COFFEE CHAIN SALES PERFORMANCE ANALYSIS

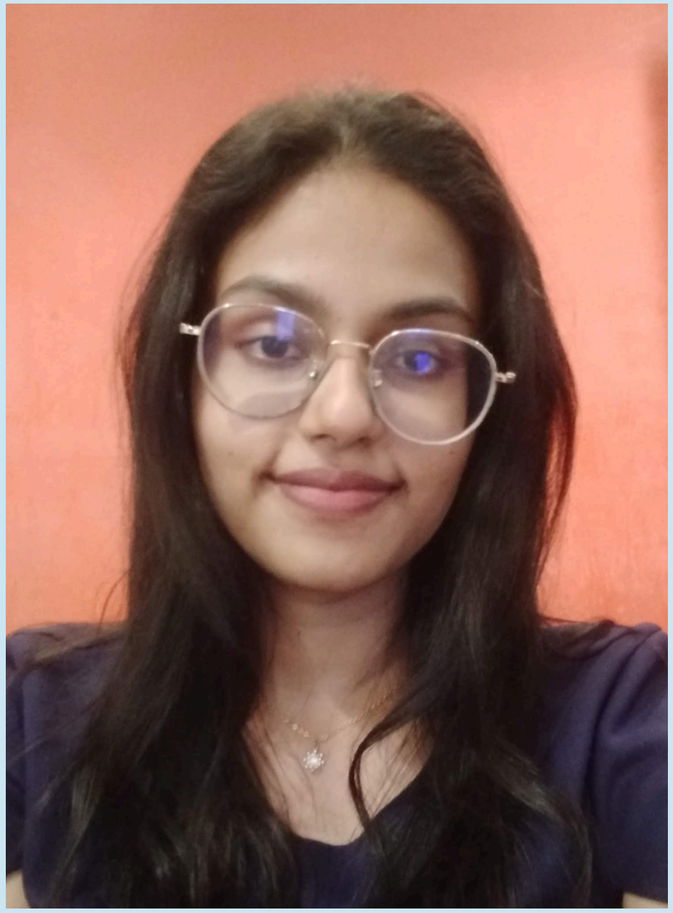
Welcome, Everyone!

I'm Aishu, and I'm excited to present my analysis of a coffee chain's sales across U.S. locations, focusing on profit margins, product performance, and sales trends to uncover actionable insights that can help enhance business strategies and drive growth.

Thank you, and let's dive in!

ABOUT ME

- **Education**
  - Bachelor's Degree in Psychology (Honors), Sultan Idris Education University (2016-2020)
  - Google Digital Marketing & E-commerce Professional Certificate (Dec 2023)
- **Work Experience**
  - APAC Marketing Specialist at STAAH (2024-2025)
  - Senior PR Executive at Commas PR (2023)
  - Marketing Associate at Society of Exploration Geophysicists (2021-2022)
  - Freelancer Content Manager (2020-2024)
- **About Me**
  - Over 5 years in marketing with a focus on data-driven decision-making
  - Proficient in KPI analytics and reporting for strategic growth
  - Experience collaborating with global teams to improve marketing performance
  - Passionate about integrating creativity and data for impactful strategies
  - Career goal: Transitioning into a business intelligence or data analyst role to leverage analytical skills for driving business growth.



CURRENT STATE ANALYSIS

- The company is struggling to effectively analyze profit margins, sales trends, and pricing metrics.
- Current methods for evaluating profit margins are limited, leading to missed insights on profitability and sales opportunities.

This project seeks to bridge gaps using data analytics techniques, including predictive modeling, clustering and Market Basket Analysis (MBA).

The analysis will explore optimal pricing strategies, customer purchasing patterns, and inventory management to keep the company competitive in a dynamic market.

PROBLEM STATEMENT

- How can pricing strategies be adjusted to improve profit margins?
- What purchasing patterns can be leveraged to drive growth?
- How can we manage overstocked/unsold items efficiently?
- Where can the business expand or improve?

Sales Trend Analysis

Spot top markets and products by tracking regional sales trends.

Customer Insights

Improve marketing strategies by understanding buying patterns.

Inventory Evaluation

Optimize stock by assessing inventory turnover and profit impact.

Marketing Opportunities

Find growth opportunities with targeted marketing strategies.

TECHNOLOGY STACK

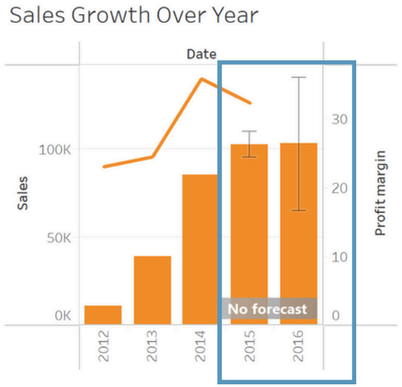
- Exploratory Data Analysis: Pandas, NumPy, Matplotlib, Seaborn
- Data Scaling & Balancing: StandardScaler
- Machine Learning Models: XGBoost, Scikit-learn (k-means)
- Market Basket Analysis: MLxtend (Apriori for association rules)
- Data Visualization: Tableau, Matplotlib, Seaborn
- Repository Hosting: GitHub

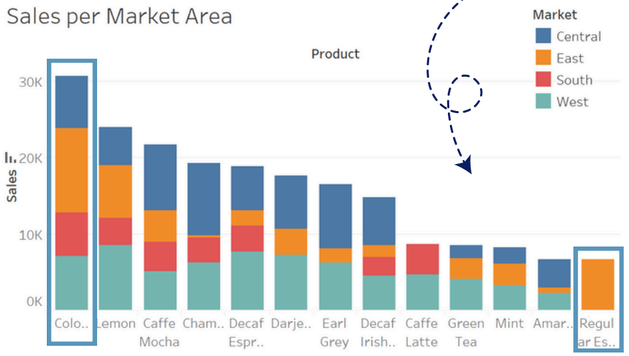
DATA VISUALIZATION

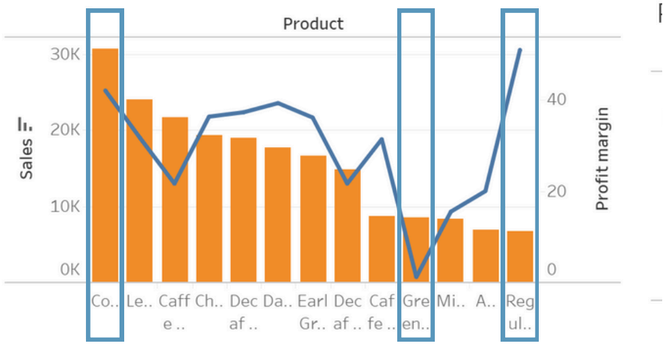
The West and Central regions are key markets with the highest sales, while South and East show growth opportunities.

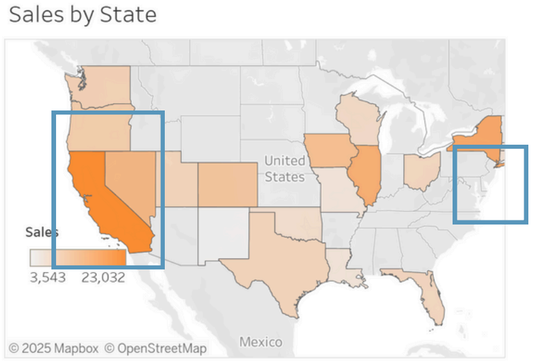
Colombian coffee has the highest sales (30,761) and a strong profit margin (42.04%), Regular Espresso boasts the highest profit margin (50.98%) despite its lowest sales (6,744), while Green Tea has the lowest profit margin (1.04%) even with solid sales (8,520).

Profit margin fell from 35.75% in 2014 to 32.21% in 2015.

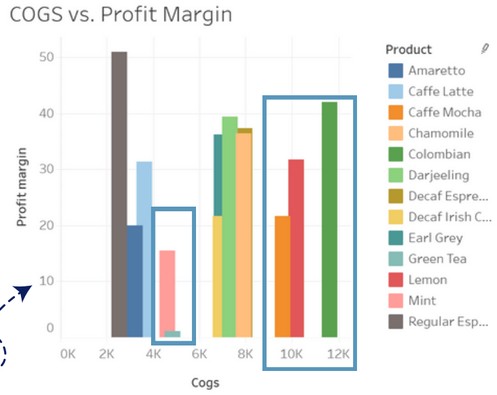




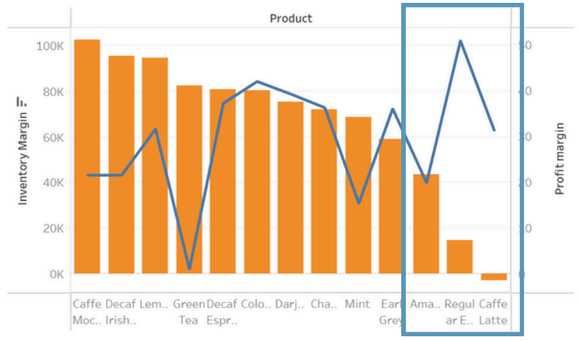




Illinois and California are high-performing states, while New Mexico shows very low profit margins



Green Tea, Cafe Mocha, Lemon and Colombian have high costs relative to profit margins; reducing these costs could enhance profitability.



Negative inventory margins for Caffe Latte and low margins for Regular Espresso and Amaretto may reduce profitability due to overstocking and unsold items.

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MARKET BASKET ANALYSIS

- It employs supervised learning to recognize cross-selling opportunities through purchase patterns enabling tailored product recommendations and personalized promotions.

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift
12	(Caffe Mocha, Darjeeling)	(Caffe Latte)	0.001073	0.057940	0.001073	1.0	17.259259
90	(Green Tea, Darjeeling)	(Mint)	0.002146	0.051502	0.002146	1.0	19.416667
107	(Caffe Mocha, Darjeeling, Lemon)	(Caffe Latte)	0.001073	0.057940	0.001073	1.0	17.259259
110	(Caffe Mocha, Darjeeling)	(Caffe Latte, Lemon)	0.001073	0.002146	0.001073	1.0	466.000000
111	(Caffe Latte, Darjeeling)	(Caffe Mocha, Lemon)	0.001073	0.006438	0.001073	1.0	155.333333
113	(Caffe Mocha, Caffe Latte)	(Darjeeling, Lemon)	0.001073	0.008584	0.001073	1.0	116.500000
123	(Green Tea, Earl Grey, Darjeeling)	(Mint)	0.001073	0.051502	0.001073	1.0	19.416667

Caffe Mocha, Darjeeling → Caffe Latte

Green Tea, Darjeeling → Mint

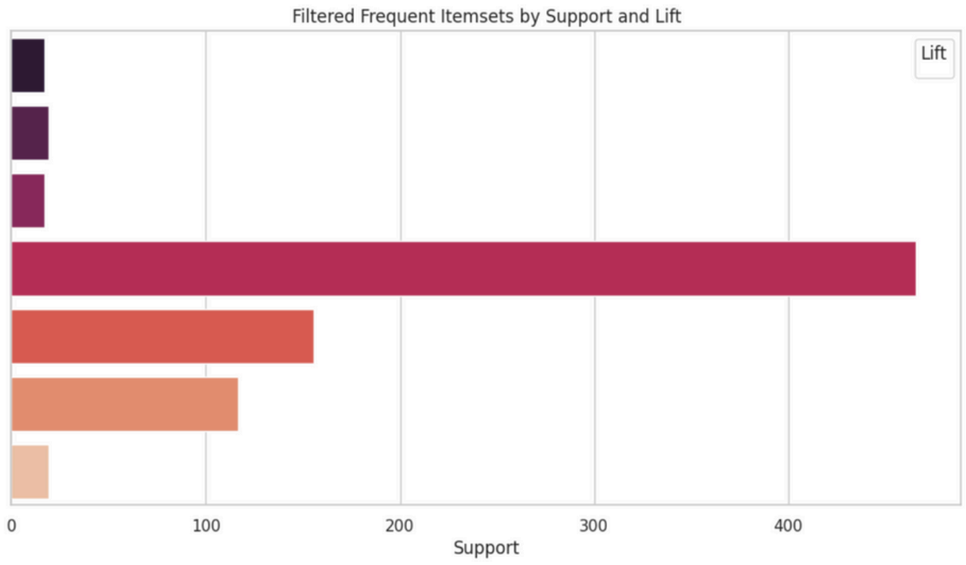
Caffe Mocha, Darjeeling, Lemon → Caffe Latte

Caffe Mocha, Darjeeling → Caffe Latte, Lemon

Caffe Latte, Darjeeling → Caffe Mocha, Lemon

Caffe Mocha, Caffe Latte → Darjeeling, Lemon

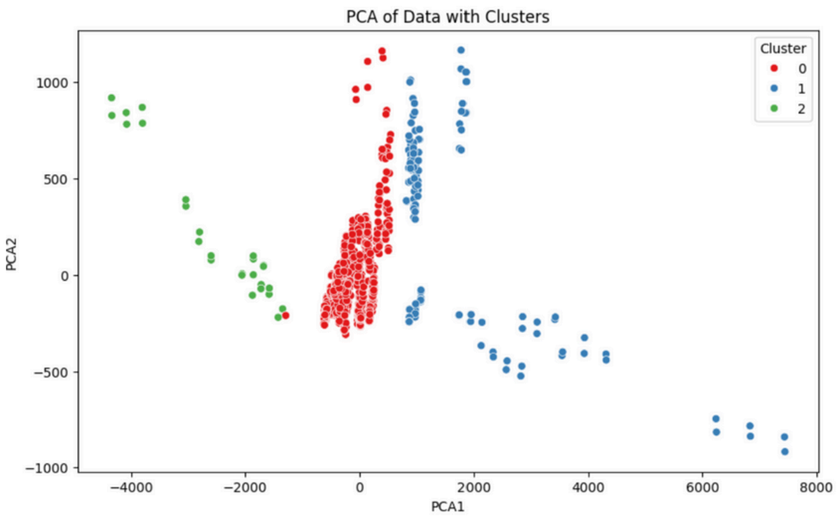
Green Tea, Earl Grey, Darjeeling → Mint

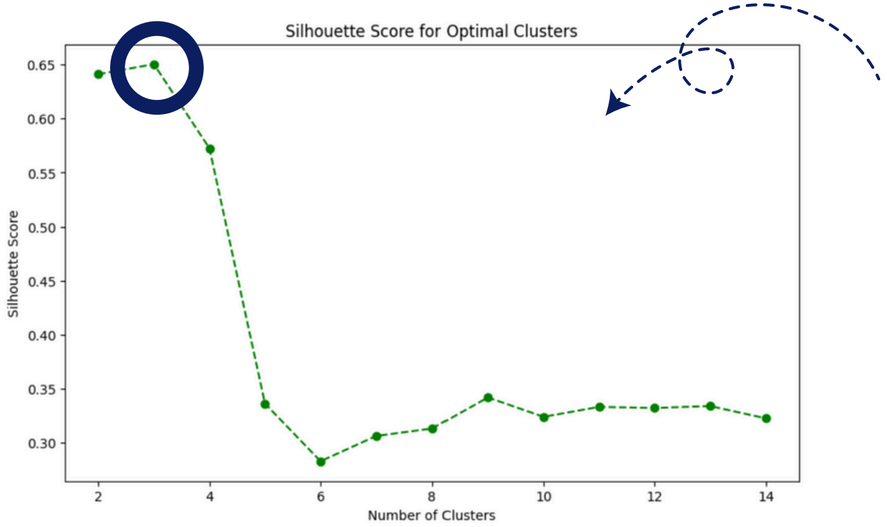


The rule indicates that whenever "Caffe Mocha" and "Darjeeling" are purchased together, "Caffe Latte" and "Lemon" are also bought, with a confidence of 1 and a lift of 466. This strong association highlights a significant cross-selling opportunity to enhance sales.

CLUSTERING ANALYSIS

Cluster	Characteristics	Key Products	Profit Margin	Recommendations
0	Low COGS, Steady Profitability, Diverse Product Mix	Caffe Mocha (11.8%), Lemon (11.8%)	33.84%	Increase marketing for Caffe Mocha and Lemon to capitalize on steady demand, reduce stock of Mint & Regular Espresso
1	High COGS, High Marketing Spend, Moderate Profit	Amaretto (5%), Colombian (10%)	21.65%	Reduce marketing spend by optimizing campaigns for Decaf Espresso and Earl Grey. Address overstocking issues for Chamomile and Mint.
2	Niche Products, High Profit, Inventory Issues	Caffe Latte (78.5%), Colombian (21.4%)	54.23%	Focus on Caffe Latte and explore premium packaging for Colombian to boost its appeal. Reduce inventory for Amaretto.





The clusters represent different product performance groups based on sales, marketing, and costs, with a silhouette score of 0.65 indicating good separation between clusters.

PRICE OPTIMIZATION PROTOTYPE

This model optimizes prices, helping to increase profitability by predicting ideal target prices based on cost and margin, reducing guesswork and manual errors in pricing decisions.

Data Preparation

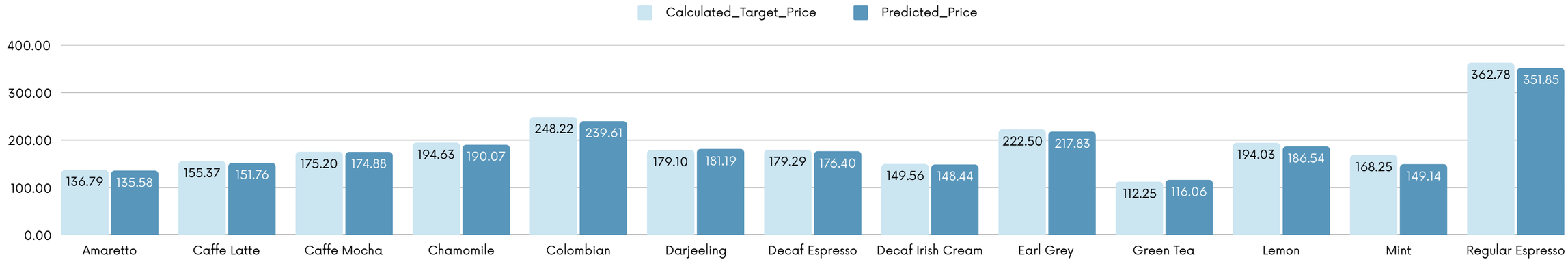
Preprocessing Steps

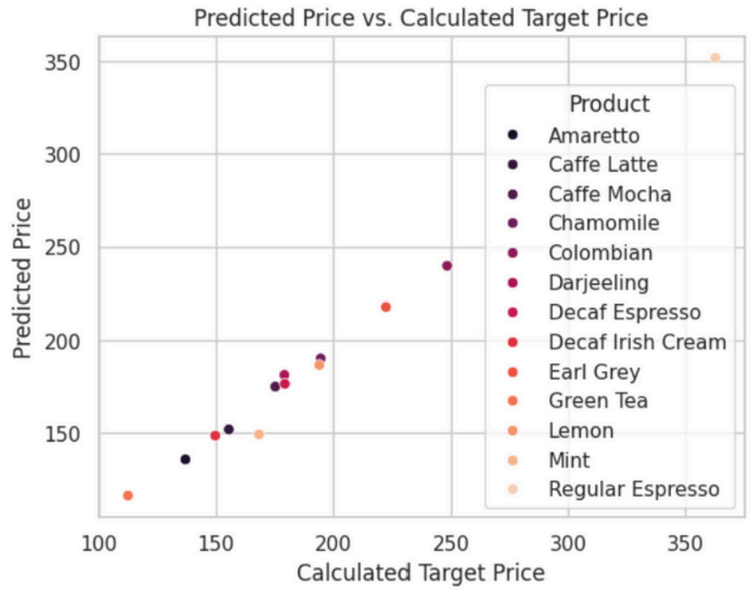
Model Training

Model Evaluation

Price Predictions

PRICE OPTIMIZATION MODEL





Metric	Value
Mean Squared Error	10.6868
R-squared	0.9994

The model's performance was assessed using two metrics:

- **Mean Squared Error (MSE)**: Lower values indicate better accuracy.
- **R-squared**: Values closer to 1 indicate a better data fit.

BUSINESS INSIGHTS: PRODUCTS WITH HIGHEST AND LOWEST PROFIT MARGINS

1.04%

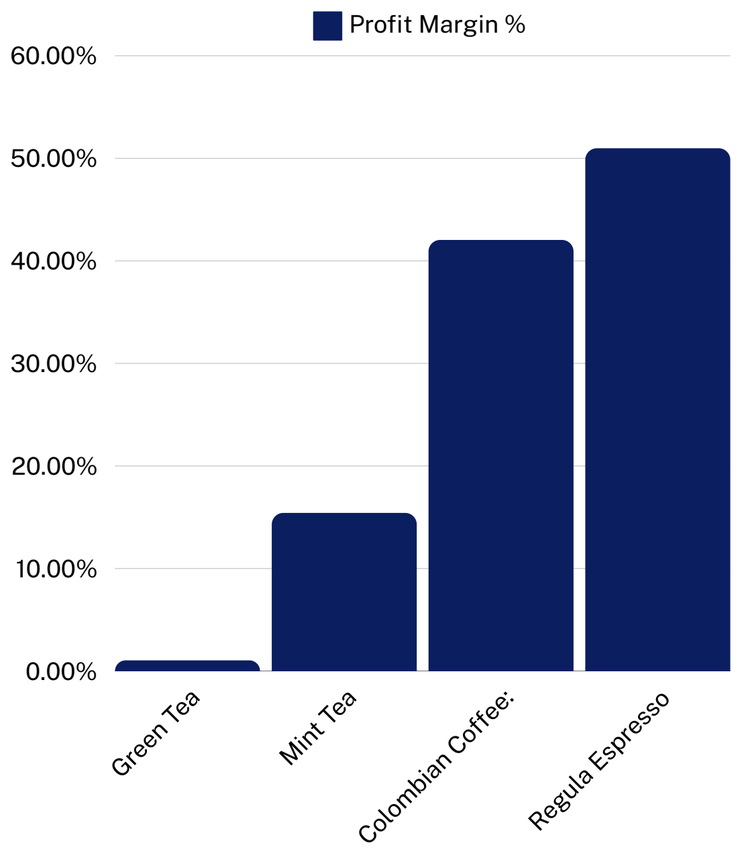
GREEN TEA

Extremely low margins, suggesting issues with pricing, cost structure, and product appeal.

15.42%

MINT TEA

Despite decent sales volume, Mint Tea shows a relatively low profit margin, indicating issues with high costs of goods sold (COGS)



COLOMBIAN COFFEE

Strong market demand and good cost management.

42.04%

REGULAR ESPRESSO

Despite low sales, the product has a high profit margin, indicating it can be highly lucrative. Improved marketing could further enhance its profitability.

50.98%

BUSINESS IMPROVEMENT STRATEGIES

COST MANAGEMENT

- Reduce Costs for Green Tea, Caffe Mocha, Lemon and Colombian
- Reduce overstocking for products with negative or low inventory margins (e.g., Caffe Latte, Regular Espresso and Amaretto).

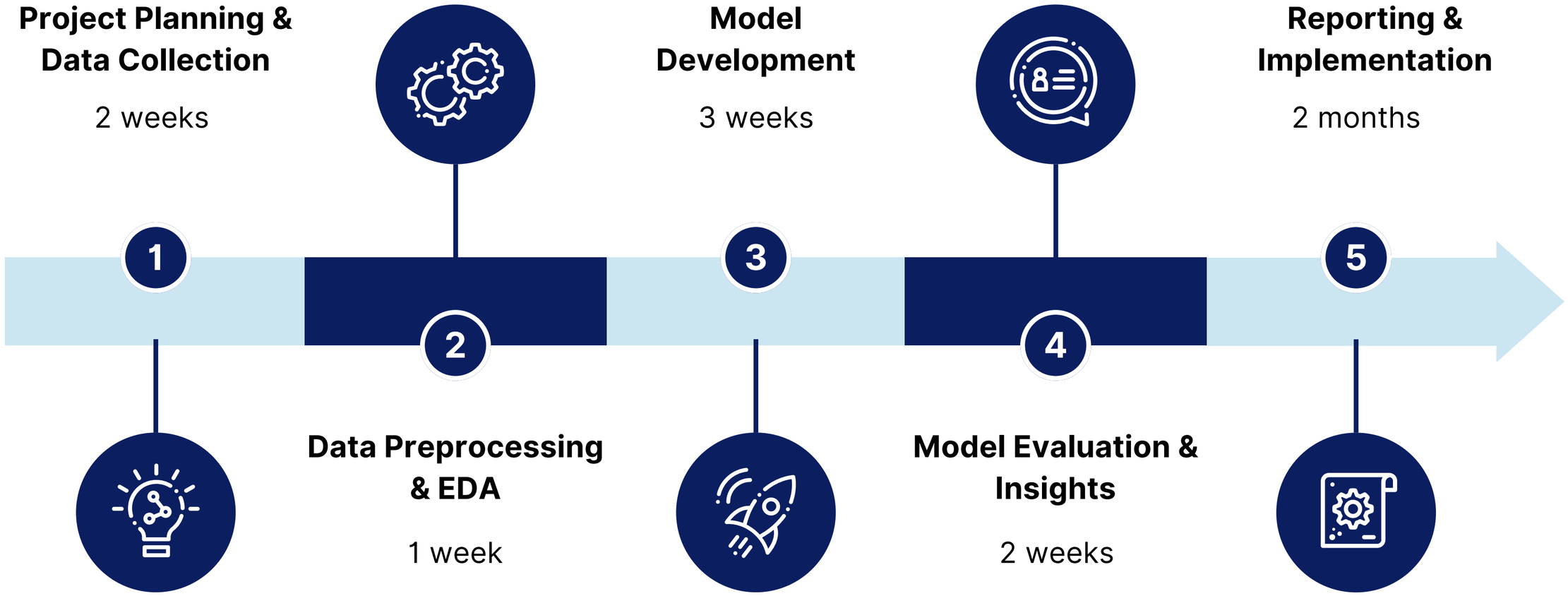
MARKETING OPTIMIZATION

- Reallocate budgets from low-return products like Caffe Mocha to higher-profit items like Regular Espresso and Colombian Coffee.
- Promote Caffe Mocha and Caffe Latte during colder months and focus on Green Tea and Lemon for the warmer months.
- Bundle related products to boost sales.

EXPANSION AND GROWTH

- Prioritize California, Illnois and New York for inventory stocking and promotional campaigns.
- Introduce bundles or new products for top performers like Chamomile, Colombian, and Lemon, based on their consistent sales trends and higher margins.

PROJECT TIMELINE



CHALLENGES AND ACTIONABLE SOLUTIONS

Aspect	Current Challenges	Suggestions for Improvement	Tools Needed	Key People to Engage With
Competitor Pricing Data	Absence of competitor pricing information	Gather competitor pricing data through market research, competitor analysis reports	Web scraping tools (e.g., Beautiful Soup) or market research services	Marketing Team or Market Research Analysts
Market Pricing Insights	Lack of understanding of overall market pricing	Conduct surveys or focus groups to gather customer insights on pricing expectations	Survey tools (e.g., SurveyMonkey)	Customer Experience Teams
Communication Gaps	Limited communication with stakeholders has	Schedule regular meetings with relevant teams (marketing, sales, finance)	Collaboration tools (e.g., Slack, Microsoft Teams)	Cross-functional Teams (Marketing, Sales, Finance)

THANK YOU

Q&A SESSION

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