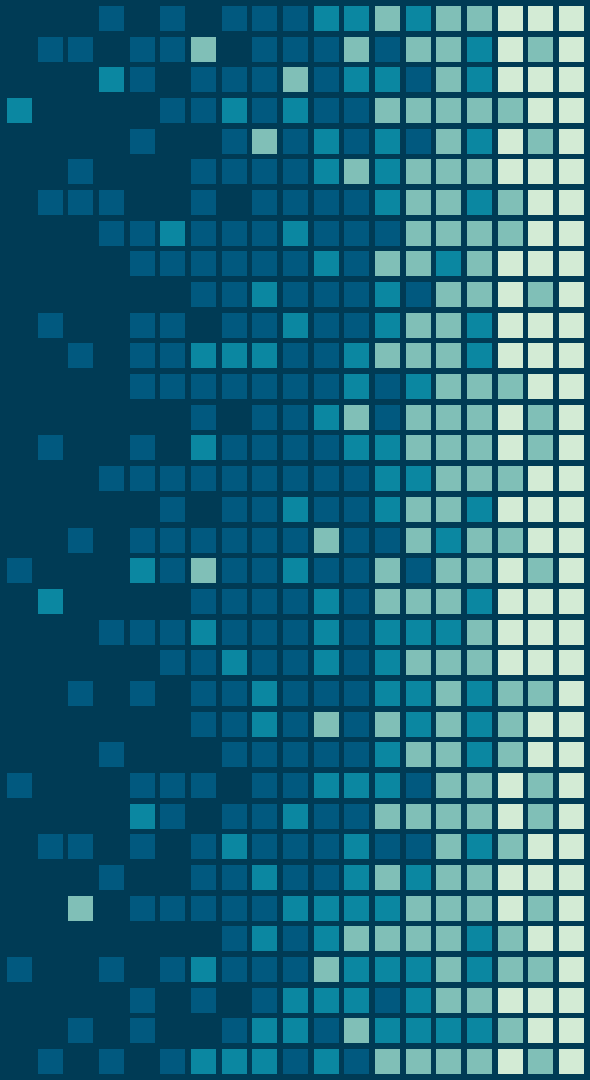
PREDICTING REPEAT PURCHASES AT INSTACART

MAI ANH LY
DATA SCIENTIST



BIO

@ The University of Sydney

- Education Data Analyst
- Bioinformatician
- PhD in Microbiology

AGENDA

1. Business problem definition
2. Data process design
3. Delivery
4. Next steps and summary

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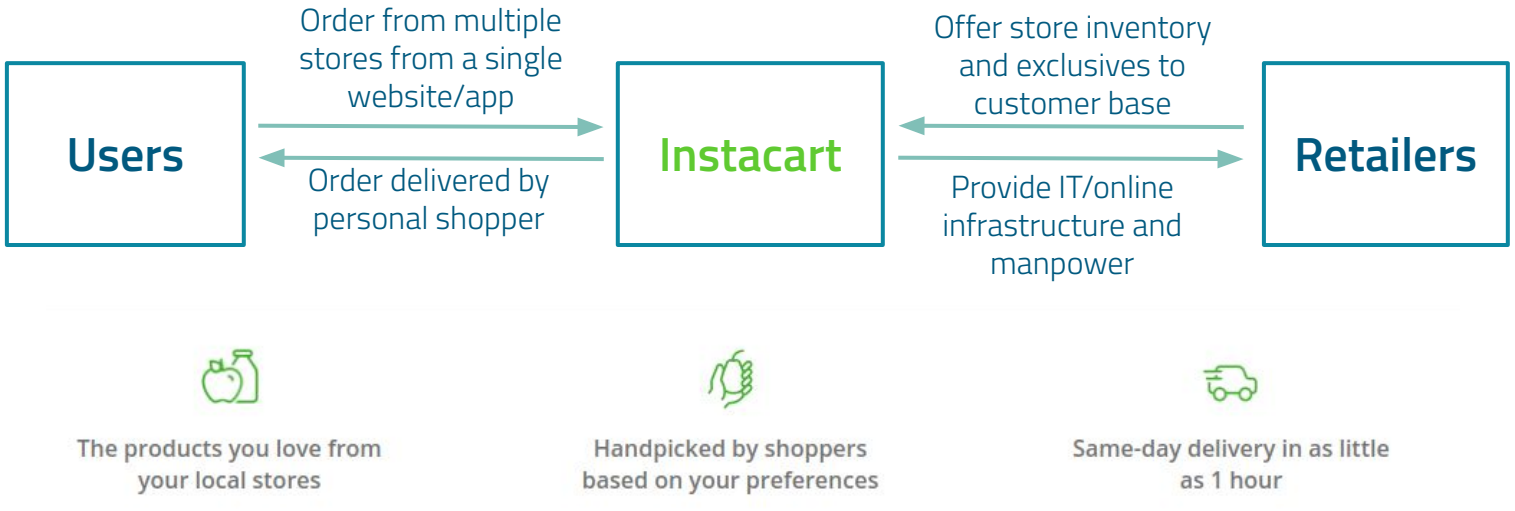
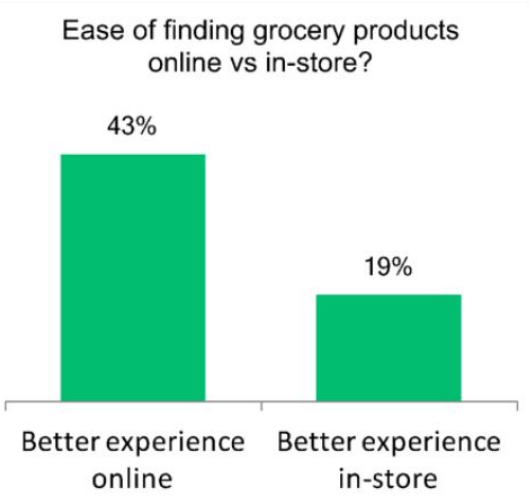
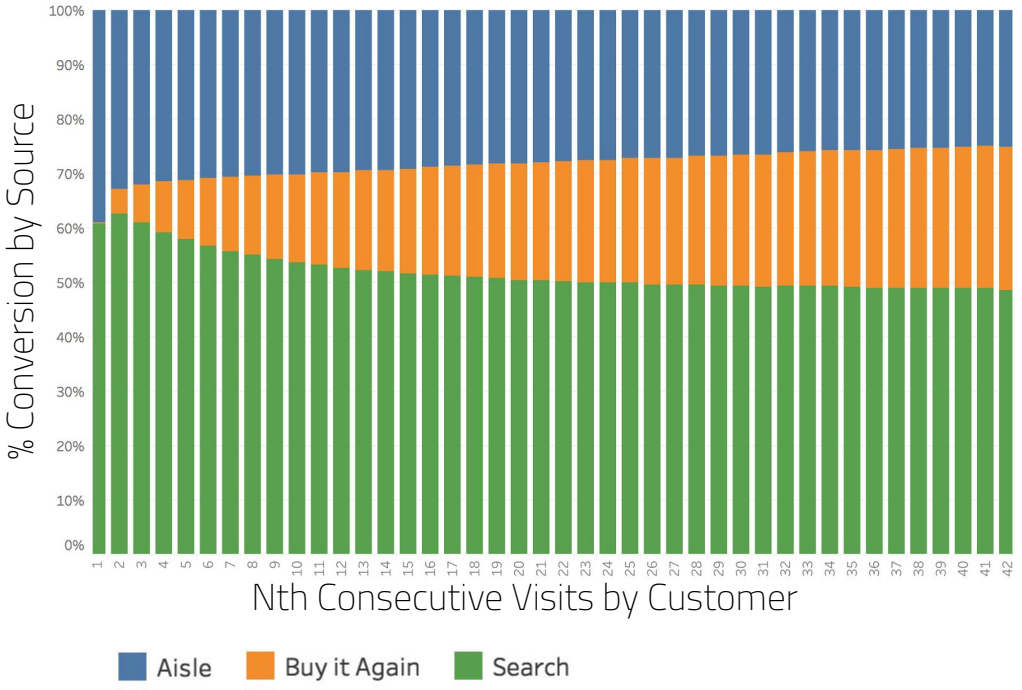
- Online grocery delivery/pick-up service valued at 4 billion USD
- 2017 revenue: 2 billion USD (Forbes estimate)
- Rely on retail partners (e.g. Costco, Aldi) for inventory management



VALUE PROPOSITION

How can Instacart improve retention of their customer base?

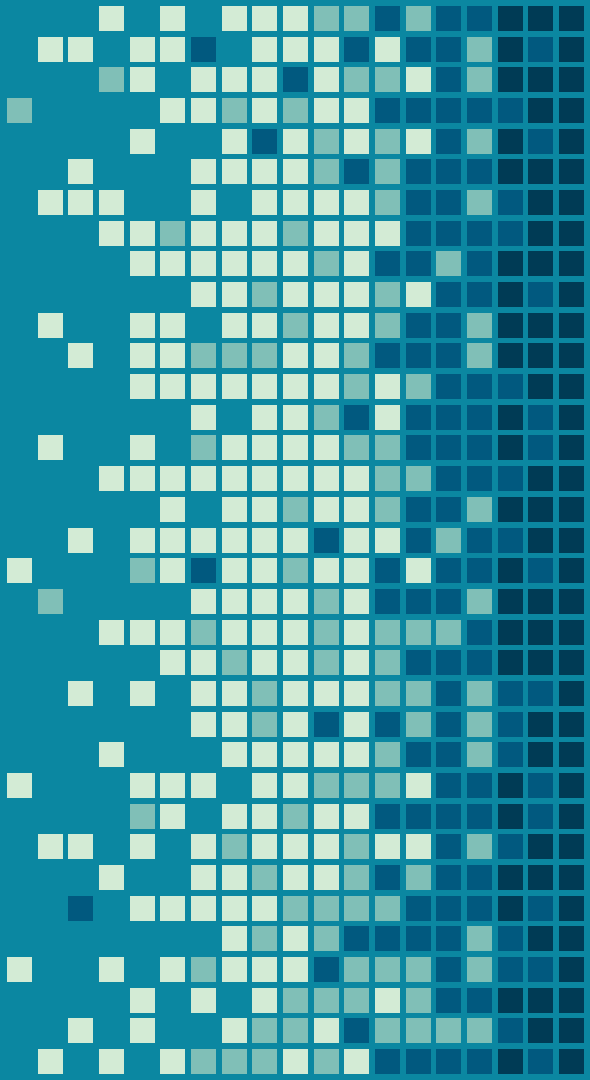




Source: "Winning the digital shelf: it's all about the customer" Instacart blog

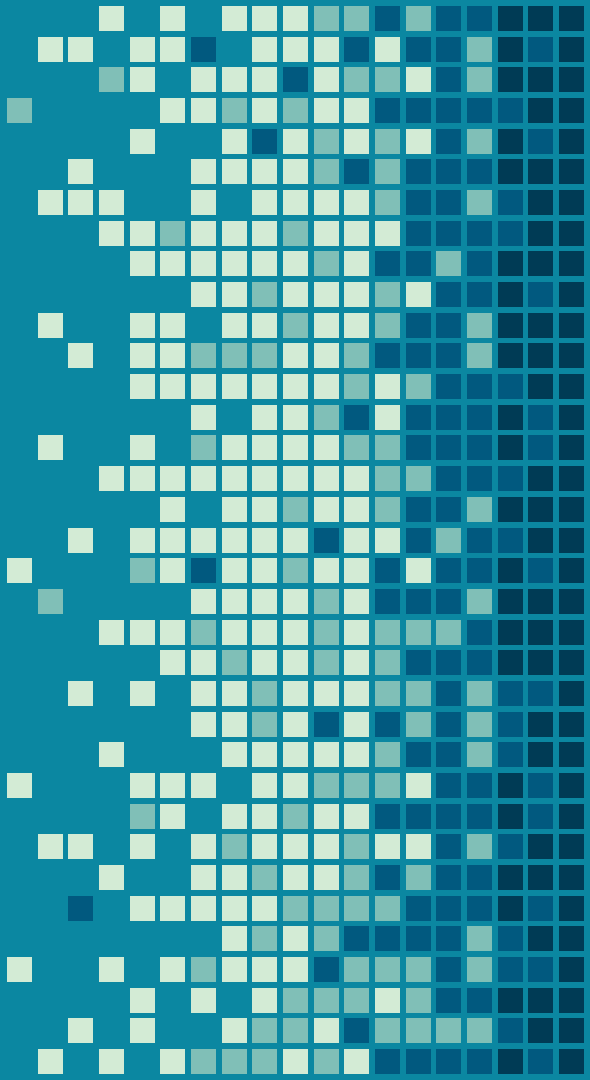
THE BUSINESS QUESTION

> *How much value will be added if we choose to increase customer retention by improving the online shopping experience?*



THE DATA QUESTION

> *Based on a customer's purchase history, how accurately can we predict the products that will be in their next order?*



THE CUSTOMER ORDERS DATASET

- Three million orders by 200 thousand users

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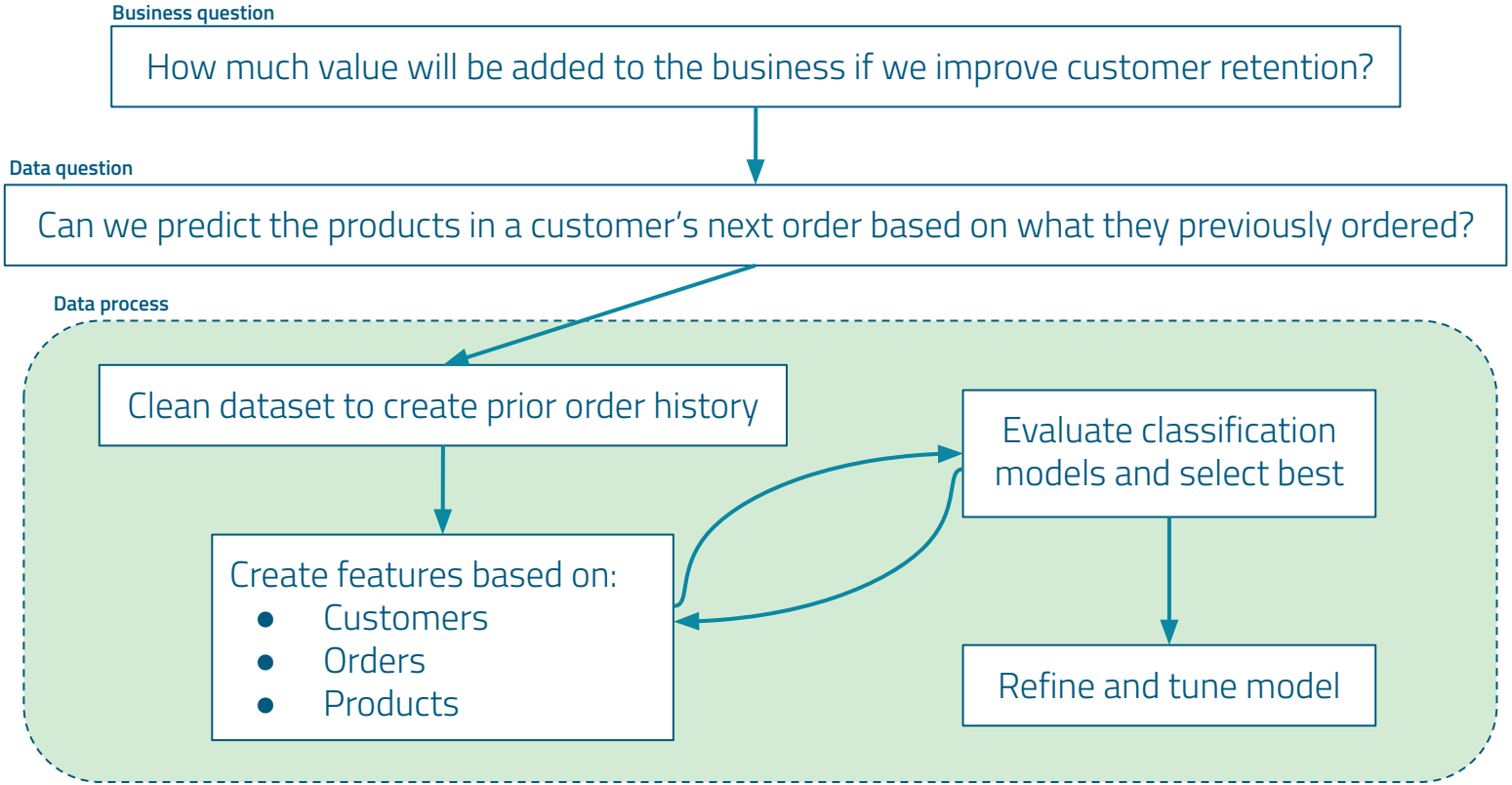
PROCESS WORKFLOW



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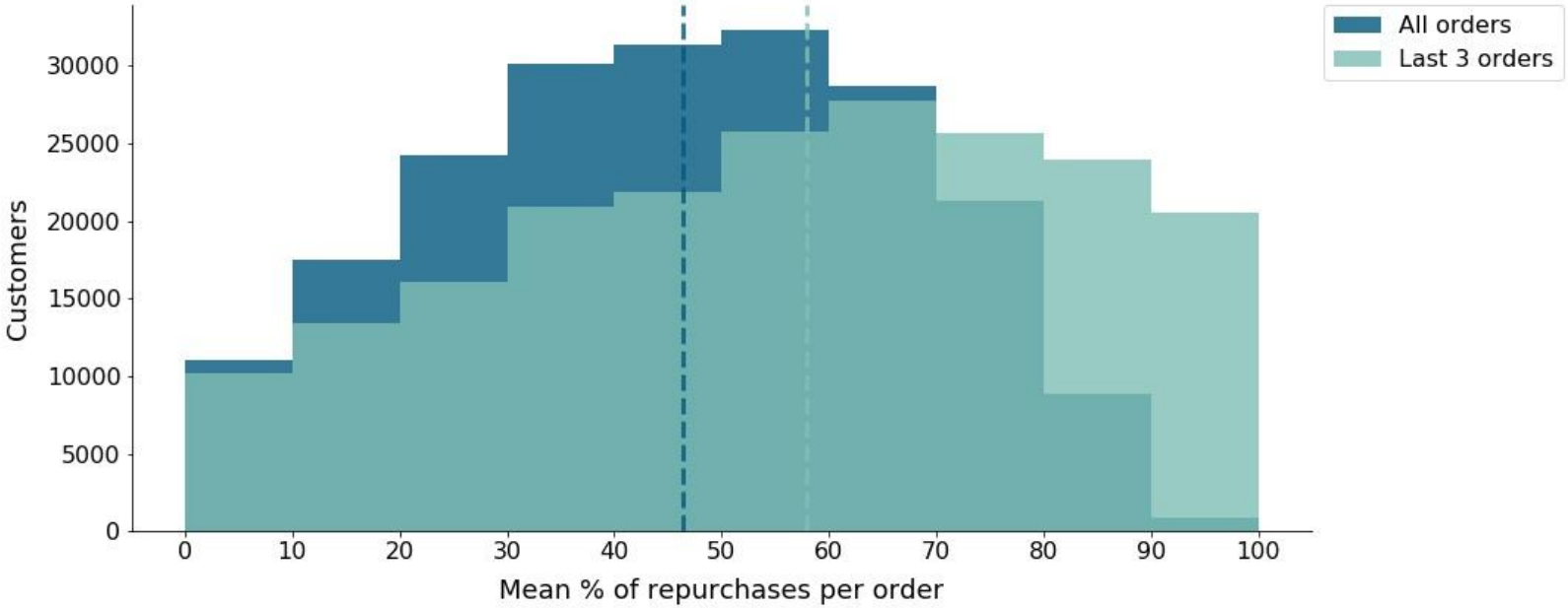
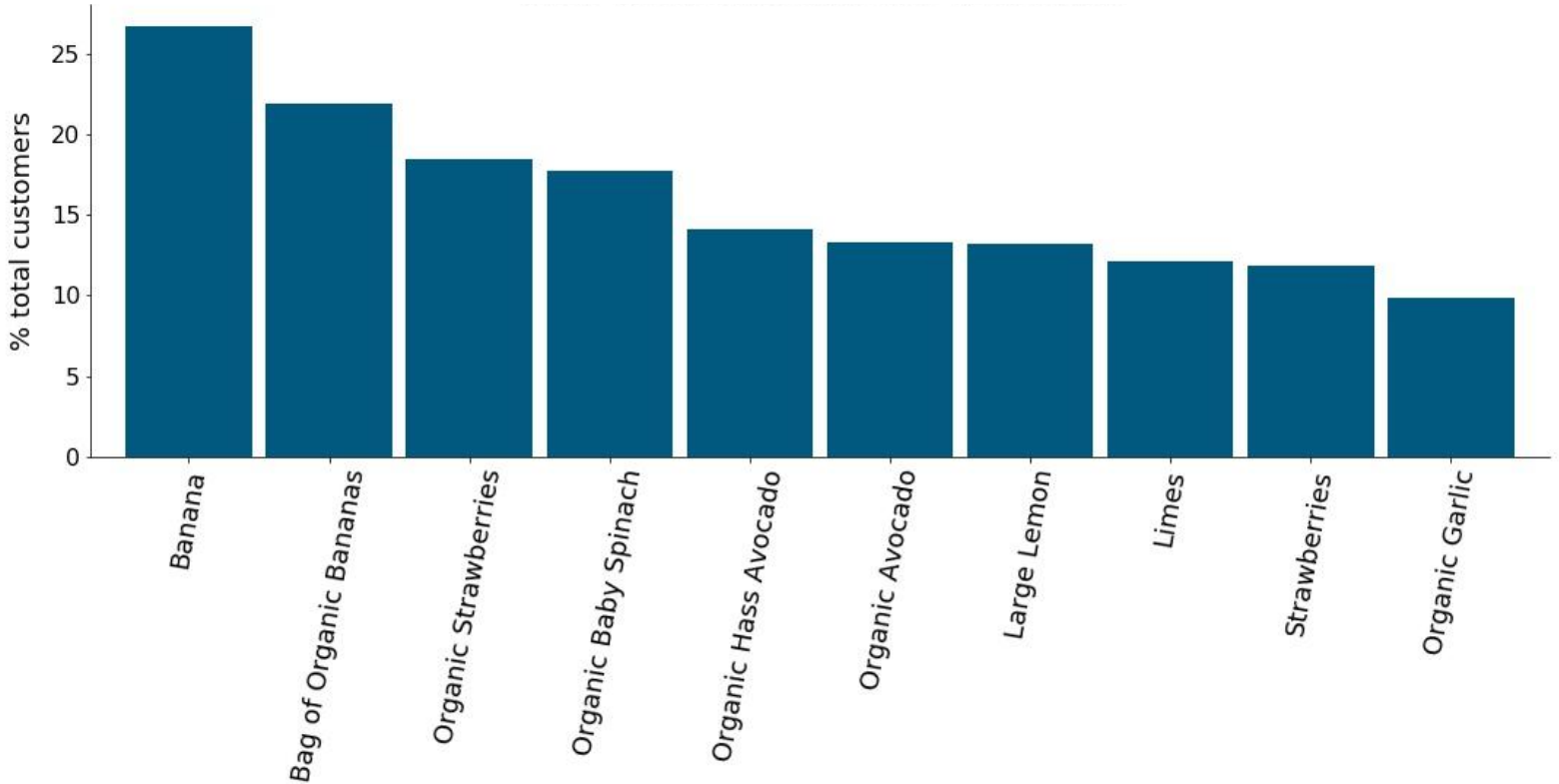
PRODUCT REPURCHASE % PER ORDER



TOP 10 REPURCHASES BY CUSTOMER



MODEL DEVELOPMENT & EVALUATION

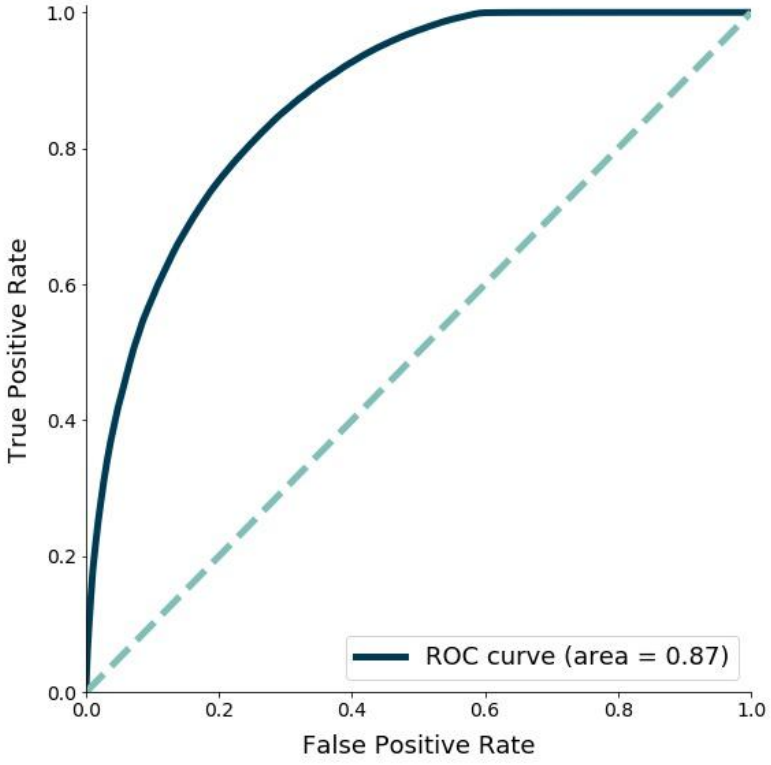
- Models trained on 1.3 million observations and 17 predictors

COMPLEXITY

Model	Accuracy
Baseline (most frequent)	**0.60**
Logistic regression	**0.71**
Random forest	**0.80**
XGBoost	**0.77**

- RF model (9 predictors)

  → **79%** accuracy



KEY FACTORS INFLUENCING REPEAT PURCHASES

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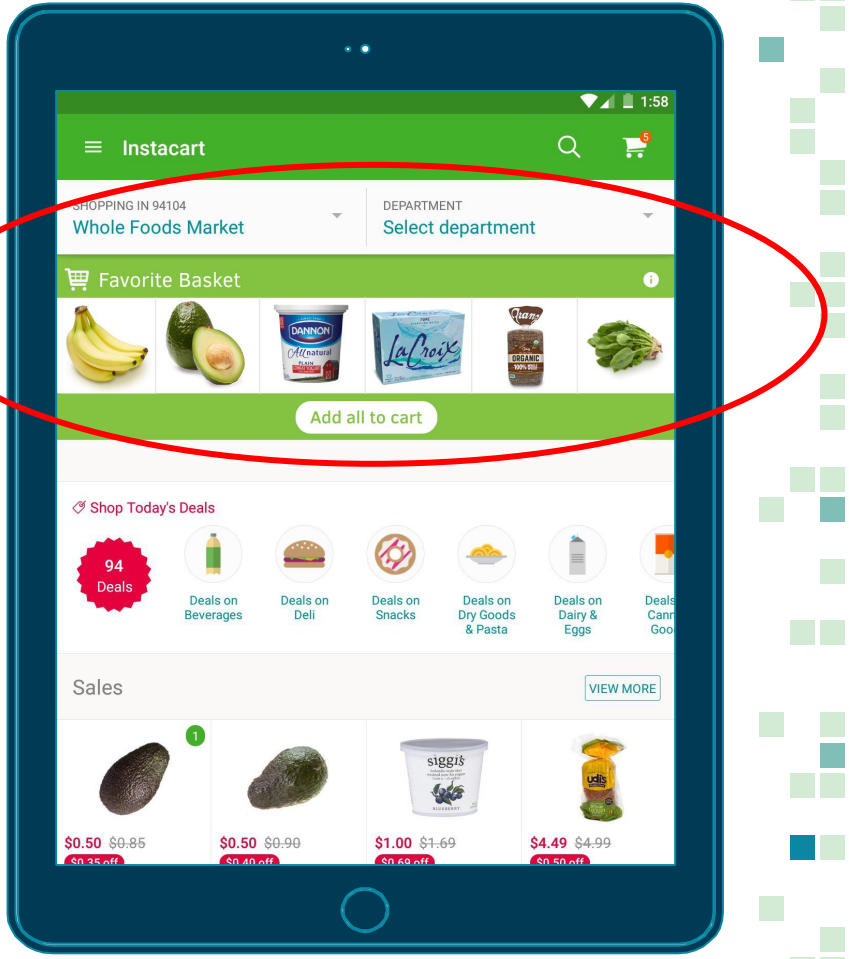
NEXT STEPS

1. Deploy model
2. Develop ‘Favorite Basket’ feature
3. A/B test and measure month-to-month customer retention/churn
4. Decide on implementing feature site-wide



SUMMARY

Business question

How much value will be added to the business if we improve customer retention?

Data question

Can we predict the products in a customer's next order based on what they previously ordered?

Data process

Clean dataset to create prior order history

Create features based on:
- Customers
- Orders
- Products

Evaluate classification models and select best

Refine and tune model

Data answer

We can predict products a customer will reorder with **79%** accuracy

Business answer

Improving customer retention by **1%** will increase revenue by **$1.4 mil**

THANKS!

Any questions?

Supporting documentation
@ github.com/maianhly/instacart_repurchases