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Social and Q&A interfaces for app download



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ABSTRACT

Downloading software via Web is a major solution for publishers to deliver their software products. In this context, user interfaces for software downloading play a key role. Actually, they have to allow usable interactions as well as support users in taking conscious and coherent decisions about whether to accept to download a software product or not. This paper presents different design alternatives for software download interfaces, i.e. the interface that prompts the user if he wishes to actually complete its download, and evaluates their ability to improve the quality of user interactions while reducing errors in user decisions. More precisely, we compare *Authenticode*, the leading software download interface for Internet Explorer, to *Question-&-Answer*, a software download interface previously proposed by the authors [Dini, Foglia, Prete, & Zanda \(2007\)](#). Furthermore, we evaluate the effect of extending both interfaces by means of a reputation system similar to the eBay Feedback Forum. The results of the usability studies show that (i) the pure Question-&-Answer interface is the most effective in minimizing users incoherent behaviors, and (ii) the differences in reputation rankings significantly influence users. Overall results suggest guidelines to design the best interface depending on the context (brand reputation and product features).

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1. Introduction

User interfaces for software download on the Internet are the front end of online software publishers for remote users. One important component of such interfaces is the *software download interface*, namely the interface that prompts the user if he wishes to actually complete its download, after that he/she has browsed on a web site and selected the desired product to download. The design of such an interface is critical, because it usually shows product related information that should guide the user in its final choice. Software download interfaces are critical for users who may take unconscious or misguided decisions if the interfaces have not been properly designed ([Allen, Currie, Bakken, Patel, & Cimino, 2006](#); [Maxion & Reeder, 2005](#)). Software download interfaces are critical for publishers too, if the interfaces reduce user trust and satisfaction and system usability at large ([Flavian, Guinaliu, & Gurrea, 2006](#); [Hoffman, Blum, & Lawson-Jenkins, 2006](#); [Shin, 2010](#)). Finally, software downloading has security implications too. [Brustoloni & Villamarin-Salomon](#) have shown that a poorly designed software download interface may cause *unjustified risks* in terms of breaches in a per-user derived policy adopted to classify risks ([Brustoloni & Villamarin-Salomon, 2007](#)).

The Security Warning Dialog Box in the Microsoft Authenticode interface is a reference, largely-used software download interface for Internet Explorer. Prior works have highlighted weaknesses of such an interface ([Dini, Foglia, Prete, & Zanda,](#)

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2006; Cranor, 2007), as well as the attitude of the users to seldom act appropriately when presented with such a download interface (Wood2010). In particular, in line with Brustoloni and Villamarin-Salomon (2007), *incoherent behaviors* in users interacting with the Microsoft Authenticode interface were observed in Dini et al. (2006), where an *incoherent behavior* consists in a download decision that is incoherent with the motivation given a posteriori. According to Shin (2010), the rate of online visitors who buy a product or download software is influenced, among other factors, by trust and attitude, with trust also depending on user interface design quality (Flavian et al., 2006; Hoffman et al., 2006). As a consequence, software download interfaces should have a good design that minimizes *incoherent behaviors*, increases user trust and, then, supports the user intention to purchase.

In prior works we have proposed a *Question-&-Answer* (Q&A) interface, i.e. a software download interface aimed at reducing incoherent behaviors by asking the user questions about specific product download issues, e.g., the product cost (Dini et al., 2007). Furthermore, we have suggested the use of a *Reputation System* (RS)—a service like the eBay Feedback Forum—to increase the user trust on a given software product (Dini, Foglia, Prete, & Zanda, 2013).

In this paper we experimentally compare the Authenticode and Q&A software download interfaces and evaluate the effects of their extension by means of a reputation system. The overall result is that any solution that increases users attention to the interface contents also significantly reduces incoherent behaviors. Nonetheless, the three design choices are not equivalent as they make users focus on different aspects of the proposed products. For example, RS make users to focus on the aggregated social feedback from previous users whereas Q&A makes users to focus on specific software download issue, such as the cost. Even if the minimization of incoherent behaviors through a Q&A-enhanced interface has positive effects on users trust, it causes a strong reduction in all software downloads because users tend only to accept free software, refusing software that entails a charge. So, if having a large market penetration is needed, publishers should not adopt a Q&A interface if the software offered entails a charge. However, embedding a reputation mechanism side by side to a Q&A dialog reduces the relevance of cost, and reduces incoherent behaviors at an intermediate level. Showing aggregated feedback from previous users has a mitigating role between the common interface and the Q&A interface. From these findings we indicate how designers can better tackle the design tradeoffs in these user interfaces.

The paper is structured as follows. Section 2 presents the background of the problem, and shows how the macro-hypotheses under test have been developed. Sections 3 and 4 show the graphical interfaces that have been tested in the experiments and present the experimental settings. Then, the experimental results are given with a concluding discussion on the observed trends.

2. Background and hypotheses

2.1. Issues in online software delivery

Online software delivery, like common e-commerce, must solve concerns especially regarding authentication and trust, in order to make users confident that they are not being cheated (CommerceNet., 2000; Corritore, Kracher, & Wiedenbeck, 2003). Complex Web interfaces and fraudulent software houses have caused serious problems such as spreading dialers, spy-wares and other threats (Shukla & Nah, 2005).

In this environment users cannot relate with a merchant and understand whether the software is in line with their expectations. In an ordinary shop, clients relate with a merchant and establish a trust relationship, and a similar relationship should be established also online (Corritore et al., 2003; Cheskin research, 1999). Easy-to-use interfaces and complete information are highly correlated to user trust (Flavian et al., 2006; Hoffman et al., 2006; Nilsson, Adams, & Herd, 2005; Laberge & Caird, 2000; Lanford, 2006), and a trustworthy interface is more likely to make users trust a vendor on the Internet (Fogg et al., 2001).

A trustworthy, usable interface would not solve two relevant questions for users dealing with software download from the Internet: first, the need to know who really published the file offered, second, supporting the user in understanding what to expect from the executable file. As a solution to the first problem (authentication), major software vendors have developed frameworks for code signing (Jansen, 2000; Thawte., 2007), such as the Microsoft Authenticode that has been taken as reference in the current study due to its widespread diffusion on the Internet: 53% of the market share (BMS, 2012). By signing code, publishers seek to build a relationship of trust with users, satisfying the matter of accountability at the same time. Software publishers sign the piece of software they are releasing. The publisher's certificate, the certification authority certificate, and the signed code are then packaged together.

At the client side, the browser verifies the publisher's signature on the code, and, if verifications are successful, the Security Warning dialog box (SWDB) is presented to the user (Fig. 1). If some problems arise, the user is notified with a different dialog box. The SWDB presents the certification authority name, the software publisher name and the software name, as well as other details such as the cost and other optional information pieces. This information is shared by means of the different Authenticode versions that have been released over the years.

The further issue to be faced in software downloading concerns the user's expectations of the file. The Authenticode framework, like other code signing frameworks, ties a publisher to a file via its certification authority, but it does not help the user understand what to expect from the file. Predictability in this scenario would be important as it influences trust (Corritore et al., 2003). Current software download frameworks do not give any safe information about what and how the

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