

SE eBusiness Case Studies

Web 2.0 Technology and Privacy Issues

Robert Hilbrich
Robert@Hilbri.ch

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Maybe Privacy, with the words from Calvin Gotlieb, is a term “whose time has come and gone”. According to his opinion “despite all assurances, most people don’t really care enough about Privacy to protect it, if there are other interests at stake. [...] Sacrificing Privacy for your personal benefit has become so common that effectively, it doesn’t exist anymore” [?][?].

This paper focuses on Privacy Issues in Web 2.0 by analysing its roots in Public Spaces and Private Spheres. Conclusions will be drawn to show how to deal with Privacy concerns and issues at hand in the new era of the Internet.

Contents

1 Introduction

Web 2.0 - often described as the new era the Internet - fundamentally increases the level of participation by the users. Active participation by supplying usergenerated content leads to a new pattern of communication. Communication is no longer *unidirectional*, instead it is now similar to real life by offering *bidirectional* communication channels. This new model for communication is the foundation for a whole range of new applications and services for internet users.

Web 2.0 simplifies the use of the new technology on the one hand and increases its usability on the other hand. As supplying content for the Web does not require a deep understanding of the underlying technologies anymore, the user base is heavily growing. More and more people are joining by consuming or even providing content. Additionally, users are now also able to structure and integrate their new content with information already contained in Web 2.0. Now, it is the task of the users to ensure and improve the quality of the service or applications.

This leads to enormous *distributed informational databases* that are fed, structured and maintained by its users and allow a mostly unrestricted *public access*. Although restricting the access is possible, it requires additional effort and some of the advantages of Web 2.0 are only usable with public access. Web 2.0 relies on a broad and public user base. Restricting access interferes with this requirement.

Agglomerating data to such an extent naturally raises questions about data-security and anonymity. Many papers dealing with data warehouses and privacy have been published. The public access and simple usage of Web 2.0 information shows the importance to analyse the relation between Privacy and Web 2.0.

The technological possibilities of Web 2.0 lead to a highly integrated community whereas

1 Introduction

privacy and anonymity pursuit to reduce the level of integration to achieve autonomy. This indicates that Privacy and Web 2.0 are *diametrically opposed* to each other. The more you gain profit out of having one, the more you lose the other.

After having defined Privacy in the first part, Web 2.0 is introduced and further analysed. The third part compares Web 2.0 to Private and Public Spaces. This leads to Privacy Issues that are discussed in the fourth part. Finally, a conclusion will be drawn to illuminate the difficult relation between Privacy and Web 2.0.

2 Privacy

Privacy and privacy issues have been widely discussed in many different areas of research, ranging from social sciences to computer sciences. Naturally, every definition emphasises different aspects of privacy that are useful for the research topic at hand. Likewise, this paper needs to have a solid definition of privacy to work with. This will be developed in the next sections.

At first, we need to discuss why privacy is important at all, because violations can only be properly criticised when there is a concise reason why it is important and valuable.

What is the value of Privacy?

Why do we need to think about privacy and privacy violations? Where is the problem, if someone writes down the address personal information of other people on a piece of paper and puts that into a little box - even if this little box is a computer?

What must happen to turn that incident into a violation of privacy? Apparently, it is not obvious why people think privacy is valuable. What is it about privacy, that one needs to appreciate?

The Dutch philosopher Beate Rössler gives interesting and insightful answers to these questions in [?]. According to her, Privacy is appreciated, because in democratic societies a high level of *autonomy* is required. This autonomy cannot be practiced properly without the protection of privacy. Autonomy cannot be experienced without clearly demarcating the public and private dimensions of life.

How to define Privacy?

2 Privacy

Privacy has a variety of definitions. All definitions of privacy, however, have one main point in common - *Access*. Controlling access to *information*, *location*, *decision* or habits. This can be either meant in the classical sense, e.g. to allow or deny physical access to a location, or in the metaphorical sense, e.g. to have *access* to the decision to abort pregnancy.

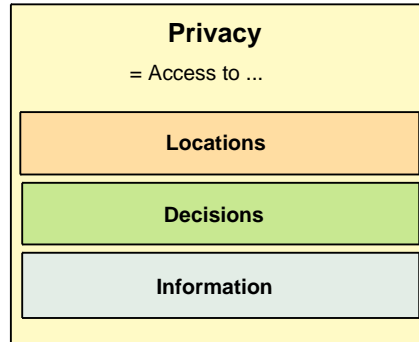


Figure 2.1: Layers of privacy

What privacy tries to protect is also common among most definitions. Privacy protects the *freedom* and *autonomy* of the individuals in the society. The demand for privacy is so high, because without privacy, it would not be possible to lead a free and self-determined life [?]. That is also the main reason, why privacy needs to be protected: Giving up privacy implies giving up the claim for free and self-determined life. The protection of Privacy is constitutive to leading that life.

Different aspects and dimensions of life are affected and protected by privacy. *Decisions* should be private, otherwise decisions and life plans could not be properly lived. *Locations* should be private, because the protection of intimate relationships must be guaranteed and personal *information* should be private, because controlling access to personal information is fundamental to live freely. [?]

These three layers constitute the meaning and the reach of privacy throughout the rest of this paper. This definition will be picked up again later, when specific Web 2.0 privacy issues need to be analysed and discussed.

3 Web 2.0

The previous section described the focus that is being used to analyse Web 2.0. In the next section, Web 2.0 will be introduced and current developments will be presented.

3.1 What is Web 2.0?

During the last two years the buzzword *Web 2.0* was picked up by the media and press to describe a new type of phenomenon in the internet sphere. This new phenomenon comprises of applications and services that evolved after the dot-com-bubble burst in 2001. They all have a certain key feature in common: a new level of *user-interaction*. This is essential for Web 2.0 applications, because the usefulness increases dramatically with the participation of the user.

Compared to the early years of the World Wide Web, this is a complete change in the way people use the Net. Classically, there were only two different user-roles in the Web - the content *provider* and the content *consumer*. Due to technology constraints that made user-interaction a difficult task, these roles were clearly separated. Thus, the *information flow* was always directed from the provider to the consumer, very similar to Radio or TV. In contrast to this *unidirectional* communication model, Web 2.0 introduced the *bidirectional* communication by overcoming the technology constraints and hiding the complexity from the user.

The term *Web 2.0* itself was born in a brainstorming session with Tim O'Reilly and MediaLive International [?]. In the style of a new software version, the term was mainly picked to denote a new era of the World Wide Web.

About two years after the birth of *Web 2.0*, it's now regarded as a common term to describe the latest developments in internet technologies and the cultural aspects behind it.

3.2 Design and Development of Web 2.0

The term *Web 2.0* is often considered to be very foggy and not clearly defined. The main reason for this perception is, that the term spans over the development in different areas - thus posing a challenging task to give a thorough definition.

In the press, the major achievements of Web 2.0 are mostly summarised as “interactive and user-generated content“ [?]. As this is rather the cherry on top, the more constitutional achievements and features of Web 2.0 are listed in [?] and [?]. They all fall in one of the following categories that can be labelled as *infrastructure-*, *cultural-* and *architectural* developments.

The *infrastructure* group comprises of new technologies to enable the use of the *Web as platform*. Mainly, these are *Linux* as the basic operating system, *Apache* and *MySQL* as the fundamental Web- and Database-Server-applications, *Python*, *Perl*, *JavaScript* and *PHP* as the fundamental programming languages and *AJAX* - a combination of JavaScript and XML. The all have the same core attribute: they are open source. This means, that everybody is able to use them without paying license fees and they can be easily customised. In addition to *Web as platform*, this *Hackability* is another fundamental element of Web 2.0.

In the *cultural* category, Web 2.0 is rather seen as an attitude and not only a certain kind of technology. The main motto here is: "Trust the Users". This leads to the expectation that the service automatically gets better the more people use it [?].

The File-Sharing-Network *Bittorrent* is very good example of how the quality of the service increases with number of participants. If more people are connected to this network, the chances to be able to download a certain kind of software from a peer-user are higher and the overall-bandwidth-usage is also improved. The trend towards *user-*

generated content is another good example of how the increased trust in the user affects the way content is generated. Before Web 2.0, the content of a website was usually generated by the owner or maintainer of the website, whereas the visitors were mostly consumers of the content provided.

Trusting the users also means that their opinions can be trusted as well. Therefore *User-Reputation-* and *User-Reviewing-*systems are being used to improve the service quality. A well-known example is *Amazon* and its product reviews. Here, users are not only able to rate a certain product, but also to assess the reviews about the product with regard to their helpfulness.

Allowing users to participate in the development of a service assures that the service will adapt to the changing needs of the users. Consequently, the service is constantly changing and thus not leading a “stable” and “final version”. This breaks with the classical view of software- and system development and therefore Web 2.0 services are often considered to be in a state of a *perpetual beta*. In software developers terms a “beta” depicts a development-state of a software that is still heavily developed and not necessarily stable.

In the remaining category - the *architectural* group - a whole set of new concepts have been employed. Classically, the World Wide Web was centrally organised. Web 2.0 on the contrary tries to decentralise as much as possible. The filesharing tools, such as *bittorrent* [?] implement this concept in a very successful way. With regard to decentralisation, Web 2.0 is now rather seen as “small pieces loosely joined“ [?]. This level of integration between the services is essential for the new Web and leads to a substantially higher integration of users of different services. The term ”getting the long tail“ [?] has been established to describe that it is very simple now to address and integrate a larger number of people by using these new technologies.

3.3 Web 2.0 Examples

All these new standards and concepts described in the previous section lead to very interesting and useful products. These products fundamentally changed the way people use the Internet and perceive Web 2.0. Therefore, it is useful to give a short overview

about them.

Probably the most popular development is the *blogosphere* which is a term to describe the sphere where lots of different web logs - so called blogs - exist. The blogs are websites where the author of the blog - a *blogger* - publishes their opinion regarding a certain topic. By using *trackbacks*, other bloggers now have a chance to refer to that statement and publish their own opinion on that topic.

This method of integrating different blogs is vital for the blogosphere. According to [?], this blogosphere is not just journalism on an amateur level. It is seen as a different *media ecosystem* with its own chances and dangers.

Due to the increased amount of high-speed internet connections in private households, a blog is not necessarily limited to text anymore. Lately the video blog - *vlogs* are rapidly emerging. However their main focus is still similar to the blogs.

Two other websites got a lot of media attention during the last two years. The first one is flickr and the second one is YouTube. The former was bought by Yahoo in March 2005 and the latter was bought by Google in October 2006 for \$ 1.65 bn. At flickr, users can upload their photos hence having a very comfortable way to create a photo archive online.

These photos can be equipped with *tags*, which are names of categories where the picture fits into. Other users are now able to search the flickr photo database for pictures with a certain tag - e.g. "cats". Many bloggers use flickr as their photo storage and provide links in their blogs. Some photos are also *geotagged* so users are able to search for pictures taken in a certain area around the world. These tags are usually user-generated and create a structure of categories in the huge photo database of flickr. So the value of the database is increased when there are more people using it.

YouTube on the other hand is a huge video-storage website, where users are able to upload their video. These uploads are categorised and downloadable for all the other users. Lately TV-stations are also uploading previews of new TV series or movies. This shows, that the user base of YouTube seems to have grown to a point, where it is profitable for media companies and TV stations to use YouTube for advertisement.

Another great example of Web 2.0 and the successful implementation of tagging-technology is *del.icio.us*. This is a database containing bookmarks. Each bookmark is tagged and put into certain categories. Every user is now able to create their own bookmark list based on entries in the *del.icio.us* database. The value of each bookmark is measured by the amount of people adding it to their personal list. Thus, a really popular link appears in many bookmark lists. Searching results are now heavily based on the assessment of other users regarding that link. Again, it is the community which is generating the value of the service.

There are a lot of other really useful and popular Web 2.0 applications available on the internet, but blogs, flickr, YouTube and del.icio.us are good examples for illustrating the new concepts and attitude of Web 2.0.

4 Comparing Web 2.0 to Private and Public Spaces

Considering [?], very few people still regard the Web 2.0 sphere to be *virtual*. What happens there is now as real as real life. But what needs to happen in terms of Privacy and data-security that the users would perceive as a *violation*?

Whether Privacy issues are seen as a violation or not depends on the *expected* level of Privacy for the sphere these users are interacting within. Living together with one's family typically reduces the expected level Privacy. Living so closely together naturally limits one's Privacy with regard to the decisions or locality, as the level of integration is so high, so that all decision being made affect all other "individuals" as well. Autonomy cannot be fully experienced here.

Otherwise, when interacting with people in the City - the typical public space - the expected level of Privacy and anonymity is significantly higher compared to the previous example. An individual in the city would be rather surprised and cautious if a *stranger* knew his name or even his habits.

What level of Privacy do the users expect when moving through the Web 2.0 Sphere? Is Web 2.0 a Public Space? Is it a Private Space? In order to answer these questions it is necessary to show the constitutional differences between Public and Private Space first and secondly relate the Web 2.0 sphere to these Spaces. This will lead to conflicts and competing elements of Public and Private Space incorporated in Web 2.0 and build a solid working base for analysing potential Privacy Issues.

Throughout the following section, I will primarily focus on the *pure* realisation of Private and Public space, although in reality, a broad variety of these spaces exist due to

environmental conditions. To the best of my knowledge there is currently no concept in computer science research available to describe the characteristics of the Web 2.0 sphere. Therefore I will use a concept from research in social sciences and review its usability for describing the Web 2.0.

4.1 Six Dimensions To Polarise Public and Private Spheres

Walter Siebel developed a concise model in [?] to polarise Public and Private space in five dimensions. As the title of his book indicates, this model has been originally created to describe the social environment in a modern city. Although this may appear to be a bit off-track, but due to the fact of not having a good model in computer sciences, it still builds a good foundation for later analysis.

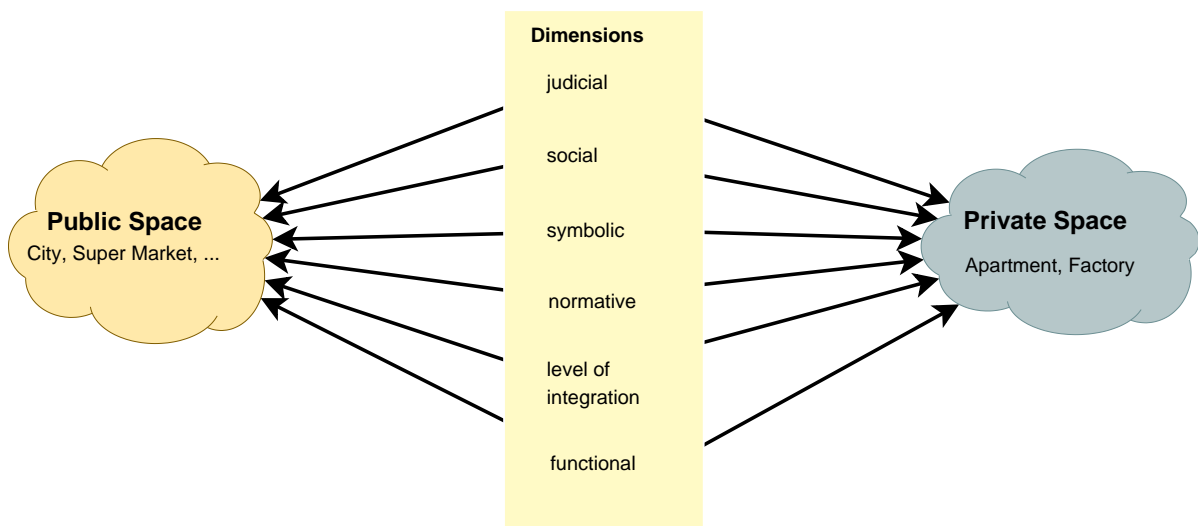


Figure 4.1: Seven Dimensions to polarise Public and Private Spheres

According to W. Siebel, functional, judicial, social, symbolic and normative elements are entangled to constitute Public and Private space. In the *functional dimension*, the public streets and places of a city are used for politics and the market. Whereas the private apartments and private industries get the function of production and reproduction assigned.

The next dimension - the *judicial dimension* - compares the applicable laws for public and private spaces. So in contrast to public laws applying to public spaces, civil rights apply to private spaces.

The third dimension is the *social dimension* and depicts the social norms and the expected behaviour of the people acting in a certain sphere. Here, the public spaces of a modern city are characterised by encounters of strangers, as a place of anonymity, where each individual only allows a part of its identity to become visible for the others. The so-called *Simmel-citizen*, with its main features of a certain detachment, indifference and a high intellect as described in [?], is dominant here.

Private spaces on the other hand are spaces with intimacy, emotion and physicalness as developed in [?].

In the *symbolic dimension*, public and private spaces are easily distinguishable by the materials used to build the space and its arrangement. Thus, public spaces create an atmosphere of openness and transparency with no or few physical barriers, but then private spaces are made of doors with locks to limit the number of people being allowed to enter the space and curtains to block the view at the private space from the outside.

The *normative dimension* of the Public Space is overloaded with perpetual demand for emancipation by the citizens. So the public space stands for the hopes for equal opportunities on the market, democracy and social participation. Consequently, this leads to the demand for general access. According to [?] events are considered public if they are accessible by the public.

The private space on the other hand is the area of the autonomous business man and the family with the promise of life-long love and mutual trust.

These five dimensions were proposed by W. Siebel to polarise public and private spaces. Nevertheless, another dimension will be added to this concept. The sixth dimension portrays the *level of integration* and was introduced by Hans-Paul Bahrdt in [?]. According to him, private spaces feature a substantially high level of integration, so that anonymity is almost impossible. Public Spaces on the other hand have been described as places with encounters of strangers in the social dimension. So the level of integration

is remarkably low leading to a high degree of anonymity.

4.2 Applying that Concept to Web 2.0

All these six dimensions - functional, judicial, social, symbolic, normative and the level of integration - polarise public and private spaces. All of them describe core differences between these spheres. It is a quite difficult task to map these dimensions to the Web 2.0 sphere, because a precise classification needs a precise definition of Web 2.0. Due to the changing nature of Web 2.0, this definition can not be developed, so hopefully this mapping will lead to some interesting insights.

Starting with the functional dimension, the main question is - *What is the function of Web 2.0?* As Web 2.0 is rather a medium than a physical device or sphere, its function is depending on its usage. Currently it is used to connect people and offer social networking by using internet technology. Web 2.0 is no longer a niche for computer science students. It is becoming a common *cultural skill*, like the ability to use a cell phone.

Its political potential becomes apparent, when looking at the political effects of Blogs in countries with high level of repression, e.g. China or Iran. Blogs affect the media bias in these countries and offer content and opinions that are not controlled by the government. This potential is also used in politics to promote presidential candidates, like in France [?] or in the United States, where presidential candidate Barack Obama maintains a blog and announced his candidacy online.

On the one hand Web 2.0 can be used to create a public space with its classical functions of politics and market. On the other hand, blogs about hobbies and other personal interests show that it is also used for recreational purposes.

The symbolic dimension leads to next question - *How does Web 2.0 present itself to the user?* As technology challenges are being dramatically reduced, the whole system presents itself as an easy-to-use system. The effort needed to create a Weblog is very low - all the complexity is hidden behind the curtains. All that is necessary to participate in that sphere are some mouseclicks at `blogger.com` or `myspace.com`. Integration

between your personal Weblog and your pictures at flickr is also done in nearly no time.

Creating and structuring content gratis on a network is not gainful, if there are only very few people allowed to access it. Thus, the access for Web 2.0 is mostly public or at least limited for large group of people. This leads to an atmosphere of openness and transparency. Web 2.0 is used as a public space and its access is also created in a public manner. This is plausible, because a public space could not exist without a public access.

Does this tendency towards a public space also lead to the same result at the social dimension? Is the Web 2.0 sphere also dominated by the *Simmel*-citizen with its detachment and indifference?

At first, the *citizens* of Web 2.0 need to be examined more closely. In Web 2.0 it is a common norm to pick a *nick name* for accessing services. Actually, this is strongly suggested by the *Deutsches Bundesdatenschutzgesetz* (German Data Protection Act) in order to increase privacy. Web 2.0 participants are nick-names that were chosen to conceal the real identity of the user.

While nick name were chosen to create anonymity and privacy, the Web 2.0 sphere is not dominated by the encounter of strangers. Indifference is also not a common feature of Web 2.0 as suggested in the social dimension for public spaces. Referring to certain blogs or news is so simple, that the atmosphere is not dominated by indifference and detachment. It rather common to pick up an interesting topic and present your personal view of things in your blog by providing track-backs to the origin of the topic.

[?] describes the typical situation in Web 2.0 as the follows: morales agglomerate quickly, rumours spread quickly and reciprocal insults are a very realistic reactions to published opinions.

As the nature of Web 2.0 is not physical, it naturally can not be a place of physicalness in the closer sense. But nonetheless, it can be used to create a level of intimacy and emotionality in certain forums or in social networks. A very good example for this are all the personal blogs at myspace. Here people tend to disclose a lot about

themselves that would be considered extremely private in other surroundings. Topics they would never talk about with strangers on the street they live in. The anonymity by hiding behind a nick name seems to lower the inhibitions and concerns about Privacy.

On the social dimension, Web 2.0 spans over a broad area between the private and public space, but with a high tendency towards private space. As Web 2.0 is a *networked* sphere that is used to connect people, it is obvious that this sphere rather tends towards the *private sphere side* as it tries to establish communication channels in an easy way between people that might never even meet in real life.

Web 2.0 is a networked sphere and therefore we can expect a higher level of integration compared to public spaces. On the other hand, it is still *just* a medium for communication and a medium itself cannot enforce a certain level of integration. Due to its nature, Web 2.0 only allows and simplifies a tight integration between the users. Therefore, the level of integration always depends on the user's attitude.

This leads to the structure of the users in Web 2.0. Here, it is rather common that certain groups of users - communities - are closely integrated whereas the groups themselves are only loosely connected. Although the barriers to switch from one community to another one are very low or even nonexistent, the more a user adds to it in the form of new content or new arguments in a discussion, the more the user starts to identify with that community. Thus the bond between the individual user and the community gets stronger.

According to [?], this bonding is the rare good of the Web 2.0 sphere. Bonding is also the reason for the competition between the different communities. Why? - because a strong bond could be changed to commitment or even better to contracts - sale contracts.

Web 2.0 does not enforce a high integration of the users, however, it is designed to achieve that. All techniques of *trackbacks* and *peer-reviewing* increase the level of integration with every use. Web 2.0 is mostly about the integration of people and services! Nevertheless, while talking about people, only nick names are being integrated. Whether profiled information in different integrated services have the potential to disclose the real user behind a nick name will be discussed in the next section.

4 Comparing Web 2.0 to Private and Public Spaces

With regard to the underlying norms, Web 2.0 creates no barriers and allows an unrestricted access. This is a constitutional feature of Web 2.0 as one of its core ideas is about "getting the long tail". Unrestricted access to information and events existing within Web 2.0 forms a very democratic basis and is similar to the public side of the normative dimension.

The last aspect of Web 2.0 that needs to be evaluated with respect to Public and Private spheres is the judicial dimension. Although, there are many participants acting in the Web 2.0 sphere and Public laws would seem to be appropriate here, but as all judicial issues trickle down to the individual, Civil Law applies here. Although it appears to be public, all litigations are subject to Civil Law. That only changes if personal rights or human rights are violated. These violations are then subject of Public Law.

What kind of sphere is Web 2.0? It seems to be a very ambivalent sphere, as different elements of private and public spaces are present or even overlap. Its success derived from the public side with a simple interface and transparent access. But it is used like a private sphere: topics are intimate, users have a substantial level of integration and communities are forming where opinions are quickly exchanged. It is not a meeting place of strangers. This ambivalent sphere is a *public sphere with a private attitude*. How much privacy can we expect here? Where are the privacy issues?

5 Potential Privacy Issues in Web 2.0

This chapter will combine the definition of privacy and the characteristics of the Web 2.0 sphere to discuss potential privacy issues. Previously, privacy has been defined as a necessity for autonomy and applies in three different aspects - *locations*, *decisions* and *information*. These aspects will be further evaluated in this section.

With regard to its non-physical nature, it is not possible to describe a potential violation of *location-Privacy*. How could a medium possibly limit the disposability of our private location, e.g. apartment? Whenever Web 2.0 started to invade the location, the user would have the chance - the *access* - to shut down their computer thus disabling any connection to the Net. Apparently, the location-aspect can be neglected when evaluating Privacy violations.

How could Web 2.0 limit one's access to decisions? Due to its nature of being a medium and not a legal institution, it is again hard to develop a scenario where the aspect of *decisions* could be violated. Moreover, many books and articles are being published that deal with the question, whether Web 2.0 has the potential support the user making an *informed* decision.

[?] concludes that the group outperforms the individual at solving complex problems. This applies to all mechanisms that are used to discuss or form opinions - such as blogs or user reviewing systems. The variety of opinions is increasing due to the broader user base which leads to a more unbiased decision [?]. It is now possible for the user to make a well-informed decision based on the pluralism of opinions present in Web 2.0. This is known and discussed as *the Wisdom of the Crowds*. Summarising, Web 2.0 does not seem to violate Privacy in the decision aspect, it rather supports the user making their decisions.

Before discussing the last and most important aspect - Privacy regarding *personal information* - the following recent examples need to be discussed. All examples are taken from [?]:

- "Admissions dean Paul Marthers at Reed College in Portland, Ore., says the school denied admission this year to one applicant in part because his entries on blogging site LiveJournal included disparaging comments about Reed."
- "In Costa Mesa, Calif., 20 students were suspended last month from TeWinkle Middle School for two days for participating in a MySpace group where one student allegedly threatened to kill another and made anti-Semitic slurs. The student accused of making the threat could face criminal charges and expulsion, says Bob Metz, assistant superintendent of the Newport-Mesa Unified School District."
- "A 16-year-old boy in Jefferson, Colo., was arrested after police say he showed pictures of himself on his MySpace page holding handguns. Police subsequently found the same weapons in his home, says Jim Shires of the Jefferson County Sheriff's Office. The boy has been charged with three misdemeanours for being a juvenile in possession of handguns, says Pam Russell of the district attorney's office. "
- "Two Louisiana State swimmers were kicked off the team last spring for criticising their coaches on Facebook. A University of Colorado offensive tackle was suspended from a bowl game in December for sending a racially threatening message through Facebook to a Colorado cross-country runner."
- "An employer who was ready to hire a student from Vermont Technical College in Randolph Centre changed his mind after seeing the student's Facebook page, says Lauri Sybel, director of the college career centre. Since then, Sybel says she has checked other students' pages to make sure they weren't hurting their job prospects."

These are just a few examples having one thing in common - the nick name did not protect the individual behind it properly. Whether the consequences are justified or not, the anonymity aspect of Web 2.0 in these cases seems to have vanished. The differentiation between the individual and their usernames did not exist anymore.

Assuming the *victims* did not intend to be suspended or arrested, they acted under false assumptions regarding their level of anonymity. All information was plainly presented in MySpace or Facebook, they could have easily deleted sensitive data. No data mining methods were applied here, so nearly everybody could have accessed these information with very little effort. What are the reasons that lead to the false assessment of their privacy level?

First, the question needs to be asked whether they knew about the public access to their profile. Why is that a problem? If an individual is not aware of who knows what about them, they run the risk of acting under false assumptions. This clearly affects the freedom and autonomy of the life of the individual. But all the websites mentioned above were designed for a public access. The users want their profile to be available online.

The only reason capable to explain the examples above is *lacking experience*. Web 2.0 is a totally new medium that is creating a sphere where users interact and that features public and private aspects at the same time. It also incorporates the advantages and possibilities of modern it-technologies to deal with enormous amounts of data. The society needs more time to gain more experiences with this new medium. We need to learn how to apply Web 2.0 properly and this will take time.

In the meantime, privacy issues are likely to occur when users derive an expected level of privacy out of the private nature of Web 2.0. But even hiding in the masses by thinking that the personal account on MySpace is just one of many and therefore hard to find is not working anymore. Extremely efficient search and integration techniques allow getting "the long tail" [?] - one core feature of Web 2.0.

Is it still possible to keep up a high level of anonymity while having an account on MySpace with your pictures at Flickr and your personal blog linked to your account? Is it still possible to conceal who your friends are and what hobbies you have? Some sites, such as xing.com, live off the true identity of their users to offer jobs or internships to the real individual.

When does this possibility to penetrate the nick name and reach through to the individual lead to privacy violations? It poses a violation if the user cannot answer the question "Who knows what about me?" anymore. At this point, it is a violation of the

privacy regarding *personal information* and limits the autonomy of the user. Whenever an individual has false assumptions regarding the capabilities of a medium they use, it may lead to privacy issues. Web 2.0 with its difficult nature, where public and private elements are intertwined, has a high potential to create privacy issues, because users derive their expected level of privacy out of their experiences with the *old* internet. At that time, the internet was very heterogeneous and the level of integration between websites on the internet was very low. Therefore it was possible to keep up a high level of anonymity and privacy.

While the underlying structure and technology changed a lot with the introduction of Web 2.0, the interface - basically an html browser - still looks very similar. As the interface is the only part a user notices from the internet - and it did not change much - how can we expect them to reconsider their assumptions regarding privacy and anonymity?

6 Conclusion

Privacy violations may exist when autonomy is in danger. This can be happen, if the individuals do not have full *access* to their personal information - either because they are not aware of these issues or are not able to deny access. Whether a potential privacy issue is perceived as a violation of privacy depends on the expectations of the individual regarding their level of privacy. The expectations are developed upon two aspects: the *characteristics* of the sphere and past *experiences*.

As it was shown with some examples, occasionally people are lead to false assumptions regarding their privacy. It was clearly proven, that anonymity vanished and private information was published. Privacy violation do exist in Web 2.0 services and applications.

Their causes may be found by understanding Web 2.0 as a *sphere* where individuals interact within and compare it to pure private and public spheres. I analysed the characteristics of Web 2.0 and identified an *open and transparent nature* with a decentralised architecture on the one hand and a *high integration of the users* on the other hand. In Web 2.0, aspects of private and public spaces are closely intertwined and create a new form of sphere. It generates a private atmosphere with an open and public access.

In addition to these potential causes of privacy issues in Web 2.0, past experiences of the users regarding the internet as a communication medium are another important aspect. As the concept of Web 2.0 is new and totally different compared to the *old* world wide web, past assumptions and experiences do not apply to Web 2.0 anymore.

However, the interface to the internet did not change fundamentally, so there is no *trigger*

6 Conclusion

for the users to reconsider their assumptions. This is clearly another point that may eventually lead to privacy issues.

So, does Web 2.0 *automatically* lead to Privacy violations after all? All new technologies have been designed to achieve a higher level of integration of the users. While this creates a lot of advantages for the user and improves usability a lot, a higher level of integration makes it harder to keep a high level of anonymity. Does this necessarily lead to Privacy violations? No, it depends on the user. They need to be aware of the possibilities of Web 2.0 and adjust their expectations towards Privacy accordingly.

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