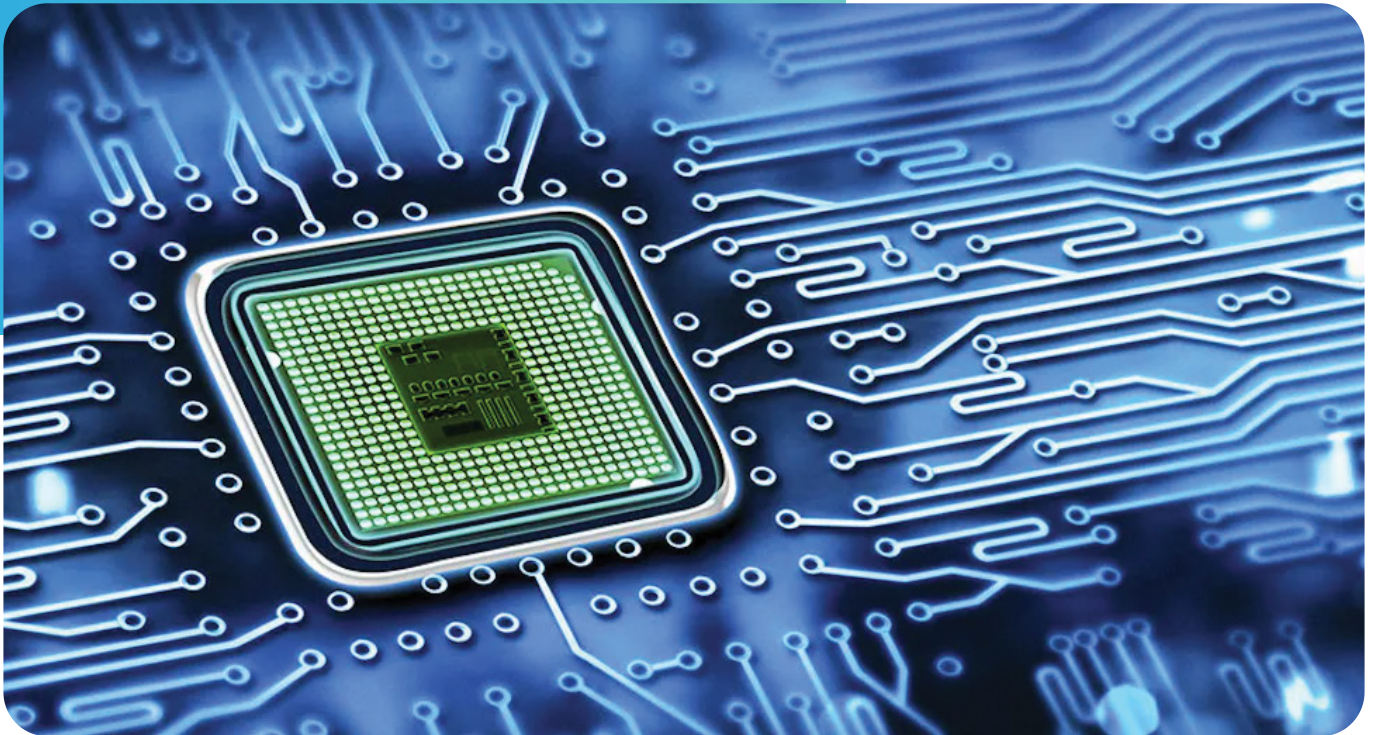


SUCCESS STORY



ANALYTICS PRODUCT FOR PREDICTIVE MAINTENANCE & DATA VISUALIZATION IN THE SEMI-CONDUCTOR INDUSTRY

PROJECT OVERVIEW

The client set up an IoT infrastructure that collects all critical data points along the process chain. The recipes and conditions of the process chambers are recorded and stored in real-time by sensors installed in the processing module. The client commissioned Indium to develop the analytics layer of its IoT infrastructure, which would: Measure the efficiency of wafer production, Monitor wafer production lines, Identify outlier process modules, Predict defects in process modules, and Enable predictive maintenance. Although the semiconductor industry is highly complex and domain-intensive, Indium Software was able to deliver all the requirements and a few additional value-added features by leveraging its Big Data, Predictive Analytics, and Visualization capabilities.

SOLUTION DELIVERED

Big Data, Predictive Analytics, and Data Visualization

CLIENT DOMAIN

Semi-Conductor Manufacturing

KEY HIGHLIGHTS

- Achieved a 3X reduction in repair and maintenance costs, minimizing downtime and improving the overall operational efficiency of process modules.
- Realized a 20% increase in process module efficiency, leading to higher wafer production within the same time frame.

ABOUT CLIENT

The client is one of the world's most advanced semiconductor manufacturing enablers; today, nearly every advanced chip is built using its technology. Its manufacturing centers across the Americas, Europe, and Asia develop and supply wafer fabrication equipment and services to every semiconductor manufacturer worldwide.

The client is a California-based value-added services provider for semiconductor manufacturers. They develop and supply wafer fabrication equipment and services to build innovative devices. Creating chips involves a chain of individual steps, with each process module producing multiple wafers in defined recipes of temperature, pressure, and other conditions.

BUSINESS REQUIREMENTS

The application is a data bank of the all-critical data points gathered in the process chain. The recipes or the conditions of the process chambers are recorded and stored in real-time by sensors installed in the process module.

The data produced was continuous, time series in nature and significantly huge in size. This led to an unusual IoT problem. However, the Data was an asset to business which when put to insightful use, facilitates real-time monitoring and defect prediction in the process module.

The client wanted a solution to make use of the available data to achieve the following goals:

- Measure efficiency of the wafer productions
- Monitor production line of wafers
- Identify outliers process modules
- Prediction of defects in process modules
- Predictive maintenance

SOLUTION HIGHLIGHTS

Indium Software analyzed the data collected from the sensors installed on process modules and modeled a solution that treated the data for business use, making it potentially describe, predict, and prescribe insights for business efficiencies.

We implemented a data science solution combined with a visualization layer to aggregate the data volumes from the process chambers and extend it on an actionable interface for key business users.

The continuous flux of data from the process required a powerful database to handle raw and aggregated data (processed). We introduced a Hadoop-based solution for data storage.

The data so processed performs the following:

1. Identifies outliers/anomaly modules in regular production.
2. Reports defects.
3. Caters to wafer-level resolutions (lowest possible resolution).
4. Monitors production guidelines.

Data insights were realized in interactive and responsive charts using powerful visualization tools. The charts render quick response times. Feature interactions like zoom-in, brush & deselect, simulations, pop-ups, and drill-downs are enabled.

End-to-end analytics is possible, from data navigation (selecting Customer, Lab, and Process modules of choice) to model building for displaying results and recommendations in a single snapshot.

BUSINESS IMPACT

- Achieved a 3X reduction in repair and maintenance costs, minimizing downtime and improving the overall operational efficiency of process modules.
- Realized a 20% increase in process module efficiency, leading to higher wafer production within the same time frame.
- Developed a highly sought-after product that has become an essential offering for our clients, adding value to their customers and driving business success.

TECH STACK



ABOUT INDIUM

Indium Software is a fast-growing Digital Engineering company, focused on building modern solutions across Applications, Data, and Gaming for its clients. With deep expertise in next-gen offerings combining data and applications, Indium offers a wide range of services including Product Engineering, Low-Code development, Data Engineering, Ai/ML, Digital Assurance, and end-to-end Gaming services.



USA

Cupertino | Princeton
Toll-free: +1-888-207-5969

INDIA

Chennai | Bengaluru | Mumbai | Hyderabad
Toll-free: 1800-123-1191

UK

London
Ph: +44 1420 300014

SINGAPORE

Singapore
Ph: +65 6812 7888

www.indiumsoftware.com



For Sales Inquiries
sales@indiumsoftware.com



For General Inquiries
info@indiumsoftware.com

