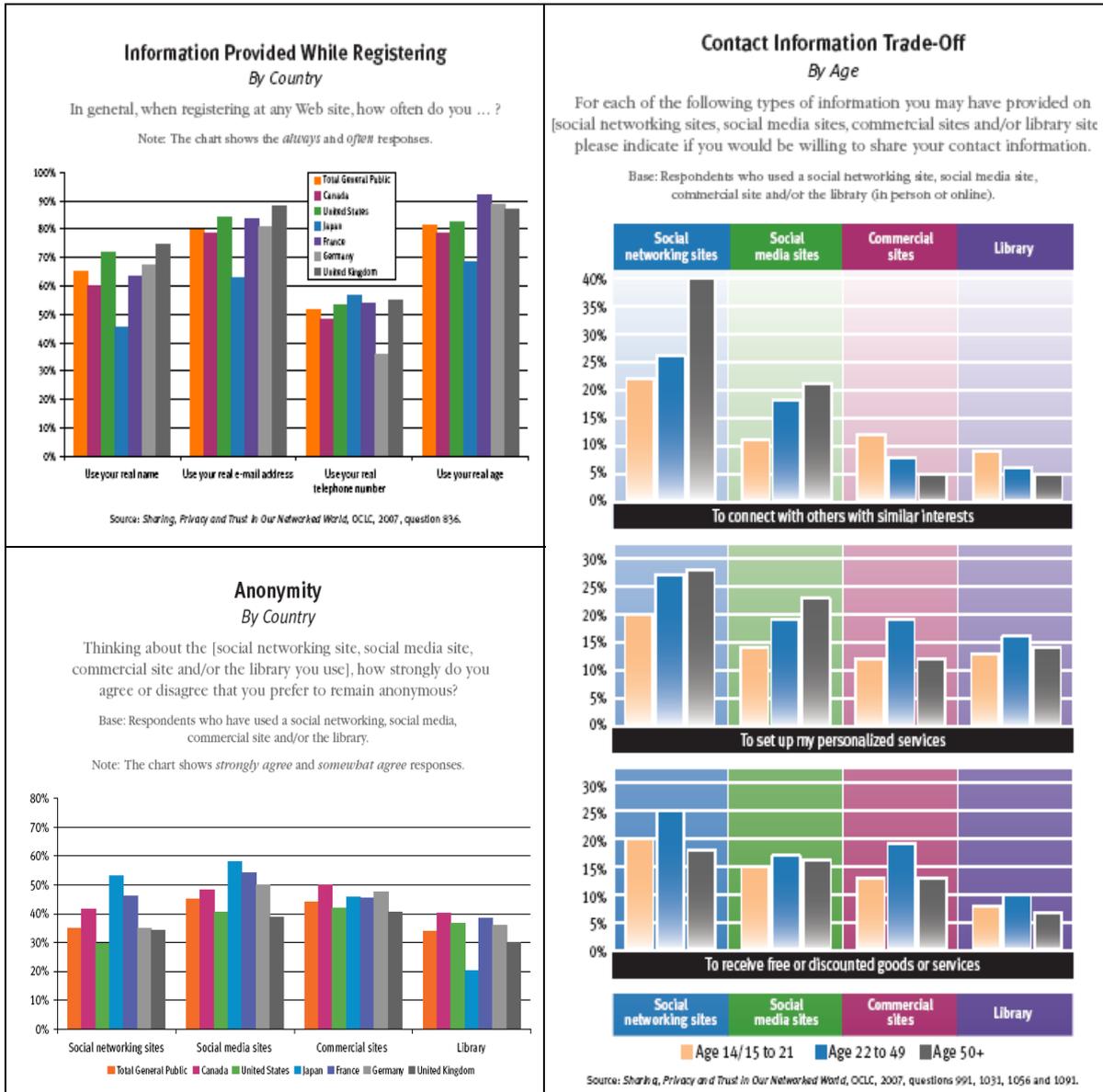


Figure 14 : Survey results on revealing personal information (OCLC study [77]).

3 Open source software collaboration

Collaborative production over the internet is not a new phenomenon, created by social computing applications. Collaborative products with open collaboration communities have been around for a long time, although in more closed communities, requiring more than basic IT skills for participation. Open source software development communities can be seen as predecessors to more general collaborative content development on the Internet. For example, Wikipedia is using both tools and models developed by them. This chapter aims to give an overview of open software development communities and their similarities to collaborative content applications. In addition, this chapter gives a brief overview of the types of open licenses which are enabling the emergence of open collaboration for different contexts.

3.1 Basic concepts

A proprietary software product is typically implemented by specific project personnel and delivered as an executable computer program to the customer. The customer has only limited rights for using and distributing the software and no access to the source code. If the customer wants to have changes made to the software (even correcting errors), these have to be separately bought/commissioned from the vendor. Hence, for the customer, "buying a software product" does not actually mean buying its ownership. This has been compared to buying a car, for example, and not being able to change the CD player in it. The ideology of free software arose from objections to this limited ownership of the software, and led to open communities of software developers.

The Free Software Foundation¹⁰⁰ (FSF) was founded in 1985, and provided the basis for the Open Source movement which emerged in late 90s. Software is defined as 'free' if the user has the right to run, copy, distribute, study, change, and improve the software.¹⁰¹ The word "free" is used in the same sense as it is in "free speech" and not as it is in "free beer", i.e. free software can also be freely used for commercial development. A computer program is free software if users, without the need to ask or pay for permission, are free to:

1. run the program, for any purpose;
2. study how the program works, and adapt it to their needs;
3. redistribute copies so they can help their neighbours;
4. improve the program, and release their improvement to the public, so that the whole community benefits.

Today, the term "open source" (OS) is often more familiar to the public than free software, mostly because of some well-known OS projects, such as Linux¹⁰² and Apache.¹⁰³ The main difference between Free Software and Open Source lies in the ideology: the Free Software community regards access to the source code as a fundamental right, the Open Source movement considers it to be a practical issue supporting collaborative software development

¹⁰⁰ <http://www.fsf.org/>

¹⁰¹ The Free Software Definition, <http://www.fsf.org/licensing/essays/free-sw.html>

¹⁰² <http://www.linux.org/>

¹⁰³ <http://www.apache.org/>

[102]. FLOSS (Free, Libre and Open Source Software) is often used to refer to both types of software.

In software development, access to the source code is a precondition for fulfilling all the rules above. In content development, some of those freedoms are achieved automatically, such as reading the contents or redistributing it to other users. However, for collaborative improvement efforts to a content resource, the requirement for the editable form of the content (equivalent to the source code in the software) is essential and not automatic. For example, resources that are available only in secured PDF (portable document format) or PostScript cannot be easily edited. Sharing contents in these formats only allows the user to use the content, and the user's contribution to content can only be in the form of sharing, reviewing, rating, or tagging the resource.

Open standards and licenses

Open standards and licenses are enablers for collaborative participation, both in a technical and an economic sense. Open standards refer to implementation interfaces, enabling the development of components that can communicate with each other, and hence facilitate tailoring and building products/services incrementally. Many software developers use open standards to improve the applicability of their products and FLOSS communities are typically based on open standards.

For content, open standards mean file formats that can be used with different software applications. For example, Hypertext Markup Language (HTML) is a presentation description format defined by the World Wide Web Consortium,¹⁰⁴ which can be viewed by any browser application and edited in many types of editors, both proprietary and FLOSS. However, collaborative content development communities may also use proprietary content formats, e.g. Microsoft Word documents for developing and sharing content. This restricts the group of potential participants to those using the same (commercial) software environment for content editing. Tools such as MediaWiki software¹⁰⁵ have boosted the possibilities for content collaboration by creating environments where users can create, comment on and improve content with user-friendly and easily accessible web interfaces.

FLOSS may be produced under several different licenses with differing conditions. It is possible that the license allows all the basic freedoms of free software as listed above. However, the most typical restrictions in licenses concern:

1. *Forbidding the addition of restrictions to the license when modifying the product.* 'Copylefted' software means free software, the distribution terms of which do not allow redistributors to add additional restrictions when redistributing or modifying the software.¹⁰⁶ It follows from this that every copy of the software, even when modified, must be released under a similar license. The GNU General Public License (GPL) is an example of a well-known copyleft license.¹⁰⁷ Open Source software is often close to the definition of copylefted free software.¹⁰⁸ However, OS licenses may also

¹⁰⁴ <http://www.w3c.org/>

¹⁰⁵ <http://www.mediawiki.org/wiki/MediaWiki>

¹⁰⁶ Categories of Free and Non-Free Software, <http://www.fsf.org/licensing/essays/free-sw.html>

¹⁰⁷ <http://www.gnu.org/licenses/fdl.html>

¹⁰⁸ The Open Source Initiative (<http://www.opensource.org/>) manages the Open Source Definition and the list of licenses that fulfil it.

provide more freedom (not requiring further distribution to have the same license) or define additional restrictions (e.g. technology neutrality).

2. *Restricting commercial utilisation.* Semi-free software is free software that individuals can use, copy, distribute, and modify as long as they do not make a profit out of it. It is important to note that there is both commercial and non-commercial free software (i.e., one should not confuse the terms 'commercial' and 'proprietary').

Although FLOSS development communities work on software, they have also developed text content such as manuals, and have developed content licenses for them. The GNU Free Documentation License (FDL)¹⁰⁹ is a copyleft license, similar to the GNU GPL. As with software and source codes, FDL requires that a modifiable form of the document is available. FDL is mostly used for software manuals and books, but, for example, Wikipedia uses this license as well.

Presently, very commonly used open content licenses are defined by the non-profit Creative Commons Corporation.¹¹⁰ Creative Commons provides flexible licenses for different kinds of materials, giving the author the possibility to select the restrictions and permissions granted in the license. For creative works, there are also sampling licenses that allow parts of the work to be used, while prohibiting the use of the whole work. The organisation supports authors by providing a web-based facility which allows them to easily create and attach a suitable license to their work. Table 1 presents the basic elements that can be selected and combined to form a Creative Commons license. The basic license elements for content follow the example of software licenses (forbidding the addition of license restrictions, or requiring non-commercial use). In addition, it is possible to require that the work is used only as it is, without modifications.

	Attribution. The work can be copied, distributed, performed and modified, when the author is given credit from his work in the way requested. This is a compulsory element in the license.
	Non-commercial. The work can be copied, distributed, performed and modified only for non-commercial purposes.
	Share Alike. The derivatives of the work must be distributed under a similar license to the one that governs the original work.
	No Derivative Work. The work can be copied, distributed and performed only in its original form; no modifications are allowed.

Table 1: Basic elements available for Creative Commons licenses (information based on <http://creativecommons.org/about/licenses> and images used under [Creative Commons Attribution 3.0 License](http://creativecommons.org/licenses/by/3.0/))

¹⁰⁹ <http://www.gnu.org/licenses/fdl.html>

¹¹⁰ <http://creativecommons.org/>

3.2 Collaborative FLOSS communities

FLOSS development projects were the first large scale collaboration projects on the Internet which allowed anyone to participate in the community and make their contribution. FLOSS development projects vary from minor projects with only a small initial group of developers to large multinational initiatives, competing with proprietary software (e.g. Linux OS,¹¹¹ Apache web server,¹¹² OpenOffice office software,¹¹³ Moodle learning management system¹¹⁴). Communities are composed of both professional programmers and people who have less experience in programming. Additionally, software users contribute to the community by sending error reports and suggestions for new features, or by contributing to the contents of the software manuals or to the translation of the software user interface.

It is often stated that free/open source software is more secure and reliable than proprietary products, because the volume of peer review can be much larger than in the internal inspections in software companies [20]. It is also claimed that FLOSS can lead to more innovative, versatile and cost-effective solutions, which support a larger variety of platforms than proprietary software. As the improvements are incremental, recruiting new developers to bring their knowledge and capacity to the project can lead to rapidly increasing system functionality [105]. However, open source development principles do not guarantee special attributes for the software products as such; the results depend on the size and quality of the community behind the work.

Software developer motivation for releasing software as open source often has a traditional argument: “What you give, you receive back improved”. The nature of software development is such that more developers can improve the quality of the software by noticing errors. They can also enhance the original product with new features and its usage possibilities in different environments. Hence, releasing FLOSS gives the software a chance to get more users and visibility, which can motivate both individuals and businesses to release their products as FLOSS.

A survey study of 684 FLOSS developers showed that the strongest driver for participating was enjoyment-based intrinsic motivation, even though 40% of respondents were paid for participating in the FLOSS projects [59]. The top reason for contributing was participating in an intellectually stimulating project (44.9%), improving ones own programming skills was a close second (41.8%) and the willingness to participate in an open source community (as an ideology) came third (28.6%). The survey showed that beating commercial software ranked low among respondents as a motivating factor, even though this is often publicly mentioned as being part of the ‘FLOSS attitude’. Community reputation and professional development also ranked low in the total sample, though it did motivate 22.8% of the respondents who were paid contributors. The most common motivation for paid contributors was work-related user needs (56%), for voluntary contributors improving skills (45.8%) or their own need of the software (37%). [59]

Successful co-operation requires that developers share the basic knowledge of the requirements and the architecture [34]. In practice, several software projects have gone open

¹¹¹ <http://www.linux.org/>

¹¹² <http://www.apache.org/>

¹¹³ <http://www.openoffice.org/>

¹¹⁴ <http://www.moodle.org/>

source only after the basic implementation has been completed. This approach provides something concrete to share that others can familiarize themselves with, use, adapt, and improve if they find it interesting enough. This means that projects start small and get bigger only if they raise enough interest and motivation for others to join. Research shows that in most open source projects the developer community is small and the number of developers correlates positively to the age of the project [58].

3.3 Related business models

The availability of the software source code may not seem a relevant subject for discussion, since many software users do not have the skills to modify computer programs by themselves. However, it is important to note that open access to source codes also provides users with the freedom to decide who is doing the development or maintenance work and where to use the software. There are cases where public organisations have concluded that open source is the most cost-effective choice for them. For example, the discussion paper of the Justice Ministry of New Zealand¹¹⁵ states that government adoption of OSS is extensive around the world and that an explicit strategy for its adoption is needed [85]. Table 2 compares the differences, from an institutional viewpoint, between FLOSS and proprietary software with regard to various attributes.

Attribute	FLOSS	Proprietary software
License	Licensed to provide freedom to use for any purpose, modify, and redistribute.	Licensed to restrict use to “acceptable uses”, not allowing modification or redistribution.
Control	Consumers and providers of commercial products have equal access.	Vendor is in control.
Innovation	Rapid and diverse. Incorporates a large community of users and developers working in parallel.	Limited to vendor investments. Typically caters to the features sought by the largest audience. May have low level of innovation.
Risk of abandonment	Software will be along as long as it serves a useful purpose among the audience. The larger the adoption, the safer the investment.	Depends on the success of the vendor.
Costs	Initial acquisition costs are low, and do not depend on the scale of the use. Support and training can be organized internally or by selecting the implementers.	License costs that depend on the scale of the usage. Lack of choice in support, costs determined by the vendor.
Platform support	Broader platform and server support, fits more easily to existing institutional infrastructures.	Platform support limited to what the vendor offers. May not fit well with institutional infrastructure.

Table 2: Differences of FLOSS and proprietary software products (adapted from [20])

Limiting the access to the software source code is important for software businesses which rely on selling access and usage rights to proprietary software. With FLOSS products, business models have to be built on services or products providing additional value for the software user, as opposed to the basic software itself, which is available for free. Companies can deploy one or more OS-related mechanisms for commercial goals.

¹¹⁵ <http://nzoss.org.nz/news/2007/ministry-justice-open-source-discussion-paper>

In the *dual-license model*, a software developer publishes the code under an open source license and a commercial license simultaneously. The commercial license includes, for example, additional closed-source features, supplementary documentation, testing, and quality, as well as intellectual property indemnification to protect the purchaser from legal liability. The license differentiation can be based, for example, on the type of use, requiring that full-scale or commercial users need to buy a license.

Software developers can build new products based on OS software using *functional encapsulation*, where an open source framework or library is installed on a user's computer separately from the commercial product. For example, Sony uses Linux core (released under GPL license) as part of their products. This requires them to make available the modified versions of the Linux source code under GPL,¹¹⁶ but lets them keep private the other parts of the software.

The company can use the model of *software as a service*, where software is not shipped to the user or installed on his computer. In this case, vendors typically charge a subscription fee for the use of their hosted applications. Maintenance and user support for the software are typical examples of services which are very important for institutions taking up new software. As FLOSS communities do not provide formal support or local maintenance, this model is very useful for organisations with insufficient resources or interest to set up their own IT administration services.

Companies can also base their business on *support, training, and consulting services* that assist users of the open source software. Vendors may charge, for example, annual fees for support, per-student or per-course fees for training, and per-project fees for consulting tasks, such as integration or customisation of the software to the environment of the customer. As the installation and usage documents of FLOSS are often not as polished as they are in proprietary products, companies can also do business by packaging and delivering the software and manuals (e.g. on CD-ROM, books), making it easier for new users to start using the software.

FLOSS projects can be, and often are, hosted on a common platform, which operates on a business basis. For example, SourceForge, Inc.¹¹⁷ hosts OS software projects for free, but adds advertising of related companies to the main pages and builds a network of other related resources, such as Slashdot, ThinkGeek, Linux.com, freshmeat.net, ITManagersJournal and NewsForge. In April 2007, the SourceForge network served more than 33 million unique visitors each month from around the world.¹¹⁸ In June 2008, the SourceForge.net site hosted 179,000 registered OS projects, having 1.86 million registered users. According to Alexa.com in June 2008, its global traffic rank average of last 3 months was 124th. The traffic to this site came mostly from the US (20%), and then from Germany (9%) and Italy (6%).

Finally, companies engaging in open source software may also do so in order to gain indirect commercial benefits, by (a) reducing the influence of proprietary software vendors (e.g. Microsoft), (b) targeting open source users with commercial products at a later stage, or (c) developing a large community, which is often used for corporate valuation.

¹¹⁶ <http://www.sony.net/Products/Linux/Download/search.html>

¹¹⁷ <http://sourceforge.com/>

¹¹⁸ Source Google Analytics and Omniture, according to http://web.sourceforge.com/about_us.php

3.4 Socio-economic impact

A report on the impact of open source software in Europe¹¹⁹ concludes that the existing code base of quality FLOSS applications with reasonable quality control and distribution would cost firms almost 12 billion euros to reproduce internally. This has doubled every 18-24 months over the past eight years, and this growth is projected to continue for several more years. FLOSS directly supports a 29% share of software that is developed in-house in the EU (43% in the U.S.), and is said to provide a natural model for software development for the secondary software sector. Firms have invested an estimated 1.2 billion euros in developing FLOSS. [39]

Companies which base their business models on FLOSS products can benefit from the innovations of the developer community (both software improvements and comments and error reports of a large group of users). For example, 40% of the source code of the Firefox web browser comes from outside the employees of the Mozilla corporation – although they have put many contributors from the community on their payroll [72]. It has been estimated that FLOSS potentially saves industry over 36% in software R&D investment, which can result in increased profits or be more usefully spent in further innovation [39].

The European study concludes that the existence of FLOSS communities improves the software development skills of the people participating, both professionals and non-professionals, and therefore contributes to the competitiveness of the workforce. Furthermore, the report concludes that by providing a skills development environment valued by employers and retaining a greater share of value addition locally, FLOSS can encourage the creation of SMEs and jobs. [39]

FLOSS has a positive effect on Information Society inclusion, as it enhances computer usage in general in poorer regions, both for individuals and institutions (e.g. schools), by providing important applications such as operating systems and basic office tools at low or no costs. Also better customisation (e.g. adapting interface language) has improved the utilisation of computers in institutions, and provided the possibility of adopting ICT-based work practices. In educational and work usage, FLOSS provides the possibility of using the same software both at the place of work/study and at home, without expensive licenses.

The openness of software supports the users' abilities to innovate in their work tasks when using the software. For example, in the educational environment, the emergence of the Moodle learning management system¹²⁰ increased rapidly the tools available for teachers to try different learning approaches. Innovative teachers could collaborate with the community, and new modules, developed for e.g. peer reviewing, wiki tools, automatic assessment, informed other teachers about these new methods by providing the tools available. Hence, rapid innovations in tool development also distribute knowledge about new working models for tool users. There are also examples where students and teachers use FLOSS tools to learn new collaboration models with the global Internet society and contribute to tool development [63].

FLOSS has also had a major impact on the development of content collaboration projects. First of all, many of the most common platforms are based on FLOSS software, i.e. were

¹¹⁹ <http://ec.europa.eu/enterprise/ict/policy/doc/2006-11-20-flossimpact.pdf>

¹²⁰ <http://www.moodle.org/>

already created by a collaborative community for collaboration purposes. Secondly, FLOSS provides models for open licenses that can be used to guarantee the continuing development of the work. Thirdly, FLOSS communities provide examples of collaborative open working models (e.g. community accreditation and content managing organisation) for content communities.¹²¹

3.5 Discussion

FLOSS examples show that it is possible to collaboratively create resources that are serious competitors to proprietary resources. For example, the Apache web server had a dominant market share of 48% of active web servers in May 2008.¹²² MySQL is a business success story, in which the core software was released under OS license, and the business model was based on separate commercial licenses and additional services.¹²³ Gartner has forecasted that, by 2011, at least 80% of commercial software will contain significant amounts of open source code.¹²⁴ A considerable amount of OS-supported software already exists in Europe [39].

FLOSS projects that are found intellectually interesting and contribute to important goals, attract both professional and non-professional developers. The large communities are well organized, and also contain paid contributors. The acknowledgement and position of individual contributors in the community depends on the skills they demonstrate in the project. Their participation is motivated by the personal desire to participate, learn, share the products of their work, to improve the product for their own use, and also by financial gain, as there are several companies which base their business on FLOSS products. Open standards are typically used to improve the interoperability, and open licenses are used to ensure the continuous evolution of the products. FLOSS products have several attributes that make them a very competitive option when compared to proprietary software. The reduced costs for access have been especially important in increasing the availability and use of computers in developing regions. The customizability of the product, dynamic development and the possibility to contribute to it, are important for institutional users.

When compared to FLOSS communities, collaborative content authoring projects, such as Wikipedia, are the ones closest to them. Like FLOSS communities, the working model for Wikipedia is based on combining user-generated content with user-based evaluation and collaborative improvements by all community members. Both FLOSS communities and collaborative content projects with multiple content creators need clear common guidelines and a motivating goal. Tensions between groups with different opinions can create constantly changing contents and even vandalism, as well as a lot of discussion on the related discussion platform. The quality of the (content) product is important for attracting more people to participate in the community [96] and with Wikipedia, for example, the search for the best quality assurance model still seems to be going on.

As with FLOSS projects, there are many small collaborative content communities and only a few large ones with a high number of participants. Another similarity is that, a lot of community members use the collaborate content, but do not participate in the creation work

¹²¹ http://www.estigmergia.net/en/w/index.php?title=Table_of_comparisons_Wikipedia-OS

¹²² http://news.netcraft.com/archives/2008/05/06/may_2008_web_server_survey.html

¹²³ <http://www.mysql.com/news-and-events/sun-to-acquire-mysql.html>

¹²⁴ <http://www.networkworld.com/news/2007/092007-open-source-unavoidable.html>

directly. They may, nevertheless, contribute by commenting, reporting errors and suggesting improvements, and by spreading the knowledge of the products to other users.

Studying FLOSS communities may give useful information about collaborative development communities, which is also applicable to content collaboration. Studies of FLOSS communities suggest that motivations for participating are largely intellectual, which might be related to the fact that learning programming skills is heavily based on personal programming experience. With software, the issue of quality assurance is also supported by the non-negotiable forces of source code compiler and functional testing, which can point out clear errors in the work [26]. Hence these community models, their motivations and quality assurance, may not be directly transferred. However, they offer related resources for research on collaborative content communities. Commercial models for utilising FLOSS communities are also applicable (and have been applied, as will be shown in later chapters) to collaborative content, hence they provide material for studying the economic viability of the collaborative communities in the future.

4 Economic impacts

Collaborative content is becoming an important economic phenomenon with direct impacts on a widening range of actors in the content-related value network. The McKinsey worldwide survey in 2007¹²⁵ showed that more than half of the company executives said they are pleased with the results of their investments in web2.0 technologies over the past five years and nearly three quarters say that their companies plan to maintain or increase investments in web2.0 technologies in coming years [68]. Companies that acted quickly in the previous wave of investment are more satisfied than late movers. More specifically, from the companies surveyed, 33% plan to invest in wikis, 32% in blogs, and 48% in collective intelligence in the future. Table 3 presents the geographical distribution of companies and their willingness to use Web2.0 technologies. "Collective intelligence" stands for any system that taps into the expertise of a group rather than individuals, including collaborative publishing.

	Asia-Pacific	China	Europe	India	Latin America	North America	Other developing markets
Blogs	25	20	26	29	23	32	19
Collective intelligence	32	37	35	33	31	30	35
Wikis	19	10	23	26	17	20	12

Table 3: % of respondents using or planning to use web2.0 technologies (from [68])

The same survey also shows that the willingness to invest applies to many industries, 77% of retail, 74% of high tech, 70% of telecommunications, 63% of financial services and 53% of pharmaceuticals companies plan to invest in Web2.0 technologies [68].

This chapter discusses the economic impacts of collaborative content applications from the viewpoints of i) greater diversity and access to content, ii) content-based connections, iii) collaboration tools, and then discusses iv) the business models appearing with collaborative content. The chapter aims to concentrate on the specific aspects of collaborative content, although it is acknowledged that there are significant impacts arising from internet use and online content availability in general as well.

4.1 Greater diversity and easier access

Collaborative content applications now allow anyone to publish and share content with high visibility. This has impacts on content developers, who previously dominated content channels, and on the consumers reading the information from these new sources. In some industries, the effect of collaborative content has been disruptive, e.g. for printed encyclopedias or the adult entertainment industry [64][62].

¹²⁵ The McKinsey Quarterly conducted this survey in January 2007 and received responses from 2847 executives worldwide

Increased content competition. Collaborative content weakens the position of media companies, which previously held gatekeeper positions and selected which content was available. Traditionally, media companies could only offer content that attracted sufficiently large numbers of consumers to compensate for the creation and delivery costs. Collaborative content platforms, however, are able to provide content at low costs and much smaller audiences are sufficient to cover the costs. Hence, even content that no media company was interested in can now be made available. Media companies also face competition for the content they want to publish, as content producers can use collaborative content platforms instead. The low cost of providing collaborative content also lowers the barriers for market entry, making the market much more dynamic. A company can be established literally over night and, even if it has no serious financial backing, quickly become a major competitor.¹²⁶

Losing viewers on traditional content channels. Internet and collaborative content diverts attention from other media offerings, both traditional ones like TV and web 1.0 offerings like professional websites. In addition to original user-generated content, copyrighted content may be published online on a collaborative content site without the consent of the media company and without remunerating the rights-holder.¹²⁷ For example, YouTube has faced several charges for hosting material that infringes copyright. It has been pressured to adopt preventative measures for IPR infringements and has also started paying royalties for the music that is played in the user-created videos.

Informed and demanding customers. In the analogue world, reputations are built or destroyed slowly, though the effect is long-term. Collaborative content applications transfer this mechanism online, but with much greater speed and more permanent visibility.¹²⁸ This is increasingly important, as surveys suggest that word-of-mouth (WOM) consumers (i.e. those giving and receiving advice for their purchases) watch less TV and use more Internet than non-WOM consumers, 71% of them are online at least monthly [11]. Users publish product and service reviews on special websites or on blogs, and take them into account when making purchasing decisions (e.g. [22][49]). Reputations can be made or destroyed very fast. Companies have to react quickly to such exposure, and quality control becomes more important, since a picture of a single malfunctioning product says more than a thousand advertising words.

4.2 Content-based connections

New advertising channel. As discussed, collaborative content gathers remarkable attention and numbers of readers. IBM global survey showed that 71% of the respondents used the Internet 2 or more hours per day while only 48% watched television the equivalent time [10]. Also OFCOM research shows that 22-36% of Internet users in the countries surveyed said they watched TV less as a result of having the Internet [82]. Hence, the advertising industry needs to find new channels and consider the segment of collaborative online content for connecting with the potential customers. The diversity of collaborative content provides possibilities for well-targeted advertising, in which advertisers can select the content closest

¹²⁶ See e.g. The History of YouTube <http://www.YouTube.com/watch?v=x2NQiVcdZRY>

¹²⁷ For examples Viacom said that it had found more than 150,000 unauthorized clips of its material on YouTube that had been viewed 1.5 billion times (<http://news.bbc.co.uk/1/hi/technology/7420955.stm>)

¹²⁸ An example of bad visibility: on 2nd June 2008, Google search with "Dell technical support" lists as a third result a negative blog post complaining about the support services.

to the interests of their target groups, e.g. with YouTube or blogs. Furthermore, contributors are sometimes motivated by being given a share of the advertising revenues.

Promoting through collaborative content. Since customers are changing their media consumption, companies and producers must review their PR strategies to connect with the customer. From the organisations that already use social computing tools, 70% said they used it as an interface with customers (including entering new markets) [68]. In May 2008, 11.6% of Fortune 500 companies have an active public blog by company employees about the company and/or its products.¹²⁹ Companies can also use product placement in online videos or blogs promoting products.¹³⁰ Furthermore, uploading professional content to general content platforms can be done for promotion purposes, especially in the case of photos, pictures or music. For example, the UK band Koopa got to the UK top40 list without a record deal [7]. Many media companies have YouTube channels for promoting their products with previews, etc., and traffic measurements show that e.g. in October 2006, 3.5% traffic from YouTube went to television sites and 1.1% to movie sites [103].

Customer loyalty and attraction. Producers and businesses may use collaborative content for finding and creating audiences for their content-related activities. Businesses can also provide collaborative content platforms without making any direct profit, but aiming instead to reap indirect benefits for their product, such as visibility and customer loyalty. Companies can, for example, support professional communities of practice that typically utilize their products, e.g. Intel vPro Center.¹³¹ Media companies apply cross-media strategies in their products by, for example, creating forums which allow TV viewers to have a sense of ownership of a TV programme as they can suggest plots and characters, and try to influence other viewers. This results in an active community that increases interest in the product [53].

4.3 Collaboration tools

Although, at first glance, it would seem that collaborative content cannibalizes traditional media business and that companies risk losing their reputations through negative reviews, collaborative content also provides new ways of developing and complementing products and services. A collaborative content approach, both inside and outside companies, can be an excellent tool for enhancing the innovation processes with new inputs and ideas. Collaborative content applications also provide a new way of achieving interaction and discussion with the customer and with the links in the product chain, thus developing improved value and experience.

Enhancing content products with collaborative content. Traditional media companies can use collaborative content to improve their products and services. Many major newspapers and broadcasters now extend their products by using blogs and user-created content. For example, media organisations such as the BBC and the New York Times ran background links to online video postings from people affected by the July 2006 fighting in South Lebanon [48]. CNN Exchange is inviting user contributions to its news services,¹³² and specific platforms are set

¹²⁹ By Fortune 500 Business Blogging Wiki, <http://www.eu.socialtext.net/bizblogs/index.cgi>

¹³⁰ 75% of Blogspot blogs were considered spam [110]

¹³¹ <http://communities.intel.com/community/vproexpert>

¹³² <http://www.cnn.com/exchange/>

up for users to publish and sell their pictures for news and magazine usage.¹³³ Another type of example is Google Maps, where the map service is complemented with user-provided content on places of interest and their evaluations.¹³⁴

Getting user feedback and ideas. Collaborative content interfaces with customers for product feedback can be a source for companies to gather user innovations and development ideas for improving their products. Users are very efficient innovators in adapting and enhancing products for their own use, even 10-40 of them engage in developing or modifying products [109]. This has been also recognized by companies. For example, a McKinsey survey¹³⁵ showed that 28% of top managers and 22% of other executives said that their innovation is primarily driven by customer feedback [70]. The same survey showed that 67% of top managers said that personal interaction with consumers is a source of new ideas for their company. Handled carefully, because of the self-selection of input providers, collaborative content can provide at least as much feedback as traditional customer research and surveys. Companies benefit from such feedback as it allows them to rapidly respond to customer concerns. Furthermore, studies show that volunteered online movie reviews can provide information that is as accurate a predictor of public opinion as information collected by surveys of representative samples of respondents [23].

Enhancing service with collaborative content. As the customers often know more about using the products than the developers themselves, companies can employ this knowledge by hosting collaborative content platforms for user support. 22% of surveyed marketing executives¹³⁶ said their company hosts a user forum on their corporate sites so that consumers can help other consumers [69]. Gathering and encouraging user reviews can also be used as a promotional tool, for increasing the customers' trust and usage of the service. Online auctioning sites¹³⁷ often incorporate user-generated evaluation of the seller/purchase as an easy part of the auction process. Online shops¹³⁸ also benefit from user reviews that inform and support customers in their purchasing decisions. User provided reviews have become part of the marketing information of the platforms, often complemented with automatically collected information of most popular choices or product combinations.

Knowledge sharing and collaboration. In large companies, improved knowledge sharing can have a significant effect on productivity. As many companies are operating in increasingly international settings, efficient tools for asynchronous, easily usable and available collaborative work are essential. In the McKinsey survey in 2007, 75% of executives from organisations which use web2.0 tools, used them for managing collaboration internally, and 51% as interface with suppliers and partners [68]. For example, CIA agencies use wiki collaboration and the Allen and Overy law firm uses social computing collaboration within an international company [83]. IBM¹³⁹ and Oracle have published enterprise suites including

¹³³ for example, <http://www.scoopt.com/>

¹³⁴ <http://maps.google.com/>

¹³⁵ The McKinsey Quarterly conducted the survey in September 2007 and received responses from 722 top managers and 736 other executives from around the world.

¹³⁶ In July 2007, McKinsey surveyed 410 marketing executives from public and private companies around the world.

¹³⁷ For example, eBay, <http://www.ebay.com/>

¹³⁸ For example, <http://www.amazon.com/>

¹³⁹ IBM also announces using an internal blogging central and a tool for social bookmarking [47]

wikis, blogs and other networking tools.¹⁴⁰ It has been suggested that the low effort needed in participating in wiki-based collaboration create a catalyst for collaborative development, and that a "creative construction" approach encourages participation [17] The Forrester study found in 2007 that 62% of enterprises see content-sharing platforms (blogs, wikis, SharePoint) useful for their organisation [33]. Outside communities also matter, as according to King Research, 93% of IT professionals state that they save time by using online communities to find answers [56].

4.4 Business models

Companies which are deal with collaborative content are often still developing their business models, and no studies are available detailing their costs vs. revenues streams. However, based on the information gathered and the discussions from other reports such as [53][80][62], the following main models of financial gain (direct and indirect) with collaborative content can be identified: (i) advertising (ii) content mediation (iii) value-added services (iv) talent/idea spotting (v) bundling and other models for indirect benefits (vi) donations.¹⁴¹ The content-hosting platforms may choose to remunerate content creators through direct payment or through revenue-sharing schemes, or they may just rely on voluntary content contributions.

Advertising. Content platforms typically incorporate advertising on the platform and also in the content (e.g. in videos), and can share the advertising revenues with the content producers. For example, Weblogs, Inc¹⁴² pays its blog contributors and NewsVine¹⁴³ users are paid 90% of all advertising revenues generated by it [101]. Collaborative content platforms also provide a new channel for traditional media, e.g. YouTube has content partnership deals with major media content providers, such as CBS, and the BBC, which receive advertising revenues from users viewing their products on the YouTube platform. The YouTube Partners Programme¹⁴⁴ also gives a possibility for independent video creators to share advertising revenues from YouTube videos. However, the criteria for joining the programme is i) creating original videos suitable for online streaming, ii) owning the copyright of the videos, and iii) regularly uploading videos that are viewed by thousands of YouTube users. Hence, this revenue possibility is available only to those content creators who manage to create videos with high interest and a large audience. In practice, reports show that the most popular YouTube content is created by professionals. It also seems that, in general, advertising revenues are not the main income for amateur content producers.

Content mediation. Some collaborative content platforms mediate content for third parties as part of their business model. For example, voluntary content contributions can be licensed for TV-stations. This can be accomplished, because users agree, when they upload content, that the site can use the content freely (e.g. YouTube¹⁴⁵) or they agree that the site can distribute

¹⁴⁰ For example, IBM Lotus Connections, Oracle Enterprise 2.0.

¹⁴¹ Furthermore, it should be noted that that many collaborative content companies (e.g. YouTube) have been acquired by established players such as Google, Yahoo and Microsoft. Some observers regard the starting of a company in order to sell it later as a business model in itself.

¹⁴² <http://www.weblogsinc.com/>

¹⁴³ <http://www.newsvine.com/>

¹⁴⁴ <http://www.YouTube.com/partners/>

¹⁴⁵ User grants YouTube "a worldwide, non-exclusive, royalty-free, sublicenseable and transferable license to use, reproduce, distribute, prepare derivative works of, display, and perform the User Submissions in

the content under conditions specified in the agreement (e.g. Revver¹⁴⁶). There are also specific platforms that have been built for content mediation purposes. For example, photo agency Scoopt¹⁴⁷ was set up by 16,500 amateur photographers. When an image is sold, the platform retains part of the price and the photographer gets 40% royalty. However, it is said that it is not easy to sell user-generated content, and Scoopt, for example, is only successful because it is run by journalists and known by them [101].

Value-added services. Content platforms can also get revenues for providing value-added services related to collaboratively created content. This can be considered as similar to the typical subscription fee for online newspaper content. However, with collaborative content, the basic access to content creation and usage is rarely restricted, but the platform may charge for additional services. For example, the same provider can provide blog hosting for free and provide services for additional space and support for fee.¹⁴⁸ KodakGallery¹⁴⁹ is an example of a company-hosted photo sharing platform, where anyone can publish, organize and share photos, and Kodak offers a service to order different print products created from the photos. Flickr gives basic user accounts for free, but provides a possibility for a paid pro account with more storage space and extra services.¹⁵⁰

Idea and talent spotting. Collaborative content environments can be used to gather the collaboratively-created user innovations and ideas for business product development. For example, Lego Mindstorm¹⁵¹ allows customers to design personally-tailored products, which can later be added to the general product selection. Threadless,¹⁵² an Internet-based clothing retailer sells t-shirts which have been designed and rated by members of the public. BBC Backstage¹⁵³ collects ideas and contributions from anyone in order to find new contents and models for the broadcasting company in changing times. Cambrian House¹⁵⁴ applies a crowd sourcing model to identify and develop software and web-based businesses, inviting users to send suggestions and vote on them. Revver¹⁵⁵ and Wreck A Movie¹⁵⁶ are example of video making communities, where companies can sponsor and spot talents and products for their purposes.

Bundling and other indirect benefits. Sometimes collaborative content is bundled with products and services, in order to create additional value for the customer. For example, Yahoo is testing an approach to complement search results with delicious tags¹⁵⁷ and it has been announced that the planned “\$100 laptop” would contain offline Wikipedia.¹⁵⁸ Companies developing products such as mobile phones, fitness equipment, or media

connection with the YouTube Website and YouTube's (and its successors' and affiliates') business",

<http://www.youtube.com/t/terms>

¹⁴⁶ <http://www.revver.com/go/tou/>

¹⁴⁷ <http://www.scoopt.com/>

¹⁴⁸ See, for example, <http://wordpress.org/hosting/>

¹⁴⁹ <http://www.kodakgallery.com/>

¹⁵⁰ <http://www.flickr.com/upgrade/>

¹⁵¹ <http://mindstorms.lego.com/>

¹⁵² <http://www.threadless.com/>

¹⁵³ <http://backstage.bbc.co.uk/>

¹⁵⁴ <http://www.cambrianhouse.com/>

¹⁵⁵ <http://www.revver.com/>

¹⁵⁶ <http://www.wreckamovie.com/>

¹⁵⁷ <http://searchengineland.com/080121-095345.php>

¹⁵⁸ http://news.soft32.com/the-100-laptop-will-include-wikipedia_2063.html

companies also maintain collaborative content platforms for creating customer loyalty and communities to support their branding and product attention [53]. Google Maps allows and invites voluntary user contributions to their map service, hence increasing the value of its service by allowing a voluntary collaborative content community to form around complementing the service.

Donations. Many collaborative content initiatives, such as the projects of Wikimedia Foundation,¹⁵⁹ are only supported by donations. It has also been suggested that voluntary payments for accounts etc. (such as a small charge for a yearly Flickr pro account) can be considered as a form of voluntary contribution to the platform. The costs of running the platform are low as these initiatives typically do not offer the content producers any monetary compensation for their work. However, these initiatives may also be seen to have economic effects if the time spent by the active individual users is considered. For example, Wikipedia administrators seem so active in maintaining the content they are responsible for that it is probable that at least some of them do it during working hours.

4.5 Discussion

Although mostly non-commercial in origin, collaborative content is already an economically important phenomenon, creating opportunities and posing challenges for players in the established content/media industry as well as other industries. For the media industries, collaborative content has largely been seen as new competition leading to a possible loss of consumption and advertising revenues, with the risk of copyright infringements. However, traditional media players are also already grasping opportunities through embracing and creating synergies between traditional and collaborative content and developing partnerships with popular collaborative content platforms.¹⁶⁰ Thus, the impact on the traditional content industry is not only one of predation and competition, but also complementary and collaborative.

Collaborative content changes the environment in which all the industries and organizations operate. It opens up opportunities for improved external relations and advertising, and for utilizing the knowledge and innovation of users in product and service development. At the same time, collaborative content gives rise to increased competition due to better informed customers and, as a result, efficient quality management strategies are required. In addition to this change that is already appearing between producers and consumers, collaborative content has the potential to transform industries and organization models from within. Companies can use collaborative content tools for intra-company content creation, collaboration and sharing, overcoming difficulties in geographically-distributed teams and improving communication and knowledge sharing.

Collaborative content generates economic growth for ICT goods and services providers platforms by increasing the demand for connectivity (e.g. more and better internet access), support services (e.g. firewalls, file backups), software solutions (e.g. collaborative content platforms and tools, incorporating collaborative content tools in knowledge management solutions) and the necessary hardware (e.g. personal devices, servers, databases). However, the extent of this economic impact on the ICT industry is not clear as the demand for new products may also decrease the demand for older products.

¹⁵⁹ <http://www.wikimedia.org/>

¹⁶⁰ For example, YouTube Partners Program.

Collaborative content constitutes a two-sided market,¹⁶¹ which has to attract content production as well as content consumption. In most cases, the quality and quantity of these two sides affect each other positively. In addition, a third side is often needed – advertising. Direct revenues for platforms come from advertising, content mediation or donations. Collaborative content also provides indirect financial gain opportunities through gathering ideas, promoting brands, getting customer attention and loyalty or bundling collaborative content as additional value with other services. While advertising seems to be the most important revenue source for the platforms at the moment, there is no clear "success story" in generating substantial revenues from collaborative content. Many of the experts consulted during this study believed that the most important way of making money from collaborative content in the future will be to bundle it into services and products.

A notable difference between collaborative content and open source software initiatives seems to be the heavy reliance on voluntary contributions by amateur content creators in many of the content communities. FLOSS communities typically contained people who contributed to the community as part of their paid work tasks, which does not seem to be the case with present content communities. It has been suggested that user-generated content is here to stay and will increase the competition among professionals, amateurs, and semi-professionals with the easy production tools [10]. Furthermore, new communities are emerging to support the quality development and commercialization of user-created products (e.g. Revver¹⁶² in video making, Lulu¹⁶³ in book writing, Song community¹⁶⁴ in music making, Wreck A Movie¹⁶⁵ in film making). A future development that will be interesting to follow is the impact of these communities on developing professional skills and supporting "semi-professional" content creators.

¹⁶¹ For two-sided markets, see Rochet & Tirole in [95].

¹⁶² <http://www.revver.com/>

¹⁶³ <http://www.lulu.com>

¹⁶⁴ <http://www.songcommunity.org/>

¹⁶⁵ <http://www.wreckamovie.com/>

5 Social impacts

This chapter discusses the social issues that are emerging as collaborative content provides new opportunities for expression, discussion, sharing and participation in the society. The impacts and opportunities of collaborative content are already affecting a large number of European internet users,¹⁶⁶ especially the young who are the most active internet users.¹⁶⁷ This chapter aims to concentrate on the specific viewpoints arising from collaborative content, leaving out impacts of general ICT and internet development. The structure reflects the same viewpoints that were raised in the previous chapter: i) greater diversity and access to content (and information) ii) content-based connections, and iii) collaboration tools. Furthermore, these aspects are elaborated in the sectors of iv) education, and v) health.

Naturally, a major concern is whether society will benefit from these opportunities equally and to what extent they will be taken up, as not everybody is using the internet. These challenges (and negative impacts) will be discussed in Chapter 6.

5.1 Greater diversity and easier access

Wide range of up-to-date resources. Collaborative content initiatives increase the information resources available, and citizen journalism meets the interests of various readers in more diverse ways than traditional media providers. These additional views can help to address the bias that characterises mainstream information provision. Collaborative content can bring issues, that would otherwise probably not have seen the light of day, to the fore. Additionally, collaborative content reacts quickly, hence information is quickly updated to reflect recent changes, as in the case of the war in Iraq, Hurricane Katrina, terrorist bombings, etc [48]. People are in fact using this opportunity to be aware and updated, by following, for example, political and news blogs actively [19]. It should be noted that collaborative content initiatives on the Internet also benefit people who do not use computers actively. Many of the applications (even Wikipedia, YouTube and blogs) have versions for mobile phones, which can be used to access the Internet from remote areas. These can also provide resources for non-internet users - for example, there are offline versions of Wikipedia.

Practical knowledge. Collaborative content supports people in their personal tasks and decisions by providing access to the experiences, assessment and advice of other people in new ways. There are plenty of topic-specific resources available, which have been created by a variety of contributors, and which even offer a possibility for interaction (e.g. through commenting facilities) with the authors. King Research¹⁶⁸ found in their survey that all IT professionals using online communities said they believed that they are benefiting professionally from the use of online communities, 75% valued it for "doing a better job" and 93% for saving time [56]. For private purposes, Wiki HowTo¹⁶⁹ for example, provides vast citizen advice resources about anything, from "How to migrate to open source software" to

¹⁶⁶ According to Eurostat, in 2007, 57% of people in EU-27 had used internet in the last 3 months.

¹⁶⁷ According to Eurostat, in 2007, 78% of individuals 16 to 24 years old in EU-27 accessed internet on average at least once a week.

¹⁶⁸ King research carried out the survey in June 2007 by inviting respondents from an independent IT professional database to complete an online survey and received a total of 203 completed survey answers.

¹⁶⁹ <http://www.wikihow.com/>,

“How to eat a rambutan” or “How to plan a wedding in 6 months”. Also the information gathered from people’s activities offers resources which show the collective results of choices and preferences, such as seeing which books or articles other people interested in the same topics selected.

5.2 Content-based connections

Self-expression. Collaborative content adds to the ways people can be creative and it has changed and expanded the audience for personal and social creativity. Surveys show that blog users commonly write for themselves [61] and video platform users upload videos for fame, fun and expressing themselves [12]. Furthermore, people want to share their personal experiences and practical knowledge with others. For example, pregnancy seems to be an issue that future mothers want to share, and a study shows that the community responds. YouTube users “adopt” the baby by following the pregnancy and then the growth of the child through videos [32].

Skills and work recognition. Participating in collaborative content communities also provides a way of getting recognition for one's skills and work. For example, it is possible to develop an identity as a recognized expert in a specific field by maintaining a high-quality blog on the topic, which may not necessarily be related to one's profession at all. In organized collaborative communities, such as Wikipedia, community recognition leads to a higher position in a community organization. Collaborative content also provides means for self-employment for the best contributors, through monetary compensations from platform or advertising. New communities such as Revver and Lulu allow participants to develop skills and earn money with the products developed. For artists and musicians, collaborative content provides a new way to show the quality of their work, getting them more visibility and customers, and bypasses the traditional media selection processes [7].

Creating communities and connections. Collaborative content provides a new means for connecting with like-minded people, and it seems that older users especially appreciate this aspect [77]. Research suggests that collaborative content has been used to connect people with similar ethnic backgrounds, through blogging, for example [24]. During this study, experts suggested that knowledge workers, who often change jobs, find that the professional online communities of practice are becoming more important and relevant than communities at workplace. Benkler also discusses the fact that peer production projects create new connections by bringing together otherwise unconnected individuals and replacing common backgrounds or geographic proximity with a sense of well-defined common purpose [9]. New tools allow people to incrementally build communities for collaborative tasks. Collaborative pledge approaches¹⁷⁰ are an example of small scale connections, and collaborative disaster management assistance efforts with collaborative content tools (e.g. for the Asia Pacific tsunami, or Hurricane Katrina) showed large scale collaboration communities created bottom-up by the internet users [52].

5.3 Collaboration tools

Impacting public opinion. Collaborative content applications empower people to express their concerns and ideas and report issues more visibly. If these are also considered by others to be

¹⁷⁰ See, for example, <http://www.pledgebank.com/>

important, they may attract a lot of attention. Blogs especially seem to be a communication and information channel which can influence people to act. A significant number of bloggers want to "motivate readers for action" [61] and many people have been spurred into action by reading information from blogs [28]. Studies also suggest that people read political blogs actively¹⁷¹ and that blogs can even affect the results of national elections.¹⁷²

Increasing transparency. Collaborative content published by individuals and organizations can raise issues previously unknown to the wider public. This provides a new form of monitoring for public people, who need to be more careful with what they say and do than before, because everything can be recorded and publicized [48]. The same approach can be used to increase the transparency of public organizations and processes. Already applications exist which make undisclosed official documents public,¹⁷³ or follow and inform on discussions in parliament,¹⁷⁴ or send information requests to government officials, and tracking and publish the answers.¹⁷⁵ This provides opportunities for governments to employ the efforts of citizens, civil servants and organizations to improve the quality of public services.¹⁷⁶

Participative public services. Collaborative content approaches are increasingly being used by citizens and civil society, which applies pressure for the modernisation of public services. Governments have already been experimenting with the opportunities offered by collaborative contents for the improvement of these services, as collaborative content can provide the same benefits for government functions as it can for companies [83]. For example, collaborative content can provide a new information channel with the capacity to reach and interact with young audiences,¹⁷⁷ provide citizens with new tools to get their voices heard,¹⁷⁸ and improve cross-agency collaboration and knowledge sharing.¹⁷⁹ Collaborative content development approaches have also been used for regulatory tasks in patent review processes, for example¹⁸⁰ and the preparation of legislation.¹⁸¹ Furthermore, citizens can participate in monitoring public services through these applications which increase transparency and the visibility of citizen opinion.¹⁸² In these examples, the final decision and editing power is kept by the government offices, but they benefit from the contributions and knowledge of the citizens for their work.

¹⁷¹ http://weblogs.hitwise.com/bill-tancer/2006/09/blogs_increasing_influencer_in.html

¹⁷² <http://www.observatoire-presidentielle.fr/?pageid=20>

¹⁷³ For example <http://www.wikileaks.org/>

¹⁷⁴ For example. <http://www.theyworkforyou.com/>

¹⁷⁵ For example. <http://www.whatdotheyknow.com/>

¹⁷⁶ For example, citizens reporting needs to fix streets to council at <http://www.fixmystreet.com/> or patients and families giving feedback on health services at <http://www.patientopinion.org.uk/>.

¹⁷⁷ For example EuTube, personal blogs of politicians, gathering video questions through YouTube for US presidential debate

¹⁷⁸ <http://petitions.pm.gov.uk/>

¹⁷⁹ Demonstrated e.g. with the case of Intellipedia wiki used by CIA agencies [83]

¹⁸⁰ See peer-to-patent described in Chapter 3

¹⁸¹ The government of New Zealand has started an approach to open up laws under preparation for public consultation and collaborative development in wiki environment (<http://news.bbc.co.uk/2/hi/asia-pacific/7015024.stm>)

¹⁸² For example, monitoring cars offending bikelane rules at <http://www.mybikelane.com/>

5.4 Education

Education is one of the public services that faces both pressure and opportunities for change because of the rise of collaborative content, which affects both organized and informal learning settings. Increasing usage of social computing puts pressure on educational institutions to take the participatory culture of students outside the schools into account. They should not make the classroom space seem “pale by comparison”, reducing the motivation to learn [37]. Furthermore, if students see educational institutions as environments on their own, not related to the outside world, they may employ strategies for their learning tasks that cannot be transferred to other situations [60]. Hence, educational institutions need to bring organized learning closer to the everyday practices of the present student generation. Today, this means finding ways to benefit from the wide usage of social computing and incorporate it into learning practices. Social computing and collaborative content applications have potential to be used as a tool to transform education systems to support personal learning spaces in a knowledge society [91].

One of the major challenges caused by the use of collaborative content for learning is the need to acquire skills for accessing and using collaborative content with a critical attitude. This challenge will be discussed in Chapter 6. This section covers aspects relating to the impacts and opportunities of collaborative content for learning and educational institution. These impacts apply on the level of organisations and individuals, learners, teachers and learning designers.

5.4.1 New availability of resources and information

As discussed before, collaborative content makes a whole new range of resources easily available, possibly responding better to a wide diversity of needs than the products of traditional publishers and media. Materials previously bought by students or libraries can now be found for free online, such as encyclopaedias, dictionaries, etc. Although collaborative content resources are perhaps not always of the same quality, they provide useful information and students especially, who have limited financial resources, can choose not to buy products of traditional publishers. Examples show that learning material repositories are often used for enhancing personal knowledge, and not only for work purposes or formal studies. For example, 49% of the visitors to MIT OpenCourseWare site said they were self-learners, of which 56% said that their aim was to enhance their personal knowledge, and 16% to keep up to date in a particular field. Other groups of visitors were students (32%) and educators (16%) [73].

Collaborative content provides increasing numbers of channels for educational institutions to open up their learning materials, as can be seen, for example, in YouTube university channels. Additionally, collaborative content allows individuals to visibly express their opinions of education and training providers. As well as blogs and videos, there are even specific platforms such as RateMyTeachers¹⁸³ for students or RateMySchool¹⁸⁴ for teachers who are considering employment. As curricula and learning materials for degrees, courses and modules are increasingly online, students are better informed when they choose their field of interest and training provider. The OECD suggests that open educational resources will also

¹⁸³ <http://www.ratemyteachers.com/>

¹⁸⁴ <http://www.ratmyschool.org.uk/>

affect the curricula of educational institutions as students can better compare the options available [79]. 39% of the new students at MIT who had been aware of the OpenCourseWare site, were influenced by it when they chose their studies [73].

5.4.2 Connecting with other learners and practitioners

For individuals, collaborative content offers the opportunity to publicise their skills and specialities, by creating personal portfolios with blogs, for example. Peer recognition of work quality can lead to higher positions in collaborative content communities and also provide possibilities for self-employment. Participating in communities also supports informal learning, e.g. by participating in Wikipedia collaboration or FLOSS communities. In addition to gaining topic-specific competencies, for example, learning to use cameras, edit digital images and videos, etc., participation also develops skills in self expression and collaborating with others. Hence collaborative content communities can have a positive impact on skills, which are also needed outside the community.

Collaborative resource communities can help people in practical tasks and support updating their skills. According to the King study of IT professionals using IT online communities, 75% of the respondents said that communities help them to do a better job and 68% stated that they benefitted personally in their professional development [56]. In education-related professions, the availability of openly-shared materials can help teachers to develop good learning materials and practices in both online and face-to-face learning approaches. For example, 46% of educators visiting the MIT OpenCourseWare site say that they have adopted or adapted site content, and 92% plan to do so in the future [73]. Collaborative wiki communities can form spontaneously for a common research and learning tasks, and lead to very effective results, as has been demonstrated e.g. with a case of literature research [97]

Collaborative content facilitates access to learning without buying a book, or participating to a course, but with a support of a community. Many communities of practice have collaborative content development initiatives, supporting the communications and knowledge sharing between community participants. There are professional communities and health related communities supporting sharing and obtaining knowledge as a form of informal learning. Specific learning communities are emerging, such as LiveMocha¹⁸⁵ combining native speakers with language learners. Furthermore, there are initiatives supporting the collaboration and community of both teachers and students, e.g. Wikiversity.¹⁸⁶ Lulu is an example of a semi-professional community that helps people improve their writing skills and even helps them earn money from their work.¹⁸⁷

5.4.3 Collaboration tool for education

As collaborative approaches are increasingly present on the Internet, students also expect to use them and similar participative approaches in organized education. Sitting in a classroom with blackboard and books is not part of their normal way of communicating, and exchanging information or looking for it [37][51]. Collaborative content approaches now provide the tools to support personalisation and constructivist learning approaches, where learners are also

¹⁸⁵ <http://www.livemocha.com/>

¹⁸⁶ <http://www.wikiversity.org/>

¹⁸⁷ <http://www.lulu.com/>

considered to be knowledge builders and creators, owners of the learning process, and not just the recipients of transmitted knowledge (e.g. [1][35]). Collaborative content approaches in education can also increase openness and interaction between course participants and between people outside the course.

Collaborative approaches using, for example, wikis and blogs on the course facilitate heterarchical approaches, which allow students with special expertise to teach others, and also the teacher. Furthermore, joint content development can be used to let students point out their learning needs, and suggestions for the improvement of a course. Participative content development approaches can also reduce the time spent on preparing learning material, and publishing and delivery costs (although more time is needed in preparing and guiding the collaboration that supports learning).

Shared bookmarks, wikis and blogs are new and efficient tools for collaborative learning tasks, both for groups meeting face-to-face and for distance learning. Asynchronicity and traceability of collaboration improves possibilities for flexible learning participation, e.g. combining part-time and full-time students together in groups. Learning management systems are already incorporating and providing these tools integrated into their platforms. Opening up educational resources for collaborative development can also facilitate new collaboration, knowledge and work sharing between institutions and practitioners. This may improve both the internal quality assurance methods [38] and the quality of resources, with the increased interaction and feedback.

5.5 Health

Similarly to learning and educational services, collaborative content can have an impact on people's health and cause pressure for change in healthcare services. There is very little literature on the scale and status of the impact on the health sector, but some viewpoints and examples can be found of existing and potential impacts. Also in the sphere of healthcare, the main impacts arise from the new availability of information resources, patients empowered to connect with each other in new ways, and new processes and tools made possible by collaborative content applications.

New availability of resources. It has been suggested that a major effect of social computing is the increasing equity in accessing health-related information [41]. There are many examples of health-related blogs and wikis sharing health-related information and reviews by both individuals and professionals, sometimes supported by professional editorial control.¹⁸⁸ For example, the blog Clinical Cases and Images¹⁸⁹ provides descriptions of real cases, and aims to be a case-based curriculum for medical students. There are also sites which gather and rate health-related news and articles, such as DissectMedicine.¹⁹⁰ A ComScore survey suggested that women turn more often to the internet and web sites (60%) for health information than to friends, family and significant others (51%), although they still relied heavily on professionals (82%).¹⁹¹ On the issue of birth control, 42% of the respondents had not yet consulted user-

¹⁸⁸ See, for example, blogs <http://runningahospital.blogspot.com/> , <http://www.healthcareguy.com/> or wikis Ganfyd, Ask Dr Wiki, Wikisurgery, Clinfowiki, Flu Wiki, and Wellness Wiki.

¹⁸⁹ <http://clinicalcases.blogspot.com/>

¹⁹⁰ <http://www.aboutus.org/DissectMedicine.com>

¹⁹¹ The study was designed to help explain how women choose their birth control method, how they view alternative methods and ultimately whether their online activity influences their offline decisions. ComScore

generated content to research birth control options but were open to the idea, 35% of respondents had already consulted a birth control-related collaborative content site, and only 23% would not consider using user-generated content to research birth control options.

Connecting people. Content-based communities provide a means for people with similar medical interests or experiences to share and exchange knowledge and to discuss with peers. This may be important support for people with difficult illnesses. There are examples of illness-related communities, for example, at the NHS¹⁹² in the United Kingdom. New studies suggest that creative writing can benefit people with critical illnesses such as cancer, and that using blogs for this may give additional benefits.¹⁹³ Also health-related product manufacturers are supporting online communities for health issues. However, it has been suggested that the collaboration and interaction between users is more active in independent web-based user communities than it is on sites established by players such as pharmaceutical companies and fitness device manufacturers [6].

Collaborative tool for healthcare. Collaborative content provides an opportunity for the users (patients, relatives, informal carers and health professionals) to become innovators and enrich the system for the benefit of the patient. There is an important need in healthcare for tools to enhance the dialogue between doctors and patients to allow better disease management, especially for chronic diseases, with a more collaborative and closer doctor-patient relationship. *Patient Opinion*¹⁹⁴ is an example of a British initiative that gathers and publishes opinions and rankings of the National Health Service and private health companies. It empowers the patients to give feedback on their experiences and so helps the healthcare system to improve its services [45]. User inputs are moderated in order to protect people's privacy and to monitor the contents. Luo suggests that, as a general trend, physicians have been slow to adopt new technology, but this may rapidly change because of the new opportunities for patient referral (e.g. in treatment-refractory cases) or research in specific areas (e.g. rare diseases)[65].

5.6 Discussion

Collaborative content is having an impact on the social fabric of society as a result of significant changes in information provision and new participation possibilities affecting the different roles people play in society. Citizens are becoming better informed on what is happening in society, at work and in everyday life. They have better access to resources they need for their individual tasks and goals, whether related to their jobs or personal interests. More open channels for public information are emerging and trials of new participative processes in previously hierarchical organizations and models are being carried out and increasingly requested.

For individuals, collaborative content applications are providing new means for self-expression, individual creativity and development. At the same time they also contribute to a change in people's mindsets, as they are now able to voice their needs, opinions and

surveyed 921 women between the ages of 18 and 44, who had been heterosexually active in the past six months and had used a form of prescription or over-the-counter birth control. ComScore press release, January 22 2008, <http://www.comscore.com/press/release.asp?press=2012>

¹⁹² EQUIP. <http://www.equip.nhs.uk/search.html>

¹⁹³ <http://www.sciam.com/article.cfm?id=the-healthy-type>

¹⁹⁴ Patient Opinion. <http://www.patientopinion.org.uk/>

suggestions in public. Collaborative content allows new means for collective actions, which go beyond consumer satisfaction and support solidarity. Collaborative content applications and platforms also give new ways of forming connections and communities for sharing and supporting knowledge and experiences on various issues relevant to society.

Increasing usage of participative approaches on the internet, which is strengthening its importance as a media, also raises people's expectations for similar approaches in traditional institutions, such as education or health. These are areas where people have personal knowledge, which could be used to personalize services and provide better experience for learners or patients. Furthermore, they may already be informed about options for achieving their goals when they go to the doctor or to a course, as they may have studied the related information materials and the opinions and experiences of their peers beforehand. Hence, healthcare and education providers need to be prepared to handle better informed and quality demanding clients on a more equal level than before.

When considering social aspects, the challenges relating to the quality and usage of collaborative content are very important, relating concretely to people's lives in many aspects. With collaborative content, people can easily contribute their experiences and subjective viewpoints relating to e.g. health or learning, without considering broader perspectives. These views may be uncritically accepted and used by others, if they too are ill informed. This could lead people to, for example, further spread biased opinions as fact or to take medical advice which is unsuitable for them. Hence, although collaborative initiatives have a significant potential for the education and health sectors, there is a special need for accredited experts as well. It is remarkable, for example, that the European eUser study showed that, of respondents who had searched online for health information, 7.9% had decided not to follow a doctor's advice, and 19.5% had decided not to go to a doctor, because of information that they had found online.¹⁹⁵ JupiterResearch study¹⁹⁶ found that only 3% of online health users believed most health information found on the Internet is untrustworthy. Their selection criteria for online health resources is based much more on the relevance to their health query (65%) than on the trustworthiness of the source or author (16%).

The many challenges for the society to benefit from collaborative content approaches are discussed more in the next chapter. The challenges to education systems are particularly important, as collaborative content applications are emerging in all areas of life and examples show that people often lack skills in dealing with them. However, the resources and communities emerging through collaborative content also provide a new opportunity for the lifelong development of individuals. By equipping people with the skills and knowledge to use collaborative content resources, communities and practices for self-directed lifelong learning, the formal education system could support people to be better prepared to work, live, and participate in a collaborative knowledge society with changing jobs and needs for skills.

¹⁹⁵ eUser survey of 10 European countries, 2005, http://www.euser.eu.org/eUSER_PopulationSurveyStatistics.asp?KeyWordID=2&CaseTitleID=878

¹⁹⁶ Levy, M. "US Health Consumer Survey, 2007: Understanding Search Behavior". July 11, 2007.

6 Challenges

As shown in previous sections, collaborative content approaches are already having socio-economic impacts, although as the phenomenon is still very recent, it is difficult to estimate their significance without strong evidence. Collaborative content also brings many challenges and problems, which arise from the openness of participation. These challenges need to be addressed before the benefits arising from the potential of collaborative content approaches can be realised.

6.1 Quality of content

Information accuracy and reliability. The quality of collaboratively-produced content information can be questioned, as in principle, anybody can write anything. Information may be inaccurate because the author simply did not know the issue well enough, did not check the sources, or made an error. Furthermore, the author's different personal, political or commercial motivations may lie behind the content. For example, a study on Amazon book reviews showed that actually many of the reviews were not "real" product reviews but done by friends and the authors themselves. Sometimes they were just copied from other reviews in order to increase the reviewer ratings [21]. Studies have shown that Wikipedia articles contain errors, although at the same time they prove that the traditionally-published encyclopedias are not perfect either [40][16]. Open content editing and contributions also provide possibilities for content vandalism. However, the example of Wikipedia shows that in active communities, malicious edits are often noticed and corrected quickly. Hence, it can be assumed that in collaborative authoring projects the most outrageous commercialism or incorrect information will be put right quickly on pages where there are plenty of contributors. For less popular topics and projects, however, this remains a problem, as studies show that only a small number of users actually contribute to these.

Productional quality. The technical and productional quality of user-created photos, videos and text is often not on the same level as professional content [54]. The ease of creating and publishing content with new technical tools reduces the time spent on the production process and also possibly the creator's critical thinking about the quality and appropriateness of the content for publishing. Concerns have been expressed that people lose their appreciation for professionals because of the easy availability of content with poorer quality, or that real professional content is only available to an elite. Using collaboratively-created dynamic information resources (e.g. Wikipedia) for work or study purposes may cause other problems. As the content may change at any moment, using it as a reference may not serve its purpose because it may disappear or change. The Wikipedia developer himself has stated that Wikipedia should not be used for serious research.¹⁹⁷

Quality management. It is not unusual for the quality of content on the same platform to vary considerably and have different quality problems. This may further confuse the content users and their perspective on content quality. In communities, where the content is created by individuals, such as YouTube, the technical platform aims to manage the content quality by monitoring and removing unsuitable contributions. However, in practice, the platform and

¹⁹⁷ <http://chronicle.com/wiredcampus/article/1328/wikipedia-founder-discourages-academic-use-of-his-creation>

technical solutions (e.g. digital watermark recognition for IPR infringements) cannot detect everything, and the quality of the content relies very strongly on individual contributors. In communities, where the content is elaborated by a collaborative effort, such as Wikipedia, the content quality is collaboratively managed by users themselves, although it is governed by community rules. However, it seems that even Wikipedia is still in the process of developing its model for quality assurance, and recognizes the need for improvement. Furthermore, as a critical mass of users is needed to ensure collaborative quality assurance, it is difficult for initiatives with smaller numbers of active contributors to find models for collaborative content quality management.

6.2 Legal and personal misuse

When anybody can use, create and publish content online, both conscious and accidental infringements of copyrights and moral rights, and personal misunderstandings can occur, as demonstrated by several examples.

Copyright infringing content contributions. Most of the content publishing platforms require submitting users to agree to a declaration saying that there are no copyright violations in their contributions, but this cannot be extensively monitored. Although the removal of illegal content can be requested and automatic detection systems for uploaded content have been developed, some illegal material remains undetected and is a challenge for copyright-owning industries. As long as the material has low visibility and remains niche content, the industries do not necessarily take action, but when it gets large audiences, the infringements are taken more seriously [62]. For example, YouTube has faced several charges - this is, of course, a challenge for the platform as well. On the other hand, the question has been raised as to whether copyright rules are fitting for the present times of digital sharing and production. The concept of fair use can sometimes be challenged, and new tools may allow public access to material which is intended mainly for only personal use or a very small niche audience. Furthermore, the line between an original product and a new creative product created by mixing and using other copyrighted materials can sometimes be disputed [62].

Infringing usage of content. Online material in general, and now the new availability of targeted collaboratively-created material, gives rise to digital text which can be copied, pasted, and used easily without referencing the original source. Plagiarism is a concern at universities [74], as now almost anything can be found online and used without showing the original source. Misuse may also threaten privacy rather than copyright. For example, Virgin Mobile in Australia took photos from the Flickr site and used them in a national advertising campaign, referring to Flickr as a source and hence following the license requirements. However, it did not, and the license did not require it to, inform the photographer or the people who modelled in the photos. These people later found that their pictures were edited and displayed on roadside billboards in Australia under slogans such as “Dumb Your Pen Friend”¹⁹⁸ or “People who talk in lifts have bad breath” or even “Strangers are just serial killers you haven’t met yet”.¹⁹⁹

Uncritical personal use of content. An important challenge arises from availability of content, which has not gone through traditional quality checks, and may therefore contain incorrect

¹⁹⁸ <http://flickr.com/photos/sesh00/515961023/>

¹⁹⁹ <http://www.australianit.news.com.au/story/0,24897,22115934-15306,00.html>

information. Educational institutions have banned the use of Wikipedia as the students have not shown that they possess the necessary skills to use it critically. When learners can choose to learn in a self-directed fashion from available resources and communities, rather than through expert-led, organized and assessed learning, they may learn incorrect facts or be influenced by the subjective interpretations of other people. In the case of health information, this may lead to serious consequences as the advice and experience of peers cannot always be applied to other individuals. Peer interaction does not necessarily reveal the differences in individual situations, and may lead to false self-diagnosis and self-medication [13].

6.3 Risk of digital divides

When developing services for internet users, there is a risk that those already less privileged will be excluded even further.

Figure 15 demonstrates that, at present, only a small number of European individuals have contributed content to online discussion facilities. If new opportunities to be informed, to raise issues for discussion and to connect are based on specific internet applications, they exclude people who do not have access and skills to participate. Skills may be related to the usage of the tools themselves, to the usage of content or to the skills for collaborating with others. If the social agenda is increasingly set on the Internet with the new collaborative approaches, it is important that everybody has the possibility to have his/her voice heard there [42].

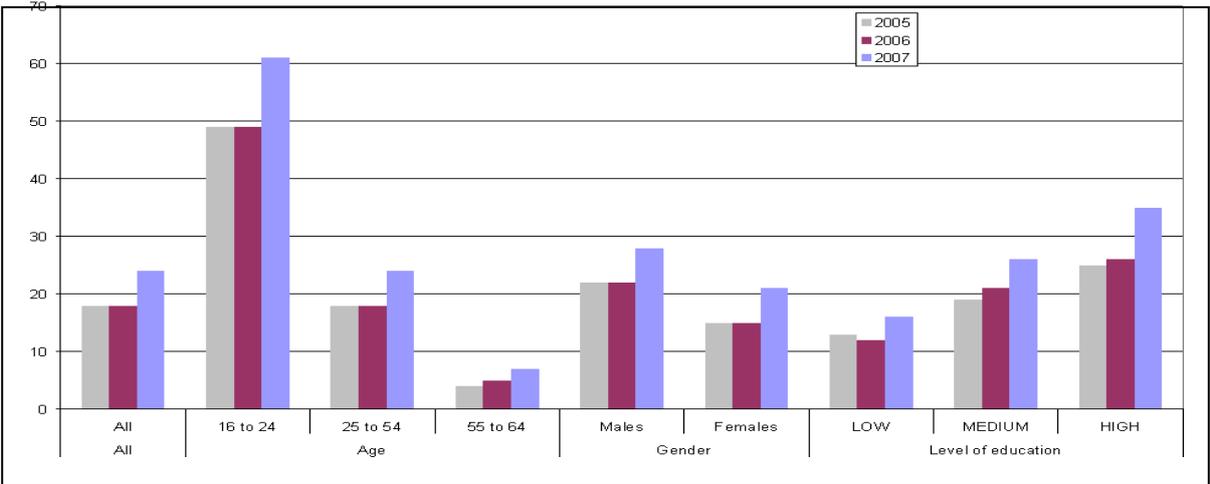


Figure 15 : Percentage of individuals in EU-27 who have posted messages to chat rooms, newsgroups or an online discussion (based on Eurostat data)

Internet usage divide. Lack of resources to invest in hardware and software is an economic barrier hindering participation in internet-based approaches especially in developing countries [79]. As shown in Figure 16, 57% of the EU27 population on average had accessed internet access in last three months in 2007. However, there are large differences between and within countries, especially rural and poor areas where internet penetration can be low. Furthermore, there are different social groups at risk of exclusion, such as older people, the less educated or the unemployed. For example, only 19% of females and 31% of males aged 55-74 used the internet regularly in the EU27 in 2007, as opposed to 77% of females and 79% of males aged 16-24.²⁰⁰

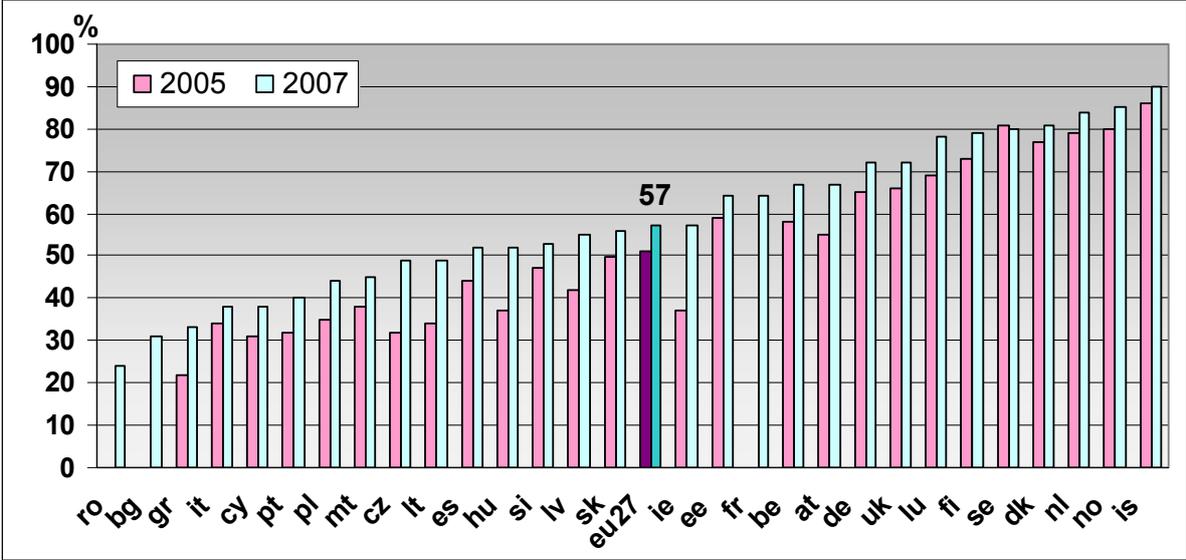


Figure 16 : Percentage of Europeans that have accessed internet in last 3 months (Eurostat data)

Internet skills divide. Studies suggest that ICT skills are a major factor in explaining the different participation rates in collaborative content creation between men and women [42]. In 2007 in the EU27, 71% of 55-74 year olds indicated that they have no internet skills (as opposed to only 11% of 16-24 years olds). Furthermore, the level of education has a strong effect. The percentage of people with no internet skills was 40% for the total population, but only 12% for the highly educated and 63% for those with low or no education.²⁰¹ Figure 17 shows differences of the internet skills for different groups in EU27, based on Eurostat data.

²⁰⁰ http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-QA-07-023/EN/KS-QA-07-023-EN.PDF

²⁰¹ <http://epp.eurostat.ec.europa.eu/portal/>

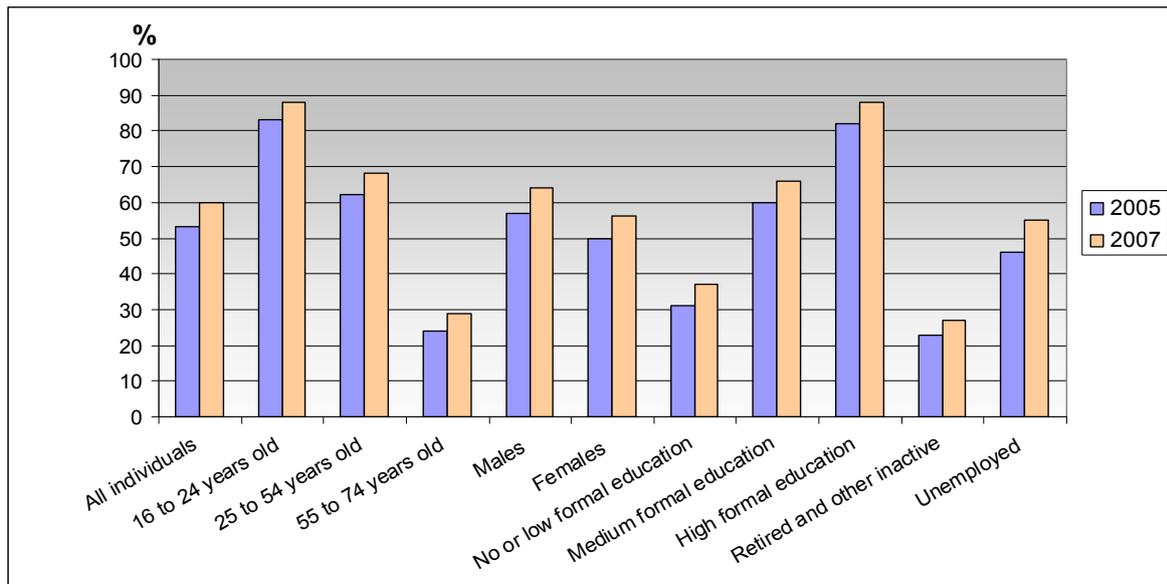


Figure 17 : Percentage of individuals with internet skills in EU-27 (Eurostat data)

Advanced digital competence. As benefitting from collaborative content and social computing requires skills that are more advanced than those needed for simple ICT and internet usage, this may give rise to a second level of skills divide [92]. It is a big challenge to equip people with the necessary digital competence, "the confident and critical use of information society technology for work, leisure, learning and communication. It is underpinned by basic skills in ICT and the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet" [31]. However, with collaborative content these are essential because people need to evaluate the reliability of information sources, which traditionally was done by journalists and publishers. Although Wikipedia studies show that the information is often reasonably correct, there are also cases where incorrect information has been detected only after several months. As collaborative content gives everybody the freedom to create content from their viewpoints, it places the responsibility for critical assessment (and the freedom to suggest improvements) on all the readers. Collaborative content is easily available, but cannot be consumed without considering its reliability and appropriate usage, including IPR issues.

6.4 Privacy and Security

Examples show that collaborative content may reveal personal information in the content itself and in social metadata such as tags and that this can be a concern for content creators [99]. Furthermore, the licenses for collaborative content and user information stored on platforms may allow its use without first informing or asking the creator, which may lead to undesired consequences. In addition, moving aspects from offline life to online, may bring wide visibility and traceability to personal issues and can be considered as invading the privacy of the users. Research suggests that young users often are not worried about this [14]. However, these are important issues as there are risks that information found on the internet may be used for illegal purposes.

Digital trails. Overall, collaborative content may create an easy way to collect personal information about the users without them knowing it. It is possible to determine, by a short

study of different contents on photo and video sharing sites and blogs, things about people's families, work and free time. These could be used for identity theft, for example, by impersonating someone in an email. Concerns have been raised that employers could use the digital trails of available online materials to search for information on personal issues such as ethnicity, sexuality or other criteria in recruitment processes [104]. It has been estimated that less than half the digital data created by users actually comes from intentional user activities (photos, emails etc) and the rest constitute a digital shadow of activities [36].

Cyberbullying. A negative phenomenon that arises out of collaborative content is the possibility for insulting and traumatising contents. The ease with which content can be created and published with new tools may lead to less critical thinking in the process. It is easy and fast to send angry blog posts or funny embarrassing videos and pictures of neighbours, classmates, teachers, and public people for everybody to see, but the consequences may be damaging. The McCann case of a missing child²⁰² showed a tremendous number of blog postings, where people took a stand on the case, without knowing all the facts of the ongoing police investigation. There are cases of cyber bullying of both students and teachers through online materials, and educational institutions which have restricted access to collaborative content sites because of it. Concerns have been raised as to whether internet users may start valuing informal postings and ratings more than formal systems of measurement, and whether there are now new emotional challenges facing those working in public professions such as education [8].

Need for policies for employees. The phenomenon of social computing affects companies through their employees, even though they do not use social computing for work purposes, as previously private personal conversations about work may become public [104]. As companies are worried about employees revealing sensitive information, they can forbid or limit access to social computing sites from work, monitor employee online activities and also set up guidelines for their employees regarding posting content. Proofpoint research showed that, in the US, 62.3% of companies reported they already have a simple or detailed written policy to define appropriate uses of internal and external web log or message board systems. These may include personal use policies, confidentiality rules, monitoring and privacy policies, etc. Furthermore, 64.6% of companies reported that they have a simple or detailed written policy specifically addressing the use of video or audio content sharing sites and P2P (peer-to-peer) networks [88]. However, the same research showed that in the past 12 months, many companies had detected exposure of sensitive information by employees online, and 11% of companies had disciplined an employee for violating media sharing/posting policies and 6.8% reported terminating contracts for such a violation [88].

Internet security threats In addition to policy creation, organisations should improve user awareness training on Web2.0 and web-borne threats. The Forrester study concludes that organisations have not paid enough attention to training and a typical enterprise web user is likely to be unaware of the threats associated with the use of Web2.0 applications [33]. For example, many people²⁰³ use the same password for every website, and if there is enough information to guess it from the collaborative content site, then it may be used in others, in both private and work-related networks [100]. User-contributed content can also be infected with various forms of malware [89][81]. For example, in March 2007, the SpaceStalk

²⁰² <http://www.timesonline.co.uk/tol/news/world/europe/article2459924.ece>

²⁰³ 32% according to Sophos report [100], 41% in OCLC study [77] use same password always or often.

spyware Trojan horse was discovered embedded in a QuickTime movie uploaded to MySpace [100]. Surveys suggest that 50% of IT and security professionals have concerns that increases in user-contributed content will also increase the prevalence of vulnerabilities in the enterprise, and 45% have concerns that the employee access to confidential information combined with web2.0 services increases the risk of data leaks and theft [33].

6.5 Challenges for organizations

Employing participative approaches and collaborative content creates new challenges, requiring new learning for organizations and individuals and finding the best models for benefitting from the new opportunities.

Interactive, flat and transparent organizations. When encouraging open expression for internal communications, discussions, and suggestions, e.g. through blogging, the approach may bring out issues not typically discussed in public at company level [67]. Similarly, if a company opens a channel to interact with customers and lets them express their feedback and suggestions, it needs to facilitate and follow up actively and be prepared react to the issues raised quickly. Examples suggest, for example, that the healthcare systems are not prepared to respond to, or deal with, the thousands of external public opinions that are emerging about the work they carry out [45]. This is beginning to be the case even when a company or an organization has not itself opened collaborative content channels for interaction, as clients and workers are blogging and sharing their experiences anyway.

New learning for institutions and skills for employees. As discussed, many companies have already invested in Web2.0 tools or plan to invest. However, in a McKinsey survey of executives who have already invested in Web2.0, 42% think that they should have invested more in their company's internal capabilities [68]. There is a tendency to use tools to improve existing processes rather than to explore alternatives [1]. For example, in educational institutions, deploying the opportunities of ICT for learning may be hindered by unsupportive institutional settings for teacher training, course structure and assessment [2]. People and institutions are not by definition hostile to change, but there should be sufficient incentives and support to make change possible [91]. In addition to the barriers to providing an opportunity and skills to use technical innovations, there may be cultural obstacles against sharing or using resources developed by other people or institutions [79]. New leadership skills are necessary to first support users to take up new tools and working approaches and then be open for the new innovations coming from the collaboration and shaping the working models further.

Question of productivity. A technical challenge for the ICT infrastructure of organizations is that social computing consumes bandwidth, and hence it may slow down the operations of companies with large numbers of DNS queries and media files. 55% of organisations say that more than 30% of organisation bandwidth is consumed by non-business use of Web2.0 [33]. The demanding nature of social-networking sites was highlighted in May 2007, when the US Department of Defence announced it was blocking access to 13 web sites, including MySpace and YouTube.²⁰⁴ It is also said to be one of the reasons why Australian schools are banning

²⁰⁴ <http://www.networkworld.com/news/2007/062207-myspace.html>
www.pcworld.com/businesscenter/article/133494/how_myspace_is_hurting_your_network.html

social computing sites.²⁰⁵ These technical requirements are challenging the participation possibilities of people inside organizations. As long as social computing and collaborative content is not seen as beneficial for organizations, they will tend to restrict access to them instead of investing in solutions that support their usage. At the moment, the messages available are contradictory. For example, a Forrester study concludes that businesses are suffering reductions in employee productivity because employers log onto many social networking sites [33]. IT professionals, however, think that participating in online communities helps them to do a better job [56].

Sustainability of collaborative content communities. A major challenge for both the collaborative content communities themselves and the companies who base their business on public contributions is the sustainability of the development. There is the risk that users stop contributing, or high rates of vandalism occur, which damages both the quality and the amount of the resulting content. Research has suggested that community rules and the quality of content are important factors for the viability of the community and for attracting users [96]. Community rules are important for managing tensions between groups with different opinions, unsuitable content and even vandalism. As yet, no sustainable models to ensure the development of quality outputs seem to have been found. Quality assurance through moderated and otherwise restricted collaborative initiatives do exist, but none of them are as popular or have as many contributors as Wikipedia with its open editing access to everyone. User participation is difficult to anticipate and there are examples showing that initiatives created by organizations do not always manage to attract contributors as effectively as communities created bottom-up [83][62].

6.6 Discussion

The socio-economic impacts and opportunities of collaborative content can be categorized under i) diverse content availability, ii) content-based connections between organizations and individuals, and iii) new collaborative and participative working models. However, there are several challenges that need to be addressed before we can get the most out of this positive potential.

The main challenges relate to the need for a responsible and critical internet user culture, which would lead users to create and use quality content and be aware of privacy and security issues and respect for IPR rights. This would require that people in formal education, and those who have already completed it, receive training in media literacy skills. Furthermore, special attention should be paid to people who do not use the internet so that collaborative content and new participation possibilities do not create increasing divides between those already using internet and those currently excluded.

If companies and organizations want to benefit from the potential of collaborative content approaches in their internal processes or as an interface with the customer, they need to invest in their own organizational learning and development. Moreover, functional working models for collaborative content initiatives themselves still seem to be in the development phase. For smaller communities with small numbers of active contributors, it may be especially difficult to find models to ensure sustainable content development and quality assurance. This brings

²⁰⁵ <http://www.australianit.news.com.au/story/0,24897,21330109-15306,00.html>

additional challenges for companies, which rely on collaborative content contributions as part of their business model.

An interesting development worth following is how the planned restrictions for immediate edit visibility will affect Wikipedia's activities. For example, if only the 4,000 most active contributors of the English Wikipedia, who by July 2008 were responsible for 32.5% of the edits,²⁰⁶ get their contributions made immediately visible, will the remaining contributors still be motivated to do their 67.2% of overall edits? Furthermore, how would this affect the quality of the articles since studies [57][87] suggest that the most active contributors provide the content additions and the long tail of other (often unregistered) users contributes with small changes and corrections? Or, will Wikipedia show the way for a model where initial content and popularity is developed through very wide open collaboration and, afterwards, the initiative moves into a phase of maintenance and improvement, relying on a smaller number of contributors and already established popularity and content?

²⁰⁶ http://en.wikipedia.org/wiki/Wikipedia:List_of_Wikipedians_by_number_of_edits, accessed 30th August 2008

7 Policy options and research challenges

Social computing and content-based collaboration provide opportunities for a more participative society and economy. During this research, experts have expressed the opinions that, in the end, there will be no disruptive change in the society; people will keep doing the same things they have always done, but with new tools, speed and reach. These tools allow the collaborative power of people to be used for improving the functionality of the different elements in society.

Policy issues

The experts pointed out, during the research, that policy intervention is not always necessary [90]. In participative approaches it may even discourage participation and, in fact, markets and people themselves are guiding development towards the best functioning solutions. Governments should, however, continue to observe working initiatives (networks grown from the bottom-up) where people willingly share their emotions and knowledge, and learn lessons from them. It was suggested that the best emphasis for policy, at this point, would be on raising awareness and skills, and paying attention to the vulnerable groups and groups at risk of exclusion.

- *Awareness raising.* It is important to raise the general awareness of the nature and challenges of collaborative content for all actors. It is within the power of every user to pay attention to their privacy and security settings, to the type of content they publish online and to the ways they trust and use the content. The i2010 Mid-Term Review has already taken the initiative in this regard by setting a target for the European Commission to publish a guide that explains user rights and obligations in the digital environment in 2008.²⁰⁷
- *Improving digital competence.* Basic ICT skills, information searching and evaluation, and collaborative skills are important for preparing people to use participative communities and collaborative content for living, working and lifelong learning. These skills need to be incorporated into the formal education curricula for young people, and also taken into account in training approaches for people who have completed their formal education. ICT courses could be developed to introduce some relevant collaborative resources and also to explain the concerns relating to using and participating in these sites.
- *Protecting minors.* In addition to general awareness raising and training, protection approaches for young Internet users should be considered. They may reveal personal information when using collaborative content applications, be contacted and also otherwise influenced in their offline life. As an initiative towards this, it is already defined in The i2010 Mid-Term Review already includes plans for the European Commission to launch a Safer Internet 2009-2013 programme for the protection of minors and the fight against illegal content.²⁰⁸

²⁰⁷ http://ec.europa.eu/information_society/europe/i2010/i2010_actions_2008_2009/index_en.htm

²⁰⁸ http://ec.europa.eu/information_society/activities/sip/programme/index_en.htm; See also <http://teachtoday.eu> site developed to help teachers and pupils.

- *Supporting local developments.* Most Internet content is in major Internet languages, and inclusion of other language speakers could be promoted by supporting collaborative content development in local languages. Furthermore, initiatives built around local collaborative content development could aim to enhance, with peer support, inclusion and interest in ICT usage and ICT skills among groups at risk of exclusion (e.g. older people [3]). Reaching through local initiatives to people who are not yet involved in the major global initiatives, is a means of supporting a second wave of adoption of these new collaborative technologies.
- *Improving and maintaining internet access.* Improving broadband and internet penetration and ICT skills in Europe remains an important issue, if people are to equally benefit from the opportunities brought by collaborative content. Basic ICT and internet access together with basic skills need to be especially enhanced for disadvantaged areas and groups. Policies may also be needed to ensure equal network access to the increasingly important online participation opportunities for the society.²⁰⁹
- *Supporting collaborative research and innovation.* For utilizing the opportunities and learning lessons from collaborative content, R&D policies could promote and support projects with open collaborative interfaces with the society (and open standards for technical interfaces). R&D projects could benefit from the knowledge of practitioners by involving, for example, professional communities of practice in product development projects. Open collaborative projects could increase public knowledge and also get better results with the additional input from internet users.
- *Regulation and guidance on IPR.* The present laws and practises for IPR management are not flexible, and sometimes the line between acceptable and unacceptable use is unclear. Platforms are often confronted with lawsuits and the users themselves are not always clear about what they allow their content to be used for. Common guidelines for negotiating the IPR agreements between platforms and users and also recommendations for handling different types of copyright infringements could be developed to facilitate dialogue between stakeholders, instead of always going to court in the case of problems.
- *Participative approaches in public services.* In public processes, an increased number of open consultations and the promotion of openness and transparency could improve these processes and show whether government-created platforms can work.²¹⁰ Opening public data and inviting innovations from citizens and civil servants could allow innovative public services to appear. Work processes inside public services could also be better steered towards supporting public value with collaborative content. For example, students and teachers could use open resource platforms in their activities when possible, letting the public outside educational institutions benefit as well.

²⁰⁹ See, for example, discussion of Internet governance and the Future of the Internet, http://ec.europa.eu/information_society/activities/foi/challenges/gov/index_en.htm

²¹⁰ ePractice <http://www.epractice.eu/> is an example of a collaborative EC platform aiming to create a community of practitioners in the fields of eHealth, eGovernment, and eInclusion.

- *Supporting change in public institutions.* The need for more individual-oriented processes in government, healthcare and learning is recognized, but the institutions are difficult to change. Utilizing effectively collaborative approaches requires changes in the institutional systems, remuneration systems of employees, reassessment of objectives and development of new methodologies. For promoting change in the institutions, there needs to be investment in developing new models for working, awareness raising, training, and support for all levels of civil servants (e.g. doctors, teachers, managers).

Research challenges

During the research, the experts suggested that instead of traditional research, experiments and living labs approaches should be encouraged to see what works and what does not work with collaborative content and social computing in practice. Research should pay special attention to unintended consequences and activities and the sustainability of activity models. Collaborative content communities develop their models of working themselves, and do not necessarily respond to the ones planned by a project or platform designer. Hence, an experimental approach might provide the best results. Furthermore it has been suggested that a cross-media approach, considering both old and new media, would improve assessment of the reliability of results.

Business models, sustainability. From the economic aspect, it is be important to study real business models of collaborative content platforms, considering the revenues vs. costs and finding the most viable models. It is worth exploring how the future business models could best utilize co-creation of value with the customer [94], the long tail model in gathering customers and producers [5], and aspects of attracting and balancing two-sided markets of content producers and consumers [95]. Furthermore, there is a need to study how existing industries, under pressure to change, could most beneficially take on board the opportunities of collaborative content in their business. For example, it was suggested during the research that the traditional textbook publishers could develop organized collaborative content models to create books by aggregating the products of different expert teachers. New initiatives in making music, videos and books are emerging, supporting collaborative creation and earning money from the products created. However, research is needed in order to find ways to build this kind of model effectively and with economic viability.

Collaboration models. As pointed out throughout the report, models for content-based collaboration that support both participation and quality content still have to be found. Research into developing collaborative activities that are motivating and beneficial for individuals and the society at large is needed. The factors, which make some collaborative content communities popular and successful and others not, should also be identified. Possible approaches for research could be, for example, to consider the motivations of the participants (as, for example, in [99]), community outputs and rules with, for example, an activity theory approach [30] and what turns a community into a committed community of practice [111]. Research is needed into both large-scale open communities and suitable models for smaller groups (e.g. inside organizations), or on how to set up communities for a specific purpose. Finding best practices for organizational change also needs to be investigated, in order to learn how to best manage the opportunities and challenges of new internal information sharing and knowledge management and ways to engage with user innovations in work processes.

Technical solutions. The increasing amount of available information is a challenge for searching the most relevant resources. Different tagging mechanisms, metadata and ontologies are being developed to help in the task, but widely-accepted solutions do not yet exist. RSS and Atom technologies, usually classified under web2.0, help in the information abundance by supporting aggregation services to create individual dynamically-updated content portals. However, the solutions are often still very complex - more user-friendly simple solutions for finding and staying up-to-date with the most relevant content for oneself are needed. New technological solutions are also needed for digital rights management, in order to support content creating and mediating companies, and also the users to differentiate legal and illegal use of content.

Utilizing social learning. An overall challenge is to find ways to bring home to all collaborative content participants the importance of a critical and responsible attitude in creating and using content. As collaborative content approaches have the potential to contribute to peer learning with the community around topics of common interest, it should be discovered if, and how, this could be used to spread knowledge of the skills needed for participating in collaborative communities. Maybe the communities themselves could develop models where they help newcomers to learn the most important skills for participating in the community safely and beneficially. This would support these communities to become places for on-demand learning and connections for people to support their personal development in any relevant topics relating to work and social life.

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Annex: Examples of collaborative content initiatives

The aim of this list is to show a variety of different collaborative content initiatives, it is neither covering them all, nor all types of them, as the number of the initiatives is countless and growing.

Collaboration for creating information resources		Collaboration	Scope	Commerciality
http://www.wikipedia.org/	Wikipedia is a free encyclopaedia, 250 different language versions	Altering; enhancing; Discussion	General	Non-commercial
http://species.wikimedia.org/	Wikispecies is a directory of species	Altering; enhancing; Discussion	Biology	Non-commercial
http://www.wiktionary.org/	Free language dictionary, 172 language versions	Altering; enhancing; Discussion	Language	Non-commercial
http://cnx.org/ , http://www.wikiversity.org/	Examples of initiatives aiming to develop educational resources with collaborative development. Users can create materials, improve them, comment on the materials and discuss with each other.	Altering; enhancing; Discussion	Education	Non-commercial
http://www.wikihow.com/	WikiHow gives how To instructions for everything that has been found interesting by the users, developed on a wiki platform and containing related discussion pages. In Feb 2008 contains 31000 articles and has 6 language versions (English, Spanish, German, French, Dutch and Portuguese).	Altering; enhancing; Discussion	Anything	Commercial platform
http://answers.yahoo.com/	Yahoo! Answers is an example of a project, where users can answer questions and other users suggest answers to them, including discussion facilities.	Enhancing; Discussion	Anything	Commercial platform

Sharing individually created content with the community		Collaboration	Scope	Commerciality
http://www.YouTube.com/	YouTube is a platform for publishing and sharing videos, supports commenting and personal collections. Contains content produced by both individuals and media companies.	Assessing; Discussion	Anything, videos	Commercial platform
http://www.scivee.org/	SciVee is a video sharing site for scientists to upload their technical papers and podcast videos explaining the research results in the papers. Although worldwide, this initiative is launched and operated in US by the Public Library of Science (PLoS), the National Science Foundation (NSF) and the San Diego Supercomputer Center (SDSC). According to the portal, the goal is free and widespread dissemination and comprehension of science.	Discussion	Scientific; informative	Non- commercial
http://www.flickr.com/	Flickr, photo publishing, sharing, tagging	Discussion	Anything, photos	Commercial platform
http://www.quizilla.com/	Quizilla contains poems, stories, and quizzes published and rated by users	Assessing; Discussion	Anything, writing	Commercial platform
http://www.slideshare.net/	SlideShare worldwide community for sharing presentations on the web. Provides tagging and also possibilities to restrict the slide visibility.	Assessing; Discussion	Anything, slides	Commercial platform
Communicating experiences, opinions		Collaboration	Scope	Commerciality
http://www.blogger.com/ , http://www.wordpress.com/ , http://www.typepad.com/	Examples of commonly used blogging platforms	Discussion	Anything	Commercial platforms
http://www.ratemyteachers.com/ , http://www.ratemyprofessors.com	Sites for rating and commenting teachers. Provide also possibilities for teachers to send responding video comments back.	Discussion	Education	Commercial platforms
http://socialight.com/	Website to create and send "sticky notes" for sharing places and experiences of them around the world, describing them with text, photos, audio and video.	Enhancing, discussion	Leisure	Commercial platform
http://www.tripadvisor.com/ , http://www.tripconnect.com/	Websites containing customer reviews and advises relating to travelling.	Discussion	Travelling	Commercial platforms

Sharing and managing preferences		Collaboration	Scope	Commerciality
http://del.icio.us/	Social tagging and bookmark sharing	Assessing, recommending	Web content preferences	Commercial platform
http://last.fm/	Last.fm allows users to find, tag, organize, recommend, discuss music they like. Supports creating groups and networks with other people with similar music interests. It gathers collaborative ratings of songs based on how people are using and recommending it.	Assessing, recommending, discussion.	Music preferences	Commercial platform
http://www.digg.com/ http://www.reddit.com/ http://www.newstrust.net/	Platforms for users to submit links to online content they consider interesting and vote on contents they like, as well as comment and discuss the content. NewsTrust aims at rating news also on the base of quality, not only popularity.	Assessing; discussion	Anything	Platforms commercial
http://www.citeulike.org/ http://www.connotea.org/	Free online services to organise and share information on academic papers. Support tagging, discussions and creating groups of users.	Assessing; discussion	Scientific	

Communities of practice		Collaboration	Scope	Commerciality
http://www.ganfyd.org/	Ganfyd is a knowledge base in a wiki form for medical doctors and students, gathering together medical information. Editing is allowed only for medical professionals but the resources created are available for everyone.	Altering, Enhancing, discussion	Medical	Non-commercial
http://communities.intel.com/community/vproexpert	Intel vPro Expert Center, community of practice that aims to share IT best practices and technology deployment, providing an open dialogue between Intel and the IT community.	Enhancing, discussion	IT practices, product deployment	Commercial platform
http://www.libsuccess.org/	Library Success: A Best Practices Wiki. This wiki was created to collect in one place experiences, ideas and information for all types of librarians. I.e. a global wiki approach to support a community of practice.	Altering; enhancing; Discussion	Librarians	Non-commercial
http://www.oercommons.org/	OER Commons is an open learning network where teachers and professors can access their colleagues' course materials, share their own, and collaborate on affecting today's classrooms. It aims at using tags, ratings, comments, reviews, and social networking to create an online experience that engages educators in sharing their best teaching and learning practices.	Altering; enhancing; assessing; discussion	Education	Non-commercial
http://www.epractice.eu/	The European Commission ePractice portal aims to create a dynamic community of practitioners, disseminating, exchanging, and assessing good practice in the eGovernment, eHealth and eInclusion domains of public services.	Enhancing, discussing	Public services	Non-commercial

Crowd sourcing for collaborative tasks		Collaboration	Scope	Commerciality
http://www.peertopatent.org/	Peer reviewing initiative for patent applications.		Scientific review content	Non-commercial; public service
http://www.mybikelane.com/	Citizens monitor bikelane offenders by sending pictures.		Reporting law violations	Platform commercial
http://www.galaxyzoo.org/	Galaxy Zoo is an online astronomy project which invites members of the public to assist in classifying over a million galaxies.		Scientific	Non-commercial
http://www.ohmynews.com/ http://www.agoravox.com/ http://www.nowpublic.com/ http://www.newsvine.com/ , http://www.slashdot.org	Citizen media initiatives. Journalistic reporting of current events or more free form stories sent by users. Some initiatives allow users moderate the selection for publishing, some have editors. Users can often comment the articles.	Assessing; Discussion	General; informative	Commercial platforms
http://www.code-is-law.org/	Code 2 is an example of an online collaborative book update. Lawrence Lessig first published <i>Code and Other Laws of Cyberspace</i> in 1999. After five years in print and five years of changes in law, technology, and the context in which they reside, he thought it needed an update and using a wiki opened the editing process to all, to draw upon the creativity and knowledge of the community.	Altering; enhancing; discussion	Writing; book update	Aims at a commercial product
http://maps.google.com/	Enhancing basic map information with user-created information pieces of locations, sights, metro stations etc.	Enhancing, discussion		Commercial platform

Support for improving skills in content production (professional amateurs)		Collaboration	Scope	Commerciality
http://www.lulu.com/uk/	Lulu is an example of a new collaboration, publishing, and marketing system that gives authors a possibility to work on their book by showing intermediate versions and getting comments and discussions from peers. Lulu helps in printing the final book and provides buying and selling mechanisms for published books. In June 2008 the platform announces to have creators from 80 countries and distributing books to over 100 countries.	Enhancing; discussion	Writing	Platform commercial, supports commercialization of products
http://www.songcommunity.org/	Song Community is an example of collaborative music making, where people can create lyrics, riffs, samples and melodies, starting new songs and continuing and improving the ones others have started. All song versions are stored with version management, and people can vote over best lyrics and riffs. The community aims to promote best songs also for record companies and hence gives the creators a possibility to profit commercially of the songs in which they have been participating.	Altering; enhancing; assessing; discussion	Music	Platform commercial, Supports commercialization of products
http://www.wreckamovie.com/	Wreck A Movie, is an online collaborative film community for creating short films, documentaries, music videos, Internet flicks, full length features, mobile films and more. Everyone can participate, but each production has a leader, with more decision power than average users. Resulting productions may commercially use all materials and ideas submitted by users to the production royalty-free unless otherwise agreed with the production Leader or terms specified in the chosen license type of the production. Companies can also participate as sponsors for the productions they are interested in.	Altering; enhancing; discussion	Movies and videos	Platform commercial; Supports commercialization of products
http://www.globalvoicesonline.org/	Global Voices is a non-profit global citizens' media project founded at Harvard Law School's Berkman Center for Internet and Society, a research think-tank focused on the Internet's impact on society. Their goal is with their editors to 1) call attention to the most interesting conversations and perspectives emerging from citizens' media around the world by linking to text, photos, podcasts, video and other forms of grassroots citizens' media being produced by people around the world and 2) Facilitate the emergence of new citizens' voices through training, online tutorials, and publicising the ways in which open-source and free tools can be used safely by people around the world to express themselves. They say that because voices from North America and Western Europe are already over-represented in the global media, they are not focusing on those regions at this time.		General; inclusion	Non-commercial

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Abstract

Collaborative content, created with web2.0 technologies, is part of the social computing phenomenon. The key feature of collaborative content is that it is created, reviewed, refined, enhanced and shared by interactions and contributions of a number of people. The report provides an assessment of the use, adoption and impact of collaborative content applications, giving an in-depth description of YouTube, Wikipedia and blogging, and discussing the socio-economic impacts and challenges of collaborative content. The great variety of collaborative content applications is providing people with access to a diversity of content and information, new relations to other people based on common interests, and a new tool for collaboration. Organizations can not avoid responding to the challenges that arise, but there are various ways in which they can also benefit from the opportunities available. A major challenge is how to nurture a responsible digital culture, where users adopt a critical attitude to both creating and using the content, and where the collaborative communities have sustainable models for participation and content quality management.

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