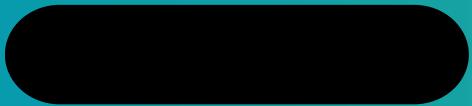


# SIEMENS

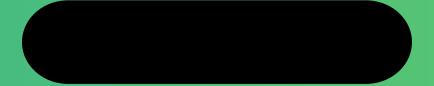
## SALES FORECASTING



**YOUNG TALENT CONSULTING GROUP**



# Meet our Team



Pedro Leal



Rodrigo Silva



Carolina Costa



Rúben Serpa



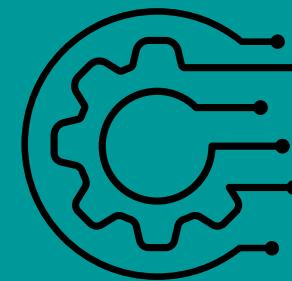
Martim Santos

# INDUSTRY OVERVIEW

**Global Smart  
Infrastructure Market**

**23.8%**

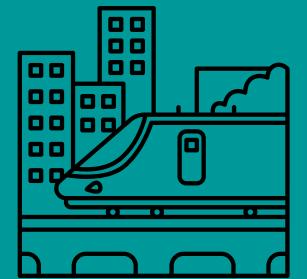
Compound Annual  
Growth Rate (2021-2028)



Technology  
Advancements



Sustainability and  
Green Energy



Increasing  
Urbanisation

# BUSINESS OBJECTIVES

- 1 Increase **sales margins**
- 2 Enhanced **consistency** and **transparency** of quotes



# PROJECT PLAN

The project was divided into three main steps:



1

Data Exploration  
and Business  
Insights

2

Data Treatment and  
Modelling

3

Sales Forecast and  
Recommendations

# DATASETS IMPLEMENTED

In addition to Sales, exogenous data is critical to understand sales trends



SALES DATA



MARKET DATA



COVID DATA

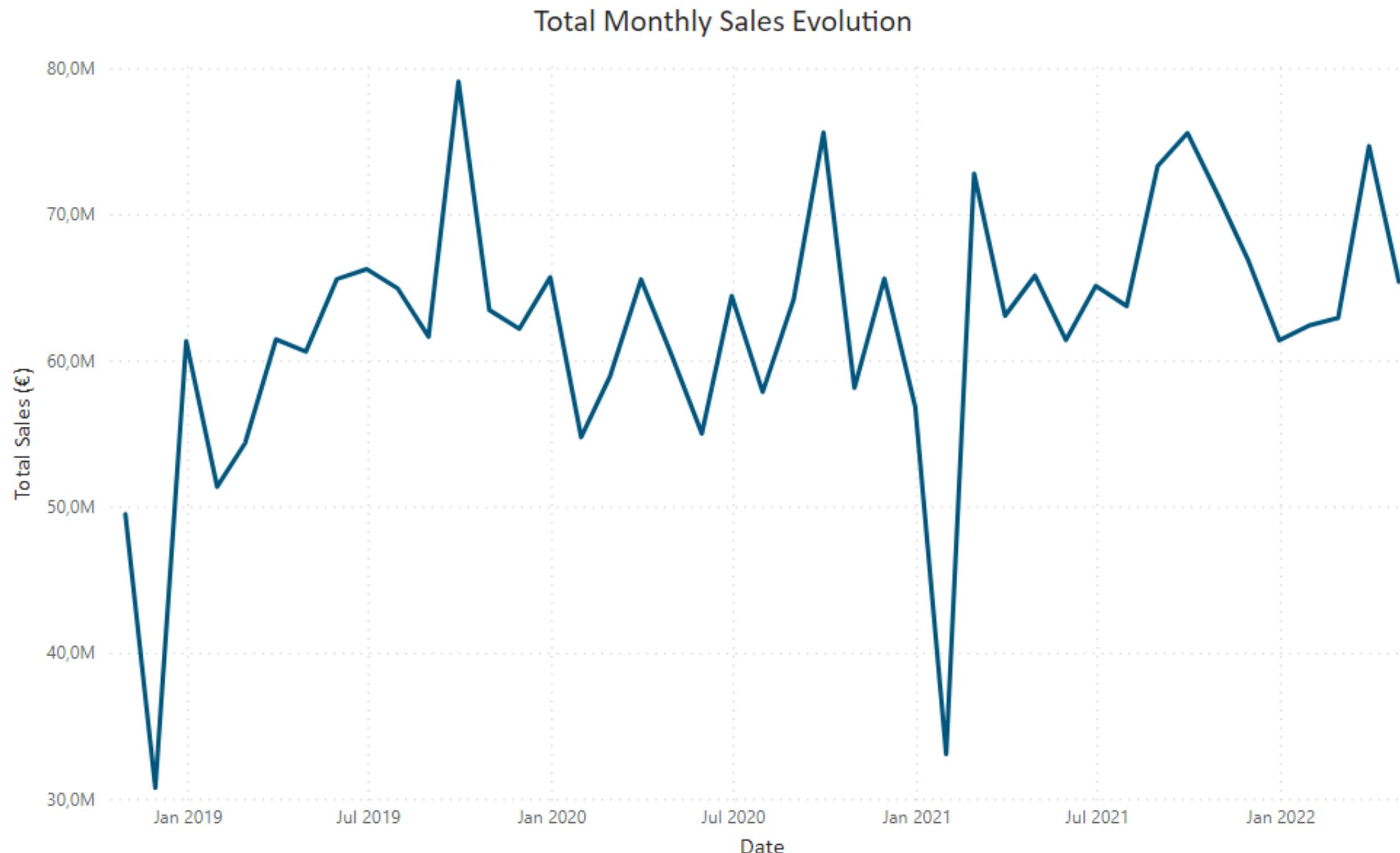


HOLIDAYS DATA



GDP AND INFLATION

# SALES OVERVIEW



TOP 3 MOST SOLD  
PRODUCTS



GCK\_1

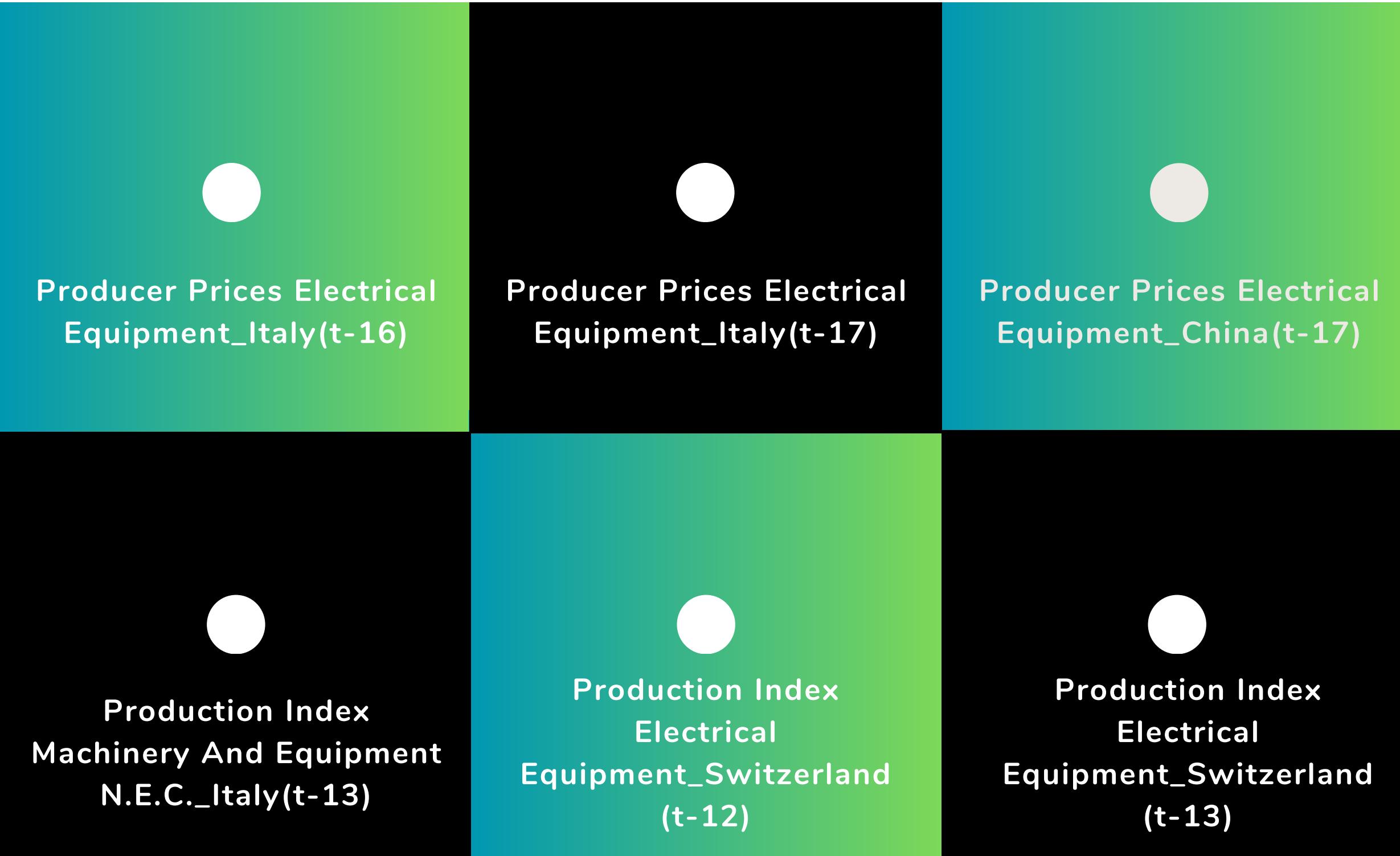


GCK\_3



GCK\_5

# FEATURE SELECTION



# MODELLING METHODOLOGY

32 MONTHS

TRAIN

OCTOBER 2018 - JUNE 2021

10 MONTHS

VALIDATION

JULY 2021 - ABRIL 2022

10 MONTHS

TEST

MAY 2022 - FEBRUARY 2023

# MODELLING

- ✓ Stationarity before or after applying diff
- ✓ No significant total or partial autocorrelation



1

Mean

2

Median

3

XGBOOST

# MODELLING

- ✓ Stationarity before or after applying diff
- ✓ Significant total or partial autocorrelation



1

ARIMA

2

Prophet

3

XGBoost

4

Ensemble Method

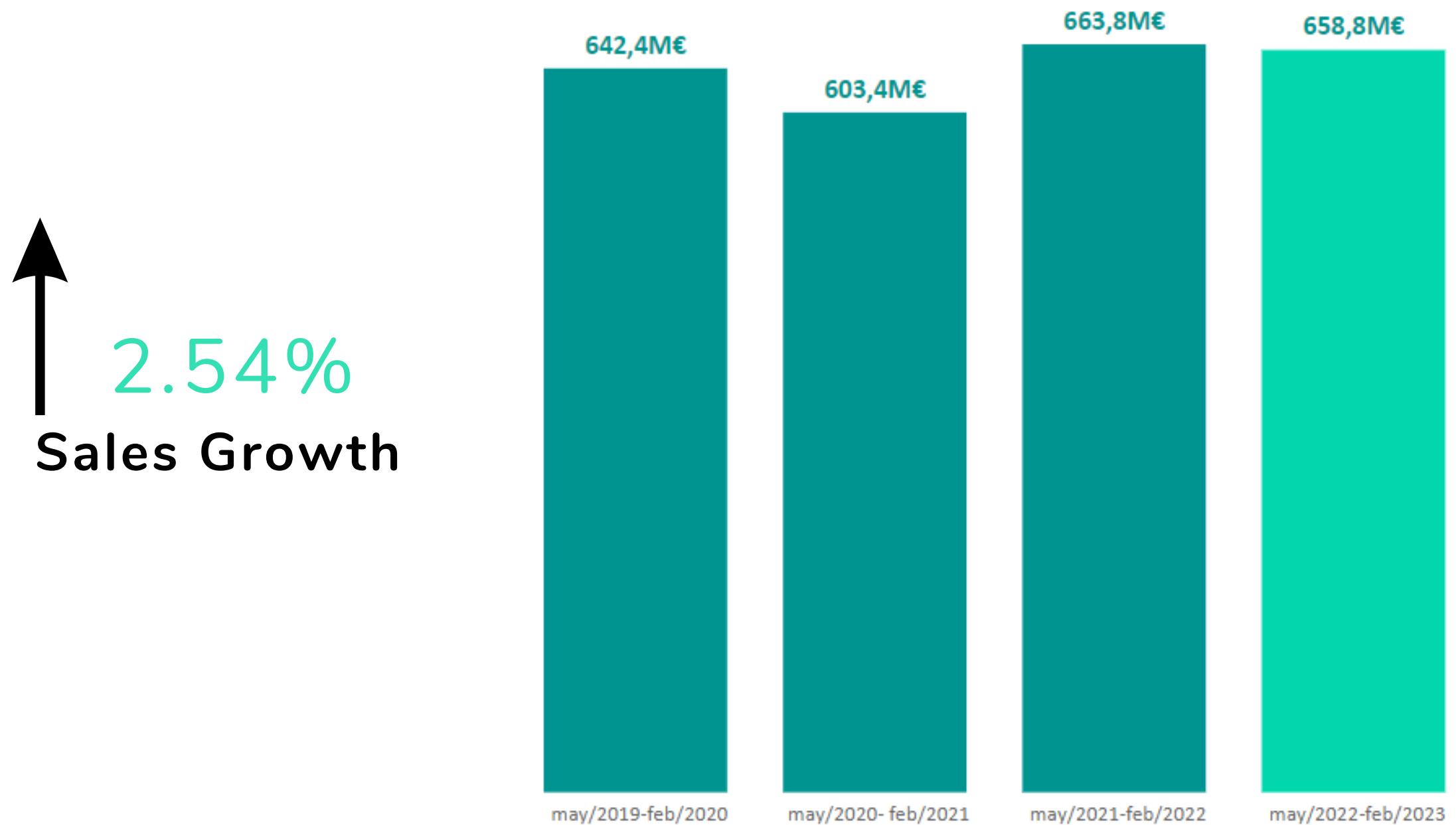


# MODEL EVALUATION

- 1 R-square
- 2 Root Mean Square Error (RMSE)
- 3 Maximum (MAX)
- 4 Mean Absolute Percentage Error (MAPE)

# SALES FORECASTING OVERVIEW

Total Sales Evolution (2020-203)



# MARKETING STRATEGIES



Constant over time

Products 1, 3, 4, 9, 13, 14, 16, and 20

Seasonal over time

Products 5, 6, 8, 11, 12, and 36





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**Co-Marketing  
Strategies**



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**Loyalty  
Program**



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**Transparent  
Communication**



Packages



Premium options



Remarketing  
Strategies

# FINAL REMARKS

- 1 Unprecedented events negatively impact sales prospectives
- 2 Ongoing monitoring and updating of the models is critical

