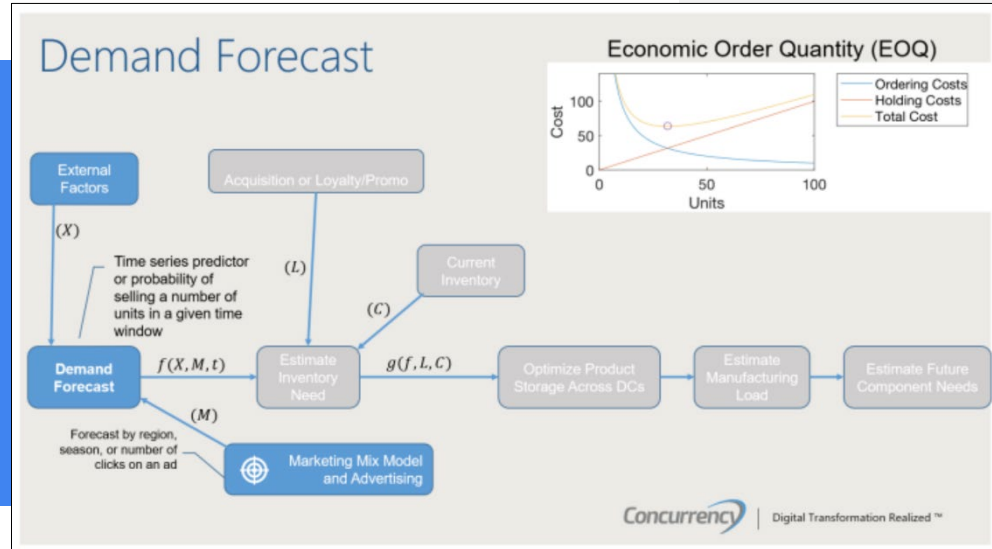


PROJECT CASE STUDY
Automate Supply Chain Optimization



PROJECT LEAD

Concurrency

PROJECT TEAM

Brunswick

PROJECT OBJECTIVE

Implement a machine learning model that will efficiently forecast product demand to streamline manufacturing inventory control, increasing inventory turns, reducing overstocks and ensuring inventory availability.

[MORE ON CESMII.ORG](https://www.cesmii.org)

Small Manufacturer Sees 20% Improvement in Demand Forecasting by Implementing Machine Learning Models

BENEFITS TO OUR NATION

Access to more precise demand forecasts will enable American manufacturers to optimize their production processes and supply chain management, leading to increased operational efficiency and cost savings. Improved forecasting accuracy will allow manufacturers to respond more effectively to market changes, enabling them to capture new opportunities and expand their market share both domestically and internationally, leading to an increase in American manufacturing jobs and manufacturing output.

BENEFITS TO INDUSTRY

By implementing machine learning models at a partner manufacturing site, the project team was able to demonstrate a 20% improvement in demand forecasting accuracy.

Improving forecast accuracy will enable American manufacturers to optimize production schedules, increase inventory turns, and reduce waste. Improving manufacturing productivity in this way will shorten production lead times, leading to greater customer satisfaction and contributing to increased product demand and business growth.

PROJECT DESCRIPTION

TECHNICAL APPROACH

- Consolidate demand data:
 - Integrate data from industrial partner Customer Relationship Management system.
 - Query data with Synapse. Azure Synapse Analytics is an enterprise analytics service that accelerates time to gain insights into large data systems.
- Implement Azure Machine Learning and Databricks to compare production demand to on-hand assets. Databricks is a unified, open analytics platform for building, deploying, and sharing data, analytics and AI solutions.
- Integrate the supply chain data model to the CESMII Smart Manufacturing Innovation Platform (SMIP).

ACCOMPLISHMENTS

- Created Azure machine learning environment to train model on consolidated data
- Developed Azure machine learning production code to automate the inventory predictive process
- Created Azure SQL database for storage of prediction results
- Connected data environment to client tenant
- Implemented Azure Data Factory to ingest initial dataset into Azure Storage
- Trained and validated models
- Tested production data
- Performed production simulation
- Validated models at customer production site

DELIVERABLES

- Completed Provisioning of Azure Environment for Client
- Delivered machine learning datasets
- Delivered inventory control machine learning models

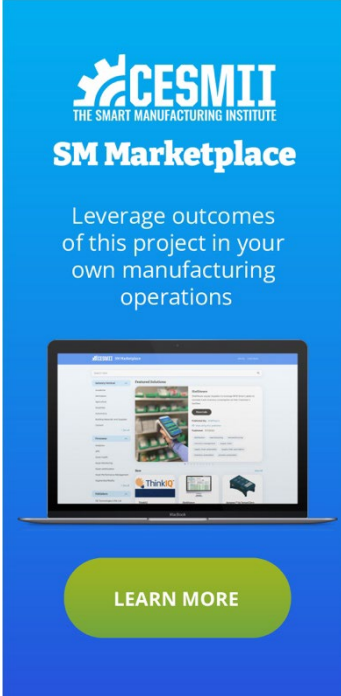
REUSABLE OUTCOMES / SM MARKETPLACE

- Inventory control machine learning models

RESULTS

↑ 20%

Demonstrated a 20% improvement in demand forecasting accuracy at customer site when implementing inventory control machine learning model.



The banner features the CESMII logo at the top, followed by the text 'SM Marketplace'. Below this, it says 'Leverage outcomes of this project in your own manufacturing operations'. In the center is an image of a laptop displaying a dashboard with various charts and data points. At the bottom is a green button with the text 'LEARN MORE'.

PROJECT DETAIL

Budget Period: BP4
Submission Date: 5/11/2022
Sub-Award (contract) Number:
4550 G ZA036
SOPO: 2333

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