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Usable Security: Revealing End-Users Comprehensions on Security Warnings

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Abstract

Security warning is a form communication between user and computer to inform the users on the risk of allowing random applications to run on the computer system. Security warning is designed to warn the users such as notify, inform and advice users about the consequence effect of an action. However, computer user s tend to ignore security warning due to the lack of attentions, did not understand the meaning of the warnings, difficulties on the technical jargon used, lack of motivation and users become habituated to security warning. Therefore, a survey was mounted online utilising 156 participants to investigate and to understand further general understanding of user's perceptions on security warnings. This paper describes two main findings utilising Chi-Square and Cramer's V test. The findings suggested that in all three scenarios, the results were not statistically significant. However, results portrayed in Cramer's V test were in a better outlook. The result indicates on the need to look closely on each variable involves within the study sampling to improve the security warnings.

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Keywords: Security Warning; Chi Square; Cramer's V Test; Usability; Usable Security; Human Computer Interaction.

1. Introduction

Today, security warning is introduced to alert the user whenever security threats have been detected and prevent potential harm from occurring. In general, security warning is a warning system of biological or any technical nature that is developed by a person or a group of organizations to inform society of the future dangers such as natural

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disaster warning, road safety warning and food product. In computing context, security warning is a warning system to alert the users from the security breaches. One of the features of the security warning message is it protects the computer system from the potential threats to help users reduce the risk of security threats [1]. Security warning is a warning that provides basic computer systems functionality which provides benefits and problems of physical warnings [2]. In addition, warnings can be viewed as type of alert that protect computer systems from other threats such as information theft, spoofing and malwares. In general, security warnings can be classified into five types which are dialog box system, in-place system, notification system, balloons system and banners system [3]. Among all classifications, dialog box is one of the type that usually being used to alert the user when it involves toward the fundamental characteristic of warning such as system access or integrity, privacy or control confidential information and other asset data.

Regardless of the importance of security warnings, most end-users still ignore the warning due to various reasons. Among those is lack of attention towards security warnings [4,5], users did not understand the security warnings [6,7,8], too much used technical jargons in the contents of the warning [9,10,11] and user become habituated to security warning [1,12,13]. Having various issues that had been addressed, it is useful to understand the relationship between variable involves and it can be the input to the developers for a better creation of security warnings in the future.

This paper is organized as follows: Section 2 explores on the related work and literature studies: Section 3 describes the methodology implemented in this study, Section 4 explains the hypotheses used and the significance value of Chi-Square. Section 5 describes the associations between the groups of participants, Section 6 presents a brief discussion and finally Section 7 ends with the conclusion highlighting the limitation and the future work of this study.

2. Related research

Warning is a medium of communication to inform users about possible issue in computer systems. One of the features of the security warning message it is to protects computer system from potential threats and to help user reduce the risk of security threats [6]. In computing context, security warning can be described as a warning system to alert computer users from the security breaches. According to [2], computer security warning provides benefits and problems of physical warnings to the basic computer system. These security warning, notify users any possible threats that can make the computer system become vulnerable [14].

Security warnings usually prompt users when the threats happen in various conditions. The content of the security warning is triggered based on these scenarios such as when user want to install an application, when user want to open an attachment from the emails or windows needs to be updated and restarted.

Microsoft [3] described that there were series of design guidelines and explanation based of the usage of security warnings interface. These guidelines are explained clearly based on its terminology, capitalization and punctuation, standard message phrasing and the appropriate design icon use. These security warnings message provide an ability to the user to interact correctly the security issue based on the guidelines given. With respect to different perceptions, background, knowledge and experiences from various users, it might influence end-users' comprehension on security warnings contexts. Not many researches had been conducted to assess the influencing elements on how security warning had been presented. Amongst the notable one was designing the security warnings utilizing iterative design [11], Polymorphic design [15], and mental model approach [16,17]. Although all these approaches can be considered meaningful, lack of focus had been given to the elements involved in the influencing elements (i.e. demographics elements, perceptions etc). Therefore, this paper determines to investigate further given the results from the survey where Chi-Square and Cramer's V test are used as means of evaluation. By using both tests, the relationship between two dependent and independent variables can be helpful when interpreting the data using the statistical significant values [18].

3. Methodology

A survey to understand the end-user's perception and understanding towards security warning is presented. The target participants are the people who use the computer and Internet anonymously. Once the survey is published, the