



## REQUIREMENTS DOCUMENT

CLIENT: SUSTAINABLE BUILDINGS

VERSION 1.2

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# A visualizing tool for OrientDB

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*Authors:*

Niels Bugel  
Albert Dijkstra  
Antal Huisman  
Carlos Isasa  
Yona Moreda  
Emanuel Nae

*TA:*

Ai Deng

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## 1 Introduction

Sustainable Buildings is a company that develops the next generation of energy management systems. The goal of this is to reduce energy consumption in office buildings, ease the job of building managers, and make the working environment of building users healthier and more productive. The users can view and manage the energy consumption of multiple buildings from one dashboard. All this means that a lot of hierarchical information is being stored. Our aim is to provide a tool that can display these hierarchies in a clear and structured manner.

## 2 System Overview

The OrientDB visualising tool will serve as a graphical interface with the scope of visualising the information from the Sustainable Buildings database in a manner that can be easily read and interpreted. This will be done so by creating a hierarchical tree structure with the following levels of entities, in this order: organisations, locations, buildings, floors, rooms. The rooms are considered the leaves of the tree, which contain multiple sensors with information about the environment of the room. By building and using this tool, the user will be able to see the information in a clear and structured way.

## 3 Users

In its first stages, the only users of this tool will be the SB-Users and the organisations admins. A reason for that could be that, even though the tool will be rather easy to use, the shown information might require expertise knowledge for further analysis. As the application and its functionality grow, multiple users might be added to the system in the future.

One of the main concerns with adding multiple users is the notion of security. Therefore the main focus of this program will remain on the SB-Users rather than the Organisation-Admins well. The SB-Users should be able to see the information about the structure of all the organisations.

### **Organisation Admin:**

The organisation admin is the person that works in the administrative level of an organisation which has access to the visualising tool for better energy management of a location. The organisation admin will have read-only access to the tool.

### **SB users:**

A SB user is a person that works for sustainable Buildings. Unlike the organisation admin, the SB users will not have a limited access to the tool. The SB users will be able to see information about all the organisations and, moreover, have access to further developing the tool. On top of that, the SB users will be able to add or edit certain things in the database via this tool.

## **4 User Stories**

The requirements of this system are represented by using user stories. The reason for this is that user stories help both the client and the team to understand what the system will consist of and why is that happening. There are 5 categories of requirements, which can be seen below.

### **4.1 Terminology**

First we will explain some of the terminology used in the requirements below.

- **Place** A place can refer to either a location, a building, a floor, a room, an area or a cell.
- **Vertex:**  
The database that is used is graph based. This means that it consists of vertices and edges. A vertex is a concrete object, while the edges refer to the relations between these object. We will also use the term vertex for our program.
- **Tree structure of a location:**  
The data about a location is stored in a hierarchical order. This means that it we can represent it as a tree-like structure. This tree has multiple levels and each of these levels can have multiple vertices.
- **Entity** When we refer to an entity, we refer to sensors. These sensors can be physical, raw message or virtual. These sensors are connected to a place.

## 4.2 Critical Functional Requirements (MVP)

1. As a Organisation-Admin/SB-User, I would like to see the tree representation of a location and its buildings, floors and rooms.
2. As a Organisation-Admin/SB-User, I would like to see a list of entities connected to a vertex when I click on said vertex.
3. As a Organisation-Admin/SB-User, I would like to select an entity in the entity list so that I can see the id of that entity.

## 4.3 Important Functional Requirements

1. As a Organisation-Admin/SB-User, I would like to see a list of all available organisations.
2. As a Organisation-Admin/SB-User, I would like to see a list of all available locations.
3. As a Organisation-Admin/SB-User, I would like to select a location so that I can see the total electricity consumption/generation for that respective location.
4. As a SB-User, I would like to filter the list of locations based on organisations/prefixes.
5. As a Organisation-Admin/SB-User, I would like to expand the tree structure of a place.
6. As a Organisation-Admin/SB-User, I would like to collapse the tree structure of a place.

## 4.4 Useful Functional Requirements

1. As a Organisation-Admin/SB-User, I would like to search for an entity, so that I can find information about that specific entity.
2. As a Organisation-Admin/SB-User, I would like to search for an organisation, so that I can select and find information about that specific organisation.
3. As a Organisation-Admin/SB-User, I would like to search for a location, so that I can select and find information about that specific location.
4. As a SB-User, I would like to rename vertices in the tree structure.

5. As a Organisation-Admin/SB-User, I would like to select an entity in the entity list so that I can see all available data of that entity.
6. As a Organisation-Admin/SB-User, I would like to see a list of all the entities that are connected to the current vertex and its children.
7. As a Organisation-Admin/SB-User, I would like to toggle certain parts of the sensor list.
8. As a Organisation-Admin/SB-User, I would like to select a location so that I can see the address, number of buildings, number of floors and number of rooms for that respective location.

## 4.5 Non-Functional Requirements

1. As a Organisation-Admin/SB-User, I would like to be able to access this application on web in order to have easier access.
2. As a Organisation-Admin/SB-User, I would like to be able to refresh the system so that the data stays synchronised.
3. As a Organisation-Admin/SB-User, I would like to be able to use the visualising tool easily.
4. As a Organisation-Admin/SB-User, I would like to be able to read the information in the system in a structured manner.

## 4.6 Won't Do

1. As a (SB)developer, I would not like to have a clustered code.
2. As a SB developer, I would not like to have all the organisations available for testing at the MVP stage.

## 5 Meeting log

When	What
20 febr 2019	Client Meeting <ul style="list-style-type: none"><li>- Introductions of client and the company.</li><li>- Chose the programming language, Java. We have to research the right visual extension.</li><li>- Discussed the options with their API. The client will send their documentation for us to study.</li><li>- The client shared their wishes.</li><li>- We will hold client meetings every two weeks.</li></ul>
7 mrch 2019	Group Meeting <ul style="list-style-type: none"><li>- Discussed the Architect document:</li><li>- The front-end's task is to learn JavaFX and create the view-controller</li><li>- The back-end's task is to learn OrientDB and create the model</li><li>- The all-round's task is to create a skeleton program and make sure everything stays consistent</li><li>- Everyone should use the project tracker and trello</li></ul>
11 mrch 2019	Client Meeting <ul style="list-style-type: none"><li>- Discussed the requirements document feedback</li><li>- Discussed the architecture document</li><li>- Showed and discussed the JavaFX demo. We should use dependencies for this.</li><li>- Discussed the architecture of OrientDB</li></ul>
14 mrch 2019	Group Meeting <ul style="list-style-type: none"><li>- TA asked for the current progress</li><li>- We got introduced to the goal tracker</li></ul>
19 mrch 2019	Group Meeting <ul style="list-style-type: none"><li>- Discussing Error with the connection</li><li>- Discussing first sprint</li><li>- Deadline for connection to database is Thursday</li><li>- Discussion about the presentation</li></ul>
25 mrch 2019	Group Meeting <ul style="list-style-type: none"><li>- Carlos and Antal need to get the data transfer to work before Thursday</li><li>- Yona and Albert will do the presentation</li><li>- The deadline of the slides of the presentation is friday 29 march</li></ul>

1 Apr 2019	<p>Client Meeting</p> <ul style="list-style-type: none"><li>- Showed minimum viable product and demo.</li><li>- Discussed visual representation of sensors and other general feedback</li><li>- Discussed some questions regarding the database structure</li></ul> <p>Group Meeting</p> <ul style="list-style-type: none"><li>- Discussed some group issues</li><li>- Discussed and practiced presentation</li></ul>
12 Apr 2019	<p>Group Meeting</p> <ul style="list-style-type: none"><li>- Discussed sprint 2</li><li>- Discussed group issues</li><li>- Discussed when we will get feedback</li><li>- Discussed current workflow</li><li>- Discussed tasks for sprint 3</li></ul>
18 Apr 2019	<p>Group Meeting</p> <ul style="list-style-type: none"><li>- Discussed front-end and back-end for part 3</li><li>- Discussed menu bar functionality</li><li>- Discussed way of visualising linked entities</li><li>- Attempted to fix bug for expanding anchor pane</li></ul>
25 Apr 2019	<p>TA/Group Meeting</p> <ul style="list-style-type: none"><li>- Discussed feedback presentation and sprint 2</li><li>- Discussed what needs to be finished before sprint 4 ends</li><li>- Discussed what needs to be done in sprint 5</li><li>- Discussed grades for first half of the course</li><li>- Discussed layout of main menu</li></ul>



## 6 Change Log

Date	Who	Section	What
21 February 2019	Niels Bugel Albert Dijkstra	Document	Created document and layout
21 February 2019	Niels Bugel	Introduction	wrote the introduction
21 February 2019	Antal Huisman	Meeting Log	Added Client Meeting Log
21 February 2019	Yona Moreda	System Overview	Wrote system overview
22 February 2019	Niels Bugel	User stories	Added the user stories from the meeting document
22 February 2019	Emanuel Nae	User stories	Refined some user stories + added non-functional and won't do requirements
22 February 2019	Emanuel Nae	Document	Refined some writing, changed some sections + added own comments on changes
28 February 2019	Niels Bugel Albert Dijkstra	Document	Resolved some comments, added a few other comments.
4 March 2019	Niels Bugel	Users, User Stories	Adjusted the users and user stories to fit the feedback of the customer.
4 March 2019	Emanuel Nae	User Stories	Adjusted the critical requirements.
7 March 2019	Antal Huisman	Meeting Log	Added Meeting Log
11 March 2019	Niels Bugel	Meeting Log	Added Meeting Log for client meeting
15 March 2019	Antal Huisman	Meeting Log	Added Meeting Log
19 March 2019	Antal Huisman	Meeting Log	Added Meeting Log
25 March 2019	Antal Huisman	Meeting Log	Added Meeting Log
1 Apr 2019	Niels Bugel	Meeting Log	Added Meeting Log for client and group meeting

1 Apr 2019	Niels Bugel	Meeting Log	Added Meeting Log for client and group meeting
12 Apr 2019	Niels Bugel	User stories	changed some requirements. Mainly sensor graph to entity list and sensor to entity
17 Apr 2019	Niels Bugel	Meeting log	added meeting log for group and TA meeting.
17 Apr 2019	Niels Bugel	User stories	changed some requirements.
18 Apr 2019	Niels Bugel	Meeting log	added meeting log for group meeting.
25 Apr 2019	Niels Bugel	Meeting log	added meeting log for TA/group meeting.
29 Apr 2019	Niels Bugel	User, User stories	added a note regarding security, made some things more clear.