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Department of Computer Science Institute for System Architecture, Chair for Computer Networks

# Application Development for Mobile and Ubiquitous Computing

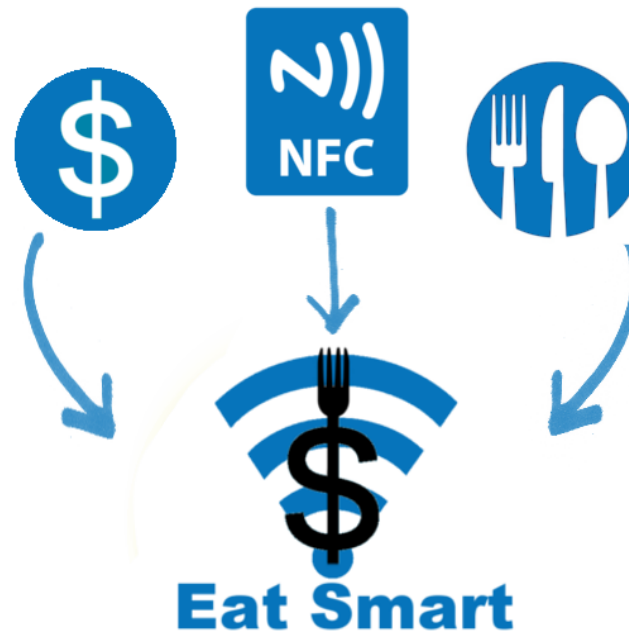
## Seminar Task Adaptation Concept Presentation

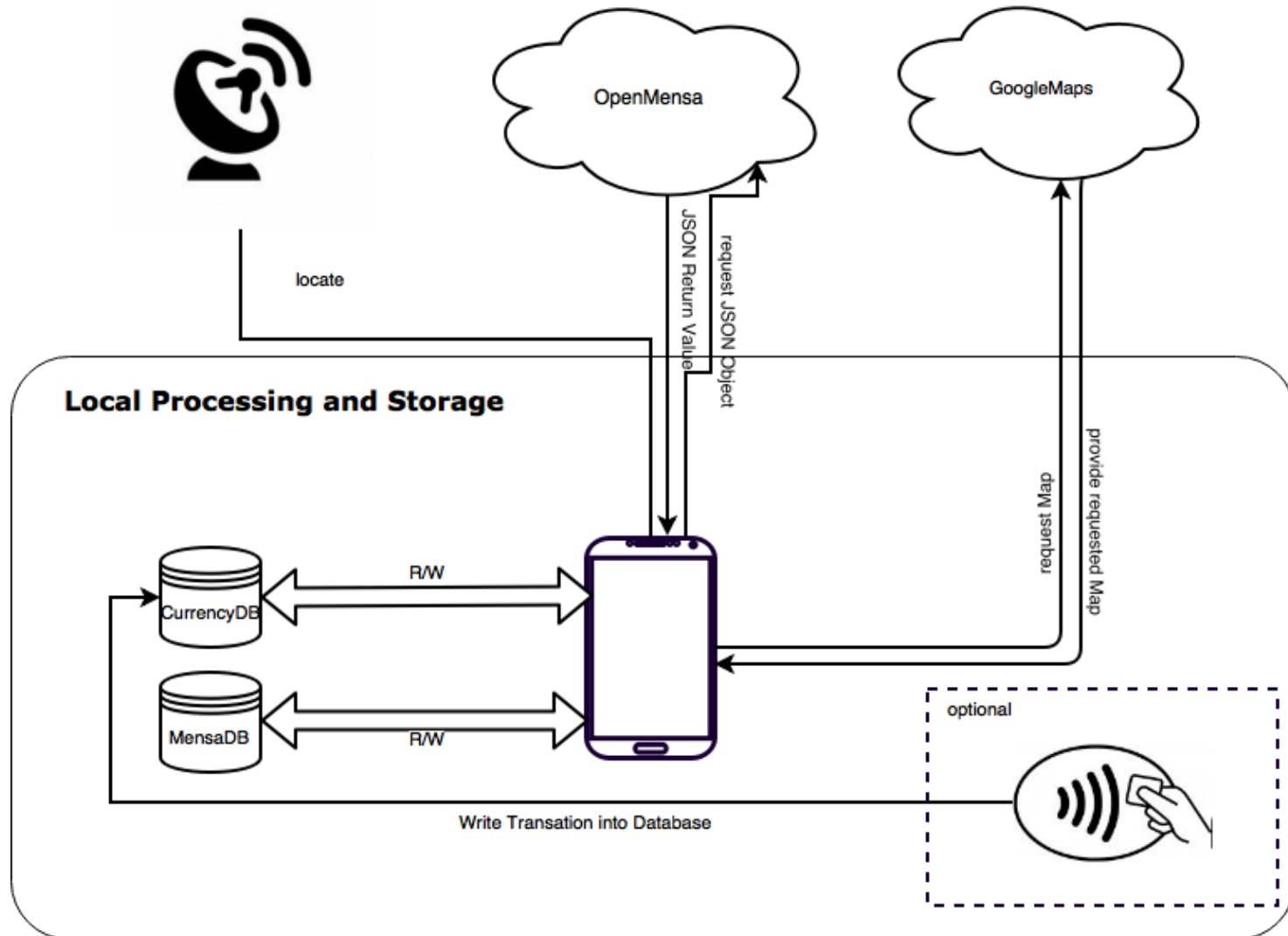
Group No. 14  
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Dresden, 18.12.2015



DRESDEN  
concept  
Exzellenz aus  
Wissenschaft  
und Kultur





## Solved Challenges

- Offline Challenge
  - Caching menu plan
- Usability
  - No NFC needed
  - Use of GPS is possible
- Battery life
  - Location Services are restricted
    - Replacement with last known location
    - Checked before transmission

## Unsolved Challenges

- Offline Challenge
  - Weekly prefetching
- Usability
  - Favorites

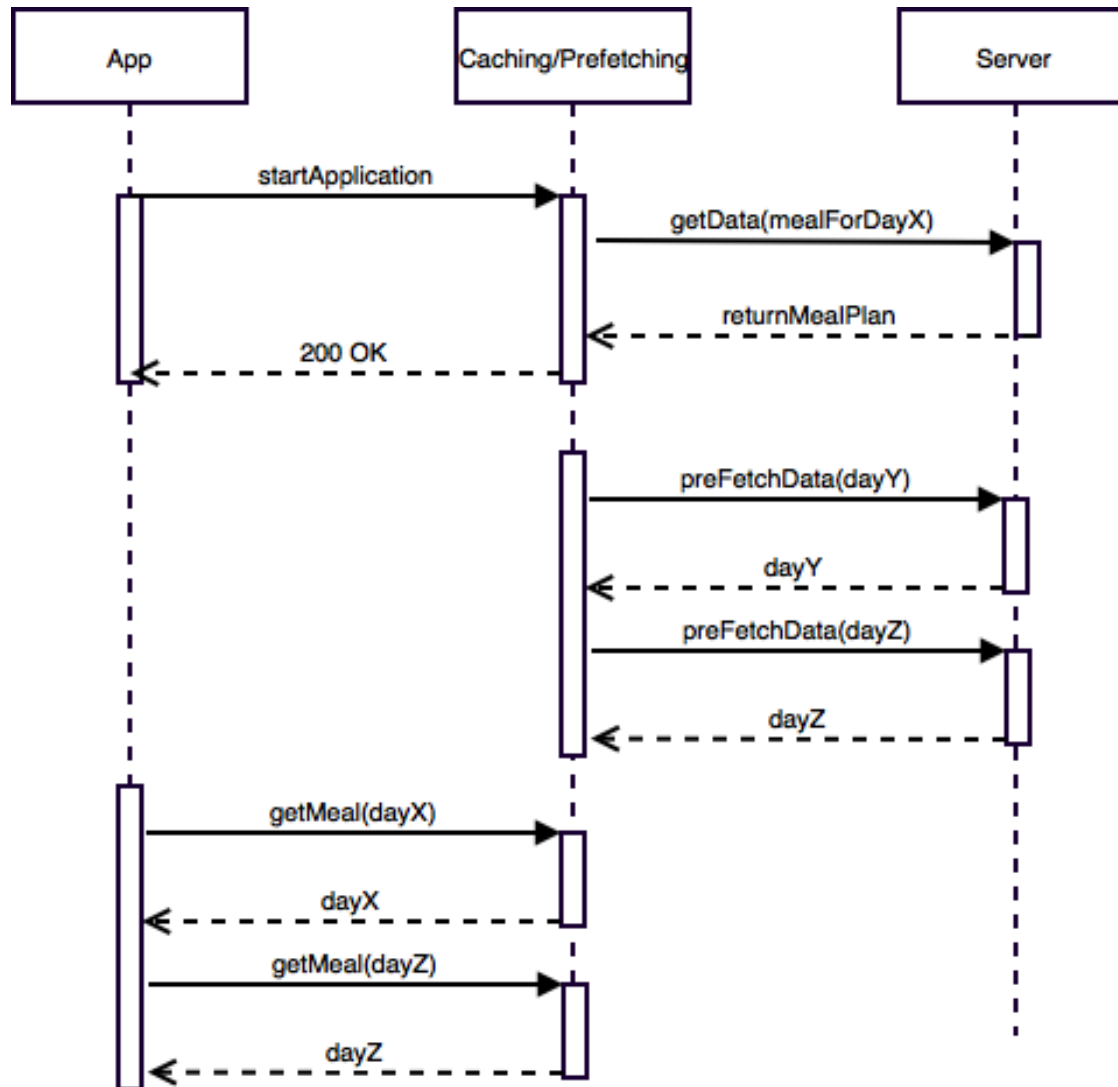
## Disconnected Operations

- Context: Network availability
  - Detection by checking internet speed and connection (ConnectionManager)
  - Check bandwidth and latency and availability of internet connection
  - Updates only with good bandwidth and good latency to guarantee a good “workflow”
- Why? Processing Mensa Information and Meals every time
- Offline availability, less network and power consumption
- Disconnected Work with MobileDBs
  - Replication of Mensa Information from OpenMensa (Hoarding)
  - Manipulate data in local DB for adding new Spots (Emulation)
  - Manipulation even with established connection
  - Synchronization of local DB with OpenMensa explicitly

- Caching
  - Caching of meals for a week with help of a database
  - Long-term need of caching for availability
  - Need for cache updates detected by accessing meal plan for next week or accessing application at the weekend
- Prefetching (collecting data before accessing it)
  - Triggering of prefetching by initial start of application
  - When accessing e.g. meal plan for a Mensa, prefetching for all other days of week
    - > Flawless work
  - Send request for meal plan and current Mensa for a whole week
  - Request meal plan for favored Mensa, too
- Filtering: Permanent updates only for favored Mensa

## Technology: Embedded Mobile Database





## Location Based Services

- GPS is used
  - Permission is requested
  - Not necessary to use maps
- reduction of data volume
  - Loading Map Tiles (Lazy Evaluation)
  - alternative View (Selection)
  - data accessed via local database
- Filter rules for selected canteens





- Prototyping took more time than expected
- Backend almost finished
- Open task: Frontend Design
- Integration of different features into an working application

