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CAPITIS SOLUTIONS INC.

IoT, Data Analytics and Machine Learning Models for Predictive Maintenance on AWS

ABOUT THE CUSTOMER

The client is a leading global manufacturer of industrial UV curing systems. These systems are vital to the production of thousands of items people use every day ranging from furniture and sporting goods, to semiconductors and medical devices. Rather than heat, this advanced technology utilizes microwave energy to generate intense UV light from gas filled electrodeless bulbs. The benefits include faster cure times and reduced costs while promoting environmentally friendly manufacturing practices.

THE CHALLENGE

Any failure to the UV light equipment during the manufacturing process can result in costly downtime, diminished product quality, or scrap. Equipment failures and anomalies that might affect product quality need to be predicted in near real-time, before they occur. To achieve this goal, the UV light equipment has been instrumented with an array of over 100 sensors. Each machine is connected to an IoT (Internet of Things) system that transmits the data to the client cloud. The system collects and sends over 200 metrics per machine several times per second. The challenges include:

- Ingesting, cleaning, and processing millions of time series data records
- Fusing instrumentation data with contextual data such as external temperature and factory conditions
- Storing health events in a database for profiling, viewing and developing models
- Developing baseline metrics
- Developing business rules for identifying anomalies in near real-time
- Developing machine learning models for predicting failures well before they occur
- Visualizing data for identifying anomalies and identifying correlations between multiple features
- Designing dashboards for service engineers and operators

THE SOLUTION

Capitis implemented a data analytics platform using compute, storage, database, analytic, and data visualization technologies. The solution included the following:

- S3 object store as a data lake for storing ingested and processed data
- Lambda (Serverless architecture) for data processing
- RDS for querying timeseries data
- EC2 for R Studio
- AWS ML platform for machine learning models
- AWS QuickSight for online data visualization
- R and python libraries for advanced data analysis and visualization to establish baseline metrics

Capitis was able to establish baseline metrics, develop business rules for anomaly detection and create machine learning models for predicting failures well in advance of their occurrence.

THE BENEFITS

- By leveraging AWS infrastructure and platform services Capitis data scientists and software developers assembled a system to ingest data, process the data through machine learning models and visualize the results quickly and cost effectively.

CAPITIS SOLUTIONS AND AWS

- Capitis team is building and managing a highly scalable and re-liable IOT analytics platform on AWS for an UV light equipment manufacturing company. The platform is expected to be a game changer for the UV light curing industry by providing advanced preventive and predictive maintenance advisories.

NEXT STEPS

- To learn more about how AWS and Capitis Solutions can help your business, visit www.capitissolutios.com