

# Chapter 14

## Users as Prosumers of PETs: The Challenge of Involving Users in the Creation of Privacy Enhancing Technologies

**Julio Angulo**  
Karlstad University, Sweden

### ABSTRACT

*Frequent contact with online businesses requires Internet users to distribute large amounts of personal information. This spreading of users' information through different Websites can eventually lead to increased probabilities for identity theft, profiling and linkability attacks, as well as other harmful consequences. Methods and tools for securing people's online activities and protecting their privacy on the Internet, called Privacy Enhancing Technologies (PETs), are being designed and developed. However, these technologies are often perceived as complicated and obtrusive by users who are not privacy aware or are not computer or technology savvy. This chapter explores the way in which users' involvement has been considered during the development process of PETs and argues that more democratic approaches of user involvement and data handling practices are needed. It advocates towards an approach in which people are not only seen as consumers of privacy and security technologies, but where they can play a role as the producers of ideas and sources of inspiration for the development of usable PETs that meet their actual privacy needs and concerns.*

### INTRODUCTION

In the era of Information Technologies, the topics of privacy and security have become of paramount importance, especially when it comes to the discussions of the possible threats to individual users and societies in general. However, it has been recognized since the late 1990's that users

often fail to protect their private information on the Internet because they lack the cognitive means to understand the technicalities behind the IT systems that offer to secure their private information (Whitten & Tygar, 1999), commonly referred to as Privacy Enhancing Technologies (PETs) (Blar-kom, Borking, & Olk, 2003). Solutions for PETs have often comprised of complicated terms with

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confusing analogies that do not directly map to users' mental models of the real world, and some of these solutions fail to recognize that privacy and security activities are seldom the primary goals of ordinary users when interacting with online businesses. Examples of this include the notions of asymmetric cryptography or anonymous credentials (Camenisch & van Herreweghen, 2002).

Since their conception, great advancements for the development of security tools and PETs have been taking place, such as the investigations carried out by Carnegie Mellon's CUPS<sup>1</sup> laboratory, the results from important European FP7 projects such as PRIME<sup>2</sup>, PrimeLife<sup>3</sup>, ABC4Trust<sup>4</sup> and others, as well as the concept of Privacy by Design (PdD), which have resulted in the creation of privacy-enhancing computer tools, architectures, designs and standards that had the intention of helping people protect their privacy online and promote trust in online businesses. These initiatives and other corporate developers of privacy and security solutions have tried to adopt an approach in which regular users can be considered during the design process. Yet, it is still a challenge to get users involved in appropriate ways in order to develop suitable features for security and privacy tools, which these ordinary users would find beneficial and easy to use.

A fundamental problem is that many of the solutions developed for protecting the privacy of users are only made available with the hope that these users will adapt them and make use of them in their daily online activities. This issue arises, in part, from the fact that software developers, lawmakers, and stakeholders, who dictate how things should be done, are often disconnected from the reality of ordinary users' everyday lives and their actual privacy needs and concerns.

In this sense, the whole process of superficially considering users for the development of privacy and security enhancing technologies is fundamentally flawed, mainly because users and usability experts are not considered in an appropriate and/or timely fashion during the development process. In other words, a democratic (Bjerknes & Bratteteig,

1995; Björgvinsson, Ehn, & Hillgren, 2010) and user-centric approach is broken or absent at different aspects from the way these technologies are being developed, which reflects on the number of security and privacy attacks through IT systems that are still a threat to society today.

In this chapter, we explore a democratic approach to the development of security and privacy tools. An approach that not only considers ordinary users' tasks and goals, but that also tries to unveil these users' fundamental privacy needs and concerns, and that places users in the role of co-creators, or *prosumers*, rather than simple consumers, of the evolution and creation of PETs.

First, the concepts of privacy and PETs are introduced along with the practices of user involvement in the design of technologies common within the field of Human-Computer Interaction. Then, a discussion about the need for stronger democratic approaches to the development process of PETs is presented. Afterwards, notions related to the involvement of users as co-creators or prosumers of PETs are introduced. Finally, a conclusion and ideas for future explorations of methods that suggest unprompted users' involvement for the creation of PETs are given.

## **CONCEPTS ON PRIVACY AND USER-CENTERED DESIGN**

In order to set the scope for the further discussions presented in this chapter, this section introduces a short background on the definition of privacy and the notion of privacy enhancing technologies. Also, the traditions of user involvement for the design of technology, of user-centered and participatory design are presented.

### **Privacy for E-Businesses**

The American Supreme Court, Louis Brandeis referred to concept of privacy as "the right to be left alone" in 1890 (Warren & Brandeis, 1890). In

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