
ConSumar

Researchers:

- [Cénits](#) [1]-[COMPUTAEX](#) [2].

Language English

Description:

Energy consumption is one of the main expenses that citizens and businesses must face. New technologies play a major role when establishing control and monitoring systems to manage consumption and energy sustainability. Proper planning of large consumption equipment can mean significant savings. The aim of the ConSumar project is to develop tools that, based on Big Data techniques, allow consumers to improve the planning of their energy expenditure by predicting costs, relating the price of energy with climate data.

Objectives:

In this project the following objectives have been achieved:

- Achieving energy efficiency in both the home and business environment.
- Application of Big Data techniques to the analysis of energy consumption data.
- Search for economic and ecological sustainability through new technologies.
- A prospector software of the different electricity rates in each moment.

Methodology:

After having developed a detailed study of the legal regulations of the electricity sector, as well as having analyzed the needs and the available ecosystem to apply the Big Data paradigm to the energy sector, an open platform has been developed to obtain the data and perform its analysis, mainly focused in the cost of energy.

These data are reviewed by the analysis tools to find patterns of behavior between the cost of electricity and the different independent variables to be measured, such as climate information, the capacity to generate renewable energies, etc.

To do this, a set of tools has been designed to perform the following tasks:

- Fixed data collection. Energy costs and climate data must be available for the analysis.
- Display tool for different electricity rates.
- Satisfaction platform about the electricity service.
- Data analysis tools.

Achieved objectives:

Intelligent energy management not only helps consumers in making decisions when they must program the functioning of the equipments with the highest energy consumptions. This fact allows a greater planning depending on different factors such as economic ones, or, even, the environmental consequences.

There are broad lines of work in this field, allowing to cover many fields of action. In this project, a large number of tools have been developed in order to allow, not only the collection of data from heterogeneous sources, but also its classification and availability to be consulted by consumers in a simple way.

The development of the prices display tool and the satisfaction platform about the electricity service, are based on the MEAN applications stack. This acronym is formed by the initials of the four main technologies used: MongoDB, Express, AngularJS and Node.js.

In addition to the collection and visualization tools of the different project data sources, a data analysis tool has been developed for the study of energy costs through Big Data techniques.

For the analysis of the data stored in mongoDB, several scripts have been developed using the programming language R under the Machine Learning paradigm, applying techniques of neural networks and multiple linear regression.

The new data, calculated through the scripts, are stored again in the mongoDB database to be also incorporated, both to the application that shows the results, and to the Big Data system itself.

This application, developed for this purpose under the MEAN paradigm, provides the hourly values of the electrical prediction.

Links

[1] <https://www.cenits.es/cenits> [2] <https://www.cenits.es/fundacion>