



# ARTIFICIAL INTELLIGENCE IN PRODUCTION PLANNING



*Implementation of an Artificial Intelligence model that would predict the high demand periods of the year, based on the history of orders that the company has.*

# AI IN PRODUCTION PLANNING

*Predicting big clusters in the data will help DKG to take faster business decisions about restocking materials.*

Amazon

# ML FOR TREND FORECASTING

“We looked at how our human forecasts were performing and how our machine learning forecasts were performing. And it was night and day in terms of the difference.” - Freshwater (Vice President of Fashion and Fitness of Amazon)

Amazon

# ML FOR TREND FORECASTING

The goal of the model was to maximize the customer experience and achieve a cost-effective advantage over their competitors.

Amazon recognised the limitations of traditional machine learning models and preferred a more intricate approach to predict the times of high demand.

**Amazon**

# **ML FOR TREND FORECASTING**

The enterprise developed a complex neural network model that takes into account various factors like region, time of the year and the customer's behaviour.

The model was first implemented almost 1 decade ago and with unexpected events like the COVID 19 pandemic, the company kept their reputation and offered the best customer experience.

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# **PROS, CONS AND CONSIDERATIONS**

## **PROS:**

- **Improved Decision Making:** Accurate trend forecasting can help in making informed decisions about production schedules, inventory management, and resource allocation.
- **Optimized Production Planning:** By identifying high-demand periods in advance, the company can adjust production schedules to meet customer demand efficiently, reducing lead times and avoiding stockouts or overstock situations, thus optimizing production processes.
- **Enhanced Customer Satisfaction:** Meeting customer demand promptly can lead to increased customer satisfaction and loyalty.

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# **PROS, CONS AND CONSIDERATIONS**

## **CONS:**

- **Costs:** Implementing an ML model for trend forecasting incurs upfront costs for software, hardware, and training. Ongoing maintenance and updates also add to the expenses.
- **Data Privacy Concerns:** Collecting and analyzing historical order data for trend forecasting raises privacy concerns, especially with regulations like GDPR. Ensuring compliance adds complexity and potential costs to the project.
- **Dependency on Data Quality:** ML models heavily rely on the quality and completeness of historical data. Inaccurate or incomplete data can lead to unreliable forecasts and subsequent production inefficiencies.

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# PROS, CONS AND CONSIDERATIONS

## CONSIDERATIONS:

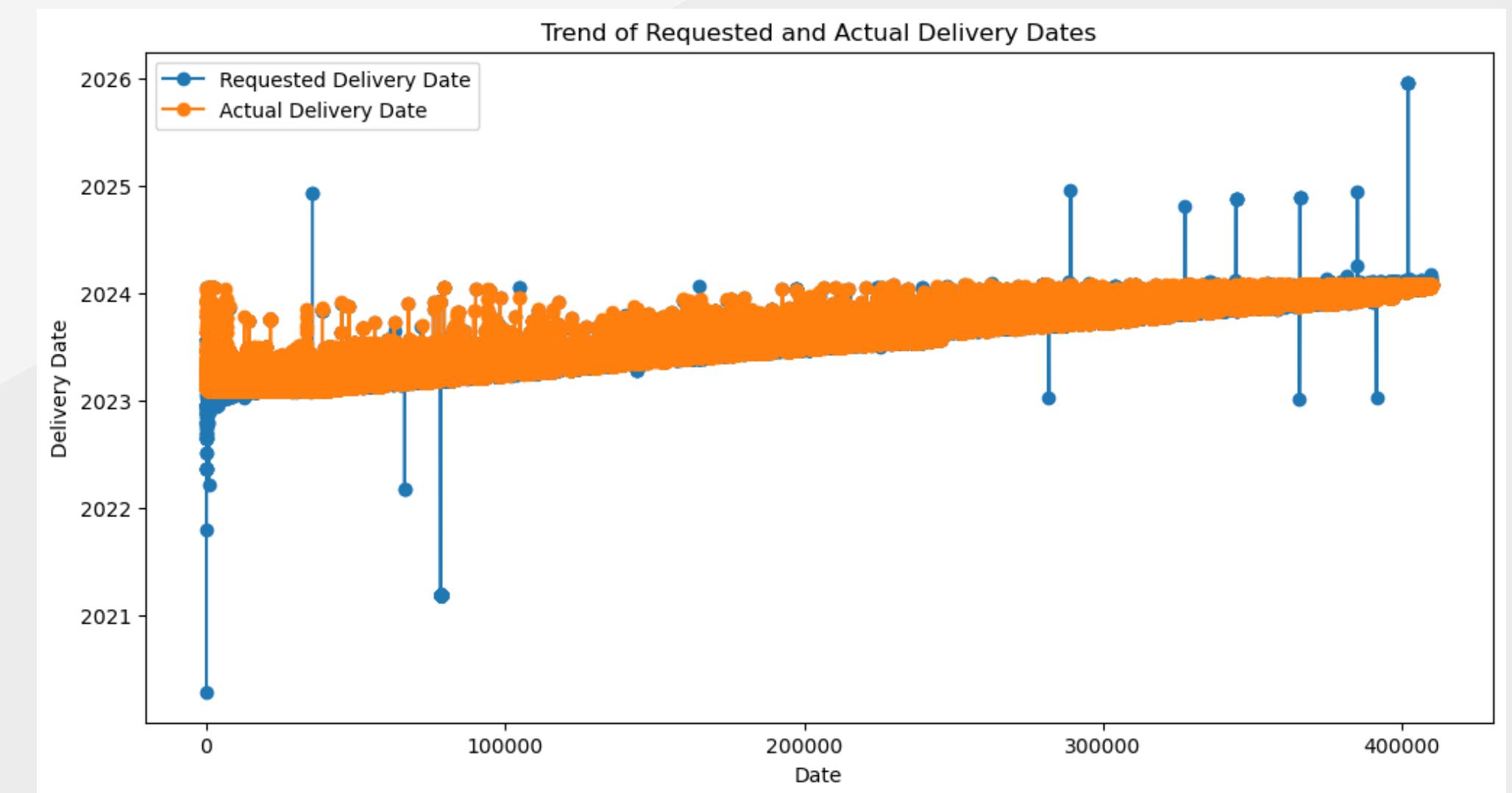
- **Resources:** Adequate skilled personnel, computational infrastructure, and budget allocation are crucial for successfully implementing and maintaining an ML-based trend forecasting system. Assessing existing resources and addressing any gaps is vital before starting the project.
- **Time:** Developing and implementing an ML model for trend forecasting can be time-consuming, especially during the initial phases of data collection, model development, and testing. It's essential to allocate sufficient time for each stage of the implementation process.
- **Costs:** Implementing an ML model incurs costs for data collection, software, hardware infrastructure, personnel, and maintenance. Careful budgeting and planning are essential for project success.





# EDA FINDINGS

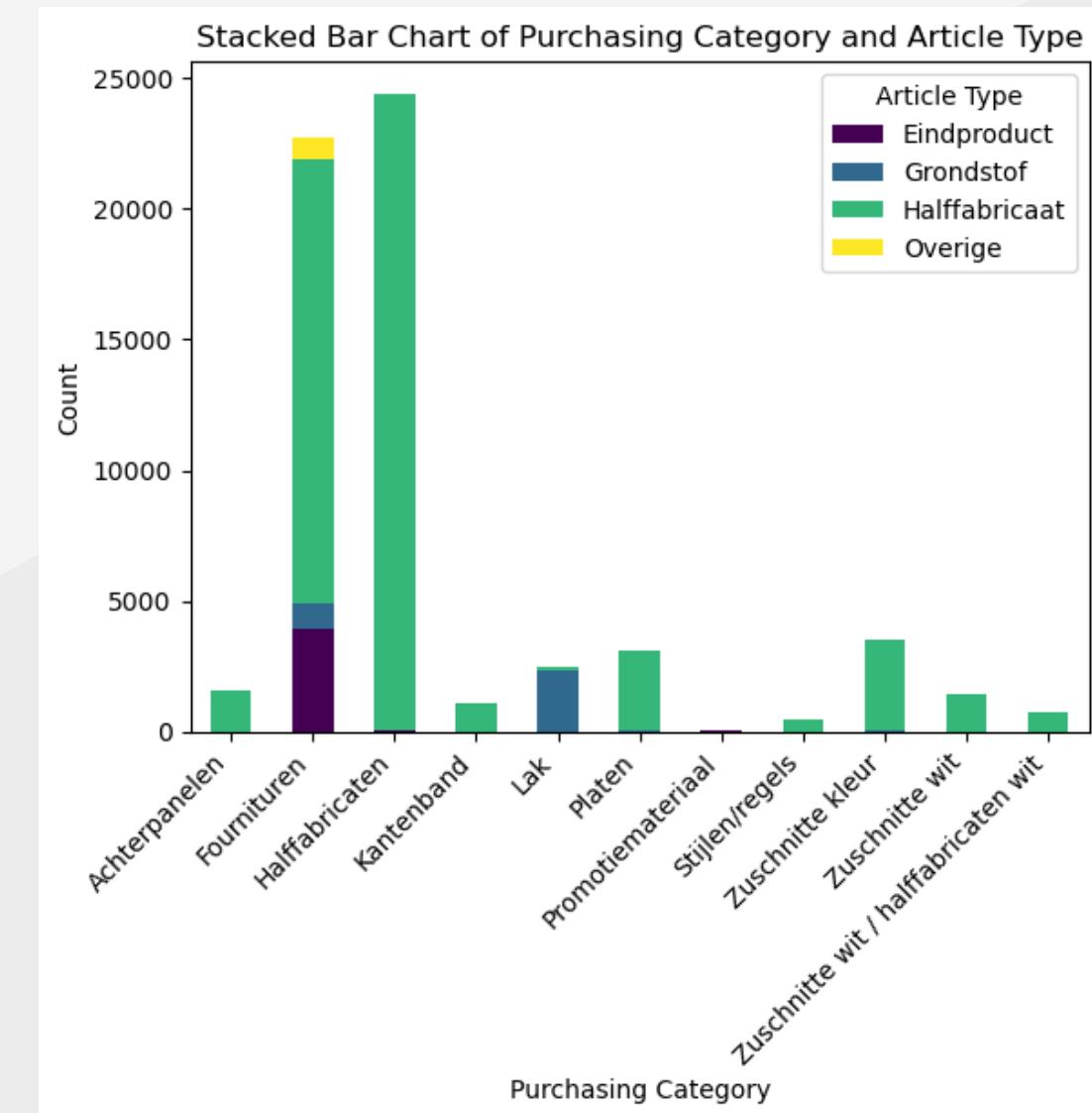
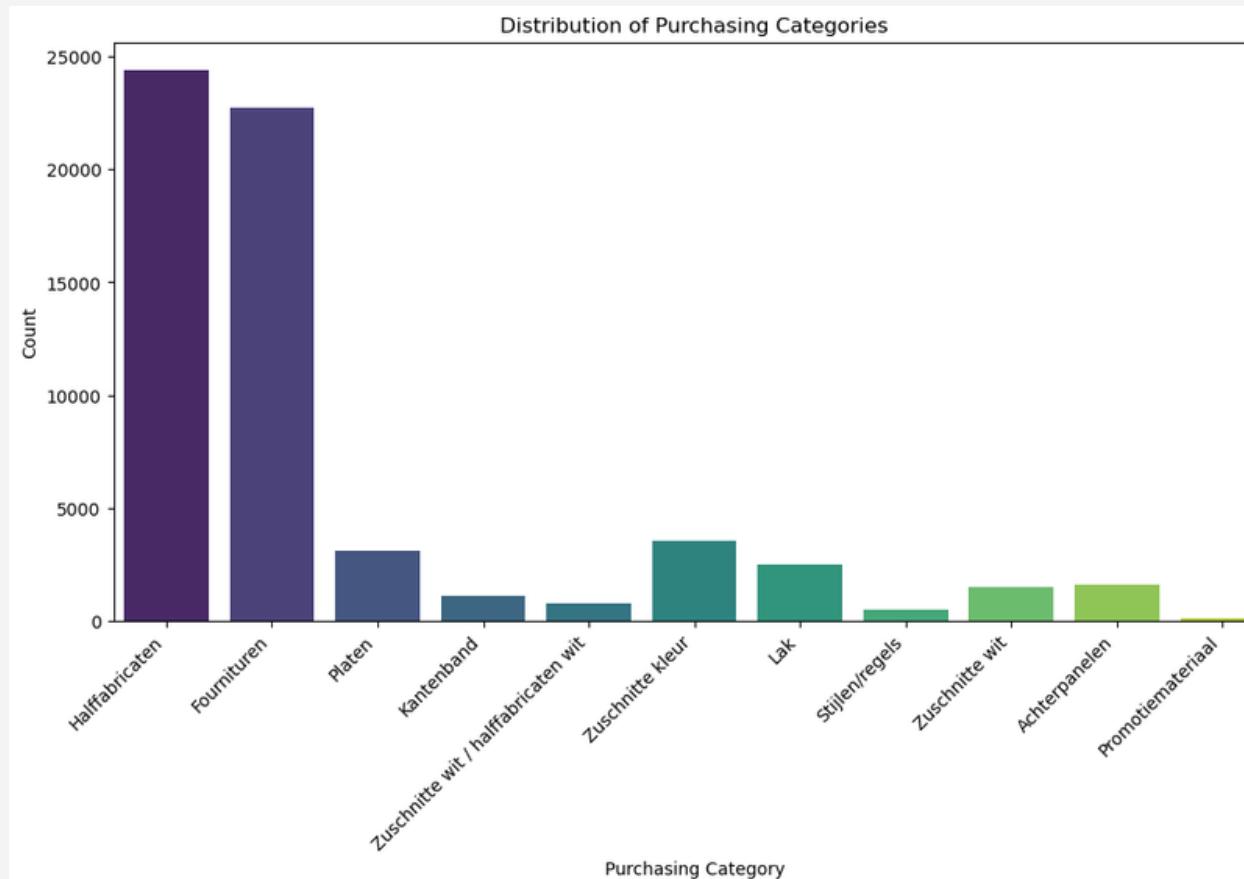
- After conducting exploratory data analysis, it was found that the given data set did not require significant cleaning or preprocessing. Only minor adjustments were needed. The graph on the right side shows that the requested delivery date and the actual delivery date are almost identical for most of the data. This is the most important finding of the analysis, which can be further improved with machine learning to provide greater precision and accuracy in predicting delivery outcomes.





# EDA FINDINGS

One way to enhance our ability to predict purchases is by closely examining the count per item and the article type in the graph. This analysis can provide valuable insights into which items are more likely to sell and help us make informed decisions to optimize sales.



# **DEVELOPING AN AI-DRIVEN PRODUCTION PLANNING SOLUTION**

Paying a company to develop the solution.



Developing in-house.



# PAYING A COMPANY

- Pros:

- **Expertise and Experience**
- **Faster Implementation**
- **Access to Latest Technologies**
- **Scalability**
- **Reduced Internal Workload**

- Cons:

- **Cost**
- **Dependency on External Vendor**
- **Less Control**



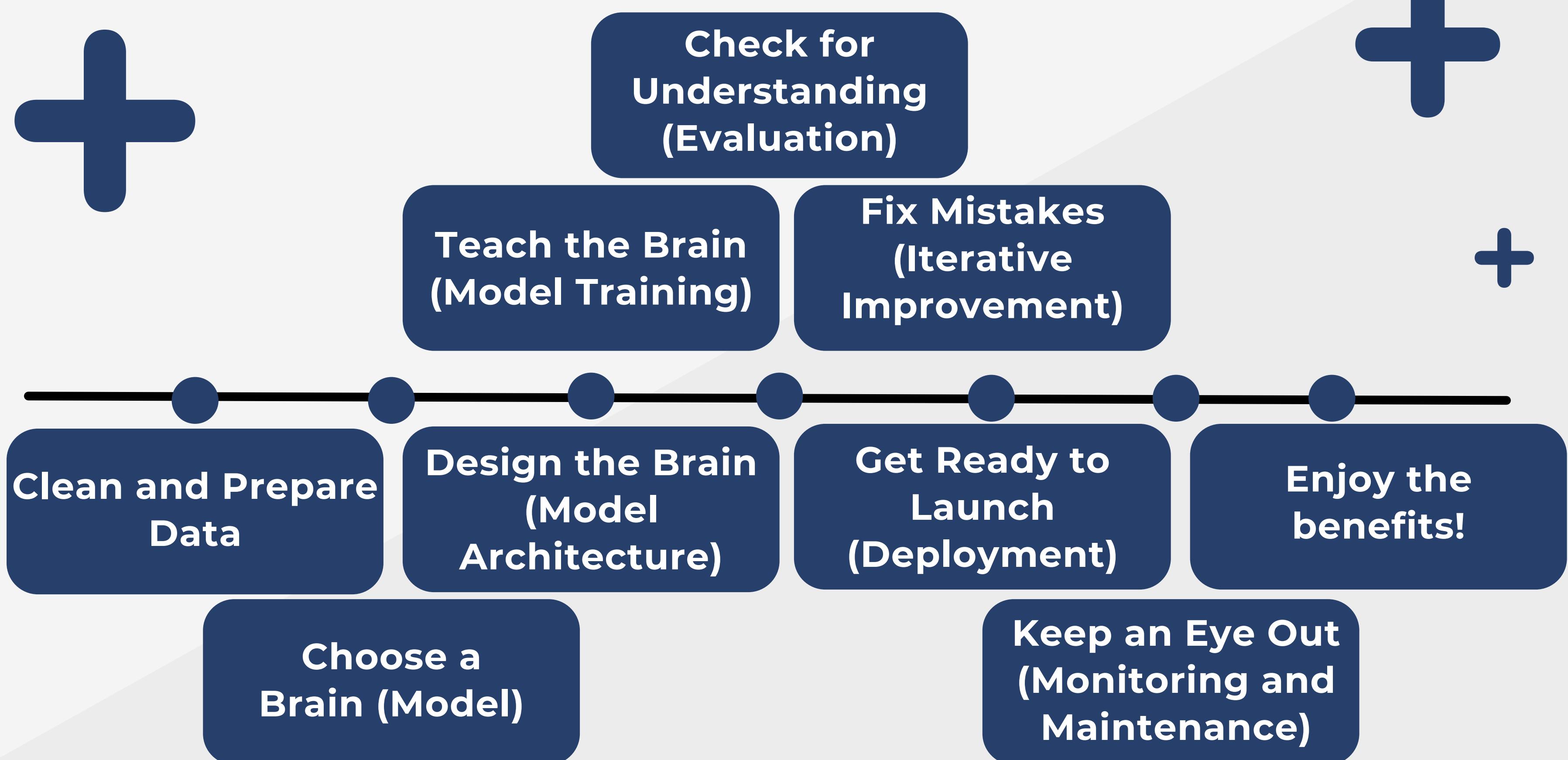


# **DEVELOPING IN-HOUSE**

- **Pros:**
  - **Cost Savings**
  - **Direct Control**
  - **Internal Knowledge Transfer**
  - **Customization**
- **Cons:**
  - **Learning Curve**
  - **Time-Consuming**
  - **Risk of Overlooking Best Practices**
  - **Resource Allocation**



# **DEVELOPMENT STEPS**





# THANK YOU

