Digitalization and Maintenance

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Aalto CRE

Aalto CRE **maintains**, **develops** and **rents out** Aalto University facilities in Otaniemi.
We also **build new concepts** and shared facilities for parties outside the university, turning Otaniemi into a unique partnership centre and the most inspiring campus in the world.

Developing campus

2018

School of Arts, Design and Architecture, shopping centre A Bloc and startup community A Grid open

2019

School of Business opens, building in Töölö and the old shopping centre renovations begin

2020

New student housing and office buildings, improvement of green areas on campus begins

2021 – 2022

Aalto Works & Otakaari 2 opens, building of Student Life Centre and development of Konemies block

2023 – 2035

Development of Marine Tech block, Kivimies block and Maarinranta area, new residential buildings

A? Aalto University

Campus Development Principles

Increasing social density & diversity

Re-inventing user experience

Ensuring long-term capability for the University

Enhancing health, well-being & culture

PHYSICAL, SOCIAL & DIGITAL

Structure of the Presentation

1. **Digitalization on the Real Estate Sector**

2. **Digital Service Development:** Case Aalto Space & Smart Campus

3. **Digitalization perspective to the maintenance services on the Aalto Campus**

Picture: Mika Huisman & Aalto University

Digitalization

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The biggest revolution since steam engine and electricity (e.g. Brynjolfsson & McAfee 2014)
- mechanization replaced muscle work
- digitalization replaces basic knowledge work?

Provides new opportunities in resource efficiency, for example
- cars: Uber
- apartments: Airbnb

Most solutions still are not commercially stabilized yet
- energy markets: storage & demand response
- facility markets: utilization/occupancy rates still remain as a challenge in the campus development as well

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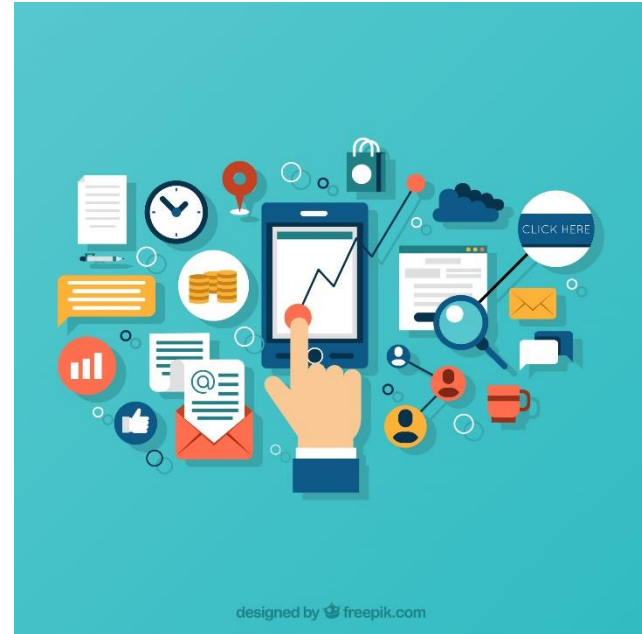
New key feature of digital services: data which provides knowledge

Digital solutions provide means for better understanding

The assets:
- indoor conditions
- utilization rates
- footfall
- dwell time
- etc.

The customers:
- demographics
- preferences
- habits
- etc.

➤ **More informed development decisions**

Aalto Space is a mobile application for Android and iOS devices.

It helps navigating around Aalto University's campus and allows application users to book facilities for studying and work.

Aalto Space is part of Aalto ITS Project Portfolio

Aalto Space Campus App

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- **A mobile application developed for campus users**
  - Roughly 20k downloads
  - Soon to be supported in all Otaniemi Campus buildings

- **The current features**
  - Mobile space reservations
  - Indoor & outdoor navigation
  - Emergency communications
  - Indoor Climate Service (pilot)

- **Future features**
 - Location sharing
  - Transactions
  - Campus Membership
  - etc.

Download on the App Store

GET IT ON Google Play

Aalto Space Indoor Climate Service

The service involves users to the indoor air service provision via Aalto Space

- **Functionalities:**

  - **Room Temperature:** Colder/Auto/Warmer (-2/+2°C), provisioned via Fourdeg remotely adjustable thermostats

 - **Air Ventilation:** Auto/Boost, provisioned via Fidelix air ventilation control unit
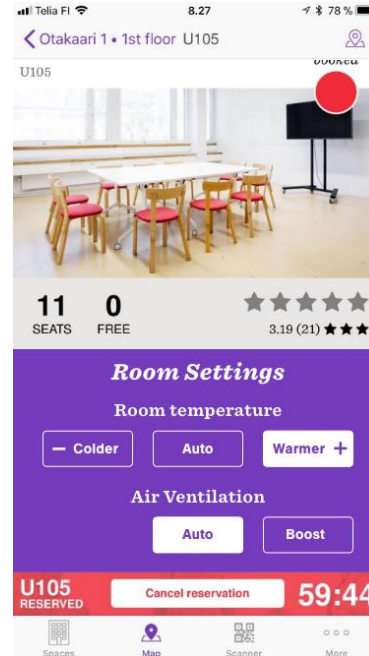
Aalto Space Indoor Climate Service

- R&D environment
  - Seven Otakaari 1 U-wing multi-purpose rooms

- Benefits of the service

  - **Provide the users a possibility to influence the indoor conditions**
    - Less complaints

  - **Utilize data of the users**
    - Promote productivity & well-being
    - Save resources – no heating or cooling without a need for them

  - ➢ **Improve the space attractiveness and customer value production**
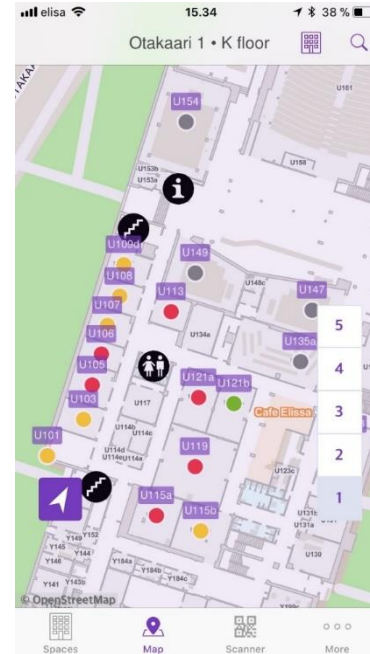
Smart Campus Service

- Department of Computer Science hosts the Smart Campus Service

- Gathers data from building automation & other systems/sensors

- Also able to steer the connected building systems
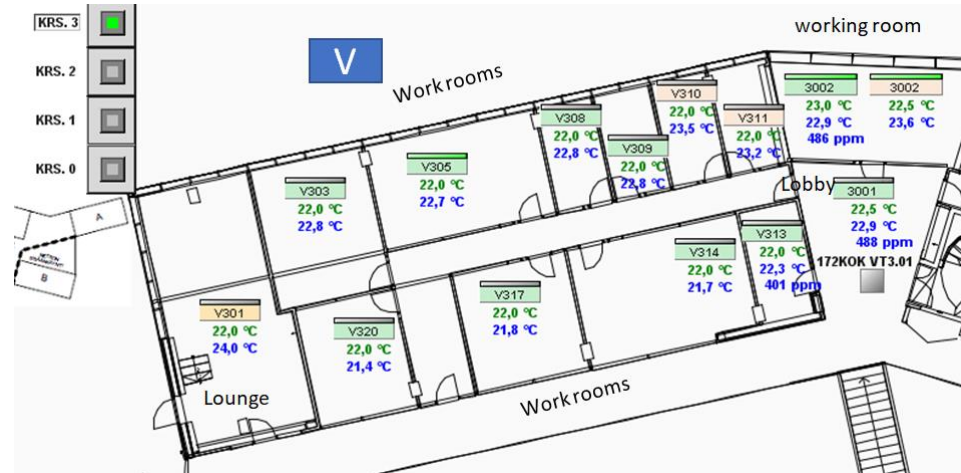
Digital maintenance services

Aalto property structure and organization:

- The properties owned by the Aalto University are divided into 27 separate real estate companies

- The departments and other tenants pay rent & maintenance charge to the university

- Aalto CRE maintenance team owns the building manager level activities

- On the behalf of the Aalto University Aalto CRE procures most of the property and facility services from the external providers e.g. L&T, ISS and Palmia

Digital maintenance services

- How to improve the maintenance services with the new data?

- Challenges of the digital maintenance services:
  - Data availability
  - Operation model flexibility
  - Others?

- Garbage disposal example?

- Cleaning example?
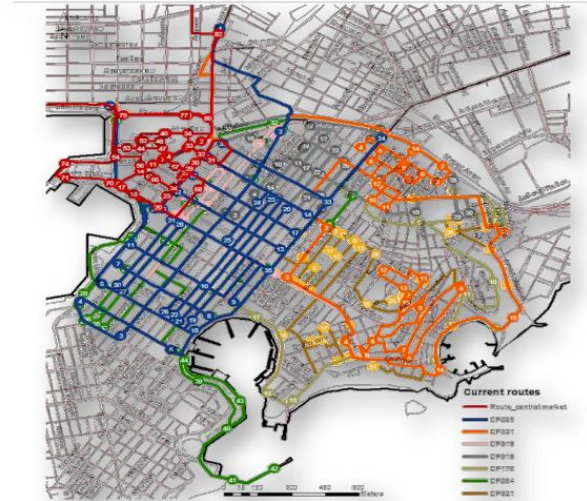
Anagnostopoulou et al. 2013: An Advanced Solution Approach for Energy Efficient Garbage Collection Service

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