IoT and data enabling the most functional city in the world

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Let's make Helsinki the most functional Smart City in the World

An innovation unit for the City of Helsinki, Forum Virium aims to build Helsinki into the most functional smart city in the world in collaboration with companies, the scientific community and residents.

Photo: Lauri Rotko

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What is Forum Virium Helsinki?

- An innovation unit established in 2005, which develops urban solutions of the future

- These encompass smart city, smart mobility, open data and the Internet of Things

- A non-profit limited liability company fully owned by the City of Helsinki

- Employs 40 top experts

- The unit operations are funded by the City of Helsinki and different EU projects with about EUR 5 million a year
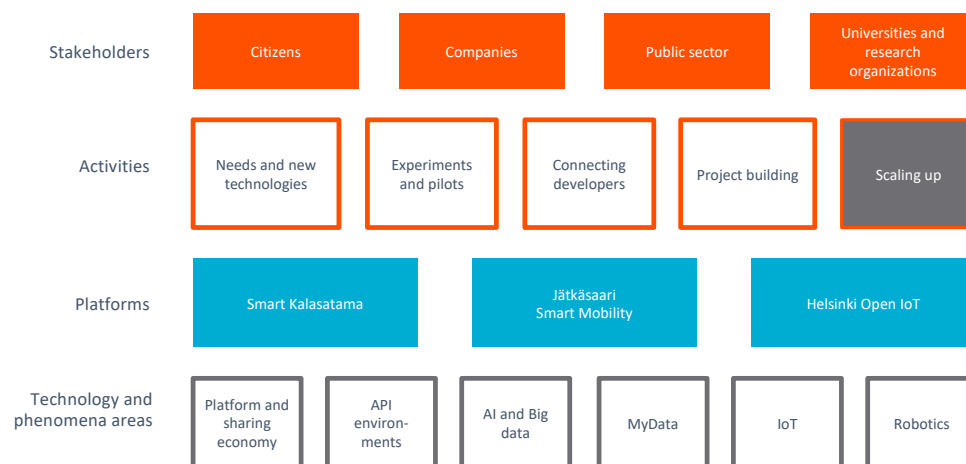
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What does Forum Virium Helsinki do?

- Smart city projects in Finland and EU countries. Currently 25 projects running.
- Collaboration with companies, the scientific community and residents
- Digitalization of the City of Helsinki
- Our achievements:
  - We made Helsinki data open to the public
  - We turned Kalasatama into a smart city district
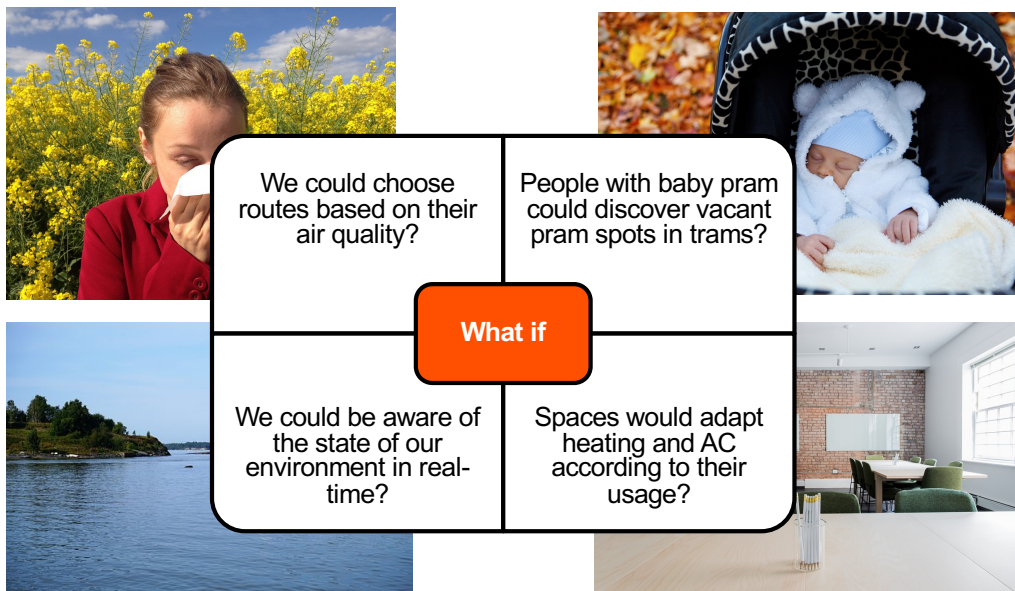 - Next we will bring robot buses onto the city's streets

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Co-creating urban futures

Stakeholders	Citizens	Companies	Public sector	Universities and research organizations		
Activities	Needs and new technologies	Experiments and pilots	Connecting developers	Project building	Scaling up	
Platforms	Smart Kalasatama		Jätkäsaari Smart Mobility		Helsinki Open IoT	
Technology and phenomena areas	Platform and sharing economy	API environ-ments	AI and Big data	MyData	IoT	Robotics

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Internet of Things (IoT)

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IoT can help us solve many challenges in Smart Cities

We could choose routes based on their air quality?

People with baby pram could discover vacant pram spots in trams?

What if

We could be aware of the state of our environment in real-time?

Spaces would adapt heating and AC according to their usage?

Smart City Open IoT program

Aiming for open and modular IoT infrastructure and ecosystem

Taking out friction from utilizing data and IoT technologies in Helsinki through:

- Developing new means for collecting meaningful
- Supporting piloting through physical and digital platforms and technologies
- Providing funding and resources,
- Training and capacity, and
- Building digital single market

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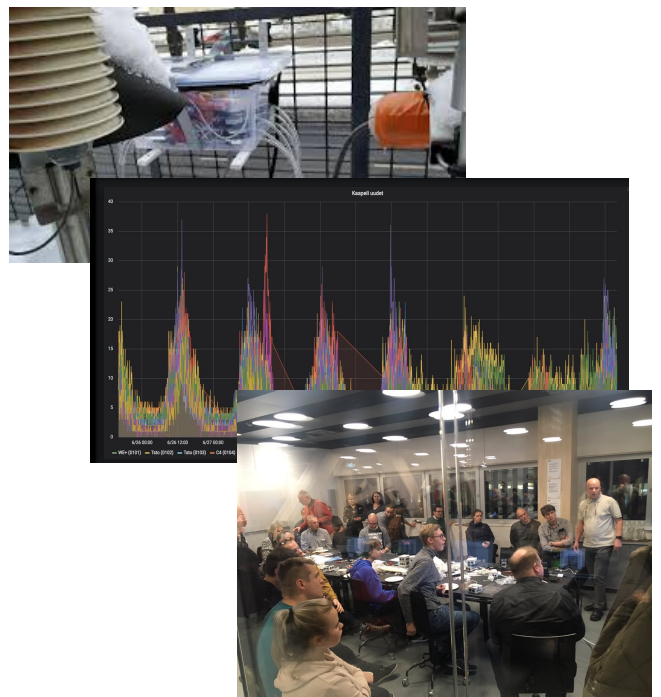
IoT project portfolio

Vekotinverstas "Gadget workshop"	SELECT for Cities	SynchroniCity
Biotope	mySMARTLife	Climate smart housing companies
CircVol	Quasimodo	UIA Hope
AI4EU	Croboddit	Urban Eco Islands

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IoT-tiimimme

Natalia Reen

Juha Nummila

Timo Ruohomäki

Eero Jalo

2 project managers

Aapo Rista

Tiina Inki

Data scientist

Aki Salminen

Veli Airikkala

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Digital single market

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Helsinki API harmonization timeline

**MySmartLife
2017-2022**
SensorThings
API

Consent
management

Synchronicity

2017-2019
Northbound
and
Southbound
APIs

**Six city
strategy
2014-2017**
4 APIs

**CitySDK
2012-2014**

3 APIs

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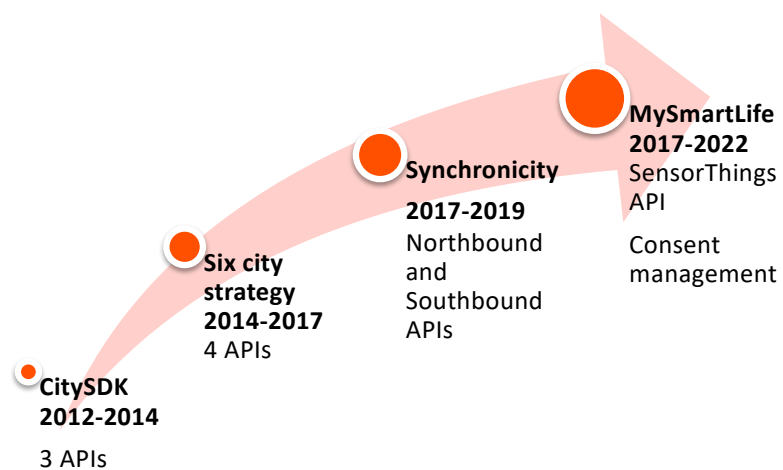
OPEN & AGILE SMART CITIES

117 member cities from 24 countries and regions in Europe, Latin America and Asia-Pacific.
oascities.org
@oascities

Precommercial procurement as a tool for shaping the landscape together

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SELECT for
Cities
competition
aims to harness
data in a city-
wide platform
for Smart City
innovation

SELECT
for Cities

Design and develop a city-wide, data-driven,
Internet-of-Everything (IoE) platform for large-scale
co-creation, and testing of services

Validating market through pilots

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SynchroniCity pilots

SYNCHRONICITY

Cities & Pilots   Community   Tech   News   Medi

Theme: All themes

Active Travel Insights

Autonomous Air Quality Management (AAQM)

BlueAlpaca

Clean Air School Districts (CASD)

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UrbanSense 5G Pilots

Massive IOT

Edge Computing

VR / AR

Capacity building and training

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Vekotinverstas:

is a low threshold environment for IoT experimentation.

Businesses can either introduce their tech to others or try out things themselves

Engaging citizens:
Vekotinverstas ideation sessions

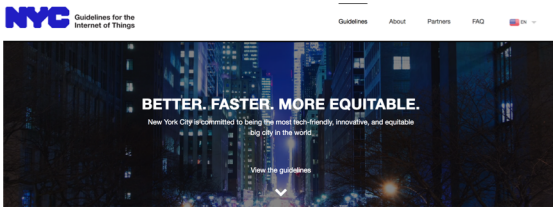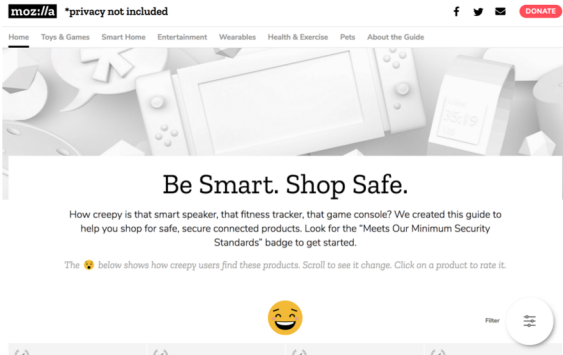## Chatting flower pot

Vekotinverstas.fi

What could it enable?

Dry   Value "0.8"

What could this info
be used for?

How to motivate
people to water
plants?

Moist

Value "3 000"
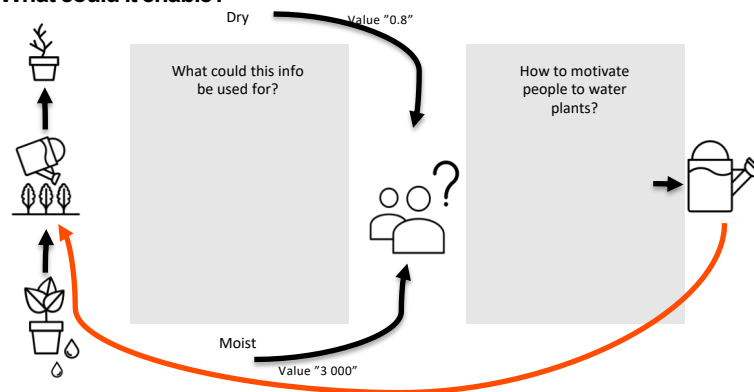
Data collection needs vs.
data collection means?

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Guidelines, principles

Tämä on Helsingin
kaupungin kokeilu.
Tarvittaessa ota
yhteyttä aapo.rista
@forumvirium.fi

VEKOTIN
VERSTAS

moz://a *privacy not included

Home   Toys & Games   Smart Home   Entertainment   Wearables   Health & Exercise   Pets   About the Guide

Be Smart. Shop Safe.

How creepy is that smart speaker, that fitness tracker, that game console? We created this guide to
help you shop for safe, secure connected products. Look for the "Meets Our Minimum Security
Standards" badge to get started.

The 😊 below shows how creepy users find these products. Scroll to see it change. Click on a product to rate it.

NYC   Guidelines for the Internet of Things

Guidelines   About   Partners   FAQ

BETTER. FASTER. MORE EQUITABLE.

New York City is committed to being the most tech-friendly, innovative, and equitable
big city in the world.

View the guidelines

These guidelines provide a framework to help government and our partners
responsibly deploy connected devices and IoT technologies in a coordinated and
consistent manner. More than 35 leading cities, spanning 11 countries, have
now joined New York City in this effort.

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Renewing data collection: crowdsourcing / citizen science

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Environmental data - situation vs. future?

Data gathered by officials:
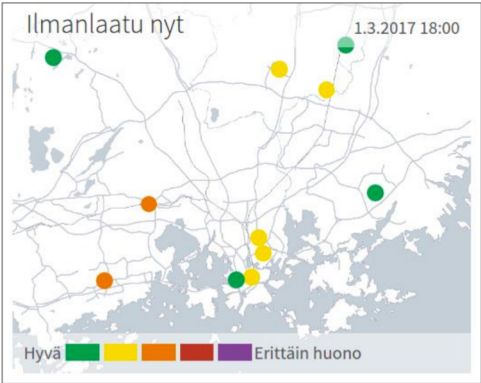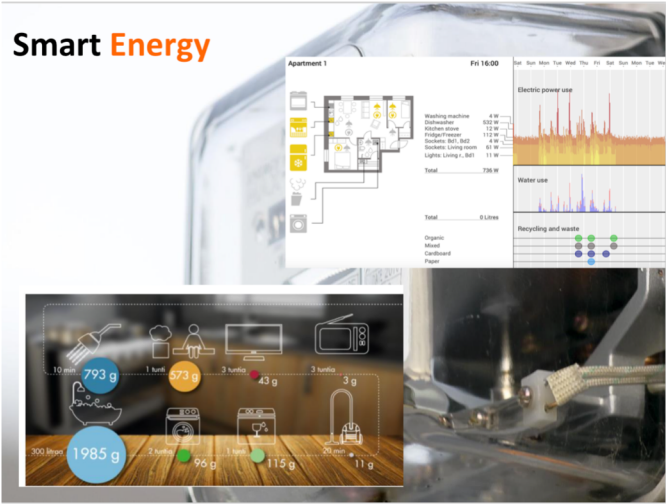

Data gathered by private citizens:

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X 300
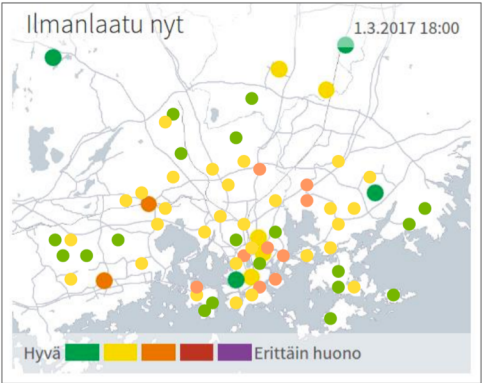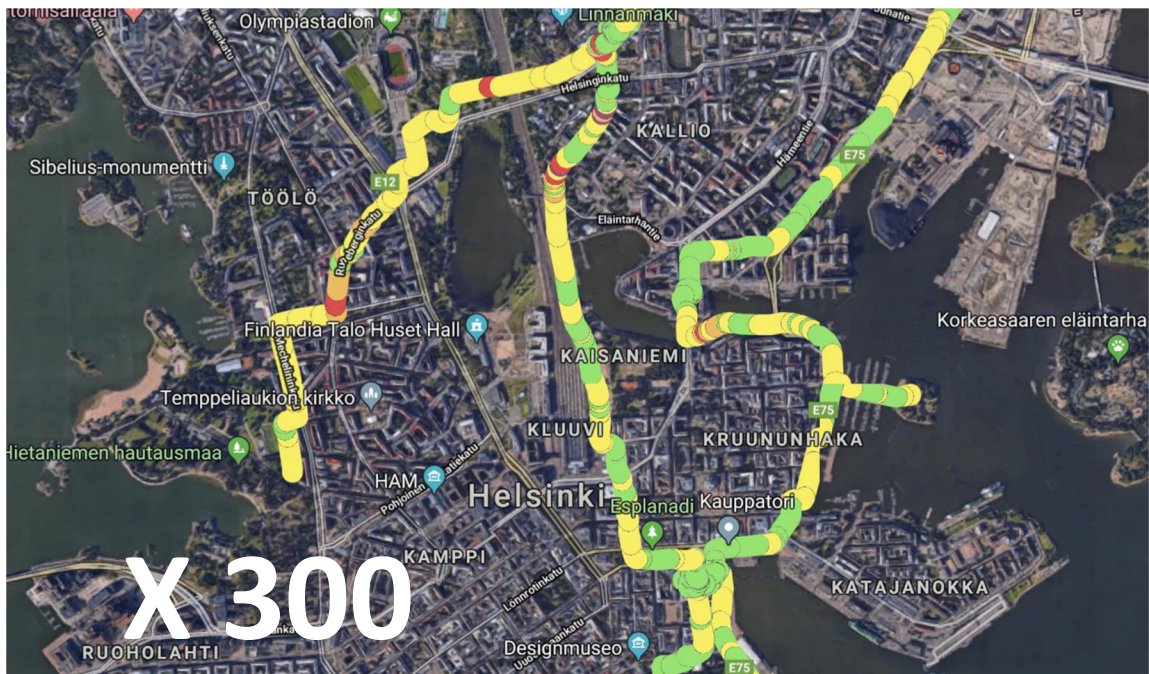
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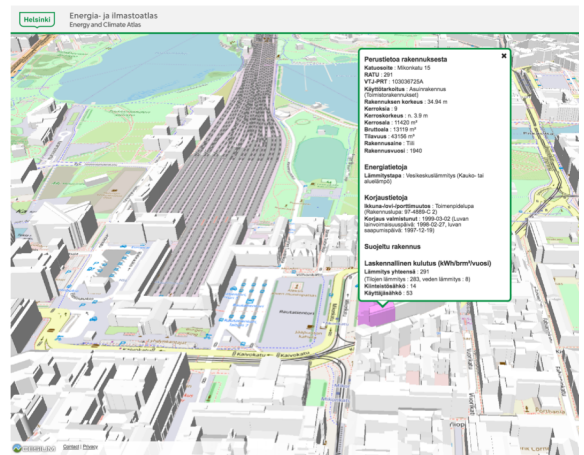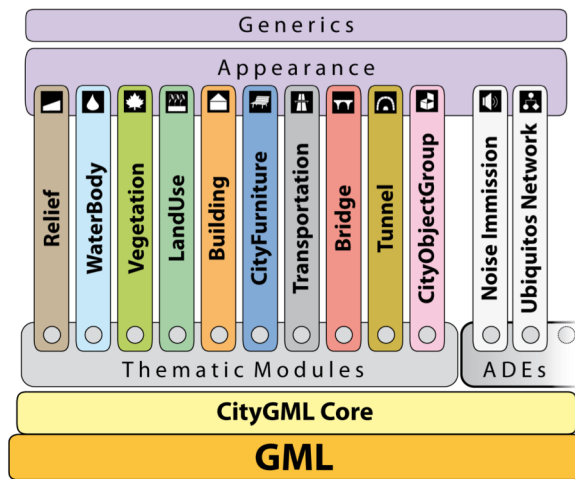# Case energy & building automation data

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Smart Energy

Title of the presentation
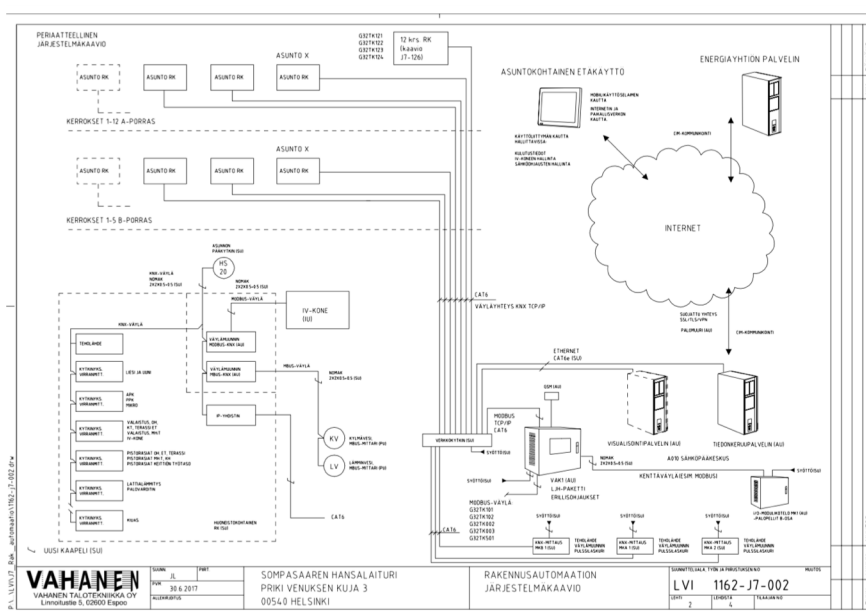
Metering subtypes:
1) Lighting
2) Wall and floor outlets
3) Kitchen countertop
4) Washer/dryer
5) Refridgeration
6) Sauna heater
7) Direct heating devices
8) Storage heating
9) Boilers
10) Air ventilation
11) Cooling devices
12) Vehicle chargers

3D Model – OGC CityGML

CityGML vs. BIM

IFC ●———●————————● BEMS?

GeoServer WMS, WFS

SoftGIS

FME

(InfraGML)
CityGML ●————————●————————————●————————●

geo survey

land use   cadastre   construction   maintenance

underground

INSPIRE →

my SMART Life
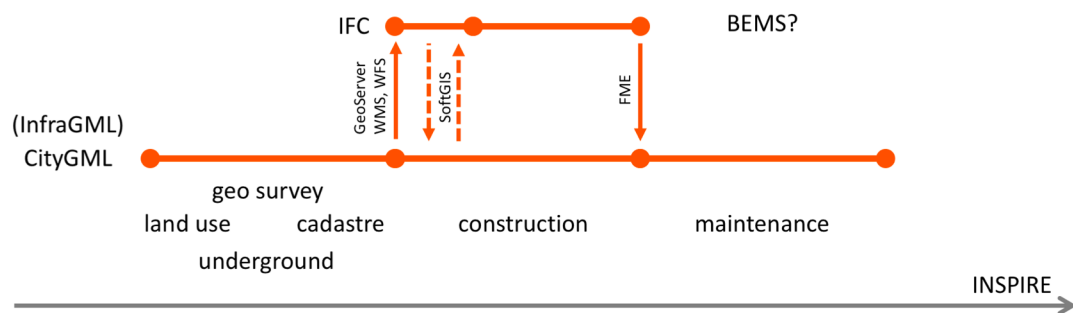
Putting personal data to work

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MyData Vision

The core idea is that individuals should be in control of their own data.

The MyData approach aims at strengthening digital human rights while opening new opportunities for businesses to develop innovative personal data based services built on mutual trust.

Lot's of data usage

Google
facebook

Organisations decide how the data is used

MyDa

People decide on how their data is used

Less usage of personal data

Old paper times

GDPR

´just´ complying with the regulation

Weak Data Protection

Strong Data Protection
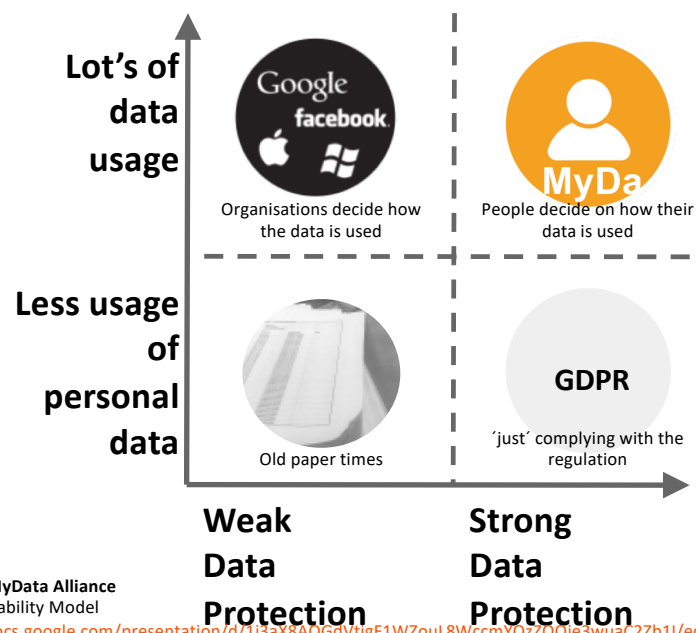
Helsinki committed to furthering mydata principles

- Helsinki has already taken first steps to this model by **mapping the sources** of the city's personal data reserves and **drafting concepts** for trying out MyData solutions in the future. https://www.hel.fi/uutiset/en/kaupunginkanslia/helsinki-commits-to-furthering-mydata-principles

- Report states that at **least 209 out of almost 800 Helsinki's** IT systems contain personal data

- Types of personal data vary -> but email or address were included in 40% of the cases

Yleisimmät tietotyypit kaupungin henkilörekisteriselosteissa

Sulkeissa tietotyypin tarkat esiintymiskerrat 65 henkilörekisteriselosteen otoksessa. Prosenttiosuus kuvaa osuutta otokseen valituista rekisteriselosteista, missä kyseinen tietotyyppi esiintyy. Esimerkiksi sähköposti ja osoitetiedot esiintyivät n. 40% tapauksista.
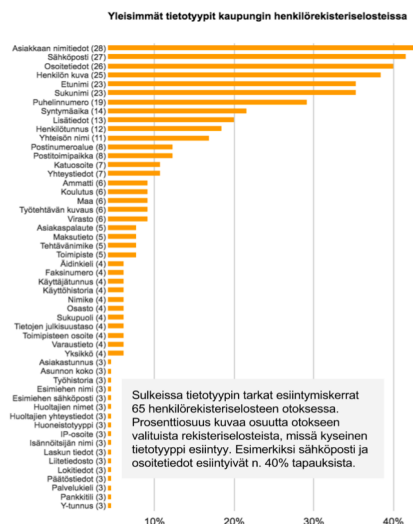
Images from Sähköinen asiointi ja henkilötieto
Selvitys- ja kokeiluprojekti MyDatan hyödyntämisestä kaupungin palvelujen kehittämisessä
Antti Poikola, Emilia Hjelm, Daniel Schildt ja
Open Knowledge Finland ry.
Funded by Helsingin innovaatiorahasto.
https://docs.google.com/document/d/1nmg5kSZuZgOk9E6WOkWCvHX0Xyfkh_AYEAwt6gWAZCQ/edit

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Machine learning?

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Machine learning and data

"Garbage in, garbage out" brings new needs regarding data

Improving data quality with ML

New ways to gather data e.g. computer vision

From descripting to predecting and prescripting

Algorithms gain power: transparency and design guidelines needed

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We aim for data-enabled smart cities where data, whether open, closed or mydata, can create value for both individuals and society.

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To achieve this, we collaborate with the city, companies, the scientific community and residents.

We bring ease to using the city as a platform through data, APIs, open source code, funding and support.

How can we help you to create future city services in Helsinki?
How can we shape future of cities together?

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https://forumvirium.fi/en/tag/iot-en/

https://forumvirium.fi/teknologiahakemisto/
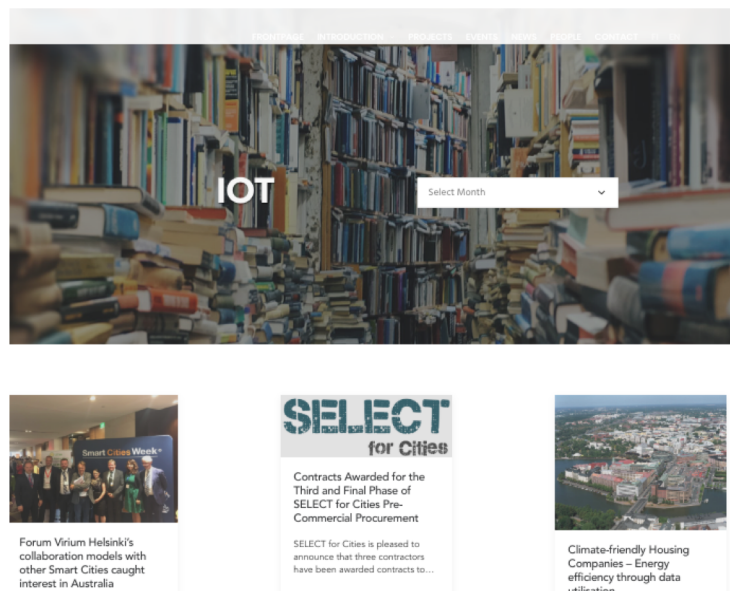
Tarjolla dataa, teknologioita ja tukea tulevaisuuden kaupunkiratkaisuihin

Soon also in English!

Help us to make it even better.

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Thank you!
Hanna.niemi-hugaerts@forumvirium.fi
@CitySDK_Hanna

slideshare   f   vimeo   Linked in   forumvirium.fi