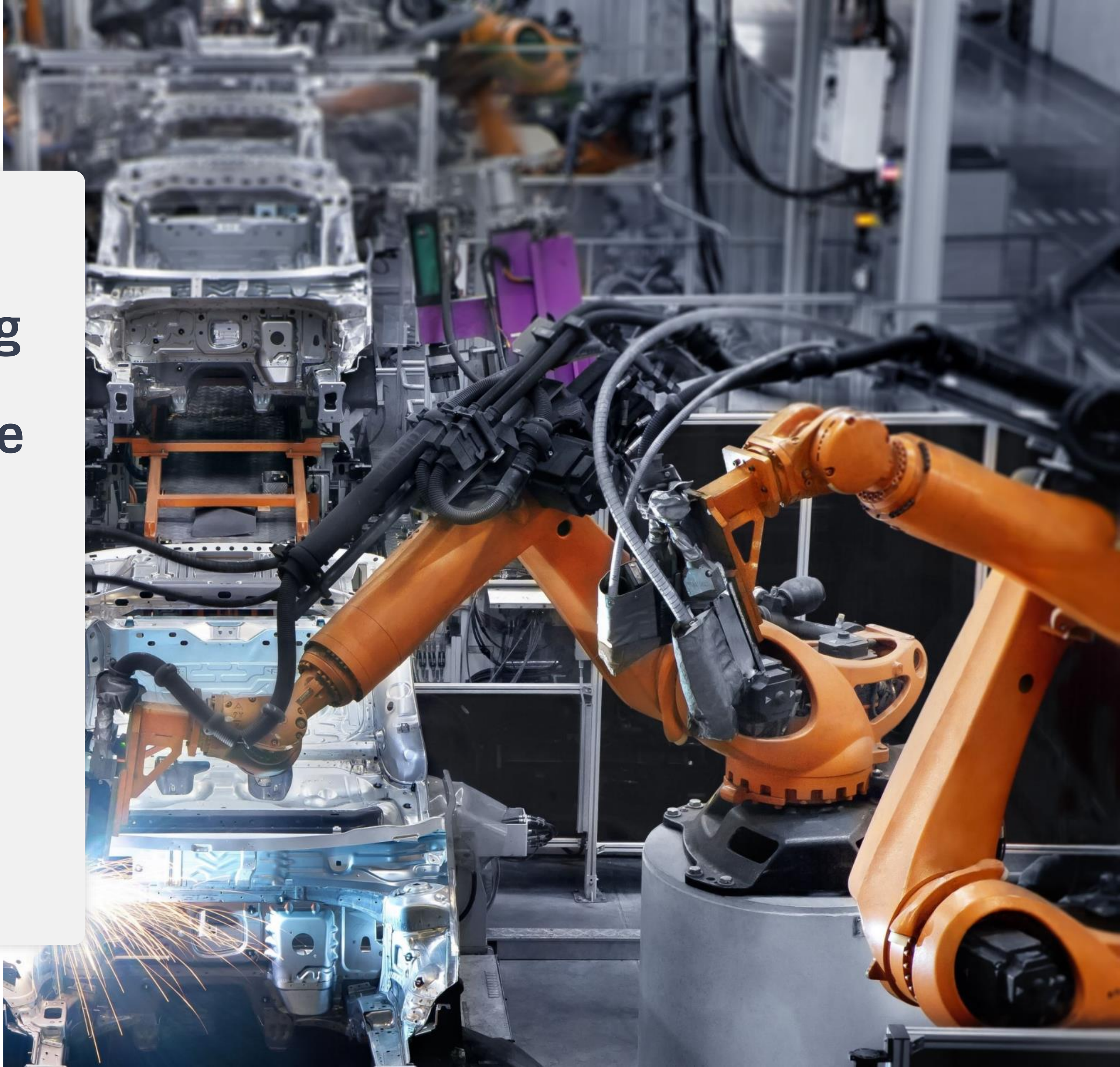
Demand Forecasting with Artificial Intelligence

Manufacturing

Webinar

Michael Danninger, AI.S²
Dr. Timo Klerx, paiqo

27.06.2023



Recording of the webinar

This session will be recorded.

If you do not wish to appear in the recording, please turn off the camera and microphone.

However, you are always welcome to ask questions in the chat.

Introduction

Dr. Timo Klerx
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Founder paiqo GmbH

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in linkedin.com/in/TimoKlerx

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Managing Director
AI Software Solutions GmbH – AI.S²

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in linkedin.com/in/MichaelDanninger

Agenda

- Company Overview
- Why Demand Forecasting with AI?
- AI Demand Forecasting in Manufacturing
- AI Demand Forecasting Solution Demo
- Your way to AI driven Demand Forecast
- Questions

Company Overview

About paiqo

+ 50 Customers

In the field of (online-)retail, healthcare and fitness, manufacturing

> 10 Years

Experience with focus on data platform & AI

+ 40 Experts

Data Scientists, Data Engineers and Business Developers with years of experience in successful delivery of data science projects for many well-known companies.

Microsoft

Newcomer of the Year 2022

Microsoft
Solutions Partner
Data & AI
Azure
Specialist
Analytics

paiqo
The Platform & AI Company

databricks

KI BUNDESVERBAND

Know-How

Methodological and technical (e.g., Spark, Azure ML, In-Memory, Machine Learning)

Background

computer scientists, mathematicians, statisticians, engineers, economists

Projects

A variety of projects including MLOps, Operationalization, Data Management, Pricing, Recommender, AI Assistance Systems, Demand Forecast, Operating Services, Coaching

Why Demand-Forecasting with AI?

DEMAND/SALES FORECASTING

Why Demand Forecasting with AI?

FUTURE

The better we anticipate the **future**, the better the company runs

EFFORT

Bottom-up Forecasting takes a lot of **sales power**

COMPLEXITY

Market volatility makes **manual planning** more complex

PRODUCTION

Avoidance of **over-** and **underproduction**

COSTS

Significant **cost savings**

MANUAL

Significantly less **manual effort**

INSIGHTS

Identification of **drivers** for sales and demand

PROCESSES

Along the entire **value chain**, AI can be used to significantly improve processes

paiqo
The Platform & AI Company

AI.S²
SOLUTIONS FOR THE FUTURE

Microsoft

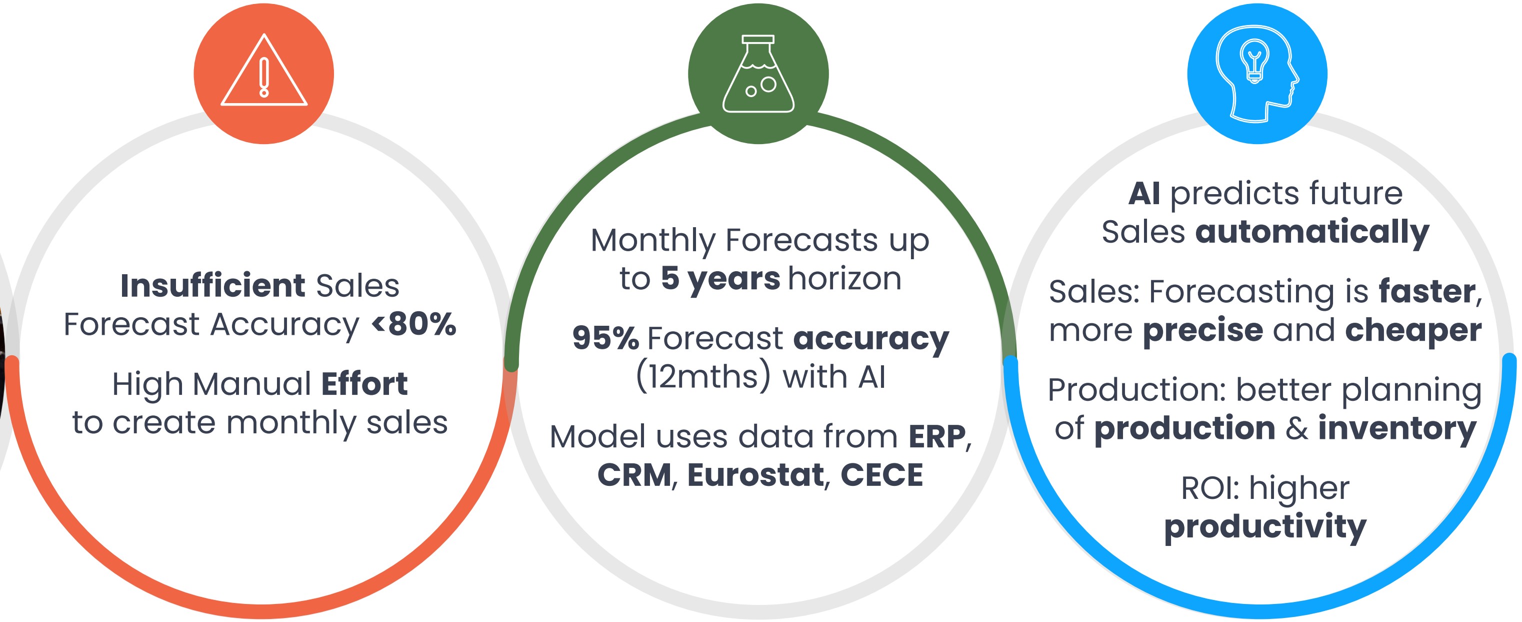
Microsoft Azure

CUSTOMER REFERENCE

95% Forecast Accuracy with AI

How a manufacturer improves production and supply chain planning by forecasting orders in different countries for different products (e.g., excavators or wheel loaders).

Heavy Equipment Manufacturer



Insufficient Sales Forecast Accuracy **<80%**

High Manual **Effort** to create monthly sales

Initial Situation

Monthly Forecasts up to **5 years** horizon

95% Forecast **accuracy** (12mths) with AI

Model uses data from **ERP**, **CRM**, **Eurostat**, **CECE**

Our Solution

AI predicts future Sales **automatically**

Sales: Forecasting is **faster**, more **precise** and **cheaper**

Production: better planning of **production** & **inventory**

ROI: higher **productivity**

The Benefit

paiqo AI.S²

CUSTOMER REFERENCE

15% less waste due to AI demand forecasts

How Spar Austria, with over 1,500 stores, continuously optimizes sales planning of its product range, associated costs and food waste with AI.

Microsoft Stories

SPAR

Initial Situation

Planning **errors** decrease **sales** and customer **satisfaction**

Frequent **out-of-stock** situations and **overstocks**

Changing product range and **complex** market structure

Complex **manual** demand planning

Our Solution

AI-based **weekly forecast** for several **million** combinations of market/article/day

Integration with existing planning system

State-of-the-art AI models based on Microsoft Azure

The Benefit

Better forecasting results compared to common planning tools: **>90% accuracy**

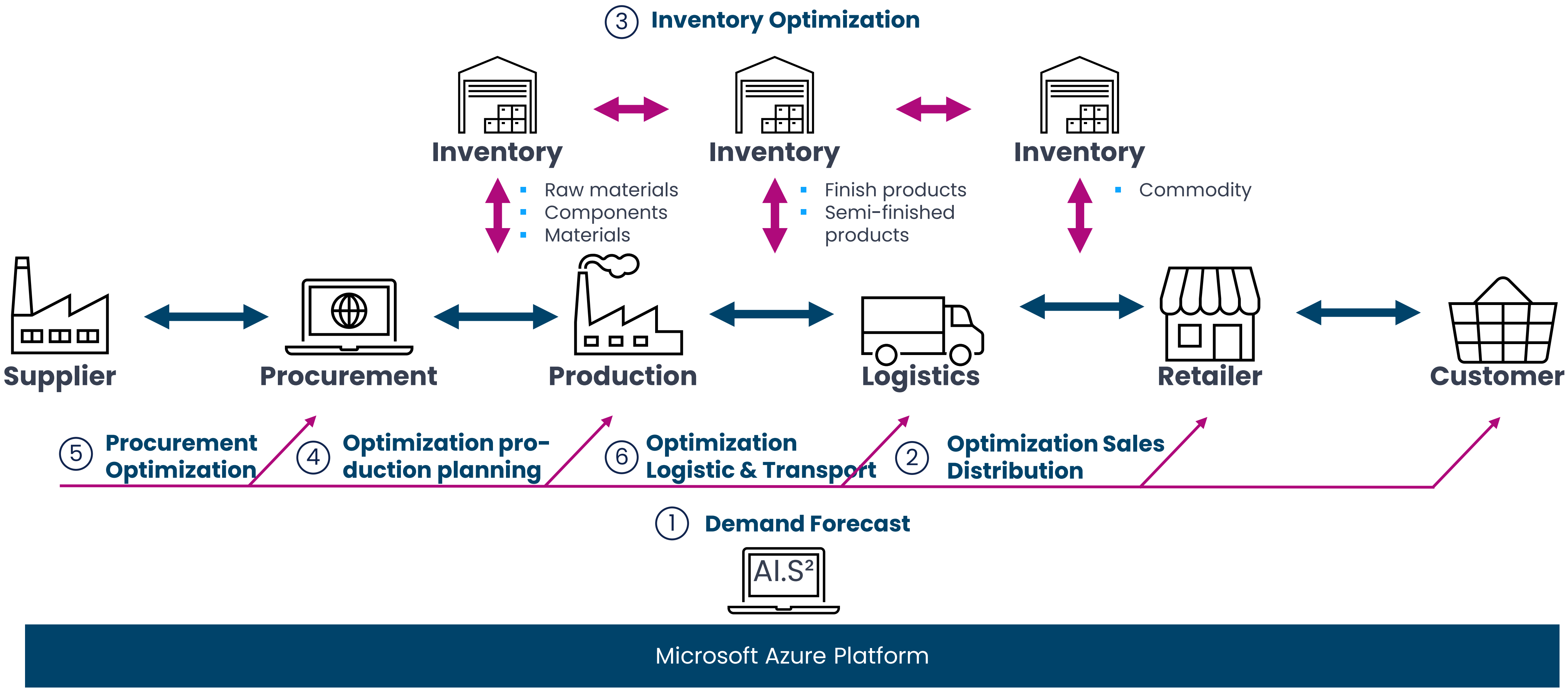
Cost reduction through **15% less waste** and less manual effort

Higher **customer satisfaction**

AI Demand Forecasting in Manufacturing

OVERVIEW

Optimize the value chain with AI



③ **Inventory Optimization**

Inventory

- Raw materials
- Components
- Materials

Inventory

- Finish products
- Semi-finished products

Inventory

- Commodity

Supplier

Procurement

Production

Logistics

Retailer

Customer

⑤ **Procurement Optimization**

④ **Optimization production planning**

⑥ **Optimization Logistic & Transport**

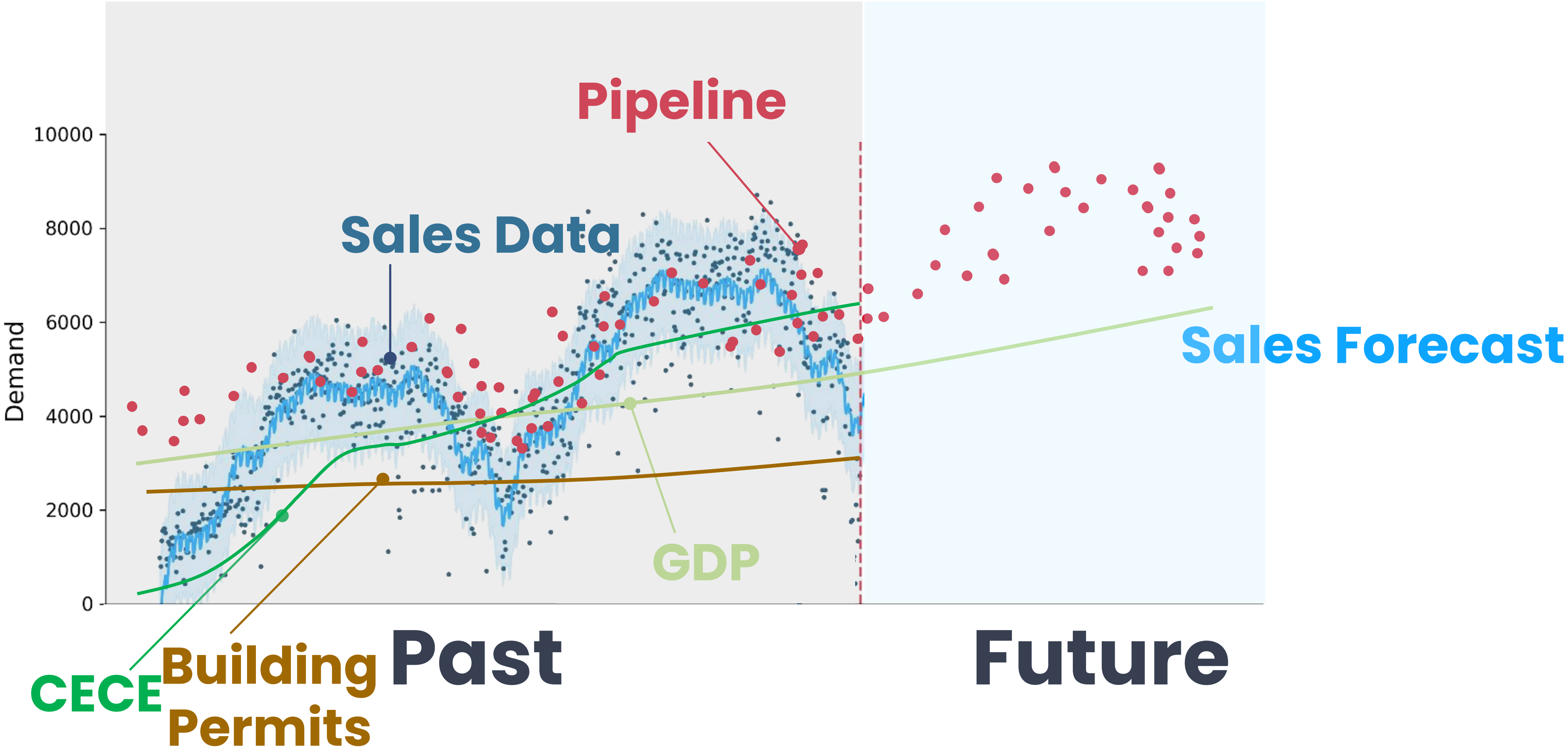
② **Optimization Sales Distribution**

① **Demand Forecast**

Microsoft Azure Platform

REFERENCE CASE – MACHINERY

Step by Step Forecast Modelling



Demo

PRODUCT

Demand-Forecasting is ready to use

industry-specific templates

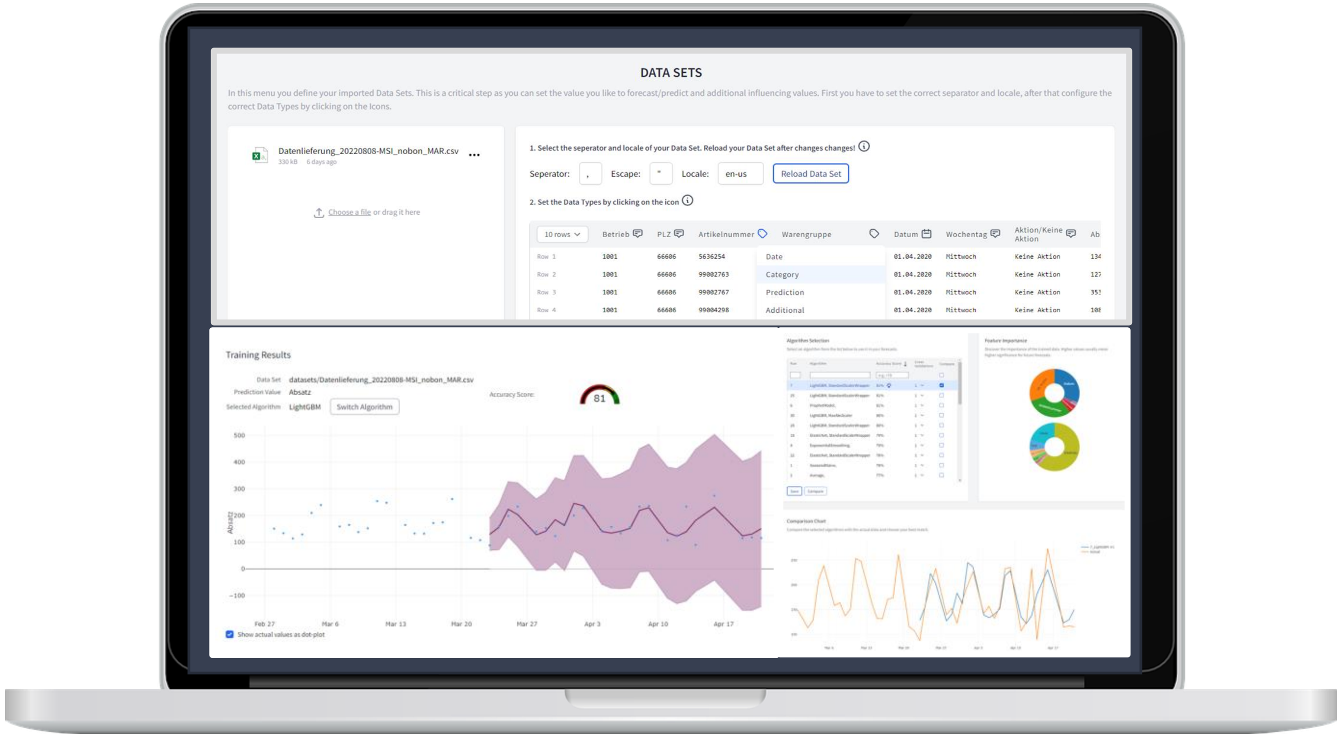
user-friendly UI

Cloud ready

scalable versions

State-of-the-art AI

excellent accuracy



DATA SETS

In this menu you define your imported Data Sets. This is a critical step as you can set the value you like to forecast/predict and additional influencing values. First you have to set the correct separator and locale, after that configure the correct Data Types by clicking on the Icons.

Datenlieferung_20220808-MSI_nobon_MAR.csv
330 kB 6 days ago

Choose a file or drag it here

1. Select the seperator and locale of your Data Set. Reload your Data Set after changes changes!

Seperator: , Escape: " Locale: en-us

2. Set the Data Types by clicking on the icon

10 rows	Betrieb	PLZ	Artikelnummer	Warengruppe	Datum	Wochentag	Aktion/Keine Aktion	Ab
Row 1	1001	66606	5636254	Date	01.04.2020	Mittwoch	Keine Aktion	134
Row 2	1001	66606	99002763	Category	01.04.2020	Mittwoch	Keine Aktion	127
Row 3	1001	66606	99002767	Prediction	01.04.2020	Mittwoch	Keine Aktion	35
Row 4	1001	66606	99004298	Additional	01.04.2020	Mittwoch	Keine Aktion	10

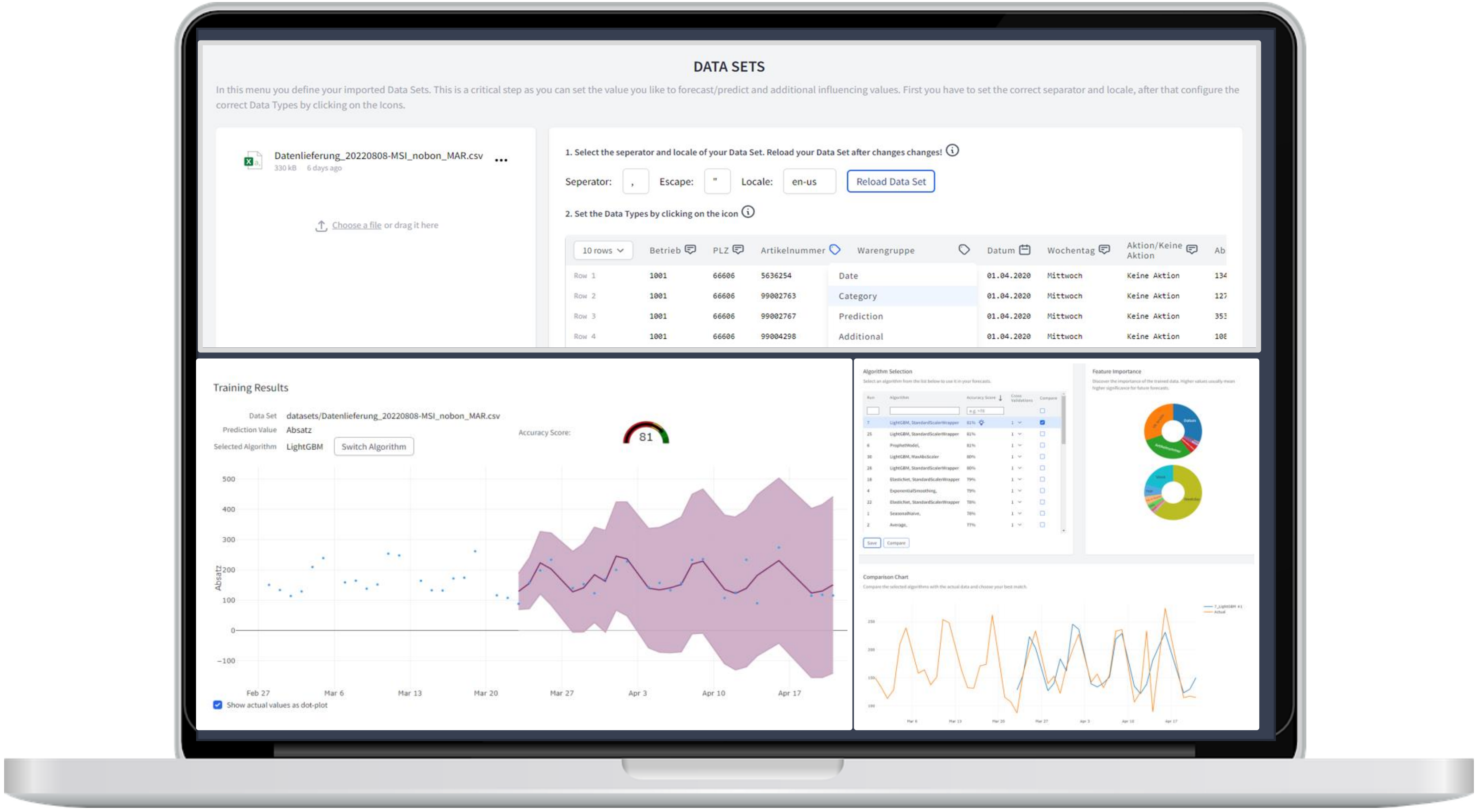
Training Results

Data Set datasets/Datenlieferung_20220808-MSI_nobon_MAR.csv
Prediction Value Absatz
Selected Algorithm LightGBM

Accuracy Score: 81

☑ Show actual values as dot-plot

Demand-Forecasting is ready to use



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Reload Data Set
Date
Category
Prediction
Additional
Switch Algorithm
500
400
300
200
100
0
−100
Absatz
Feb 27
Mar 6
Mar 13
Mar 20
Mar 27
Apr 3
Apr 10
Apr 17
Algorithm Selection
Feature Importance
Comparison Chart

Available on Microsoft Azure Marketplace

Microsoft Azure Marketplace

PRICING AND VERSIONS

Pricing

STANDARD

€ 1.075

Monthly

Our ready-to-go with access to all solutions.

PROFESSIONAL

€4.350

Monthly

Get this if you want to be able to use multiple models and up to 1 Mio datapoints, automate process steps and gain access to our external sources

ENTERPRISE

Contact Sales

Monthly

Get unlimited access to the data-lake and make the most of your forecasted models

Additional Pricing Information

- Prices do not include azure setup & consumption fees
- Number of Users is unlimited
- Licenses are per Legal Entity
- First 12 months are mandatory

PRICING AND VERSIONS

Pricing

	STANDARD € 1.075 Monthly	PROFESSIONAL €4.350 Monthly	ENTERPRISE Contact Sales Monthly
# of operational forecasts	1	Up to 5	Unlimited
Historical Data Import per Model	Up to 10.000 lines Up to 10 columns	Up to 50.000 lines Up to 20 columns	Unlimited
Different Training-sets per Model	1	Up to 3	Unlimited
Future Forecast Horizon	Up to 1 Year	Up to 3 years	Unlimited
Use our External Sources	-	Up to 2	Unlimited
Advanced Algorithm Settings	-	Included	Included
Access to the Datapool API	-	Included	Included

Your way to AI driven Demand Forecasting

Steps to AI driven Demand Forecasting

1. Predictability Check
2. Tool Setup
3. Data Sourcing
4. Process Integration

COSTS

Predictability Check

Total cost for
Predictability Check:

€ 4.800,-

DATA

Initial Data Analysis

CHECK

One feedback-loop if data is not appropriate

ENRICHMENT

Enriching data with additional **external** data

TRAINING

Demand Forecast Training with state-of-the-art **AI models**

ACCURACY

Analysis of accuracy per segment

FEEDBACK

Feedback meeting with you

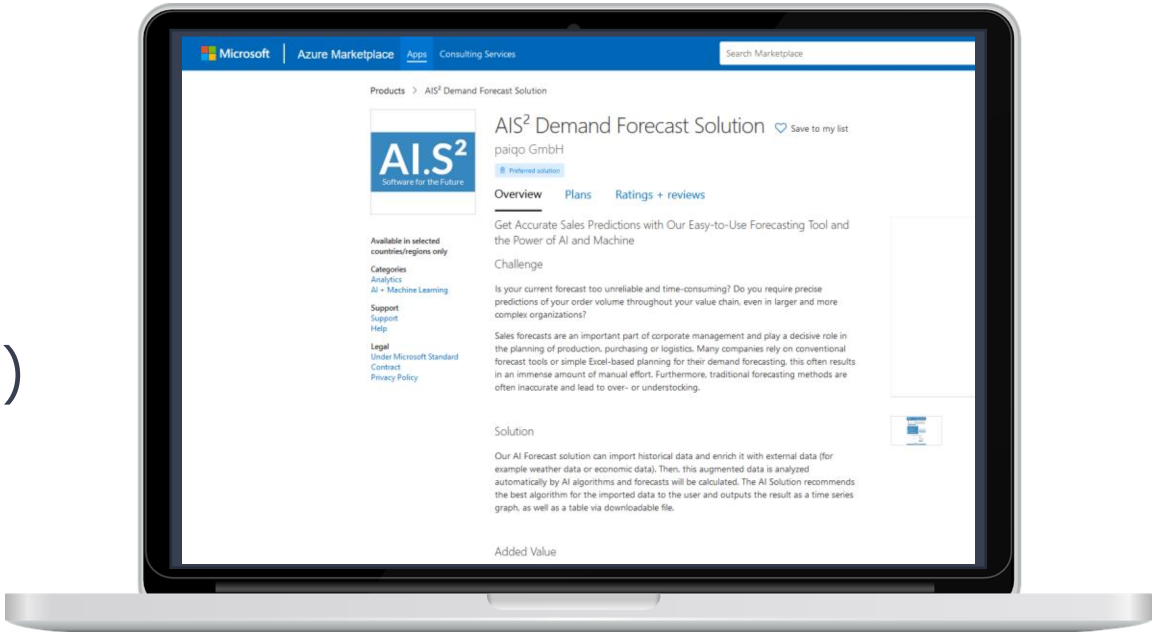
Microsoft Funding for Predictability Check

- Microsoft provides funding for certain customer activities like POC's, envisioning, etc.
- For the first 5 customers that decide to go for the Predictability Check, we would try to get this funding from Microsoft for you.
- To limit the risk for you: If we don't succeed, we will bear 50% of the cost.
- Contact us within the next 2 weeks with reference to this Webinar to get onto the list!
  - Please send a mail to predictabilitycheck@paiqo.com

DEMAND/SALES FORECASTING

How to get AIS² Demand Forecast Solution

- Go to: azuremarketplace.microsoft.com
- Search for: paiqo.ais_demandforecastsolution
- If you have an EA (Enterprise Agreement) with Microsoft, you can use your EA-commitment


Microsoft
Azure Marketplace
Apps
Consulting Services
Search Marketplace
Products > AIS² Demand Forecast Solution
Save to my list
Preferred solution
Overview
Plans
Ratings + reviews

AIS² Demand Forecast Solution

paiqo GmbH

Available in selected countries/regions only

Categories
Analytics
AI + Machine Learning

Support
Support
Help

Legal
Under Microsoft Standard Contract
Privacy Policy

Get Accurate Sales Predictions with Our Easy-to-Use Forecasting Tool and the Power of AI and Machine

Challenge

Is your current forecast too unreliable and time-consuming? Do you require precise predictions of your order volume throughout your value chain, even in larger and more complex organizations?

Sales forecasts are an important part of corporate management and play a decisive role in the planning of production, purchasing or logistics. Many companies rely on conventional forecast tools or simple Excel-based planning for their demand forecasting, this often results in an immense amount of manual effort. Furthermore, traditional forecasting methods are often inaccurate and lead to over- or understocking.

Solution

Our AI Forecast solution can import historical data and enrich it with external data (for example weather data or economic data). Then, this augmented data is analyzed automatically by AI algorithms and forecasts will be calculated. The AI Solution recommends the best algorithm for the imported data to the user and outputs the result as a time series graph, as well as a table via downloadable file.

Added Value

Your Questions

Feedback

We would appreciate your feedback

https://forms.office.com/e/j6PjxnbjGT

Your Contact

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