Computer and Information Science; Vol. 9, No. 1; 2016
ISSN 1913-8989 E-ISSN 1913-8997
Published by Canadian Center of Science and Education

# Implementing End-User Privacy through Human Computer Interaction for Improving Quality of Personalized Web

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Received: November 28, 2015 Accepted: December 30, 2015 Online Published: January 24, 2016

doi:10.5539/cis.v9n1p75 URL: http://dx.doi.org/10.5539/cis.v9n1p75

**Abstract**

Users are exposed to an overwhelming amount of information in several application domains. There is a remarkable increase in the usage of Internet and general technology improvements. From this, it follows that there is a demand and need to create personalized web systems. Thus, personalized web systems are a good method of handling the flood of information and information overload, by helping people to surf the net and look for what they need. Unfortunately, the privacy issues that end-users face have not been taken seriously by some of these personalized web systems, as some of them apply it partially or fail to address the privacy issues in personalization. This affects the quality of the existing personalized web. The paper aims to investigate and explain the reasons behind the end-user's fears in giving out his/her personal information on personalized websites. Then, based on the results modifying approach of personalized web through the use of Human Computer Interaction models to enhance the quality of the current personalized web. By addressing the main privacy issues in human computer interaction that helps the end-user trust the personalization web and website with his/her personal information and improve the quality of current personalized web. A survey study with 134 Internet users was conducted. The findings show that personalization plays different roles of attracting users in personalized websites. Internet users want useful personalized services, but at the same time, they are concerned with the manner in which firms use their data for personalization. If the involvement of Internet users with their current site is high, then personalized services are not attractive enough to motivate them to give their personal information.

**Keywords:** privacy, personalized, personal, human computer interaction, website, trust

## 1. Introduction

Users have access to information which loads in many application domains (e.g. the World Wide Web, electronic commerce, and digital television). Therefore, there is a necessity for creating personalized web systems based on the customer's interest and needs. According to Klusch (2001) large amounts of data and information are available on-demand, as advanced Internet solutions for the acquisition, mediation, and maintenance of information relevant to the end-user. Therefore, web personalization is a new interdisciplinary science for discovering knowledge and finding certain types of information, such as educational and even personal ones.

The Internet and the global open web allow many people worldwide to access multimedia data and knowledge. It is evident that these new technologies offer enormous opportunities to publish, find, organize and share large amounts of information. Web customization can play a key role in our information infrastructure which is constantly changing, as it has proved to be useful for individuals, organizations and businesses for intelligent information search and management. In fact, this whole process is focused on end-user support for the end-user to access, search, and find information. However, in practice, some of the web customization does not address the end-user privacy and some of it is limited to the privacy concerns of the end-user or does not address privacy. Thus, the personalization web should pay attention to both the end-user privacy and user preferences, and Internet users, whether professional or private.

Web personalization goals (1) to provide a resource, (2) to solve the impedance information to consumers and information providers, and (3) to provide information services and value-added products. According to Groot et al. (2005), custom web is supposed to address the difficulties associated with the user's information overload, preferably just in time and end-user support to find the information they need and in the way they prefer it.

The impacts of the increasing globalization of information overload have created a large amount of network resources, regardless of the end-user privacy, due to fears that the end user will not give his/her personal information at these sites. However, in practice, the personalization web is lacked concern in terms of end-user privacy. It on the web means that the site assures users that their personal information is not used and shared by anyone else using this site and keeps this data secured and protected. Indeed, as shown in some empirical studies (i) people who refuse to give information (personal) to a personalization web are estimated at 82%, (ii) those who never give personal information to a personalization web are estimated at 27%, and (iii) providing wrong or fake information to a personalization web, when they are asked to record the value, was 30%. Due to the weakness of most websites and personalization's web, existing operations with the end-user privacy and preferences should be customized. Iachello and Hong (2007) explain that privacy is becoming a critical element of the design of interactive systems in different areas, such as health services, office work, electronic commerce, and personal communications (International Labour Organization, 1993; U. S. Department of Health and Human Services, 2003; Cranor, 2003).

An important stream of Human Computer Interaction (HCI) research is Computer Supported Cooperative Work (CSCW). HCI began by examining largely single-user applications and systems. Starting in the late 1980s, CSCW began as a counter-effort to consider collaborative computer use. Although this subarea of HCI began in the consideration of cooperative or collaborative work, it quickly grew to include many different forms of coordination and social organization. It also grew to include many levels of analysis, from small groups to Internet-scale systems, and many types of activity, including work, entertainment, chat and other communication activities, and the like. Privacy is, in fact, the contrapositive of this research interest, it is what happens when many people can share data, some without their knowledge and as such has become a research interest in its own right within CSCW. Privacy can be a key aspect of the user experience with computers, online systems, and new technologies. Knowing what to consider about users and their views of computer systems can only improve privacy mechanisms.

## 2. Personalized Website System

### *2.1 Introduce the Problem*

There is tremendous amount of information available on the Internet due to exponential growth of the World Wide Web. Users are now provided with more information than ever and it has become difficult for them to find the relevant or interesting information in the web page because of this information overload. The website customization leads to power and success because it affects how quickly end-user can find what they are looking for and find more relevant and interesting information easily. There is an important need to rely on the power of computers for information, data collection and web personalization to aid in classification and data management. This resulted in information flooding and created a new need: People need more help to get the right information; namely, the information that is relevant and attractive to them. A possible solution to address the described issue is by personalization, building information systems flexible to the user, assuring him that only information that is interesting to the user is retrieved and offered in a way appropriate to that user.

### *2.2 Problems*

In recent years, this has led to the development of various personalization systems and increased their benefits, such as people surfing the Internet every day to look for a specific kind of information described (Kobsa, Koenemann, & Pohl, 2001).

In order to have a successful and effective personalized system, it is required that one should be familiar with the personal information and understand the user's need. However, people are more concerned about their privacy when they are asked to provide their personal information on the Internet, necessitating an increase in the trust from the end user in these personalization systems.

The impacts of the increasing globalization on the information overload have led to the creation of a lot of websites and personalization's web without considering the end-user privacy. This has caused fears in the end-user, resulting in not giving out his/her personal information in these websites. For example, "a meta-study of 30 surveys has shown that Internet users strongly dislike the collection and use of personal data" (Teltzrow & Kobsa, 2004). This example shows that a number of end-users do not like to share their personal information on the Internet. A major obstruction for user-adaptive e-commerce (Culnan & Milne, 2001) and a more wide-spread use of personalization (Leathern, 2002) corresponds with these privacy concerns. So far, the web privacy statements are currently being written in such a way that they do not want them to be read by the users. "Whereas 76% of respondents indicated that they find privacy policies very important" (Department for Trade and Industry, 2001), lately it has been discovered that users do not pay any attention to it. Kobsa, Koenemann

and Pohl (2001) gave an example of a company that aimed at plugging the Web Search Engine gap, featured in a 60-minute segment (Excite@home) on Internet privacy. It showed that out of 20 million unique visitors, only 100 accessed the privacy pages of the company. Many site managers claimed that the users who read the privacy policies were less than 1%.

Unfortunately, the privacy issues that end-users face have not been taken seriously by some of these personalized web systems. (Wang & Kobsa, 2007) Personalized systems need to care about the privacy concerns of the user. According to Bettina and Teltzrow (2005) the existing systems are based on relatively complex syntactic methods, which skip a lot of information during the description of the references. All the existing personalization techniques select recommendations based on syntactic instruments, which lead to missing out on big amounts of information regarding the user's preferences. Wang and Kobsa (2007) indicate that the existing approaches have weaknesses, in terms of a flexible, efficient and scalable solution which respects privacy limits that may vary among users.

### *2.3 Purpose of the Study*

End-users are very concerned about their privacy. They expect benefits in exchange for their personal data, such as free goods or services, or even non-monetary incentives, such as not having to watch ads. End-user also want companies to be transparent about what information they collect and how it will be used. Above all, end-user want to be in control of their personal information. That means having to "opt out" or turn off the flow of information from companies. To focus on this dilemma, some key factors should be considered for influencing the willingness of consumers to share personal data, including the general attitude of privacy in data collection of specific data types (Ackerman, Cranor, & Reagle, 1999; Spiekermann, Grossklags, & Berendt, 2001), reputation of the site (Earp & Baumer, 2003; Teo, Wan, & Li, 2004), the types of data collected (Ackerman, Cranor, & Reagle, 1999), intended use of the data, the recipient of the data (Cranor et al., 2002) along with the benefits, the presentation and design of personalization and privacy policy (Hui, 2004; Patrick & Kenny, 2003).

This collection of personal preferences enhances the crucial role of trust (Culnan & Armstrong, 1999; Jarvenpaa et al., 2000). Indeed, misuse of these data-mining technologies can have a major strategic impact on a company, damaging its reputation and limiting the amount of trust it can foster in relationships with customers (Bloom et al., 1994). The main problems that need to be investigated in this study: (i) people not giving out their personal information, (ii) personalized web not consideration the end-user privacy, (iii) the personalized web not consideration the user's preferences. This paper aims to explain the reasons behind the end-user's fears while giving out his/her personal information on personalization web and websites. Then, based on it modifying the approach of personalized web through the use of Human-Computer Interaction models to enhance the quality of the current personalized web. By addressing the main privacy issues in human-computer interaction that helps the end-user trust the personalization web and website with his/her personal information and improve the quality of current personalized web.

### *2.4 Motivations and Study Questions*

There is much publicity about delivering personalized services over the web and the stakes are high for vendors selling related products. In spite of that, important questions that persist in the mind of end users are unanswered. For example, is web personalization an effective marketing strategy to attract users? What are the factors motivating users to a personalized website? How can addresses privacy concerns in human computer interaction to increase end users trust?

From understanding of the impact of web personalization is inconclusive. Thus, this study is to conduct a survey to address the above questions.

The paper is organized as follows: Section 3 provides the background and literature review. Section 4 presents the methodology and hypotheses development. Section 5 Personalized user privacy application design. Section 6 discusses the results of this study. A conclusion is presented in the last section.

## 3. Related Work

Customization has been associated with desktop applications. Many desktop applications have customizable menus and tool bars, with options that the user can pick from to customize their environment. In many ways, web customization achieves the same basic goals as traditional customization, making an interface better suit personal need. Yet the web's unique platform and culture bring about several differences from traditional customization. Some of the barriers to desktop customization are not as prevalent on the web; the types of changes that user make on the web are different, and the customization on the web is driven by a wider set of the motivations.

Web personalization means providing the users with their needs without asking them directly for it (Eirinaki & Vazirgiannis, 2003). Click-stream analysis, collaborative filtering, and data mining are examples of technologies that are lately applied in websites with the aim of trying to offer web personalization to users. This view has been supported in the works of Bamshad (2007) explained that the following techniques are applied to monitor the user on the website, such as, the links that have been clicked and the products that have been checked, to help the website identify the user's interests with the purpose of personalizing his/ her needs in the website.

One of the well-known techniques applied on websites known as the delivery of content, which is divided into customization and automatic personalization, the difference between them being who will be in control of the profile creation and the interface elements, was explicated by Bamshad, Robert and Jaideep (2000). Klaus, David and Andreas (1999) demonstrated the difference between Customization and Personalization. Customization is allowing the users to have full control to choose, design, and reorganize the page manually based on their preferences, and what they would like to see on the website, based on the given and built options on the website, such as MySpace (www.myspace.com). Automatic personalization is quite the opposite, because it observes the user's actions as well as the given information on the website profile to recognize his/ her needs. It then automatically creates a page, which can be easily updated from time to time to facilitate producing a page which meets the user's desire, for example, Amazon (http://www.amazon.com).

Lately, automatic personalization has become more applicable then customisation in most web browsing activities. "Web personalization can be described as any action that makes the Web experience of a user personalized to the user's taste", as stated by Bamshad, Robert and Jaideep (2000). Browsing the Internet for specific information or for example purchasing a book from Amazon.com could be the experience, where mapping the user preferences in his/ her profile depends on the methods used to create this profile or the type of chosen data. For the purpose of making predications, specific types of algorithmic approaches are used.

In a study of the WordPerfect word processor for Windows, Page et al. (1996) describe five types of customization found on the desktop. Most common was (1) setting general preferences; then (2) using or writing macros to enhance functionality of the application; (3) granting easier access to functionality, typically by customizing the toolbar with a shortcut; (4) "changing which interface tools were displayed," for example, showing or hiding the Ruler Bar; and (5) changing the visual appearance of the application. These categories are certainly relevant to web customization. In fact, the customizations encouraged by end user programming are most strongly associated with enhancing functionality and granting easier assess to existing functionality.

Wendy Mackay studied (1991) a community of customization around a shared software environment, MIT's Project Athena, and identified four classes of reasons that users customized. The top technological reason cited was that "something broke," so that the customization was actually a patch. The top individual factors cited were first that the user noticed they were doing something repetitively and second that something was "getting annoying." All of these reasons can be found in web customization as well.

*3.1 Applying Human Computer Interaction to Privacy*

To address the end user's privacy concerns, the study of Berendt and Teltzrow (2005) aimed at improving the web personalization proposals (the quality and performance), and gave more attention to the privacy problems of the user. Recently, many approaches have been available. (Abrams, 2003, Patrick & Kenny, 2003; Cranor, Arjula, & Guduru, 2002) applied some proposed and adoptable solutions in order to improve the privacy of the end-user in web personalization. Data type and User data are used to describe it logically. The policy can be measured and a user can be reviewed. The text of the privacy policy can sometimes be quite long (which could be too general or there may be too many technical words) and this could be a problem at times. Users are not willing to spend so much time in something they do not understand, and this is a fact that was proven by many studies, as shown in this report.

P3P Preference Exchange Language (APPEL) was recommended to overcome the abovementioned problem, the Worldwide Web Consortium (W3C, http://www.w3.org/) recommends (W3C, a P3P Preference Exchange Language 1.0 (APPEL1.0) (http://www.w3.org/TR/P3P-preferences/) and the Platform for Privacy Preferences (P3P) (W3C, The Platform for Privacy Preferences 1.0 (P3P1.0) rules P3P is a language based XML, which provides a platform for service providers (running sites of adaptation) to express their privacy policies. Appel is a similar language that allows users to express their privacy preferences.

Abrams (2003) prepossessed a non-technical approach to communication privacy. They are alternatives to the privacy statements of long and legalistic ones. Abrams (2003) suggested a layered approach which consists of a short-term brief to the standard term which highlight very important information, and which was easy to follow.

Patrick and Kenny (2003) dealt with communications privacy options on Data Protection in the European Directive. Since the start of the Directive, four guidelines were drawn by the authors for effective design, namely, HCI interface data protection, understanding, consent, awareness and control. Privacy of communication has suggested several browser-based approaches to the user. The AT & T Privacy Bird (http://www.privacybird.com; Cranor, Arjula, & Guduru, 2002) enables users to determine privacy first choice, compare privacy policy sites, P3P-encoded and was warned that this policy does not meet its standards. The latest versions of Internet browsers, such as Mozilla, enabled the users to determine specific limited P3P the privacy preferences and compare them to the visited sites. Nevertheless, these approaches suffer from the following limitations:

- They ask the users to make upfront privacy decisions, regardless of the situation in specific websites or individual pages.
- They do not improve any basic understanding of privacy settings for the users.
- They do not give any information about the benefits once the users provide them with the requested data.

Design teams have got a good help from Man-machine interaction to meet the challenges for protecting the personal information and the user's privacy. HCI can provide the power needed to help and understand many privacy concepts which the people need.

Westin (1967) describes four states of privacy: "solitude, privacy, anonymity and reserve". These standpoints can characterize differing privacy viewpoint. For instance, it was argued by some researchers that privacy is a fundamental right. On the other hand, Moor (1997) claims that "privacy is not a core value on par with life, security, and freedom", and is just an instrumental right to help people protect and secure their personal data.

It obvious that Human Computer Interaction is uniquely suited to help design teams manage the challenges brought by the need of protecting privacy and personal information as:

- HCI can help understand the many notions of privacy that people have.
- Concept of tradeoff is implicit in most discussions about privacy.
- Privacy interacts with other social concerns.
- Privacy interacts with other social concerns, such as control, authority, appropriateness, and appearance.

This study aims to help people to use the Internet and look for a specific kind of information, such as, educational information or even personal information. Besides this, it assures privacy to the end-users by applying it in a personalized web, with concern for the user preferences. It also aims to increase the trust by the end-user in personalized web through using of Human-Computer Interaction models, which reflects the performance and the quality of the personalized web.

## 4. Methodology and Hypotheses Development

Apart from the technology-related factors, prior Information System (IS) research also explores ethical issues related to personalization (Kramer et al., 2000; Stewart & Segars, 2002; Volokh, 2000). Users face a dilemma. Although they demand more personalized services, they are increasingly concerned about privacy infringements and how their information is being used by online firms. Users are concerned about how their purchase histories and navigation behaviours are analyzed and whether this information may be abused (Nash, 2000; Pitkow et al., 2002). Thus, we anticipate that users' concerns will affect for giving their personal information to a personalized website.

Trust, as previously discussed, refers to the consumer beliefs about certain characteristics of the supplier (The reputation of website operator, The design of a website, The presence of a privacy statement or policy, The presence of a privacy seal and Positive experience in the past) (Gefen et al., 2003). As described in the literature review, it shows that there is an effect of trust on increasing willingness of users to share personal information. Lin and Wang (2006) also proved that trust has a positive effect on increasing willingness of users to share personal information. Customers who cannot trust a personalized websites systems will not be willing to give out their personal information, even though they are satisfied with the product/services provided. In light of the above research the Hypotheses are proposed as below:

- Hypothesis 1: Privacy concerns discourage a user for giving personal information to a personalized website.
- Hypothesis 2: Website designs often rely upon the willingness of users to share personal information in order to function effectively.

- Hypothesis 3: Trust has a positive influence on users for giving personal information to a personalized website.
- Hypothesis 4: There is a significant influence of a websites design to increase willingness of users to share personal information.
- Hypothesis 5: There is a high impact and influence between factor "hours online per week" and willingness to share personal information.

These hypotheses were tested using a survey. Items used to measure the constructs were adopted from previous research. Privacy concern was operationalized as the control over the collection and usage of information.

*4.1 Sampling*

The sampling procedure that was adopted in this study for data collection was a random sampling method through questionnaire survey with a pre-planned sample size of 134 respondents. The total number of respondents in the study was 153. The number of valid responses was 134. The sample consisted of 71 males and 63 females and 84 were in the age group 18-29. The most of the respondents answered that their job title is student. The use of a student convenience sample was appropriate for a number of reasons. Firstly, as this study relates directly to end users, it is deemed appropriate that participants be users of the Internet. Furthermore, as "the likelihood that an adult is an Internet user decreases dramatically with age" (ABS, 2000) and as adults aged 18 to 24 hold the highest Internet usage rate (74%) consumers from within this age. students are regular users of the Internet for communication, research and the accessing of university online learning materials, this group represents a potential target. Secondly, in experimental research, the researcher is less concerned about projecting or predicting and is more concerned about testing for the existence of an effect (Kardes, 1996).

*4.2 Data Analysis and Finding*

4.2.1 Participants

The sample consisted of 71 males and 63 females and 84 were in the age group 18-29. Respondents consisted of 134 that were selected through a random sampling. The demographic profile of the respondents is 73 of respondents are in Malaysia, 26 of respondents are in France, 13 respondents are in USA, 9 respondents are in Philippine, 13 from other countries. Thus, the study shows mainly the views of people from Malaysia. The age of 84 of respondents are in the range from 18 to 29, in the range from 30 to 39 are 17 of respondents, less than 18 are 4 of respondents, 50 or older are 12 of respondents, in the range 40 to 49 are 15 of respondents and 2 respondents in other range.

4.2.2 Reasons for not Giving Personal Information

The main focus of the survey is to investigate that end-users would be willing to give out their personal information to personalized web systems.

Item "Would you give your personal information to a website if you know that the reason behind collecting it is to create personalized pages for you that meet your needs and interests" was formatted with simple yes (I would give my personal information to a website) vs. no (I would not give my personal information to a website) and the respondents who respond no (I would not give my personal information to a website) asked to specify the reasons why they not given their personal information to a website. Total numbers of 134 respondents were obtained from the distributed questionnaire, where it is distributed randomly. 43.0% of respondents answer "yes", 57.0% answer "no". The details are in Table 1.

Table 1. Willing to disclose personal information

| Willing to disclose personal information | Frequency | Percentage |
|---|---|---|
| Yes | 58 | 43% |
| No | 76 | 57% |
| Total | 134 | 100% |

This analyses in this paper focus on the subset of respondents who are would not give their personal information to a website (i.e., the 57% would not give my personal information to a website).

76 respondents (57%) who respond "no" (I would not give my personal information to a website) are asked to specify the reasons why they not given their personal information to a website. 7 of respondents had not given any specification of the negative reasons. 27 of respondents responded that they do

not trust websites. They expressed their distrust with different words such as: *"Do not use such websites", "I decide what meets my interests, not an algorithm"* and *"I want to control my own information"*. 42 of respondents who refuse to share personal information because of concerns about their privacy explanations are more specific such as: *"Privacy", "Privacy concerns", "To afraid of unsolicited emails"* and *"I would suspect that this would lead to attempts to sell me something"*. 34 of respondents, who refuse to share personal information because of concerns about their privacy, specify the reasons why they not given their personal information to a website responded that, they need more information about the website to make a decision whether to give out their personal information or not. They explanations such as: *"Not immediately, I would try to see if the website is trustworthy, for instance, do they have a trusted ssl certificate", "It depends on how reliable it may appear to me this website", "I need to know more details about the purpose"* and *"Depends"*. 5 of respondents are concerned about the security of their personal information, for example, if there is a hacker attack. Finally, 3 respondents is concerned about the *identity theft*. The details are in Table 2.

Table 2. Respondents who will not giving personal information

| Respondents Comments | Frequency | Percentage |
|---|---|---|
| No (not given any specification of the negative reasons) | 7 | 17% |
| No (do not trust websites) | 27 | 33% |
| No (because of concerns about their privacy)" | 42 | 50% |
| Total | 76 | 100% |

4.2.3 Time Spend on the Internet per Week

Item "How much time do you spend on the Internet per week" was formatted with simple (Less than 1 hour, 1-5 hours, 6-10 hours, 11-20 hours, 21-30 hours and more than 31 hours). Total numbers of 134 respondents were obtained from the distributed questionnaire, where it is distributed randomly. (56) 42.0% of respondent's answer more than 31 hours they spend time on the Internet per week and (31) 23% spend between the ranges 11-20 hours on the Internet per week. The details are in Table 3 and Figure 1.

Table 3. Time spend on the Internet per week

| Time spend on the Internet per week | Frequency | Percentage |
|---|---|---|
| Less than 1 hour | 8 | 6% |
| 1-5 hours | 16 | 12% |
| 6-10 hours | 14 | 10% |
| 11-20 hours | 31 | 23% |
| 21-30 hours | 9 | 7% |
| More than 31 hours | 56 | 42% |
| Total | 134 | 100% |

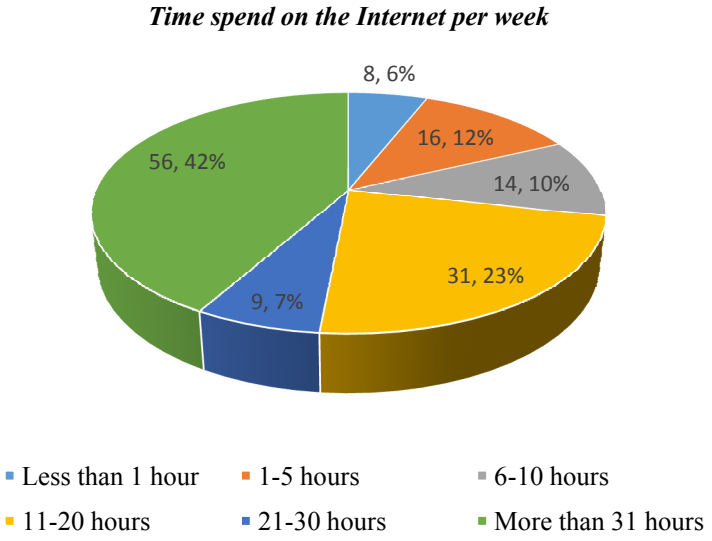


Figure 1. Time spend on the Internet per week

The link between "Time spend online per week" and "Willing to give out personal information to personalized websites systems". Total numbers of 58 who willing to give out their personal information to personalized websites systems respondents were obtained from the distributed questionnaire, where it is distributed randomly. Less than 1 hour (2) 4.0% of respondent's willingness to share personal information, 1-5 hours (3) 5.0% willingness to share personal information, 6-10 hours (4) 7.0% willingness to share personal information, 11-20 hours (8) 14.0% willingness to share personal information, 21-30 hours (2) 3.0% willingness to share personal information. More than 31 hours (39) 67.0% willingness to share personal information, the details are in Table 4 and Figure 2.

Table 4. Willing to give out their personal information vs Time spend on the Internet per week

| Willing to give out their personal information vs Time spend on the Internet per week | Frequency | Percentage |
|---|---|---|
| Less than 1 hour | 2 | 4% |
| 1-5 hours | 3 | 5% |
| 6-10 hours | 4 | 7% |
| 11-20 hours | 8 | 14% |
| 21-30 hours | 2 | 3% |
| More than 31 hours | 39 | 67% |
| Total | 58 | 100% |

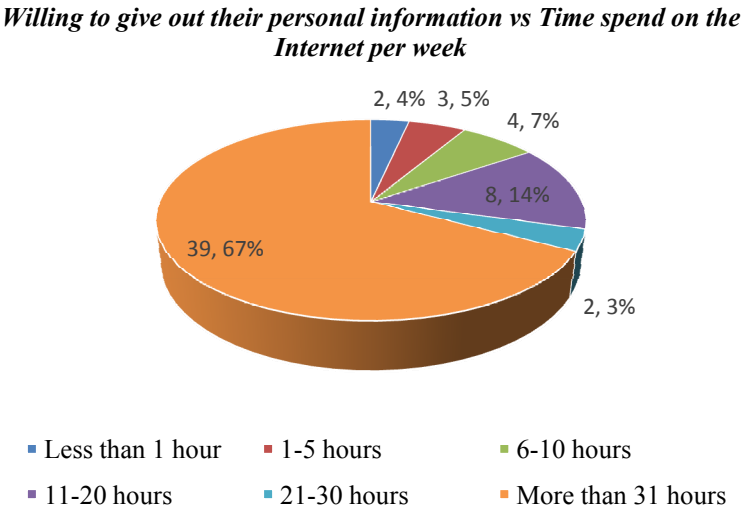


Figure 2. Link between time spend online per week and willing to give out personal information to personalized

4.2.4 The Willingness for Sharing Personal Information Depends on Website System Design

Total numbers of 134 respondents. (81) .60% of respondents answer “yes”, (53) 40.0% answer “no”. The details are in Table 5 and Figure 3.

Table 5. Willingness for sharing personal information depends on websites system design

| Willingness for sharing personal information depends on websites system design | Frequency | Percentage |
|---|---|---|
| Yes | 81 | 60% |
| No | 53 | 40% |
| Total | 134 | 100% |

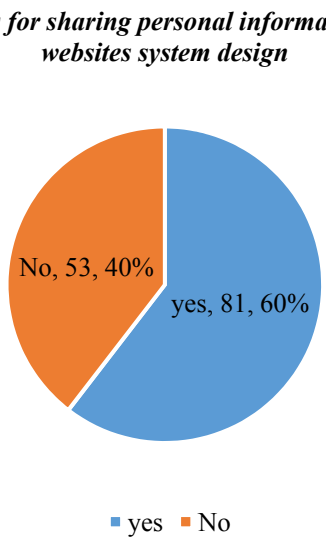


Figure 3. Willingness for sharing personal information depends on websites system design

4.2.5 Factors Increase Trust

*Item "Select applicable factors that increase your trust in a website to provide personal information"*. The respondents had to choose and rank their five factors increasing trust from a selection list. In light of the past researches and we used regular reports from the factors that increase trust to decide which factors were included in the selection lists. Factors that increase users trust in a website to provide personal information it obvious that the factor that increase users trust in a website to provide personal information are: The reputation of website operator and The design of a website, while the factors which less increase users trust in websites are the presence of a privacy seal and positive experience in the past. The details are in Table 6.

Table 6. Factors that increase trust

| Factor | Frequency (Yes) | Percentage |
|---|---|---|
| The reputation of website operator | 116 from 134 | 87% |
| The design of a website | 97 from 134 | 72% |
| The presence of a privacy statement or policy | 53 from 134 | 40% |
| The presence of a privacy seal | 46 from 134 | 34% |
| Positive experience in the past | 45 from 134 | 34% |

Privacy of end-user concerns is a main weakness in personalization web systems. The concerns regarding the user privacy is increasing day-by-day. In fact, personalized systems require to assure privacy to the end-user and to help the existing web personalization of protecting privacy and personal information. An alternative solution is to use Human-Computer Interaction to address privacy issues of the end-user to be better and more efficient in giving personal information and increase the trust from the end user in these personalization web systems.

## 5. Personalized User Privacy Application Design

End-users often do not have a correct understanding of where their personal data is stored and processed and to what entities their data is transferred. When designing and testing privacy-enhancing identity management systems, investigations are thus needed on how to evoke the correct mental models in users with regard to where, what data are transmitted and under whose control the data are stored and processed. Having a comprehensive mental model will be essential for them to estimate privacy risks correctly, to understand better how far personalized user privacy application design can protect their online privacy. The suggest approach will show to the end-user what is the required data should be entire, and by using the suggest approach can the end-user choice to add some other data or remove it from the list. It also, enable to the user where will save that data in the PC or in the server. From the respondents comments show there are a significant influence of the factor "hours online per week", the Personalized User Privacy Application Design should be designed further to include the user's needs and interests, where more information is obtained as the end-user has increase attraction by the Personalized websites. Thus, will increase hours online per week, in addition, the importance of trust in the online environment, describing some of the antecedents and consequences of trust, and provides guidelines for integrating trust into website design. The respondents comments discussed in the survey are presented under personalized user privacy application design.

As obvious from the survey results the willingness for sharing personal information depends on how users are asked for this information, as result as, the personalized user privacy application design considered that by using Add sign or Minus sign. Therefore the user will decide to share the information or not and share personal information depends on the user.

At personalized user privacy application design, we respect individuality and understand that everyone has different needs and tastes. We acknowledge that the standard look and feel of the browser, the user interface may not suit everyone, which is why we make it easy to personalize it. Based on the results discussed above, This study aims at reconciling the goals and methods of user modeling and personalization with privacy considerations, and to strive for best possible personalization within the boundaries set by privacy through including these results to design the new approach. In the following figures explain the personalized user privacy application design. Figure 6 shows all the fields that are required including the indicators and the details of indicators are mentioned in the legend, after legend box there are two main fields username and password, in front of them two indicators: Required not optional and sensitive data.

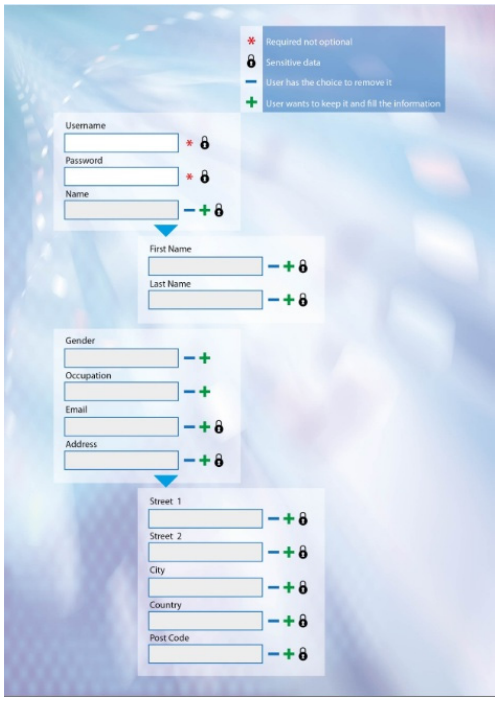


Figure 4. Main page

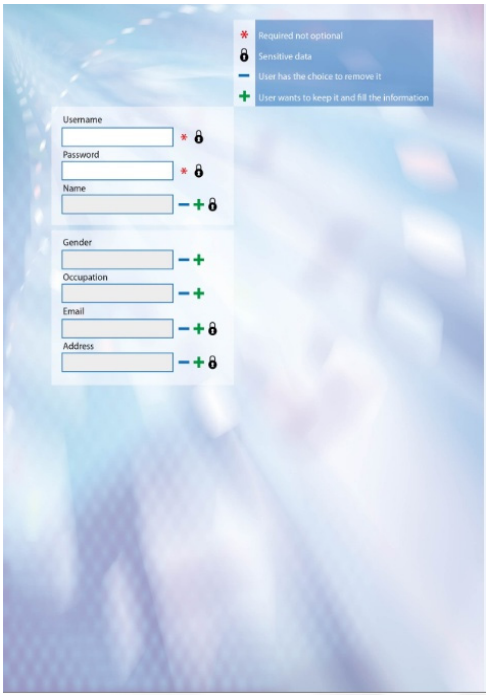


Figure 5. Active username and password fields

Figure 4 shows other fields as ***Name***, ***Gender***, ***Occupation***, ***Email*** and ***Address***. As noted the ***Username*** and ***password*** are active fields because it's required to fail it from the user. While the other fields it's optional, can the user choice to fill or remove it by using ***Add*** sign or ***Minus*** sign.

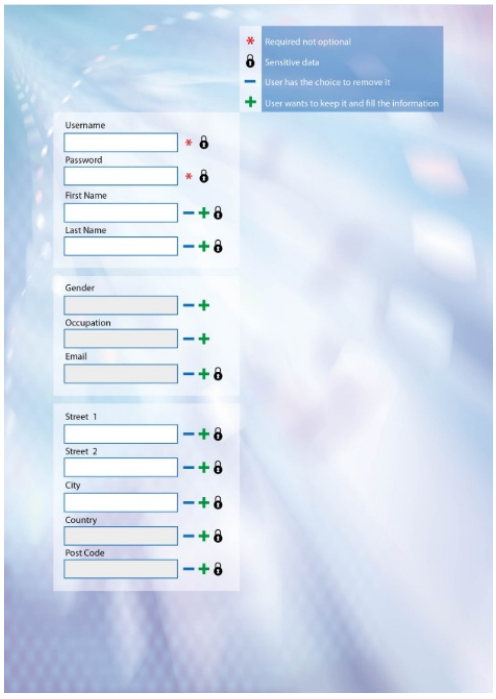


Figure 6. After user choice to fill the name field

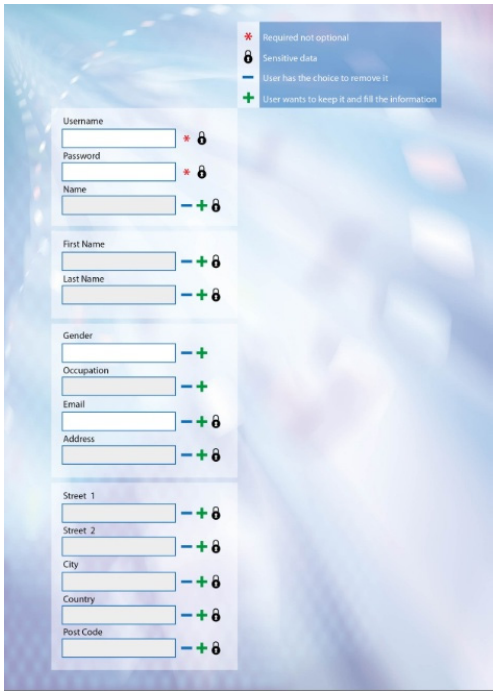


Figure 7. User choice to fill Gender field

Figure 6 shows after pressing ***Add*** sign it will show two more elaborated fields asking for ***First name*** *and* ***last name***. As noted the ***First name*** and ***last name*** are active fields after press the ***Add*** sign. Figure 8 shows that the

user choice to fill the ***Gender.*** Figure 8 shows that the user choice to remove the ***occupation*** field.


Figure 8. User choice to remove occupation field

## 6. Results and Discussions

HCI is a large research field in its own right. HCI's roots were in human factors and the design and evaluation of "man-machine" interfaces for airplanes and other complex and potentially dangerous mechanical systems. The first papers in what would later be known as HCI were in the 1970s and concerned the design of user interfaces in time-sharing systems. The field took off with the advent of personal computers and the single-user interface in the early 1980s. HCI's roots then were in cognitive-oriented, single-user interfaces. The so-called user interface.

HCI has since expanded to consider a variety of subareas design methodologies, usability and usability testing, intelligent interfaces, adaptive interfaces, and so on. Of particular interest here will be Computer-Supported Cooperative Work (CSCW), sometimes known as groupware. CSCW is interested in how groups of people work or interact together using computational technologies. Indeed, HCI has grown in general to consider organizational, institutional, and even societal factors affect how computer systems are put together and how users interact with systems. This has become increasingly important as systems are no longer single-user, but are also Internet-wide in their use.

Problems of trust websites and privacy concerns of web personalization are on-going. As personalized web systems it partially apply or fail to address the privacy issues in personalization. Despite of the personalized web system is incapable of providing highly relevant and meet users need and interest. In fact, a personalized websites systems should identify the exact needs of a user. The relevance of end users expectations of, and demand for, increase willingness of users to share personal information, there is a gap between system performance from the aspect of privacy issue and the online user's expectations and wants. Personalized privacy concern increases even if the personalized websites systems invests a lot in privacy.

The current research has two purposes. First, it is a first step to examining and investigating why users not willing to give out their personal information. To achieve that, this study looks at some elements for reasons for not giving personal information, Time spend on the Internet per week, websites system design and factors increase trust. Then, link between "Time spend online per week" and "Willing to give out personal information to personalized websites systems.

On the other hand, modifying the approach of personalized web through the use of Human-Computer Interaction models to enhance the quality of the current personalized web. By addressing the main privacy issues in

human-computer interaction that helps the end-user trust the personalization web and website with his/her personal information and improve the quality of current personalized web.

In the improving quality of personalized web survey, discussed about "what are the main privacy issues that keep users from giving out their personal information on websites to provide personalization". The total numbers of the responders are 134. A pilot of this survey was undertaken to discover any possible problem in current personalization web, obstacles that making the End-Users not willing to give out their personal information and the factors effect on it. From the results of this survey for the main variables in revealed that:

- More than half of our study participants were not willing to disclose information regarding the privacy concerns.
- People who spend more time on Internet per week are more willing to give their personal information.
- Users responses are strongly dependent on how users were asked for personal information.
- It is much more likely to get a positive answer to indirect open question about sharing personal information, such as "how much time" or "how much information" rather than to a direct closed question.
- The most important things for a website is positive user reviews/comments. Next in importance is the design of a website, presence of privacy policy and/or privacy seal. The design is last in importance.

The results of this survey highlight ways in which instructional material should be clarified. The design of the websites it is important to increase willingness of users to share personal information, providing them with interesting content, therefore, they can spend more time on the site. The way of asking for this personal information such as simple and clear, and asking user's indirect open questions about sharing personal information.

## 7. Conclusion

Personalized systems need to take users privacy concerns into account. The most important issue that should be encountered in personalized web systems is privacy violation and privacy concern. Many users are reluctant to give away personal information. Privacy can be a key aspect of the user experience with computers, online systems, and new technologies. Knowing what to consider about users and their views of computer systems can only improve privacy mechanisms. Human-Computer Interaction (HCI) is the subfield of Computer Science that studies how people interact with and through computational technologies. In this paper has investigated the reasons for not giving personal information to personalized web systems. The elements effecting the end-users would be willing to give out their personal information to personalized web systems and examined how these elements influence users for giving personal information to personalized web systems. It also, investigating the concerns have a direct impact on quality of personalization that requires to collect personal data (such as the user's descriptions, preferences), and thereby makes accurate personalization based on user preferences. In order to accomplish the study objectives and improving quality of personalized web by implementing privacy through Human Computer Interaction. It helps the end-user trust the personalization web and website with his/her personal information and improve the quality of current personalized web. In general, human-computer interaction lead to a high level of competence and integrity trust. This study represents a first step toward understanding how design system using HCI affect users' trust in and their attitudes towards personalized content, and ultimately their behavioral intention to o give out their personal information.

## Acknowledgments

The author wish to thank Qassim University, Kingdom of Saudi Arabia. This work was supported in part by a grant from Deanship of Scientific Research, Qassim University.

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