

Forecasting product demand by 10 weeks in advance with Machine Learning

Linus Matkasse Group



Introduction

The **Linus Matkasse Group** (Godtlevort, Adams Matkasse, Linus Matkasse & Ret Nemt) is the leading meal kit provider in the Nordics. They work every day on composing menus and inspiring meal kits with the best and freshest ingredients.

Challenge

In order to fulfil their objective of providing the freshest ingredients while avoiding food waste, the **Linus Matkasse Group** takes on a unique approach where they only order the raw materials they need to meet demand. But for that, the company needs to send the most accurate estimates to their local producers 10 weeks in advance, so they can plan the production growth in line with the predicted consumption model. Therefore, the challenge was to create the best analytics architecture and most powerful forecasting model, that could **predict orders with 10 weeks in advance** and the **lowest margin of error (<10%)**.

Benefits

Linus Matkasse can now predict orders with 10 weeks in advance and an average error rate of 2,3%! The best forecast so far, had a maximum error rate of 1,3%, for a 11-week prediction. This solution allows the company to reduce food waste and lower operational costs.

Keep reading to know all about this great story!

Solution

The solution included the migration of their **traditional Datawarehouse to Azure** and its reengineering in order to calculate and produce the analytical model, more suited to the company's needs. Syone used Machine Learning to forecast orders, with the help of **Azure Databricks** and the new **Analytics Model**.

About Linus Matkasse Group

The Linus Matkasse Group comprises four brands - Godtlevant, Adams Matkasse, Linus Matkasse & Ret Nemt – and is the largest meal kit supplier in the Nordics. The group works every day on composing menus and inspiring meal kits that will make it possible to gather the whole family around the dinner table, every single day.

They have a large in-house team of skilled professionals who work to develop new and exciting recipes.

They have a long and broad experience in the food industry, and they pride themselves in finding the best and freshest ingredients from selected suppliers, excluding expensive intermediaries like the large wholesalers.



Every week, customers can go to any of the group's websites and choose from a tasteful selection of dinners, breakfasts and other supplementary products.

The Challenge

In order to provide the freshest ingredients while avoiding food waste, the Linus Matkasse Group - Godtlevort, Adams Matkasse, Linus Matkasse & Ret Nemt – takes on a unique approach where they only order the raw materials they need to meet demand.

But for that, their local producers need to make sure that they have grown and produced the right amount of food.

And since growing the best produce takes time, the Group's purchasing department needs to send the most accurate estimates to the food producers, 10 weeks in advance.



Within the Analytics team, they worked actively in improving these estimates, but in order to achieve the desired results, they needed a dedicated team of both data and engineering experts to help them reach excellence.

The Challenge

Syone & the **Linus Matkasse Group** have a great and long relationship. It all started in 2015 when Syone implemented a **Nearshore** team to help them in their Digital Transformation journey. Since that day, Syone has been improving their digital operation and internal processes to become more efficient, scalable and able to embrace new technological challenges. Although the **Linus Matkasse Group** had made quite a progress on the forecasting, the goal was to be more accurate.



That's when they realized that Syone could be a great partner in this new journey as well. The job was to create the **best analytics architecture** and **most powerful forecasting model**, that could predict orders with **10 weeks in advance** and the **lowest margin of error (<10%)**.

Solution

To start, Syone migrated the **traditional Datawarehouse** to **Azure**, since their operation was already running on this powerful Microsoft cloud solution. Syone **reengineered the existing application landscape** to a different analytical solution, more suited to the company's needs, changing from **AWS Redshift** to **SQL Server**.



The new environment included:

- Staging area for **Segment** and **Stich** data to have a better control over the data;
- Dedicated QA environment for testing new developments;
- Fault group for the analytics DB to ensure business continuity and disaster recovery;
- **Machine Learning** environment to predict future orders.

Solution

With the new analytics DB settled, we had the chance to feed the Machine Learning model. We used Databricks to prepare the workspace, input the data and train the predictive model on a Spark cluster, and the Analytics Module to track, manage and deploy machine learning models.

We started to work with Linus Matkasse specifically, due to their more mature operation and biggest data volume.

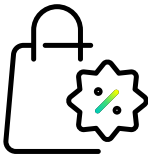
To ensure the new solution was working properly, we inputted all available data until the end of 2018, and tested the model for the first 40 weeks of 2019 to see if the estimates matched the actual number of orders.



The results were very positive, and the model passed the test with an error rate lower than 10%. After that, the **Machine Learning** model was settled, and the real predictions started.

The model has been running ever since and is being continuously improved by adjusting the parameters, testing errors and adding new sources of information.

Results & Benefits



With the current solution, **Linus Matkasse** can predict their orders **10 weeks in advance** with an average error rate of **2,3%**! The best forecast so far was during week 50, with a maximum error rate of 1,3% for a 11-week prediction.

2.3 %

Average Error Rate

10 weeks

Order Forecasting



These results allow the meal kit supplier to:
Reduce food waste by ordering the same amount of produce their customers are going to need;
Lower operational costs by being more efficient with their orders and warehouse management;

This solution will be expanded to all the Group's brands and becomes even more important with the Group's new offer: **Godtlevort Dinnertime**. This mobile app will allow customers to choose from 40 different dinner selections and order their meal kits.

You can also watch this case presentation in a video format. The link to access is in the following page.

Case video presentation



How to optimize your business with a forecasting model

<https://hubs.la/HOGRjig0>

How Linus Matkasse replaced human decision in its core processes by Artificial Intelligence

<https://hubs.la/HOGRjrX0>



About Syone

From Portugal to the world, Syone works with leading companies in Telco, Banking & Insurance, Government, Utilities, Industry, Retail and Hospitality by implementing mission-critical projects and helping organisations to increase agility and to drive Digital Transformation.

Recognised as a **Competence Center** for **Open Source** technologies such as Red Hat, SUSE, Couchbase, Elastic and also Microsoft, we have worked with more than 500 clients and in more than 15 countries.

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