

Using Physical Mobile Interaction for the Personalization of Ubiquitous Services

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Final Presentation**

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- **Introduction**
- **Related Work**
- **Designed Scenarios**
- **Preliminary Survey**
- **Design and Development**
- **Evaluation**
- **Conclusion**



- **Increasing number of ubiquitous information and services**
- **Great flexibility vs. great annoyance**
- **Personalization of ubiquitous services**

- **Physical mobile interaction for the conscious indication of personal interests and preferences**
 - Gathering of information
 - Creation and management of user profile
 - Personalization based on user profile



• Personalization

- Implicit: without knowledge of the user
- Explicit: with knowledge of the user
- [Kern: Shaping How Advertisers See Me]

• Location Based Services

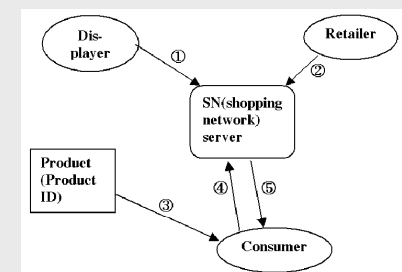
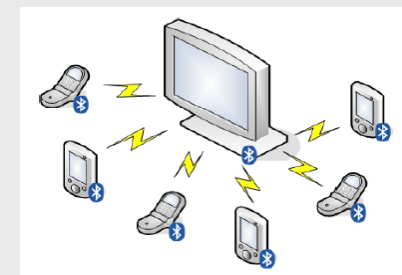
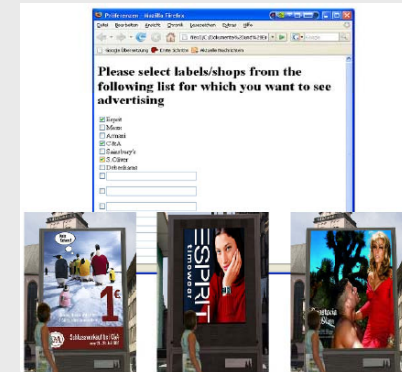
- Show specific advertisement of the region (GPS, server)
- [Hristova: Ad-me]

• Bluetooth Based Services

- Public Display Advertising, Bluetooth-ID and profile (server) [Sharifi]
- Finding persons via Bluetooth-ID and profile (server) [Eagle: Social Serendipity]

• RFID Based Services

- Personalized shopping experience, RFID-Tags and server
- [Lee: Design of a RFID-Based Ubiquitous Comparison Shopping System]





- **Gathering 1 - Unconscious Gathering of Information**

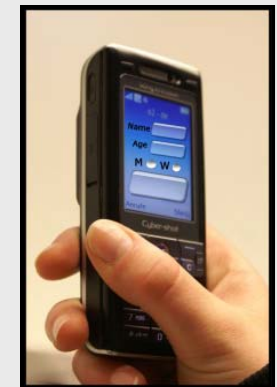
- Information is implicitly gathered
- e.g. when the products are registered at the checkout
- Edit profile at a later point of time



Scenario 1

- **Gathering 2 - Direct input of Information**

- Form on the mobile device
- Create and edit the profile



Scenario 2



- **Gathering 3 - Explicit Selection of Information**

- Information is explicitly gathered
- e.g. catalogues with NFC-Tags
- Touch NFC-Tag with mobile device to read information



Scenario 3

- **Gathering 4 - Interactive Gathering of Information**

- Information is explicitly gathered
- Shown on a public display
- Get information via Bluetooth or via NFC-Tag



Scenario 4



- **Personalization 1 - No Personalization of Services**

- Send via Bluetooth
- without any filtering



Scenario 1

- **Personalization 2 - Filtering of Services**

- Send via Bluetooth
- Filtering of received services and information according to the user's needs and interests



Scenario 2



- **Personalization 3 - Personalization with a Static Interface**

- Interaction with a static interface with NFC-tags
- Each tag represents a mobile service
- Filtering received information (via Bluetooth) according to the selected services and the user profile



Scenario 3

- **Personalization 4 - Interactive Personalization of Services**

- Public display shows advertisements or information according to the users in its immediate vicinity
- Transfer the user profile to the public display via Bluetooth or NFC-Tag



Scenario 4



- Online Survey (tool: limesurvey)
- **46** participants
- **Already used mobile services:** route planer, information services, booking services, hotel/restaurant search
- Fear to be spammed higher concerning advertisement
- **Personalization of services but protection of given data!**

- **Disadvantages of Personalization:**
 - Data abuse because of a security lack
 - User profile is created to fine-meshed because of fear to be spammed
 - Change to a glazed human
- **Advantages of Personalization:**
 - Comfortable to get individualized information
 - Come easily to wanted information is higher
 - No loss of time



Gathering of information Scenarios:



- Easy to use
- Useless information



- Standard use case
- Secure and controllable



- Easy to use
- High feeling of control



- Less Privacy
- Easy to use

Personalization Scenarios:



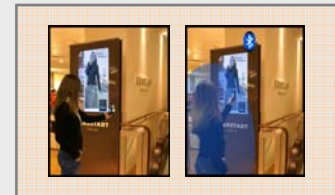
- Fear of being spammed
- To much information



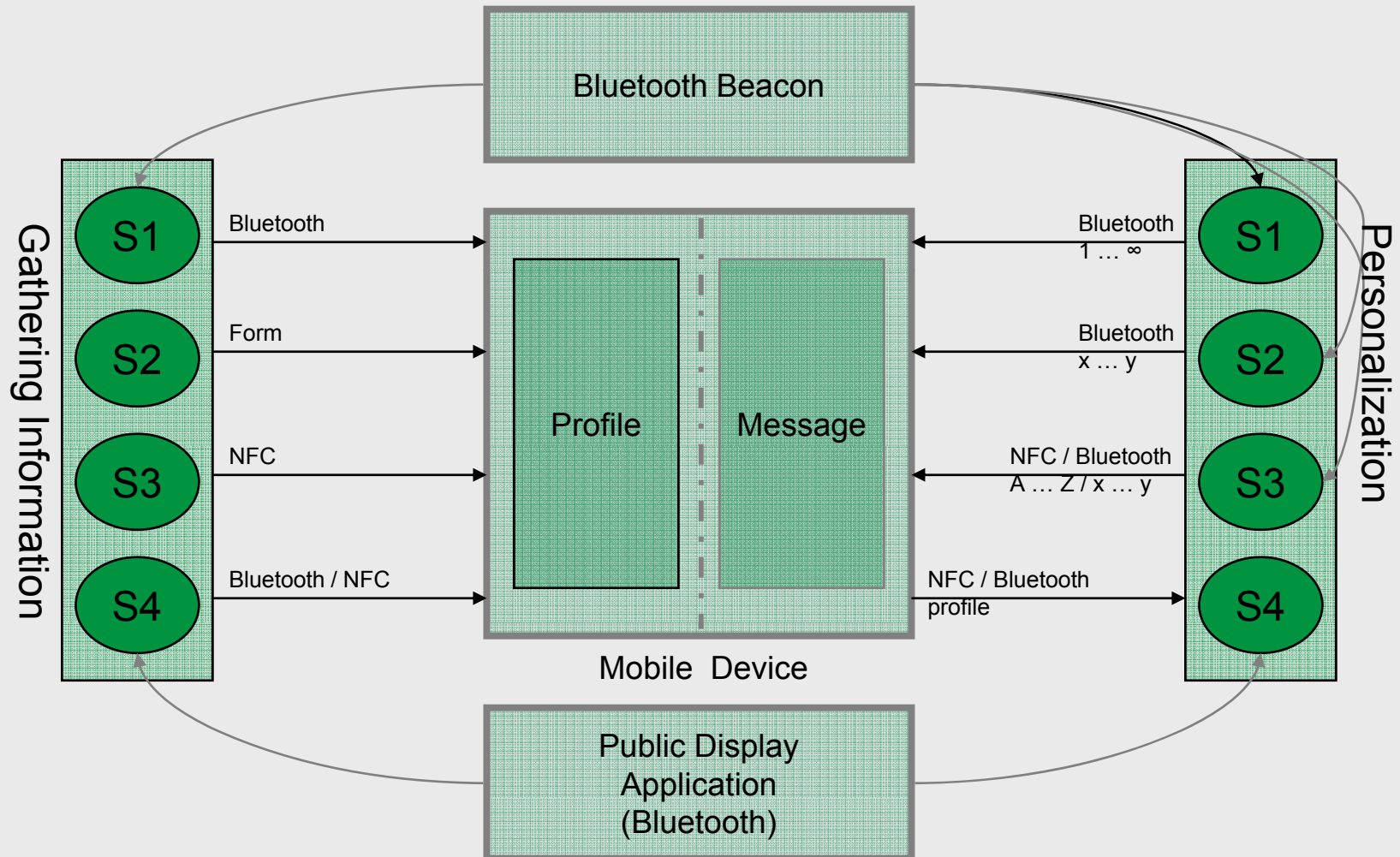
- Easy to use
- Filtered information



- High feeling of control
- Less privacy (touch)



- Less Privacy
- Less control (data transfer)



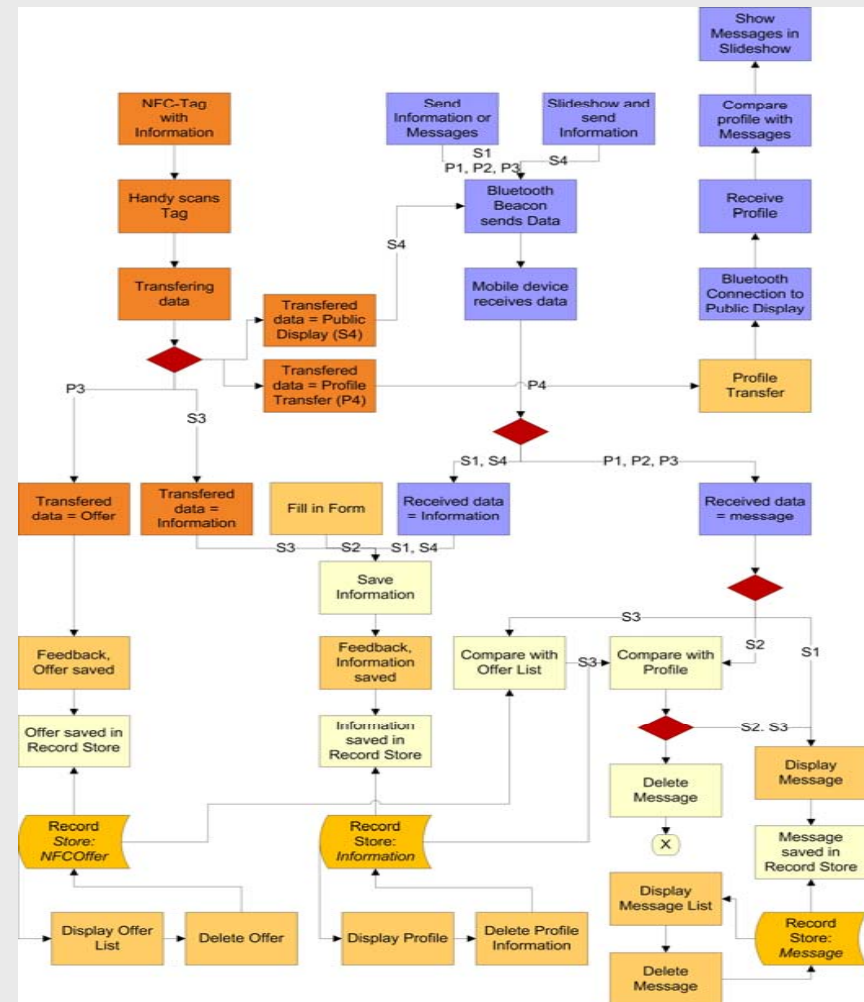


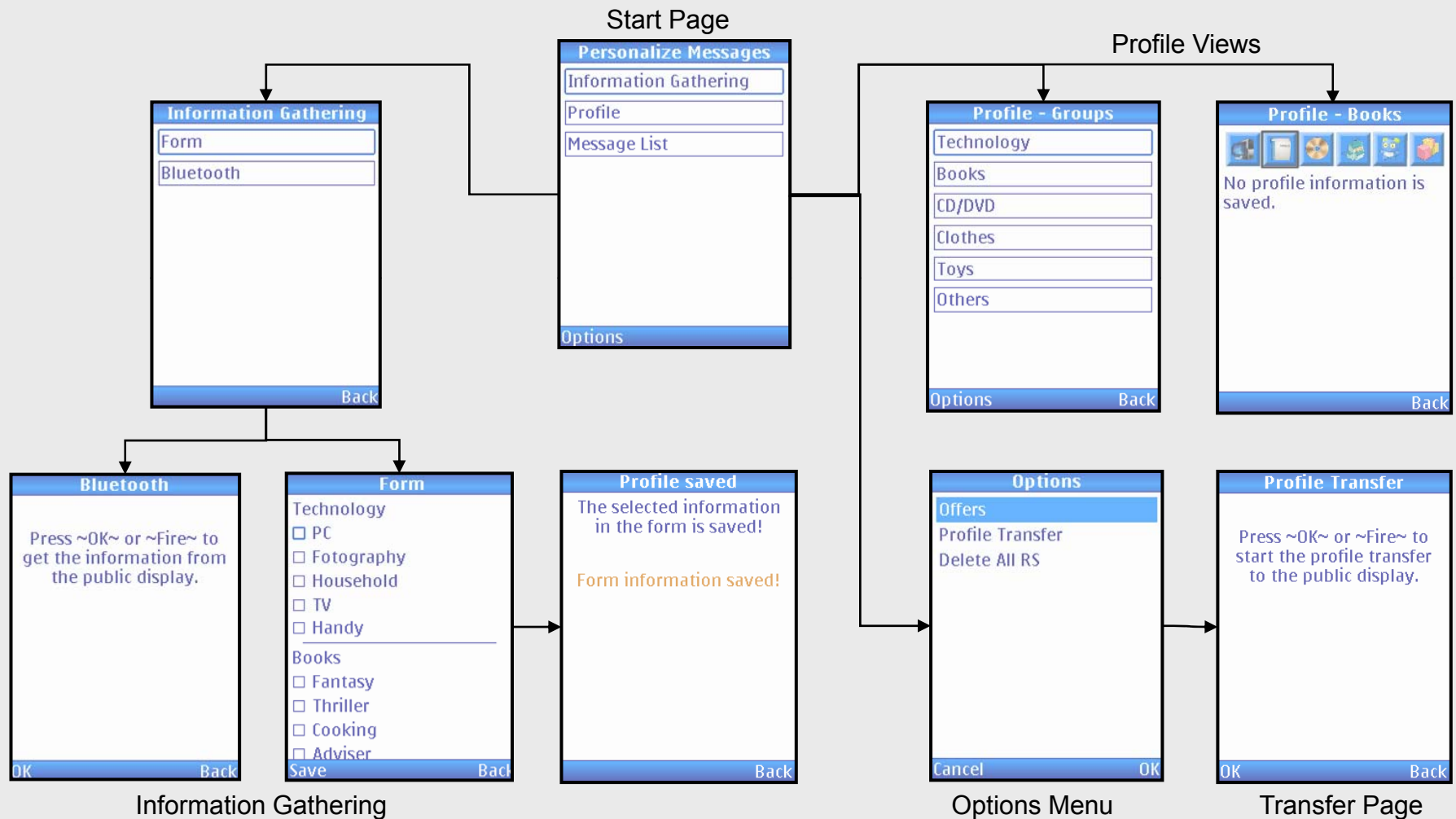
- Application: **JAVA ME**
- User Interface: **J4ME**
- **Nokia 6131** (integrated NFC reader)

- User Profile stored in **3 Record Stores**
- Data Strings:
 - **Information:** *[scenario];[ID];[genre];[shop];[title];[content];[date];[record store ID]*
 - **Message:** *[scenario];[ID];[genre];[shop];[title];[content];[date];[record store ID]*
 - **Offers:** *[scenario];[ID];[shop];[title];[content];[date];[record store ID]*



- **Bluetooth Beacon** (blue coloured):
 - Sending Data (information or messages)
 - Sending accessory information while showing ads on Public Display
 - Receiving the transferred profile and show ads
- **NFC Tags** (reddish brown coloured):
 - Profile information
 - Services or shops
 - Connection Data to the Public Display
- **Mobile Device** (yellowish coloured):
 - Storing data in the record stores
 - Display stored data
 - Delete stored data
 - Compare received data with profile







- Get a better idea of the scenarios
- Gather some experience with the used technologies
- **11 tasks for the user study based on the interests of a model person**
- **Get comparable results based on the according questionnaires**





Introduction

- Demographic Questions
- General Questions concerning mobile services, mobile advertisement and user profiles

Part I – Gathering of Information

- Slimed IBM Questionnaire
- **Criteria:** Like to use / Easy to use / Easy to learn / Control / Security / Privacy
- Questionnaire of comparison

Part II – Editing the User Profile

- Slimed IBM Questionnaire
- **Criteria:** Easy to use / Easy to learn / Fast / Navigation / Easy search / Structure
- Questionnaire of comparison

Part III – Personalization of Mobile Services

- Slimed IBM Questionnaire
- **Criteria:** Like to use / Easy to use / Easy to learn / Control / Security / Privacy
- Questionnaire of comparison



Demographic Facts:

- **16** participants
- **12 male** and **4 female**
- **Average age: 24** (minimum age: 22 / maximum age: 29)
- **Countries:** Germany (14), Turkey (1) and Bulgaria (1)
- **Educational level:** Students
- average general technical knowledge: **3.94**
- average time of owning a mobile device: **7.63 years** (minimum: 2 year / maximum: 10 years)
- average technical knowledge of mobile devices: **3.5**
- Already used technologies: **Bluetooth** (data synchronization and the use of a headset), **NFC** (user studies)



General Facts:

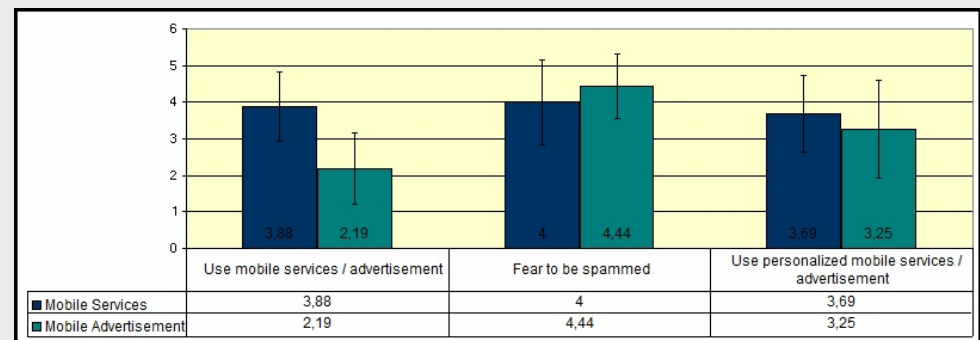
- **Already used mobile services:** route planer, information services
- **Mobile Services:** usage with / without personalization
- **Mobile Advertisement:** no usage without personalization → fear to be spammed

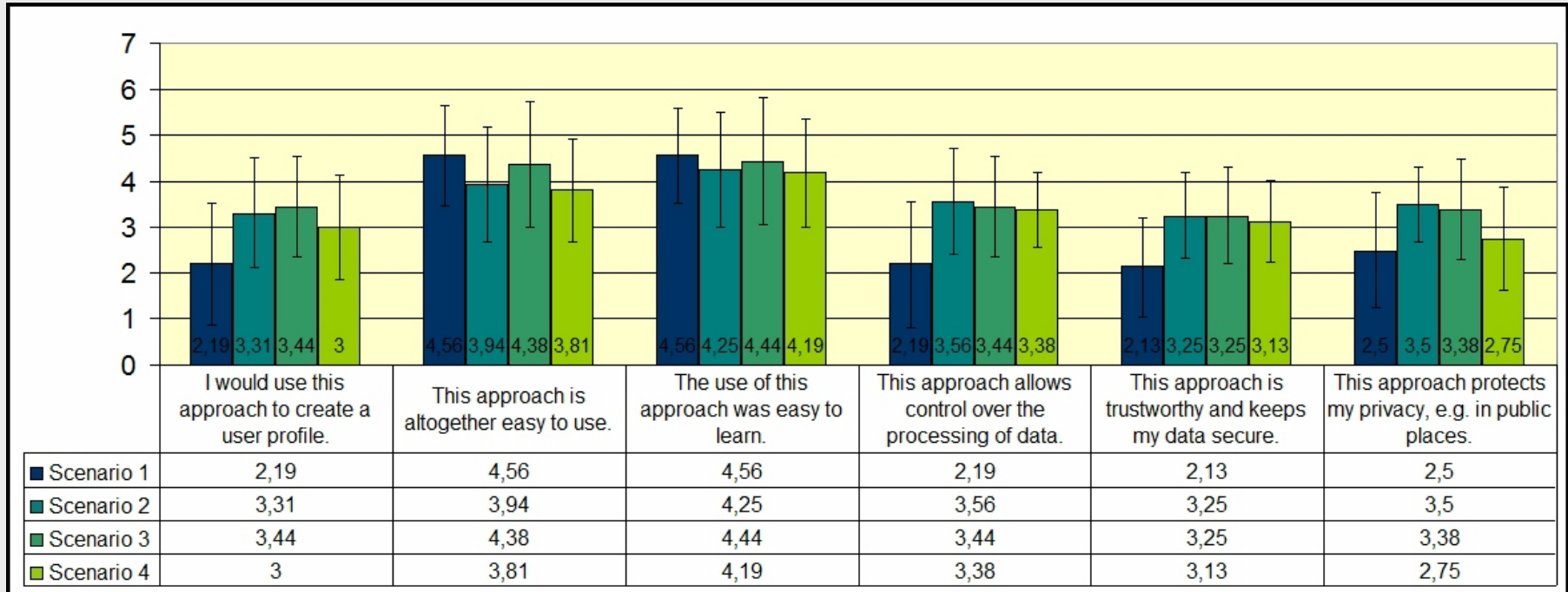
Disadvantages:

- Tracking and glazed human
- Fear of data abuse, missing privacy and interception

Advantages:

- Better acquisition of the broad offer range
- Every time and mobile usage





Scenario 1



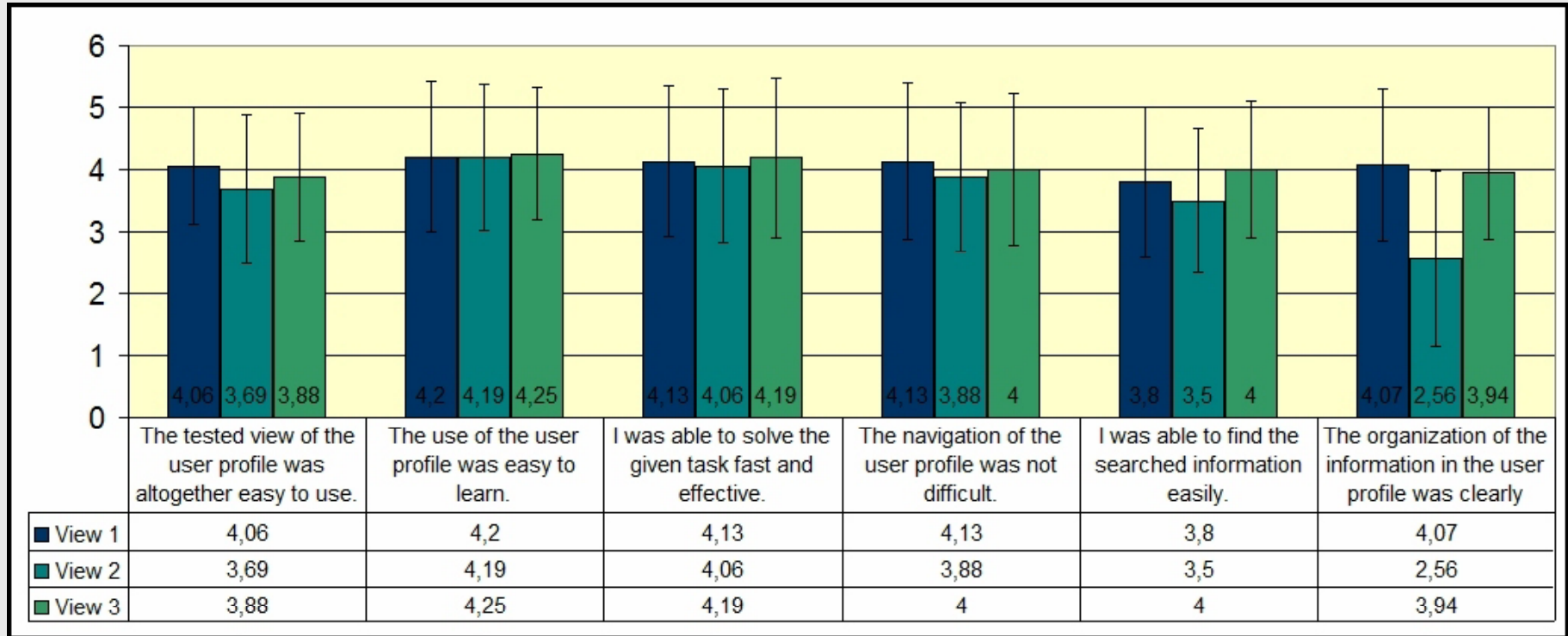
Scenario 2



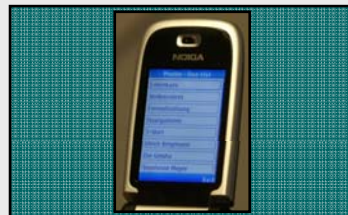
Scenario 3



Scenario 4



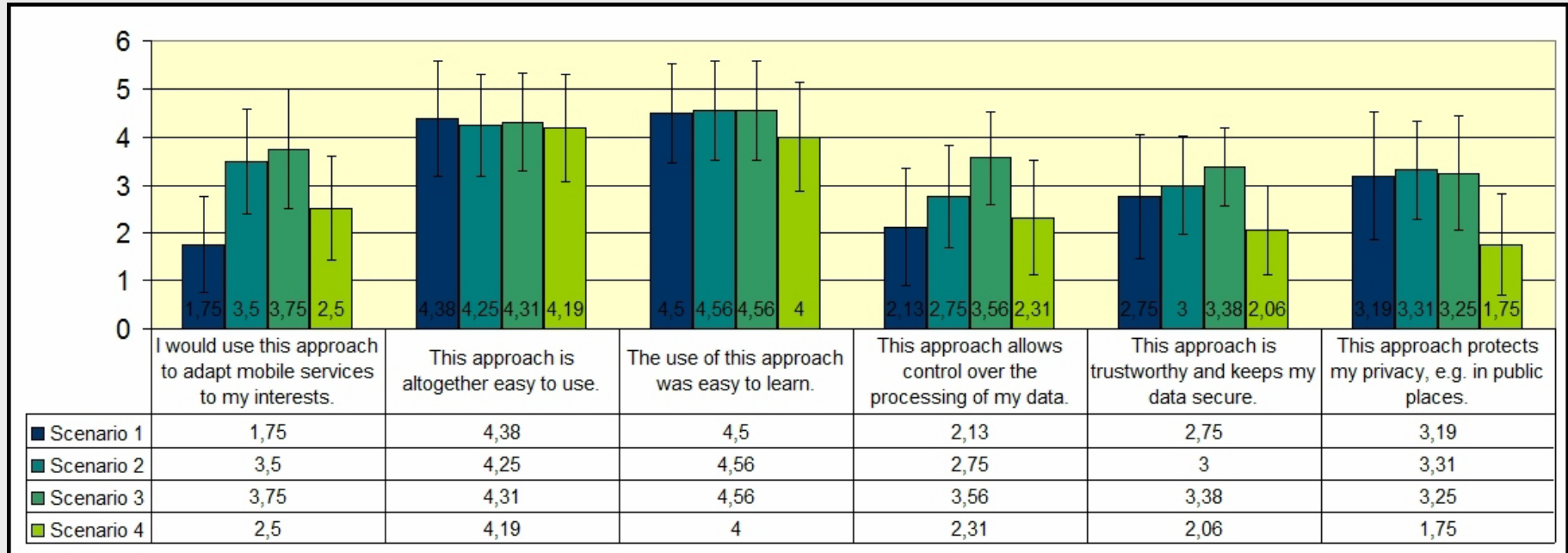
View 1



View 2



View 3



Scenario 1



Scenario 2



Scenario 3



Scenario 4



Usage of PMI for mobile services:

- High feeling of control (NFC tag)
- Natural gestures (touch NFC tag)
- Fast and innovative (fun factor)

→ **everybody can learn it**

Disadvantages:

- Technological requirements
- User Profile created step by step with a lot of contacts (NFC tags)
- Security risks concerning connections to external devices (Public Displays)



Preliminary Survey vs. Evaluation:

- Evaluation helps to reduce the mistrust towards the new technologies
 - A better idea of control, security and privacy
- **Clearer results in the evaluation than in the preliminary survey**
- **Doubts concerning new technologies (security) and providing data**
- **Ensure security and feeling of control**



Thanks for your attention!



Personalize Message

Information Gathering

Profile

Message List

Options

Options

Offers

Profile Transfer

Delete All RS

Cancel

Profile - Books

No profile information is saved.

Back

Form

Technology

- PC
- Photography
- Household
- TV
- Handy

Books

- Fantasy
- Thriller
- Cooking

Bad

