

User-centered cyber-security

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The securing of information systems has become a major concern worldwide. For individuals, security breaches can lead to intrusions of privacy and them falling victim to cyber-crime. Even more dangerous are attacks against commercial and governmental organizations which can greatly disrupt their activities. In recent years it has become clear that incorrect or risky user actions often cause the exposures of systems to threats. It is therefore necessary to consider the human user if one wants to develop secure cyber-systems. The goal is to design systems that prevent users from causing damage or that alert about possible threats, while still allowing users to do as much as possible. Limiting users to actions that are definitely secure will lower the user's productivity and the efficiency of system use. We describe a large-scale interdisciplinary research project in the department of Industrial Engineering at Tel Aviv University, funded by the Israel Ministry of Science and Technology that looks at the possibility of adjusting security settings to the characteristics of the individual user and the usage situation, considering the user's past history with the system. The project combines research on the detection of risky behavior in user logs (led by Irad Ben-Gal), the study of user behavior with laboratory experiments (led by Joachim Meyer), the development of models of optimal user behavior and their adaptation to serve as descriptive models (led by Tal Raviv and Joachim Meyer), and the analysis of field data and the implication of the results of the study on information system design (led by Eran Toch). After providing an overview of the approach, we will present the basic model used to describe user decisions and some experimental results that look at the extent to which model predictions do indeed correspond with user behavior. Some theoretical, methodological and practical conclusions are drawn.