



RF SensIT

Continuous Moisture Monitoring

04.06.2018
Mika Mäkitalo

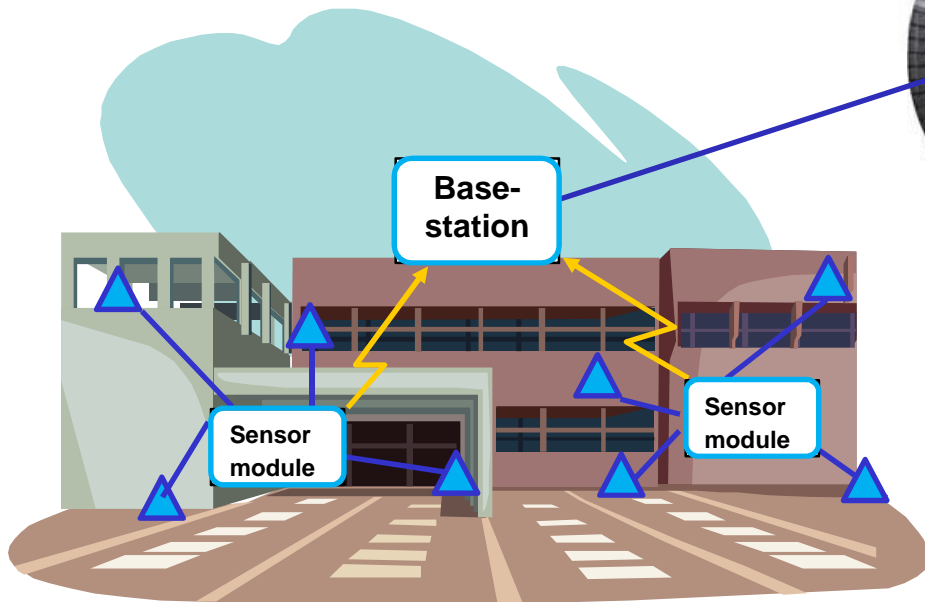
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www.rfsensit.com

RF SensIT CMM

Continuous Moisture Monitoring

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CMM is an automatic IoT-system for monitoring moisture and temperature in building structures.

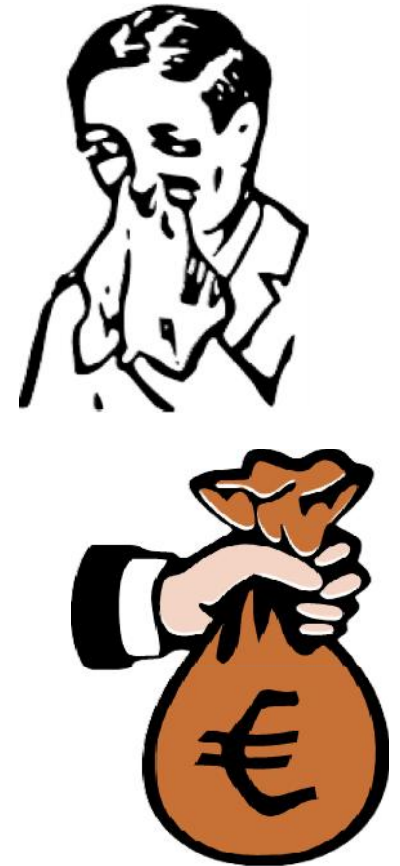


It provides a way to detect favourable conditions for mold growth and other moisture problems.

The mould problem

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- Moisture, which fast develops into mold, is one of the largest single factors creating serious health issues, and causing high costs for the real estate property owners both in public and private sector. Today 1/3 of the buildings in Finland suffers moisture problems at some point of their life cycle.
- Asthma, respiratory infections, eye and skin irritation, headache, etc. 600 000 - 800 000 people in Finland are exposed daily to impurities caused by the moisture and indoor air problems.
- The cost of these health problems in Finland is 450 Mill. euros per year
- Renovation cost is 1.2 – 14.5 Bln. Euros



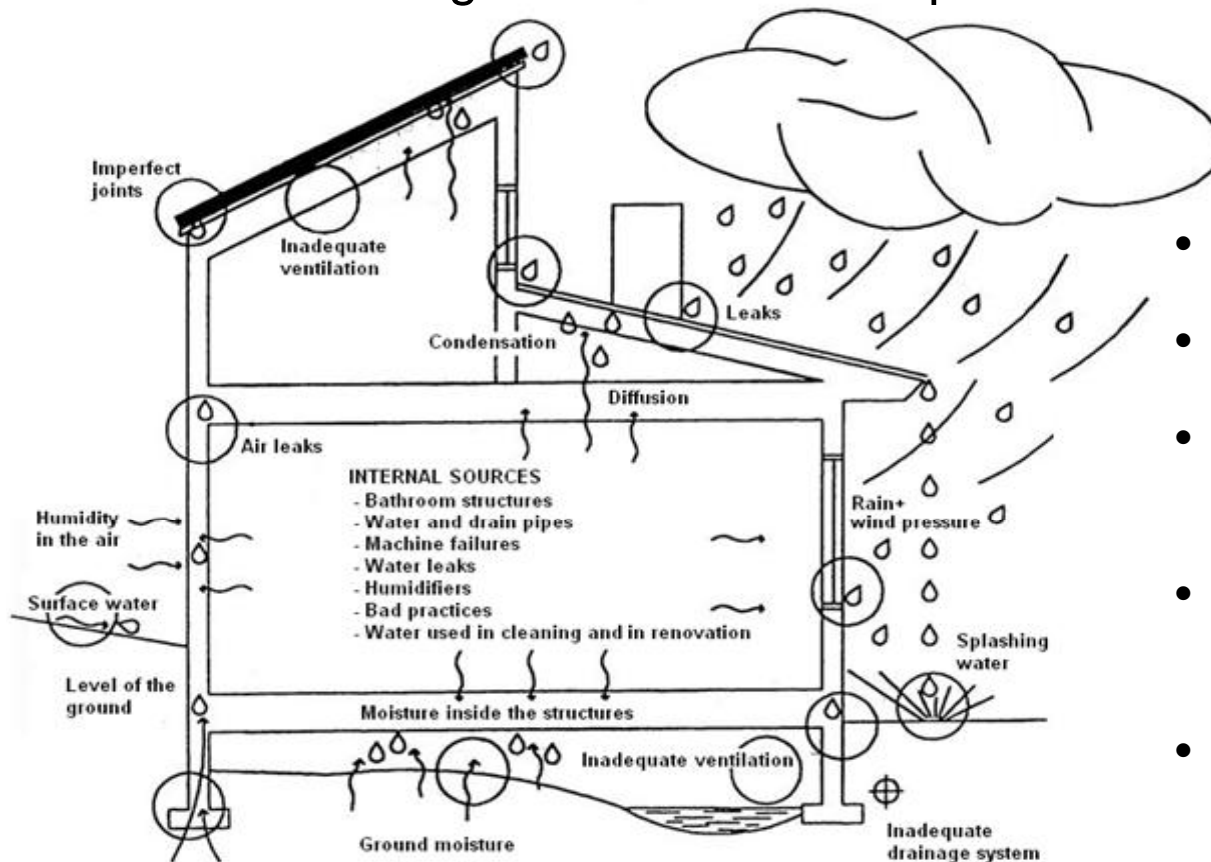
Source: The inspection committee of Finnish Parliament, www.hometalkoot.fi



Reasons for the moisture problems

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- Moisture sensitive structures and materials.
- Shattered design and construction processes.

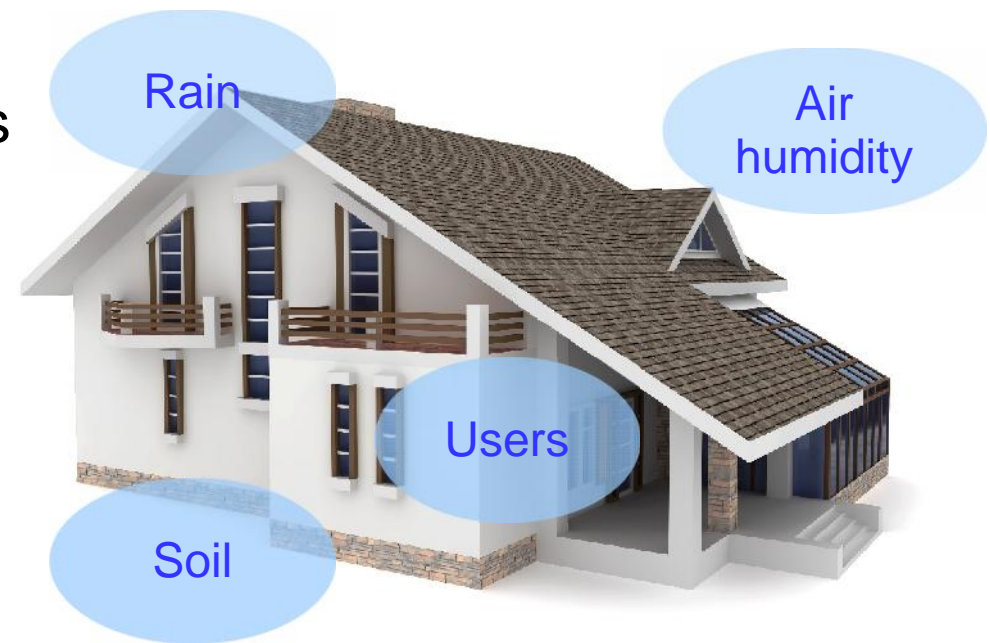


- Carelessness, construction defects
- Over tight construction schedules
- Inadequate rain protection on construction sites
- Improper use and insufficient maintenance of the buildings
- Wearing of the structures

Hidden moisture inside the building structures

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- Moisture problems are often hidden inside the building structures
- Detection can be difficult - without opening the structures
- The low energy houses with thick insulation layers have even more moisture related problems.
- Detecting the excessive moisture – as soon as possible – health problems can be avoided and renovation costs can be minimized
- *The need for systematic and continuous monitoring increases*



RF SensIT - Team

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- CTO, Mika Mäkitalo



- Erkki Hynninen, Head of Sales



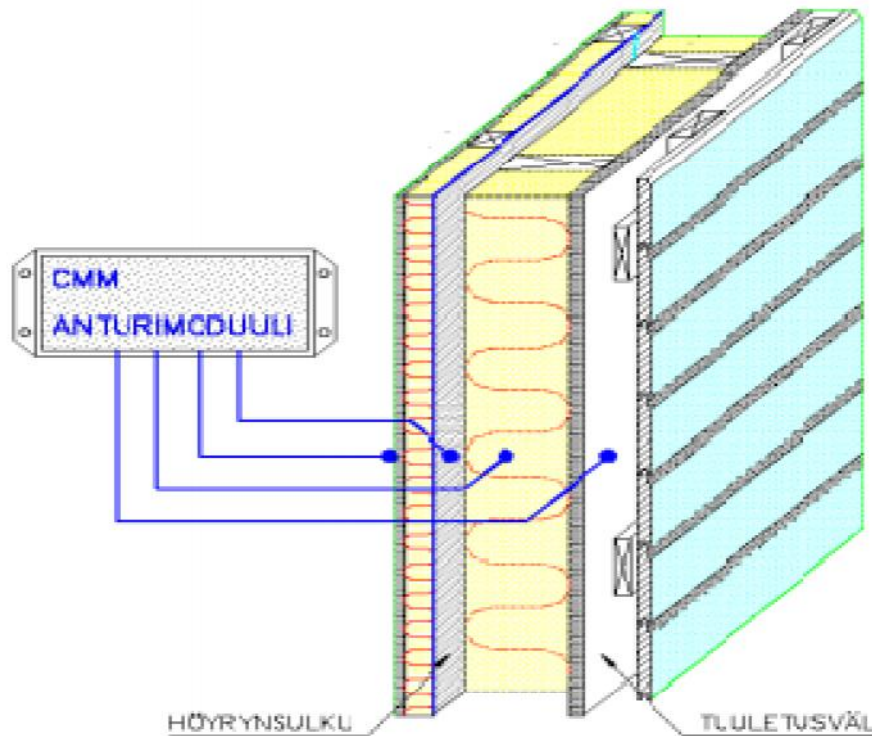
- Hannu Eränummi



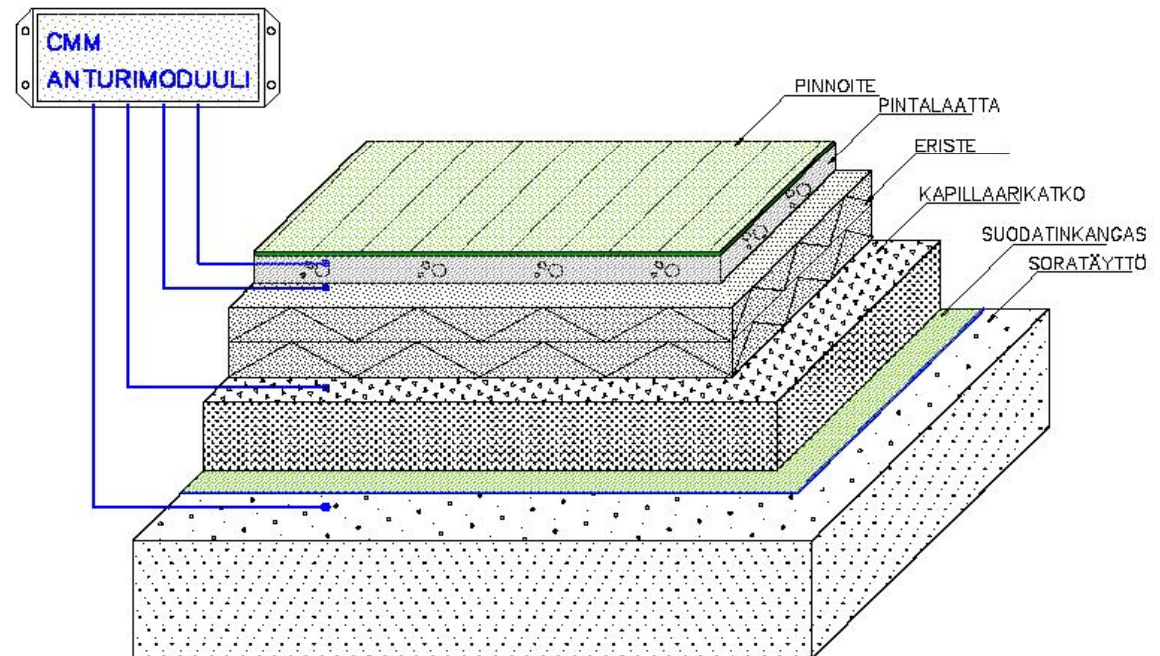
- Esa Kesänen

Implementation

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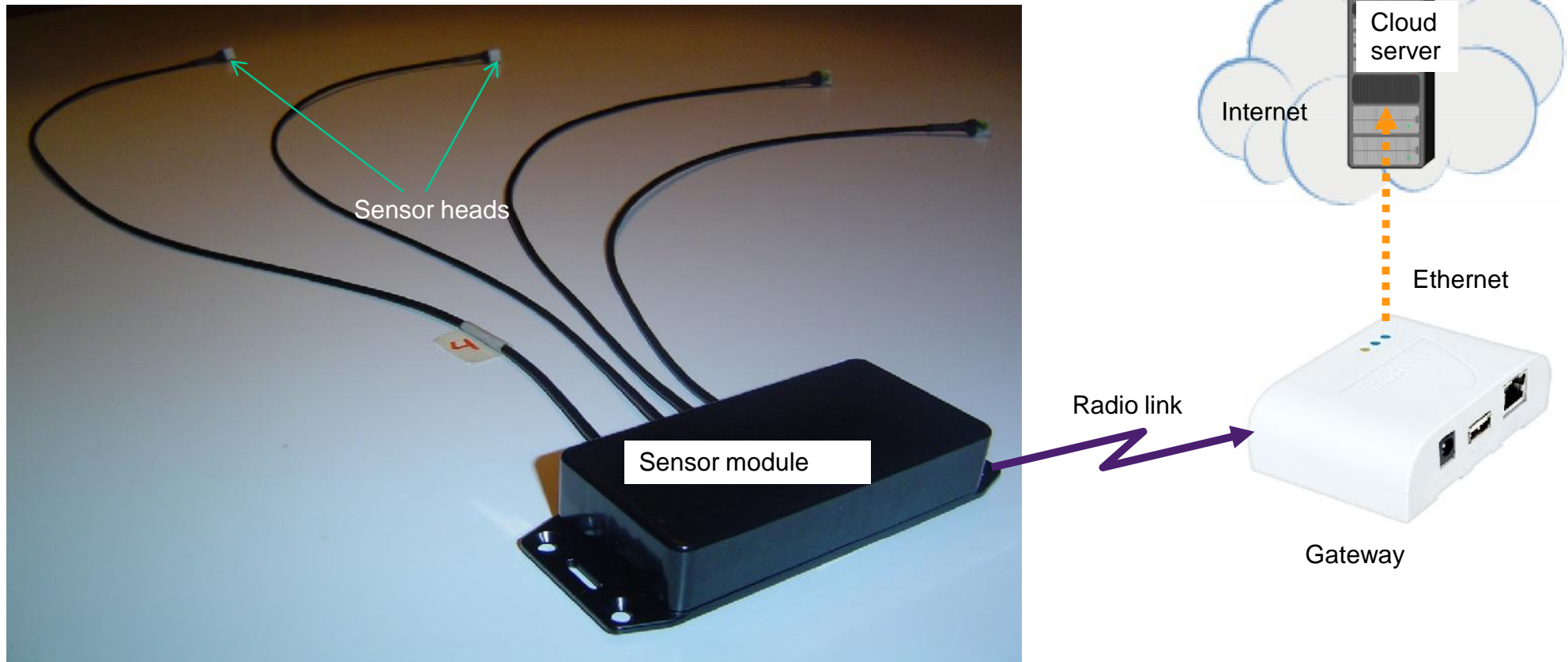


Functioning of the wall structure can be monitored by placing the sensors between the different layers



Moisture rising from the soil to the floor structure will lead to loosening of the surface material and indoor air problems

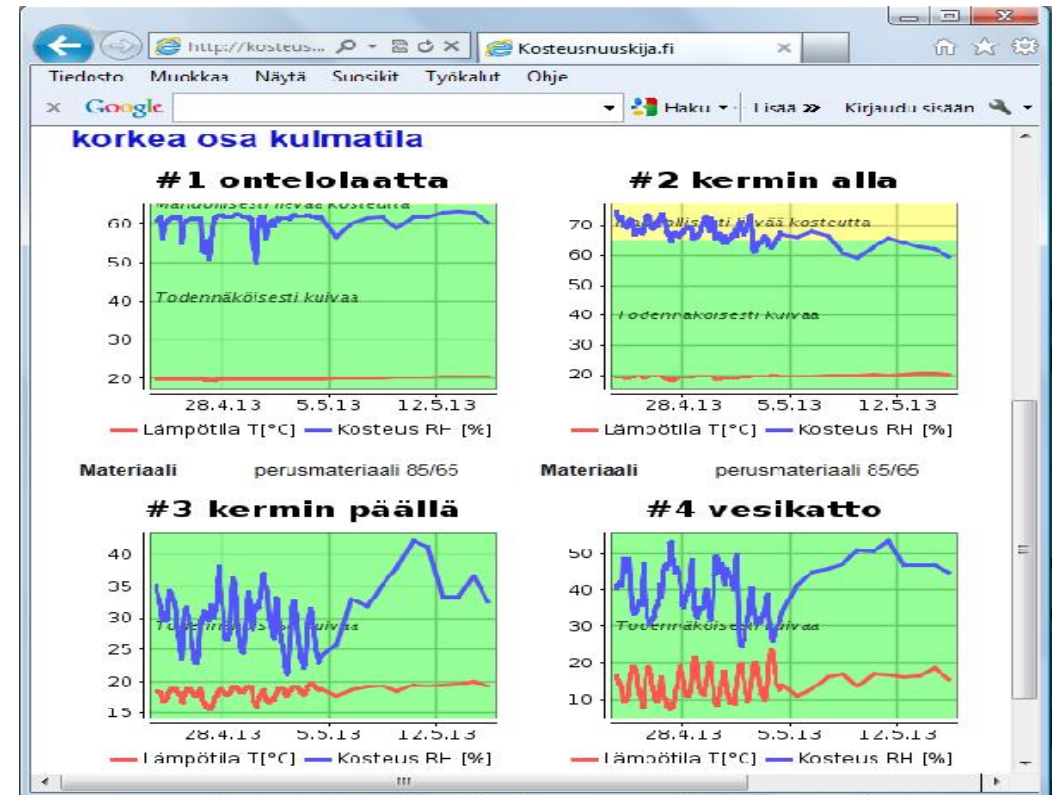
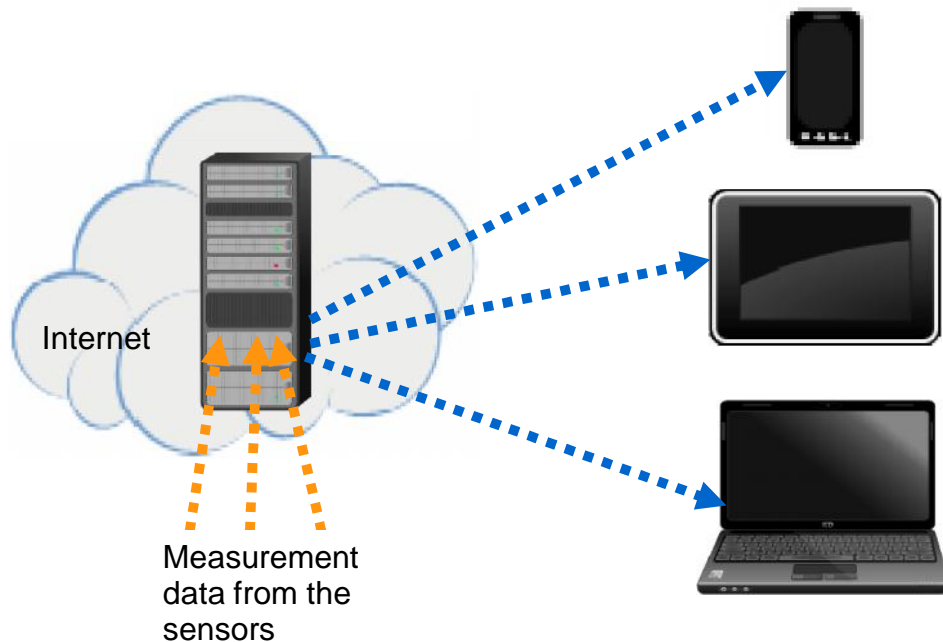
IoT-system



- The sensor module measures the relative humidity and temperature.
- The measurement data is transferred wirelessly to the gateway, which sends the data to the cloud server

IoT service

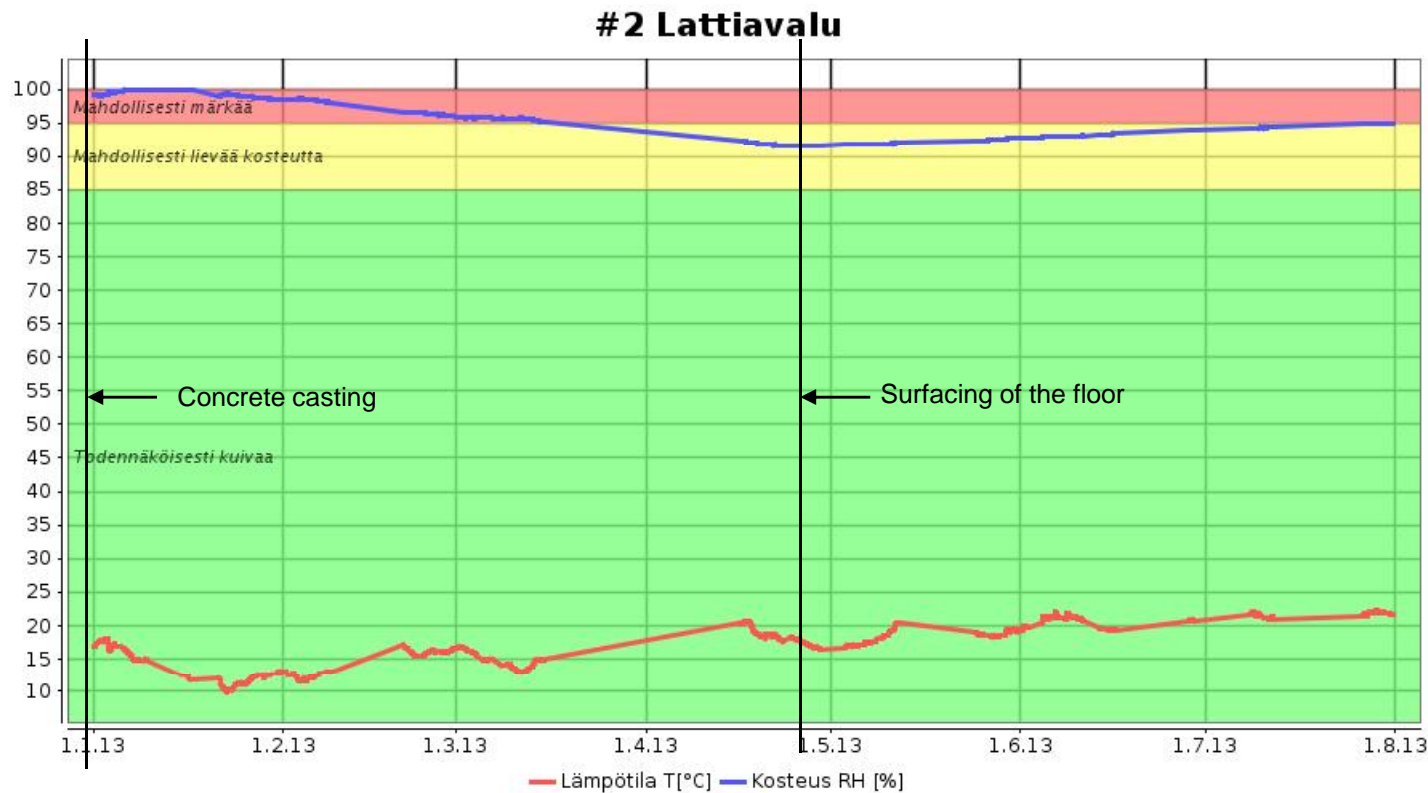
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- Measurement data can be seen in a web browser

Monitoring data

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- The data is available on the Internet – anywhere, anytime .
- The monitoring history is stored on the RF SensIT database.
- Defects of the building structures and maintenance problems can be detected.

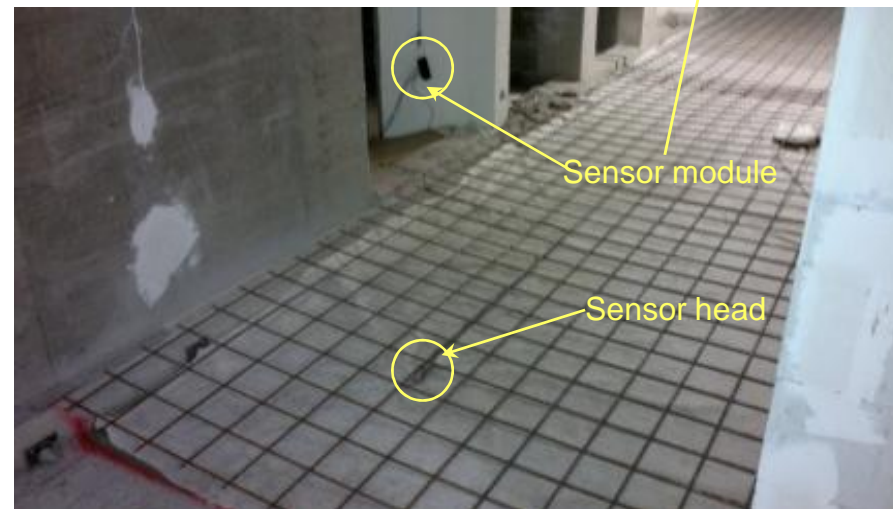
Placement of the sensors

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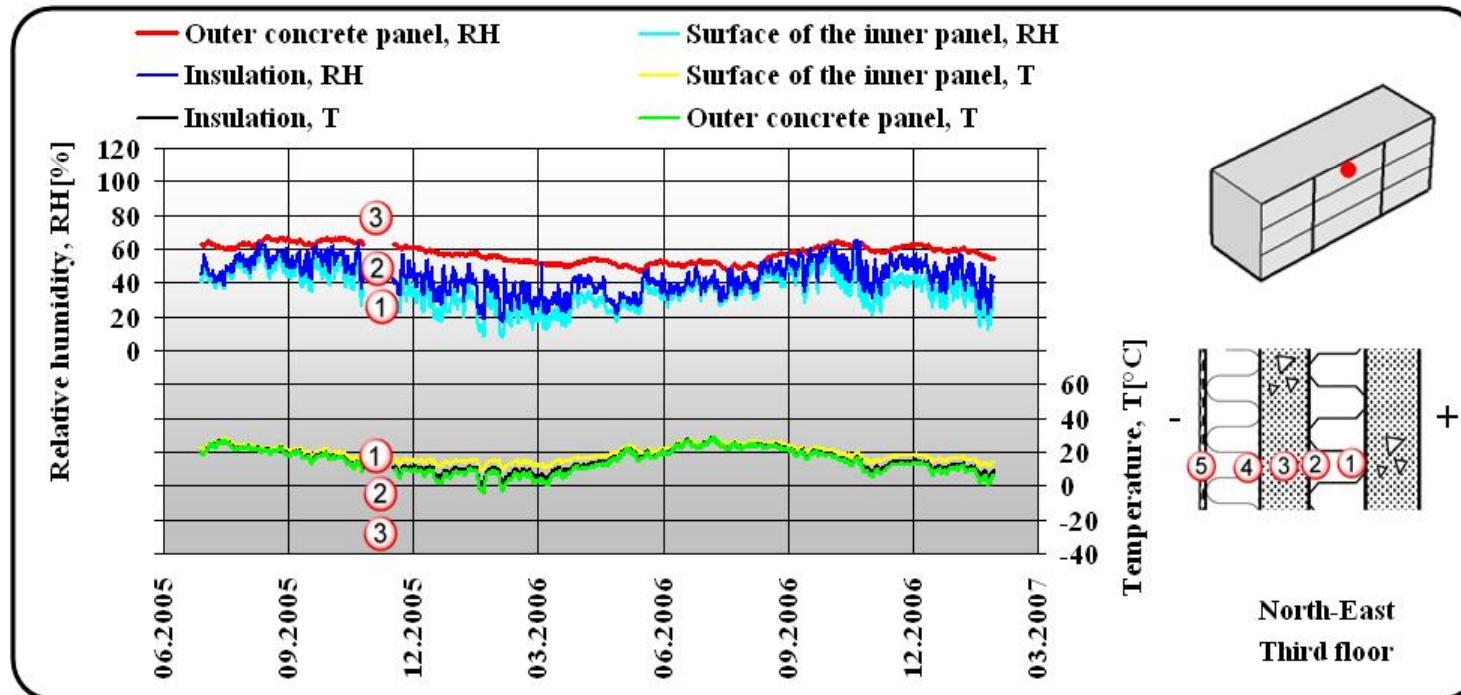
Surface assembly in a typical renovation project

Sensors can be placed inside the concrete casting.



Research background

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Aalto-yliopisto

VTT

Senaatti
KIINTEISTÖY

Helsingin kaupunki
Rakennusvirasto

ESPOO
ESBO

- RAILO project at Aalto University (2009 – 2012), Reliability Research of the Humidity Sensors Integrated into Building Structures.
- Goals: reliability and long lifetime in demanding conditions.
- The sensors have to survive in high moisture and alkalinity conditions - inside the concrete casts.

Hundreds of buildings are monitored by RF SensIT

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RF SensIT CMM – To avoid moisture problems

Comparison to other methods

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- Automated measurements - does not require a human involvement.
- Human factors and variations in the measurement process don't affect the measurement results
- Measuring can be done without breaking the structures.
- Information can be obtained from deep inside of the building structures.
- Measuring data creates a continuous moisture measurement history - mould grow and remaining service time of the building can be estimated.
- Results are documented automatically.



Benefits of the system

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- *CMM system provides a healthier way to detect mould related problems than the symptoms of the people.*



- *Comprehensive moisture monitoring history verify the good condition of the building materials and value of the building.*

Customers

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3000 monitoring points in the system (February 2017)

