



Opening data in Higher Education Institution

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Open data

Open data is the idea that certain data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control. (source: wikipedia)

Reasons to open data

- Finnish government encourages public sector to open their data for services and new business development, and utilization of information.
- Combining with other public data can create new value.
- New markets and innovations from and around the data.
- Services made by users, user-driven Innovation!

Benefits for the organization & end users

- New usage for the data
- Organizations reputation for opening data to others
- Transparency
- Democracy
- Better services for the users

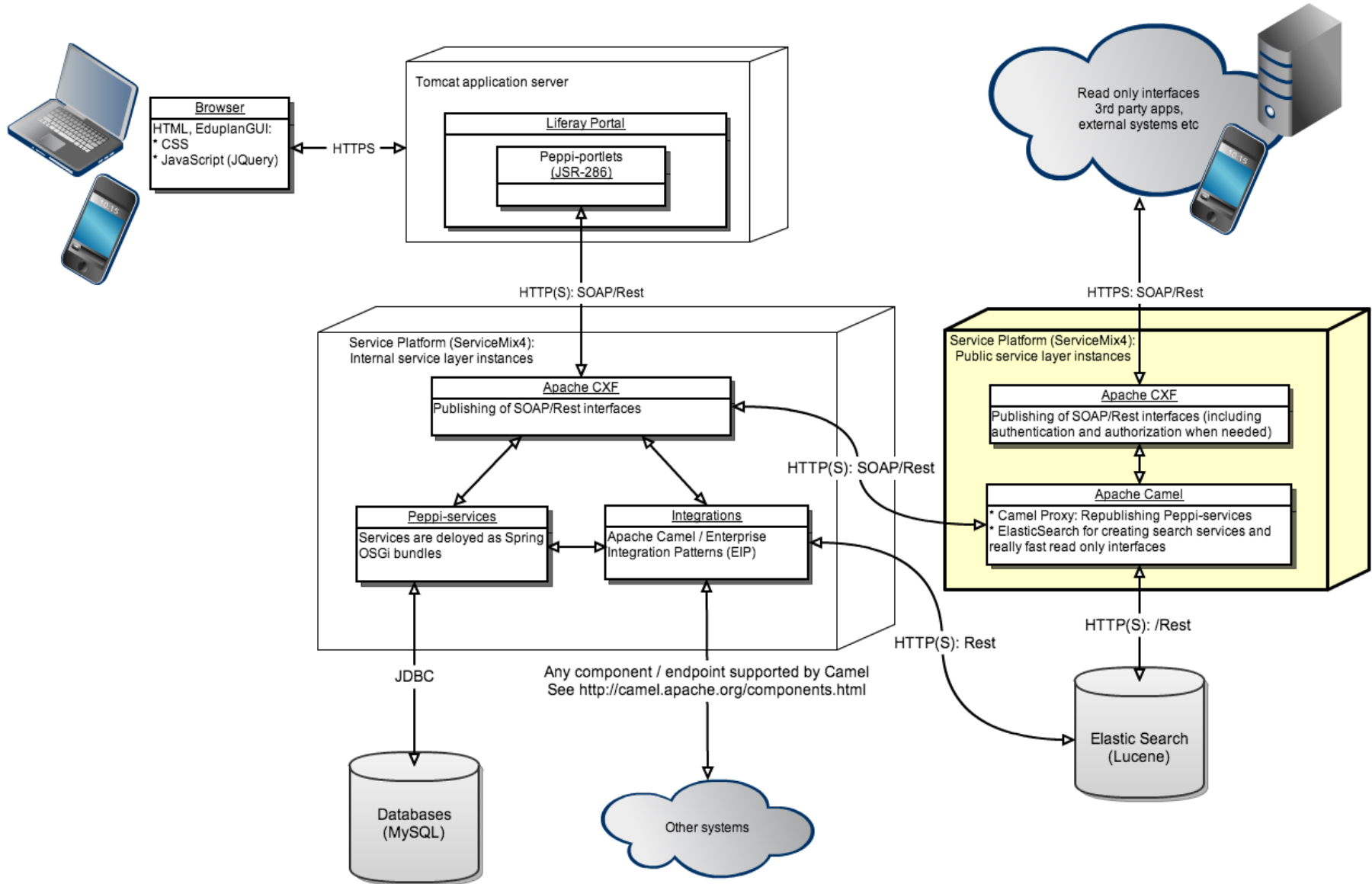
Benefits for the business

- Dispersed development, multiple suppliers
- Everyone can create new apps combining schedule info, lecture info, staff info and so on.
- Rapid development through multiple independent developers
- Competition increases development activity



Architecture

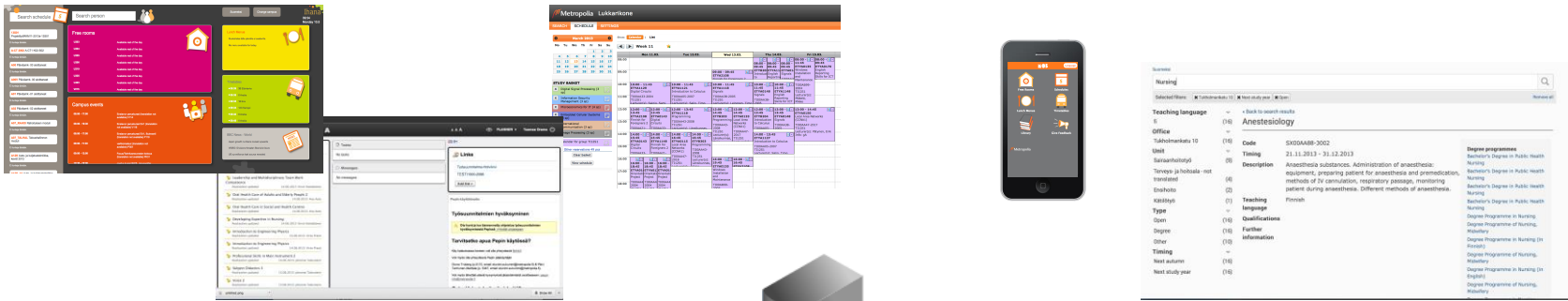
Deployment diagram



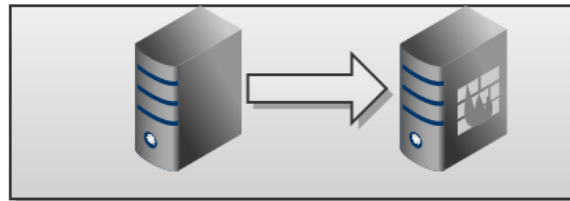


Opening data in Helsinki Metropolia University of Applied Sciences - case examples

Case examples



Services



Datasources



Case example: Found!

- Search engine for studies
- Uses Elastic search
- Lightning fast search
- Facets for classification

Suomeksi

| | |
|----------------------------|--|
| Teaching language ▾ | 1 - 25 / 1017 » |
| fi (977) | SNXXE02-3001 – Nursing of Children, Adolescents and Families |
| en (40) | |
| Office ▾ | SNXXG01-3001 – Global and Transcultural Nursing and Health |
| Tukholmankatu 10 (518) | SNXXG02-3001 – Leadership and Multidisciplinary Team Work |
| Mannerheimintie 172(73) | |
| Vanha Viertotie 23 (50) | SHTXB03-2017 – Occupational Health Care - Clinical Practice |
| Sofianlehdonkatu 5 B (42) | SHTXF15-2002 – Maternity Nursing - Clinical Practice |
| Vanha maantie 6 | |

Case example 'Schedules'

- Schedules for students

- Information from courses

- Integration to Exchange and Google calendar

Metropolia Lukkarikone

SEARCH SCHEDULE SETTINGS

March 2013 Show: Calendar | List

Mo Tu We Th Fr Sa Su

Week 11

| | Mon 11.03. | Tue 12.03. | Wed 13.03. | Thu 14.03. | Fri 15.03. |
|-------|---|--|--|--|---|
| 08:00 | | | | 08:00 - 09:45 ETYA2108 English for Foreigners 2 | 08:00 - 09:45 ETYA0135 Windows Installation and Maintenance |
| 09:00 | | | 09:00 - 09:45 ETYA2108 English for Foreigners 2 | 08:00 - 09:45 ETYA0111 English Reporting | 08:00 - 09:45 ETYA0170 English Reporting Skills for ICT |
| 10:00 | 10:00 - 11:45 ETYA1129 Digital Circuits TI00AA33-2004 TI12S1 Lecturer(s): Sainio, Sami | 10:00 - 11:45 ETYA1121 Introduction to Calculus TI00AA05-2007 TI12S1 Lecturer(s): Salin, Timo | 10:00 - 11:45 ETYA1118 Signals TI00AA38-2005 TI12S1 Lecturer(s): Leinonen, Timo | 10:00 - 11:45 ETYA0148 Signals TI00AA38-2005 | 10:00 - 11:45 ETYA1148 English Reporting Skills for ICT TI00AB99-2004 TI12S1 Lecturer(s): Mäkelä, Mikko |
| 11:00 | | | | | |
| 12:00 | 12:00 - 13:45 ETYA2108 Finnish for Foreigners 2 TI00AA21- | 12:00 - 13:45 ETYA0143 Digital Circuits TI00AA33- | 12:00 - 13:45 ETYA1118 Programming TI00AA43-2008 TI12S1 Lecturer(s): Lämsikunnas, Matti | 12:00 - 14:45 ETYA0133 Local Area Networks (CCNA1) TI00AA47-2017 TI12S1 | 12:00 - 14:45 ETYA1150 Local Area Networks (CCNA1) TI00AA47-2017 TI12S1 Lecturer(s): Pätynen, Erik Info: gA |
| 13:00 | | | | | |
| 14:00 | 14:00 - 15:45 ETYA0143 Digital Circuits TI00AA33- | 14:00 - 15:45 ETYA1148 Finnish for Foreigners 2 TI00AA21- | 14:00 - 16:45 ETYA0115 Local Area Networks (CCNA1) TI00AA47-2018 TI12S1 | 14:00 - 15:45 ETYA1127 Introduction to Calculus TI00AA05-2007 TI12S1 Lecturer(s): Salin, Timo | |
| 15:00 | | | | | |
| 16:00 | 16:00 - 18:45 ETYA01 Orientation Project TI00AA42004 | 16:00 - 18:45 ETYA01 Orientation Project TI00AA42004 | 16:00 - 16:45 ETYA0115 Local Area Networks (CCNA1) TI00AA43-2008 TI12S1 Lecturer(s): Lämsikunnas, Matti | 16:00 - 19:45 ETYA0135 Windows Installation and Maintenance TI00AB99-2005 | |
| 17:00 | | | | | |
| 18:00 | | | | | |

STUDY BASKET

- Digital Signal Processing (3 sp)
- Information Security Management (3 sp)
- Microeconomics for IT (4 sp)
- Embedded Cellular Systems (3 sp)
- International Communication (3 sp)
- Image Processing (3 sp)
- Calendar for group TI12S1

Other reservations 49 pcs

Clear basket

View schedule

Case example 'Mobile services'

- Uses responsive design - not limited to single OS
- Uses open data
 - schedules
 - reservation info
 - lunch menus
 - transportation info
 - library services



Case example 'Ihana'

- Touch screens in every campus lobby
- Interfaces created using responsive design
- Uses multiple service interfaces located in different systems

The screenshot displays the 'Ihana' mobile application interface. At the top, there is a search bar with 'Search schedule' and 'Search person' options, a calendar icon showing the number '5', and a 'Change campus' button. The main content area is divided into several sections:

- Search Results:** A list of search results with icons and text, including '13S01 ProjektiyöRKM11-2013s-13S01', 'A-CT 2002 A-CT1 K02-S02', 'A00 Päiväamk- 00 aloittaneet', 'A00V Päiväamk- 00 aloittaneet', 'A01 Päiväamk- 01 aloittaneet', 'A02 Päiväamk- 02 aloittaneet', 'A07_RAHOI Rahoituksen moduli', 'A07_TALHAL Taloushallinnon moduli', 'A12K Auto- ja kuljetustekniikka, kevät 2012', and 'A12R 4A Aida- ja kuljetustekniikka'.
- Free rooms:** A pink section with a house icon, listing room numbers (U203, U204, U205, U206, U219, U325, U423, V215) and their status as 'Available rest of the day'.
- Campus events:** An orange section with a group of people icon, listing events with times and titles, such as '08:00 - 17:00 Enslavun peruskursi (translation not available) V114'.
- Lunch Menus:** A yellow section with a plate and cutlery icon, stating 'Ruokalista tälle päivälle ei saatavilla. No menu available for today.'
- Timetables:** A green section with a bus icon, listing bus routes and times, such as '09:39 3B Etäintarha'.
- BBC News - World:** A grey section with a newspaper icon, listing news items like 'Japan growth numbers revised upwards' and 'VIDEO: Divisions threaten Bosnia's future'.

Ongoing project 'Schedules with indoor positioning technology'

- Student project
- Uses open data from schedules
- Combines indoor positioning technology with schedule information
- Help students to find next classroom with lecture information





Steps for opening data in higher education institution

Opening data in higher education institution

- Decision to open data
- Determine
 - where the data is currently stored, what are the master data sources, what data is already public
 - how is the data structured
 - what data could and should be published
 - architecture which will be used to publish data
- Implement, create necessary services and publish them
- In general: when creating new systems, think SOA. Create reusable services instead of system specific solutions.
- Open services = Open data

Live demo

Found!

Ihana





Thank You! Further information:

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Internal Service Layer

- All core / in-house services and integrations are deployed on the internal service layer
- Only trusted internal applications have access to these services directly
- No caches, everything is real time
- No complex authentication or authorization mechanisms that might be expensive performance-wise

Public Service Layer

- The public service layer is used to republish (proxy) services from the internal service layer to the public Internet and allows us to:
 - modify the original services: e.g. strip all write methods from the public service interfaces
 - aggregate services: e.g. providing access to data from a number of internal services as a new simple interface
 - publish services in a different schema: e.g. for a specific 3rd party integration / data transfer
 - cache data to minimize load on the internal service layer and databases
 - authenticate and authorize the users of the services
 - for identifying users and possibly to provide different interfaces/methods based on authorization

Search Services with Elastic Search

- Elastic Search is a flexible and powerful open source search engine base on Apache Lucene
- Almost any action can be performed using a simple RESTful API
 - perfect for our SOA architecture!
- With Elastic Search we create search indexes based on data stored by any number of services
 - searching is really fast since the search engine index is queried instead of the database(s)
 - possibility to use *facets* and other advanced features
- Used both by the Internal Service Layer and Public Service Layer
 - can be used to create extremely fast read only interfaces for *open data!*