Big Data Analysis is used in Renewable Energy Power Generation

Priya Shukla
Lecturer Computer Science Department
Firoz Gandhi Polytechnic
Ratapur Rae Bareli 229001 UP India

ABSTRACT
As per new technology big data analytic is playing vital role in all areas such as power industry, IT industry and many more. Now day's big data is also giving a proper backup in power industry. In this industry renewal energy data is mainly used to evaluate the system performance which can be accurately evaluated with the help of big data analysis. The renewal energy is the intermittent power source which cannot be used independently to generate the power and its supply to the load. The integration of renewal energy source like solar or wind with power plant can overcome the load on existing power plant. In this paper we have proposed the new data collection technique for utilizing and managing the renewal energy and its integration with the power plant. Paper is also focusing on areas like energy monitoring, event management, fault management, MIS report generate by using concept Hadoop and big data analysis.

General Terms
Big data analysis by using intelligent data technique & data algorithm in renewable energy power data which is very helpful in power generation.

Keywords
Big data analysis, application in renewable energy, power generation.

1. INTRODUCTION
The utilization of renewal energy is big challenge for power industry. Maximum utilization of renewal energy is totally dependent on its integration with the system because this energy generator is not predictable. By using the big data technique the utilization of the renewal energy can be maximized as this technology is giving more efficient and accurate data analysis by using data analyst tool in Hadoop environment. In power plant there is lot of data in which the main purpose is to refine the correct data & store it for further analysis, thus big data works on the concept of 3 v's- volume, variety and velocity, so we are trying to integrate this concept with renewal energy generation to get accurate and efficient

Result which will be leading to the power industry with more profitable steps.

Renewal energy can be used with storage for power specification at off grid site. In day time energy is stored and in night this energy will be used to provide power. In case of small home and micro grid system is not required but in case of mini grid system data is very important. If we have accurate system data is very important. If we have accurate system data then we can reduce the human efforts for performance of the system. In this paper we will be focusing on these points:

Use of data analytic techniques for representing energy for casting which will be helpful in making power utilization factor high. Measuring the generated energy & delivering power to load. For maintenance & scheduled activity, trouble shooting on algorithm is also defined which is based on data analytic tool.

In this paper, by using Hadoop we will be making a cluster of distributed file system which will be storing and analyzing the data getting.

2. TECHNICAL LANDSCAPE
Reliable energy is not fixed power. This is very big problem for Grid Company. As per current operation model of grid company. Need to give energy forecast to Distribution Company. For providing the constant power, put it from integration of grid power. In case of solar power generation it totally depends on the radiation of sun, with respect to time. In case of renewable energy, power response changes rapidly for short time & effects supply to the load. Renewable power is not linear as per scheduled on demand. By using energy storage with renewable energy is make linear power fine with renewable energy. The data analytics shows the value of generated energy, load condition, delivered power and utilization factor. Peak hour & peak energy management .in Grid Company electricity charge is not the same. Per unit charge is

Change as per load demand time. Data analytic work on revised data from power source & implements the data analytic method at data center where all data is stored for power utilization factor that depend on data which receive through cluster at center location.

Energy management system totally depends on work received information from source & demand side. Regularly monitor through cluster. Voltage frequency, load demand and accordingly through data analytic make stream line power demand. Through data analytic reduce the error. Increase power utilization factor of the power station. The consumption of power of those clusters in very less as compare to saving & data accuracy. By data analytic & data computing technique ratio of generated energy to delivered energy in increases. In case of interruption of renewable power voltage & frequency dynamic response immediately change through fast micro consumption through smart data technique. By use of energy management system the energy is compensated by another source.

The data analytic is playing a very critical role in renewable energy power plant performance. Data center produce the accurate data & designer identity to the power requirement by which it provides dynamically power to the load.

3. PROBLEM FORMULATION

As a system requirement utilization of renewable energy should be maximize by using truly data technique supply to the load. We consider the data center should be located near the energy source. For maximize the use of local energy & feed the power to the load. By directly attaching with wind power on solar power. By using data analytic method draw energy from intermittent source in the grid because the analysis of renewable energy at given time and respond accordingly data analytic supply to the load. If data analytic is excellent then the maximum energy can be supplied to the load. From local source grid power is used in very less amount. The main problem is a system for optimization of solar power with grid power using remote control system which called energy management system.

All the pricing of the grid operator is based on data analytic. The formulation of pricing for generated energy is done by local source & grid to supply the load power. Grid operator in bill to the customer according to big analytic load.

4. METHODOLOGY

In this system there are two main components. First, how much power delivered to load? Second In delivered power how much contribution from local source & grid power by using this method. By using data analysis we can accept the power requirement as well as give the correct analysis for the cast of generation of power by renewal power source.

5. DATA ANALYSIS TRACES

Data is received on server at central location every minutes on daily basis in which is settable. If data storage frequency is required to change then by go in command mode can change data interval. In this data with respect to the location solar radiation data, wind speed, environment temperature. By using Big Data technique analyze the data, use computing technique and make for cast of power generation form renewable energy solar power & wind power. By using data analysis with respect to time wind speed.

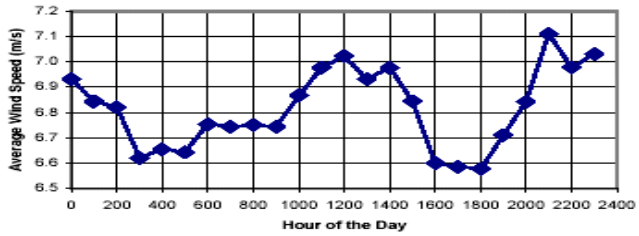

Fig 1: Average wind speed in m/s

With respect to wind speed generated power forecast is come through the big data analysis. In received data with respect to time generated power information is available. By summarizing using big data technique make generated power model with respect to the wind speed.

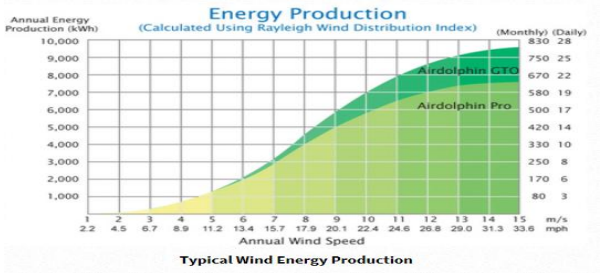

Fig 2: Typical wind energy production

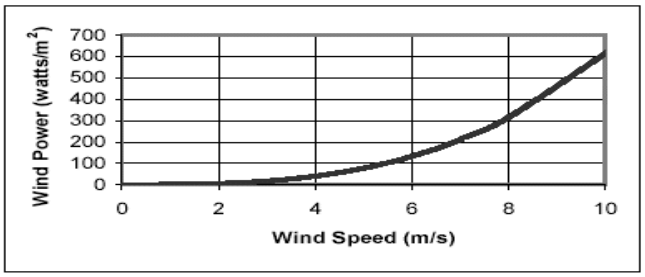

Fig 3: Power in watt W.r.t wind speed

For solar Power total power generation is depend on solar radiation & environment temperature. After increase the cell temperature more than normal temperature then every increment per degree solar power is de rated. Solar Power general curve with respect to time.

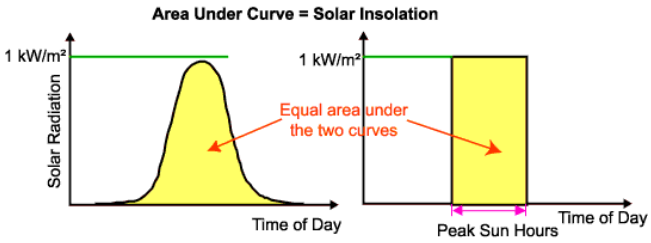

Fig 4: Solar radiation curve in a day

This is the solar generation curve with respect to the time. Generation curve is prepared from big data which is available on server at center location. By using big data technique generation curve is plotted. By the help this curve we can forecast the power generation from solar.

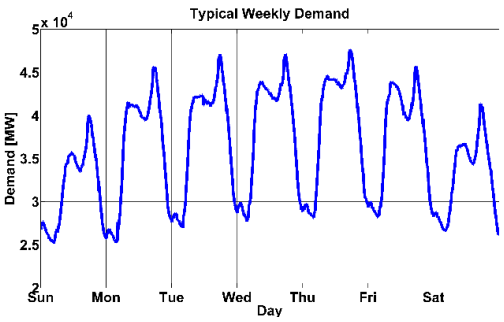

Fig 5: Demand Power Curve day vise

In this curve shows typical demand load curve daily wise with respect to this curve power generation company should full fill the power generation requirement.

6. ALGORTHIMS

The all power generation algorithm depends on how to store data on center server location. System block diagram shows how data is transmitted form source where power is generating through transfer media in encrypted form through encoder in network. This data is received at server end. All data is decoded by decoder & stored in data server. By using smart data technique & data algorithms it generates report for application.

7. FIGURES

In figure 6 system block diagram is showing in detail how data is receiving from generation source & stored in central data server. By using smart data analysis & data technique, it generates report for analysis of the actual power generation.

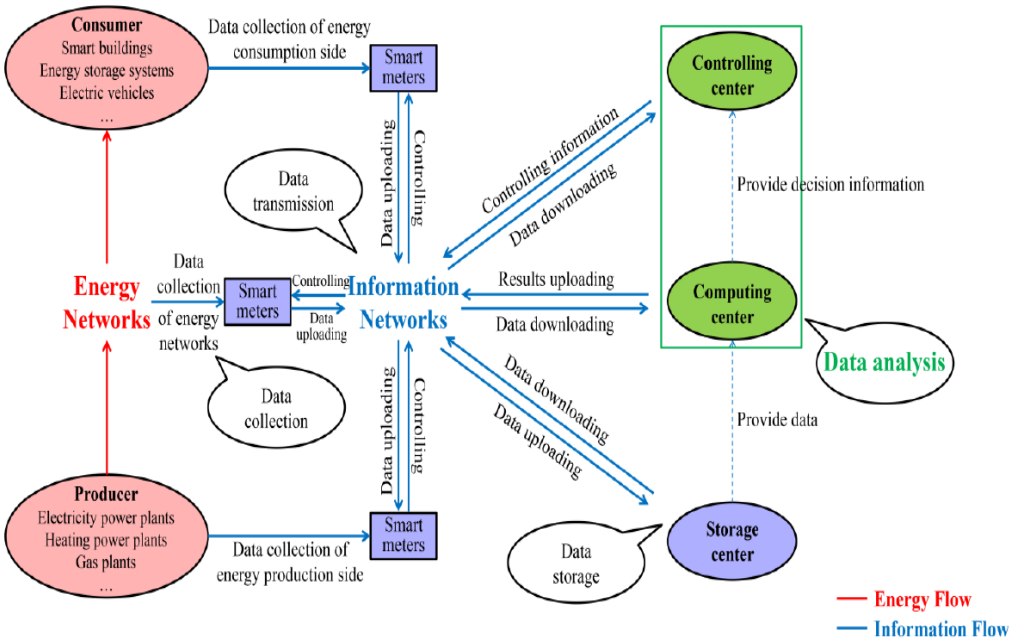

Fig 6: System Block Diagram Remote monitoring System from Power Source

8. ACKNOWLEDGMENTS

The authors acknowledge the support of the Multistage Systems Centre, which help to data analysis by using big data technique in renewable energy sector. Big data analysis is very critical role in renewable power generation. Key benefits realized with this system would be as follows:

- Improved life and performance of DTs.
- Reduced system losses leading to larger saving and efficiency.
- Lesser DT maintenance and operational challenges.
- Decongestion of upstream distribution network offering adequate capacity margin
- Long term deferral of distribution network capacity augmentation.

9. REFERENCES

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