



Application Development for Mobile and Ubiquitous Computing

Seminar Task
Adaption Concept Presentation

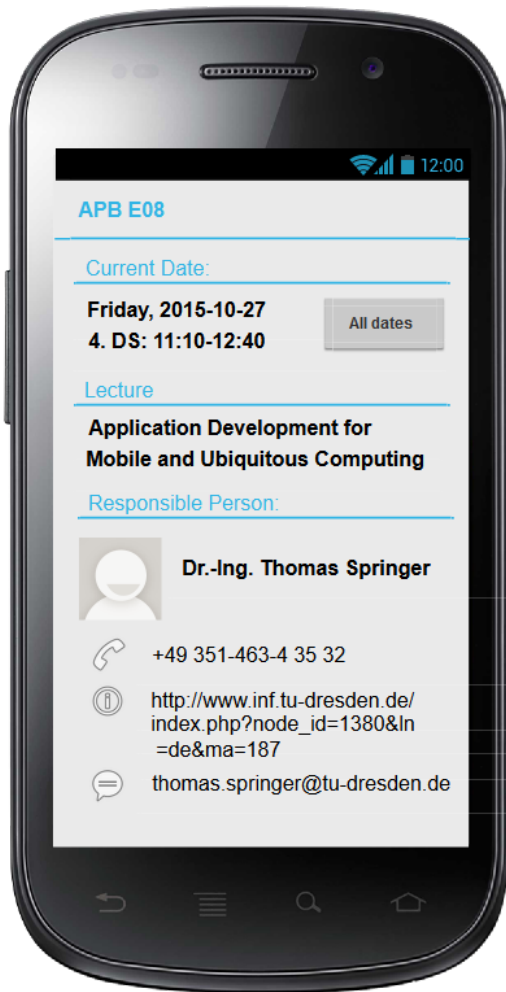
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Providing Information by NFC

Instead of writing time tables and other information on paper, they can be stored on NFC tags and retrieved by smartphones:

- view the time table of a lecture hall or office owner
- read and/or leave notes
- check if the room is occupied or the owner hasn't time at the moment
- get information about the room or the owner such as name, internet address, email address, phone number..



```
1  {
2    "room": "APB/E008",
3    "timetable":
4      [
5        {
6          "day": 4,
7          "lectures":
8            [
9              {
10             "lecture": 2,
11             "name": "Application Development for Mobile and Ubiquitous Computing (English)",
12             "internet": "http://www.inf.tu-dresden.de/index.php?node_id=2568&ln=de&lv_id=48",
13             "contact":
14               {
15                 "name": "Dr. Springer",
16                 "mail": "thomas.springer@tu-dresden.de",
17                 "phone": "+49 351-463-4 35 32",
18                 "internet": "http://www.inf.tu-dresden.de/index.php?node_id=1380&ma=187&ln=de"
19               }
20             }
21           ]
22         }
23       ]
24   }
```

- **Technological Challenge**

Restricted storage on NFC tags → lossless compression

- **Offline Challenge**

Save visited locations and related information for further availability locally on the mobile device

- **Connectivity Challenge**

Verification of correct data transfer after saving/modifying data

- **Usability Challenge**

Heterogeneous usage scenarios:

→ Visitor: show information, interface to write notes

→ Owner: show information, show left notes, interface to write notes, interface to modify information

- **Physical context: location, time**
 - Show information (timetable, room, owner..) of the current location (room) and provide the last visited ones
 - Only show necessary information (current lecture/appointment, docent..) but offer the possibility to see all information
- **Personal context: schedule, address, phone number**
 - Warn user on conflicts in personal schedule and nfc (room) data
 - Offer address and phone number of the room an the responsible person(s) and docent(s)
- **Operational context: roles**
 - Owner: read & modify data, leave notes
 - Visitor: read, leave notes

Roles are determined via logged in mail account on the mobile device and the deposited mail account on the NFC tag

- **Transformation: Lossless Compression**
 - All information which is stored on the NFC tag needs to be compressed before writing and decompressed by reading
- **Transformation: Structure/Format**
 - NFC: Data is stored as JSON String
 - App: Data is stored as .json file and is transferred to java objects
- **Transmission: Error handling**
 - check if new data is properly written on NFC tag (compare size)
 - request the user to rewrite (connect again to NFC)
- **Caching**
 - store last locations locally on the device for availability

- Interaction possibilities
 - start phone- or email-app
 - save event to Android calendar and check for conflicts
 - write messages
- Heterogeneous usage scenario
 - authenticate user role and offer corresponding interactions (read and/or modify)
- Present Information
 - show lecture/event based on current time