Privacy settings in online social networks as a conflict of interests
- Regulating User Behavior on *Facebook* -

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We are all regulated by software now.
James Grimmelmann [15]

Summary. The present chapter shall analyze the options users of online social networks like facebook have to adjust privacy settings. As the theoretical background of this evaluation an institutional economics point of view shall be applied.

Against this background, the following analysis of how facebook as a provider of an online social network designs its platform in such a way that their own interests, as many users data to keep visible and searchable, is implemented.

Both, the GUI of the platform (website) as well as the various possibilities for mobile use, such as special 'mobile' versions of the website and smartphone applications (apps) for various platforms, will be evaluated.

1 Introduction

This chapter deals with conflicts of interest concerning privacy in social networks. The parties with potentially different interests are operators of social networking sites and their users. Depending on their reasons for using social networking sites, users want as much control as possible over who they grant access to their various personal data, operators want to allow as much information as possible to remain publicly accessible and searchable.

I will examine these issues from a perspective that regards software as an institution. This has the advantage that it allows institutional attributes to be ascribed to software, and thus makes it easier to demonstrate that software can actually perform regulatory functions.

As a matter of fact, software can wield a much more direct influence on behavior than conventional institutions such as social norms, national law, or contracts. This is due to the fact that software always restricts (i.e. regulates)

users' options ex ante, i.e., prior to or during use, simply because rules for use are defined while the software is being developed.

In the following I will analyze what forms such regulation of behavior can take. I have chosen to do so using the example of *Facebook*, because it is currently the social networking site with the largest number of members.

2 Regulating Human Behavior

An appropriate theoretical framework is required to analyze the influence of software systems on human behavior. Because research into institutions is concerned with analyzing the modes of operation of regulatory systems and their effects on society [24], it makes sense to approach the subject from this perspective.

Research into institutions is conducted in a variety of academic disciplines, such as political science, law and economics, as well as sociology, (political) philosophy, and new institutional economics [24]. Each of these sub-disciplines researches different aspects of how institutions influence individuals within a society.

Institutions can be understood as generally accepted systems of rules that either facilitate, structure or limit human interactions [17]. However, this study will focus not only on the rules, but also on the mechanisms that enforce the rules. ([31] quoted from [24])

To regulate human behavior, institutions can establish rules, enforce them, and penalize those who violate them. Thus, anything that regulates the individuals' possibilities for action in a community can be regarded as an institution.

That said, institutions can take on a variety of different forms. On the one hand, institutions can comprise formal rules, as is the case with national laws and written contracts. On the other hand, unwritten behavioral norms and social conventions also count as institutions [24]. The common denominator among all these forms is that they encompass rules that are applied, monitored and enforced whenever individuals make a decision regarding their future actions. ([25] quoted from[27])

Thus, by establishing and enforcing rules, institutions determine the options for action open to individuals in a society. In the following, I will set out why software can also be viewed as an institution.

2.1 Regulating Options for Action

Human behavior is influenced by numerous factors. These factors are of various origins and regulate the social behavior of individuals within a community in different ways. When attempting to classify these factors, it is helpful to analyze what can influence the behavior of individuals in specific situations.

In his book, *Code* [19], L. Lessig sketches out such an analysis, which I will describe below.

The rules that a society establishes have a major influence over the behavior of its members. Some of these rules are laid down as laws and apply equally to all members of the society – and in the case of laws, the rules are always limited to the national territory of the society in question. Other regulatory factors are also confined to a clearly defined scope of application, although identifying the boundaries of the spheres of action in which these regulations apply is not always as clear-cut as it is with national legislation. Thus, within its specific scope of application, legislation regulates behavior through laws.

Social norms can influence a person's behavior just as strongly as laws can, but it is far more difficult to precisely define the sphere of action in which their regulatory power applies. The range of possible behaviors in a specific social situation can differ widely depending on the location (e.g. in many situations the norms that apply in Europe do not apply in the U.S., and vice versa). However, at the point in time an individual chooses to take a specific action, it is not just the relevant society as a whole that influences his or her behavior, but also the social group, subculture and community. Thus, in certain situations, people are likely to behave differently when they are with their family than when they are among colleagues at work.

Another factor that influences human behavior is the market, which determines the options for action for transactions between different actors, in this case market participants. Mechanisms, such as prices (or costs) or even just the presence or absence of supply or demand, provide the actors with specific options for action. For example, if the price of a particular product is too high or if the market simply does not offer it, a person might have to forgo or at least delay satisfying the need to buy that product.

But it is not only the market, norms and legislation (in the form of laws) that regulate behavior. Another, highly influential, factor is the architecture[1] surrounding the actor. In the physical space, architecture regulates access to places and spaces, and therefore also to spheres of action. The rules of the market, norms and legislation might make it perfectly acceptable to enter a particular building, but a locked door is highly effective in preventing anyone from doing so. Therefore, by determining the scope for movement in a given environment, architecture regulates the options for action open to the individuals in that environment.

According to Lessig [19], this means that individuals' options for action are determined and/or regulated by the modalities of laws, norms, the market, and (physical) architecture (see figure 1 on page 4).

[1] Regulation by physical architecture can be found in, for example, urban and transport planning, and in the design of public spaces such as shopping malls and supermarkets (cf., e.g. [3]).

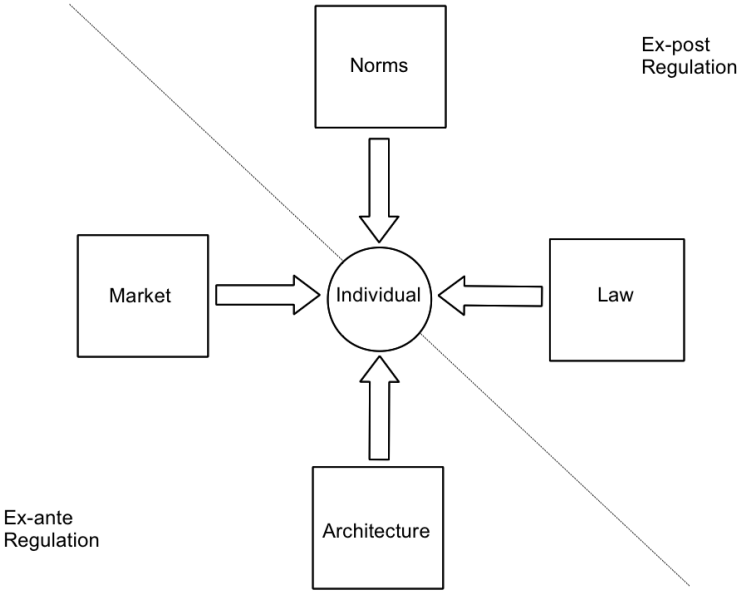

Fig. 1. Modalities of Regulation according to Lessig

2.2 Regulation Through Software

The dawn of globally networked systems like the Internet brought with it the need to reflect on the possibilities for regulating such systems. Territorial state law is clearly not particularly suited to the task, since the sphere of action that these networks offer goes far beyond national boundaries[2]. There was therefore a need to find a way of establishing and enforcing rules with a scope of application that reaches much further than that of national laws.

Joel R. Reidenberg provided the first reflections on this issue in 1998, when he published *Lex Informatica* [26]. In it he points out that the limited scope of the application of laws, and their regulatory character penalizing violations after the fact (ex post), can prove obstructive to handling global systems. Therefore, Reidenberg developed a framework that encourages incorporating rules directly into the informational and technical structures of systems. This would make it possible to establish rules that would apply throughout the system, irrespective of the user's location. This approach also means that the system could be designed in such a way as to prevent undesirable activities

[2] One example of the difficulties in regulating globally networked systems became apparent during the political upheavals in Egypt in early 2011. Because the government in power at the time was unable to limit access to the websites being used for communication and coordination among the opposition movement, it decided that its only course of action was to shut off access to the entire Internet.

from the outset. This kind of *ex-ante regulation* circumvents the need for retroactively punishing misconduct, because the system architecture prevents it from happening in the first place.

Given these properties of regulations integrated into technical systems, software can influence user behavior in a variety of ways.

Software can be used to enforce established law, as is the case with digital rights management (DRM) systems. DRM systems use informatic structures (systems that comprise hardware and software) to enforce the rules of law, in this case the provisions of copyright law.

The region codes on Digital Versatile Disks (DVDs) provide a good example of this technology. These rules are a combination of hardware and software that ensures that DVD content can only be played back within the framework conditions set out by the owner of the exploitation rights. The rights owner establishes which DVD can be played under which conditions. This involves saving a region code in the metadata of every DVD, and requiring all manufacturers of DVD players to implement routines in their devices that can read the DVD code. A device will then use the code to decide whether it is permitted to play a given DVD in the region for which this specific device was produced. If the DVD region code is not compatible with the player, it will be impossible to play back the content. Owners of the exploitation rights use this system to prevent violations of copyright law, and as a price-discrimination[3] tool. [8]

In this situation, hardware and software are used to implement a technical system for enforcing rights.

Much more common than systems for enforcing rights, however, is software that can (through its developers) define and enforce new rules that are designed independently of rights and laws or other norms. [24]

Users of software systems can only interact with the system according to the rules previously established by the manufacturer, i.e. the software itself regulates its users' behavior with predefined rules that determine their options for interaction. Thus it is virtually impossible to write texts using pocket calculator software because text processing is not a function provided for in the rules established and enforced by the programmer. [15]

I would like to stress here that any analysis of the architecture of a software system can only be a "snapshot" of a particular moment in time, because of course, unlike physical architecture, software architecture is malleable and can be adapted at any time [15]. Nevertheless, we can establish the fact that software manifestly determines its users' possibilities for action.

[3] Although I will not go into DRM systems in any further detail, this example shows that technologically supported regulation does not only shape the specific regulatory area, but can also have far-reaching effects on other legally protected rights (cf., e.g. [18]).

2.3 Software as an Institution

When considering software as an institution, it is helpful to bear in mind the process by which it is developed.

Software developers' goal is to harness computers to solve specific problems or perform certain tasks. So that computers can do what they are supposed to, they must be supplied with specific instructions that are written in a language they can "understand". In other words, developers need to translate the solution to the problem they have devised into information that can be processed by a machine.

Computers work deterministically, i.e. the same input will produce the same output every time. That means developers need to structure their instructions in a way that will ensure that the computer processes them in a certain order for the achievement of the desired result. In other words, developers not only need to write instructions in a form computers can understand, they also determine the order in which these instructions are carried out.

During this process, they must also determine what forms of interaction the software needs to make available to users in order to enable them to use the functionalities offered by the program.

In other words, software developers not only establish rules as to how and in what order the program performs which operations in the work process, they also determine how users can later interact with the software.

Software programs offer users certain functionalities on the one hand, while limiting them in their ability to act on the other. In making a number of functions available to them, they automatically eliminate the possibility of using other functions not included in that number. [15]

Accordingly, software can be seen as a system of rules that not only controls the program sequence, but also regulates users' possibilities for interaction.

If software is a system of rules that can facilitate, structure or limit the interaction of individuals, we can regard it as an institution in the sense of the definition set out by Hodgson [17] and referred to in the introduction to this section.

2.4 Discussion: Software as Architecture or as a Separate Modality

Lessig's approach of describing the various possibilities for regulation offered by software in terms of physical architecture is a legitimate subject for debate, as mentioned at the end of section 2.2.

It appears logical that software, much like architecture, can influence the behavior of its users by determining spheres of action according to rules defined by its designer. [19]

On the other hand, properties can be assigned to software systems that differ significantly from those of physical architecture, raising the question of whether the regulatory possibilities of software can legitimately be compared with those of physical architecture.

Thus software, unlike physical architecture, can regulate users' behavior in ways that are not necessarily transparent to them [15]. While the rules of physical architecture are apparent to those it regulates ("That door is locked, so I can't go that way."), it is not always evident to the users of software systems why they are supposed to utilize certain functionalities of the system while others are withheld from them.

Moreover, rules imposed by software cannot be ignored, while this is certainly possible in the case of physical architecture [15]. Thus a barrier or gate in the physical world can generally be bypassed fairly easily, while the average software user usually cannot ignore a request for a password, for example.

In addition, unlike physical architecture, most software programs are flexible and can be adapted even after they have been written [15]. For example, a software developer can change the interface of his system should it become clear that users do not interact with the system in the way intended. A highway, on the other hand, cannot simply be moved somewhere else if it turns out that it is not used to the extent the builder assumed it would be.

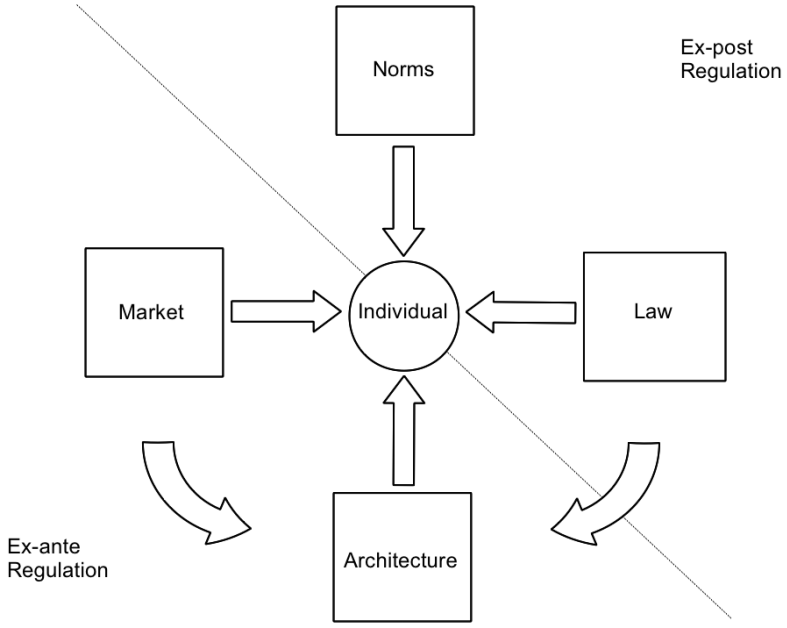

Fig. 2. indirect Regulation according to Lessig

Lessig does refer to this last point as representing a major limitation of the comparison between the possibilities of regulating software architecture and physical architecture. He argues [19] that not only can individual behavior be regulated *by* software, but the regulation *of* software itself can also be effected

by major social institutions, such as the market or by government regulations (see figure 2 on page 7). The analogy to "building regulations" could therefore certainly be applied. In the case of physical architecture, however, regulations can only be used to influence the shape of the future architecture, whereas in the case of software, regulations can also require software to be changed after it has been designed so that software systems that are already in place then have to be adapted to the requirements of the regulations.

For the following analysis in this study, however, the points addressed above are not relevant for the time being. The aim of the study is to investigate in what way the architecture of a system influences the users' scope of action through its interface design. This can only be a snapshot which evaluates the current state of a platform so it is not necessary, in this context, to take account of the discrepancies identified above between regarding software as architecture and as a regulation mode in its own right.

3 Regulating Behavior on Facebook

In recent years the popularity of social networking websites has exploded. One of the most popular and best known of these sites is Facebook.

On July 21, 2010 Facebook founder Mark Zuckerberg posted an entry on the Facebook blog announcing that his company had reached a major milestone in its history: Facebook now had over 500 million active users. [32]

This announcement led a number of media to compare Facebook to real countries. Indeed, according to the size of its (virtual) "population" of over 500 million users, Facebook could be considered the third biggest nation on earth, behind India (with 1.18 billion inhabitants) and ahead of the U.S. (with a population of 308 million). [22] [29]

If we follow this line of reasoning through to its logical conclusion, the question arises if the regulation of the behavior of Facebook's "inhabitants" by the website software can be mapped onto the modalities discussed in section 2.1. in the same way that the regulation of human behavior in the real world can (see figure 3 on page 9).

In the case of the Facebook system, the Facebook Principles [10] could be interpreted as social norms, while the Terms of Use [12] and Facebook Privacy Policy [11] apply on the site in more or less the same manner as laws, i.e. anybody who violates them can be penalized.

The modality I wish to analyze in the following, however, is the architecture of the website; as I use it here, the term architecture refers to all the various ways users can interact with the system, whereby the system consists primarily of the website *www.facebook.com*, in addition to various special versions of the site designed for mobile devices and client applications (apps) for smartphones, whose use has skyrocketed over the past few years.

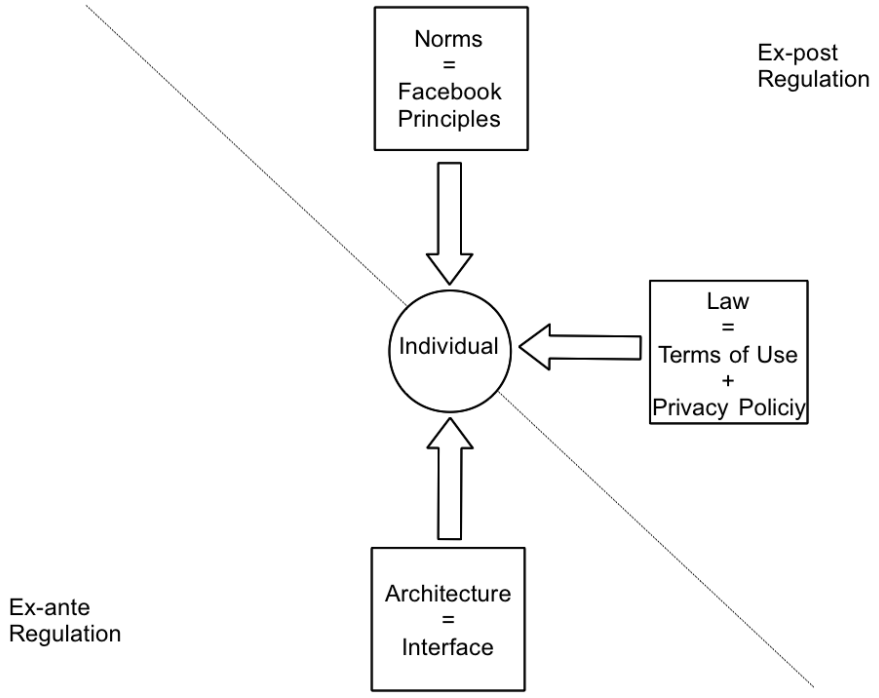

Fig. 3. Regulation on Facebook, according to Lessig

The specific object of investigation I will focus on in this section is the options given users to adjust their privacy settings to their individual requirements and preferences.

3.1 Website

The most common way to use the Facebook platform is to access it via its website *www.facebook.com*, which provides the interface for users to interact with the platform.

In principle, Facebook users have the option of adjusting all privacy settings to their own preferences. However, only a small percentage of users take advantage of that option [16] [9]. More than 30 percent of Facebook users are not even aware of the fact that the platform offers them the option of determining who is allowed to search for and find their profile information. And at least 22 percent of the site's users claim that they know nothing about privacy settings or can't recall ever having changed them. [2]

But why is that the case? The primary reason is to be found in the architecture or rather the design of the website, in which the options for fine-tuning privacy settings are not immediately apparent. These can be only accessed via

a link within a menu in the upper right-hand corner of the user's profile page. As with traditional software menus, the individual items on the menu are only visible once the menu is explicitly activated.

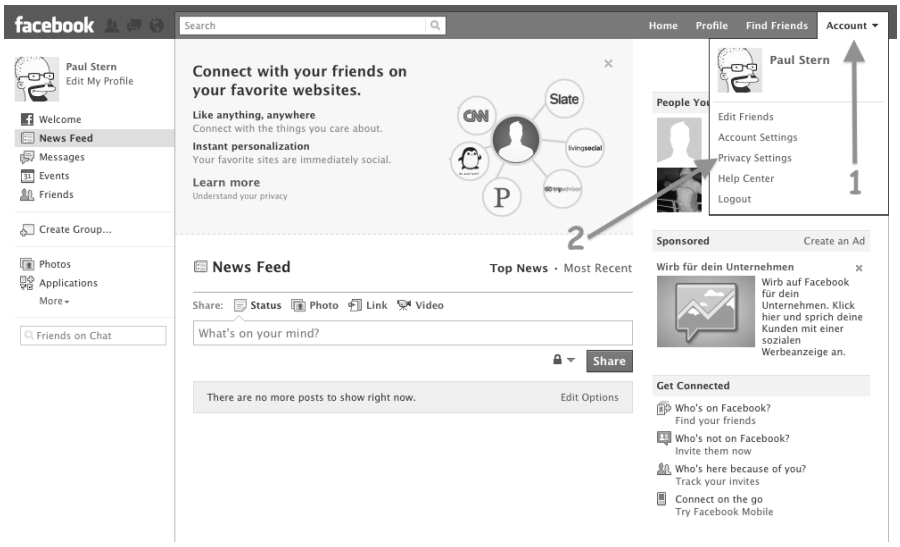

Fig. 4. Access Privacy Settings

As you can see in figure 4, users must first (1) open the *account* menu to be able to access the privacy settings (2). Thus the interface of the platform poses a hurdle ensuring that users only find the option of changing privacy settings that is potentially available to them if they specifically look for them.

Once users have located and called up the menu, they are shown a page with a fairly clear overview (see figure 5 on page 11) of the privacy settings. However, this page only allows very basic adjustments to be made. It offers only three options (*Everyone, Friends Only, Friends of Friends*) to limit access to all personal information (with some exceptions; see the next section) and provides no possibility for customizing settings. The option users select applies to all their information on the site.

Many users, however, feel that these options for limiting access are inadequate because they are forced to choose between revealing all their information to everyone and to completely block it from being publicly accessible. Since the selective sharing of information is not possible, users view changing the privacy settings as an *all-or-nothing*-process [28] and therefore often make no changes at all. [16] [9]

Alternatively, privacy settings can be left at the default setting, which is labeled here as *Recommended*. This option will be described in more detail in the section after the next.

3.2 Settings Options

Of course Facebook does offer its users the possibility to customize their privacy settings and determine precisely which data they wish to make available to whom. For that purpose users have to click on an inconspicuous link on the overview page of the privacy settings mentioned in the last section (see (3) in figure 5).

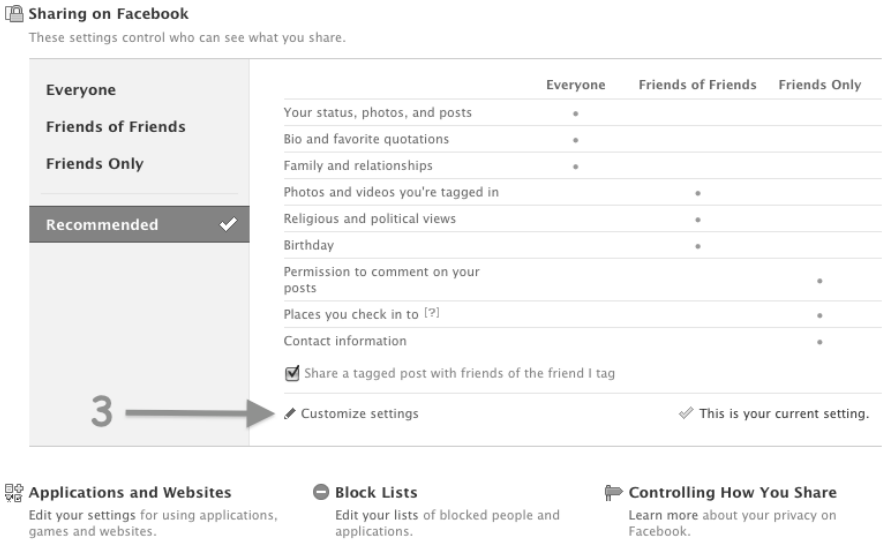

Fig. 5. Overview Privacy Settings

The page that opens when they click on the link then offers truly comprehensive options to define precisely who can access the various kinds of personal information on the user's Facebook page. The only exceptions are the user's name, gender, friends list and profile picture; access to this information cannot be restricted and it thus remains visible to everyone [14].

However, the number of options offered on this page frequently leaves users feeling overwhelmed, and surveys have revealed that many describe the interface for customizing privacy settings as confusing and time consuming. [28]

Persistent criticism from users and negative coverage in the media have led Facebook to revise the interface several times, but at least in the view of users, the new versions were no real improvement. According to more recent surveys, the new interface was also felt to be confusing [7] so that many users refrained from changing the standard settings [9].

In addition, respondents complained that the page offers only very limited visual feedback, uses confusing language and that even after settings have been changed, it is not apparent how these changes affect access to specific kinds of personal information. [20]

So far, we can state the followings: Via the website interface, Facebook in principle provides its users with all necessary options to exercise precise control over access to all their personal information stored on the platform. However, these options are not immediately apparent [2], and it is confusing and time consuming to exercise them. [28] [20] [9]

3.3 Default Settings

Considering that only few Facebook users change their privacy settings [16] [9], the default privacy settings; i.e. those settings that are applied automatically to newly registered users, are especially important.

These default settings have changed over the years with each update of the site. That each change has also been accompanied by the release of a new version of the privacy policy [11] indicates that Facebook's stance on this issue has continued to shift as the company weighs its own economic interests against users' right to privacy. An analysis of this development suggests that Facebook has evolved from a platform for people to communicate with groups of their own choosing into a company driven by profit that shares the personal data of its users with business partners and allows it to be used for targeted advertising. [23]

This transformation can easily be traced by analyzing how Facebook's terms of use, privacy policies and default privacy settings have evolved [21]. Such an analysis clearly demonstrates that the default privacy settings have been modified with each updated version of the platform to make more and more of users' personal information visible to the public if the settings are not changed.

The analysis also shows that until 2009, Facebook's default settings merely made users' personal information visible to as many other Facebook members as possible rather than to the larger public. This changed in November 2009, when the platform opened up such information and made it generally accessible on the Internet. From that time on, it was no longer necessary to be registered and logged in as a Facebook member to access information about Facebook users; anyone could simply use a search engine to locate personal data such as users' names, gender and profile pictures.

If users do not change the default privacy settings, anyone can use a search engine to gain access not only to those data for which visibility cannot be restricted in any case (name, gender, friends list and profile picture), but also to all status updates, photos, posts, and family and relationship information, as well as the user's biography and favorite quotations (see figure 5).

3.4 Mobile Use

According to Facebook, around 200 million of its members currently access the platform from mobile devices [13]. Facebook provides number of possibilities to allow mobile access, such as special versions of the website designed for small displays and applications (apps) for various smartphone operating systems.

In other words, Facebook provides mobile users with a different architecture for interacting with the platform. Just as the architecture of the website regulates users' behavior, this architecture regulates mobile users' behavior in relation to the information on the platform.

Since the interface of special mobile versions of the website and Facebook smartphone applications have not yet been the subject of academic research, I will merely provide a descriptive analysis in the following.

Mobile Versions of the Website

When the website *www.facebook.com* is accessed from a mobile device, the platform recognizes that it is a device with a small display from the user agent string. The user is then automatically redirected to a version of the website designed especially for mobile devices, either to *m.facebook.com* (for devices with traditional small displays) or to *touch.facebook.com* (for mobile devices with a touch screen).

While users are provided with no options to change the privacy settings on *touch.facebook.com*, in principle such options are available on *m.facebook.com*, although the same restrictions described in section 3.1 apply here, as well.

Users can access the options for customizing privacy settings once they have logged in, but they will only find the menu item *Settings* (see (1) in figure 6 on page 14) after scrolling down all the way to the bottom of the page.

When you click on the link, a new page opens up where the menu item for changing the privacy settings is located in the middle (see (2) in figure 6 on page 14). This link leads to another new page containing an overview like that described in Section 3.1. However, the difference here is that, besides the familiar options (*Everyone, Friends of Friends, Friends Only*), the option for user-defined settings (*Costum*) is featured relatively prominently (see (3) in figure 7 on page 15). The fact that it is less "hidden away" than on the regular website apparently has to do with the lower resolution of mobile device displays.

In other words, users of the mobile version of Facebook at *m.facebook.com* are in principle provided with all options for adapting privacy settings to their preferences that are offered through the interface of the regular version of the site. However, usability and user acceptance studies will be needed to determine if and to what extent users avail themselves of these options.

In addition, we need to take technological progress into account when it comes to mobile devices; in particular we must address the progress of smart

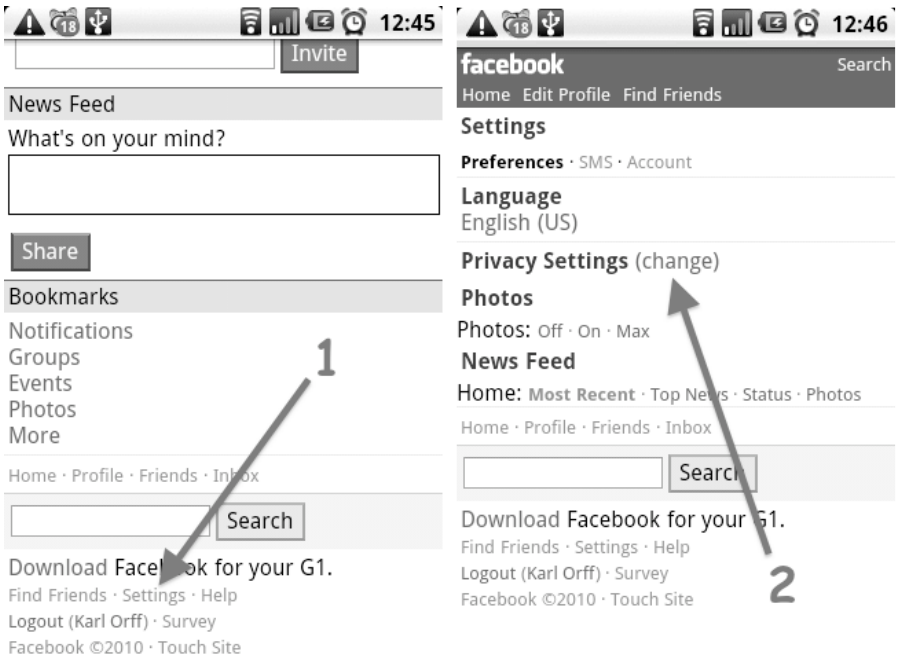

Fig. 6. Access Privacy Settings on *m.facebook.com*

phones. Since the use of touch screens in mobile devices is bound to increase rapidly in the future (+ 44% within the past year [1]), the fact that users calling up Facebook from devices with such displays are automatically redirected to *touch.facebook.com*, which offers no options whatsoever for customizing privacy settings, means that a growing number of users will be kept away from these options.

Applications for Smartphones

So-called client applications for smartphones represent another possibility of interacting with the Facebook platform. Statistics confirm that these so-called apps for accessing Facebook are immensely popular, regardless of which smartphone operating system is used. [30]

Apps promise users convenient access to the platform with a user interface perfectly adapted to the respective device/display. According to some statistics, over 100 million people already use smartphone applications to access Facebook today. [6] [4] [5]

Two applications were available to me for the purposes of this study, one for Apple's iPhone and the other the Android operating system developed by Google. The Android app lacks any options for modifying privacy settings.

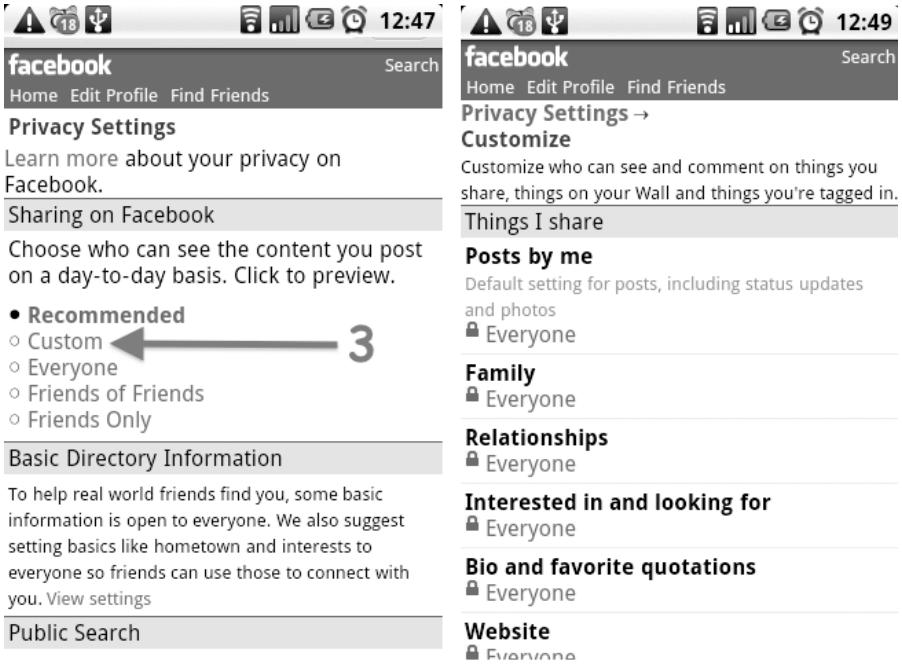

Fig. 7. Overview Privacy Settings on *m.facebook.com*

The menu of the iPhone app explicitly offers a *Privacy Settings* option, but you have to leave the app to make use of it. Clicking on the option opens a browser window showing the privacy settings page of the regular Facebook site. This not only has the disadvantages discussed in section 3.1, but these are compounded by the fact that the interface – which is confusing enough already – has to be navigated using a tiny screen with relatively low resolution.

Thus the design of the smartphone applications also puts obstacles in the way of Facebook users wishing to modify the privacy settings according to their own needs and preferences.

3.5 Summary

The analysis of the architecture of various interfaces for interacting with Facebook revealed that while they offer options for customizing privacy settings in principle, the design of these interfaces serves to make it difficult for users to avail themselves of these options.

Many users find the interface of the website confusing and time consuming so that they frequently refrain from making any changes to the standard settings. Facebook pursues the same strategy in its versions for mobile devices. A version designed primarily for older models does provide access to the full

range of options for customizing privacy settings, even if it is difficult to spot at first glance. Users with newer models, on the other hand, are automatically directed to a version that does not even offer the possibility of modifying privacy settings at all. The situation is no different when it comes to smartphone applications.

It would seem that Facebook, by structuring its architecture and designing its interfaces in the way it does, intends to deter users from making discriminating, informed choices about whom they will allow to have access to the various kinds of personal data stored on the platform.

4 Conclusion

Users of social networking sites need comprehensive options for restricting the visibility of the personal information they provide on the platform. Facebook does provide its members with all the information they need to determine precisely who can access various personal data and who cannot. My analysis of the options for interaction Facebook provides its users showed that all necessary options for customizing privacy settings are available in principle.

However, Facebook's interfaces seem to be designed with the aim of ensuring that users do not modify these settings or do so only to a limit extent, i.e. that most users simply accept the default settings predetermined by the platform's operators. Thus if users do not change these standard settings, the result is that not only their names, but also their profile photos and other sensitive personal data are accessible to the public at large through the Internet.

In selecting the default settings, Facebook's operators determine which of its users' personal data they would prefer to be generally accessible – and the design of the interfaces they provide ensures that precisely these personal data are indeed generally accessible for the majority of the site's users.

Seen in this light, the first sentence in the preface to the Facebook Principles – "We are building Facebook to make the world more open and transparent..." – would seem to be the guiding principle according to which decisions on the design of the user interface are made, with the aim of enforcing that goal even, if necessary, if that runs counter to the interests of its users.

On the face of things, Facebook does nothing that would open it up to criticism. In the documents they make available to users, the site's operators profess that safeguarding the privacy of their users is important to them, point out different possibilities for users to protect their data on the site from unwanted access, and place all functions they need to do so at their disposal on the site.

On the other hand, through the architecture of the site, they regulate their users' behavior in a certain way, i.e., they make it difficult for them to take advantage of the options available to them. Thus Facebook's operators impose their views of how much and what kinds of their users' information should

be publicly accessible on the website by the rules they themselves previously established and enforce through the design of the user interfaces.

In other words, Facebook establishes rules for dealing with users' personal information, and is at the same time in a position to impose these rules on users through the design of the website architecture. In this sense, according to the theories outlined in section 2, Facebook meets the definition of an institution that influences the behavior of individuals in its own interest by determining their options for action and is thus analogous to physical architecture.

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