



# Cloud Based Micro Array Data Analytics System

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**Abstract:** Cloud is the universal storage environment which helps in accessing global data. To work with the system we need the assistance of smart meter. Smart meter is an electric meter of energy meter which measures the amount of energy consumed by a residence, business, or an electrical power device. It has the additional feature like sharing the data over the network. By using the descriptive analytics we analyze the maximum and minimum amount of power usage at different areas and the results will be sent to the power-station which helps them to allocate power to different areas in particular regions. This system also alerts, once the user exceeds the allocated usage limit through a message.

**Keywords:** Data Analytics, Smart Meter, Electricity Consumption, Big data.

## I. INTRODUCTION

It's an analytics system which is used to analyze the electricity consumption data. The data is collected from each customer through smart meters. The particular data is stored in the cloud for the easy access and to avoid the loss of data. The large amount of data is collected and analyzed.

The result of the analyzes will be the a prediction for electricity conception in the upcoming years and also gives an alert for the customers who is exceeding the average conception level according to certain criteria. This system really helps in reducing the electricity conception in the upcoming years and it will give the electricity generating department a clear idea of the need of electricity in the upcoming year.

## II.SMART METER

- The smart meter is used to transmit the information in different intervals of an hour. This helps in storing the information on the cloud so that the live data's can be measured for each day.
- The meter is used to send the amount of data's to the cloud and as well as receive information from the cloud, thus forming a two way communication.
- These smart meters as very accurate in the real time operation. They are fully automated with the live data's taken from each users.

## III. ISSUES TO BE ADDRESSED

Automation system to do an accurate prediction of electricity consumption. Centralized repository for data storage. Analytic system based on the current timestamp data and historic data. Forecast the demand level of various regions for the utilities to generate required electric energy.

## IV. PROPOSED WORK

- Collect the required data set (electricity consumption data set).
- Develop the system which is able to analyze the collected data.
- Store the data in cloud.
- Connect the system with cloud to access the data set and do analytics over the data set.
- Forecast the demand and intimate the utilities with.r.to power consumption.
- Alert the consumers through SMS on exceeding the consumption average.

## V. ALGORITHM

The algorithm specifies the data's that can be used in classifying and grouping them accordingly to the needed basis. We use K-means clustering which classifies and groups the data according to their features. It partitions the data's into clusters which can be measured easily.

## VI.CLUSTERING

Clustering is the classification of objects into different groups, Also uses to partition the data's into different clusters. Clustering has two types.

### A. HIERARCHICAL ALGORITHMS

These find successive clusters using previously established clusters.

#### • AGGLOMERATIVE(BOTTOM-UP)

Agglomerative algorithms separates the cluster at first and then merge those data's into successively larger clusters.

#### • DIVISIVE (TOP-DOWN)

Divisive algorithms takes the whole set and proceed to divide it into successively smaller subsets.



**B.PARTITIONAL CLUSTERING**

Partitional algorithm determine all clusters at once.

**VII. K-MEANS CLUSTERING ALGORITHM**

K-means clustering algorithm is used for separating the set of data's that has been taken from the customers in particular region and making them compare with a given intervals. By comparing them with the given intervals, we can easily separate the minimum and maximum data's that are used in a particular region which gives us how much amount of power needed for that region, thus saving some power. Hence analysing those area will be helpful for the electricity board to know how much amount of data's has been used in a single day in a specific area.As a result we obtain consumers usage rates in different seasons and also an SMS will be sent by comparing each monthly usage with the average usage.

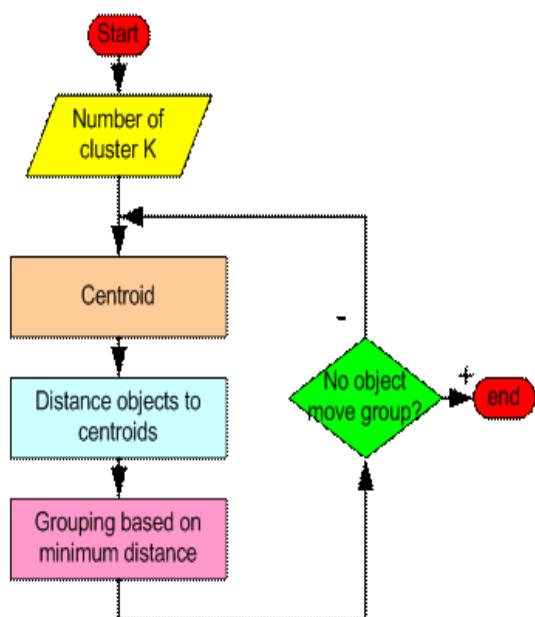


Fig 1: Working of K-means algorithm.

**VIII. APPLICATIONS OF K-MEAN**

It is relatively efficient and fast. It computes result at  $O(tkn)$ , where n is set of objects, k is set of clusters and t is set of iterations. k-means clustering can be applied to machine learning or data mining. Also used for choosing color palettes on old fashioned graphical display devices and Image Quantization.

**IX. MODULES**

**A. GUI DESIGN**

In this module, we have created the basic layout on each pages and programmed them with the working of each

systems. Also we have connected them in MySQL with the sample data's.

**B. ALGORITHM APPLICATION**

We have used the K-means clustering algorithm where we separate the data's of each customer and divide them accordingly to the usage of them. So that we can determine the minimum and maximum usage of a region.

**C.SMS**

We have programmed the SMS design as a automated system where when user exceeds their average usage, a message will be sent to them to alert that they have exceeded their average usage.

**D.MYSQL AZURE**

In the last module, we will be connecting all those data's added in MySQL to cloud (MySQL Azure) with the automated SMS systems.

**X .CONCLUSION**

This system uses the descriptive analytics to produce the maximum and minimum amount of power usage at different areas and also the results will be sent to the power-station which helps them to allocate power to different areas in particular regions. It also alerts, once the user exceeds the allocated usage limit through a message.

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