

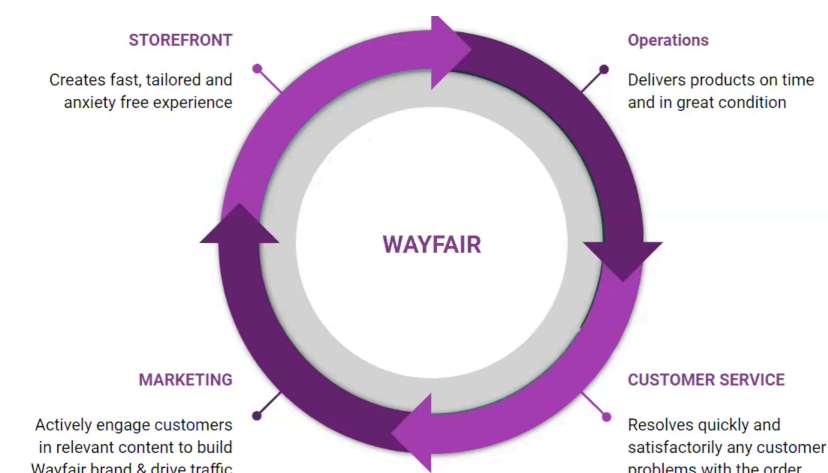
Leveraging ML to Optimize Onsite Targeting Strategy

4/7/21 4:28 PM

Speaker: Ankit Mangal (Wayfair)
Date: 4/7/2021

Special challenges for Wayfair

- Customers needs to be inspired
- Customers need uniqueness



Problem with too much information

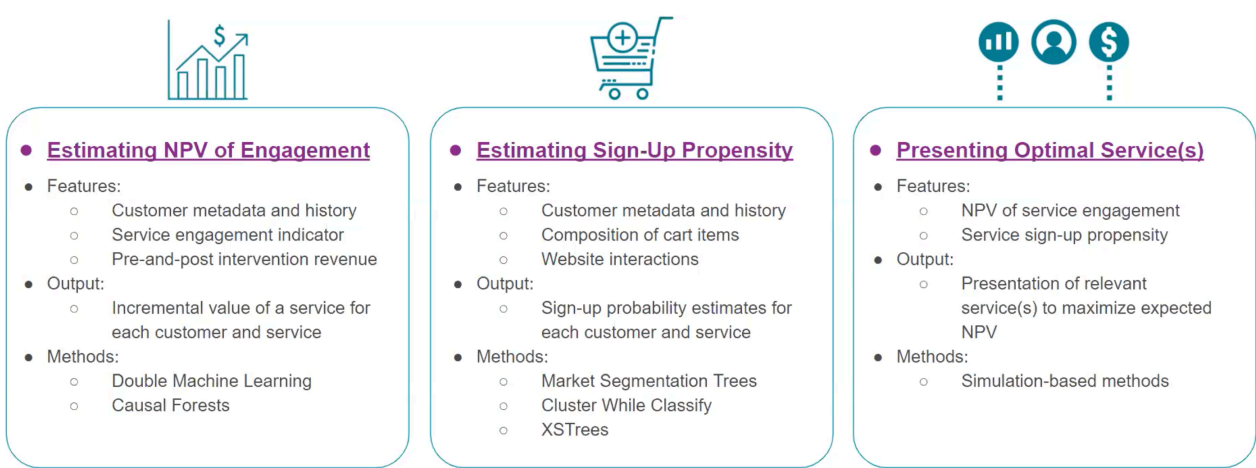
- Distracts customers from making the purchase
- Impacts speed load time of page
- Doesn't help sell more services

How to show relevant services to customers at right time and place when ensuring generating profit

Winning Content = Content Relevance + Content Value

- Content relevance: determined with in-market, predicted needs; audience segment, historical exposure, etc.
- Content value: program/vertical VCD, conversion rate, etc.

Goal is to deliver a cohesive strategy to show content to customers
3 steps model



Estimating Net Present Value of Engagement

Pick the most actionable and interpretable method:

- Causal impact
 - o Lack interpretability due to complexity of methodology (Bayesian structural time series)
- Coarsened exact matching (CEM)
 - o Limits generalizability of the results
- Solution: Causal Forest and Double Machine Learning

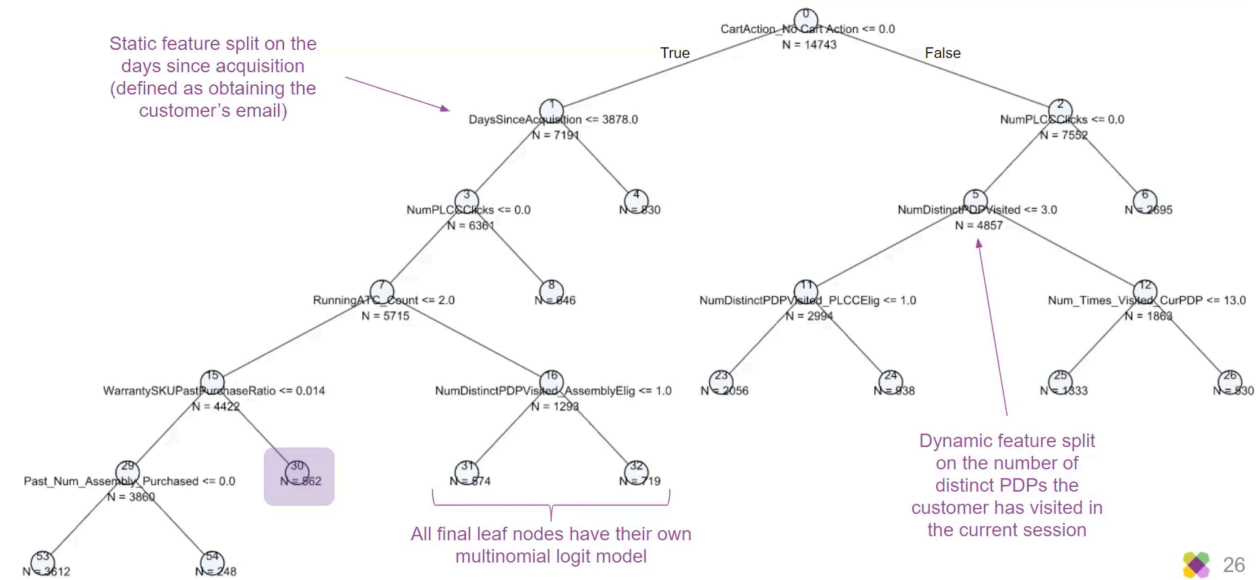
Different services have different nature of NPV change over time

- PLCC (private labeled credit card) service vs. Assembly service
- The results can help organization to determine its profit calculation



Estimating Sign-up Propensity

Market Segmentation Trees



- Each leaf node will be a segment
- For each segment, we produce a logit model

- A sample customer profile:
 - Shared their email with Wayfair (i.e., was acquired)
 - Has purchased Warranty services for more than 1.4% of their past purchased SKUs
 - Has not clicked on any PLCC call-to-actions in current session
 - Has had at least 1 cart action but has added less than 3 items to their cart in the current session

Cluster While Classify

Customer Selection Probabilities

- Marginal effects of each possible action by Wayfair

Cluster 1 Coefficients				Cluster 2 Coefficients			
Customer Selection → Wayfair Action ↓	None Purchased	Assembly Only	PLCC Only	Customer Selection → Wayfair Action ↓	None Purchased	Assembly Only	PLCC Only
Assembly & PLCC Shown	-0.029	0.046	0.049	Assembly & PLCC Shown	-0.021	0.076	0.022
Assembly Shown	0.018	0.236		Assembly Shown	-0.008	0.401	
PLCC Shown	0.089		0.629	PLCC Shown	0.411		0.109

- Interpretation: In Cluster 1, if Wayfair present the content of both Assembly & PLCC, the marginal effect on customer choosing Assembly Only is very low (0.046), compared to presenting only Assembly Shown (0.236)

Presenting Optimal Services

- Combine the first two models
- Use A/B test to check hypothesis