# Predictive Data-Driven Operating Model (DDOM) for DMe

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An AI approach to forecast the customer journey experience

# Executive Summary

## OBJECTIVE

DDOM seeks to fulfill the following goals:

1. Guide quarterly ARR expectations
2. Automate forecasts into a single, **robust model**
3. Evolve QRF and Strat/Ops Plans to an **AI Funnel Based Forecast**

## APPROACH

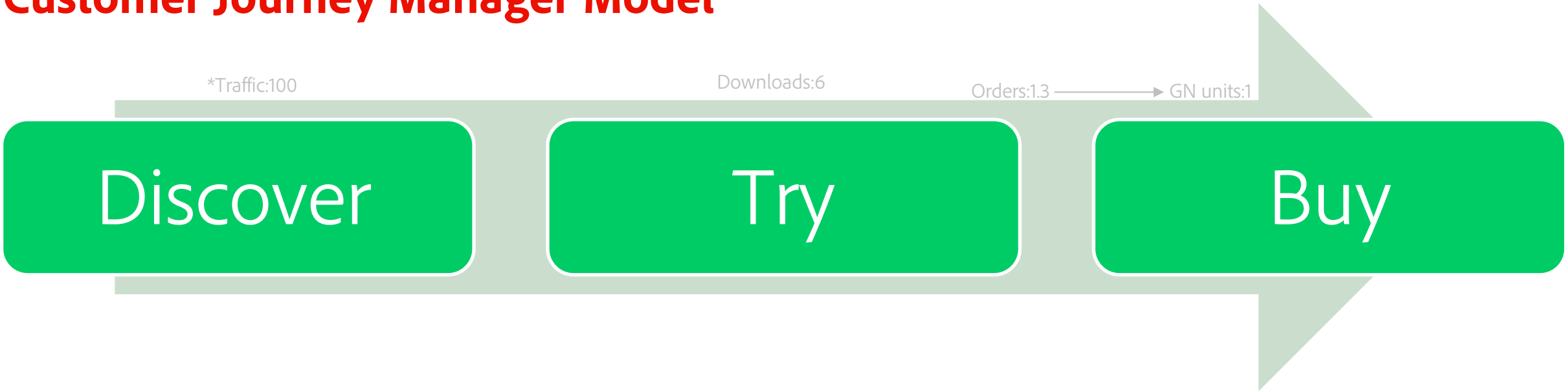
DDOM forecasts ARR using a **customer journey funnel**. Uses built web traffic, orders, gross new subscriber forecasts, and historical ARR actuals to make an ARR **forecast on a weekly cadence.**

## RESULTS

DDOM has already proven to be **extremely promising**. A high-level forecast of ARR for FY23 Q4 is **99.6% accurate** with current manual forecast techniques across FP&A – with benefits of both using a **bottoms-up** funnel approach & **economizing labor hours**.

# What is DDOM?

# Customer Journey Manager Model



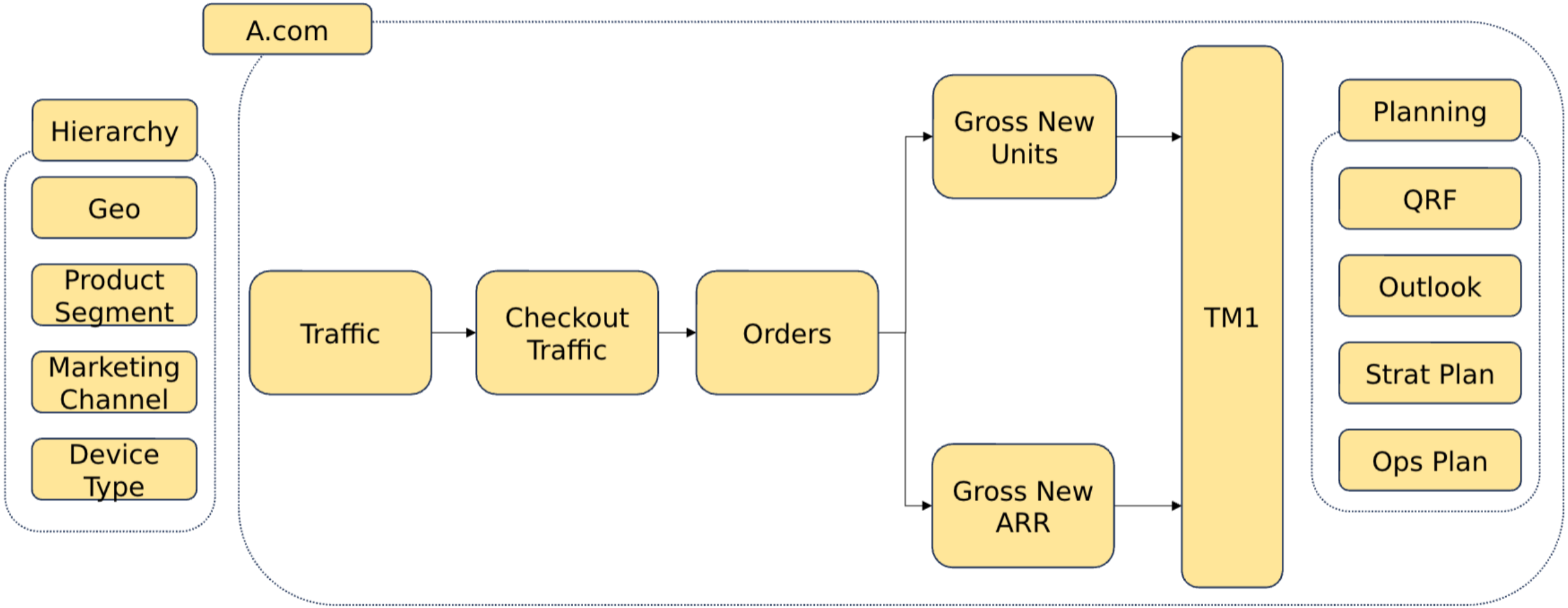

- Surface Traffic
- New Visits
- Checkout Traffic

- Sign-Ups
- New Trialists
- Orders

- Gross New Subs
- Gross New ARR

*DDOM Numbers are for representational purposes only

# DDOM Overview



# Automation and Value-Add

## Raise the bar.

DDOM's **technology stack** is the **first in FinOps** to use:

1. Databricks – powerful & modern data pipelining
2. Github – dynamic version control for collaboration

## Create the future.

DDOM **transforms** manual and rudimentary forecast processes **across FP&A** into an **automated system** that capitalizes on **AI capabilities**.

## Leveraging AI

DDOM leverages a Machine Learning driven approach to make **scalable, robust, and accurate** forecasts. Estimated to **save hundreds of hours per year** in FP&A processes.

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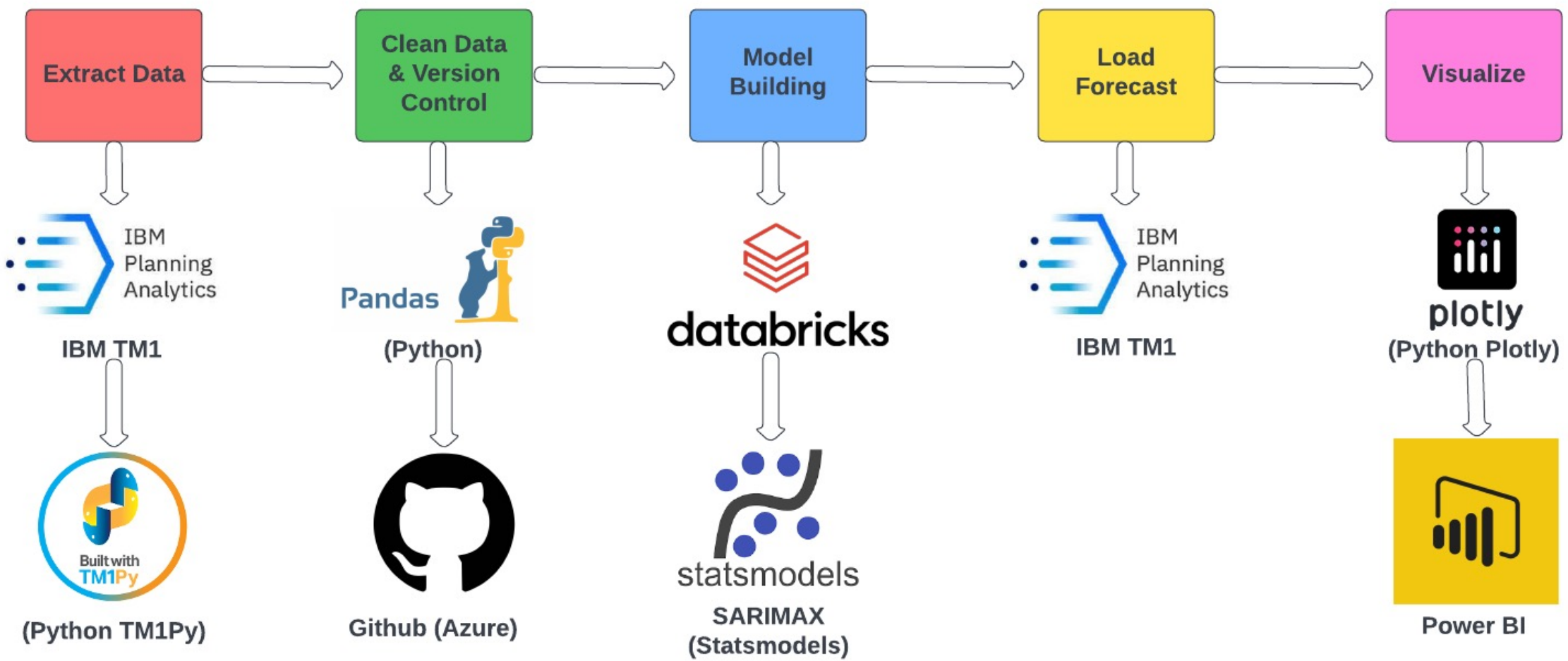
# DDOM Methodology

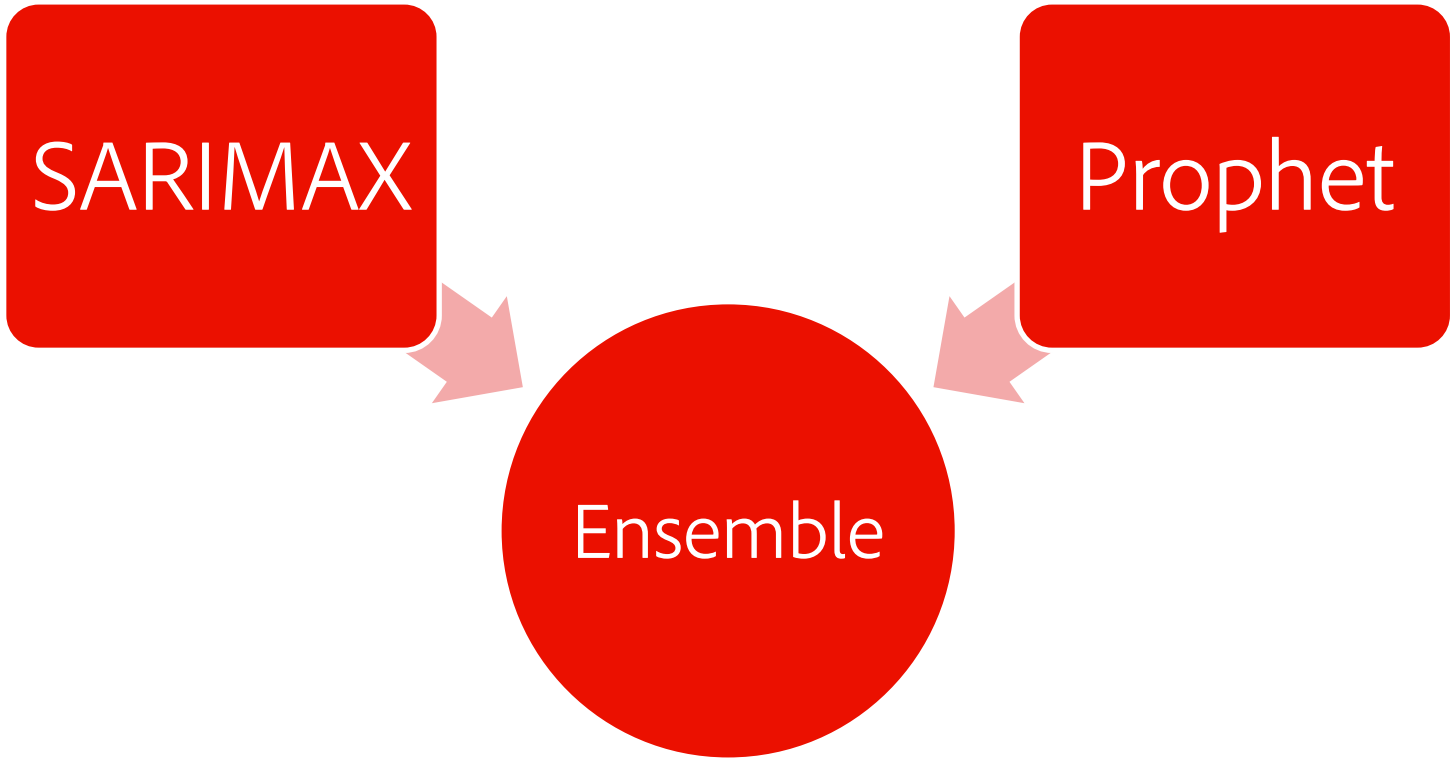
# DDOM Leverages Python, IBM TM1, Databricks, and Power BI Technologies



# DDOM Uses an Ensemble Model

DDOM utilizes an ensemble model as the **most accurate forecasting approach**.

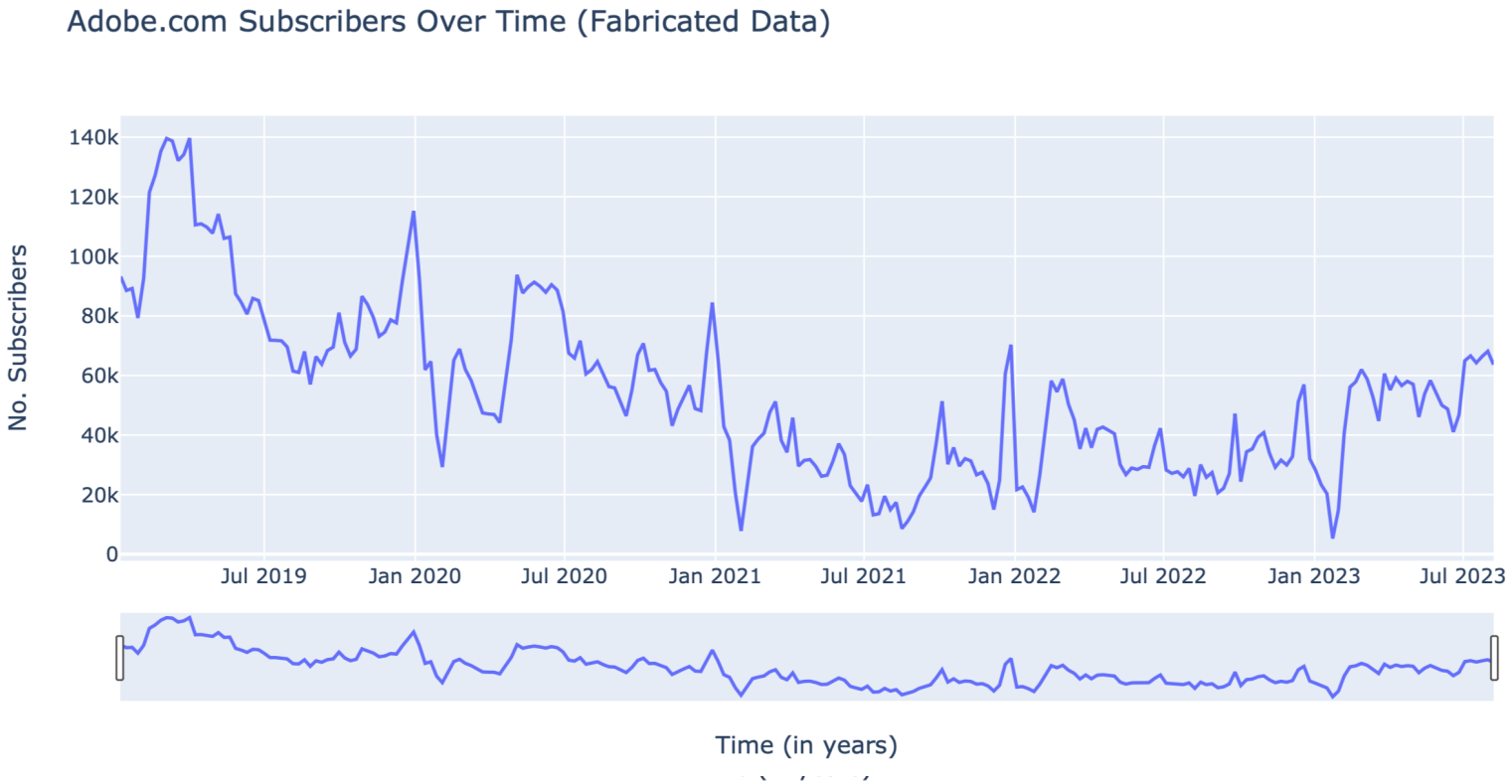
- Aggregated Results
- Leverages two AI models
- Reduces Error in Forecast
- Most Stable Forecasts



# SARIMAX Model

SARIMAX is a commonly used machine learning model for time series forecasting. The term SARIMAX is an acronym of its components:

- Seasonality (quarterly)
- Auto Regression (historicals)
- Integration (differencing)
- Moving Average (trend)
- EXogenous (regression)




[1] *Dataset is fabricated as financial data is confidential to Adobe Finance and Operations*

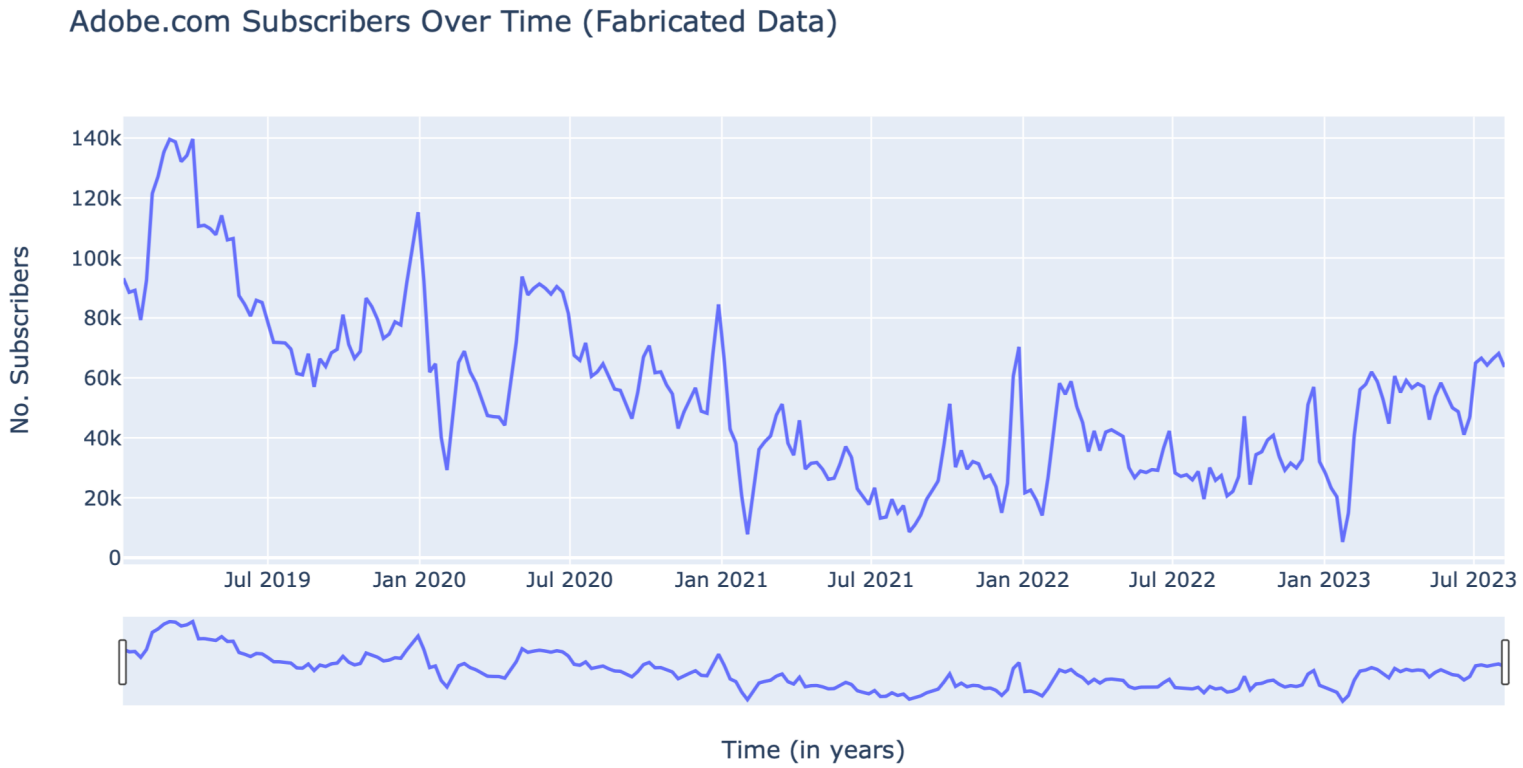
# Prophet Model

PROPHET

Forecasting at scale.

Prophet is a highly customizable machine learning model for forecasting, developed by Meta.

- Saturating Forecasts
- Custom Seasonalities
- Holidays
- Exogeneous Regressors
- Advanced Diagnostics

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# DDOM Considers Historicals, Trend, Seasonality, and the Funnel Forecast

**Trend**

- 2-year moving average from the current period

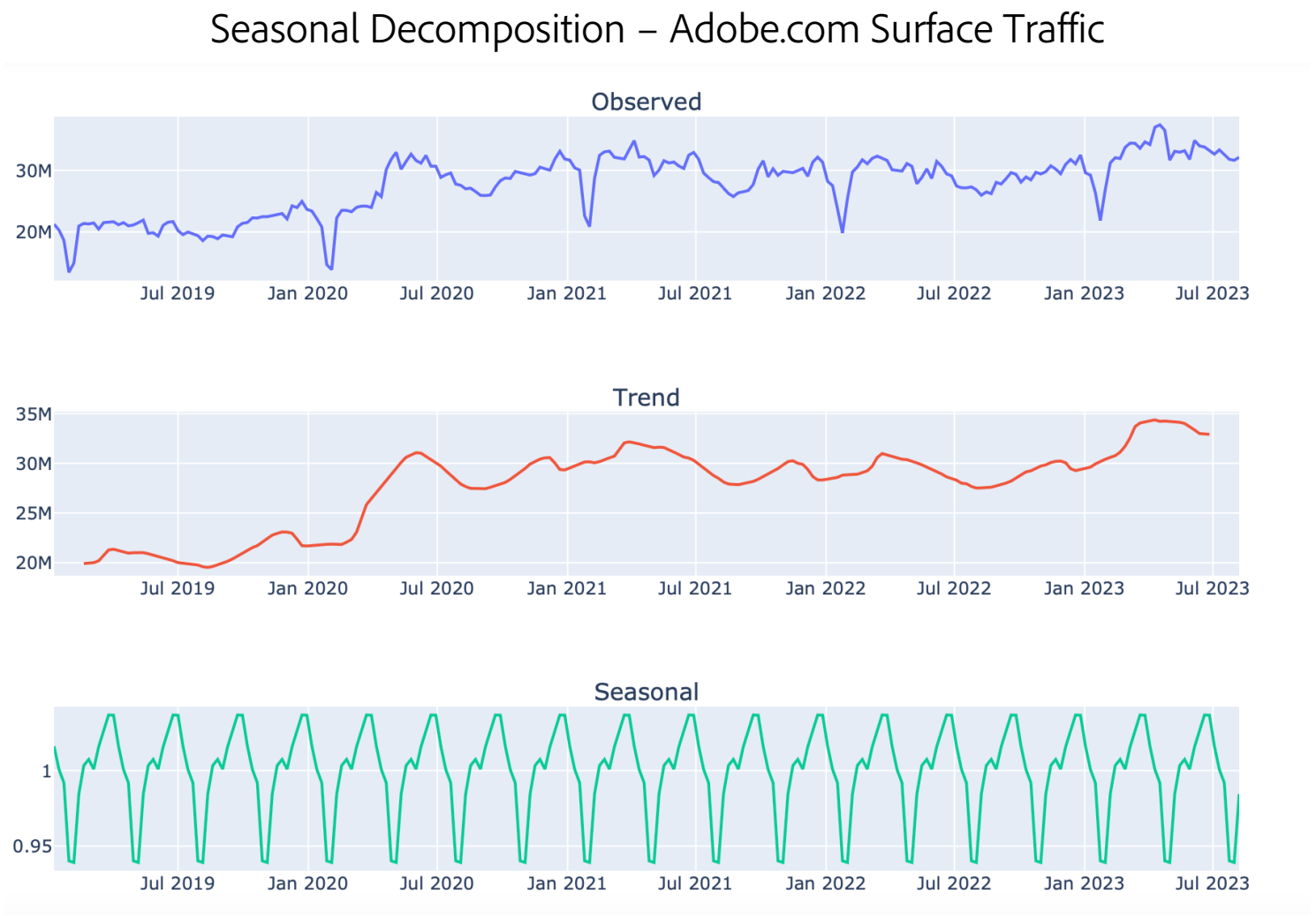
**Seasonality**

- 13-week seasonality based on the working week of the fiscal quarter

**Regression**

- Prior 52-week data & monthly seasonal decomposition
- Forecast from **prior step in funnel**

# Ensemble Trend and Seasonality Visualized



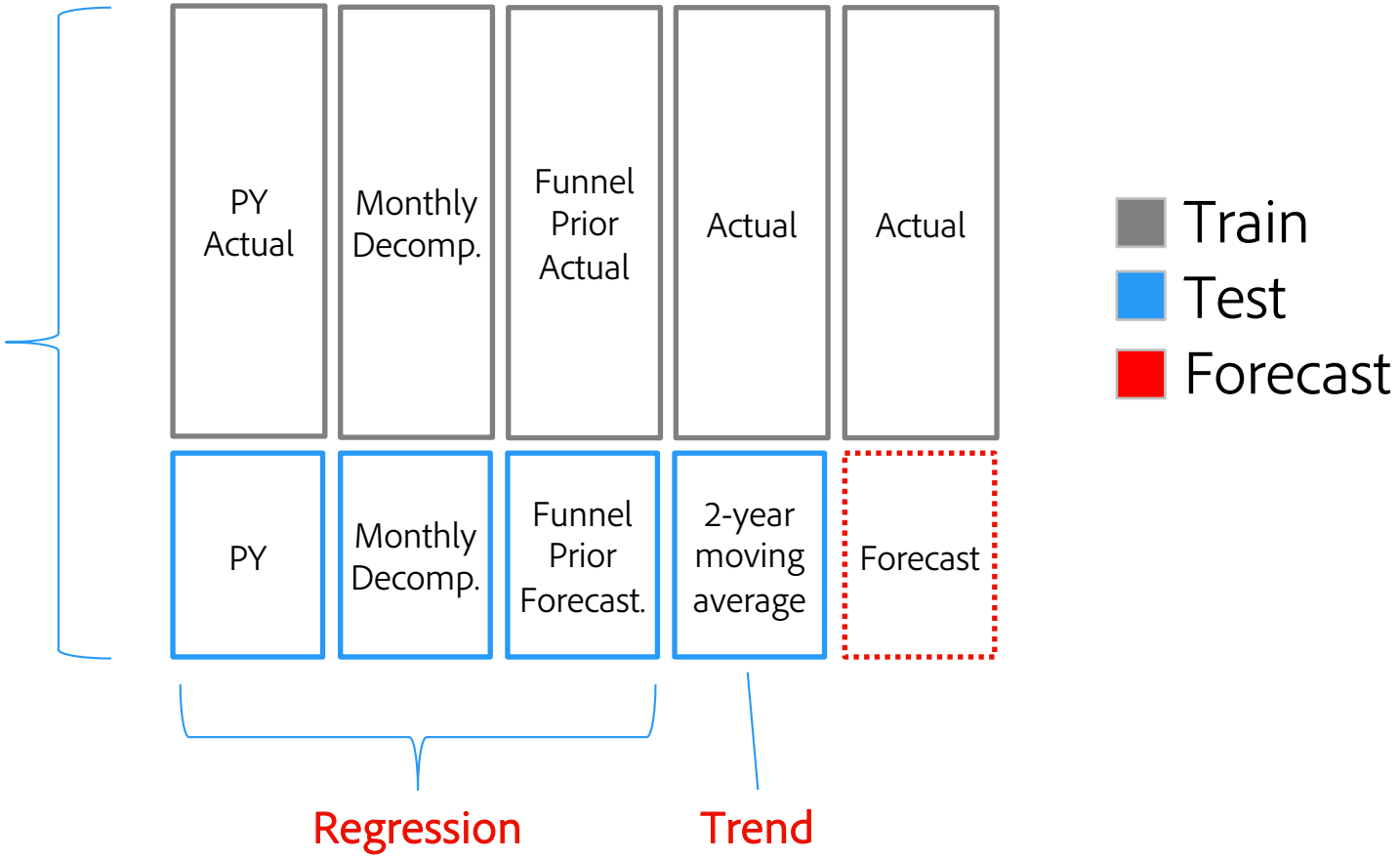

[1] *Seasonal decomposition plot is a multiplier effect representing quarterly seasonality*

[2] *Dataset is fabricated as financial data is confidential to Adobe Finance and Operations*

# Ensemble Approach Visualized

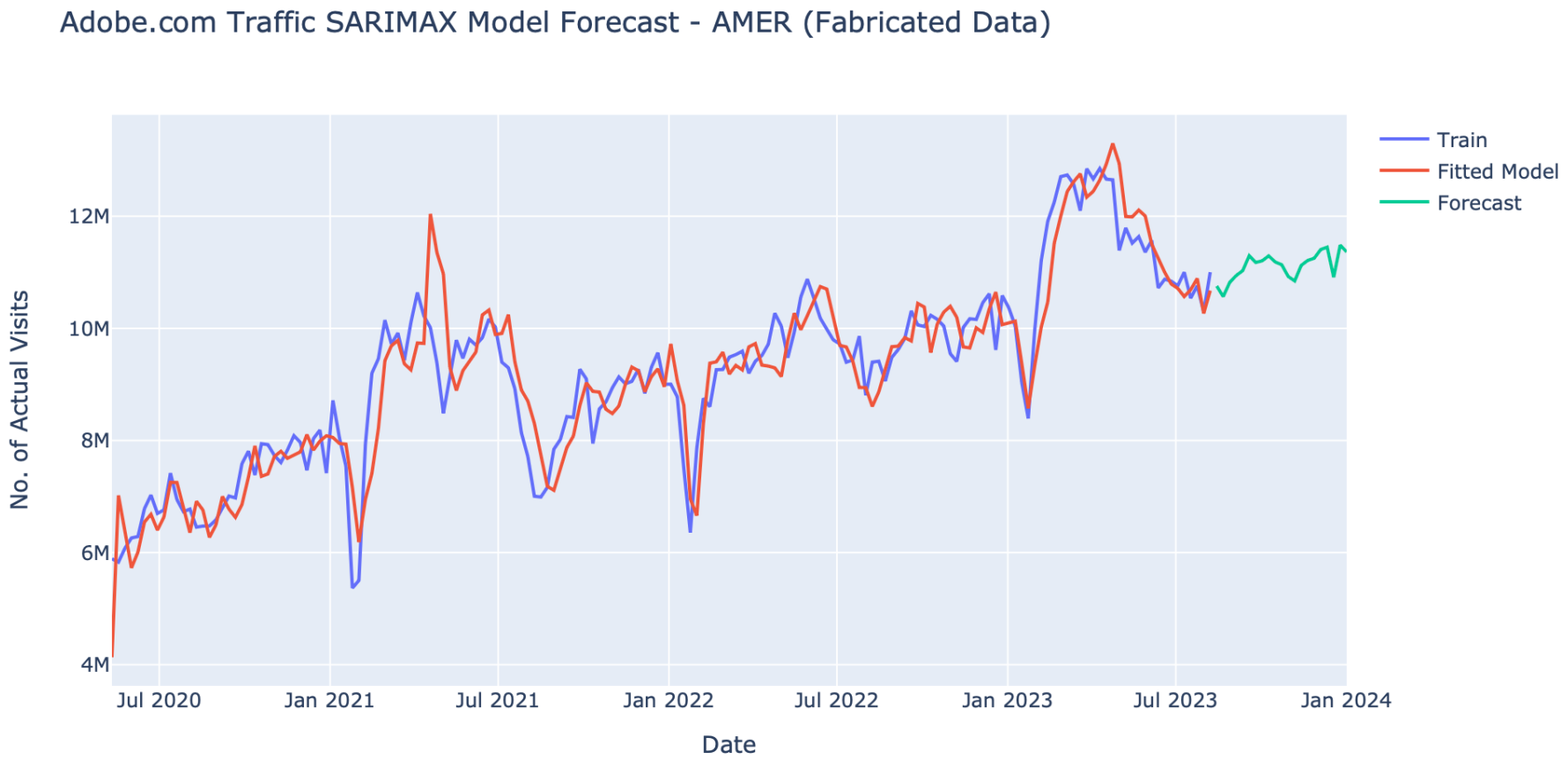
**Seasonality**

calendars aligned by working week of fiscal quarter



# DDOM is Dynamic.

DDOM is written **dynamically**, meaning it can easily be applied to each granular forecast.

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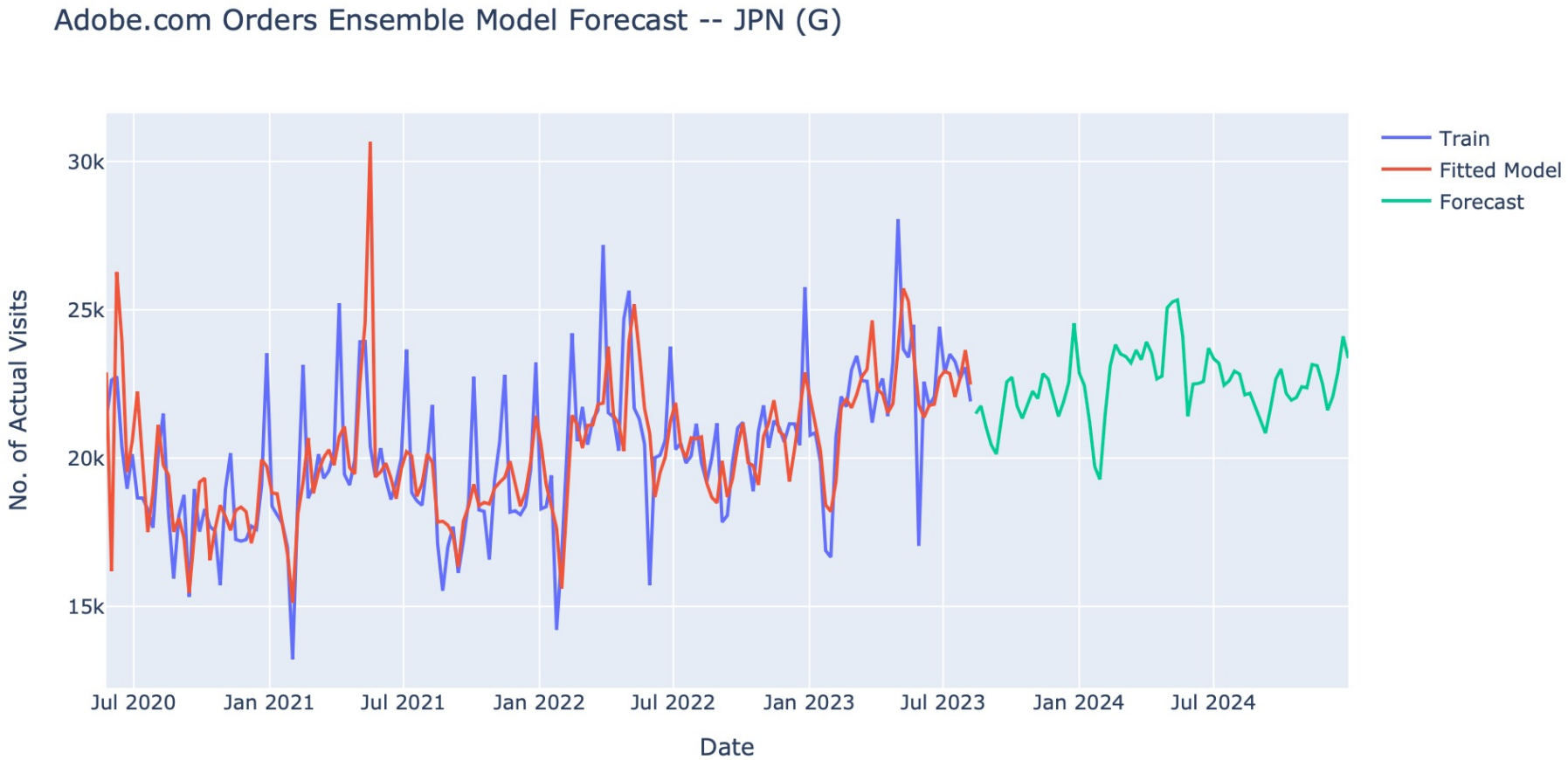
# DDOM is Autonomous.

DDOM is also **autonomous**, meaning forecasts can be run with a single click of a button.

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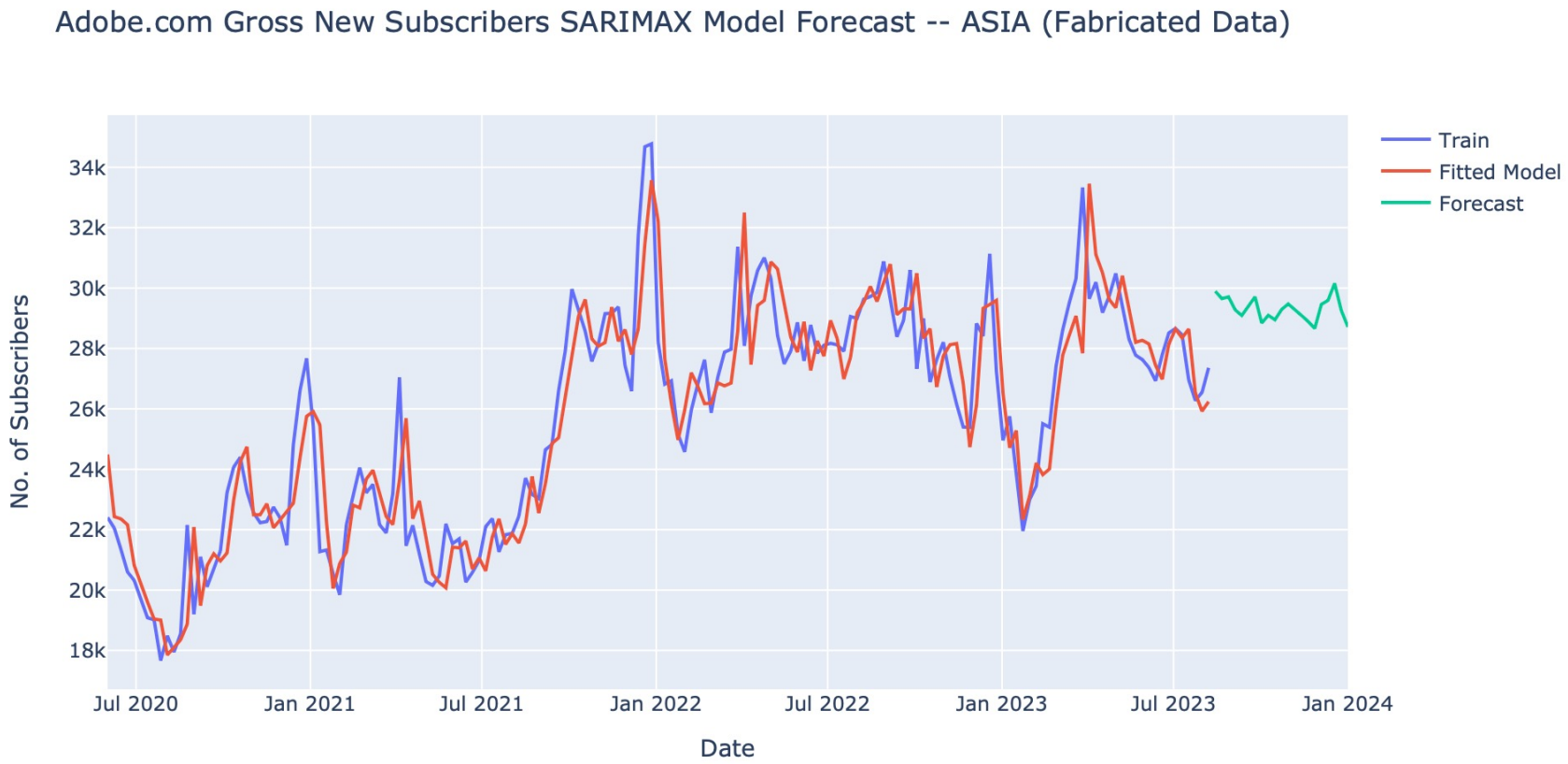
# DDOM is Optimized.

Lastly, DDOM forecasts are **optimized**, meaning each granular forecast is **uniquely fine-tuned and adjusted** to produce the most accurate results.

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# DDOM Results and Performance

# Validation Metrics Explained

Three methods are used to assess model performance:

- **RMSE**
- Forecast Accuracy (MAPE)
- Guidance Accuracy (Total Error)

| Metric | RMSE | MAPE | Total Error |
|---|---|---|---|
| **Traffic** | 2588565 | 6.65% | 4.22% |
| **Orders** | 40403 | 7.90% | 4.65% |
| **Subscribers** | 16156 | 6.13% | 3.68% |

## RMSE

- Root Mean Squared Error
- Measures how close predictions are to actuals on average (in units).

## Forecast Accuracy (MAPE)

- Measures the forecast's **absolute** accuracy in relative percentages.
- Average percent error between predictions and actuals.

## Guidance Accuracy (Total Error)

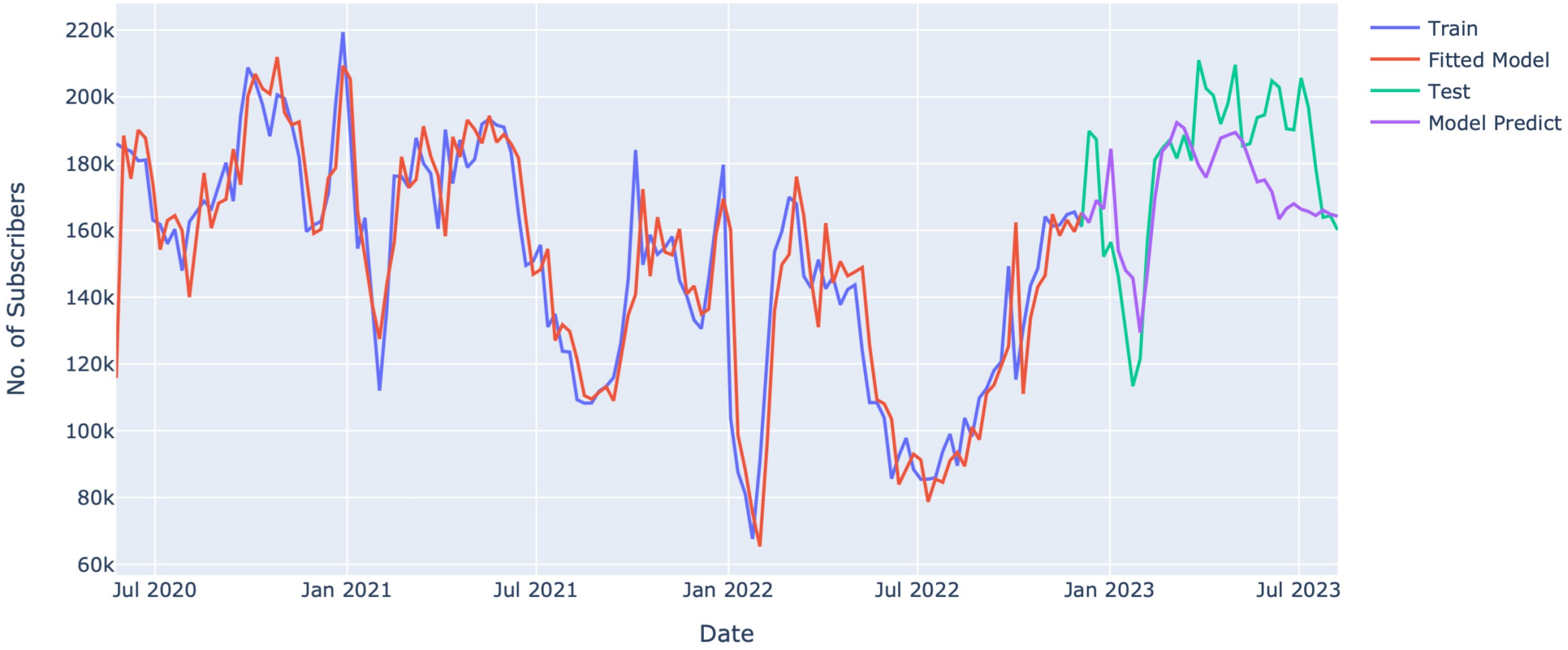
- Measures the forecast's **net** accuracy in relative percentages.
- Useful criteria for analyzing aggregate model forecasts.

# Model Selection & Comparison

**Ensemble** has shown generally the **best** performance among various models and **reduced variance**.

| Metric | Model | RMSE | MAPE | Total Error |
|---|---|---|---|---|
| Surface Traffic | SARIMAX | 2,588,565 | 6.65% | 4.22% |
| | FB Prophet | 1,616,788 | 3.83% | 4.86% |
| | Ensemble | 1,986,678 | 4.95% | 3.20% |
| Checkout Traffic | SARIMAX | 170,347 | 5.02% | 0.27% |
| | FB Prophet | 227,163 | 6.65% | 1.70% |
| | Ensemble | 166,602 | 5.01% | 2.47% |
| Orders | SARIMAX | 32,231 | 5.31% | 0.51% |
| | FB Prophet | 37,564 | 7.34% | 0.84% |
| | Ensemble | 32,067 | 5.75% | 2.13% |
| Subscribers | SARIMAX | 16,156 | 6.13% | 3.68% |
| | FB Prophet | 10,526 | 3.39% | 3.96% |
| | Ensemble | 12,406 | 4.37% | 2.49% |

# Model Validation Visualized

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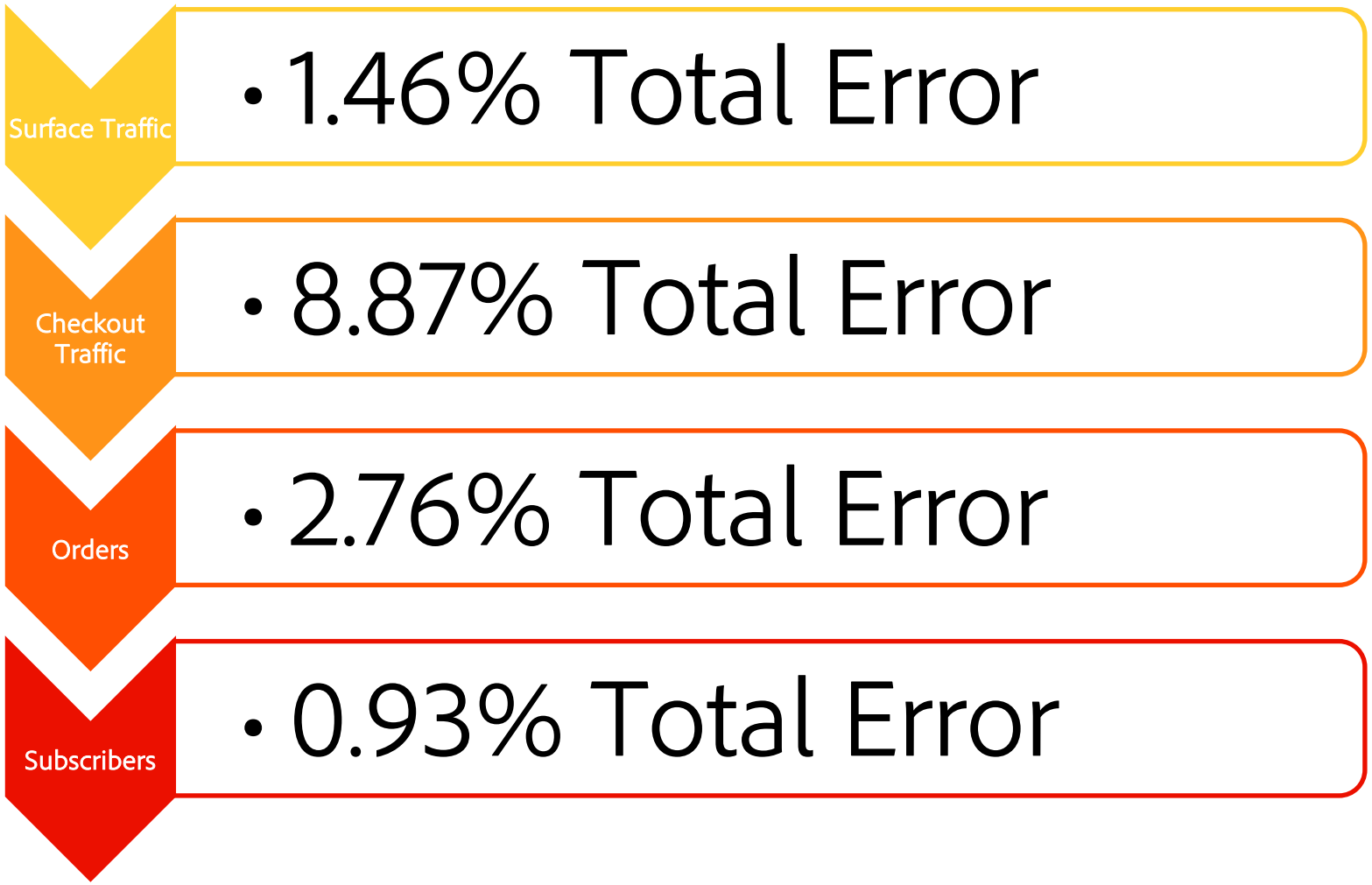
# Model Out-of-Sample Forecast Results

Since starting model development, we've had 7 weeks to compare our model's forecast to actuals.



# DDOM Demo

Click for DDOM

# DDOM’s Impact & Adobe Values

# DDOM embraces Adobe's core values.

**Raise the bar.**

- Pioneering Tech Stack in FinOps
- Databricks & Github

**Create the future.**

- Transformation across FP&A
- Automated System with AI

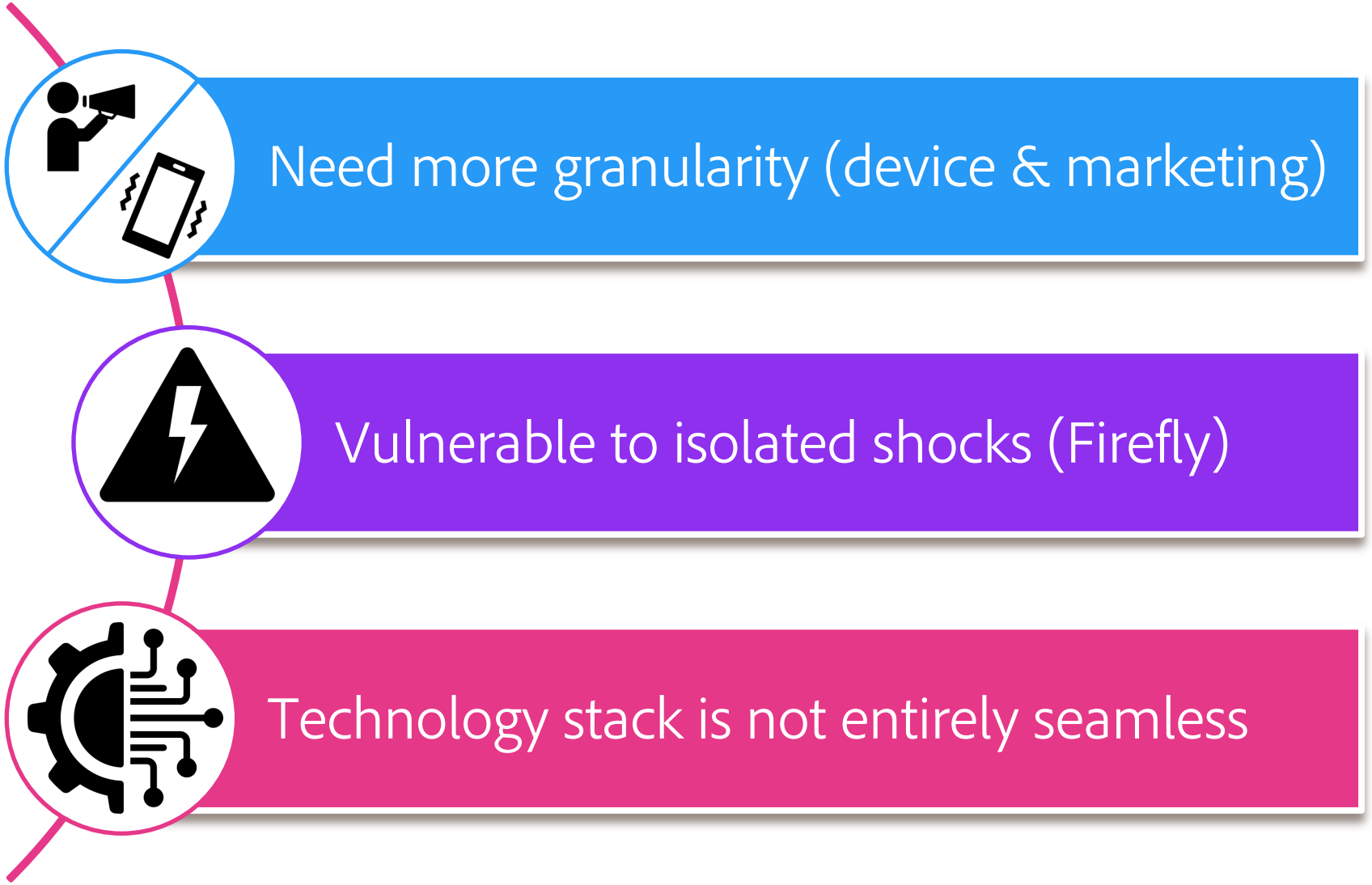
**Leveraging AI**

- Machine Learning Approach
- Scalable, Robust, Accurate

**Impact: Estimated to save roughly 500 hours per year in FP&A processes.**

# Caveats and Next Steps

# DDOM Caveats



# DDOM Next Steps

- Explore forecasting at the device type & marketing channel level
- Add holidays and isolated shocks to list of regression exogeneous variables
- Improve connection and import/export between TM1 and Databricks

# Q&A


Adobe