Case Study: Warehouse Demand Forecasting

Optimizing inventory at appropriate levels is a challenging responsibility for retail, warehouse, and supply chain managers. Optimizing inventory levels allows the management to reduce working capital allocated to excess stock while maintaining enough stock to meet the demand. Savings from optimal inventory stock management can be very significant for many businesses.

In this case study, we implemented a warehouse management system for a retail client using Odoo ERP software. Then, we developed a demand forecasting system on AWS that uses historical demand and inventory data stored in Odoo ERP. The forecasting system predicts expected demand for an item, so inventory manager can maintain inventory levels at an optimized level. We then integrated the AWS-based forecasting system with the Odoo ERP inventory module using REST API calls to get and display forecasted demand levels for a given selected item. With the forecast data at hand, inventory manager can quickly make appropriate purchase decisions based on the predicted demand for that item.

The high-level architecture of our demand forecasting implementation is given below:



How we built the demand forecasting model: After exporting data from Odoo ERP's PostgreSQL backend database to AWS S3, we performed data cleansing and preparation and fed the data into AWS SageMaker for model building. After proper data pre-processing, we used the entire set of series data as a training set to build DeepAR model with iterations over multiple periodical levels, epochs, context length, and prediction length with appropriate tuning parameters. We implemented the entire solution on AWS for a secure, low latency and scalable system.