**Software Requirements Specification (SRS) Document**

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|  | **Demand Forecasting of Air Conditioning for Commercial Complex, Team 12 and Akshat Goyal, Kanish Anand, Nikunj Nawal and Sridhar M** |

# Brief problem statement

Given the energy consumption data of any building we have to estimate the future energy demand of the complex on an hourly and daily basis. We are supposed to create a web application for the pre-stated problem statement.

# System requirements

# Frontend - HTML, CSS , JavaScript

# Backend - NodeJS

# Database - MongoDB

# Machine Learning - Python3 , Mathematics and ML libraries

# Cloud Hosting - Azure or AWS

# API - Open Weather API

# Users profile

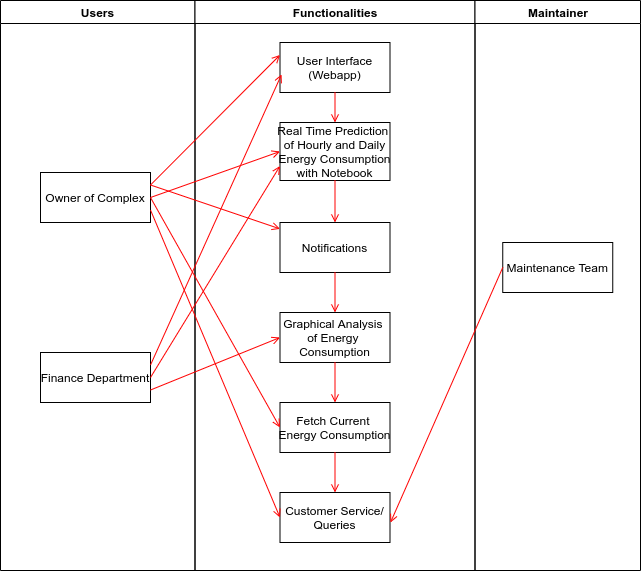
# The different users who would be using the software include:

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| S.No. | USER | Description |
| 1 | Owner of the Complex | The Owner will have full access to the product, will be familiar with using the software and can monitor energy consumption rate, generate reports and act accordingly. |
| 2. | Finance Team of the Complex | The Finance team will use the future energy consumption to reduce the consumption and cost of electricity. |
| 3. | Maintenance Team | The Maintenance team will ensure the maintenance of the software with the changing system environment and will provide updates. |

# Feature requirements (described using use cases)

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| **No.** | **Use Case Name** | **Description** | **Release** |
|  | Real Time Prediction of hourly or daily energy consumption with Notebook without User Interface. | Users can get the prediction of hourly and daily energy consumption by using Jupyter Notebook. Functional Web-app not included | R1 |
| 2. | Graphical Analysis of the energy consumption | Users can get the graphical analysis of the energy consumption. | R1 |
| 3. | User Interface | The users will be accessing the WebApp on a web browser. A responsive user interface will be designed to provide various functionalities. | R2 |
| 4. | Notifications | SMS notifications and emails will be sent to the user in case of high energy consumption. | R2 |
| 5. | Fetching the current energy consumption | The system will fetch the current energy consumption of the building to improve the model and will keep the statistics of the past energy consumption. | R2 |
| 6. | Customer Services/Queries | The user can ask the queries in case of any trouble. | R2 |

**Use case diagram**

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**Use case description**

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| **Use Case Number:** | 1 |
| **Use Case Name:** | Real Time Prediction of hourly or daily energy consumption with Notebook without User Interface. |
| **Overview:** | Users can get the prediction of hourly and daily energy consumption by using Jupyter Notebook. This can be very useful for the customer to already know the future consumption and therefore can take measures to reduce consumption. |
| **Actors:** | Owner, Finance Department |
| **Pre condition:** | The data of the building is required to train the model. Data cleaning and feature engineering is required before training the model. |
| **Flow:** | User will give the date and time to get to know data consumption. |
| **Post Condition:** | User will get the real time prediction of the energy consumption. |

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| **Use Case Number:** | 2 |
| **Use Case Name:** | Graphical Analysis of the energy consumption |
| **Overview:** | Users can get the graphical analysis of the energy consumption. The graph will show monthly, weekly, daily, hourly energy consumption. This will help user to know which time has the peak energy consumption, why and so on. |
| **Actors:** | Finance Department |
| **Pre condition:** | The database of the past energy consumption is required. |
| **Flow:** | User will give the time range for which graphical analysis is to be done. |
| **Post Condition:** | The graph of the energy consumption will be displayed |

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| **Use Case Number:** | 3 |
| **Use Case Name:** | User Interface |
| **Overview:** | The users will be accessing the WebApp on a web browser. A responsive user interface will be designed to provide various functionalities. |
| **Actors:** | Owner, Finance Department |
| **Pre condition:** | Specifications of the browser and the server on which it will be hosted. |
| **Flow:** | Select the required functionality |
| **Post Condition:** | The required functionality is displayed. |

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| **Use Case Number:** | 4 |
| **Use Case Name:** | Notification |
| **Overview:** | SMS notifications and emails will be sent to the user in case of high energy consumption then expected. If it continues, it may mean their device has some fault due to which it’s consuming more energy. |
| **Actors:** | Owner |
| **Pre condition:** | Requires Email and mobile number |
| **Flow:** | Automatic Anomaly Detection |
| **Post Condition:** | The Email or SMS sent to the user |

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| **Use Case Number:** | 5 |
| **Use Case Name:** | Fetching the current energy consumption |
| **Overview:** | The system will fetch the current energy consumption of the building to improve the model and will keep the statistics of the past energy consumption. |
| **Actors:** | Owner |
| **Pre condition:** | Cloud API of the current energy consumption data. |
| **Flow:** | Data will be fetched on the hourly basis automatically. |
| **Post Condition:** | Data will help the model to give more accurate predictions. |

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| **Use Case Number:** | 6 |
| **Use Case Name:** | Customer Services/Queries |
| **Overview:** | The user can ask the queries in case of any trouble. |
| **Actors:** | Owner, Maintenance Team |
| **Pre condition:** | User has the query to ask to Maintenance Team. |
| **Flow:** | User need go to query section, write query and submit. |
| **Post Condition:** | Maintenance team will respond to the query through mail or SMS or call and resolve the query.. |