Analyzing Users' Behaviour to Identify their Privacy Concerns

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ABSTRACT

The majority of studies examining privacy concerns of Internet users are based on surveys. Many problems have, however, been identified with using surveys to measure people's privacy concerns. Based on our experience from our previous studies, in this paper we discuss how ethnographic interviews and observation techniques could be used to analyze users' behaviour in terms of how they share personal information and multimedia content with others, and utilize this to identify issues related to their privacy concerns more comprehensively than it is otherwise possible with conventional surveys.

Categories and Subject Descriptors

K.4.1 [**Computers and Society**]: Public Policy Issues – *privacy.*

General Terms

Human Factors, Security.

Keywords

Privacy, Online Privacy, Privacy Concerns, Ethnography, User Behaviour, Online photograph collections.

1. INTRODUCTION

With the rapid growth of the Internet use, and the increasing vital role online activities play in our daily lives, our concern about our online privacy is also rising [8]. Therefore, it is not surprising that in recent years there has been a lot of interest in studying issues relating to privacy concerns that users have, and how these might impact their online activities.

Privacy is in fact rather difficult to define, and as such, multidimensional approaches are needed to fully understand it (for a review of definitions see [2]). Yet despite this complexity, most studies of the issues related to Internet privacy have taken a much simpler approach of relying on various types of surveys as means of collecting data about users' attitude and behaviour [7],

often ignoring the fact that these surveys may lead to inaccurate or unreliable findings. For instance [6] discusses how studies have reported that a high percentage of respondents to surveys claim that they read privacy policies when visiting website, whereas the informal analysis of log-files show much lower rates.

Another limitation of the survey type methodologies is that at best they are only suitable for investigating issues related to a rather narrow aspect of online privacy, generally focusing on privacy of *personal information* (e.g. date of birth, contact details, credit card information, etc.). Consequently, they mainly deal with privacy security issues such as identity theft, bank fraud, sale of personal information to third parties, etc., and how online users tend to protect such information by taking specific steps such as using secure websites, not emailing sensitive information, installing anti-virus programs, and so on.

Studies of privacy issues centred around personal information security and protection have mainly been related to the use of Internet for e-commerce. However, an increasing number of people are using the Internet to share much more than personal information with others. For instance, millions of users share their personal photographs, video, and other multimedia content online using privately managed collections, social networking sites, etc. Although in recent years some attention has been given to the study of the privacy concerns of the users of social networking sites [5, 9], the focus of this research has once again been mainly on what they refer to as *information revelation*—that is, the type and amount of personal information people are prepared to share with others online [5].

The focus of our research, on the other hand, has been to investigate the privacy concerns of the users of online multimedia collections in regard to document content [3], specifically of personal photographs. Privacy issues for photographs are more complex than those related to sharing of textual personal information. One shortcoming of many existing definitions of personal information is that they concentrate on the data itself and its ability to personally identify someone, rather than how the information content of the data is perceived by others. This approach can be too restrictive when applied to photographic data since many pictures identify someone and anonymizing them (for example, by pixilating people's faces) often destroys the value and meaning of the photograph. Personal photos may convey a more nuanced and layered impression of an individual than many common types of text-based information.

Our investigation of the issues related to privacy of digital collections has been more fully described elsewhere [4]. In this

paper we outline the ethnographic methodology used in our research to identify the privacy concerns of the users and owners of such collections by investigating their usage behaviour.

2. METHODOLOGY

People's privacy concerns over sharing personal multimedia collections are often very complex, and in some cases may even be misconceived. Therefore, rather than focusing directly on those privacy concerns that can be difficult to identify accurately, our research has aimed to better understand people's behaviour in terms of how they collect, use, and share such collections in the physical, as well as the digital realms. We believe that the analysis of the users' behaviour can assist us with better understanding their privacy concerns.

In one of our main studies [4] we successfully used ethnographic and auto-ethnographic observation and interview techniques to collect data on the behaviour of the owners of personal photograph collections. Our study participants examined their own collections and created a description of their contents. They also examined and described when and under what circumstances they take new photos, and the ways in which they allow others to access their collection (e.g. photo albums, posting photos online, sending photos via mobile phone, etc.). 'Sharing' of a photo or collection was construed as broadly as possible, so as to capture as many aspects as possible for that behaviour.

To guide this process of ethnographic observations we provided our study participants with a series of open-ended questions they could consider. These questions were divided into six categories: (1) when and where they take photos, (2) why they take photos, (3) what non-visual information they associate with their photos, (4) in what ways they share their photos with others, (5) what restrictions they place on the use of their photos, and (6) who they share their photos with.

We used grounded theory methods to analyze the summaries of these ethnographic observations and interviews. The ethnographic descriptions were aggregated and treated as raw data, and analyzed by us. This distancing of the data gatherer from the data analysis allowed us to partly finesse the difficulties in dealing with auto-ethnographic interpretation, as the auto-ethnographer in this work did not directly analyzed the data.

We were then able to use the three factors of Adams' privacy model, *Information Sensitivity*, *Information Receiver*, and *Information Usage* [1] to describe the privacy concerns of our study participants. This demonstrated the value of using ethnographic techniques to analyze users' behaviour to identify complex issues related to their privacy concerns when sharing multimedia content on the Internet.

3. CONCLUSION

This paper has briefly described how we have used ethnographic techniques to analyze people's behaviour in terms of how they take, collect, and share physical as well as digital photographs. This has allowed us to understand people's privacy concerns related to sharing their photos using online digital collections.

We argue that it would be difficult to gain a detailed understanding of people's privacy concerns of sharing multimedia documents using the conventional survey type methods. While surveys can be effective at creating broad-brush pictures of privacy behaviours and concerns regarding more straightforward software use (e.g. anti-virus software installation), small-scale ethnographic techniques can fill in the details with more complex privacy issues and more complex privacy-related attitudes.

Ethnographic methods, on the other hand, are sometimes likely to miss out on identifying privacy concerns that are perhaps "too private" for users to be demonstrated in their behaviour, and thus be observed by ethnographers. For instance, people may not mention concerns about sharing sexually explicit photographs, as they know this would imply that they do take such photographs.

We therefore advocate the use of surveys along with ethnographic methods, and not necessarily either of them on their own.

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