AroundTheCorner

Application Development for Mobile & Ubiquitous Computing - First presentation

Group 16:

António Monteiro

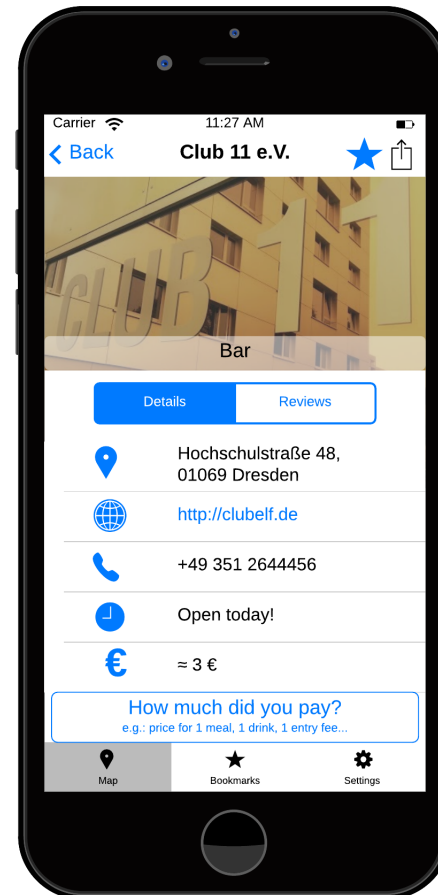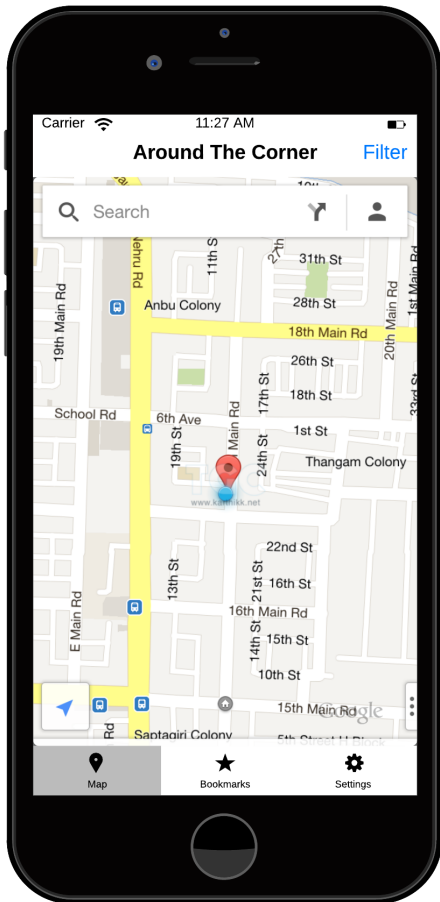Javid Abbasov

Dresden, 18.12.2015

DRESDEN
concept
Exzellenz aus
Wissenschaft
und Kultur

Application Scenario

- Find place near user's location:
  - in a map
  - by type of place (restaurant, bar, nightclub, etc.):

- check information on given place (is it open?, phone for reservations, etc.)

- bookmark a favorite place;

Sneak peek

Challenges & Adaptations

Energy challenge:

- GPS location consumes a lot of energy

- Mobile devices have limited power sources

Challenges & Adaptations

Adaptation:

- Use location only while using the app

  - (no background location querying)

  - How to achieve this? e.g. iOS:

  - NSLocation**When**InUseUsageDescription *vs.*

  - NSLocation**Always**UsageDescription

Challenges & Adaptations

Usability & form factor challenge:

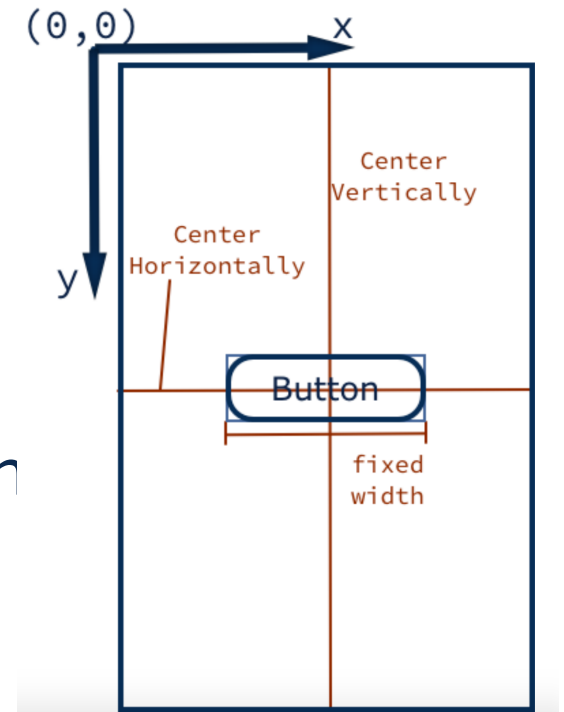• Application needs to be usable in different devices

Adaptation:

• iOS & Android native apps (cross-platform usability)

• Adapt to different screen sizes

Challenges & Adaptations

Adapt to different screen sizes:

- e.g. for iOS:
  - take advantage of Auto Layout capabilities
  - specify constraints on how the interface should be laid out
  - constraints are just mathematical definitions

Challenges & Adaptations

Offline challenge:

- Some application functionality needs to be available offline

- How to detect it? e.g. for iOS:
  - Reachability.swift library

Reachability.swift

```swift
reachability.whenReachable = { reachability in
  dispatch_async(dispatch_get_main_queue()) {
    if reachability.isReachableViaWiFi() {
      // do networking stuff
    } else {
      // do (more limited) networking stuff
    }
  }
}
reachability.whenUnreachable = { reachability in
  dispatch_async(dispatch_get_main_queue()) {
    // app offline behaviour
  }
}
```

Challenges & Adaptations

Adaptation:

- Users' bookmarks stored both on- & offline

- Merge updated information when connectivity is restored

    - simple approach (correct because only bookmarks are saved)

        - perform set intersection between local & remote
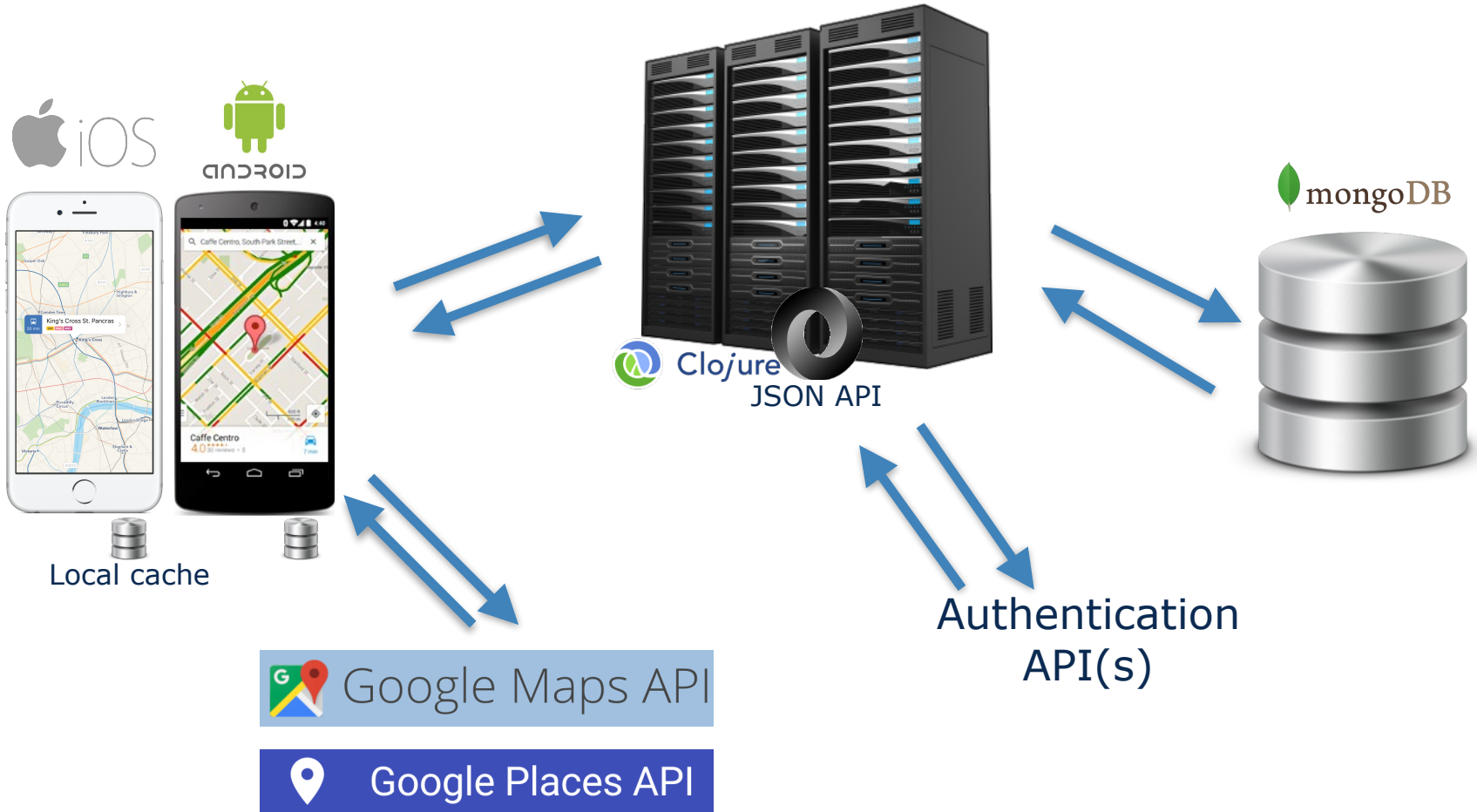
Challenges & Adaptations

<u>Connectivity challenge:</u>

- Some application functionality needs to be available offline

<u>Adaptation:</u>

- **<u>Prefetching</u>** of place data while on Wi-Fi
- Server API filters and sends only requested types of places (**<u>reduction</u>**)
  - filters passed in the API request
    - (e.g.: show me only "restaurants")

Architecture

Local cache

Clojure
JSON API

Google Maps API

Google Places API

Authentication API(s)

mongoDB

Technologies

- Backend API:

Clojure   JSON

- DB: mongoDB

- Frontend: iOS Swift   android Java

Work plan / status

- Implementation
  - 1st Prototype — due 18.12.2015
    - Local implementation only
  - API integration — due 08.01.2016
- Testing / Bug-fixing & Enhancements
  - From 08.01.2015
- Deployment (production!) — before 29.01.2016
  - (ready for last presentation)

Questions?