Trust and Privacy in the Web: Do Internet Users Feel Monitored on Websites?

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ABSTRACT
In this paper, preliminary results of an online survey on surfing habits and data privacy of 710 young Internet users are discussed. It was shown that many users feel monitored on websites and they often feel spied out by Google. Particularly, most users do not like to reveal personal data and do not want to be profiled. Most of the users have different concerns of indicating personal data like e-mail addresses, phone numbers, interests or payment data: they fear undesirable e-mails, mails or phone calls, disclosure of data to third parties and inadequate handling of sensitive data like account or credit card data. Consequently, Web users often refuse to give personal information, supply false information or decide not to use certain websites or services. Moreover, two third of the Web users do not like to be profiled. Suffering under information overload, 71% of the Internet users are not interested in receiving additional information. Internet users’ trust is highly dependent on the supplier or website itself. Website operators can strengthen users’ trust and their readiness to deliver personal information by building up good reputation and providing secure connections.

Categories and Subject Descriptors
J.4 [Computer Applications]: Social and Behavioral Sciences.

General Terms
Management, Security, Human Factors, Legal Aspects.

Keywords
Data Privacy, Trust, Data Revealing, Internet, Surfing Behavior, Data Collection, User Profiling.

1. INTRODUCTION
Web Sciences can never avoid taking into account Internet users from different perspectives. This research project in progress therefore focuses on privacy issues like website monitoring and user profiling from the web user’s point of view. The collection of data in online forms or with web analytics tools [7] is a sensitive area in several issues, from the ethic perspective to the privacy and data protection issues. Users need to trust and know the usage of data collected. This relationship of trust between the website owner and the community is a key. This study focuses on ethical aspects of data collection and web user profiling. Do website users fear to be spied out or monitored? Do users want to be profiled and do they obtain a genuine increase in value by profiling and evaluation of their behavior in the Web? Do they accept the services gladly or feel disturbed by permanent offers?

In the online survey, web users were asked directly whether they feel spied and supervised from website operators and from Google. Preliminary results of this inquiry indicate that indeed many users are afraid of being spied and they do not want to be profiled, as section 3 shows.

This work was inspired by Lanier and Saini who claimed that “research should examine individuals’ perceptions and reactions to consumer profiling” [4]. The work is also part of the Gugubara Project that brings together the fields of computer science and economics to explore web users’ behavior [1] and interests [3]. Furthermore, the study is based on the results of Milne et al. [5,6].

2. METHODOLOGY & SAMPLE
To analyze the surfing habits in the Internet, an online survey was implemented. After a pilot study, the link was send to more than 9,000 university students and researchers. Approximately, 10% of the contacted persons reacted and 794 respondents filled out one or more questions. 710 persons completed all questions of the survey, consequently the size of the statistical sample consists of 710 respondents (n=710).

The sample considered is a typical university sample among young, educated people (see Table 1): 90% of the respondents are younger than 35 years and the majority is younger than 25 years. The majority of respondents (75%) are students and the others are either employees or researchers. 60% of them are female.

Table 1. Personal Details (Gender, Age, Occupation) on the Respondents of the Online Survey (n=710)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Current Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female: 60%</td>
<td>&lt;25: 55%</td>
<td>University students: 70%</td>
</tr>
<tr>
<td></td>
<td>25-34: 35%</td>
<td>Employees: 11%</td>
</tr>
<tr>
<td></td>
<td>35-44: 6%</td>
<td>Researchers: 8%</td>
</tr>
<tr>
<td>Male: 40%</td>
<td>45-54: 3%</td>
<td>Students: 5%</td>
</tr>
<tr>
<td></td>
<td>55-64: 1%</td>
<td>Other: 6%</td>
</tr>
</tbody>
</table>

3. PRELIMINARY RESULTS
3.1 How Intensively Are Web Users Surfing?
Among other questions, the respondents were asked, how often they do surf the Internet. The majority of the users are surfing several hours every day (compare Figure 1). Every eight user is
“always online”. Only 4% of the users are surfing only weekly or just very rarely. The results of this question confirm that the Internet has become an important media mostly used every day. Especially for young people, students and researches, the Internet is an essential instrument of information and communication.

3.2 Do Users Feel Spied out during Surfing?
“Do you feel monitored and spied out when surfing on the Web?”: this question was asked on a Likert scale [2] from 1=no, not at all to 5=yes, I feel monitored. The results are shown in Figure 2: 5% of the users claim to feel strongly monitored during surfing and 25% feel somehow monitored. 31% chose the medium scale of feeling spied. 38% of the users do not feel monitored (at all) during surfing. Probably, many users are not aware that their click behavior is monitored on most websites by tools based on server-side (logfile analysis) or client-side data collection methods (using JavaScript). Other users may do not care about data collection or they appreciate the provided service offers.

3.3 What do Surfers Think about Profiling?
In a further question, users were asked if they “feel monitored and spied out by Google?” The result is shown in Figure 3. Nearly the half of the users claim to feel spied out by Google and the other half is feeling not monitored.

3.4 Further Results on Trust and Privacy
For different reasons, many web users have concerns to provide personal data on websites. Considering other questions of the survey, following results on trust and privacy in the Web can be summarized.

3.4.1 Data Indication on Websites
Questioning the users, what kind of information they already have revealed somewhere on the Internet, following results can be concluded (Table 2).

<table>
<thead>
<tr>
<th>Personal Information</th>
<th>Revealing Personal Information (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>frequently</td>
</tr>
<tr>
<td>Name</td>
<td>61</td>
</tr>
<tr>
<td>Date of birth</td>
<td>45</td>
</tr>
<tr>
<td>Unimportant e-mail address</td>
<td>60</td>
</tr>
<tr>
<td>Private e-mail address</td>
<td>35</td>
</tr>
<tr>
<td>Address</td>
<td>36</td>
</tr>
<tr>
<td>Interests</td>
<td>14</td>
</tr>
<tr>
<td>Phone number</td>
<td>23</td>
</tr>
<tr>
<td>Marital status</td>
<td>14</td>
</tr>
<tr>
<td>Account/credit card number</td>
<td>25</td>
</tr>
<tr>
<td>Payment level</td>
<td>5</td>
</tr>
</tbody>
</table>
Personal information like name, date of birth or e-mail addresses is often indicated in the Web. However, one third never revealed personal interests or phone numbers. Nearly every second surfer has never disclosed account and credit card numbers and obviously people do not like to reveal their level of income.

Asking another question about indicating personal information, following findings are reported. Four of five Internet users have concerns of indicating personal data in the Internet (Figure 5). Consequently, most users do not like to indicate personal data. Half of the respondents does not trust that data is handled thoroughly and one-fourth fear vulnerabilities. 8% answered that they even try to surf anonymously. Only 12% have no concerns and believe in the confidentiality of data or security arrangements of the website operators.

![Figure 5. What do Users Think about Indicating Personal Data on the Internet? (n=710)](image)

### 3.4.2 Concerns & Fears

What Web users specifically fear was asked in a further question. As shown in Table 3, undesirable e-mails, disclosure of data to third parties and theft of account or credit card data are the most frequent fears of Internet users.

#### Table 3. Fears of Indicating Data (n=710)

<table>
<thead>
<tr>
<th>Fear</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undesirable e-mails (Spam)</td>
<td>88%</td>
</tr>
<tr>
<td>Disclosure of data to third parties</td>
<td>77%</td>
</tr>
<tr>
<td>Theft of accounts and credit card data</td>
<td>68%</td>
</tr>
<tr>
<td>Profiling</td>
<td>45%</td>
</tr>
<tr>
<td>Undesirable phone calls</td>
<td>40%</td>
</tr>
<tr>
<td>Undesirable mail</td>
<td>36%</td>
</tr>
</tbody>
</table>

### 3.4.3 Trust & Confidence

Trust in the Web highly depends on the supplier and the website itself: 83% replied that their confidence is depending on the supplier and the website. However, website operators have possibilities to raise trust, as shown in the following section.

### 3.4.4 Reputation & Security

Good reputation of well-known suppliers or sites and encrypted connections have a significant influence on the trust of users, as the study showed. 72% of the users deliver more information to suppliers with a good corporate image or in case connections are secure (60%). As a result, companies and website operators should invest in the brand and image of the website to strengthen trust and confidence. Personal information should always be transmitted encrypted, e.g. using secure socket layer (SSL).

### 3.4.5 Protection of Privacy

To find out, how users try to protect themselves, they were asked, what they ever have done to protect their privacy and identity:

- 96% of all users answered that they have already refused to give information to a website since they felt it was too personal or unnecessary.
- 79% of the respondents have decided not to use a website or they did not purchase products in a web shop, because they were not sure how personal information would be used.
- 63% have set their computer or browser to reject cookies.
- More than 66% supplied false or fictitious information to a website when they were asked to register.
- Surprisingly, half of the respondents have asked website operators not to share personal information with third parties and to remove their name or address from a list.
- However, only one-fourth of the asked persons have ever sent a request for the termination or deletion of personal data.

### 4. OUTLOOK

This paper discussed preliminary empirical results on privacy and trust in the Web. An extended publication of this ongoing project will give further insights, how privacy and trust varies in different Internet services and web pages. Moreover, changes in web usage behavior is analyzed over time; confidentiality and willingness of indicating data has significantly changed in the recent years.

Web Science is an emerging, dynamic and young field of practical and academic research. Since developments in web technologies and web applications are fast, critical research on the influences of technical possibilities on human behavior and society is often neglected. In the eSociety, further research in the domain trust and privacy in the Web is essential. Especially, an international, representative sample of Internet users in different countries could bring further insights.

### 5. REFERENCES


