



BREWLYTICS

AI-Powered Offer Completion Prediction
with Customer Segmentation

A Technical Presentation for Data Scientists

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WHERE CUSTOMER SEGMENTS MEET SMART PROMOTIONS



BUSINESS PROBLEM

What's at stake?



- **Current Challenge**

- Only **53.4%** of promotional offers sent to customers are completed
- This means **46.6%** of marketing spend is not driving conversions
- **86,432** customer-offer interactions analyzed

- **Business Impact of Poor Targeting**

- **Wasted marketing budget** on customers unlikely to respond
- **Missed revenue** from customers who would convert with the right offer
- **Customer experience degradation** from irrelevant offers
- 12% of customers (9,963) have **missing demographic data** - performing 5x worse than best segments

The Question:

Can we predict which customers will complete offers and optimize our marketing accordingly?



DATA-DRIVEN APPROACH

01

ANALYZED CUSTOMER DATA

Demographics,
membership
tenure, past
behavior

02

STUDIED OFFER CHARACTERISTICS

Discount vs
BOGO, duration,
difficulty

03

BUILT PREDICTIVE MODELS

Tested 4
algorithms to
find the best
performer

04

IDENTIFIED CUSTOMER SEGMENTS

5 distinct
groups with
different
behaviors

05

ENSURED FAIRNESS

Checked for
bias across
gender, age,
and income



KEY FINDINGS

WHAT DRIVES OFFER COMPLETION

Offer Design Matters More Than Customer Demographics

Top Factors Influencing Completion (from SHAP Analysis):

Rank	Factor	Importance	Controllable?
1	Discount Offers	21.4%	Yes
2	Offer Duration	14.2%	Yes
3	Offer Difficulty	9.3%	Yes
4-7	Customer Demographics	23.0%	No

Critical Insight

- 52% of predictions driven by offer design (what we send)
- 34% of predictions driven by demographics (who receives it)

Actionable Takeaway

Optimize **what** we offer before optimizing **who** receives it.



KEY FINDINGS

CUSTOMER SEGMENTS

5 Distinct Customer Segments Identified

Segment	Size	Completion Rate	Profile
Affluent Females	36%	65.9%	Age 58, \$72K income, 1.3 yr tenure
Loyal Male Members	20%	65.3%	Age 57, \$64K income, 2.9 yr tenure
New Male Members	31%	44.6%	Age 52, \$61K income, 0.7 yr tenure
Data Quality Issue	12%	15.7%	Missing Demographics
Engaged Niche	1%	63.2%	Other/Diverse - highest view rate

Key Insight

Gender + Tenure are primary segmentation drivers. New male members need onboarding support.



MODEL RESULTS

THE PREDICTION MODEL ACHIEVES 86% ACCURACY

Model Performance (Random Forest)

Metric	Score	What It Means
F1-Score	0.8601	Balance of Precision and Recall
AUC-ROC	0.9277	Excellent ability to distinguish completers
Precision	83.2%	83% of predicted completers actually complete
Recall	89.1%	Captures 89% of all completers

Business Translation

- For every 100 offers sent using this model, we correctly identify 83 completers
- We miss only 11% of customers who would have completed



TRANSLATING TO BUSINESS VALUE

REVENUE OPPORTUNITY

Current State

- Total completions: 46,152
- Overall completion rate: 53.4%

If we improve underperforming segments

Initiative	Target Customers	Additional Conversions
New Male Member Onboarding	26,644	+5,523
Fix Missing Demographics	9,963	+4,004
TOTAL OPPORTUNITY	36,607	+9,527 conversions

Projected Impact

- Completion rate improvement: 53.4% → 64.4%
- 20.6% increase in total conversions
- Revenue uplift: +9,527 conversions × avg offer value

RECOMMENDATIONS

Strategic Actions by Priority

Immediate (Week 1-2):

01 Fix Data Quality Crisis – 12% of customers missing demographics

- Launch incentivized profile completion campaign
- Fix onboarding to require key fields
- Expected impact: +4,004 conversions

02 Optimize Offer Design

- Prioritize discount offers (21% of prediction power)
- Reduce offer duration (negative impact when too long)
- Lower difficulty thresholds

Short-Term (Month 1-2):

03 New Member Onboarding Program

- Target new male members (44.6% completion → 65.3% potential)
- Progressive difficulty - start easy
- Educational content: "Maximizing Your Rewards"



RECOMMENDATIONS

Segment-specific Strategies

Segment	Strategy	Expected Lift
Affluent Females	VIP treatment, premium offers	Protect & grow
Loyal Males	Early access, loyalty rewards	Retention focus
New Males	Onboarding, easier initial offers	+5,523 conversions
Missing Data	Data collection campaign	+4,004 conversions

Offer Optimization (Based on the Data)

- Use discount offers - 4x more effective than BOGO
- Keep duration short - Long offers decrease completion
- Make difficulty achievable - Lower thresholds improve conversion





RISKS & CONSIDERATIONS

IMPORTANT CAVEATS

Fairness Concerns Identified:

Group	Issue	Risk Level
Males	26% fewer positive predictions vs females	Critical
Low Income	45% fewer predictions vs high income	Critical
Young Adults (18-30)	28% fewer predictions	Medium
Seniors (76+)	43% fewer predictions	Medium

Mitigation Required:

- Legal compliance with fair lending/marketing laws
- Expected 2% accuracy trade-off for fairness compliance
- Recommend fairness monitoring dashboard before production deployment

Model Limitations:

- Based on historical data - may not capture changing preferences
- Requires ongoing monitoring for concept drift
- Model performance varies by customer segment

NEXT STEPS & ROI PROJECTION

IMPLEMENTATION ROADMAP



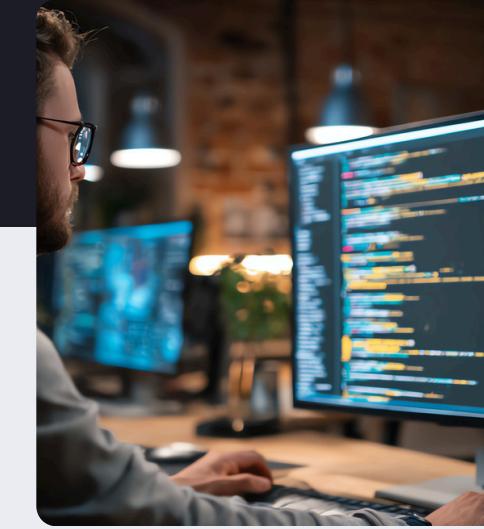
- Deploy offer optimization rules (discount, shorter duration)
- Launch data collection campaign
- Estimated ROI: +2,000 conversions

**Phase 1:
Quick Wins
(Weeks 1-4)**



- Implement new member onboarding
- Segment-specific offer recommendations
- Estimated ROI: +4,000 conversions

**Phase 2:
Segment Targeting
(Months 1-2)**



- Production model deployment
- Fairness monitoring dashboard
- A/B testing framework

**Phase 3:
Full Deployment
(Month 3)**

SUMMARY KEY TAKEAWAY FOR EXECUTIVES

WHAT I'VE LEARNED

- Offer design matters more than who you target (52% vs 34%)
- Discount offers are 4x more effective than other types
- 5 customer segments exist with completion rates from 16% to 66%
- 12% of customers have data quality issues - biggest opportunity

WHAT I RECOMMEND

- Fix data quality immediately (+4,004 conversions)
- Optimize offer design (discount, short, easy)
- Implement onboarding for new members (+5,523 conversions)
- Deploy fairness monitoring before production

Bottom Line



- Predictive model achieves 86% accuracy
- Total opportunity: +9,527 additional conversions (20.6% lift)
- Investment required: Data collection, offer optimization, monitoring infrastructure