MIT Supply Chain MANAGEMENT

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Sponsor: Footwear Manufacturer/Retailer

DEMAND FORECASTING OPTIMIZATION FOR FOOTWEAR

MIT | **MIT GLOBAL SCALE NETWORK**

January 2018 Poster Session

Motivation / Background

Top 3 words used by executives of fashion companies to describe the industry in 2017:

UNCERTAIN **CHALLENGING** **OPTIMISTIC**

FASHION INDUSTRY MOST SIGNIFICANT CHALLENGES FOR 2018*

- Trend Volatility: 12%
- Omnichannel Competition: 10%
- Digitization: 9%
- Decline in Mall Traffic: 9%
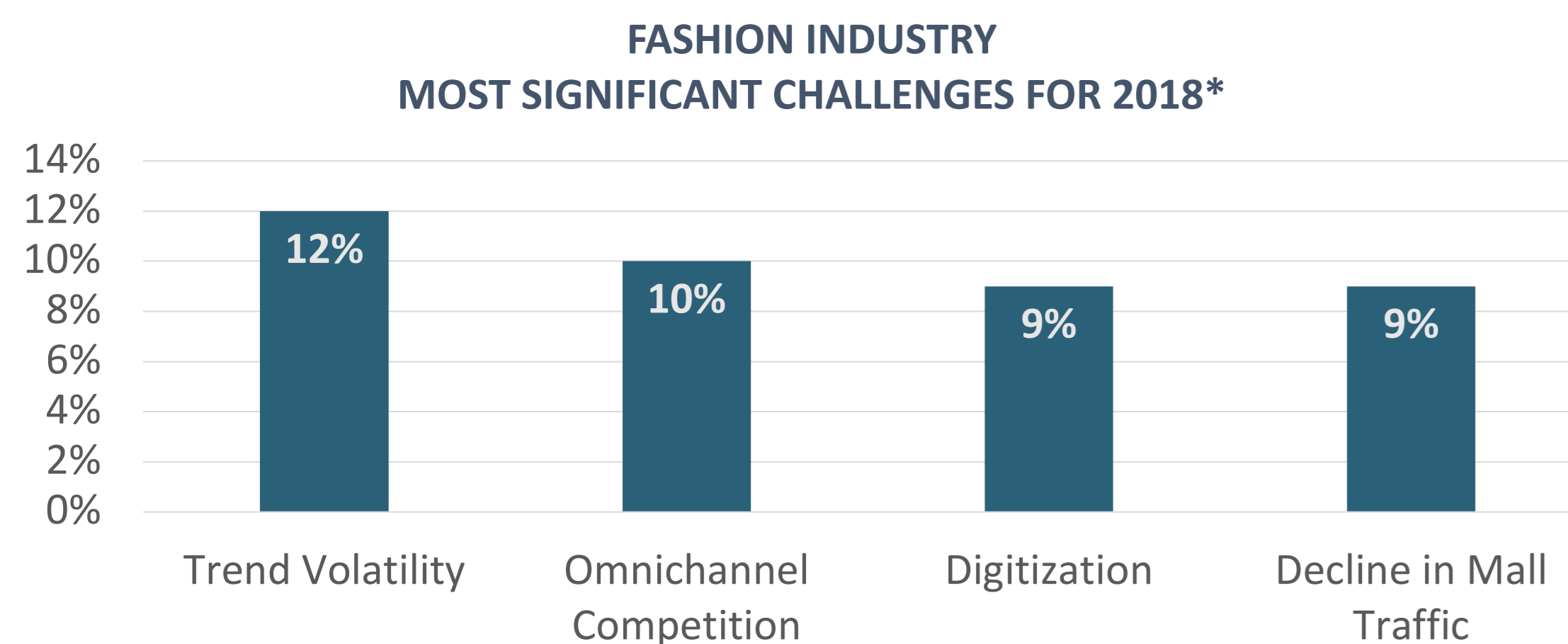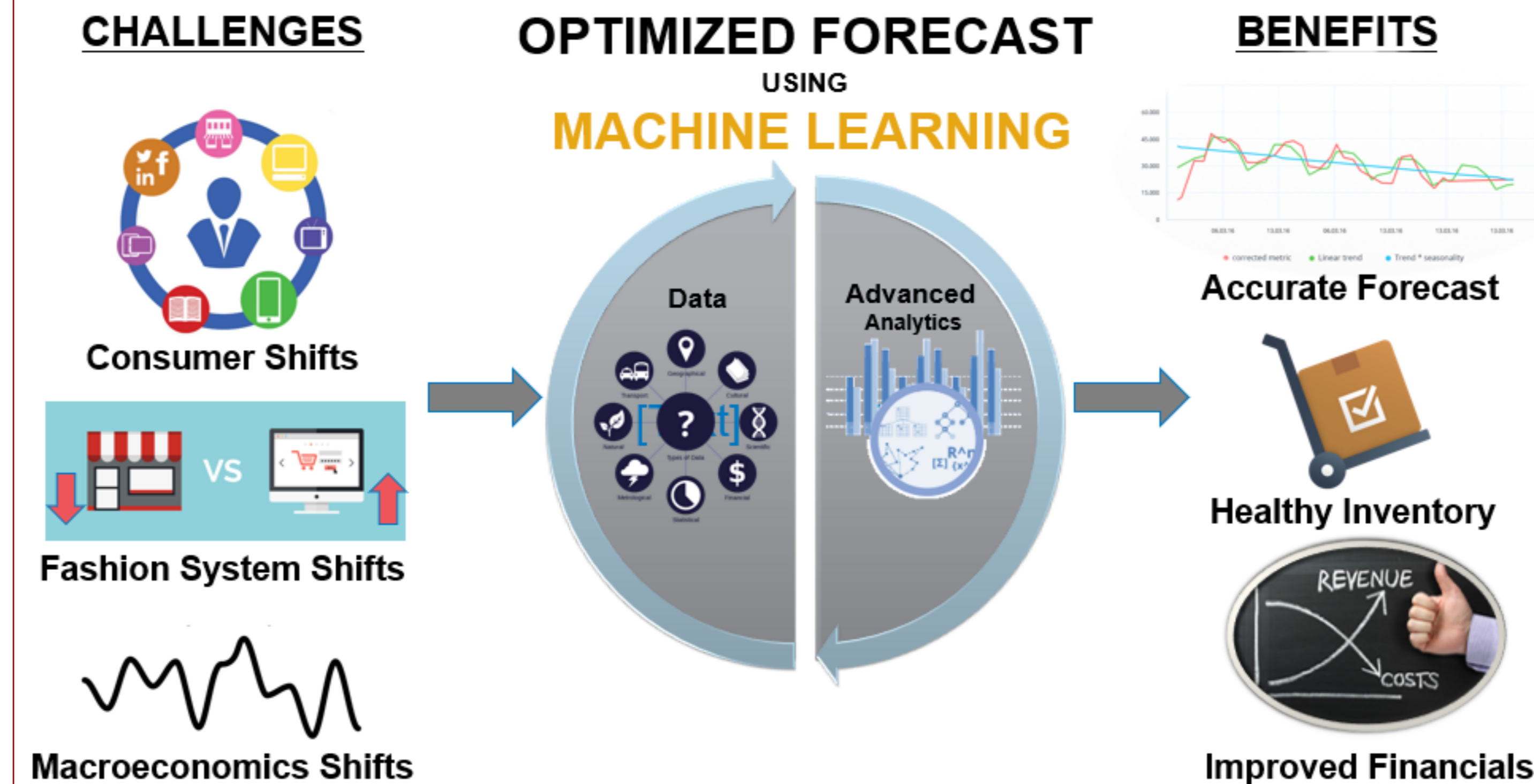
* BOF-MCKINSEY Global Fashion Survey 2017

Key Question / Hypothesis

How footwear companies can optimize their demand planning strategy toward having an agile and adaptive supply chain that is capable of dealing with:
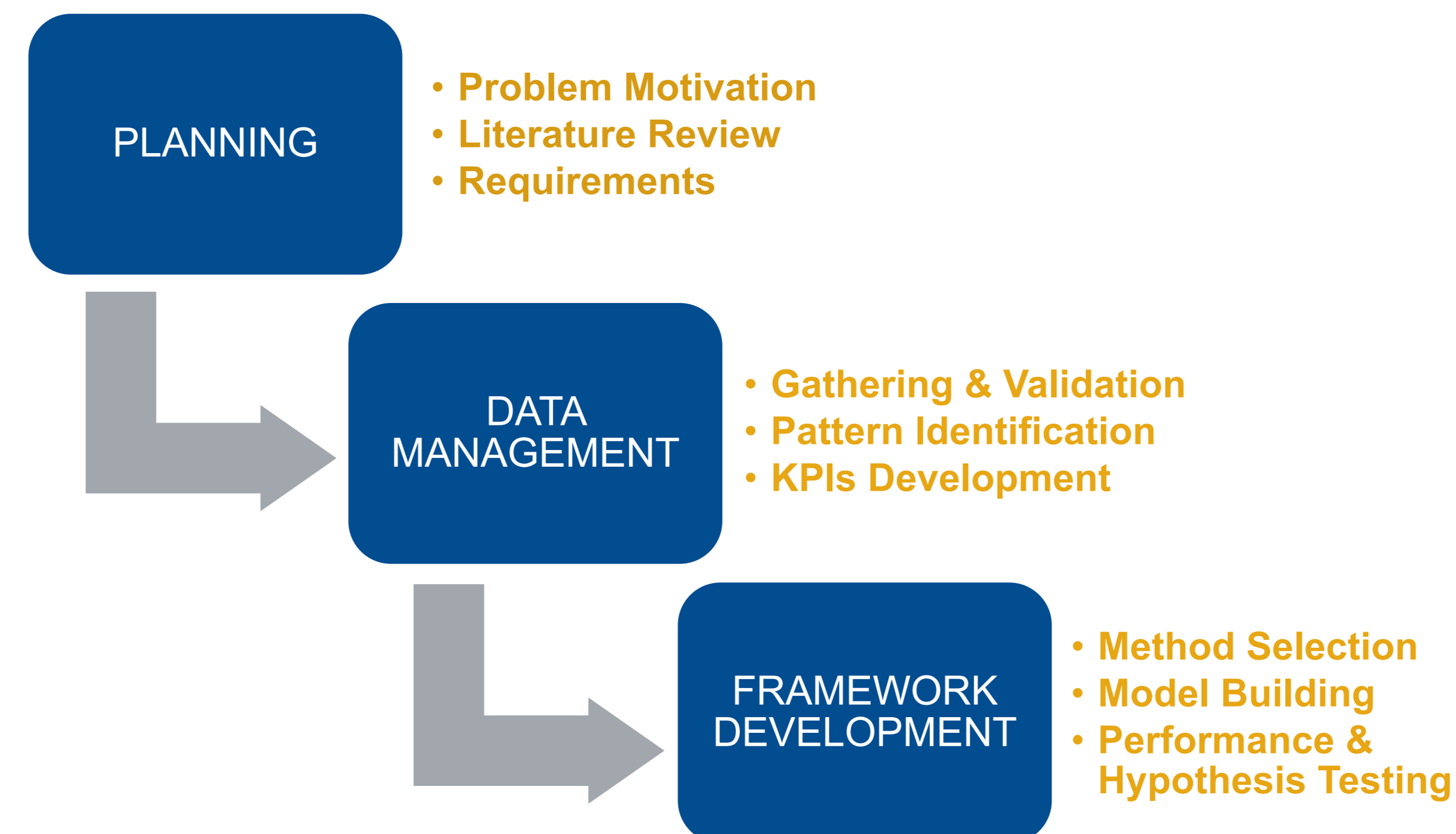
1. Macroeconomics challenges such as global economy shifts and volatility
2. Microeconomics challenges reflected in consumer's preferences and fashion system shifts

Relevant Literature

- Thomassey, S. (2010). Sales forecasts in clothing industry: The key success factor of the supply chain management
- Kaya M., Yeşil E., Dodurka M.F., Sıradağ S. (2014) Fuzzy Forecast Combining for Apparel Demand Forecasting.
- Chase, C. W., Jr. (2017). Machine Learning is Changing Demand Forecasting. Choi, T., Hui, C., Liu, N., Ng, S., & Yu, Y. (2014). Fast fashion sales forecasting with limited data and time.
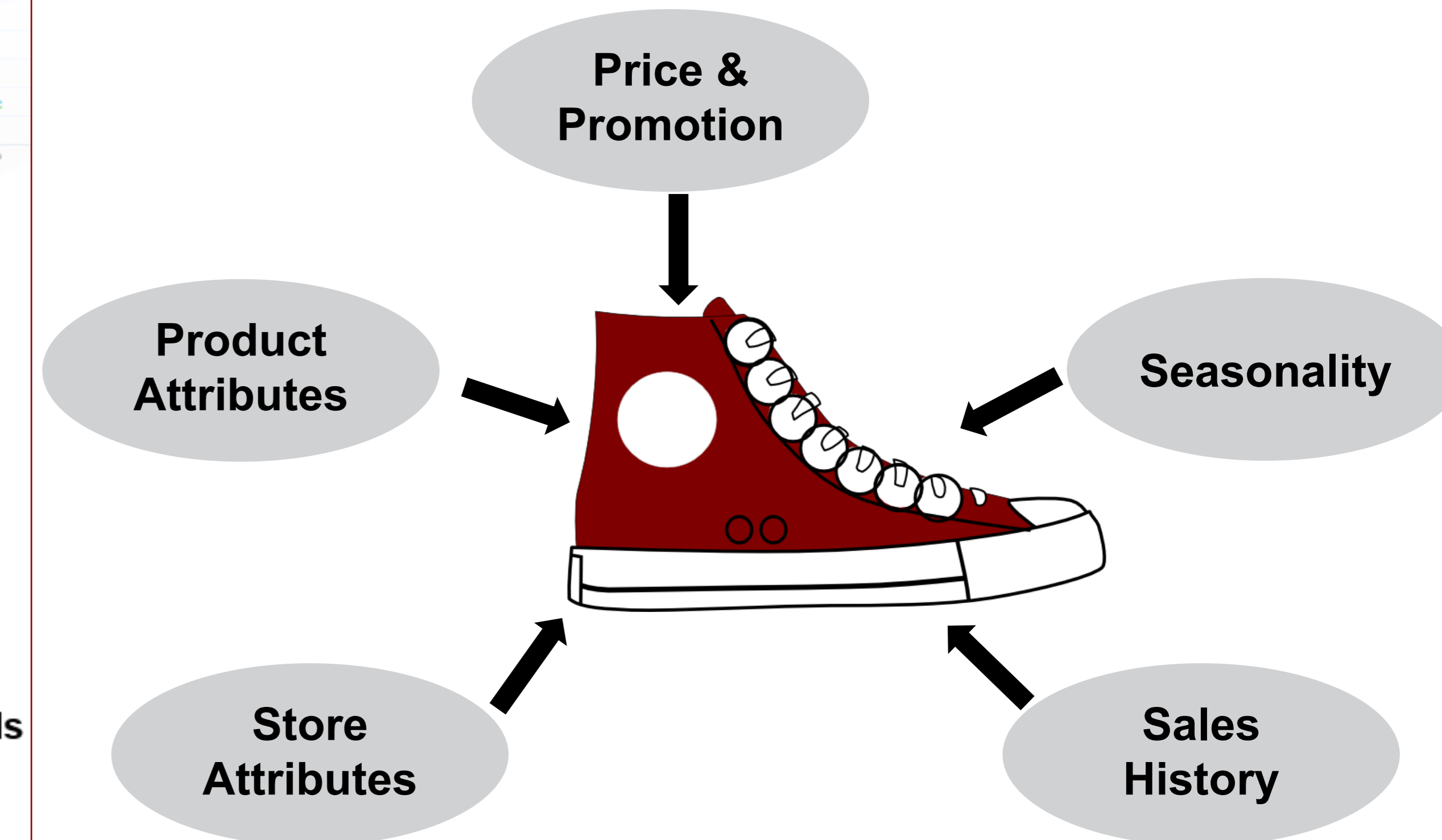
CHALLENGES

Consumer Shifts

Fashion System Shifts

Macroeconomics Shifts

OPTIMIZED FORECAST USING MACHINE LEARNING

Data | Advanced Analytics

BENEFITS

Accurate Forecast

Healthy Inventory

Improved Financials

Methodology

PLANNING
- Problem Motivation
- Literature Review
- Requirements

DATA MANAGEMENT
- Gathering & Validation
- Pattern Identification
- KPIs Development

FRAMEWORK DEVELOPMENT
- Method Selection
- Model Building
- Performance & Hypothesis Testing

Initial Results

Potential predictor variables:

- Price & Promotion
- Product Attributes
- Seasonality
- Store Attributes
- Sales History

Expected Contribution

- Identify significant predictor variables influencing demand for seasonal products in the footwear industry
- Build a forecasting model utilizing available data and leveraging advanced analytics and machine learning to improve prediction accuracy
- Recommend solutions that contribute to the development of an optimal demand planning framework in line with the company's strategic goals

Majd Kharfan   Vicky Chan