

# Workshop Model Based UI

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- Global powerhouse in electronics and electrical engineering, operating in the industry, energy and healthcare sectors.
- 400,000 employees
- In fiscal 2007, Siemens had revenue of €72.4 billion and income from continuing operations of €3.9 billion (IFRS).
- Corporate Technology develops core technologies with strategic impact for the Siemens Groups and ensures that the company's R&D successes are safeguarded from competitors.
- Focus of our Research:  
Embedded Networks and Service Infrastructure  
Technology to simplify the service provisioning process for service operators and to enable ubiquitous service access to the consumer.  
Analysis of relevant system architectures concerning their communication protocols, interfaces and algorithms for universal multimedia communication.

## Use case: Industry Automation

- Sensors within production line provide their status, e.g. temperature and liquid fill level, through an web interface as XML data broadcasts
- Monitoring devices, such as control panels, receive status updates convert values into suitable presentation and embed them into bigger UI
- Operator may adjust process parameters through control panel UI that transforms adjustments into commands and sent to actors
- Actors (e.g. heating, cooling, valves) provide XML-based interface to receive commands from operator
  
- Additional devices such as reporting instances, may listen on network traffic to record all transactions on the process and automatically create a report or keep the data for later retrieval
- Maintenance staff use a handheld device to analyze operation of parts of production line and may locally interact with system.  
Status information is based an XML data but differently presented on handheld

## Use case: Medical

- Various devices to monitor patient's vital functions
- Each device normally provides its own user interface
- Aggregation of user interfaces into single UI device through separation of data model and presentation
- Control panel next to patient's bed may be used to adjust treatment automates to operate according to the monitor devices
- Remote supervision, adaptation and/or reporting over the network is provided through network communication
- Medical personal may use their PDA to access and manipulate the patients data

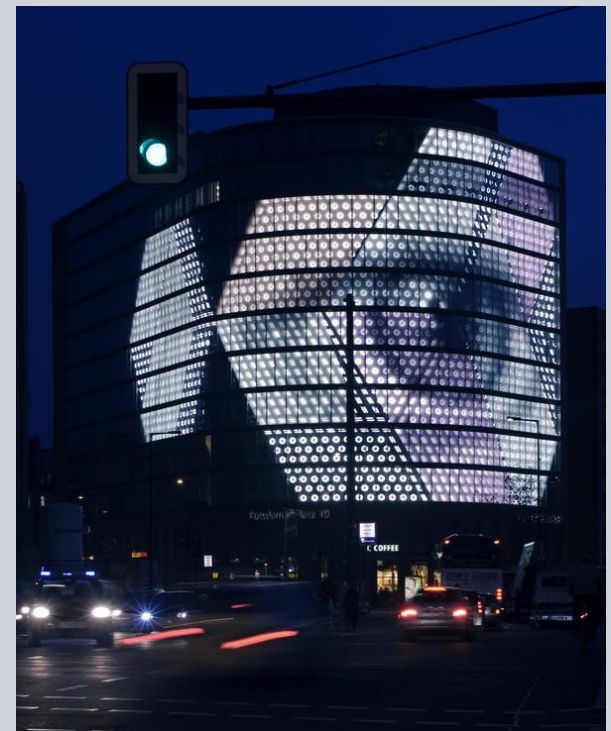
## Use case: Private Power Management

### Observations:

- Increased volatility of the power supply due to renewable energy generation
- Functionality of load management varies with availability of components (e.g. fridges)

### Scenario Assumptions:

- The price of electricity is dynamic and signaled to the customers
- Pluggable cars are capable to feed energy back to the grid
- Heat and electricity co-generator replace traditional heating
- Devices provide electrical and control interfaces



## Use case: Private Power Management

Household comprising

- Storage and generators  
(battery of electrically powered car, co-generator)
- Adaptable consumers  
(refrigerator, air condition, washing machine, etc. )

Task:

- Optimize power consumption costs throughout the day
- Cheap prices:
  - battery is charged and refrigerator cools down to lower threshold
- High prices:
  - house is disconnected from power grid and draws its energy from battery
  - refrigerator is put to energy saving mode  
(e.g. stop cooling until upper temperature threshold is reached)

## Use case: Private Power Management

### More tasks:

- Home connects to the power grid if the overall consumption of all devices exceeds the power of the battery or co-generator
- Generate electricity and heat according to forecast of weather, prices of electricity and resident behavior
- Battery should only be discharged completely to a minimum level

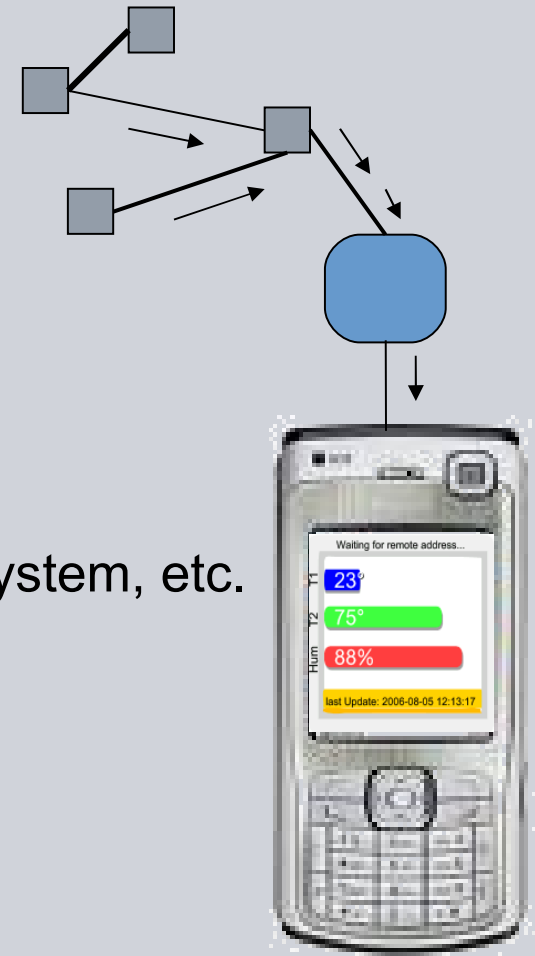
### Side effect:

- Load balancing on energy distribution network

## Benefits of Model Based UI

### UI panel for

- Monitoring
  - Sensor readings
  - Power consumption costs (delivered by external Web service)
  
- Control
  - Adjust thresholds
  - Turn on/off lights, air condition, alarm system, etc.
  
- Automation
  - Turn off air condition at 8pm every day
  - Scheduling of planned tasks (e.g. washing machine)





## Benefits of Model Based UI

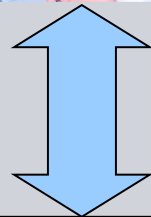
### Additionally

- Extensibility
  - Simple integrating of new (heterogeneous) devices, applications and services  
e.g., adding a roller shutter system
    - reduce the air condition load and thus power costs
- Usability
  - Separation of data model and presentation gives freedom to the UI designer
  - Hiding internals of data model reduces complexity of UI and leads focus to oril

## First ideas



Representation	Style
Data modelling	Control



Network of devices

## First ideas

### 1. Representation:

- UI-Widgets  
(Buttons, Textfields, Menus)
- Composition of Service components  
to complete application UI
- Adaptation to device capability and access policy

### 2. Style

- Color
- Themes
- Adaptation to device capability

### 3. Data modeling:

- Automation
- Data evaluation (e.g., compare thresholds)

### 4. Control

- Enable user interaction
- Service configuration



First ideas

Questions ?

Discussion !