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Cluster for Energy and Environment

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Smart Grids and Energy Markets

Utilisation of Smart Meter Data in Energy Management

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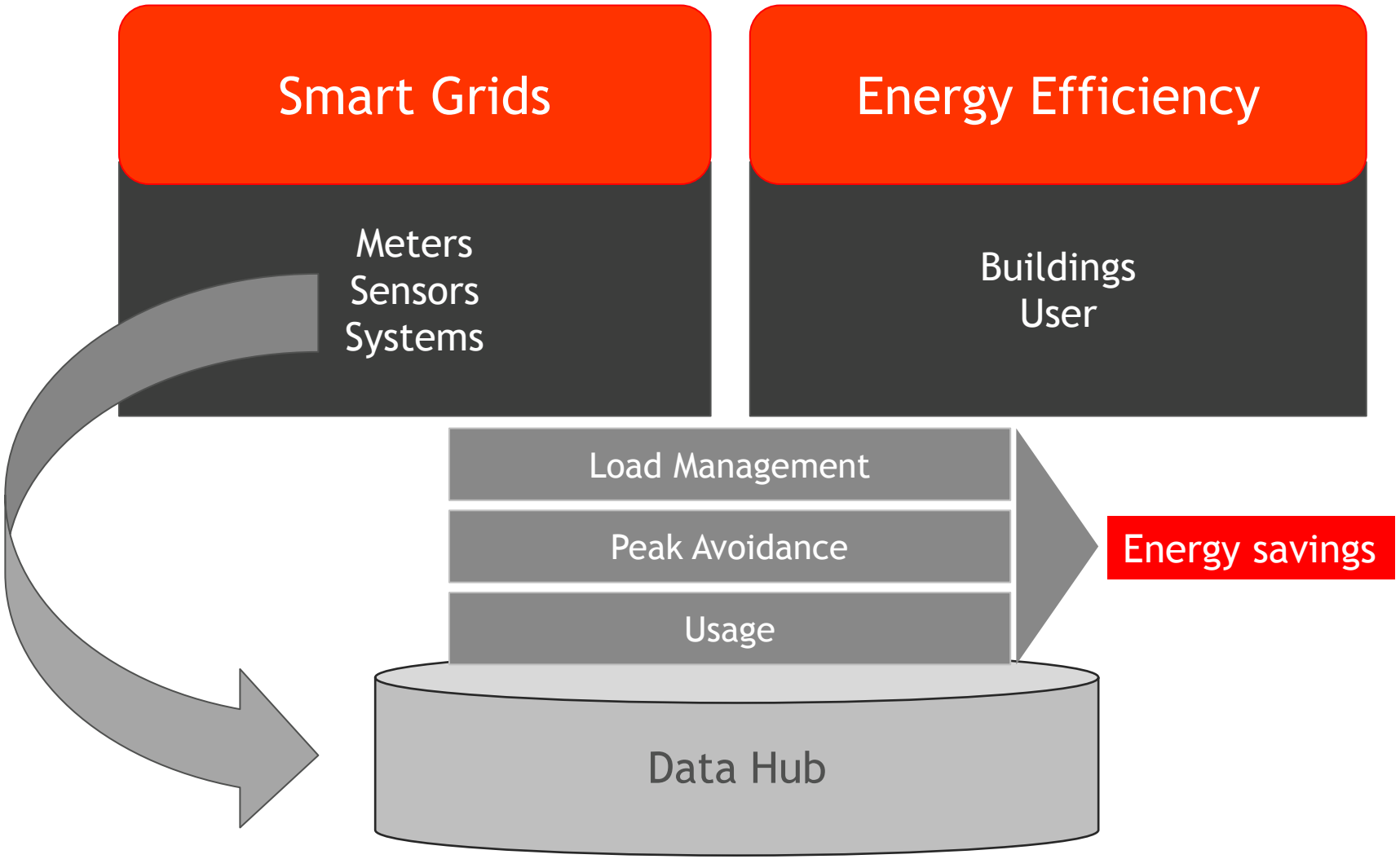
Inno-W

Demonstrating Energy Efficiency in Smart Grid

A data hub demo was developed to demonstrate the possibilities of enhancing the utilisation of Smart Meter data in Energy Management of Buildings. Data HUB collects and receives Smart Metering data from different sources and offers data to smart application for further processing. This application will show data in a way, which is easily understood by owners, users and other stakeholders of buildings.

Collecting and analysing Smart Grid data



Simple Centralised Data Hub

In centralised Data Hub all metering points have unique IDs that correspond to other information about the meter, location and consumer. In this scenario the Data Hub contains information about metering points, customers and both present and historical metered data.

This model would not change the network companies' mode of operating. The companies obtain metered values, maintain information in their own databases and upload it to a centralized centralised Data Hub.

In this model customer will grant Data Hub upload and analyze their data. Network companies would still require a customer database of their own for invoicing new connections, cable positioning, disconnection, reconnection and so on.

In addition to Smart Meter Data other information will be utilised by Data Hub in analyzing energy efficiency.

Combining Information from multiple sources in Data Hub

The number of smart meters, sensors and other devices will increase in the future. The data they provide should be utilized to maximize their full potential in energy efficiency. The Data Hub, which can combine information from multiple sources and make intelligent analyzes, is a sound concept to deploy.

Data Hub Demonstration

Smart Meters were used to collect electricity data from network. The meters were owned by electricity carrier and thus their actions to download the data in Data Hub was needed.

The data was stored and analysed in Data Hub together with experts. In this scenario the analyze process was a semi-automated. Energy and facility experts gave their opinion to energy consumption. This process can be fully automated in the future, if data hub concept will be deployed.

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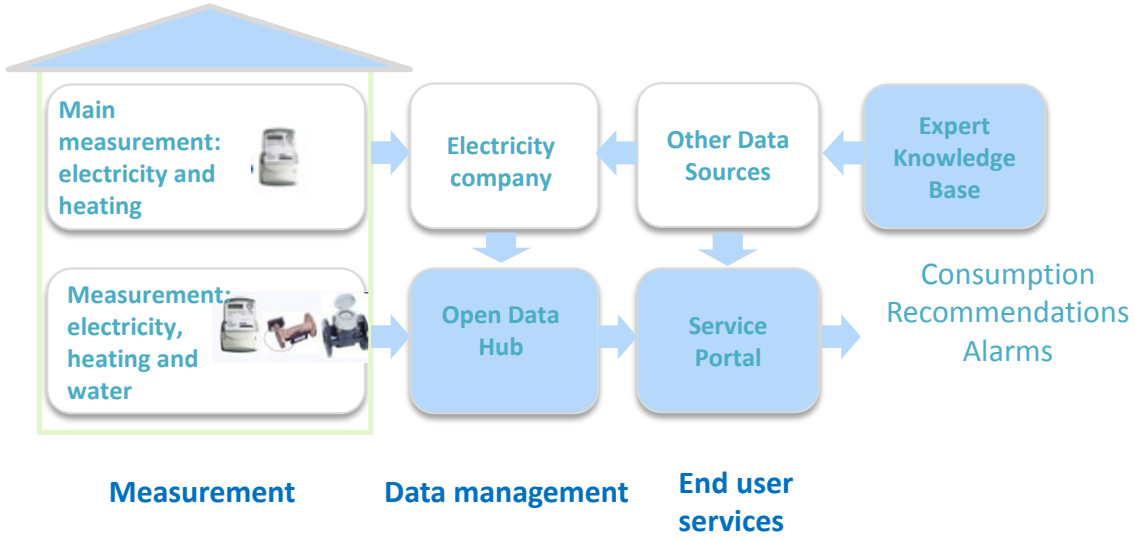
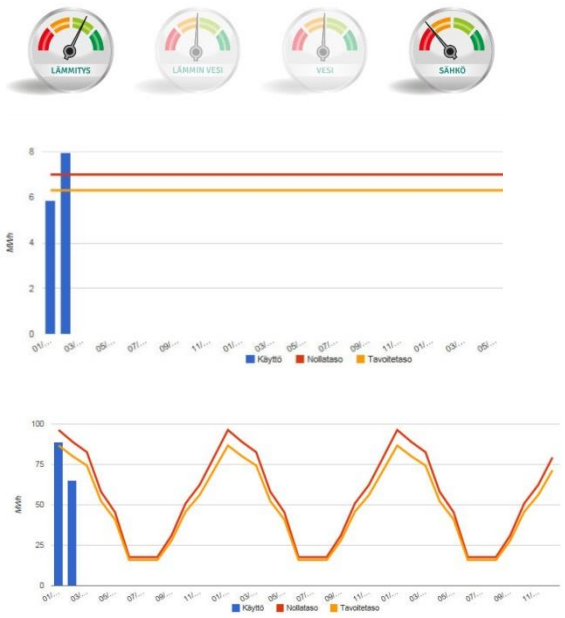
Data Hub Demonstration





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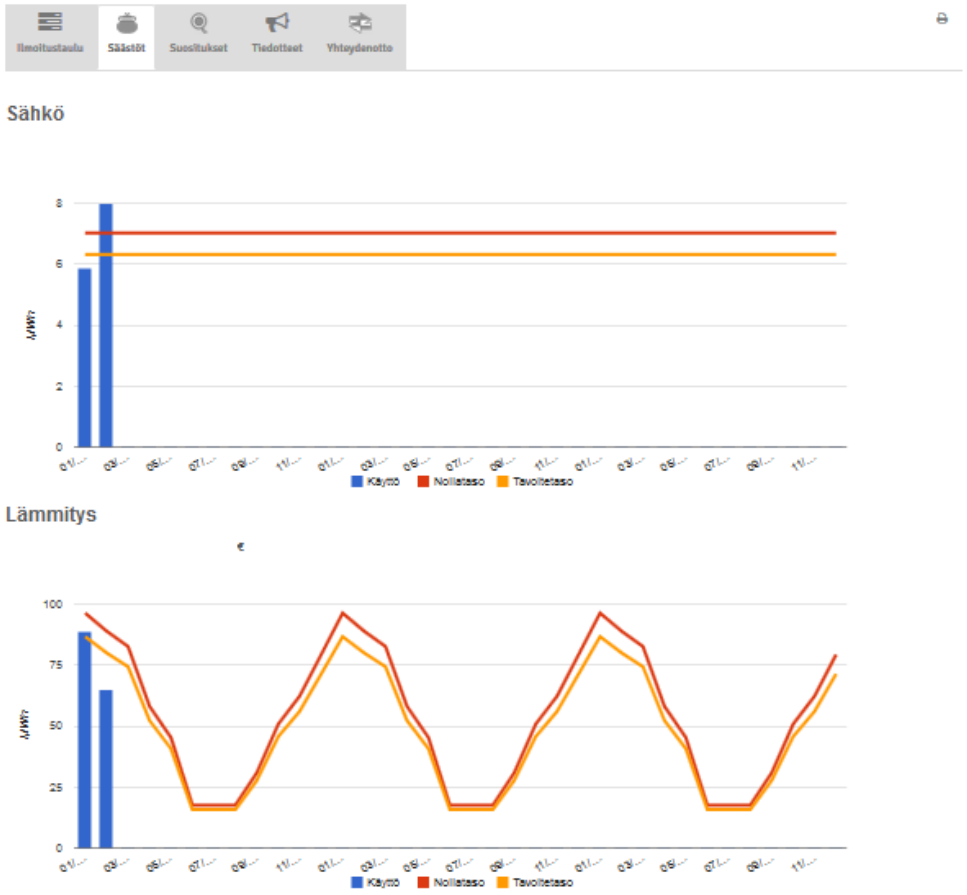
Data Hub Demonstration



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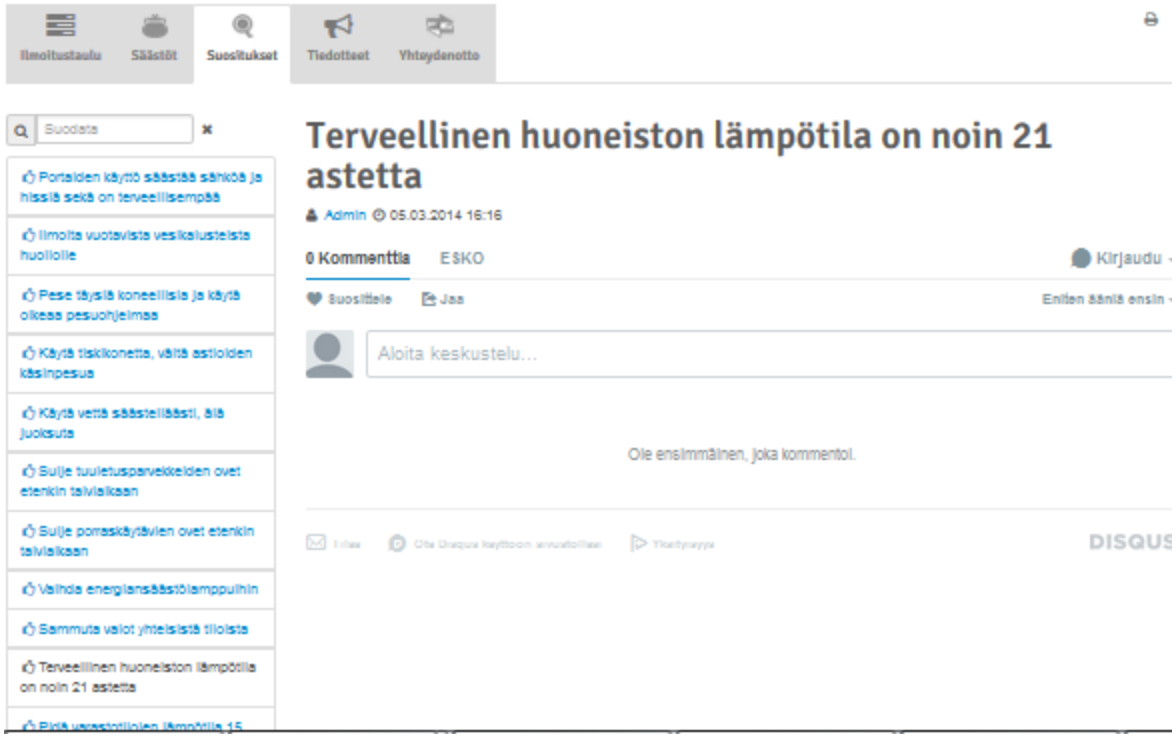
Data Hub Demonstration



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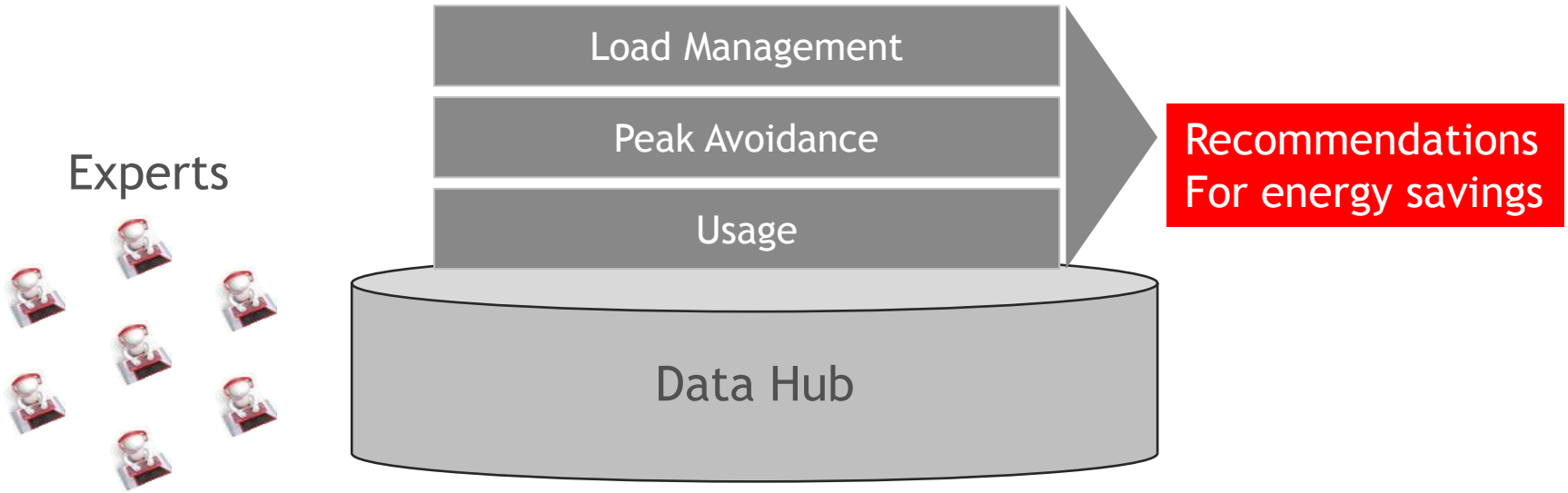
Data Hub Demonstration – Combining human expertise with data analysis



In the demonstration experts were connected in the process of analysis. Thus analysis were semi-automated.

Conclusions

- Human interaction and behavior is important part of the smart grid and energy efficiency
- Data analysis feedback system with simplified consumption and saving data for users (consumers) is essential for motivating users in energy efficiency
- Energy expertise and experts must be connected to data analysis
- Automated knowledge based expert system connected to consumption and environmental data (weather, building, location, time etc) would give a huge potential impact for user behavior and energy savings
- Average energy savings provided by Smart Grid and data analysis were 15%