



*Co-funded by the European Community Horizon 2020 Program*

Project Title:

# **ORganizational Behaviour improvement for Energy Efficient administrative public offices**



## **OrbEET**

**Grant Agreement No: 649753**

**Collaborative Project**

### **Public Summary**

Deliverable No.	<b>D3.1 Deployment plan and installation manual for the energy use data capture and management framework</b>
Workpackage	<b>WP3 Pilot Setup &amp; Configuration</b>
Task	<b>T3.1 Sensing Network &amp; Information Management Services Development</b>
Lead beneficiary	<b>HYPERTECH</b>



# 1. PUBLISHABLE PUBLIC SUMMARY

---

This report presents the results of Task 3.1 – Sensing Network & Information Management Services Development. The goal of the document is to provide a holistic view on the system Sensing Network and Information Management Services Development that consist of the interconnection layer with the physical world.

To develop OrbEEt framework we need to get access on real time measurements of energy and context data. This task develops and delivers the low-level technology framework (sensors & gateway properly integrated) responsible for collecting energy use data and pre-processing them for Enhanced OR generation. Selection of representative energy loads and appropriate sensors/meters, sensor networking configuration for the pilot site venues and development of the software stack that collect and process sensor/meter outputs and information from other pre-existing metering infrastructures to produce a unified stream of energy use information are performed. Therefore, the goal of this task is twofold:

- To select the low-level technology framework (sensors & gateway properly integrated) responsible for collecting energy use data
- To develop and document OrbEEt Information Management Layer responsible for pre-processing raw data for Enhanced OR generation. In addition, the services for dissemination of processed information are provided in this document.

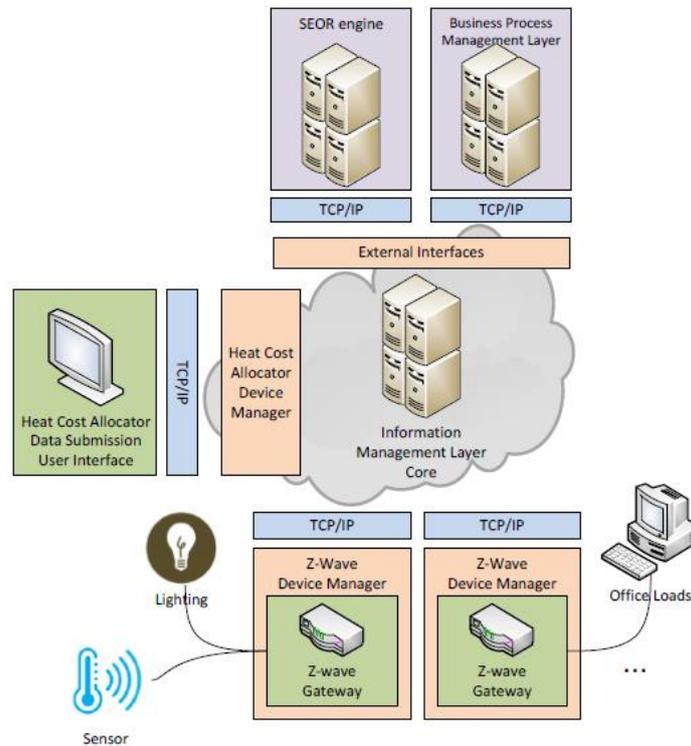
The first part of the work is the selection of sensor and gateway equipment that consist of OrbEEt WSN Topology. The selection of the final solution is not an easy task as different limitations and requirements should be considered. Therefore, a detailed evaluation of alternative solutions is considered for the final deployment. The analysis starts with the selection of criteria to be considered for the evaluation process (mainly based on requirements and specifications analysis). Then a review of the alternative solutions is performed based on the selected criteria towards the selection of optimal WSN topology for project needs. The goal of this chapter is not a complete protocol evaluation, which is also out of the scope of the deliverable, but the optimal selection of the final solution to be used based on the project needs.

In addition, OrbEEt Information Management Layer will comprise of appropriate **device managers**, allowing the integration of different sensors into the OrbEEt system and of semantically enhanced **DER/Sensor Components**, to allow the formation of specific purposed classes of physical nodes and align the respective semantics to the dynamic data gathered or managed by the various device managers towards the provision of normalized data on the upper layer services. In addition, this module will be responsible to store the historical data needed for overall system.

The main functionalities of the Information Management Layer are considered from the reference architecture document:

- Provision of interfaces with the physical world, setting interconnections on the gateway level towards the extraction of data from WSN building environment.
- Provision of a single point of access to data feeds and operations of individual loads via Web Services interface protocols.
- Provision of an Event-based model for data access for all system components.
- Provision of semantically enhanced data context information according to OrbEEt's Common Information Model.
- Logging and local storage of data streams per device

The deployment diagram of the layer reference architecture is depicted in the following figure acting as the liaison between the data collection and processing mechanism and the other components of the OrbEET framework.



The Wireless Sensor Network software installation manual is presented within the scope of the deliverable providing detailed instructions and work around to possible issues that can arise during the installation process.

We then proceed with the alpha testing of the system in lab premises, which describes the tests delivered in HYPERTECH offices lab set up towards the delivery of the final OrbEET solution. The tests cover both functional and technical issues, towards the delivery of a mature solution that can be easily adapted (plug and play) in pilot premises.

Finally, the last section summarizes the final results of this work, focusing on the interconnection of OrbEET Information Management Layer with the rest of the system components and the actual deployment of ORBEET IML in pilot premises.