RWTHApp

From a requirements analysis to a service oriented architecture for secure mobile access to personalized data

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Overview

- **Requirements Analysis**
  - Process
  - (Non)Functional Requirements

- **Architecture**
  - Existing Systems
  - Security

- **Current State**
  - Statistics
  - Lessons Learned

- **Future Work**
RWTH Aachen University

- ~40,000 Students
- ~5,000 Internationals from 117 Countries
- ~8,500 enrollments in winter term 2013/14
- ~500 Professors
- ~8,000 Employees
- 9 Faculties
- 115 Courses of study
RA - Timeline

- Idea Contest for students
- Start of OAuth project
- Start of RWTHApp project

September ‘13

- First release
- Regular meetings with students
- Establishing feedback channels

November ‘13

- Regular meetings with students and professors
- Subsequent releases every month
- Social media activity

June ‘14
RA - Process: Release Cycles

- **Meet with students and Incorporate feedback**
  - Changes, priorities, new features

- **Design and plan features**
  - Agile, release planning and feature specification

- **Develop, implement and test**
  - Feature driven development

- **Release new versions**
  - Short release cycles ~4 weeks

- **Marketing: Get in touch with students**
  - Collect feedback and announce new versions
  - Blogs, Facebook
RA – Functional Requirements

“The Swiss army knife to support the daily tasks of the students”

- Contact to teachers and organizational units
- Live feedback during classes
- Lectures seminars and exams, dates, timetable, grades
- Room finder, campus map
- Campus Life: Cafeteria, public transportation, University sports
- Library: Literature search, Lent books and lending period
- …
RA – Nonfunctional Requirements

- Cross Platform App (PhoneGap, HTML5 and JavaScript)
  - Reduce platform specific coding
  - Available for Android, iOS and Windows Phone 8, Firefox OS,…

- Secure Authentication and Authorization
  - Encrypted Communication (SSL)
  - No credentials stored in the App: OAuth2

- Use already available information
  - No double data curation

- Keep knowledge “in House”
  - To use already available knowledge about existing systems
  - To react to changing requirements of the students
Architecture – Existing Systems

Campus Management
- CAS CAMPUS
- CAMPUS Office
- HIS SOS / POS

Identity Management
- Shibboleth
- OAuth2

eLearning & eTests
- L²P
- Moodle
- Dynexit

News
- Facebook
- Blogs
- Homepage(s)

Other...
- Cafeteria
- Public Transport
- Library
Architecture – App Proxy

Identity Management → Shibboleth

OAuth2

SelfService (IdM) → Proxy

REST API

User

Organization of communication between service APIs, OAuth2 and RWTHApp

personalized information different for each service

SOAP, REST, COM, ...

Information Services

CAM PUS, LIP, BTH, CMS, ...
Secure device based authorization using OAuth2

→ (De)Authorization through web interface
→ No passwords / credentials passed through the app

OAuth2 was established as a University Service

→ Integrated with Shibboleth to authenticate users
→ Possibility to extend as a federation service
Current State

v0.2 Release
• Address book search
• Room finder

v0.3 Release
• E-learning content

v0.4 Release
• Timetable
• News

v0.5 Release
• Lecture Search
• E-Learning recent activities

v0.6 Release
• Direct feedback

Source: http://www.victorinox.com/
Current State - Statistics

- Approx. 15,000 installations
  - ~10,000 Android
  - ~5,000 iOS
  - ~300 Windows Phone 8
- Avg. 40,000 requests per day
- ~16,000 lines of code
- < 10 support requests / week
Current State - Lessons Learned

- **Students provided valuable input**
  - Feedback and meetings with students
  - Business value based on the students needs

- **Platform Independent App**
  - Has some quirks
  - Still some platform specific code and adaptations needed
  - Can adopt fast to additional platforms (FireFoxOS is coming!)
Future Work

- **Upcoming features**
  - Library, Cafeteria, Public transport, …
  - Student guide (guidelines, information, mentoring, counsellors, …)

- **Enhancements**
  - Extend direct feedback
  - Better caching mechanisms and performance

- **Software Engineering**
  - Refine software engineering process
  - More detailed reporting and statistics

- **Release APIs for students, institutes, 3rd parties …**
  - RWTH Aachen app directory
  - RWTH Aachen app guidelines

Source: http://www.victorinox.com/
Thank you for your attention!

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