**Logo**

**Project Charter Document**

**Project Name:** Monitoring of Power Consumption In Beverage Industry Through IoT Sensor

**Department:** Energy Management

**Focus Area:** Manufacturing Analytics

**Product/Process:** Data Analysis

**Prepared By**

| **Document Owner(s)** | **Project/Organization Role** |
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**Project Charter Version Control**

| **Version** | **Date** | **Author** | **Change Description** |
| --- | --- | --- | --- |
| 1.1 | 13/10/2021 | Interns | Final Document |
| 1.0 | 21/08/2021 | Interns | Document created |
|  |  | [Replace this text with the name of the Change Owner.] | [Replace this text with a list of changes for this Owner on this Date and Version.]   * [Change 1] * [Change 2] * [Change *n*] |

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# **PROJECT CHARTER PURPOSE**

To monitor power consumption in beverage industry using IoT sensors, reporting the high usage of current by the equipments.

# **PROJECT EXECUTIVE SUMMARY**

* Project goals
  + To monitor power consumption in beverage industry
* Objectives
  + Maximize power efficiency using IoT sensors
* Scope
  + Monitoring of Beverage Industry Equipments using IoT, Monitoring and reporting the high consumption of current by the equipments which helps to detect malfunction of the electrical equipment.
* Assumptions
  + All Equipment with IoT Sensors
  + Existing PLCs with IoT Connectivity
  + All Remote I/O Units Substituted with IoT-Connected Ones
* Risks
  + Security of cloud data
* Costs
  + Cost of implementation, in recognition of the fact that additional measurement has a cost—both the measurement technology and time costs for personnel—and that the cost needs to be a reasonable proportion of the overall savings achieved.
* Timeline
  + 74 days from 3 Aug 2021 to 15 Oct 2021
* Approach
  + . Collection of Data (i.e Power consumption of electric equipment in Beverage Industry using IoT Sensors)
  + Cleaning Data(EDA) using Python
  + Model Building using Python
  + Model evaluation using Python
  + Deployment using Python Flask and Heroku
* Organization
  + Innodatatics intern team

# **PROJECT OVERVIEW**

Energy management strategy of Monitoring of Beverage Industry Equipments using IoT, Monitoring the equipments and reporting the high power consumption of the equipment which helps to detect malfunction of the electrical equipment.

# **PROJECT SCOPE**

Beverage Industry has many sections like Carbonation, Chilling etc. Each section has its own list of equipments which consumes power to do work. Here our scope is to identify all the power consuming equipment and use machine learning algorithm to predict the power consumption of equipments. With this we monitor and target the malfunction equipment using IoT sensor. Finally report high consumption of electricity by the equipments. By this we attain our goal of monitoring the power consumption in the industry.

## **Goals and Objectives**

| **Goals** | **Objectives** |
| --- | --- |
| * To Monitor power consumption in beverage industry | * Power consumption data(Historical data) of each Equipments * IoT sensor data collection * Cloud data storage * ML to identify efficient power usage of Equipments |

## **Project Deliverables**

| **Milestone** | **Deliverable** |
| --- | --- |
| 1. Data collection | * Power consumption Raw data from industries |
| 1. Data Preprocessing | * Data Cleaning * Data Feature Engineering * Outlier Removal |
| 1. Model Building | * Multi linear Regression * Lasso Regression * Ridge Regression * Decision Tree * KNN |
| 1. Model Evaluation | * Model Accuracy Measure |
| 1. Deployment | * Python flask * HTML * Heroku |

## **Deliverables Out of Scope**

* Mobile app
* IoT Interface
* Cloud data storage

## **Project Duration (start date: 03/08/2021 End date: 15/10/2020)**

| **Project Milestone** | **Date Estimate** | **Deliverable(s) Included** | **Confidence Level** |
| --- | --- | --- | --- |
| Milestone 1 | [03/08/2021]  -  [02/09/2021] | * Deliverable 1.1— Power consumption Raw data from industries | [High] |
| Milestone 2 | [06/09/2021]  -  [09/09/2021] | * Deliverable 2.1—Data Cleaning * Deliverable 2.2—Data Feature Engineering * Deliverable 2.3—Outlier Removal | [Medium] |
| Milestone 3 | [10/09/2021]  -  [12/10/2021] | * Deliverable 3.1—Multi linear Regression * Deliverable 3.2—Lasso Regression * Deliverable 3.3—Ridge Regression * Deliverable 3.4—Decision Tree * Deliverable 3.5—KNN | [High] |
| Milestone 4 | [07/10/2021]  -  [12/10/2021] | * Deliverable 4.1 – Model Accuracy Measure | [High] |
| Milestone 5 | [10/10/2021]  -  [12/10/2021] | * Deliverable 5.1 – Deployment | [High] |
| Milestone 6 | [10/10/2021]  -  [15/10/2021] | * Deliverable 6.1 –   Project Presentation   * Deliverable 6.2 –   Project Document | [High] |

# **PROJECT CONDITIONS**

## **Project Assumptions**

* Mapping the given data using IoT broker
* Cloud data storage

## **Project Issues**

**Priority Criteria**

1 − High-priority/critical-path issue; requires immediate follow-up and resolution.

2 − Medium-priority issue; requires follow-up before completion of next project milestone.

3 − Low-priority issue; to be resolved prior to project completion.

4 − Closed issue.

| **#** | **Date** | **Priority** | **Owner** | **Description** | **Status & Resolution** |
| --- | --- | --- | --- | --- | --- |
| 1 | 03/08/2021 | High | Interns | Data from Beverage Industry | Not able to get Data from Industry. Prepared Dummy dataset as resolution |

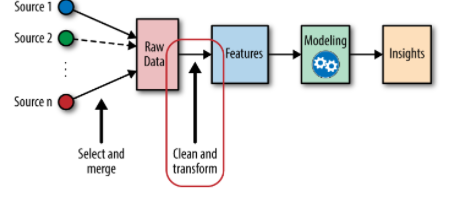
## **Project Risks**

| **#** | **Risk Area** | **Likelihood** | **Risk Owner** | **Project Impact-Mitigation Plan** |
| --- | --- | --- | --- | --- |
| 1 | Data | High |  | Real data from IoT sensor shall be verified before using this project algorithm |

## **Project Constraints**

* Need Heroku Basic Knowledge
* IoT sensor basic knowledge

# **Project Structure Approach**



* Collection of Data (i.e Power consumption of electric equipment in Beverage Industry using IoT Sensors)
* Cleaning Data(EDA) using Python
* Model Building using Python
* Model evaluation using Python
* Deployment using Python Flask and Heroku

# **Project Team Organization Plans**

| **Project Team Role** | **Project Team Member(s)** | **Responsibilities** |
| --- | --- | --- |
| Intern | Reeshabh Singh Thakur  Bollu Harsha Sri Lekha  C Apurva  Kurapati Venkatesh  Kotagiri Teja Kumar  Anandakrishnan K V  Mahak mahnot  Akshay Avinash Jagtap  Aniket Ishwardas Annam  Shubham B. Khandare  Harinath D S  Vrushali Bahubali Hulikoppe  Kapil Dev Singh | ● Deliverable 1.1— Power consumption Raw data from industries |
| ● Deliverable 2.1—Data Cleaning  ● Deliverable 2.2—Data Feature Engineering  ● Deliverable 2.3—Outlier Removal |
| ● Deliverable 3.1—Multi linear Regression  ● Deliverable 3.2—Lasso Regression  ● Deliverable 3.3—Ridge Regression  ● Deliverable 3.4—Decision Tree  ● Deliverable 3.5—KNN |
| ● Deliverable 4.1 – Model Accuracy Measure |
| * Deliverable 5.1 – Deployment |
| ● Deliverable 6.1 –Project Presentation  ● Deliverable 6.2 –Project Document |

# **PROJECT REFERENCES**

| **Milestone** | **Deliverable** |
| --- | --- |
| Data collection | Power consumption Raw data from industries |
| Data Preprocessing | EDA |
| Model Building |  |
| Model Evaluation |  |
| Deployment |  |

# **APPROVALS**

**Prepared by** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Project Manager

**Approved by** Sharat Chandra M\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Project Sponsor

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Executive Sponsor

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Client Sponsor

# **APPENDICES**

## **Document Guidelines - NA**

## **Project Charter Document Sections Omitted - NA**