



PhD Student-Mentors
Jonathan Amar
Patricio Foncea

Faculty Advisors
Vivek Farias
Nikos Trichakis



Elisa Piscitelli



Srishti Gupta

Portfolio Recommendation System For A Leading Coca-Cola Bottler

Problem Statement

Define and recommend the optimal **portfolio** for each of the **220K stores** for **682 Coca-Cola beverage products**



633 MM
Historical
Transactions
(2017 – 2019)

682
Products

220K
Stores

Input Data



Demographic	Environment	Census	Internal
300 Variables	25 Variables	416 Variables	128 Variables
Income, population, socio-economic level, vehicular and pedestrian flow	Convenience stores, hospitals, parks, schools, sport clubs	Coolers, size, presence of competitors, communication	Sales, orders, product features, store characteristics

Choice Model

Purchase history

✓ Products bought currently

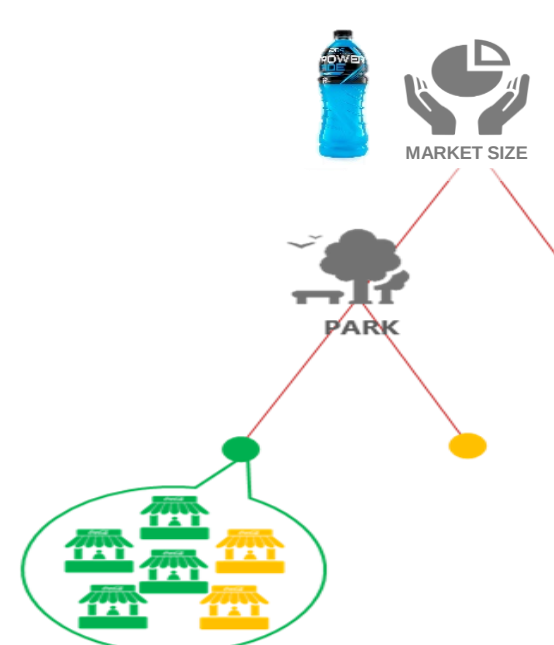
	Coca Cola	Del Valle Juice	Powerade	Coca Cola Light	Ciel
Store 1	✓			✓	✓
Store 2	✓		✓		
Store 3			✓	✓	
Store 4	✓				✓
Store 5	✓	✓	✓		✓
Store 6	✓		✓	✓	

Matrix completion

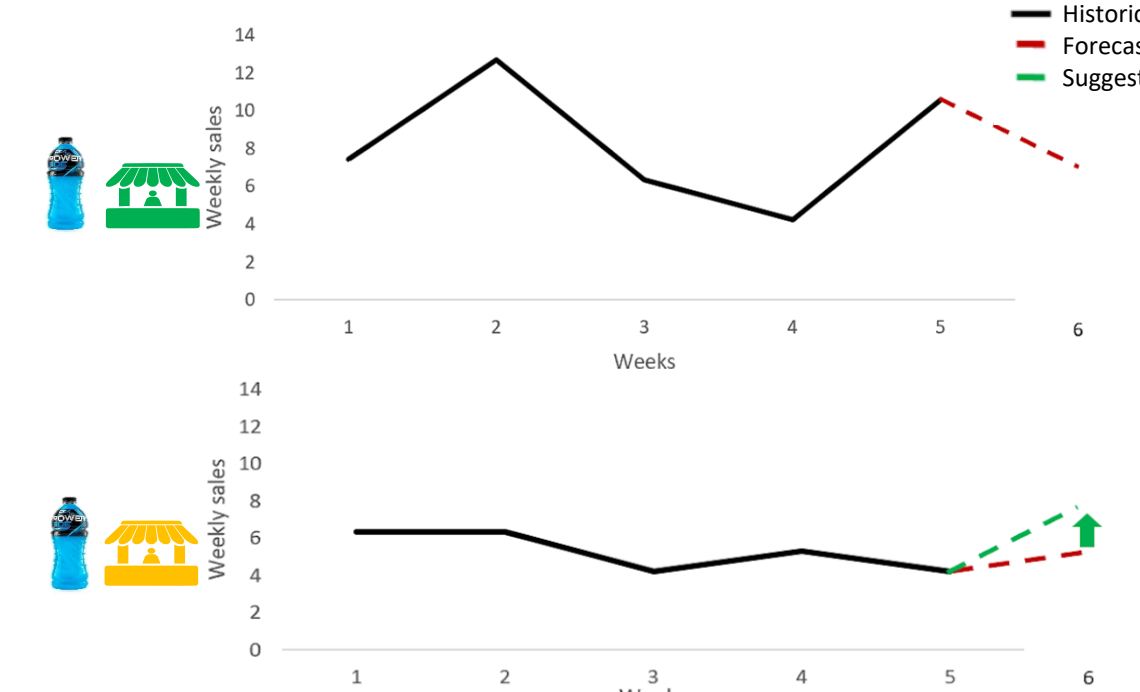
	Recommended products		Not recommended products		
					
					
     					
					
					
					
					
					

Order Quantity Model

Predictions



Prescriptions



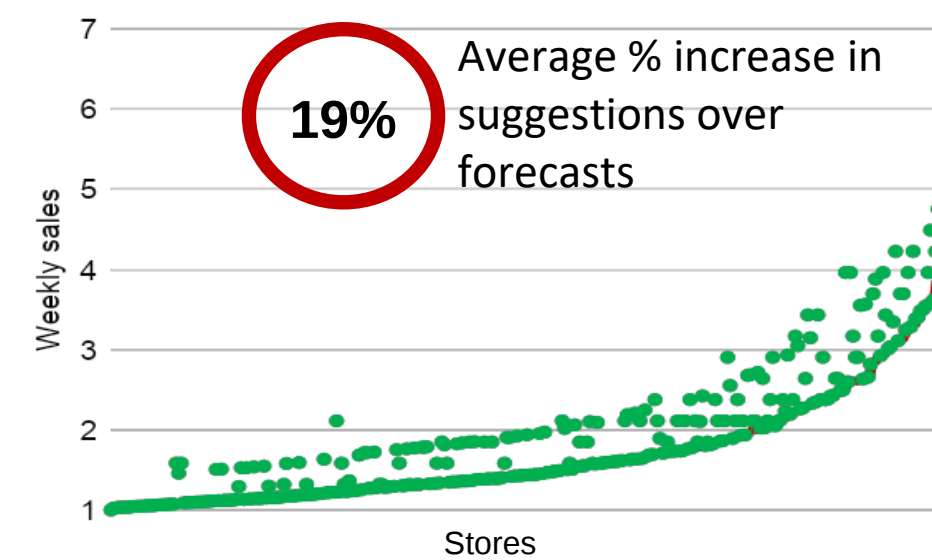
Steps :

- Develop predictive models (by product) to identify expected demand based on store's characteristics
- Identify high and low performing stores by comparing the expected demand (based on store's characteristics) with the forecasted demand (based on historical sales data)
- Optimize order quantities by allowing low performing stores to imitate high performing stores

Sales' drivers by product category

	MARKET SIZE	SEASON	TREND	SHOPS	ECONOMY	HOUSES	DOORS	ATMS	CLUBS	TRAFFIC	FOOD	SCHOOLS
Product 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Suggested vs forecasted sales



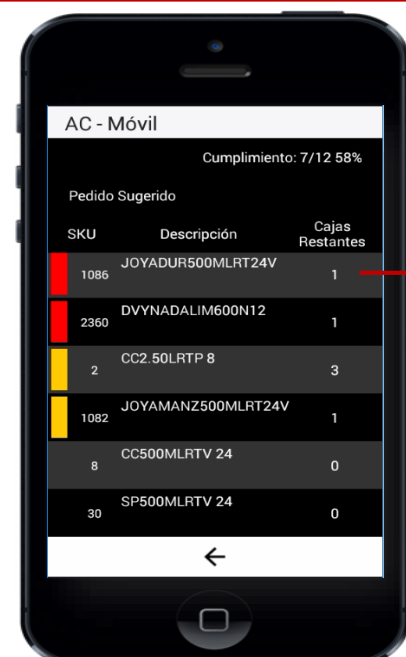
$$\frac{\text{Average weekly sales suggested by product}}{\text{Average weekly sales forecasted by product if business as usual is run}} = \frac{2.68}{2.25} = 119\%$$

Implementation



First Screen

List of products to be sold in a month suggested by choice model



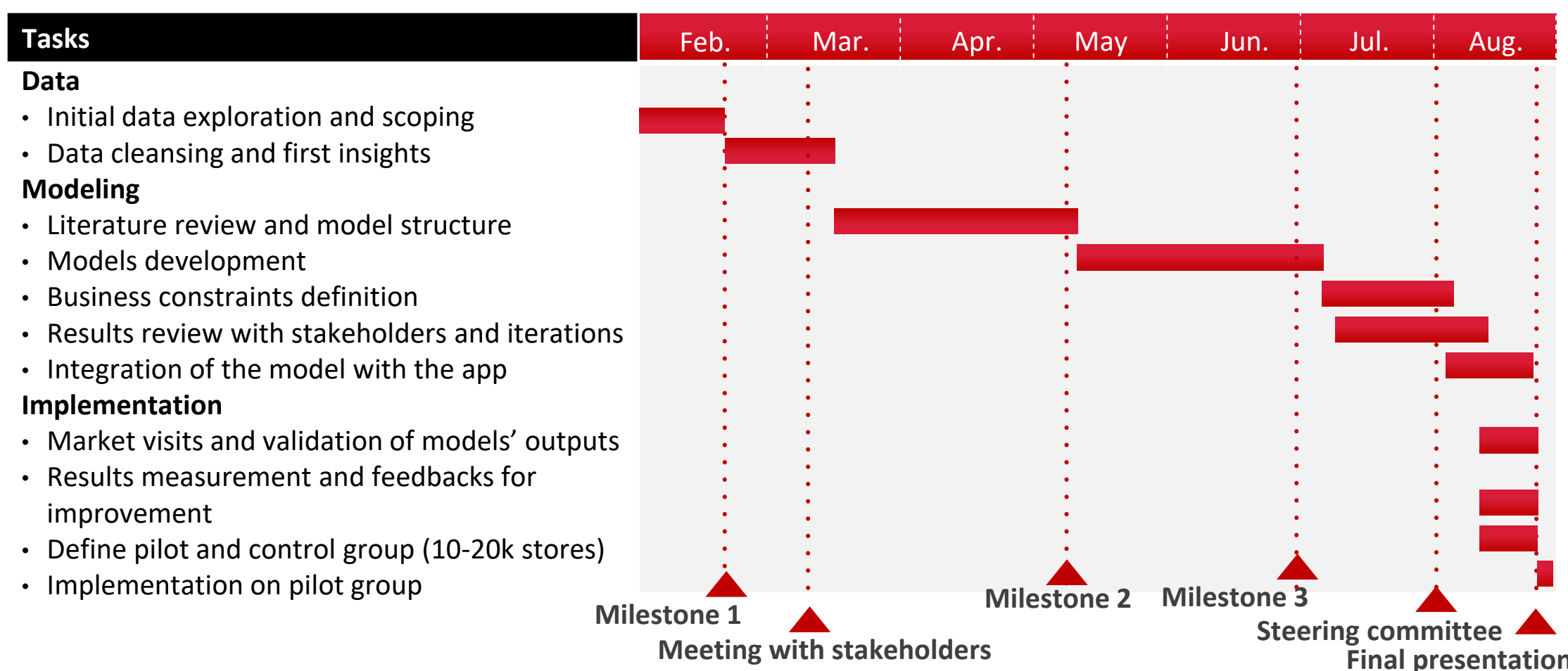
Second Screen

Quantity to be recommended for each product in a day suggested by order quantity model

Model's outputs are integrated with an existing order taking application



Work Plan



Impact

Results from market visits



Choice model

- 1-2 new products sold to stores (4% of average number of products in the current portfolio)
- 1 case of each new products sold monthly (18% of the average quantity sold monthly by product)



Order quantity model

- 85% of suggested volumes sold weekly to stores
- 19% increase in suggested volumes compared to forecasted volumes if business as usual is run

Increase in sales

+0.72%

+1.15%

Increase in revenues

\$14MM



Portfolio Recommendation System For A Leading Coca-Cola Bottler

Arca Continental, Monterrey (Mexico)