



Internet of Services Lab - Indoor Navigation

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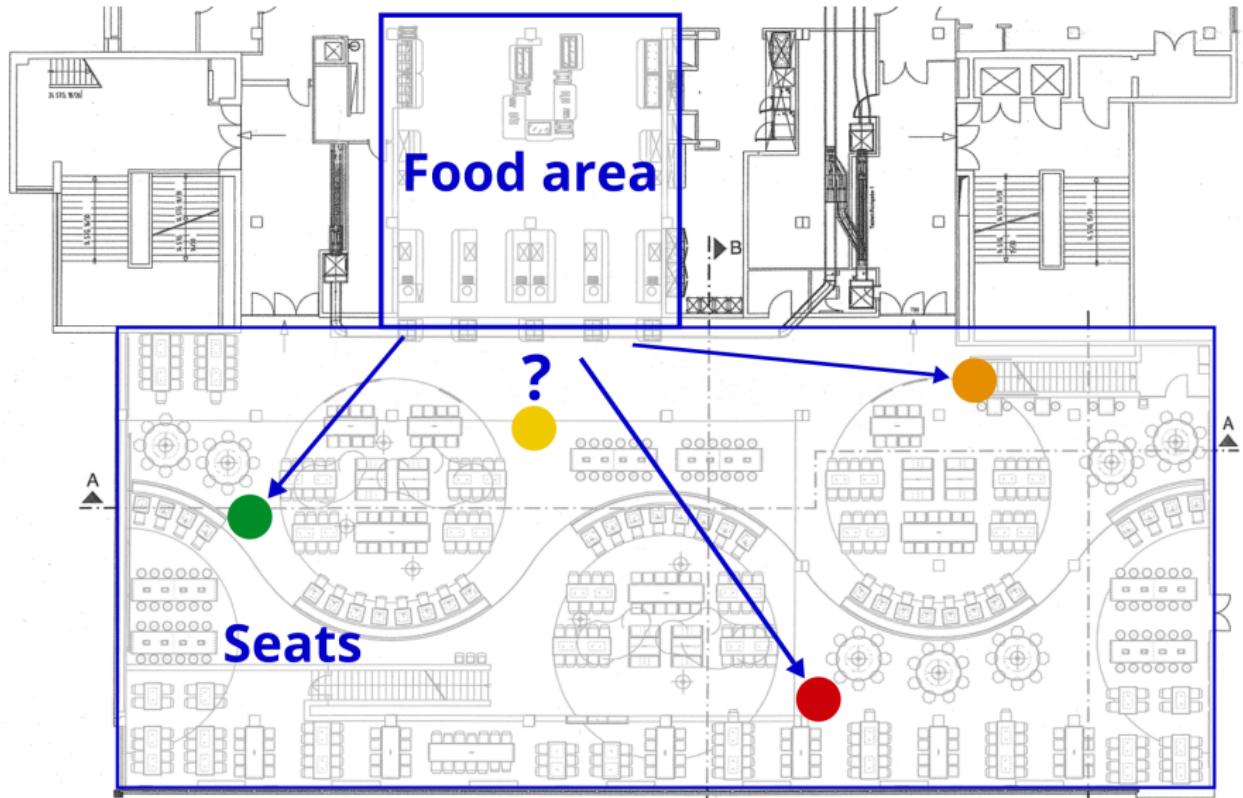
WS 2015/2016

Use case



Source left: http://www2.studentenwerk-berlin.de/uploads/pic_untenvonoben_737_full.jpg
Source right: <http://www.berlin-studis.de/images/stories/TU-Universitaetsbibliothek.jpg>

Use case



Problem scenario

App idea



Requirements

- ▶ Everyone has a smartphone
- ▶ Participants have a TUB account (Edugain account)
- ▶ For manual pin-pointing: WiFi is available
- ▶ Minimal interaction, easy to use

Functionalities

- ▶ User opens app and gets a login view for university account
- ▶ Add friends
- ▶ Share location via manual pin-pointing
- ▶ Share location automatically
- ▶ See shared locations of friends

Possible localization techniques



- + Works all over the campus out of the box
- No latitude & longitude in mensa & library

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- + Precise location, automation possible
- Extra hardware in hotspots (beacons)

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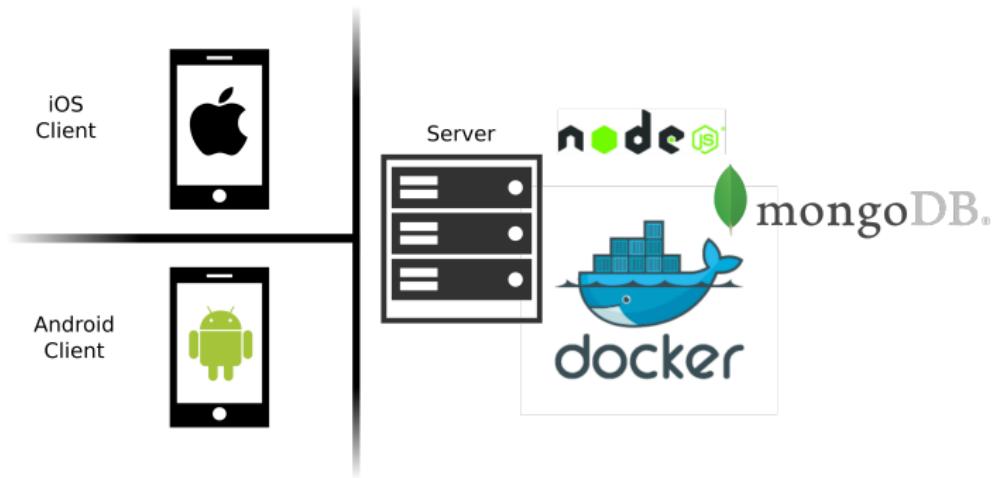


- + Precise location, automation possible
 - Extra hardware in hotspots (beacons)
-



- + Most precise technique, privacy friendly
- User interaction needed

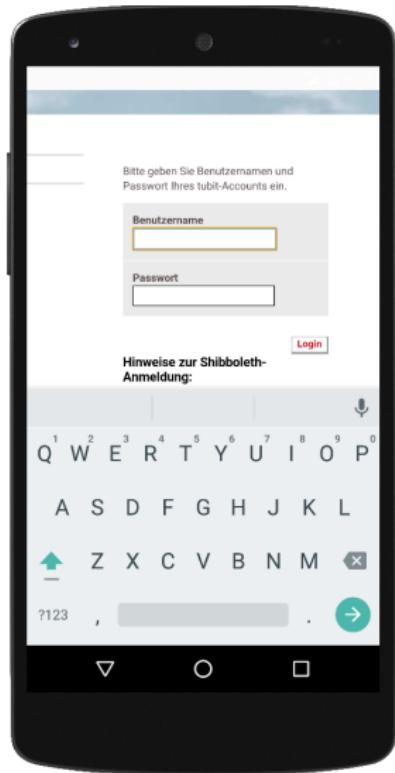
Technologic decisions



Clients



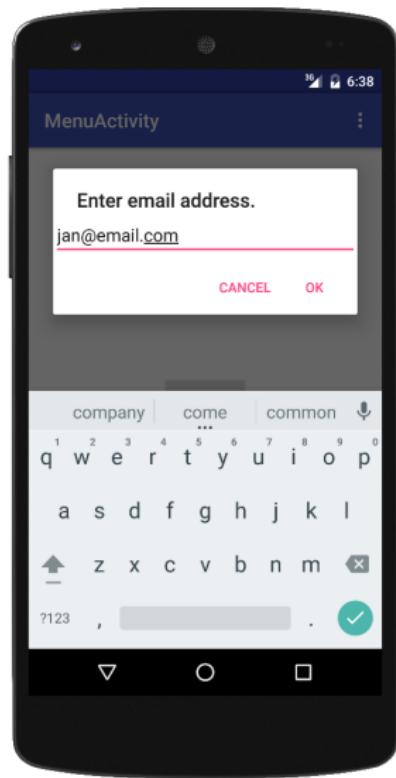
- ▶ Login in web view
- ▶ App don't handle user's credentials



Clients



- ▶ Add companion
- ▶ Accept companion request
- ▶ Manage groups
- ▶ Remove friends



Clients

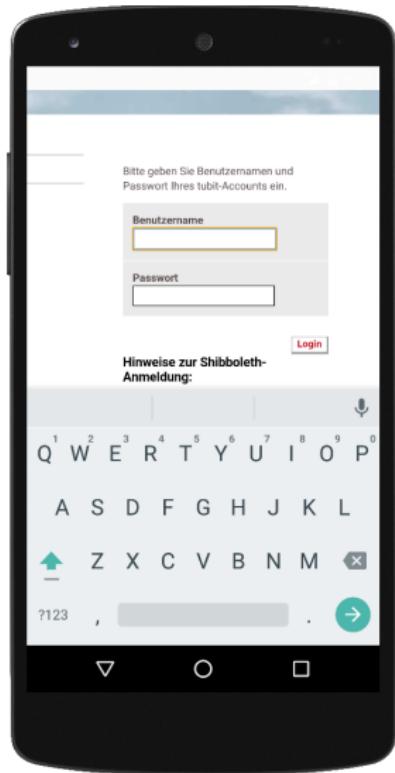


- ▶ Service scanning tubIt MSI API -> building name, floor
- ▶ Service scanning for nearby beacons -> beacon ID
- ▶ User can pinpoint location on map
- ▶ Service updates user's location with most precise location info available
(pinpointed coordinates > beacon ID > MSI info)

Clients



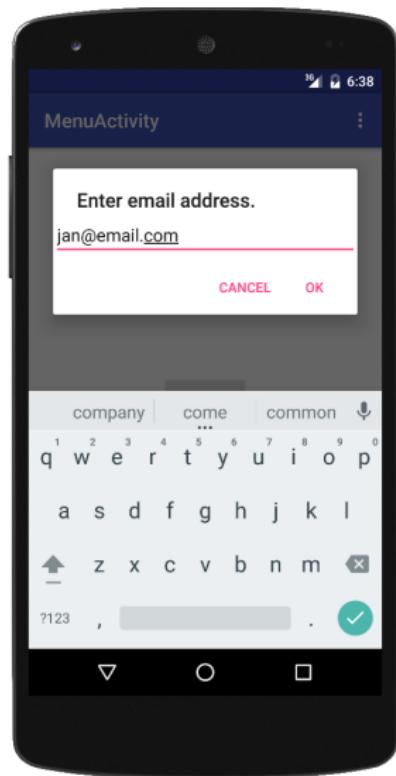
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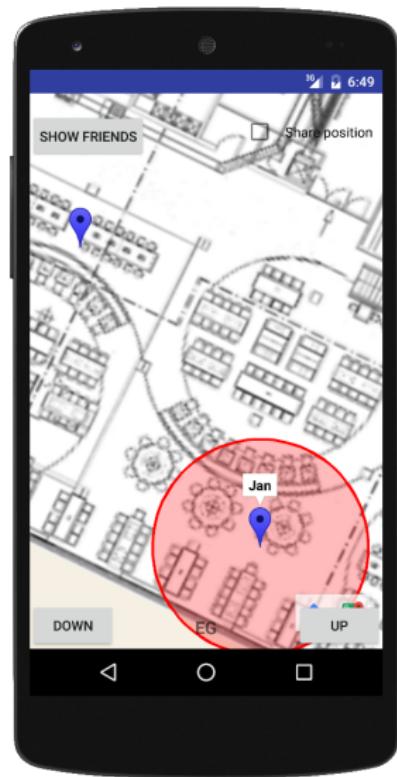


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Clients



- ▶ Friends shown on map
- ▶ Different floors
- ▶ Different markers for different accuracies



Clients



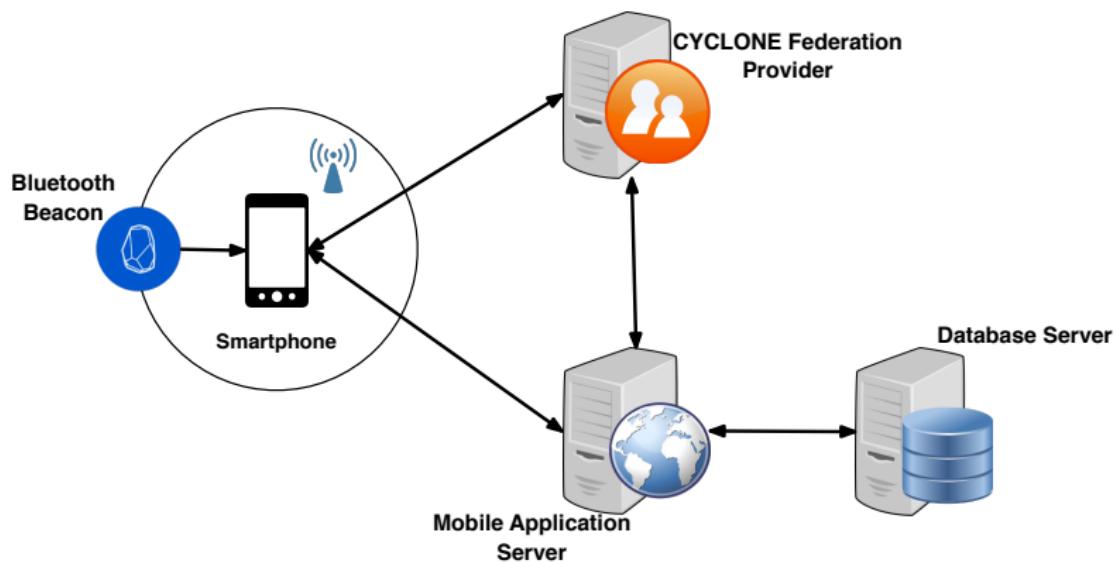
- ▶ iOS work

Backend



- ▶ Flow image
- ▶ Federation Provider
- ▶ Docker

Backend



Experienced issues

- ▶ Cisco MSE API is not fully implemented
- ▶ Bluetooth beacons have a limited range, especially when the battery gets low
- ▶ Cyclone had problems with the tubIT, therefore we also had problems

DEMO TIME

Do you have questions?

References |

- ▶ http://developer.android.com/images/brand/Android_Robot_200.png
- ▶ https://upload.wikimedia.org/wikipedia/commons/thumb/f/fa/Apple_logo_black.svg/600px-Apple_logo_black.svg.png
- ▶ <https://nodejs.org/en/about/resources/>
- ▶ <https://www.docker.com/brand-guidelines>
- ▶ <https://www.mongodb.com/brand-resources>