# Engineering with a difference

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# Versatile expertise







## **Etteplan Embedded Systems & IoT**



- Focus in Turnkey Project deliveries from Idea to Volume production.
- Operations in Finland, Sweden and Poland.
- ISO9001 and ISO13485 certified.
- Services for industrial, telecom, medical and defence technology sectors.
- Customers from startups to international companies
- 800+ designers, Embedded SW, HW, Mech, Mobile, Front-end, Backend SW, Cloud services.



# **Embedded Systems & IoT**



## Products and Solutions development

Embedded HW/SW, Connectivity, ...



**Testing Solutions** Procket, WATS, Production Ramp-up, ...



Industrial Internet Gateways, Cloud ,UX/UI, Mobile...



Laboratory Services Accredited EMC lab, Antenna, Fault Analysis, rapid Prototypes.



# Etteplan approach





# End-to-end IoT



## **Cloud service**

 Data storage, analytics, data visualization, integration to other systems, alarms





#### Ethernet/mobile data connection

- Secured and encrypted
- public network connection
- VPN tunnel for gateway configuration

## Local Gateway (COTS) • Local commercial off-the-st

- Local commercial off-the-shelf Gateway, which has ethernet & optional mobile data
- connections towards cloud services
- Optional IP54 casing (or better)

## Data transmitted via RF connection

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- Private LoRaWAN network
- Low cost and power consumption

#### **Battery operated sensors**

- · Sensors can monitor temperature and humidity
- Sensors can be controlled via Gateway or Cloud service
- Deployed in residential environment
- Long battery life



Data is accessible in back-end system. Applications can be built for analytics, system control and trouble shooting

## Case Elisa - Remote Health Monitoring (Used example by HUS) Project

Soikea made an application for Elisa, who offers remote health monitoring for hospitals in Finland as a service.

The application Soikea made is a mobile application, which works on Android, Windows and iOS operating systems.

Additionally doctors have their own portal where the results can be viewed in real time.

# PEF and Asthma

1.46

128

**Blood Press** 

## What

The Application reminds the patient when to perform actions.

The application connects via Bluetooth to the measuring device.

The measured values are automatically transferred to the application.

In case of emergency the results are forwarded to the hospital for analysis.

## Results

#### Doctors:

- 80% savings in work time
- Monitoring of own patients in real time
- Readymade report forms for analyzing and for Social Insurance Institution
- Knowledge of missed measurements

#### Patient:

- Reminders
- Automatic index entry
- Feedback of the quality of measurement
- No paperwork

Sugar Levels Oxygen Saturation Hearth Activity



## **Rollock - Goodbye to all those keys**



- Rollock gets you rid of keys; the lock is opened with an NFC tag or a smartphone. With remote opening enabled, the could be opened even without taking phone out of the pocket.. Rollock connects to cloud, the WLAN-feature makes it possible to remote open the door from anywhere in the world.
- Etteplan contribution to the project were cloud back and front end development including lock and intelligent strikeplate embedded hardware and sofware and mobile applications.



# References

#### Mikä on MyAir?

MyAir on älykäs, uuden sukupolven ratkaisu asuinkerrostalojen ilmanvaihtoon. Ratkaisu säätää, optimoi ja tasapainottaa ilmanvaihdon automaattisesti asuntojen välillä. MyAir huolehtii oikeista ilmamääristä jokaisessa huoneistossa ja varmistaa, että sisäilma on puhdasta.

Tasapainotuksessa MyAir huomioi myös rakennusvaipan yli vallitsevan paine-eron sekä siihen vaikuttavan tuulen ja hormivaikutuksen. MyAir havaitsee ja puuttuu ongelmatilanteisiin reaaliaikaisesti sekä hoitaa ongelmien ilmaantuessa huoltokutsut ja hälytykset.



## 



## Sisäilmastonmuutoksella on vakavat seuraukset

#### Kiinteistön parempi hallinta

Aktiivinen ja reaaliaikainen seuranta tehostavat kiinteistönhallintaa

Järjestelmä hälyttää ongelmien ilmaantuessa

Q

Ongelmatilanteet voidaan tunnistaa ja paikantaa nopeasti





The SKS Group is a Finnish family-owned enterprise founded in 1924. The core businesses and six companies are in Finland.

Drawing on its strong technical skills, the SKS Group offers product and service solutions to machine and equipment builders in Finland and other selected market areas.





The **WLT 310** is a wireless **LoRa** (Long Range Radio) transmitter designed for various industrial applications and capable of sending data over extremely long ranges. The smart transmitter's application parameters are configurable Over-the-Air (OTA) and it continuously measures process values. It is a low-energy transmitter with a battery life of several years, the LoRa technology has zero operating costs, and no 3G/4G network is needed.

**The Gateway** user interface suits various terminal devices and allows sensor networks to be easily configured. The Gateway includes its own local database that buffers the measurement data.

**The cloud**-based user interface monitors process values and allows external data to be combined with the measurement data.





Kemppi is a global leader in arc welding equipment, exporting to 70 different countries from two production facilities in Finland and one in Chennai, India. For over sixty years Kemppi has introduced new innovations to the market, pioneering the development of both welding technology and productive welding solutions with an emphasis on usability and design.





ArcQuality is a system that verifies, records and stores key factors in a welding procedure to ensure quality standards are met and specifications are followed. It automatically collects and stores real time data for quality documentation and traceability as well as allowing remote access to information via a cloud based share system.

"Espotel's Jhumar platform was versatile and technically mature to provide a quick start to the development project. The product specification changed many times, and Espotel was a flexible partner through these changes. The co-operation with Espotel during the project was easy in many ways", **Petteri Jernström,** Director, Welding Technology and Services at Kemppi.



# References

# enevo

Enevo provides smart sensor and analytics based logistics optimization solutions for the waste management and recycling industry.

The smart waste sensor is a core component in the Enevo ONe smart logistics solution which uses wireless sensors to both measure and forecast the fill-level of waste containers. The service automatically generates schedules and optimized routes for garbage collection.





The WE-008 container level sensor has been designed and built to accurately measure container fill levels in harsh environmental conditions. It uses ultrasonic sonar technology together with temperature and motion sensors measure the container fill level, and detect important events that it then communicates to the Enevo ONe server using standard cellular networks.

"The key to success was to optimize the cost and battery life of the smart sensor without compromising reliability. This is achieved by attention to several design details, such as good cellular antenna design that saves in transmission power as an example",

Fredrik Kekäläinen, CEO of Enevo.



# **Customers and Partners**

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