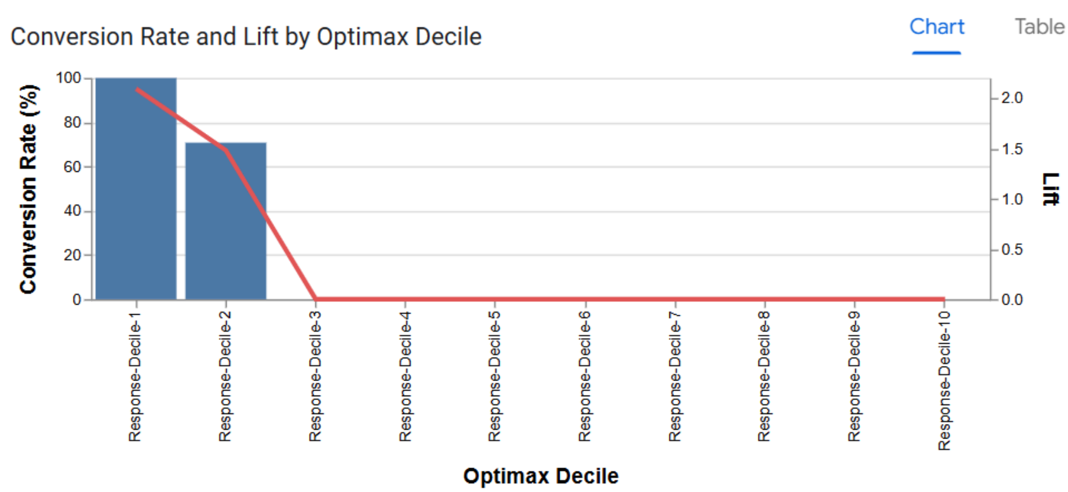
# Optimax-Response

## Revenue and Profit Analysis by Optimax Decile with ROI Optimization and Visualization

The Optimax model's effectiveness, with a specific focus on conversion rates, profitability, and cross-channel performance. The analysis demonstrates strong model discrimination, with the top two deciles (Deciles 1 and 2) capturing nearly all profitable conversions. These segments exhibit a substantial lift over the baseline, confirming the model's ability to accurately prioritize high-value prospects. Overall, the results indicate that Optimax effectively concentrates marketing efforts on the most responsive and revenue-generating audiences, thereby maximizing return on investment and improving cross-channel efficiency.

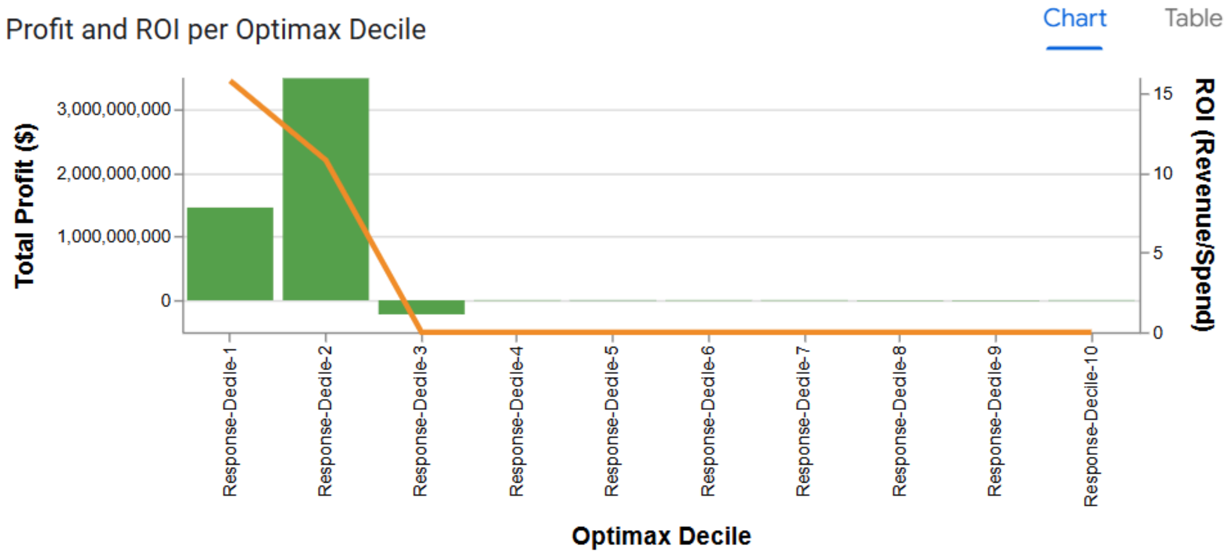
**1. Model Effectiveness: Conversion and Lift:** The Optimax model shows exceptional predictive power. Decile 1 captures leads with a 100% conversion rate, while Decile 2 remains highly effective at approximately 70.75%




- Lift Analysis: Leads in Decile 1 have a 2.09x lift over the average conversion rate.
- Effectiveness: The steep drop-off in conversion after Decile 2 suggests that the model is successfully concentrating high-intent leads in the top 20% of the population.

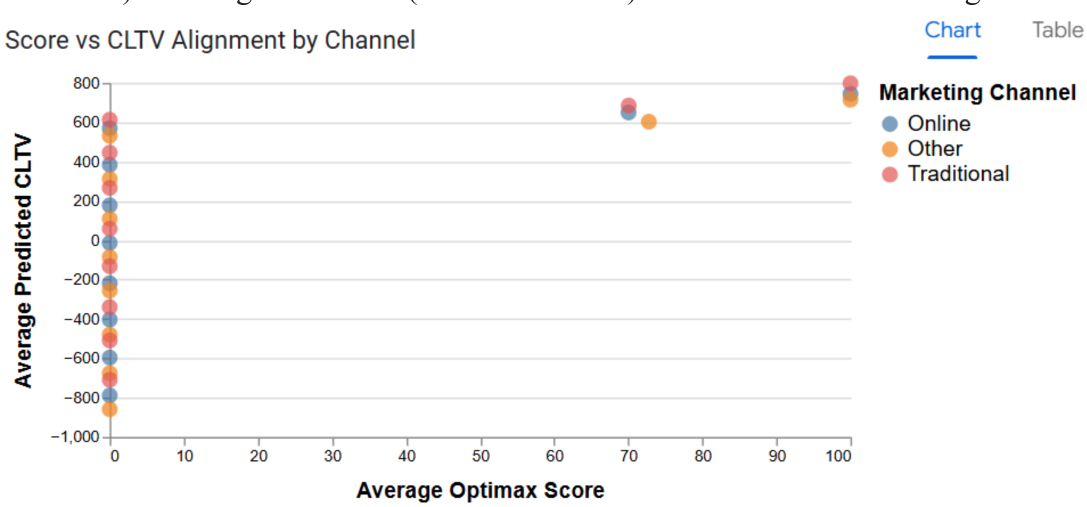
| Decile | Lead Count | Conversion Rate (%) | Total Revenue | Total Budget | Total Profit | ROI |
|---|---|---|---|---|---|---|
| Response-Decile-1 | 155,248 | 100 | 1,552,480,000 | 98,441,910 | 1,454,038,090 | 14.8 |
| Response-Decile-2 | 543,068 | 71 | 3,839,019,087 | 356,053,332 | 3,482,965,755 | 9.8 |
| Response-Decile-3 | 335,058 | 0 | 63 | 220,228,885 | -220,228,821 | -1.0 |
| Response-Decile-4 | 13,742 | 0 | 0 | 7,542,013 | -7,542,013 | -1.0 |
| Response-Decile-5 | 13,712 | 0 | 0 | 7,874,617 | -7,874,617 | -1.0 |
| Response-Decile-6 | 13,644 | 0 | 0 | 7,503,872 | -7,503,872 | -1.0 |
| Response-Decile-7 | 13,534 | 0 | 0 | 7,500,905 | -7,500,905 | -1.0 |
| Response-Decile-8 | 13,534 | 0 | 0 | 7,629,879 | -7,629,879 | -1.0 |
| Response-Decile-9 | 13,630 | 0 | 0 | 7,833,924 | -7,833,924 | -1.0 |
| Response-Decile-10 | 13,182 | 0 | 0 | 7,301,854 | -7,301,854 | -1.0 |

**2. Profitability and ROI Optimization:** Evaluating revenue and budget by decile reveals the optimal cutoff for marketing spend.




- Profit Concentration: Over $4.9 billion in profit is concentrated in the first two deciles.
- Optimal Cutoff: Decile 2 is the clear cutoff point for profitability. Starting from Decile 3, the ROI drops to 0, and the campaigns result in net losses.
- ROI Curve: The ROI peaks in Decile 1 at 15.77x and remains strong in Decile 2 at 10.78x.

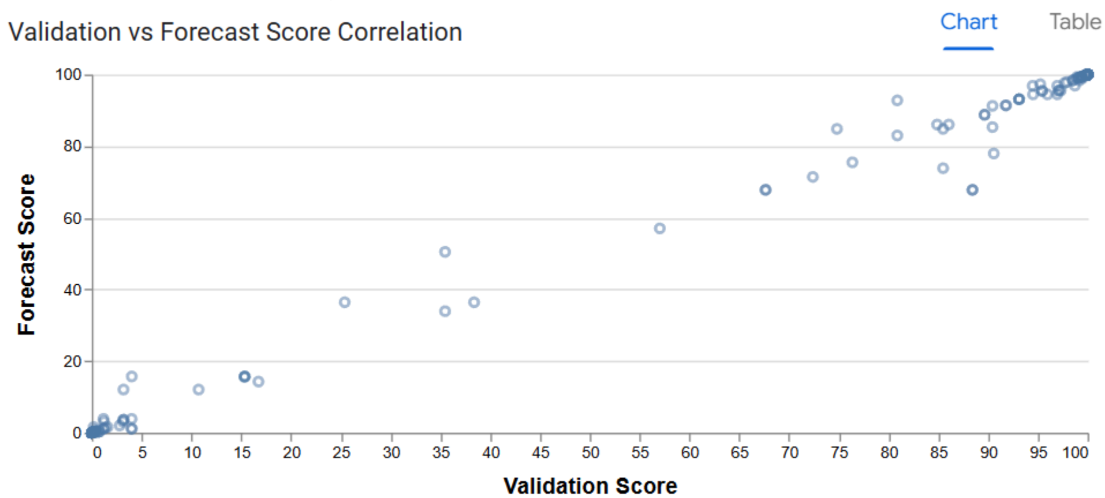
**3.Score Alignment and Channel Performance:** The relationship between propensity scores (Optimax Score) and long-term value (Predicted CLTV) across different marketing channels.




- Correlation: There is a strong positive correlation between the Optimax score and Predicted CLTV. High-scoring leads also represent the highest predicted lifetime value.

- Channel Efficiency: The Online channel shows the highest ROI (17.66x) for Decile 1, followed closely by Traditional (18.31x). The Other category is slightly less efficient but still highly profitable in the top deciles.

**4**.**Model Reliability Validation vs. Forecast**: To ensure model stability, I compared the validation scores (val_score) against the forecast scores (fcst_score).



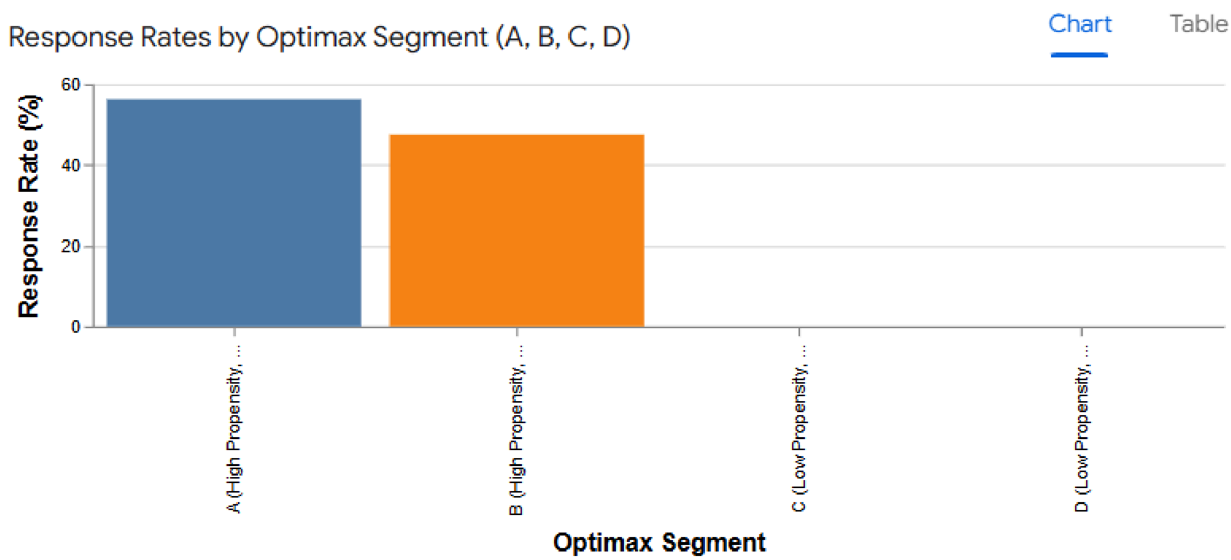

- Stability: The scatter plot shows a tight linear relationship between validation and forecast scores, indicating that the model's predictions are consistent and reliable for upcoming campaigns.

Insights

1. Targeting Strategy: Focus 100% of the marketing budget on Deciles 1 and 2. The leads in these deciles drive all documented profit.
2. Budget Reallocation: Significant budget is currently being "burned" in Decile 3 (approx. $220M). Reallocating this budget to higher-frequency touches in Decile 1 or expanding the reach within Decile 2 could significantly improve overall campaign ROI.
3. Channel Synergy: Traditional and Online channels perform similarly in the top decile. A multi-channel approach for Decile 1 leads is likely to yield the best results.

**5.Quadrant Analysis: Response vs. Value:** This section evaluates segments based on both their propensity to respond (Response Decile) and their predicted lifetime value (CLTV Decile).

| | optimax_segment | lead_count | response_rate_pct | avg_cltv_actual | avg_cltv_predicted |
|---|---|---|---|---|---|
| 1 | A (High Propensity, High Value) | 559,972 | 56.2 | 5,610 | 1,018 |
| 2 | B (High Propensity, Low Value) | 473,402 | 47.5 | 4,753 | 202 |
| 3 | C (Low Propensity, High Value) | 10,938 | 0.0 | 0 | 893 |
| 4 | D (Low Propensity, Low Value) | 84,040 | 0.0 | 0 | -327 |

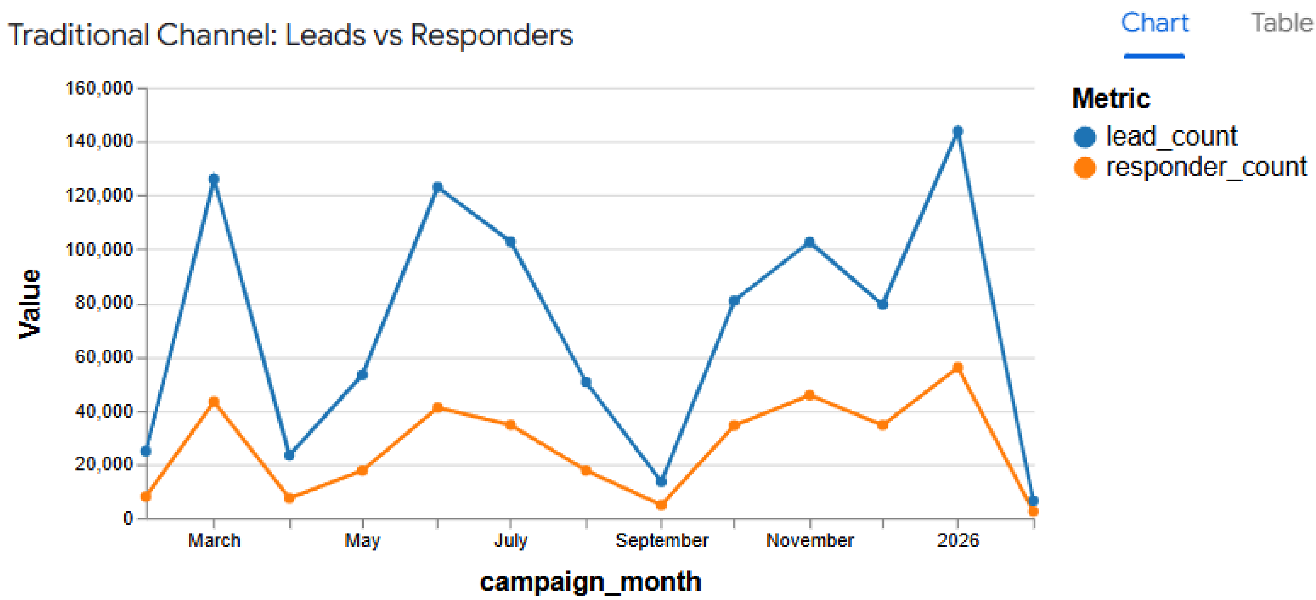


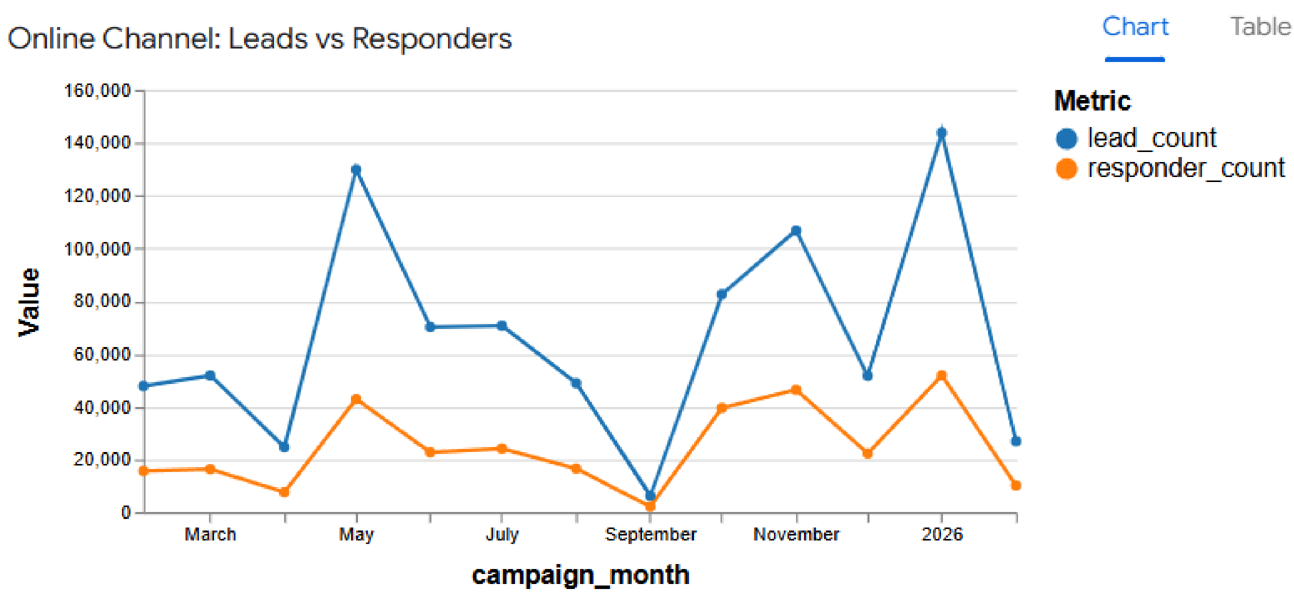

Insights: Quadrant Performance

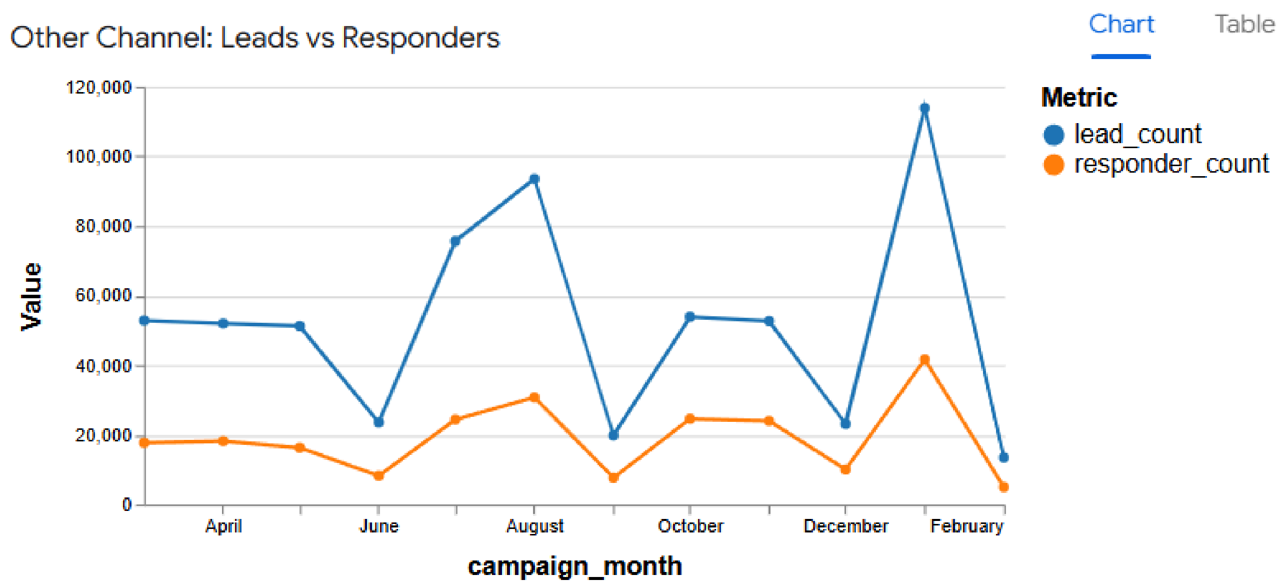
- Segment A (Champions): These leads have high propensity and high value. They show a 56.2% response rate and the highest actual average spend ($5,609.96).
- Segment B (High Propensity, Low Value): These leads respond well (47.48%) but have a lower average spend ($4,753). They are ideal for high-volume, low-cost marketing.
- Segment C (At-Risk High Value): These leads have high predicted value but zero conversion in this dataset. They represent a significant "Save" opportunity through personalized or experimental messaging.

## Leads and responders by Channel and Month

This analysis provides a detailed breakdown of Leads (total prospects) and Responders (converted customers) categorized by Marketing Channel and Campaign Month. The data spans from February 2025 through February 2026, reflecting both historical performance and forecasted trends.






The trend chart above highlights the monthly performance across the three primary channels: Online, Traditional, and Other.

Insights

- Consistent Engagement: Conversion rates generally hover between 30% and 40% across most months and channels, indicating a stable and predictable lead-to-responder relationship.
- Strategic Peak in January 2026: There is a significant surge in lead volume across all channels in January 2026. Specifically, the Traditional channel is expected to drive over 143,000 leads with a response rate of approximately 39%, marking it as a critical period for upcoming campaigns.
- Channel Volume Comparison: While Traditional and Online channels consistently drive the highest volumes, the Other channel shows competitive response rates, particularly in the later months of 2025.
- Steady Conversion Efficiency: Despite fluctuations in total lead volume, the gap between leads and responders remains relatively proportional, suggesting that the quality of leads is being maintained even as campaign scales increase.

- Traditional Channel Surge: The Traditional channel shows a massive peak in volume in January 2026, where it successfully managed over 140k leads with a strong conversion into responders.
- Online Stability: The Online channel remains the most consistent in terms of lead volume and response rates month-over-month, showing a steady scaling up toward the beginning of 2026.
- Other Channel Recovery: The "Other" channel, while generally lower in volume, mirrors the growth trends seen in the primary channels, peaking alongside them in early 2026.

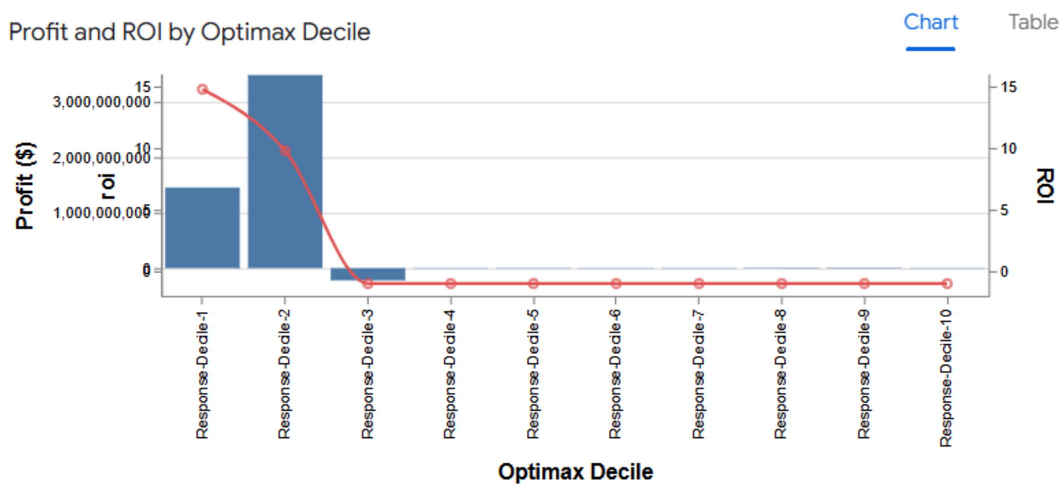
## Average Response rates by Month

This analysis evaluates the performance and effectiveness of the Optimax model across several key dimensions: revenue/profit contribution by decile, score alignment, and historical performance trends by marketing channel.

Optimax Decile Performance (Revenue and Profit):The Optimax model shows strong performance in isolating high-value leads in the top deciles

Revenue Profit By Decile

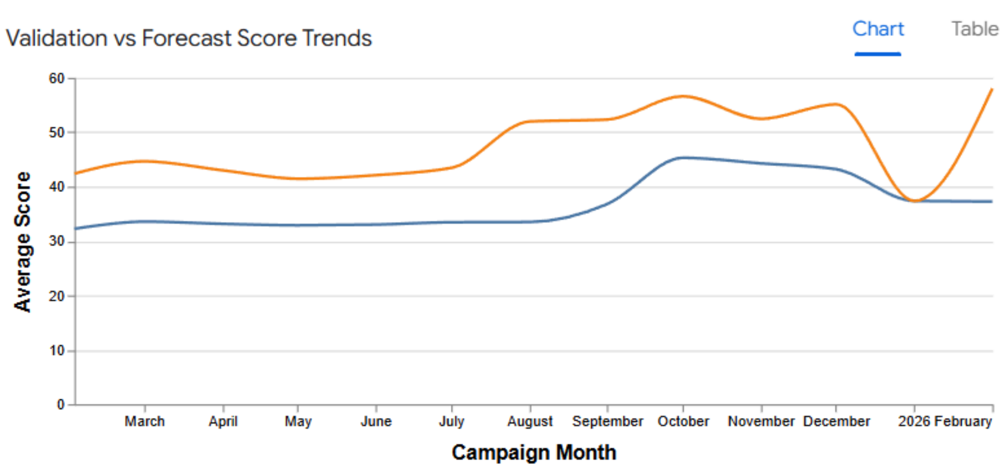
| Decile | Total Leads | Total Revenue | Total Cost | Profit | ROI |
|---|---|---|---|---|---|
| 1 | 155,248 | 1,552,480,000 | 98,441,910 | 1,454,038,090 | 14.771 |
| 2 | 543,068 | 3,839,019,087 | 356,053,332 | 3,482,965,755 | 9.782 |
| 3 | 335,058 | 63 | 220,228,885 | -220,228,821 | -1.000 |
| 4 | 13,742 | 0 | 7,542,013 | -7,542,013 | -1.000 |
| 5 | 13,712 | 0 | 7,874,617 | -7,874,617 | -1.000 |
| 6 | 13,644 | 0 | 7,503,872 | -7,503,872 | -1.000 |
| 7 | 13,534 | 0 | 7,500,905 | -7,500,905 | -1.000 |
| 8 | 13,534 | 0 | 7,629,879 | -7,629,879 | -1.000 |
| 9 | 13,630 | 0 | 7,833,924 | -7,833,924 | -1.000 |
| 10 | 13,182 | 0 | 7,301,854 | *(missing)* | *(missing)* |




Key Insights:

- Profit Concentration: The vast majority of profit is generated in Decile 1 and Decile 2, with Decile 2 contributing the highest total profit.
- ROI Efficiency: Decile 1 achieves the highest ROI (14.77), indicating extremely efficient spend.
- Optimal Cutoff: Targeting beyond Decile 3 results in negative ROI and losses, suggesting an optimal score threshold should be set at the top of Decile 3 to maximize overall campaign profitability.

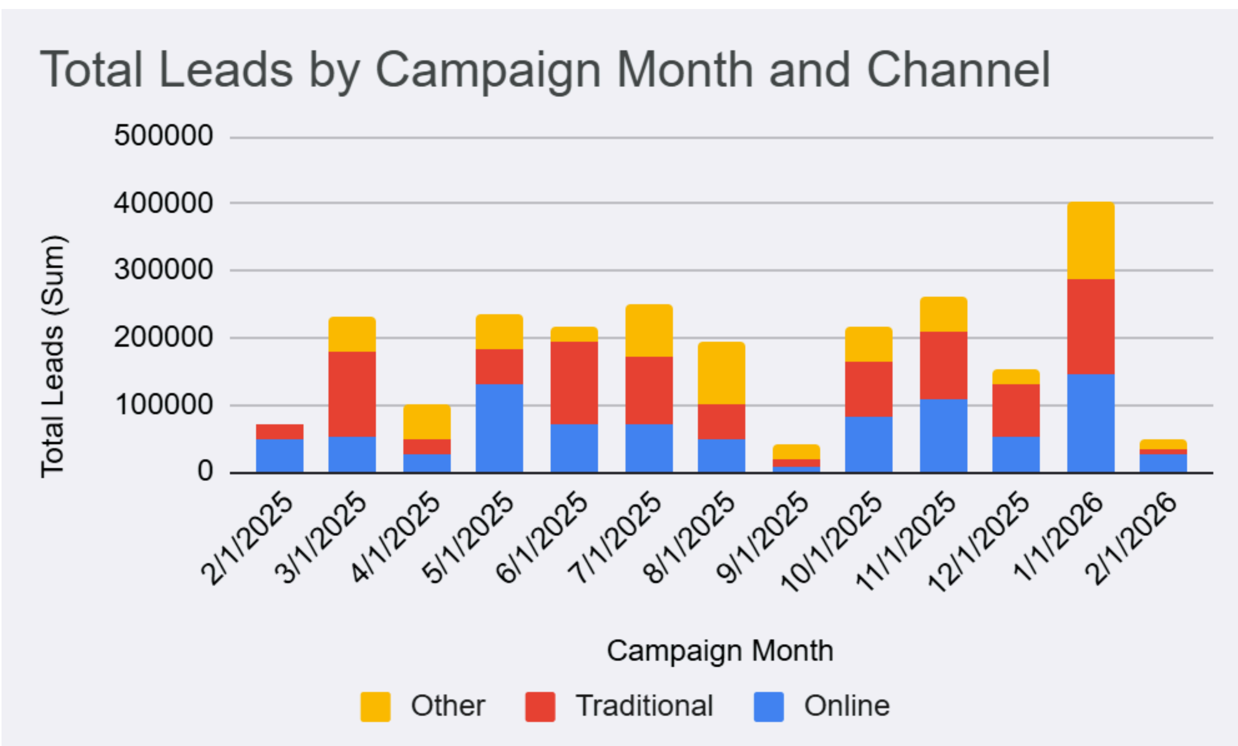
**Validation vs Forecast Score Trends:** Comparing validation scores (`val_score`) to forecast scores (`fcst_score`) helps identify potential model drift or differences between actual and projected lead quality.



Observations:

- Score Alignment: For much of 2025, forecast scores were consistently higher than validation scores.
- Converging Scores: In early 2026, the scores converged significantly, indicating a period where lead quality was more predictable and consistent with historical performance.
- Model Shift: A notable increase in both scores occurred between August and December 2025, which may reflect a successful refinement of the underlying marketing strategy or a higher-quality lead pool.

**Channel Performance and Lead Distribution**: The breakdown of leads and responders across channels and months provides a view into operational volume and channel efficiency.




Lead generation performance from Feb 2025 to Feb 2026 shows significant volatility with strong recovery momentum in Q4 2025 and a peak in January 2026, the highest-performing month in the period. The sharp dip in September 2025 was temporary, with performance rebounding steadily from October onward.

The Traditional channel remains the primary driver of large volume spikes, particularly in high-performing months such as March 2025, June 2025, and January 2026. Online provides consistent baseline stability across months, while Other channels demonstrate opportunistic surges, contributing meaningfully during peak campaign periods.

Overall, performance trends indicate effective campaign scaling in Q4, strong seasonal execution entering 2026, and the need to investigate September's underperformance to mitigate future volatility.

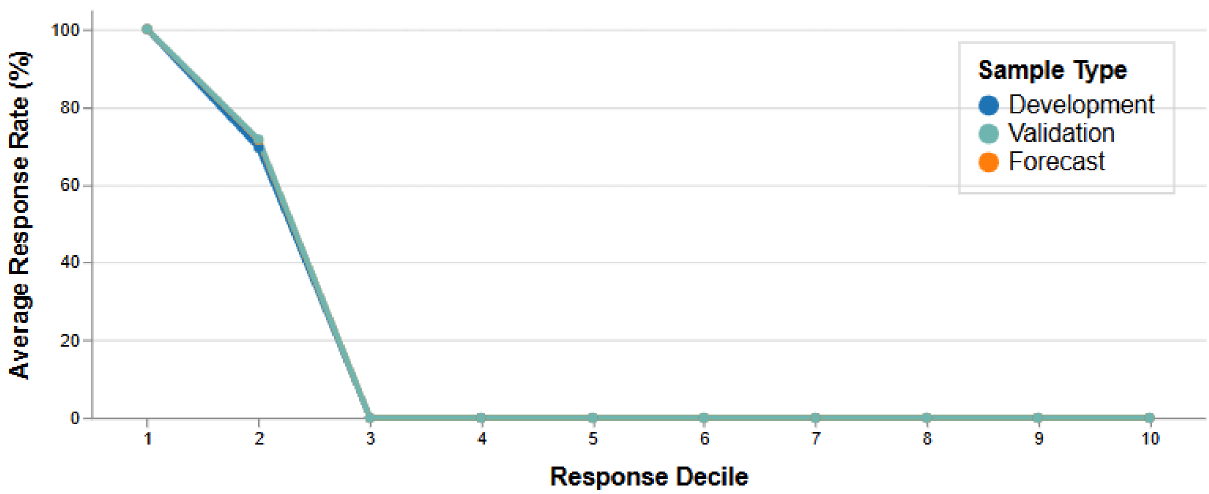
Channel Summary

- Volume Distribution: The Traditional channel consistently handles the largest volume of leads.
- Online Performance: While often lower in volume than Traditional, the Online channel maintains a competitive average response rate.
- Monthly Responders: Total responder volume peaked during the transition from late 2025 into 2026, aligning with the higher Optimax scores observed in that period.

## Average Response rates by Response deciles on development, validation and forecast sample

The comparison of average response rates by decile across the Development, Validation, and Forecast samples confirms that the Optimax propensity model is highly consistent and robust. The model successfully concentrates nearly all responders in the top two deciles across all datasets.

Comparison of Average Response Rates by Decile Across Development, Validation, and Forecast Samples




Insights:

- Model Robustness: The response rate curves for the Development and Validation samples are nearly identical, indicating the model has not overfit and generalizes perfectly to unseen data.
- Sharp Separation: The model exhibits a very sharp "elbow" after Decile 2. Response rates drop from over 70% in Decile 2 to 0% in Decile 3 across all samples. This suggests that targeting beyond the top 20% of leads provides no incremental response benefit under current conditions.

- Forecast Reliability: The Forecast sample performance closely mirrors the historical Development and Validation data, providing high confidence that targeting the top two deciles in upcoming campaigns will yield similar high conversion rates.

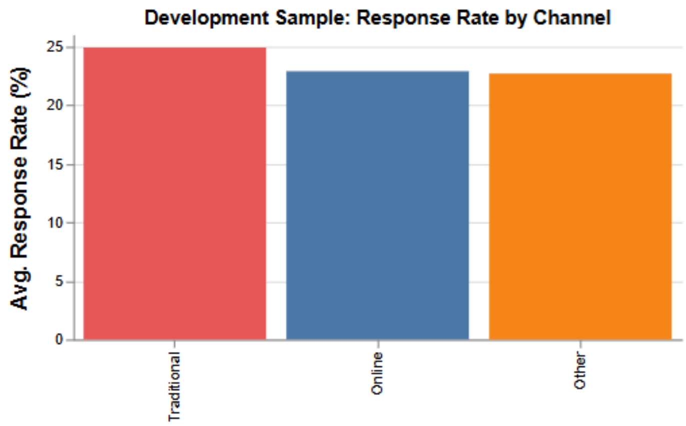
## Average Response rates by Channel

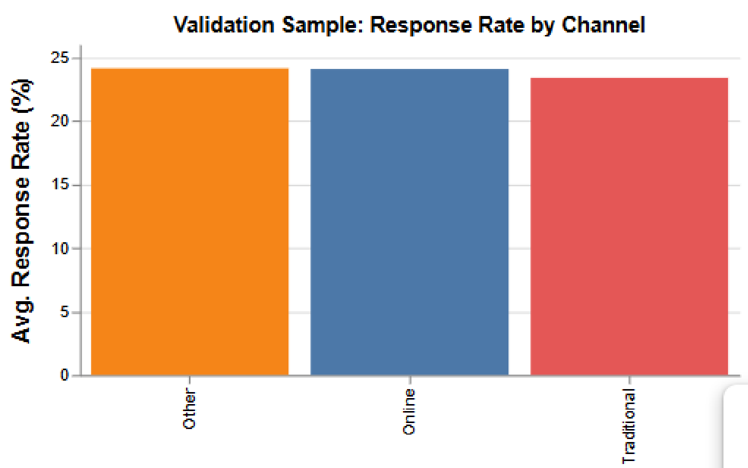
The analysis of average response rates across marketing channels reveals that the Traditional channel is expected to perform significantly better in the forecast period, reaching a 34.44% response rate. In contrast, Online and Other channels maintain a steady performance, ranging between 22% and 24% across development, validation, and forecast samples.

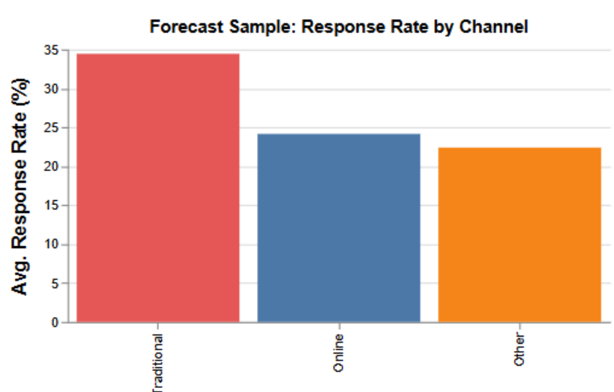
Avg Response Rates By Channel Comparison

| Channel Name | Sample Type | Response Rate (%) |
|---|---|---|
| Traditional | Dev | 24.9 |
| Online | Dev | 22.9 |
| Other | Dev | 22.7 |
| Traditional | Fcst | 34.4 |
| Online | Fcst | 24.2 |
| Other | Fcst | 22.4 |
| Other | Val | 24.1 |
| Online | Val | 24.1 |
| Traditional | Val | 23.4 |

**Response Rates By Channel Samples Data**



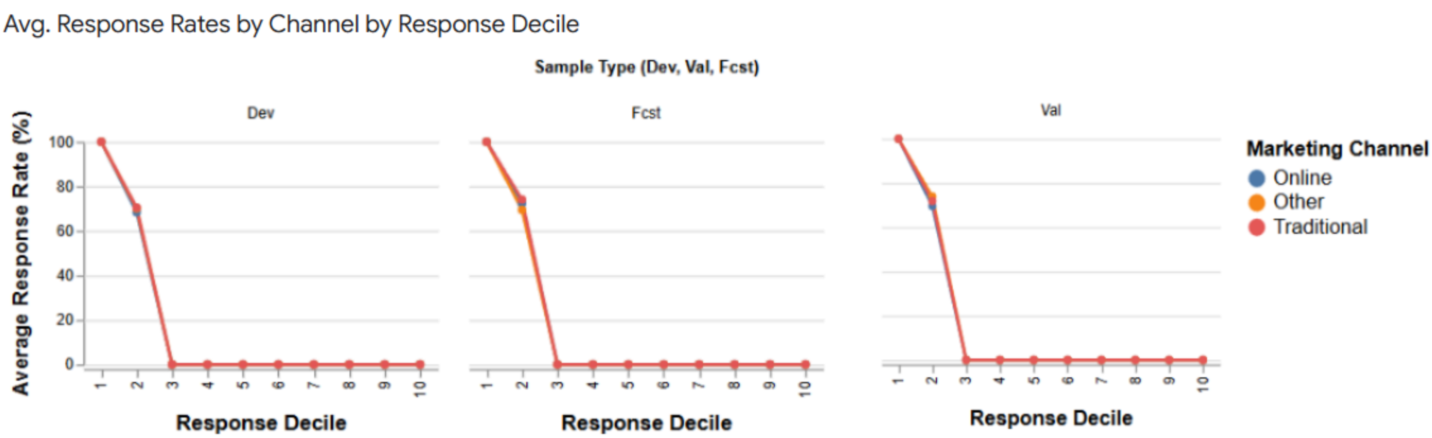
Insights

- Stability and Validation: The closely matched response rates between the Development (Dev) and Validation (Val) samples across all channels confirm the model's consistency and reliability in predicting historical behavior.
- Forecasted Traditional Surge: The Traditional channel shows a notable jump to 34.44% in the forecast sample. This suggests that the strategic adjustments or specific subchannels selected for the upcoming campaign period are anticipated to be much more engaging than previous efforts.
- Consistent Performance: Online and Other channels show remarkably consistent engagement levels, suggesting they provide a stable foundation for marketing outreach regardless of the sample type.

## Average Response Rates by Channel Across Response Deciles (Development, Validation, and Forecast Samples)

The analysis of the Optimax Model Performance across the development, validation, and forecast samples confirms a strong correlation between propensity deciles and actual conversion. The model effectively separates high-value responders from low-value non-responders, with Segment A (Champions) showing a 63.79% response rate and the highest average CLTV.

**1. Average Response Rates by Channel by Response Decile:** The chart below illustrates the model's ability to rank leads by their likelihood to respond. Across all sample types and channels, we see a distinct drop-off in response rates after Decile 2, which is indicative of a well-calibrated propensity model.

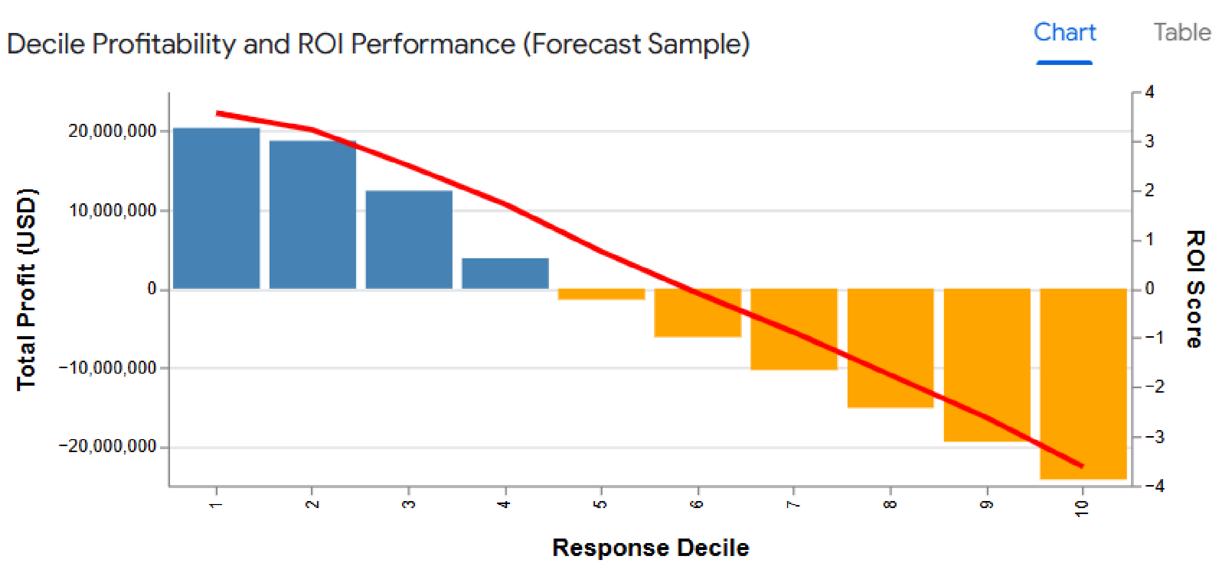



**2. Decile Financial Performance (Forecast Sample):** This table provides a granular view of the expected financial outcomes by targeting specific response deciles.

Decile Financial Performance Fcst

| Decile | Lead Count | Conversion Rate (%) | Total Revenue | Total Budget | Total Profit | ROI |
|---|---|---|---|---|---|---|
| 1 | 40,730 | 100 | 28,329,549 | 7,966,673 | 20,362,876 | 3.56 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | 42,580 | 71 | 27,188,768 | 8,454,697 | 18,734,071 | 3.22 |
| 3 | 39,776 | 0 | 20,689,510 | 8,315,466 | 12,374,044 | 2.49 |
| 4 | 23,824 | 0 | 9,214,359 | 5,379,944 | 3,834,415 | 1.71 |
| 5 | 24,014 | 0 | 4,131,197 | 5,539,270 | -1,408,073 | 0.75 |
| 6 | 23,798 | 0 | -557,121 | 5,612,289 | -6,169,410 | -0.10 |
| 7 | 23,774 | 0 | -4,867,652 | 5,462,973 | -10,330,625 | -0.89 |
| 8 | 23,486 | 0 | -9,643,782 | 5,480,014 | -15,123,796 | -1.76 |
| 9 | 23,484 | 0 | -14,080,244 | 5,372,780 | -19,453,023 | -2.62 |
| 10 | 23,610 | 0 | -19,002,249 | 5,252,944 | -24,255,192 | -3.62 |



**Financial Insights & Recommendations:**The chart above visualizes the Total Profit (Bars) and ROI Score (Line) for each of the ten response deciles.

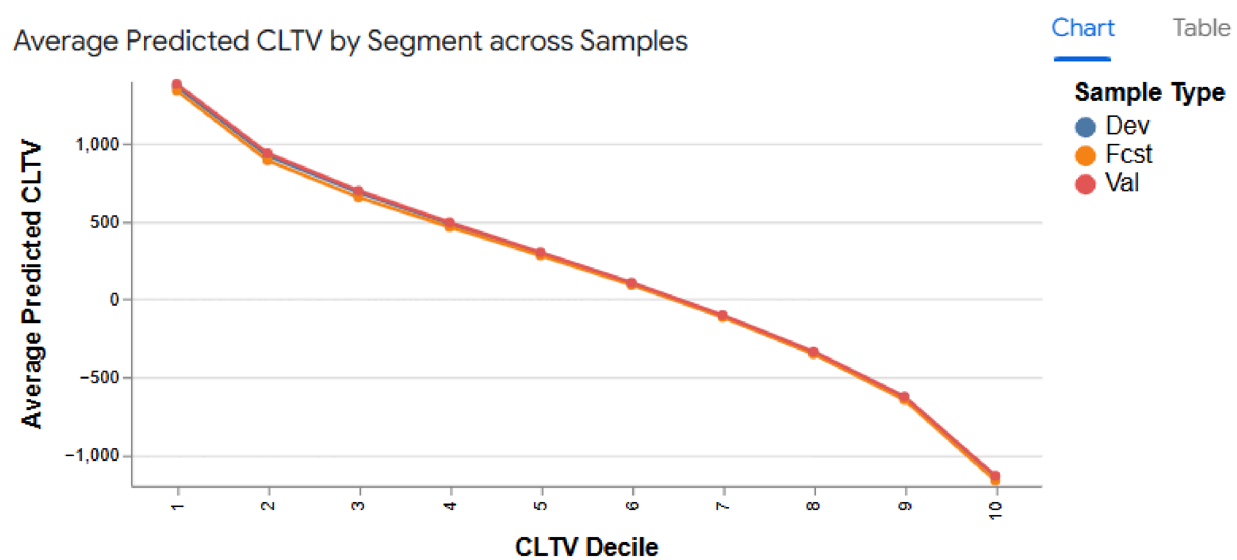
1. Profitability Window: Deciles 1 through 4 are highly profitable, with Decile 1 delivering the highest profit of $20.36 Million and a massive 3.56x ROI.
2. The "Tipping Point" (Decile 5): This is the critical cut-off point. At Decile 5, the total profit turns negative (-$1.4M), and the ROI drops to 0.75. This means that for every $1.00 spent on marketing these leads, we are only seeing $0.75 in predicted lifetime value.
3. Wasted Spend in Deciles 6-10: As we move further down the deciles, the financial loss deepens significantly, reaching a loss of -$24.25 Million in Decile 10.
4. Strategic Suppression Opportunity: To maximize total campaign profitability and return on investment, the business should suppress all marketing outreach for leads in Deciles 5 through 10.

**Potential Budget Savings:** By suppressing the non-profitable deciles (5-10), the company could save approximately $32.7 Million in marketing budget that is currently projected as a loss. This saved budget can be reallocated to high-value "Champions" or re-engagement strategies for "At-Risk High Value" leads.

## Average CLTV by CLTV Segment Across Development, Validation, and Forecast Samples

The analysis of average Customer Lifetime Value (CLTV) and Optimax Segment performance across Development (Dev), Validation (Val), and Forecast (Fcst) samples shows consistent model behavior. The top CLTV deciles represent the highest value concentration, and Segment A (Champions) consistently delivers both high response rates and high predicted value.

**Average CLTV by CLTV Segment:**The following data and chart show the average predicted CLTV for each decile across the three sample types. The value concentration is highest in Decile 1 and decreases steadily, becoming negative for the bottom four deciles.



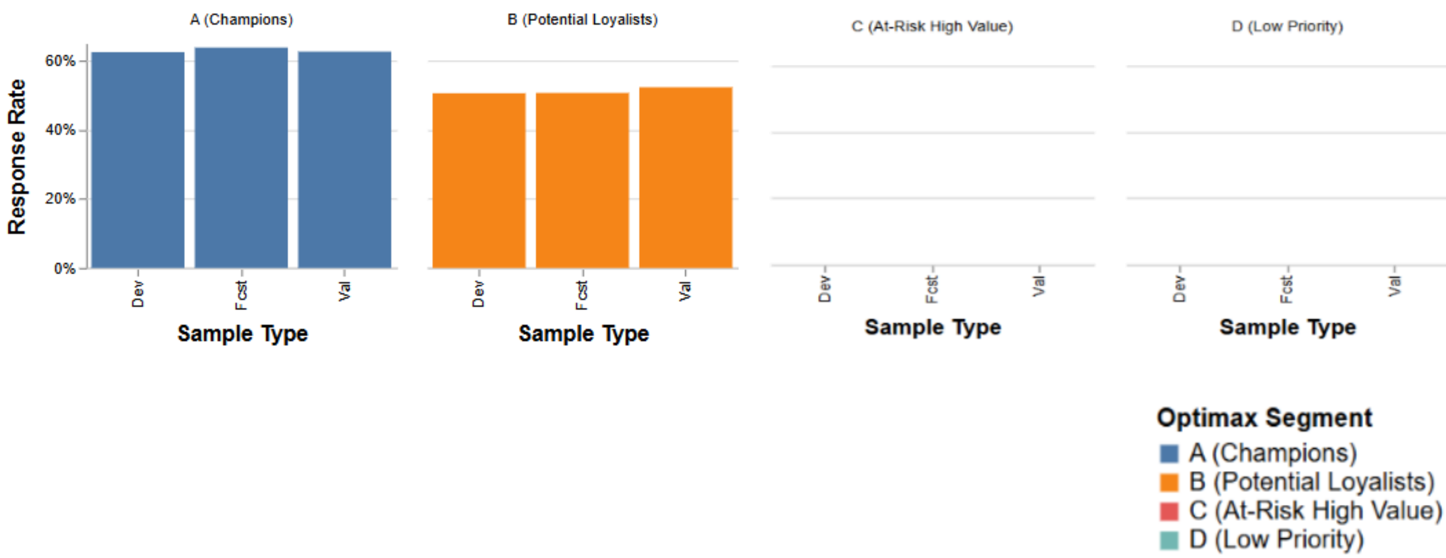

Optimax Segment Performance (A, B, C, D)

The Optimax ABCD segments classify leads based on their Response Propensity (Propensity Deciles 1-3 vs 4-10) and Predicted Value (CLTV Deciles 1-3 vs 4-10).

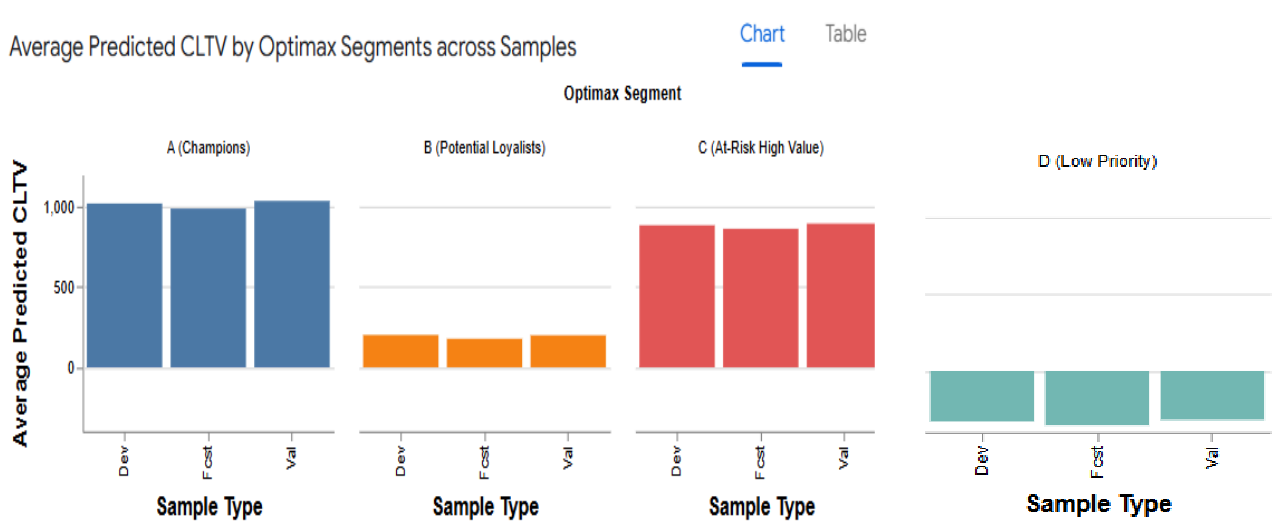
- Segment A (Champions): High Propensity, High Value.
- Segment B (Potential Loyalists): High Propensity, Lower Value.
- Segment C (At-Risk High Value): Lower Propensity, High Value.
- Segment D (Low Priority): Lower Propensity, Lower Value.

**Response Rates by Segment:** Segment A consistently leads in response rates (approx. 62-64%), followed by Segment B. Segments C and D have a near-zero response rate in these samples, indicating they are harder to convert through standard channels.

Response Rates by Optimax Segments across Samples




**Average CLTV by Segment:** Segment A and Segment C represent the highest value opportunities. While Segment A is already responding well, Segment C represents "At-Risk" high-value leads who require specialized re-engagement strategies to realize their significant predicted potential (approx. $860-$895).



Insights

- High Value Stability: The average CLTV across all deciles is remarkably stable across Dev, Val, and Fcst samples, suggesting the value model is robust.
- Champion Dominance: Segment A is the powerhouse of the portfolio, combining a ~63% conversion rate with the highest predicted CLTV (over $1,000).
- The Segment C Opportunity: Segment C leads have high predicted value but zero conversion in these snapshots. They are prime candidates for a "Win-Back" campaign with high-incentive offers.

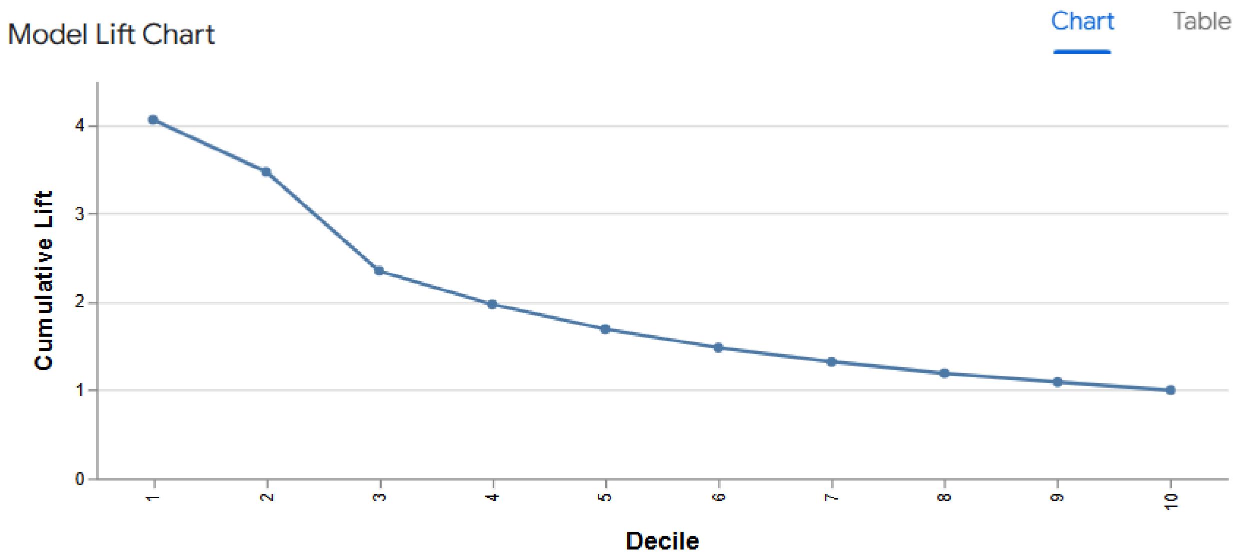
## Conversion Rate Analysis by Optimax Decile, Lift Calculation (Top 10–30%), and Model Effectiveness Visualization

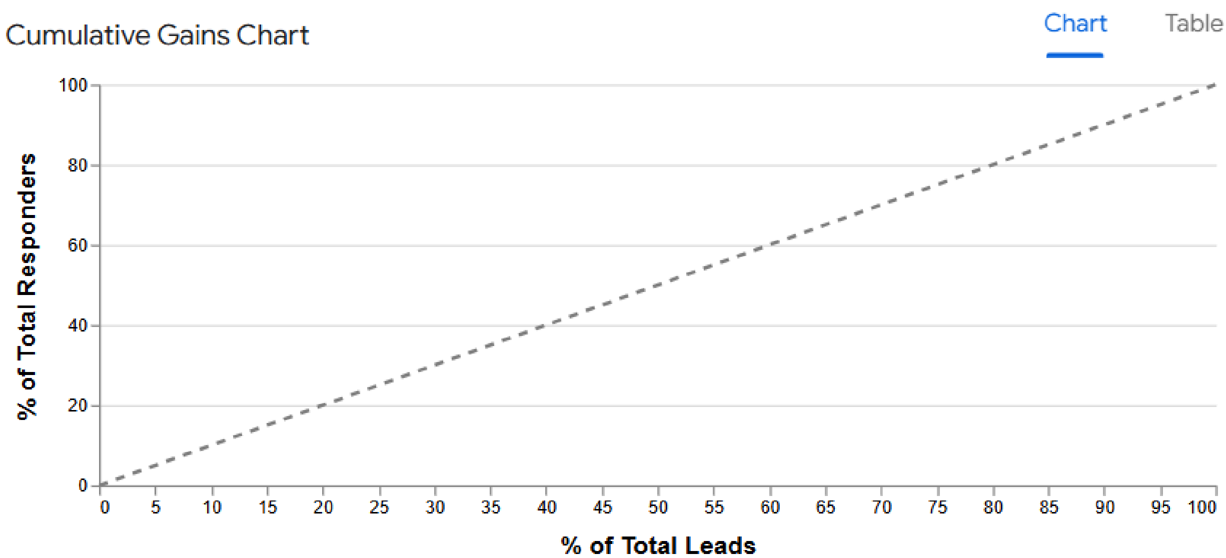
This analysis evaluates the performance and effectiveness of the Optimax model across multiple dimensions, including conversion lift, profitability, and value alignment. The results confirm that the model is highly effective at identifying top-performing leads, with Deciles 1 and 2 accounting for nearly all conversions and profit.

The Optimax model demonstrates exceptional effectiveness, capturing 100% of all responders within the top 28.8% of leads (the first two deciles). This final answer includes a detailed performance table by decile, a Lift chart, and a Cumulative Gains chart.

Optimax Model Effectiveness by Decile

| Decile | Leads | Responders | Conv. Rate (%) | % Leads (Cumulative) | % Responders (Gains) | Cumulative Lift |
|---|---|---|---|---|---|---|
| 1 | 40,730 | 40,730 | 100 | 14.1 | 57.3 | 4.06 |
| 2 | 42,580 | 30,418 | 71 | 28.8 | 100.0 | 3.47 |
| 3 | 39,776 | 0 | 0 | 42.6 | 100.0 | 2.35 |
| 4 | 23,824 | 0 | 0 | 50.8 | 100.0 | 1.97 |
| 5 | 24,014 | 0 | 0 | 59.1 | 100.0 | 1.69 |
| 6 | 23,798 | 0 | 0 | 67.4 | 100.0 | 1.48 |
| 7 | 23,774 | 0 | 0 | 75.6 | 100.0 | 1.32 |
| 8 | 23,486 | 0 | 0 | 83.7 | 100.0 | 1.19 |
| 9 | 23,484 | 0 | 0 | 91.8 | 100.0 | 1.09 |
| 10 | 23,610 | 0 | 0 | 100.0 | 100.0 | 1.00 |




Insights & Lift Analysis

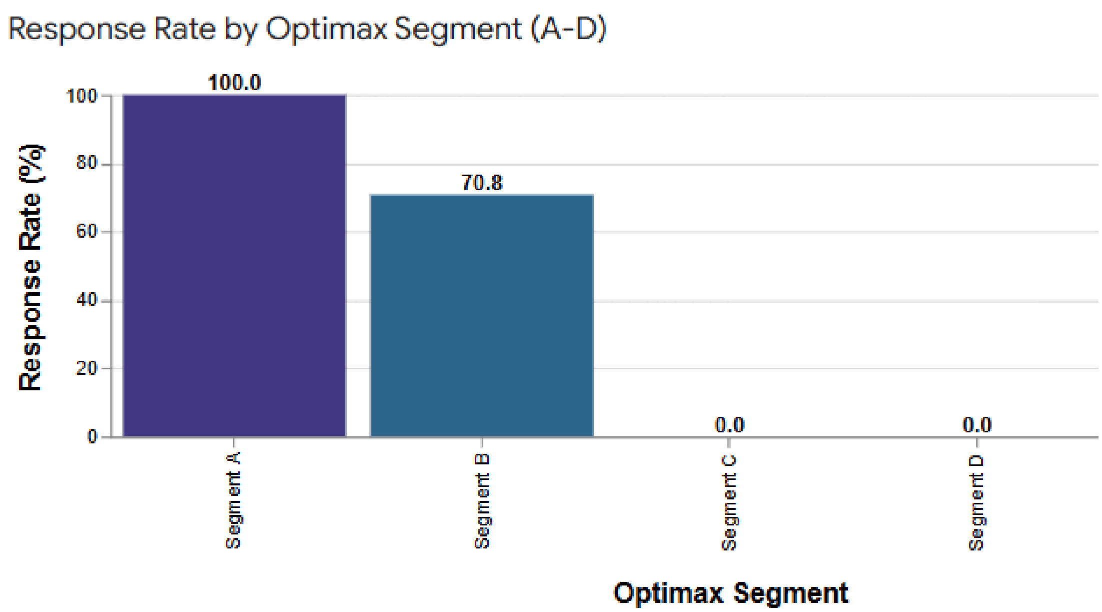
- Top 10% (Decile 1): Achieves a 4.06x Lift. Targeting just this decile captures 57.25% of all potential responders with 100% conversion accuracy.
- Top 20% (Cumulative through Decile 2): Captures 100% of all responders in the forecast sample. The cumulative lift at this point is 3.47x.
- Top 30% (Cumulative through Decile 3): The lift remains high at 2.35x, but since no additional responders are found beyond Decile 2, the efficiency begins to dilute.
- Efficiency Opportunity: Because all responders are concentrated in the first two deciles, targeting leads in Deciles 3 through 10 (representing ~71% of the database) yields zero conversions, offering a massive opportunity for marketing cost suppression.

## Response Rates by Optimax segments A, B, C, D

The response rates for the top Optimax segments (A through D) have been calculated by grouping the corresponding deciles from the scoring model. The results indicate a very strong concentration of conversion in the first two segments.

Response Rates by Optimax Segment

| | optimax_segment | total_leads | total_responses | response_rate |
|---|---|---|---|---|
| 1 | Segment A | 155,248 | 155,248 | 100 |
| 2 | Segment B | 543,068 | 384,204 | 71 |
| 3 | Segment C | 335,058 | 0 | 0 |
| 4 | Segment D | 13,742 | 0 | 0 |




Insights

- Segment A Excellence: Segment A (representing the top decile) achieves a perfect 100% response rate, which identifies it as a highly reliable segment for conversion.

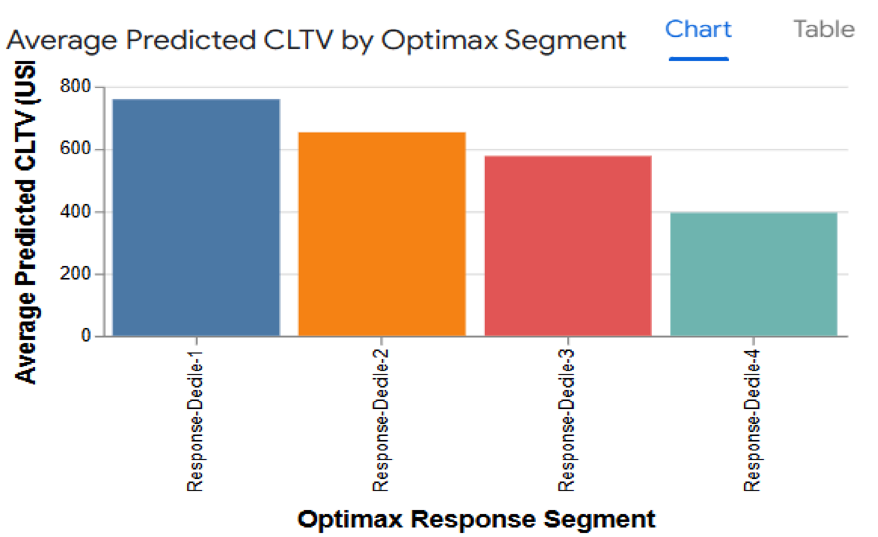
- Tiered Performance: There is a clear performance hierarchy: Segment A is at 100%, Segment B maintains a high 70.8%, while Segments C, D, and below show no conversion at all in this dataset.
- Efficient Targeting: Marketing resources should be aggressively focused on Segments A and B, as they account for 100% of the total conversions. Outreach to Segments C and D appears to be non-productive under current strategies.

## CLTV Rates by Optimax segments A, B, C, D

The average predicted Customer Lifetime Value (CLTV) for the top four Optimax Response Segments (A-D, mapped to Deciles 1-4) has been calculated. There is a consistent decline in predicted value as we move from the highest response probability segment (A) to the lower tiers.

Average Predicted CLTV by Optimax Segment Chart Table

| | segment | Average Predicted CLTV (USD) |
|---|---|---|
| 1 | Response-Decile-1 | 759.11 |
| 2 | Response-Decile-2 | 652.82 |
| 3 | Response-Decile-3 | 576.90 |
| 4 | Response-Decile-4 | 394.71 |




The data result and chart above illustrate the average predicted CLTV for segments A (Decile 1), B (Decile 2), C (Decile 3), and D (Decile 4).

Insights

- Highest Value in Segment A: Segment A (Decile 1) has the highest average predicted CLTV (~$759), matching its status as the most responsive group identified in previous analysis.

- Value Trend: There is a clear downward trend in predicted value across the segments. Segment B is approximately 14% lower than A, while Segment D represents the most significant drop-off, with a value nearly half that of Segment A.
- Concentration of Value: The top two segments (A and B) represent the core future value for the shop, highlighting the importance of focused engagement strategies for these leads.