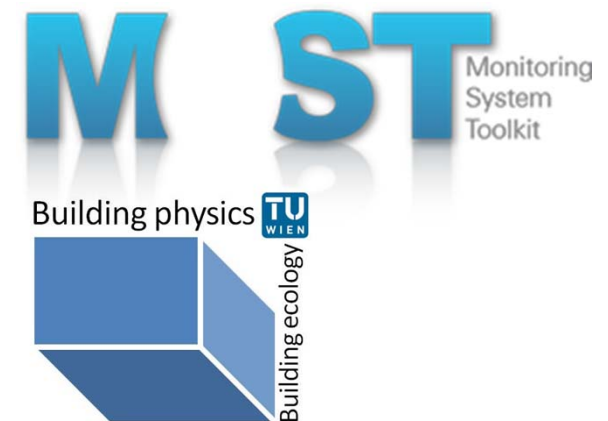
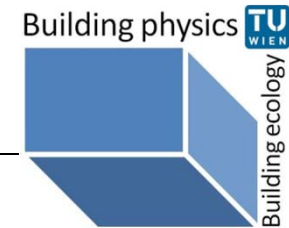


Recent advances in the development of MOST: an open-source, vendor and technology independent toolkit for building monitoring, data preprocessing and visualization

S. Glawischnig, R. Appel, R. Zach , A. Mahdavi

Department of Building Physics and Building Ecology
Vienna University of Technology, Austria
www.bpi.tuwien.ac.at





Building Monitoring – Motivation

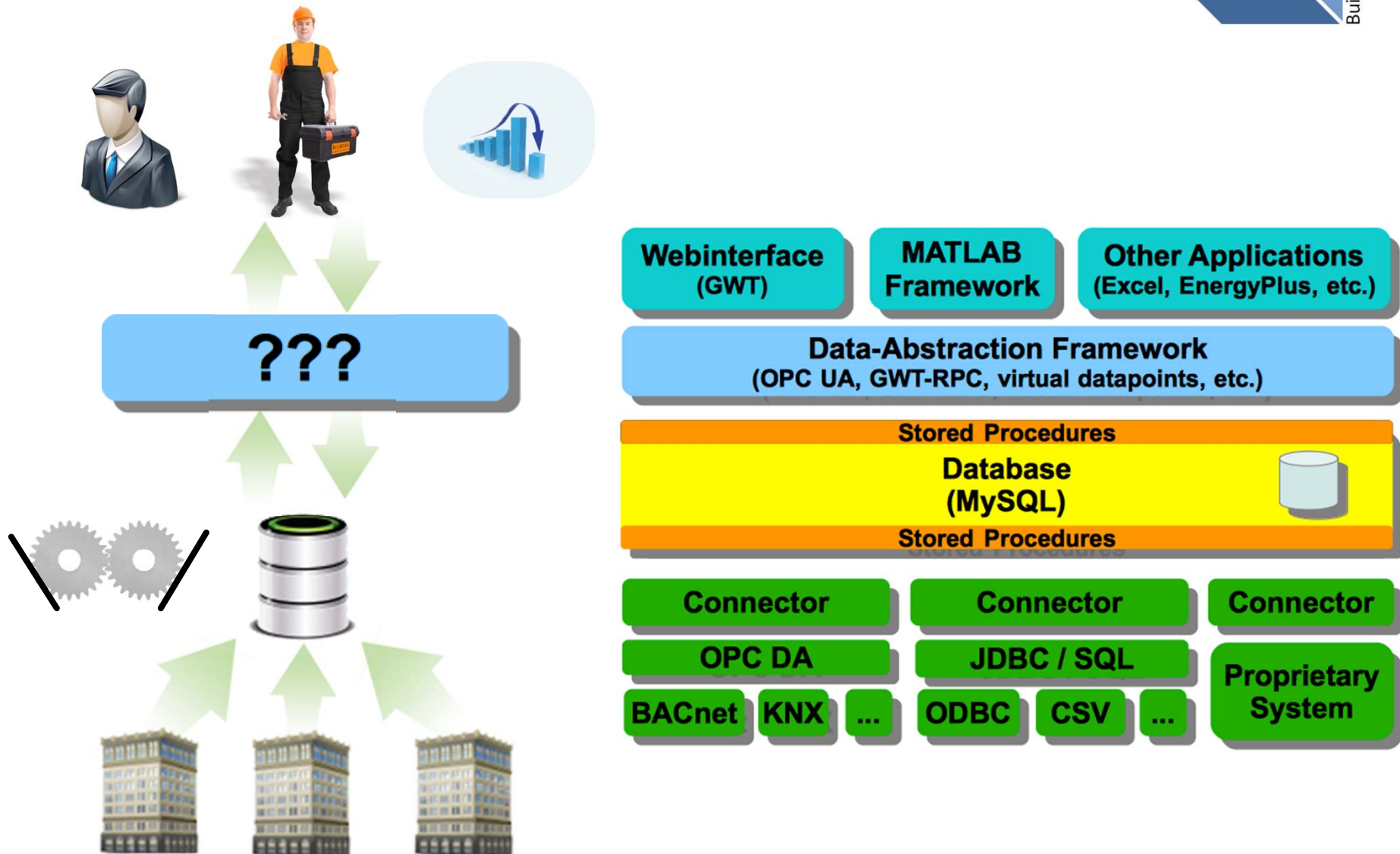
Status quo

- **No comprehensive Data Collection**
- No appropriate
 - **Preprocessing**
 - **Aggregation**
 - Software Interfaces for **Batch Processing**
- No **Real-Time** Data Access
 - **Information Loss/** never used

What we want

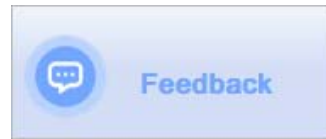
- **Continuous** Reports
- **Live** Performance Visualization
- **Fault Detection**
- Recommendations for Operation
- Personal Feedback

Monitoring System Toolkit



Framework

- Google Web Toolkit
 - Plain Java -> converted to platform optimized JavaScript
- User Interface Library
 - **No** dedicated user interface
 - **Reusable** components
- Drag and Drop
 - **Primary** interaction method
 - **Highlighting** of droppable areas
- **Modular**
 - Use cases



3D-Viewer

- Use cases
 - Lead user within 3D building model
 - Datapoint location
 - Visualize critical information

M ST Monitoring System Toolkit **TU WIEN** TECHNISCHE UNIVERSITÄT WIEN Vienna University of Technology

Logged in: GSOC Derr

Desktop

Charts

Feedback

Export

3D

Load Model

Transparency

Expose

Zoom

Warning

There are no errors!

Pan Rotate

Views

Default | Front | Side | Top
Set View to Datapoint

Zonenhierarchie (IFC)

Project (Project)

Site (Site)

BPI_05 (Building)

Ground Floor (BuildingStorey)

First Floor (BuildingStorey)

Second (BuildingStorey)

Floor (BuildingStorey)

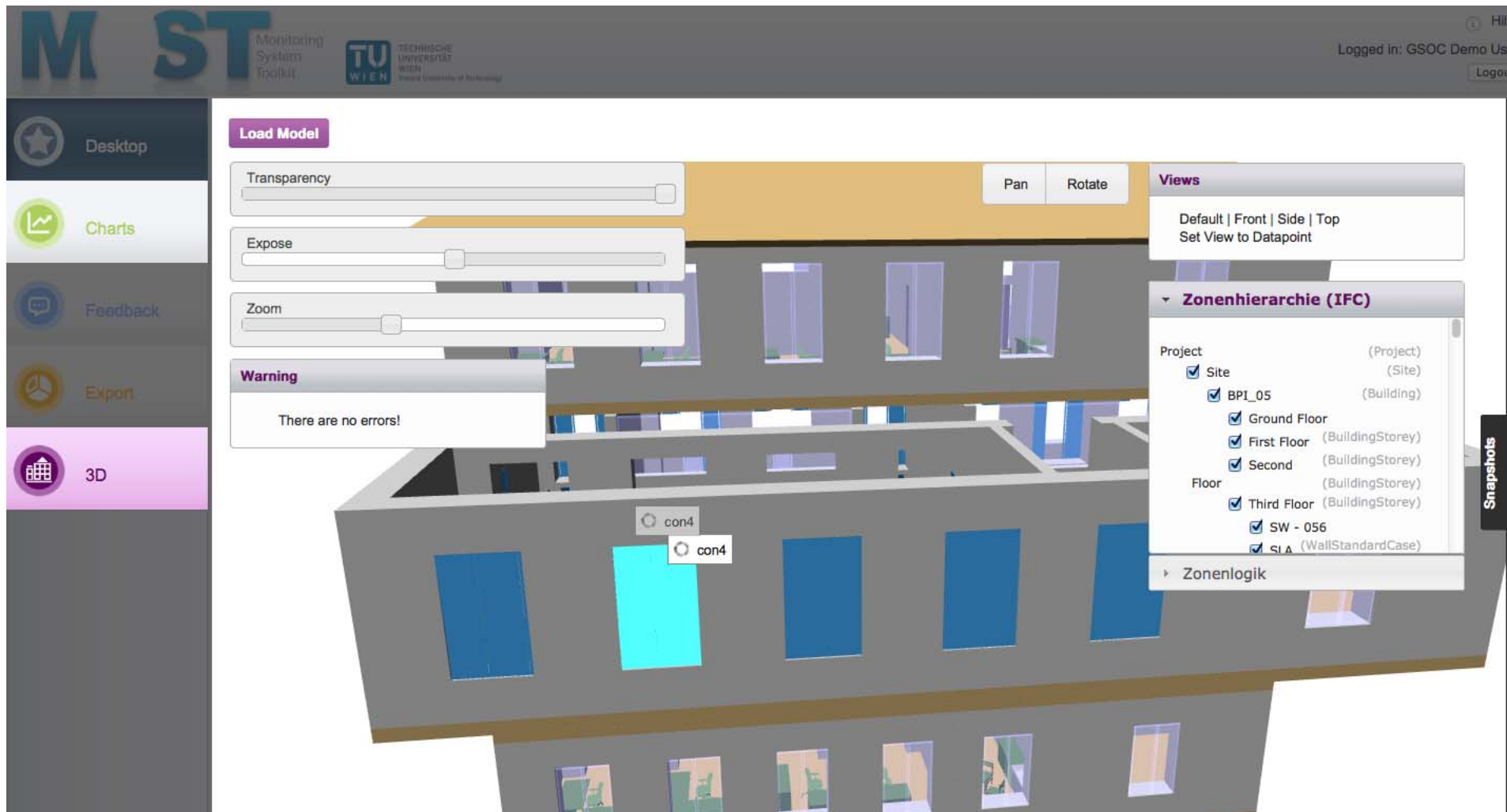
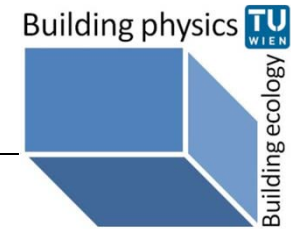
SLA - 011 (Slab)

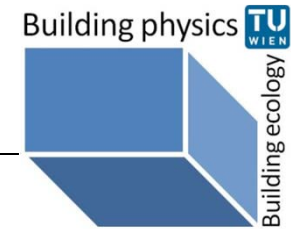
SLA - 012 (Slab)

SLA - 013 (Slab)

► Zonenlogik

3D-Viewer





Chart

Monitoring System Toolkit

TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

Hilfe

Logged in: GSOC Demo User

Logout

★ Desktop

📈 Charts

💬 Feedback

📄 Export

🏠 3D

Search

Temperature

State (contact)

Occupancy

Humidity

Meter

Brightness

Air Quality (CO2, VOC)

Power

Other

Data point output

<input type="checkbox"/> cdi1	<input type="checkbox"/> cdi2	<input type="checkbox"/> cdi3	<input type="checkbox"/> cdi4	<input type="checkbox"/> cdi5
<input type="checkbox"/> cdi6	<input type="checkbox"/> cdi7	<input type="checkbox"/> con1	<input type="checkbox"/> con2	<input type="checkbox"/> con3
<input type="checkbox"/> con4	<input type="checkbox"/> con5	<input type="checkbox"/> con6	<input type="checkbox"/> con7	<input type="checkbox"/> con8
<input type="checkbox"/> con9	<input type="checkbox"/> occ1	<input type="checkbox"/> occ2	<input type="checkbox"/> occ3	<input type="checkbox"/> occ4
<input type="checkbox"/> occ5	<input type="checkbox"/> occ6	<input type="checkbox"/> occ7	<input type="checkbox"/> occ8	<input type="checkbox"/> occ9
<input type="checkbox"/> voc1	<input type="checkbox"/> voc2	<input type="checkbox"/> voc3	<input type="checkbox"/> voc4	<input type="checkbox"/> voc5
<input type="checkbox"/> voc6	<input type="checkbox"/> voc7	<input type="checkbox"/> con10	<input type="checkbox"/> con11	<input type="checkbox"/> con12
<input type="checkbox"/> con13	<input type="checkbox"/> con14	<input type="checkbox"/> con15	<input type="checkbox"/> con16	<input type="checkbox"/> con17

X

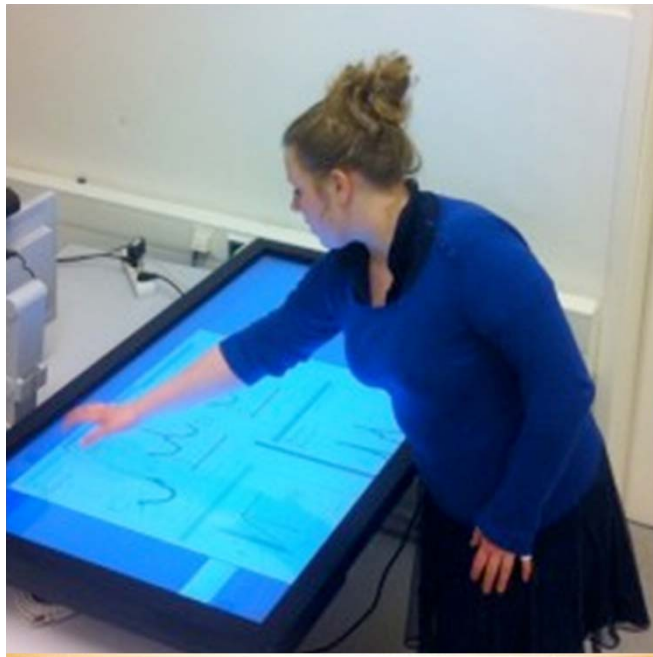
from

until

Live

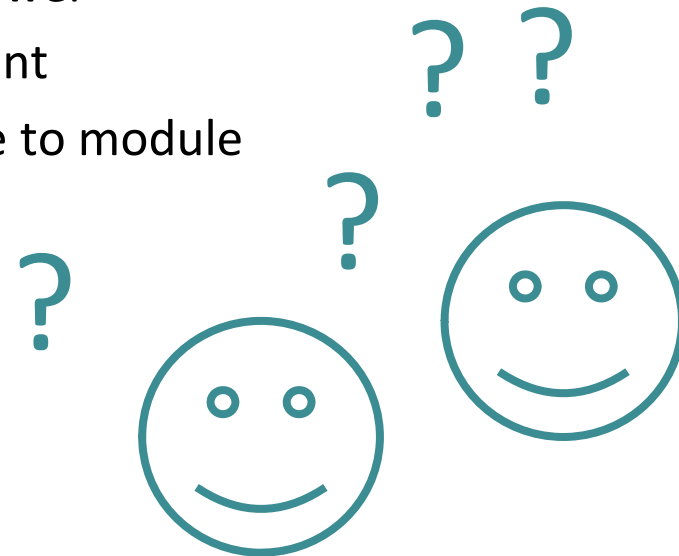
estimated values

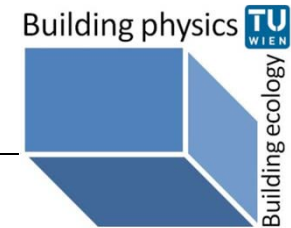
Highcharts.com



Outlook – Usability Study

- Different User Groups
 - Mouse / Keyboard
 - Touch
 - Gesture
- Tasks
 - Select datapoints within the 3D-Viewer
 - Create chart plot of certain datapoint
 - Drag and Drop widget from module to module
- Usability Guidelines
 - Sustainable
 - Analysis of Input Process





Outlook - Data

- NoSQL
 - Big data tables
- Complex datatypes
 - Building models
- RESTful Webservice for MOST
 - Datapoints
 - Zones
- Moving towards Service Integration
 - BIM
 - BimServer
 - 3rd Party Services
- Optimize Model Transmission
 - Processing
 - Image Pyramids

Conclusion



- BIMsurfer 2012
 - <http://bimsurfer.org>
- BIMserver 2012
 - <http://bimserver.org>
- Highcharts JS 2012
 - <http://www.highcharts.com>
- Open-Source / Creative Common License
 - <http://most.bpi.tuwien.ac.at>