

Howden Joinery Group PLC, United Kingdom

# LEVERAGING MACHINE LEARNING TO SOLVE REAL BUSINESS CHALLENGES



We turned to AI and Machine Learning to optimise production with change over and stoppage analysis in addition to predicting customer buyer behaviour. This exciting project has already provided invaluable business insights.

Trevor Cowan, Group BI Systems Manager, Howden Joinery Group PLC



## Challenges

- The requirement to optimise the manufacturing process by minimising unplanned stoppages and reducing changeover times on assembly lines
- The opportunity to understand customer buying behaviour in greater depth
- The need to optimise stock holding at depots



## Benefits

- On production optimisation, the telemetry generated by the manufacturing operations were coupled with enterprise data to highlight opportunities to optimise the sequence and timing of manufacturing plans
- On customer service, the use of classification models and clustering techniques provided a mechanism to identify customer segments and their unique requirements



## Solutions

- Machine Learning outcomes were underpinned by the SAP Business Technology Platform



## Why NTT DATA Business Solutions?

- NTT DATA Business Solutions understood our business and our industry
- Knowledgeable consultants with data science and advanced analytics expertise
- A positive experience from working with NTT DATA Business Solutions on earlier BI Consulting activities



**Industry:** Manufacturing & Wholesale

**Products:** Supplier of kitchens and joinery products to the building trade

**Employees:** 8,000 (2020)

**Turnover:** £1.52b (2020)

**Website:** [www.howdens.com](http://www.howdens.com)

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## Optimising Data-Driven Decisions

Howdens is the UK's number one trade kitchen supplier providing thousands of products across kitchens, joinery and hardware. With more than 750 depots throughout the UK and Europe, Howdens are the first choice for more than 470,000 loyal trade professionals.

With Howdens already using SAP technologies, and a mature analytics estate in place, an opportunity arose for the organisation to explore how advanced and predictive analytics could be used to solve business challenges. Turning to their SAP Analytics Consulting Partner, NTT DATA Business Solutions, the project quickly gained momentum when Howdens were introduced to the NTT DATA Business Solutions predictive analytics and data science team. A Proof of Concept (PoC) was initiated to explore the potential of advanced analytical techniques in specific areas of the business. Howdens were able to quickly access their highly curated and historical datasets that were hosted in their SAP Data Warehousing system and introduce Machine Learning (ML) algorithms to deliver new and invaluable insights. Five use-cases were summarised into two categories - manufacturing optimisation and customer buying behaviour:

### Manufacturing Optimisation / Stoppage Analysis

Howdens assembly lines were examined to understand and predict unplanned stoppages. Historical data was harvested from telemetry generated from the manufacturing operation and ML algorithms were applied to build a predictive model that analysed the characteristics of historical stoppages. The analysis highlighted the specific, individual components on the bill of materials that caused the greatest outages. Another influence on stoppages was identified as the amount of Total Preventive Maintenance (TPM) stoppages carried out the previous day.

### Manufacturing Optimisation / Change Over

Howdens wanted to explore the impact of each kitchen line recalibration in order to minimise changeover delays. The ML algorithms reviewed and learned the product sequencing in order to present the optimal production run scheduling.

### Customer Buying Behaviour / Customer Loyalty

Howdens adopted ML to gain greater insight into customer retention factors and predict future loyalty. The model looked at new customer behaviour within four weeks of

their first purchase to determine the influencing factors for repeat sales using the historical data. The analysis provided compelling insight with predicted customer loyalty trends and presented opportunities to improve the potential for repeat business.

### Customer Buying Behaviour / Customer Segmentation

Howdens wished to gain detailed insight into their types of customers and the impact on future productivity and revenue. The characteristics of customers were added to a cluster model that looked at customer type, spend, frequency and product mix. Predictive models were then set up to identify "what if scenarios" that could be used to inform future marketing strategies to appeal to the unique customer characteristics of each cluster as well as understanding the impact on manufacturing.

### Customer Buying Behaviour / Sales Order Prediction

With the Howdens business model focused on trade customers and accounts set up to standard payment terms, occasionally orders are placed but cancelled before invoicing. Howdens turned to ML to predict the likelihood of an order being cancelled based on historical completed and cancelled orders. The insight allowed Howdens to identify order patterns and the findings will be invaluable for reducing future storage costs and prioritising stock for certain depots to ensure the effective distribution of popular product lines. A recommendation for phase two was to include stock levels to gain further granularity into surplus stock.

The PoC used ML modelling capabilities with the SAP Business Technology Platform for the pipelining (and predictive) data layer. The results of the five PoC's have been fascinating with two projects currently prioritised to move from development to a full production project. 'Stoppage Analysis' and 'Change Over' are the initial focus with Howdens excited to explore other areas where advanced analytics can deliver deeper data knowledge and drive powerful business outcomes.

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