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Privacy by Designers: Software Developers' Privacy Mindset

Extended Abstract[†]

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Privacy by design (PbD) is a policy measure that calls for embedding privacy into the design of technologies at early stages of the development process and throughout its lifecycle. By introducing privacy considerations into the technological design, PbD delegates responsibility over privacy to those in charge of the design, namely software developers who design information technologies (hereafter called developers). Thus, for PbD to be a viable option, it is important to understand developers' perceptions, interpretation and practices as to informational privacy.

To this end, we conducted in-depth interviews with 27 developers from different domains, who practice software architecture and design. Grounded analysis of the data revealed an interplay between several different forces affecting the way in which developers handle privacy concerns. Borrowing the schema of Social Cognitive Theory (SCT), we classified and analyzed the cognitive, organizational and behavioral factors that play a role in developers' privacy decision making.

Our findings indicate that developers use the vocabulary of data security to approach privacy challenges, and that this vocabulary limits their perceptions of privacy mainly to third-party threats from outside of the organization; that organizational privacy climate is a powerful means guiding developers toward particular practices of privacy; and that software architectural patterns frame privacy solutions that are used in the development process, possibly explaining developers' preference of policy-based solutions to architectural solutions.

Further, we show, through the use of the SCT schema for framing the findings of this study, how a theoretical model of the factors that influence developers' privacy practices can be conceptualized and used for understanding current practices, and as a guide for future research toward effective implementation of PbD.

Our conclusion is that we cannot yet rely on developers to address privacy concerns. Examining their point of view, it seems that, except in the context of specific domains, developers are actively discouraged from making privacy a priority, and are expected to conform to norms dictated by a negative organizational privacy climate. But the problem goes deeper than mere prioritization; many developers do not have sufficient knowledge and understanding of the concept of privacy, nor do they sufficiently know how to develop privacy-preserving technologies. If PbD is ever to become a viable practice, a considerable change is to be made for preparing the field for the wide implementation thereof.

Leveraging the findings of this study, indicating that organizational privacy climate highly influences developers' privacy interpretation and behavior, we propose that this climate may potentially serve as an effective mechanism to bring about the required change in the privacy mindset and practices. Providing developers with knowledge, by means of well-designed educational programs for designing privacy, as well as motivation, by means of positive organizational privacy climate, could potentially create the mindset required for designing privacy-preserving solutions. Future research may examine these and other means and their actual effect on developers' perceptions and attitudes towards informational privacy. If successful, this would be an important and necessary step towards wide and effective implementation of PbD.

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