

Analyzing End-Users' Knowledge and Feelings Surrounding Smartphone Security and Privacy

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What we deal with...



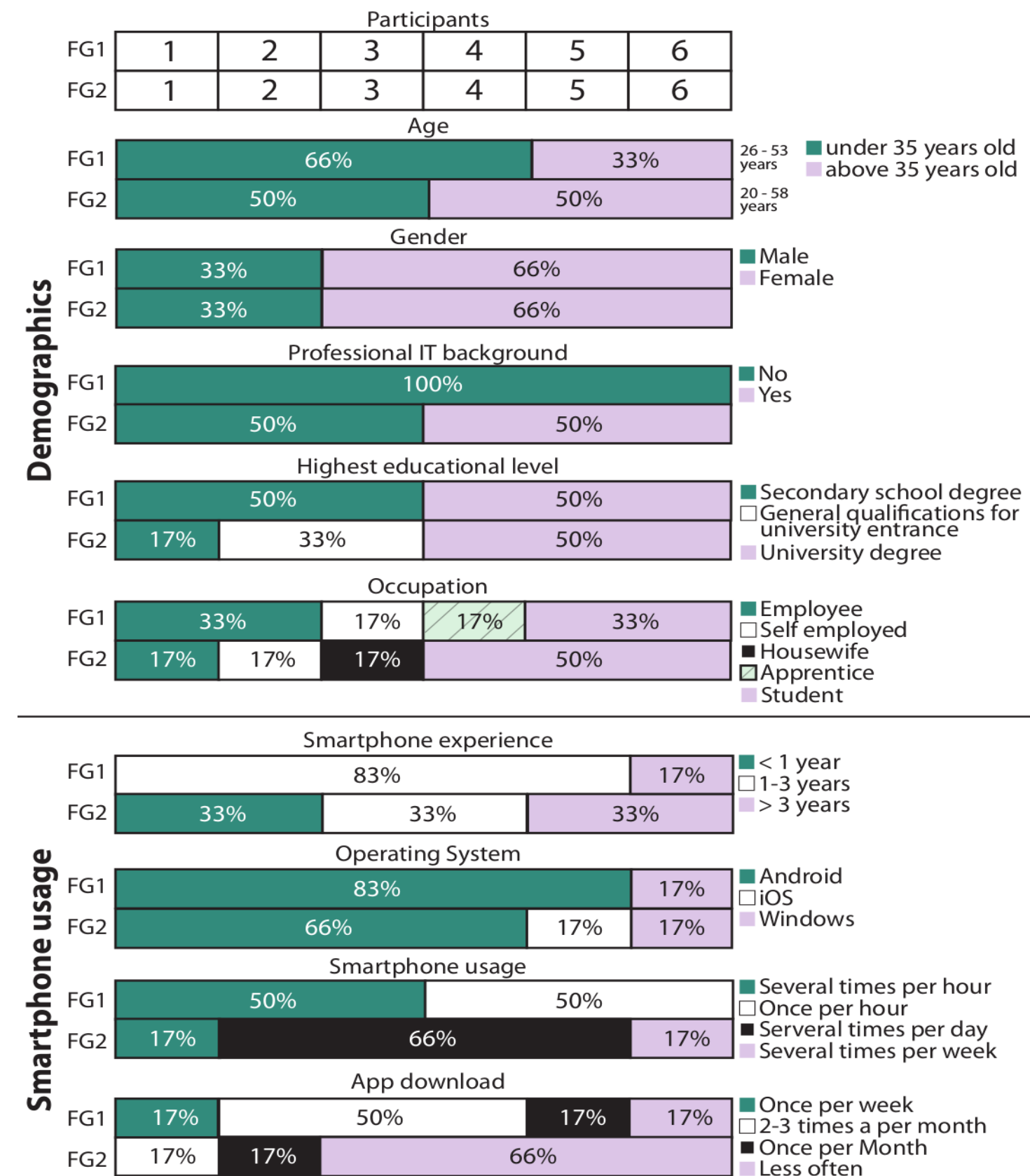
- ウェスティンホテルのクリスマスツリー / Christmas Tree at the Westin Tokyo
- kazuh from Tokyo, Japan via flickr
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Research Approach

- Multi-step approach:
 - Focusgroups <- we are here
 - Interviews
 - Large-Scale/quantitative questionnaire study
- We first have to know what bothers them and how they call it...

Methodology

- Two focus-groups of six people
- Mixed (german) demographics
- Discussion initiated by moderator
- Three open questions:
 - Advantages of Smartphones?
 - Disadvantages of Smartphones?
 - Possible Mitigations?
- One wording question:
 - How would you call the disadvantages?



Analysis

- Multi-step process
- Open coding (what is *in* the data)
- maximize validity
- Additionally: Use of pre-created list of threads and mitigations for comparison.

Transcription

— Writing down the recorded audio data

Open coding (analyst 1, analyst 2)

— Free from interpretation and solely repetition of the content

Identifying themes (analyst 1, analyst 2)

— Grouping open codes and relating them to themes

Creation of a code list (analyst 1, analyst 2, coder 1)

— Finding consent on the themes

Re-coding with the code list (coder 1, coder 2)

— The code list is again applied to the transcript

Interrater agreement (coder 1, coder 2)

— The consistency of the coders' concepts is compared

Final coding of the transcript (coder 1, coder 2)

— The transcript is coded according to the final consent of the coders

Results

Subsection	Theme	Present in	
		FG1	FG2
Social Pressure	Peer pressure	✓	×
	“Social” Availability	✓	✓
	Harassment	×	✓
Distrust vs. Trust	Dwindling Trust	✓	×
	Trust	✓	×
Dependence, Helplessness and Fatalism	Dependence	✓	✓
	Helplessness	✓	✓
	Fatalism	✓	✓
	Sacrificing Security for Usage	✓	×
Exercising one’s own influence	Inform One-self	✓	×
	Exercising Control	✓	×
	Risk Assessment (own responsibility)	×	✓
	Avoidance	✓	✓
Processes	From technological side-effects to dangers	✓	×
	Risk assessment (trade-off)	×	✓

Social Pressure ■■

Peer Pressure

“This means that even if you wanted to totally boycott the system, one does not have a choice.”
(FG1-P2)

„Social“ availability

“It’s being expected that you are available at all times.” (FG1-P1)

“Constant availability.” (FG2-P4)

“Like surveillance. So if the others [colleagues] definitely saw that one’s been online, I can’t tell my boss ‘Oh, I’m sorry I didn’t see that you wanted me to help out.’ ” (FG1-P4)

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✓ Seen
05:34 PM

Harassment

“ [...] they later said: We will call you until you take part in the survey.” (FG2-P5)

“[...]and occasionally they render the whole website as an ad. [...]Therefore, you don't have the chance to continue on what you wanted to do, but you need to give attention to the whole thing. [...]” (FG1-P1)

Distrust as disadvantage ■■

Dwindling trust in the system

“It was always getting worse, that really every app wanted to access everything. So four years ago, the first apps [...] weren’t like this that they wanted to know everything.” (FG1-P3)

“Well, when it comes to emails, in the past one could get an e-mail address for oneself and nobody knew to whom this address belonged to. But if you nowadays retrieve your emails on your mobile you are immediately identifiable.” (FG1-P2)

Trust in service providers or smartphone OS as mitigation

“[...] , so, the provider is just crucial.” (FG1-P3)

“[...] with their cloud [storage service] there’s at least more security as their company is based in Germany.” (FG1-P3)

“As far as I know Windows is more secure.” (FG1-P1)

“Exactly, I know, these WLAN networks that I do not trust, I should delete them [...]” (FG1-P1)

Negative feelings ■■

Dependency of third parties

“That is the thing, I am dependent again on someone and I again do not know, how safe this really is, that is again another alleged security, which leads me to dependence.” [On the topic of encryption] (FG1-P2)

“So, this is quite stupid in the app market, that only if you are on the most up-to-date level, you get access to the apps, and that’s why you get forced to always renew everything.” (FG1-P4)

Sacrifice security for usage ■■

A feeling of having no choice

FG1-P2: “[...]because of everything already that I am googling, every single word that I type is recorded, every single website that I looked at, every single text that I looked at, all my data that is on my phone, especially these authorizations of these apps, if I agreed to something somewhere, where I HAD TO, so that I am allowed to use the application.”

FG1-P1: “[...]it is seen by many [people] like this, that it [the disadvantages] is something that you have to accept [...]”

Exercising one's own influence as a mitigation ◀◀

Inform oneself

FG1-P4: "I just may pick this up again, it is really like this, if one is not informing oneself, it's one's own fault."

FG1-P1: "So, there are certain things I can protect myself against, against others I cannot. Partly because I do not really know what are all things that can happen. And that is the key... So ... we need a kind of responsibility, enlightenment, information.... I think, that is missing a lot."

Threats are dynamic, they develop over time

FG1-P5: “It depends on how far you go. That’s what we said. So the more you reveal, the more you have to anticipate that you will eventually lose.”

FG1-P3: “I think that is too undifferentiated, because some things are technological necessities that I am subject to, so that I can use the device at all, and some things are side effects that arise, because others misuse these technological necessities.”

Contribution

- We explore end-users' perspective on threats and mitigations in a qualitative study.
- Insights in the emotional dimension of the end-users' role in security and privacy on mobile devices.
- Design recommendations for mitigation techniques.
- Data-set for further studies (questionnaire creation) and comparison between cultural backgrounds.

Lessons Learned

- Social Pressure
 - Security and Privacy by design if we build sth. new.
 - Make privacy settings actually work.
- Negative Feelings
 - Not only usability matters. Ensure UX and need-fulfillment.
- Unmerited Trust
 - Education and awareness.

Further Work

- Compare different societies/cultures (we started Israel/Germany)
 - If you want to join, mail us: lydia.kraus@telekom.de, tfiebig@sec.t-labs.tu-berlin.de
- Go large. Focusgroup [x] -> Interviews [x] -> Quantitative Study []