

SYSTEM-OF-SYSTEMS THAT ACT **LOCALLY** FOR OPTIMIZING **GLOBALLY**

EU FP7 - SMALL/MEDIUM-SCALE FOCUSED RESEARCH PROJECT (STREP)
FP7-ICT-2013.3.4: ADVANCED COMPUTING, EMBEDDED AND CONTROL SYSTEMS
D) FROM ANALYZING TO CONTROLLING BEHAVIOUR OF SYSTEM OF SYSTEMS (SOS)

Kick-off meeting

Evaluation

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Aachen, Germany

Local⁴Global

Contact Information

For information regarding this Project: Check the Project Web-Site: <http://local4global-fp7.eu>

Participants	
1	CERTH - Centre for Research and Technology
2	ETHZ – Eidgenössische Technische Hochschule Zürich
3	RWTH – RWTH Aachen University
4	IK4 – IK4 TEKNIKER
5	TRV – TRANSVER GmbH
6	TUC – Technical University of Crete
7	TUM – Technische Universität München

Project Acronym: Local4Global

Project Number: 611538

Project Start Date: October 2013

Duration: 3 Years

Funded by: EU FP7

Program Name:

EU FP7 - SMALL/MEDIUM-SCALE FOCUSED RESEARCH PROJECT (STREP)
FP7-ICT-2013.3.4: ADVANCED COMPUTING, EMBEDDED AND CONTROL SYSTEMS
D) FROM ANALYZING TO CONTROLLING BEHAVIOUR OF SYSTEM OF SYSTEMS (SOS)

RWTH Aachen University

- Prof. Dr.-Ing. Dirk Müller , Head of the Institute



- Dr.-Ing. Rit Streblow, Chief Engineer



- Dipl.-Ing. Thomas Schild M.B.A., Research Associate



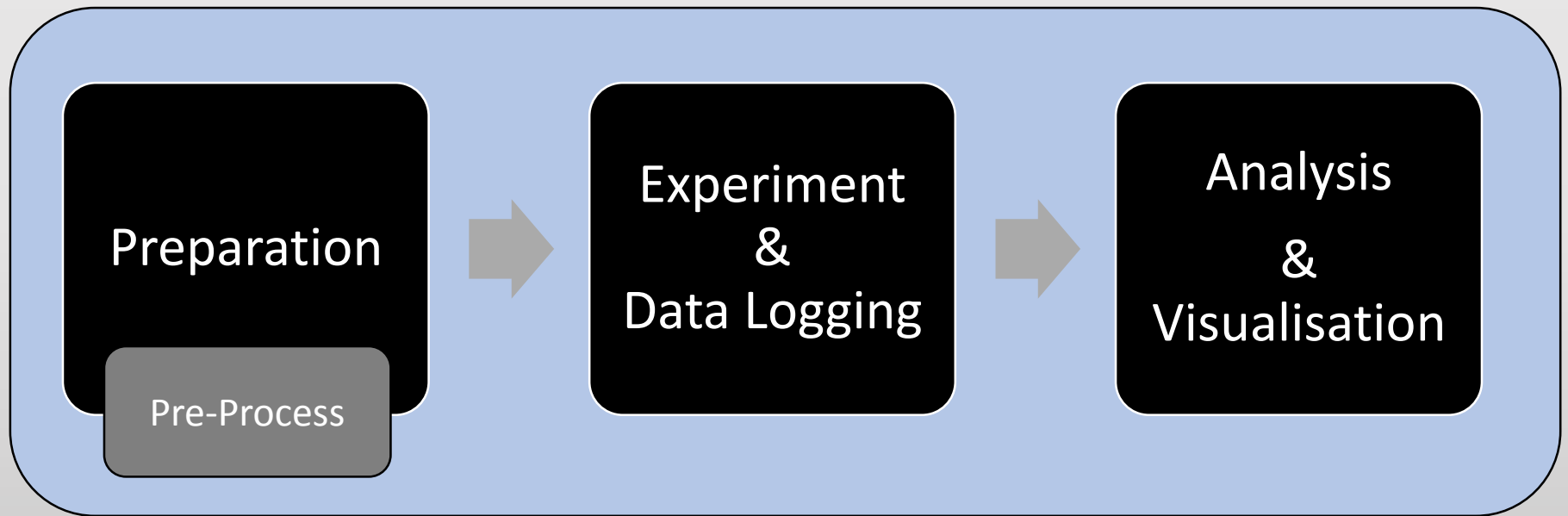
- Dipl.-Wirt.-Ing. Johannes Fütterer , Research Associate



- Roozbeh Sangi, M.Sc., Research Associate



Scope of Evaluation



Evaluation Process

Preparation

- Description of the aims
- Definition of the cost functions
- 'Indicator Table'
- Base case
- Test case(s)
- Fix the current state (performance, user acceptance)

Pre-Process:

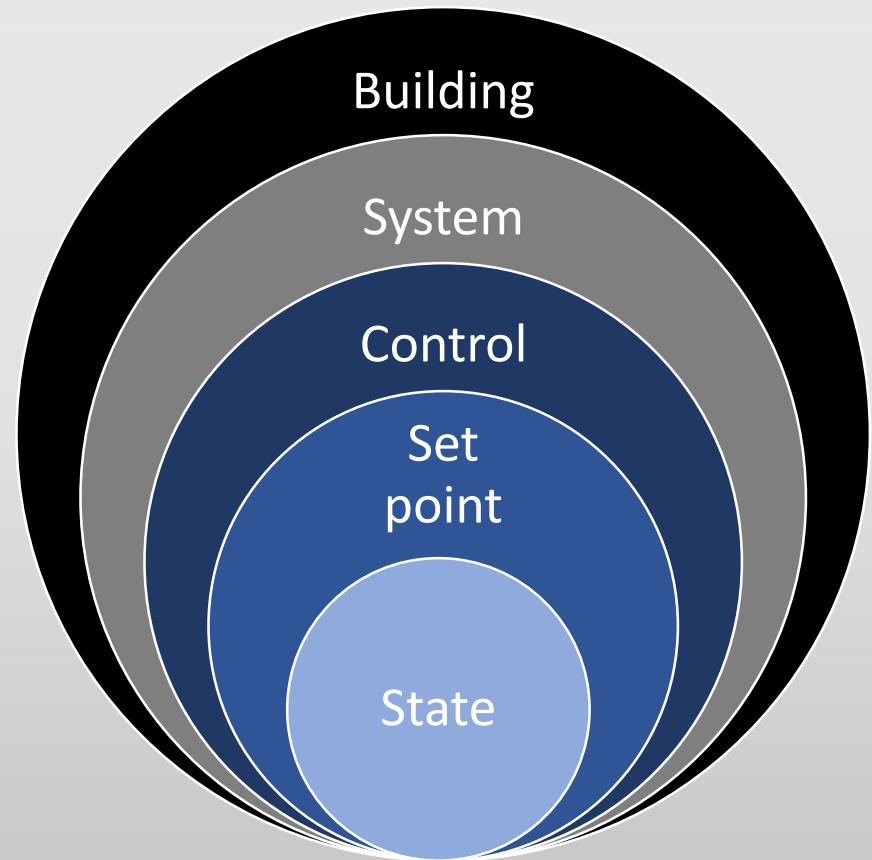
- Draft of the work plan for discussion
- Interviews and questionnaires

L4G in “Building”-Use-Case

- Implementation of the L4G-algorithm
- Theme: Energy efficiency

Example:

- Local system: control system of lowest loop
- Global system: energy balance on building-level



Characteristics in “Building”-Use-Case

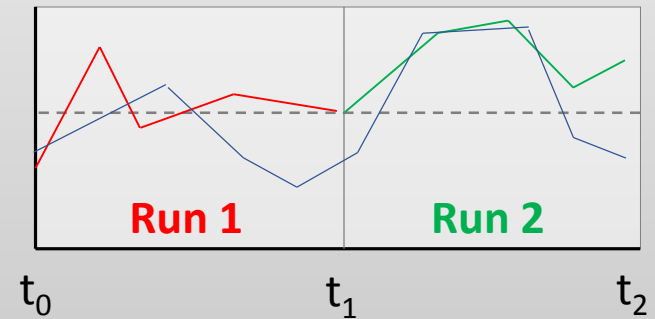
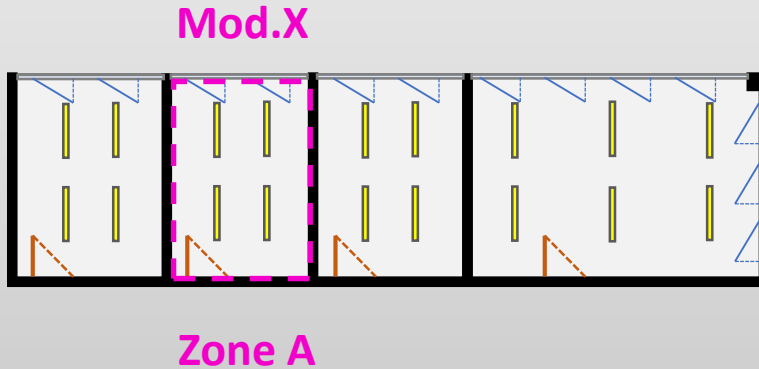
- Uncertain conditions
- Time depending influences



- High replication effort
- Preparation of the experiment is crucial for conclusive results

Method 1

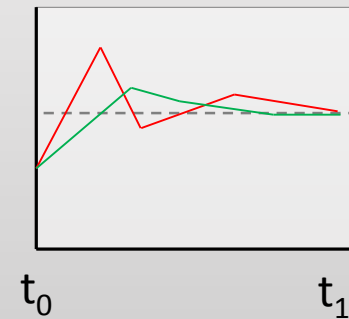
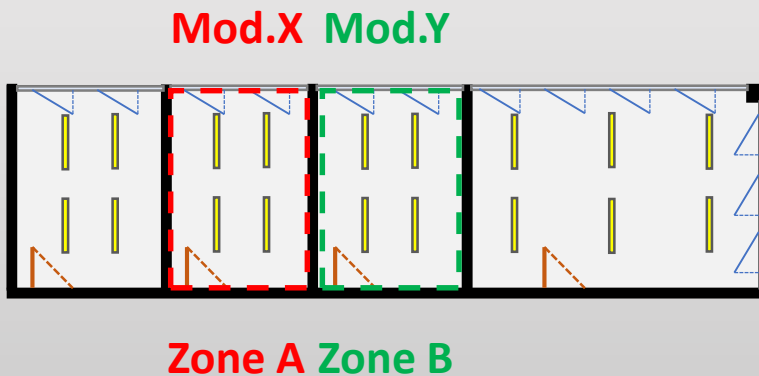
- Successive experiments
- Use of one zone/unit/system
- Long-term measurements



- Resolve differences as a result of changing conditions
- Replication of all conditions hardly feasible

Method 2

- Parallel test benches
- Use of several zones/units/systems
- Same environmental conditions



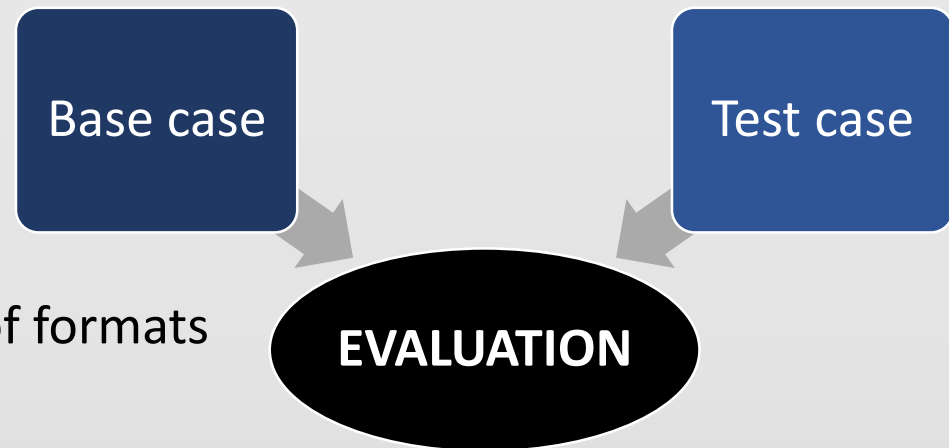
- Direct comparability of different usage
- Conceivably need for more sensor equipment

Experiment & Data Logging

- Agreement on work plan
- Implementation of relevant variables and data points
- Initiation of experiment and data logging
- Continuous measurement
- Real-time values available
- No interruptions necessary to get the data (ON-SITE)

Analysis & Visualization

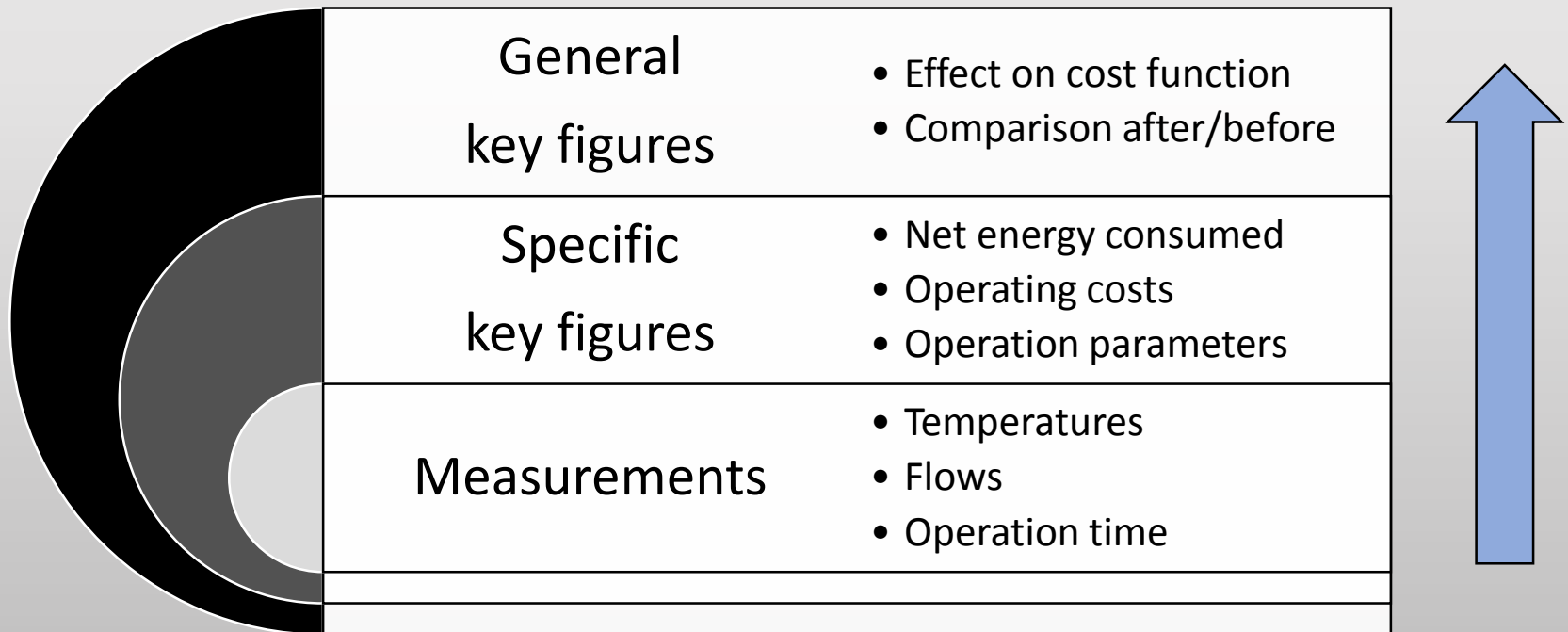
- Proposed method
- Relational database (SQL)
- Transferable to a great number of formats
- Usable in common tools
- Dynamic visualization
- Selection of relevant records
 - Base case
 - Test case



Evaluation

Strategy:

- Reduction to use-case-dependent key figures or ratios
- Transfer to general key figures or ratios



Evaluation (requirements)

- Evaluation in general and per use-case
- 1st focus: performance of local4global system
 - Average daily values, peaks
 - System performance, cost-efficiency
 - Performance during normal and abnormal operation
- 2nd focus: users' acceptance
 - Interviews and questionnaires
 - Effect of local4global system operation
 - Guidelines for socio-economic evaluation

Evaluation work flow

- Search and suggestions for L4G-applications
- Development of specific evaluation plans



Collaboration

- Derivation of the general evaluation plan
- Structuring the reports



Assembling of evaluation plans



- Discussion of the results
- Agreement on principles of evaluation

Summary

- First deliverable in 8th month
- 3 participants, 7 person-month
- dependence to WP5
- Agreement on principles of evaluation
- “1st Draft Evaluation plan”
- Dissemination level PU

- Agreement on details for presentation of evaluation results
- Expected date 8th month as preparation for the following tasks

Lab/Company

- RWTH Aachen University
- E.ON Energy Research Center
- Institute for Energy Efficient Buildings and Indoor Climate (EBC)

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