VIA UNIVERSITY COLLEGE
ICT ENGINEERING

Project Description

Moisture Data Collector

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Project Description

Background description

Moisture in buildings has been given more and more attention the latest decade. Not only old houses with water leaks but also new houses have shown damages caused by moisture accumulation within building envelopes (Brandt, 2009).

According to (Building Regulations, 2010) and the corresponding guidelines (Stang, 2008), buildings have to be secured against moisture accumulation due to moisture transport from internal air and moisture absorbed from the external ground.

The recommended approach to verify risk-free exterior building envelopes with respect to moisture transport from internal air is to use a steady-state diffusion model (DS/EN ISO 13788, 2001) and (Andersen, 2009). In this diffusion model, temperature and humidity curves are calculated using monthly averaged data for interior and exterior temperature and humidity as input. See also (Andersen, 2011).

Data measurements for temperature and humidity through an exterior building envelope can be performed as an alternative or a supplement to calculations. Life data measurements open up for a variety of uses like moisture risk monitoring, educational and research purposes e.g. analysis of averaged and peak data or to verify the diffusion model from (DS/EN ISO 13788, 2001).

Data sets can be collected using a data logger connected to temperature and humidity transducers e.g. in different depths through a wall, each measuring a new data set in a given time interval e.g. every 5 minute. A server hosting a database receives data from the data logger and thereby opens up for specific client computers to fetch the data (Demohouse Nexø - Fugt, 2011).

Today, only a few databases collecting data from a building envelope are available but in near future VIA University College and partners are expected to build in transducers and collect and send data from renovation and new construction projects. The purpose for these projects will be to collect and present data for different kinds of markers like moisture, energy usage, indoor climate and hopefully to provide a quantity of data from a number of different building envelopes.

Collecting data from various building envelopes e.g. for educational and research purposes would involve specific knowledge of each database which among other things could vary both with respect to hosting and with respect to type and structure of database. The differences in the way to fetch the data could make it difficult for a single client application to collect and compare data coming from different sources.

Purpose

The purpose is to create a system that can collect moisture data for various building envelopes.

Problem formulation

The project focus is to make data available for users in a generic way using client/server architecture. The server will be responsible for collecting data from external sources and may include a local data persistence of either selected data from other sources or processed data like averaged values and similar. The client will collect data from the server on request.

Questions to be answered are the following:

- How to make data available for download or presentation?
- How to make data selection uniformly for all building envelopes (different underlying database structure)?
- How to make the system maintainable, i.e. relatively easy to include data from other sources?
- How to make the system scalable – e.g. from 2 to 20 building envelopes?

Delimitation

- Data sets will not contain other values than temperature and relative humidity.
- The system will not include any data collection directly from data loggers but only from databases.

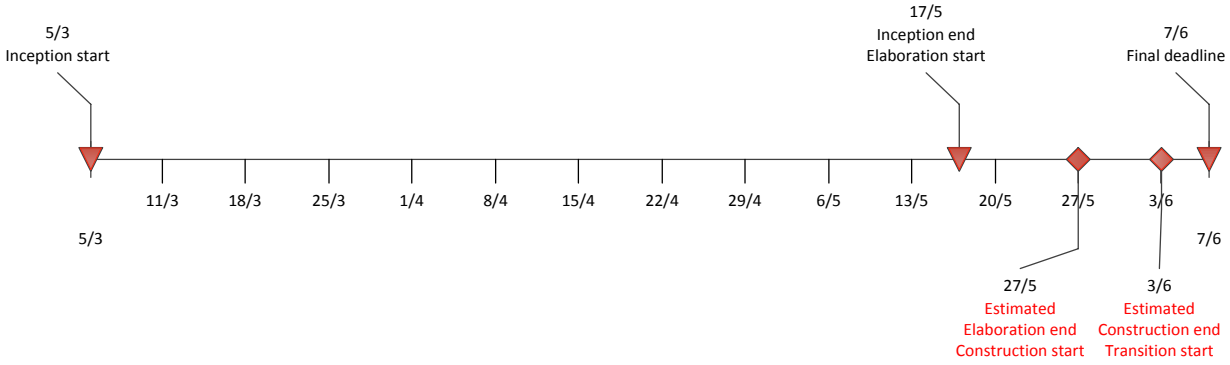
Choice of model and method

What Partial problem	**Why** Why study this problem?	**Which** Which models/theories are expected to be used to solve the problem?
How to make data available for download or presentation	Main feature of the system	Examining data from (Demohouse Nexø - Fugt, 2011). Set up requirements for data. Use Case Modelling.
How to make uniform data selection	Easy access for data coming from different sources	Inspect similarities between data from different sources. UML class modelling. Client/server architecture. Design patterns.
How to make the system maintainable	Easy to include data from new sources after first release	Use Case modelling and class diagrams for admin module or similar. Design patterns. Database design.
How to make the system scalable	Program structure independently of number of sources	UML class modelling and class diagrams for a large scale system with the ability to be used in small scale. Design patterns.

Time schedule

The time scope is estimated at 500 hours. The project is developed using AUP as method. The time schedule is based on a Phase plan as global planning of the project and SCRUM will be used as framework for controlling the project and each sprint will contain several of the AUP disciplines.

The phase plan is estimated as follows:



Inception phase is from 5/3/2013 to 17/5/2013 and final deadline is 7/6/2013. The two other deadlines are estimated and cannot be defined until their previous phase ends. The estimation is that the Elaboration phase is from 17/5/2013 to approximately 27/5/2013 where the Construction phase starts. The Construction phase is estimated to end 3/6/2013 starting the last phase, the Transition phase.

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