

Towards an Understanding of Smartphone Usage to Assess its Implications on People & Society

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The technical development of Smartphones and involved technologies evolved these devices to very powerful microcomputers with plenty of different functionalities. This development finally revolutionized the way people interact with their device and with each other. In South Korea, the country with the highest Smartphone penetration rate worldwide, 88% of the inhabitants were using Smartphones in 2015. Spain as Europe's member with the highest penetration rate reached 71% at least. Despite local differences, increased smartphone penetration is seen as global phenomena [1].

The aim of this research is to better understand Smartphone usage and investigate the consequences of their usage on people and society. The question why people start to use smartphones therefore serves as starting point. In order to get a better understanding of the adoption process, the well-established technology acceptance model (TAM) serves as basis [2]. As the basic TAM model does not seem to sufficiently explain the high Smartphone penetration, the concept of technology addiction was used to investigate inflated behavioral usage intention. Technology addictions refers to a mental health condition that is characterized by a maladaptive dependency on the use of technology [3]. In this study, perceived security and perceived enjoyment was incorporated into the TAM model as they were found to be important for the Smartphone context. Results from this study demonstrated the predominant influence of enjoyment in the Smartphone context [4]. It was also interesting that perceived security does not seem to influence the Smartphone usage behavior, despite its

importance as demonstrated by Leavitt [5] and its importance for modern workplaces [6].

As Smartphone usage is matured nowadays it seems logical to deeper investigate the usage instead of the adoption process, therefore post-acceptance models are considered to advance the research on the Smartphone phenomenon. Bhattacharjees Post-Acceptance Model of IS Continuance serves as basis [7]. Briefly explained, this model posits that confirmation influences the perceived usefulness of the IT-artifact and satisfaction about its usage finally leads to the intention to continue its usage. Due to the findings of the previous work, the hedonic perspective, respectively enjoyment, as well as security and privacy risk perception are incorporated into the model and are investigated more explicitly. The aim is to get a deeper understanding of the importance of enjoyment and investigate whether continuous usage might neutralize beliefs about vulnerabilities and related risks. It might be possible that privacy and security concerns are neglected despite their growing importance.

This importance is derived from the fact that modern Smartphones grew into a treasury of (sensitive) information stored on the devices with their enormous storage capabilities. The Smartphone additionally serves as "key" to cloud services, email- and other accounts, cars and homes, to only name a few. With their sensors and network connection, Smartphones have high capabilities of intruding privacy. On the other hand, Smartphone users generally tend to have low privacy and security awareness [8]. This is dangerous given that making payments with the Smartphone is

becoming more and more popular, not only via online banking applications where sensitive login-data is readily available on the device, but also with their NFC functionality.

For this study log-files of Android Smartphones were collected and are analyzed alongside a quantitative questionnaire. The questionnaire drew inspiration from relevant literature from related domains and was adapted to the Smartphone context. The log-data shows, amongst other things, a snapshot of installed applications and allows to search for occurrence of applications that are prone to serve as privacy risk. The questionnaire and the information of the device further allow to assess whether the user shows addiction tendencies. This is done via the Smartphone addiction scale by Kwon et al [9] alongside metrics retrieved from captured log files [10].

We posit that continuous Smartphone usage unveils interesting effects: The longer and the more intensive a Smartphone is used, the lower the overall suspiciousness about privacy and security becomes. Applications that are demanding a lot of permissions were granted them, as otherwise they would not work. People think that as they already granted that much permissions, it does not matter if another application also receives them. Establishing connection to unsecure networks is another security threatening behavior that might not be typical for a Smartphone adopter, but once getting used to be always-on and being addicted to the Smartphone, the barriers are lowered.

Continuous usage and addiction to Smartphone usage might weaken the own security conception about Smartphones to a dangerous level. Given the BYOD trend, this should be kept in mind. Employees might undermine the whole security conception of a company because they neglect the risks and store sensitive company information and login-data to the company network and to various services.

The next steps in this work-in-progress are to evaluate the collected data from the questionnaire, supplement it with data from the log-files and examine the latter for clusters that might help to push the research into directions not considered yet.

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