In-Depth User Evaluation of m-Banking Authentication Application

AHEAD iTec workshop: New trends in combining high security and user experience of mobile applications

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Agáta Kružíková, Petr Doležal, Lenka Knapová

CROCS
Centre for Research on Cryptography and Security

Project Introduction

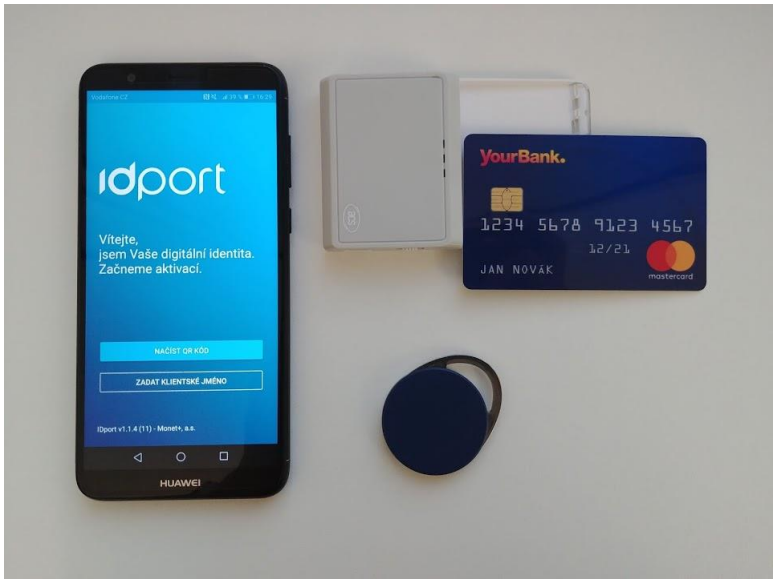
- ***Innovation and adaptation of authentication technologies for secure digital environment***
- 2/2018-2/2020
- Supported by Technological Agency of Czech Republic
- Cooperation between:
  - Centre for Research and Applied Cryptography
  - Interdisciplinary Research Team on Internet and Society
  - Monet+/AHEAD iTec

Motivation

- People do not want to use authentication method:
  - Which is not trustworthy for them
  - Nobody else uses it
  - It is not easy to use
- Secure solution != success in adoption
- Mandatory two factor authentication (2FA) for banking services in Czech Republic (from September 2019)

Investigated Authentication Methods

- One-time SMS code
- Numeric PIN code
- Hardware token (FIDO token, NFC token)
- Payment card with and without smartcard reader
- Fingerprint



User Study Design

- Study description
- Demographic questionnaire
- Getting familiar with the test smartphone
- Scenario description
- Fulfilment of the tasks
- Questionnaires and interviews based on the fulfilled tasks

Scenario Description

- IDport – application of digital identity recommended by participant bank
- Activation of IDport
  - QR code or user name and activation code
  - Choosing of personal PIN code and checking fingerprint
- Login to internet or mobile banking
- Payment of the bill(s)
- Checking of account balance

Iterative Process

- 1st round
  - One-time SMS code, FIDO token, payment card with smartcard reader
- 2nd round
  - FIDO token, payment card with smartcard reader
- 3rd round
  - payment card
- 4th round
  - NFC token, payment card with smartcard reader

Changes According to the Results

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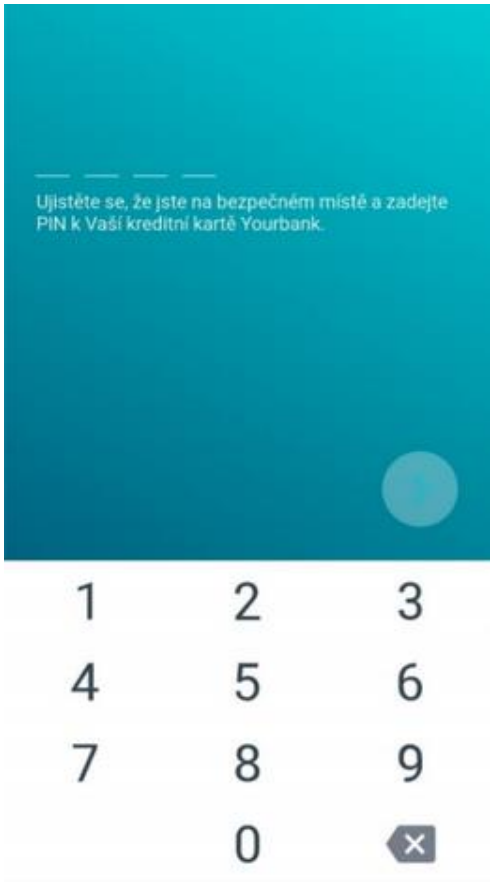
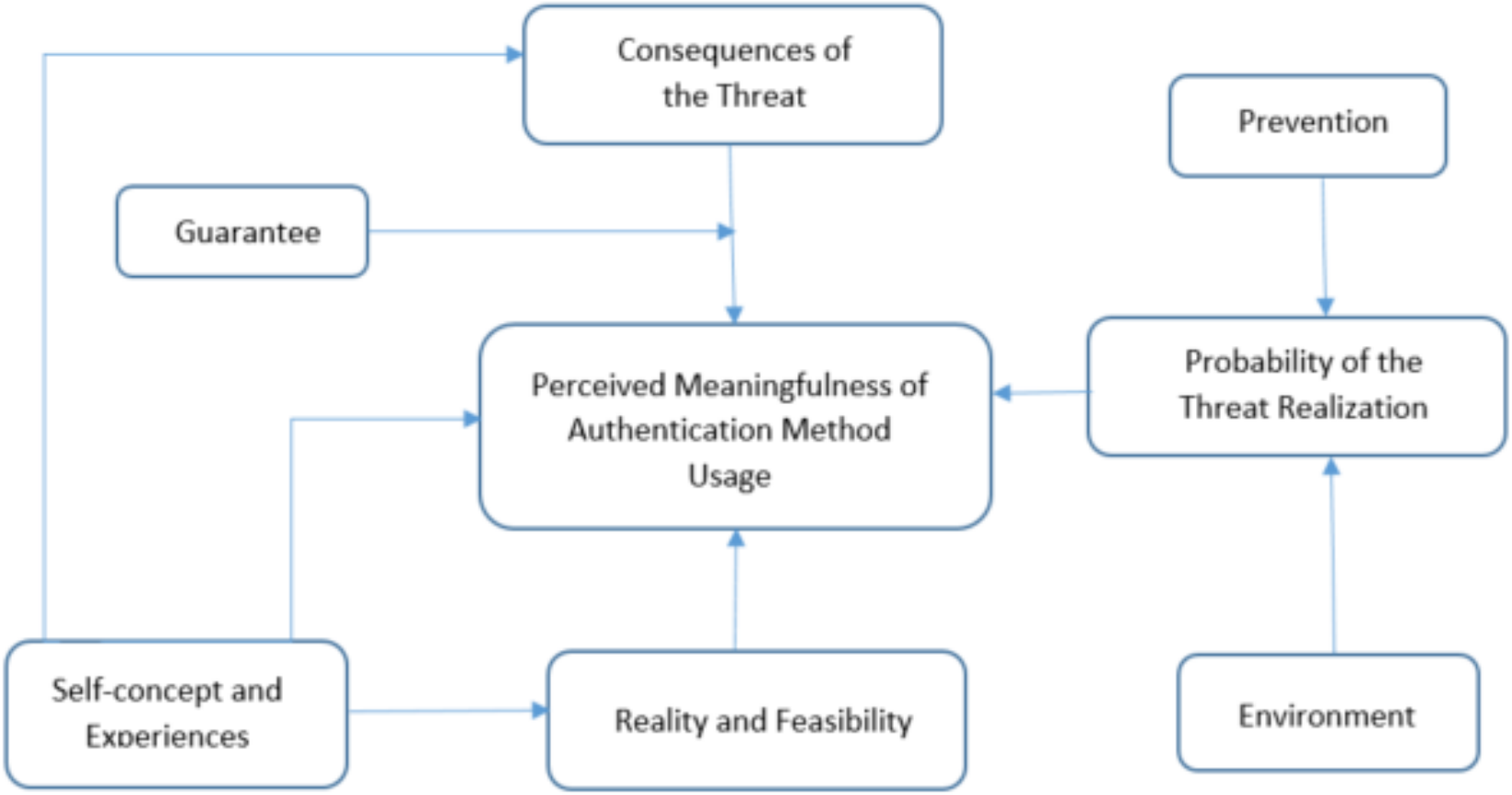


Mental Model



Perceived Meaningfulness of Authentication Method Usage

- Need to see some benefit for an „extra work“
- Banking context – money protection
- Balance
  - Authentication method cannot be:
    - Too easy
    - Too complicated

Probability of the Threat Realization

- The threat is perceived as something
  - Materialized
  - Close
  - Present
- Theft (smartphone usually close to the wallet)
- Kidnapping (bank credentials are not a target)
- Type of an attacker
  - Industry espionage
  - Random person (with/without expert knowledge)

Probability of the Threat Realization Prevention and Environment

- To follow some basic security rules
- Possibility of prevention (fingerprint vs. PIN)
- Mistakes in prevention

- To be alone in a safe space vs. to be in a public place
- Large amount of money is usually transferred at home

Consequences of the Threat

- Money losts
- Physical injury (personal health)
- Stolen token
  - No access for the token owner to the banking application
- Stolen credentials (user name and password)
  - A bank account owner has still access
- Stolen payment card – shopping

Reality and Feasibility

- Technical feasibility (no science-fiction)
- Feasibility – how to fulfil some tasks without payment card?
- Denial of access to the authorized person
- Significant users' trust
- More important than security

Self-concept and Experience

- „I trust myself.“ – no need to confirm it again
- 2FA in general is ok, but should not impact users’ flexibility
- Feeling of control – „I know my needs best.“
- Transparency is more important than amount of screens/steps
- Illusion of understanding what is going on

Thank you for your attention!

Questions?