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BIG DATA IN AGRICULTURE

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ABSTRACT

The ubiquitous growth of data provides value in almost every domain of society and the water domain is not an exception. From preventing man-made disasters like overflowing rivers containing toxic waste, to natural flooding, to raising public awareness in water conservation and minimizing the impacts of drought in arid regions. Finally, simply saving costs by improving the reliability of a city's public water works has tremendous value. All of these goals are possible with the effective use of Big Data technologies. This article will show what big data can do, not only by a short analysis of Big Data in the water utilities, but also by illustrating the value of big data with real-life examples in the US.

Keywords**: Big Data, Data Analysis, SVM, WDI, humidity, temperature, RMSE, Map Reduce.**

I. INTRODUCTION

At a very basic level, Big Data just means we have a lot of data. Water utilities see data from supervisory control and data acquisition (SCADA) systems, including flow statistics, online monitoring, dissolved oxygen (DO) measurements, and air flows, as well as data from laboratory information management systems (LIMS) and computerized maintenance management systems (CMMS), to name several examples. Such data is beneficial, and much of it has been around for years. Unfortunately, the way data is gathered at treatment facilities is often fragmented. There are silos of data in computer systems that don't always talk to each other. The Internet Age has ushered in the ability to funnel disparate data into a single, meaningful pool of information that allows water and wastewater treatment plant operators to understand, manage, and use it to optimize plant reliability and performance. Big Data initiatives and new data management tools enable us to turn all that data into understandable, useful information that helps us become more proactive and make better decisions about plant operations. For example, Black & Veatch offers ASSET360™, a smart analytics platform to give utilities, cities, and other entities a holistic, 360-degree understanding of their infrastructure-based systems. Although the focus on Big Data in the water industry is relatively new, comprehensive data management isn't new for energy utilities; Black & Veatch has provided asset analytic solutions to utility clients for more than 20 years and has operated a smart analytics monitoring and diagnostics service for more than 10 years. The company's utility analytics include operational intelligence and adaptive planning solutions.

II. CHALLENGES IN WATER MANAGEMENT AND RESOLUTIONS UNDERTAKEN

There were few success stories which I would like to put unfold addressing the benefits of Big data in agriculture.

'A 100 years old South Bend Sewer system, Indiana used a single line for plumbing waste and storm water. The adverse effect seen is any wastewater that reaches above a certain flow threshold surely falls into the nearby St.

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Joseph River. Hence Operations started in 2012 by IBM with integration of hundreds of sensors. And as a result an economy of about 100 million dollars in infrastructure and 60 million is saved.

- Nearly four years in, and the state of California continues to suffer from the worst drought ever seen along the West Coast in more than a millennium University of California (UC) at Santa Barbara, UC Davis, and big-data startup PowWow energy, experts involved and as a result Sas a tool is delivered to residents resulted in decreased in average water usage by 5% and 20% statewide
- Storm surge is often the greatest threat to life and property and directly accounts for about half of the deaths associated with tropical cyclones in the United States (Rappaport, 2014).A solution has been found as a tool for receiving advanced warning about storm. It is an experimental NWS product depicts the risk associated with the storm surge hazard from a tropical cyclone.
- In order to resolve Canada Southern Ontario Water Consortium, a project is undertaken with collecting data from three sub key watersheds with Grand River system. The data includes rain, snowfall, soil moisture, flow rates, temperature etc. In collaboration with IBM Canada 120 sensors are installed 600 data points are assimilated per hour. As a result, intense monitoring helping the decision makers to assess the need for infrastructure need and or replacement.
- In concern to managing the water distribution in the city of Thiruvanthapuram, several challenges are witnessed. The first one is aging pipes, leaking infrastructure and unauthorized use of water. Only 45% of fresh water is unaccounted for or wasted due to leakage as evidence. The second challenge is inability to track water consumption. Addressing these challenges, a regressive curve in revenue collection WA Established Water management center with IBM initiated a RTM plan. The plan includes Sensor deployment, Data collection and Data visualization using IBM big data software.

III. REALIZATION OF BIG DATA IN AGRICULTURE

Opportunities in Big data are at rudimentary, sophisticated and advanced levels. At rudimentary level, Ingested Data can be analyzed in real time. At sophisticated level, high resolution of spatial maps of soil moisture can direct. And at Advanced level, Remote sensed data coupled with measurements supports. However there are few challenges like lack of Data Scientists for analyzing the data, Mismatch in scale, precision and accuracy of data, data to be quality controlled before used in algorithm, interpreting the processed data.

IV. EMERGING TECHNOLOGIES IN BIG DATA SENSING

Internet of Things and Data Mining Techniques are two emerging trends in Big Data Sensing. Internet of Things is termed as a worldwide architecture for sensing, computation and communications. It emphasize on Data Integration and management from vast number of smart devices. It also offers a solution for traditional methods used for data collection in wireless sensor networks. Optimized data processing and connecting smart phones and data center to internet and monitoring the sensor info remotely in real time.Another set of techniques like smart phone based Sensor mining architecture, Time series prediction algorithms serve the purpose.

V. EXPERIMENTAL SET UP FOR BIG DATA SENSING ON MAP REDUCE FRAMEWORK

Objective : To find maximum temperature per year from sensor temperature data sheet

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Input :(unstructured)

0029029070999991902010720004+64333+023450FM-12+000599999V0202501N027819999999N0000001N9-00331+99999098351ADDGF102991999999999999999999

BigText format containing station ID, year, date, time, temperature, quality etc

(Structured): 1902 is year

0033 is temperature

1 is measurement quality (Range between 0 or 1 or 4 or 5 or 9)

VI. PROCEDURE

1. Convert each line to string using toString() method
2. Make substring to get year from total input string
3. Note : character positions of year and temperature are fixed for every input data
4. make substring of one character to get temp. quality and match it with our required qualities
5. If (match found) then write particular year as key and temp. as value //to context output
6. Output : Intermediate data is generated

VII. OUTPUT

Year and set of values of temperatures is given as input <1902, 0033>

VIII. CONCLUSION

In a nutshell, Big Data is about taking all the data we now have at our fingertips and turning it into knowledge that we can apply to operate our treatment facilities better. The right data, analytics, and decision framework can drive water (and energy) utilities to optimal performance.

IX. REFERENCES

[1] Ting Zhu,Sheng Xiao, Qingquan Zhang,Yu Gu,Ping Yi and Yanhua Li," Emerging Trends in Big data Sensing:A Survey",Hindwai Publishing Corporation ,International Journal of Distributed Sensor Networks ,Volume 2015.

[2] Venkata Sriharsha Kuncham ,Prof Rao N.V ,"Sensors for managing water resources in Agriculture",IOSR-JECE,Vol 9,Issue 2,Mar-Apr 2014

[3] K V Sriharsha and Dr N V Rao,"Water Management using remote sensing Techniques",CVR Journal of Science and Technology,Vol 4,2013

[4] Joseph Russo, " Big Data and Precision agriculture ",PrecisionAg,April 25,2013. www.precisionag.com

[5] Cy Cheung en Martjin Nuijten, "Big Data and the Future of Water management",meer informatie : www.agentsschapnl.nl/ianetwerk