Review WP2.1

4th Expert Meeting IBPSA Project 1, Rome

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31.08.2019 – 01.09.2019

The idea of WP2.1
City Quarter Modelling and Simulations

- Data Mapping
- Archetypical Definition
- Parsimonious geometric processing
- Semantic enrichment
- Data exchange
- Dataset demonstration
- Demonstration of workflows…..

Paper WP2.1

Name	Owner	Last modified	File size
Data acquisition	Gerald Gs	Jul 9, 2019 Gerald Gs	–
Data Enrichment	Gerald Gs	Jul 9, 2019 Gerald Gs	–
Data models	Gerald Gs	Jul 9, 2019 Gerald Gs	–
Modelling and optimization tools	Gerald Gs	Jul 9, 2019 Gerald Gs	–
Use Cases	Gerald Gs	Jul 9, 2019 Gerald Gs	–

Different Tasks along with their respective leaders

Detailed discussion over individual inputs

- Discussion → Decision: we will decide later

Structure of chapter 3

Joachim:

- I think we should start here with a review of data models and a discussion, which ones are in fact are relevant within the scope of the paper.
  - James: I only have a very superficial understanding of the concept of data model vs data format. Should this distinction be covered in a separate section?
    - Discussion → Decision: no separate chapter
- Afterwards, we can speak about "data acquisition" (of perhaps better "data availability"?), which always is related with a specific data model/format.
  - James: Yes we would need to have a section on the data availability and logically, we would need to evaluate how the available or acquired data could be converted into the models and formats that we have reviewed; however does such an exercise have a place in a review article?
    - Discussion → Decision: We need to address this but it is not the main scope (outlook, critical discussion, …)
  - Would this be better implemented in a second article that shows a work-flow applied to a case-study?

Data acquisition

Structure Overview

Contents

Individual reviews

3.1 Data models

For energy related simulations on city quarter or city level, reproducing the real thermodynamic behaviour of the target system with sufficient accuracy, a lot of information about each single building is needed (see Table 1).

Location and geometry	Geographic location of the building, shape and orientation of the building's exterior boundary surfaces, boundary conditions (e.g. air, ground, adjacent building) of these surfaces, and building's floor area size.
Openings	Location, shape and orientation of openings (doors and windows) in exterior boundary surfaces.
Thermal Zones and Thermal Boundaries	Geometric representation of internal zones (e.g. rooms) with distinct thermal conditions, and of contact surfaces (thermal boundaries) between two zones or one zone and the outside environment.
Building physics	Energy relevant thermal and optical parameters of external and internal building elements (interior and exterior walls, roof, internal slabs and ground plate, windows and doors).
Building systems	Information on energy relevant building systems, especially concerning the building's Heating, Ventilation and Air Conditioning (HVAC) systems.
Usage	Information concerning the energy relevant behaviour of the building's occupants, e.g. nominal heating / cooling temperatures and ventilation rates in different Thermal Zones.
Internal heat gains	Internal heat generation by building systems (e.g. lighting, electrical facilities, hot water production) and occupants.

Table 1: Building data for energy related simulations

Further Developments

- Further comparison between multiple simulation software and tools, such as Modelica, Energy Plus, ETU
- Development of a common data exchange platform, initiated by KIT and E3D
- Further development of tools which emphasize over multiple basic functionalities such as building search using google coordinate.
- Further to be discussed in the breakout sessions….