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Position Paper for the DIMACS Workshop on Usable Privacy and Security Software

Computer networks range from centrally served architectures to heterogeneous, dynamic and distributed environments managed by multiple administrative authorities. Such structures are shared by users with different and competing interests and preferences. However, traditionally it is assumed that all participants behave according to the goals centrally set by the system designers. It is obvious that in the presence of user strategies that are not aligned with such higher level system design suboptimal outcomes are to be expected and should be addressed by the designer.

While progress has been achieved in the analysis of user incentives and strategies in traditional market mechanisms such as auctions and posted offer markets for tangible goods we still don't know much about markets that involve goods with much more uncertain valuations such as privacy and information security. Recently many researchers have started to fill this gap (own work is numbered):

- Economic analysis of privacy and security (Alessandro Acquisti maintains a bibliography of research into the economics of privacy)

    1. Christin & Grossklags (mimeo): characterization of a market for posted security levels in a game-theoretic model

- Experimental and survey research to uncover psychological and economical foundations of individuals' privacy behavior and preferences

    1. Spiekermann, Grossklags & Berendt (ACM EC'01): experimental evidence for dichotomy between privacy attitudes and actual behavior; click-stream and flow-analysis of shopper behavior

    2. Acquisti & Grossklags (WEIS'03): discuss which economic considerations are likely to affect individual choice and advance testable hypotheses about why individuals' information security attitudes seem inconsistent with their behavior

3. Acquisti & Grossklags (WEIS'04, forthcoming): preliminary evidence from a survey of individuals' privacy attitudes, privacy behavior, and rationality

Most of my own work is seeking a more realistic assessment and understanding of individuals' motivations and behavior in privacy-relevant scenarios. Individuals often have difficulties to access privacy risks due to various factors, for example:

- Limited information: What are risks (including price discrimination, identity theft)? What are modes of protection (PET's, etc.)?

- Uncertainty about probability of risk and amount at stake due to others' usage of private information

- Behavioral biases with economic relevance (underinsurance, hindsight fallacy, miscalibration of probabilities, time-inconsistent behavior)

- Existence of ex-ante non-salient privacy costs and risks, e.g., induced by social stigma and social norms

Early work has shown that even motivated individuals in a user study will have problems to protect their information security if usability needs are only addressed insufficiently (see, for example, Whitten & Tygar, 1999). However, more importantly even well-designed interfaces (that are, for example, successfully tested in user-studies under controlled conditions) might face a daunting fate in the market-place if they lack understanding of users' long-term motivations and actual economically relevant behavior. (Note that in the last years privacy-enhancing software solutions have gained only little support in the market place with few notable exceptions! We know that individuals are concerned about security and privacy: there is a demand for protection. Firms and researchers are working on solutions: there is a supply. But surprisingly there is no market-clearance.)

Intuitively it appears obvious that interface designers could positively influence individuals' propensity to, for example, procrastinate patching of his/her computer systems or mispredict privacy risks. During the workshop I would gladly discuss such an approach and its significance for future work in usability research.

With best regards,
Jens Grossklags