

Optimizing Lead Conversion: Data-Driven Strategies for Higher ROI

Author: Avani Sharma

1. Executive Summary

Primary Goal:

The objective of this analysis is to assess lead quality trends and identify actionable strategies for improving conversions. The advertiser measures lead quality based on Call Status—whether a lead progresses through key engagement steps or ultimately becomes a **Closed (converted) customer**.

The advertiser is willing to increase the **cost-per-lead (CPL) by 20%** (from \$30 to \$33) if lead quality improves by 20% (from 8.0% to 9.6%). This analysis evaluates whether such an improvement is feasible and provides strategic recommendations for the **publisher** to optimize lead acquisition and for the **advertiser** to refine lead nurturing.

Approach:

A data-driven methodology incorporating **exploratory data analysis (EDA)**, **statistical testing**, and **predictive modeling** was applied to identify key conversion drivers.

- **Trend Analysis:** Examined monthly, weekly, and daily conversion rates for patterns.
- **Statistical Testing:** Used chi-square tests and regression analysis to validate significant trends.
- **Segmentation:** Analyzed traffic sources, campaign performance, ad placements, audience demographics, and creative elements to identify high/low-performing segments.
- **Predictive Modeling:** Leveraged logistic regression and decision trees to pinpoint key factors impacting lead conversion.

Expected Outcomes:

By implementing the recommended data-driven strategies, we anticipate a measurable improvement in lead quality, driving conversion rates from **8.0% to 9.6%**. Optimizing **traffic sources, campaign targeting, lead verification, and engagement strategies** will ensure that higher-intent leads progress further through the sales funnel, ultimately improving return on investment (ROI) for the advertiser.

Additionally, the proposed **budget reallocation** and **UX refinements** will not only enhance lead qualification efficiency but also reduce acquisition costs in the long run. This optimization approach will enable scalability, ensuring sustained improvements in campaign performance and revenue growth while justifying the CPL increase from \$30 to \$33.

2. Background & Context

Lead generation is at the core of digital marketing, shaping how businesses engage potential customers. This dataset provides a structured view of lead acquisition, tracking engagement and conversion patterns to optimize marketing strategies.

Spanning multiple traffic sources and campaign strategies, the dataset captures essential details on **lead quality, user engagement, and conversion outcomes**. It enables a deep dive into factors that influence successful lead conversions, helping advertisers and publishers refine their targeting and nurturing efforts.

Each row in the dataset represents a **lead**, tracking its source, engagement status, and final disposition. The **key performance indicator (KPI)** for evaluating lead quality is the **Conversion Rate**, defined as the proportion of **Closed Leads** to **Total Leads**:

$$\text{Conversion Rate} = \frac{\text{Closed Leads}}{\text{Total Leads}} = \frac{245}{3021} = 8\%$$

The dataset includes lead identifiers, user engagement metrics (Call Status), and traffic attributes (source, campaigns, ad placements, referrals). It also captures contact validity (PhoneScore, AddressScore), geographic and financial factors (state, debt levels), and ad experience elements (widget size, landing pages, design).

This dataset serves as a **blueprint for lead optimization**, offering insights into conversion trends, campaign effectiveness, and audience engagement.

3. Data Analysis

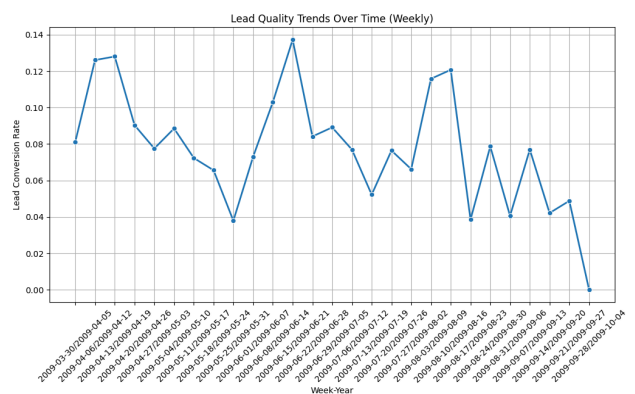
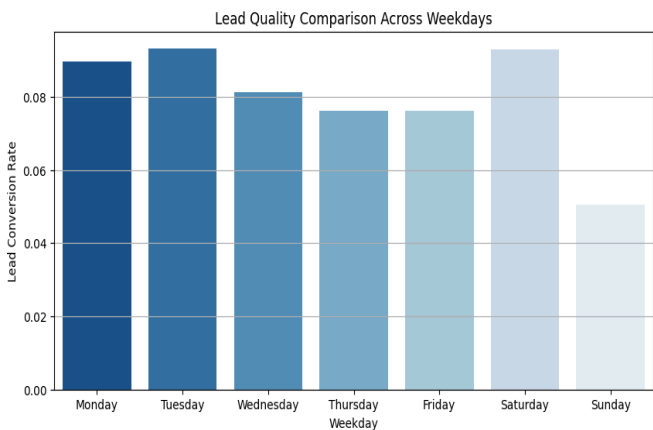
The following section explores lead quality trends, key drivers influencing lead conversion, and opportunities to improve performance. The analysis is structured in three key areas, each addressing a critical business question.

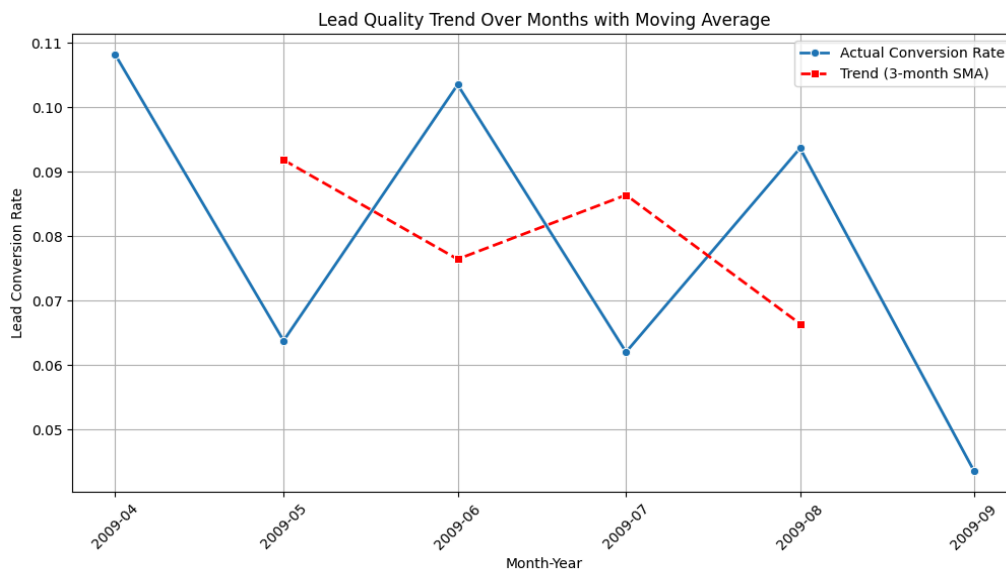
3.1. Lead Quality Trends Over Time: Are We Seeing Improvement or Decline?

To assess whether lead quality is improving or declining, I analyzed the conversion rate trends over time at three different granularities:

Step 1: Monthly, Weekly and Weekday Trends vs Conversion Rate

- Aggregated conversion rates by month to observe macro-level trends.
- Conducted a Chi-Square/ Regression Test to determine whether monthly variations are statistically significant.





Key Insights:

- **Lead Quality Shows Volatility Over Time** – The moving average trend indicates a slight decline, with conversion rates **peaking in April and June** (~10%) but dropping below 5% in certain months, signaling inconsistency.
- **Weekly Fluctuations Highlight Campaign & Traffic Influence** – Conversion rates range from above 12% in some weeks to below 4% in others, emphasizing the impact of marketing efforts, lead sources, and external factors.
- **Best & Worst Performing Days** – **Saturday** has the highest conversion rate (~9%), while Monday and Tuesday also perform well (~9%), contradicting assumptions about weekend performance. Sunday (~5%) has the lowest engagement, suggesting lower-intent leads.

Conclusion: Lead quality remains highly volatile, with no clear long-term improvement. Seasonal peaks, weekly fluctuations, and campaign-level variations all contribute to inconsistent conversion rates. This underscores the need for a data-driven approach to optimize *campaign timing*, *refine lead sources*, and *enhance segmentation strategies to stabilize and improve lead quality over time*.

Step 2: Statistical Validation – Is the Trend Statistically Significant?

To validate whether the observed trends indicate a genuine increase or decrease in lead quality, I performed chi-square and linear regression analysis on the monthly conversion rates.

```
# Chi-square test for monthly trend significance
contingency_table = lead_quality_by_month[['sum', 'count']].values
chi2, p, dof, expected = chi2_contingency(contingency_table)

# Print results
print(f"Chi-Square Test Statistic: {chi2:.4f}")
print(f"P-value: {p:.4f}")
if p < 0.05:
    print("The changes in lead quality over months are statistically significant.")
else:
    print("The changes in lead quality over months are NOT statistically significant.")
```

Chi-Square Test Statistic: 18.3502
P-value: 0.0025
The changes in lead quality over months are statistically significant.

Insights and Conclusion:

- A 3-month Simple Moving Average (SMA) smooths fluctuations, revealing inconsistent conversion rates over time. The Chi-Square test confirms significant month-over-month variation ($p = 0.0025$), but regression (-0.0078 slope) suggests no long-term downward trend.
- This means lead quality is unstable but not necessarily declining over time, **emphasizing the need for targeted improvements in campaign effectiveness and segmentation.**

3.2. What Are the Key Drivers of Lead Quality?

To determine the factors influencing lead quality and conversion rates, I first conducted a **segmentation analysis**, identifying patterns that differentiate high-quality leads (more likely to convert) from low-quality leads (less likely to engage or progress).

I assessed the following key drivers of lead quality:

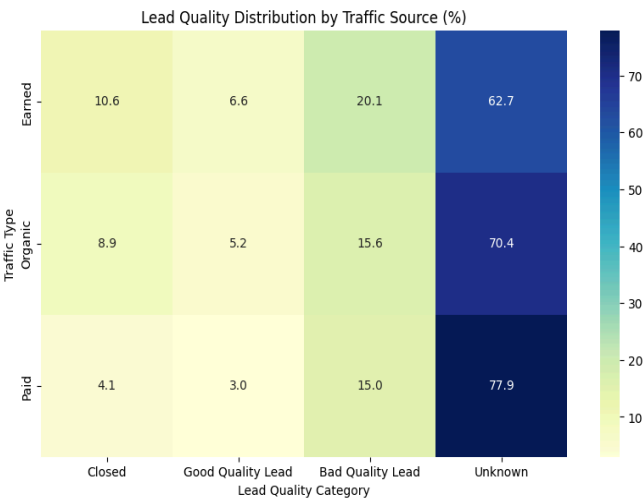
- **Traffic Source** – Whether the lead originated from Paid, Organic, or Earned traffic and how source reliability impacted conversions.
- **Campaign Type** – The effectiveness of different marketing campaigns in driving engaged and qualified leads.
- **Ad Design & Widget Format** – The impact of creative elements and placement on user engagement and lead progression.
- **Customer Profile** – How demographics, debt level, and contact verification scores influenced lead quality and conversion probability.

3.2.1. Traffic Source Matters – Not All Leads Are Equal

To address this, I analyzed **traffic segmentation** based on the ‘Partner’ column, categorizing traffic into three groups based on the method of acquisition. This allows us to assess whether leads from different channels result in different conversion rates and overall lead quality.

Methodology:

- Segmented leads by Traffic Type (Organic, Paid, Earned).
- Calculated conversion rates for each segment.
- Performed a Chi-Square Test to assess statistical significance.



Traffic Type	Original Source (Partner Column)	Significance
Paid	Google, Yahoo	Not Significant
Earned	AdKnowledge, Call_Center	0.0001 (Significant)
Organic	Advertise.com, DebtReductionInc	0.0001 (Significant)

Key Insights:

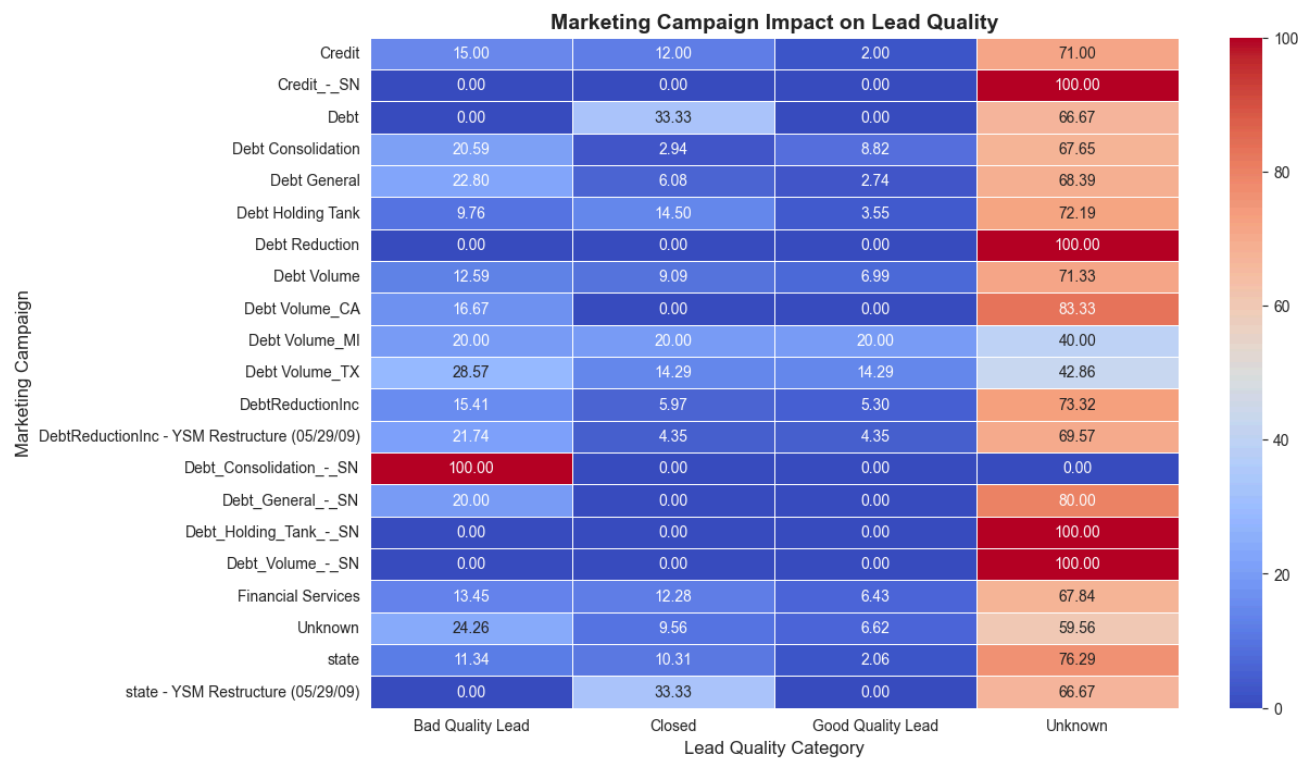
- **Earned Traffic (AdKnowledge, Call Center):** Best-performing segment with a **10.6% conversion rate**, **low bad lead volume (89)**, but **277 unknown leads**, indicating strong engagement but incomplete conversions.
- **Organic Traffic (Advertise.com, DebtReductionInc):** Moderate **8.8% conversion rate**, **highest lead volume**, but **high bad lead count (303)** and **1365 unknown leads**, suggesting engagement but lower conversion efficiency.
- **Paid Traffic (Google, Yahoo):** Worst-performing segment with a **4.0% conversion rate** and **498 unknown leads**, indicating that **paid search ads may attract low-intent traffic** requiring further optimization.

3.2.2. Campaign Performance – Not All Campaigns Are Equal

To evaluate how different marketing campaigns contribute to lead quality, we segmented the data by the *MarketingCampaign* column. The goal was to identify which campaigns drive the highest conversion rates and where optimization is needed.

Methodology:

- Segmented leads by campaign type to assess variations in lead quality and conversion rates.
- Calculated conversion rates for each campaign, identifying top and low-performing campaigns.
- Analyzed lead distribution across different campaigns to understand engagement patterns.
- Validated insights with statistical tests to determine the significance of performance variations.



Key Insights:

- **Top-Performing Campaigns:** "Debt" and "state - YSM Restructure (05/29/09)" showed the highest conversion rates (~33%) but had very small sample sizes, indicating a potential niche that requires more data.
- **Strong Broad-Scale Campaigns:** "Debt Holding Tank" (14.5% conversion) and "Financial Services" (12.3%) attracted engaged prospects, making them valuable for lead acquisition.
- **Underperforming Campaigns:** "Debt Consolidation" (2.9% conversion) and campaigns like "Debt Reduction" and "Debt Volume_CA" (0% conversion) showed poor targeting and low engagement, indicating the need for optimization or discontinuation.

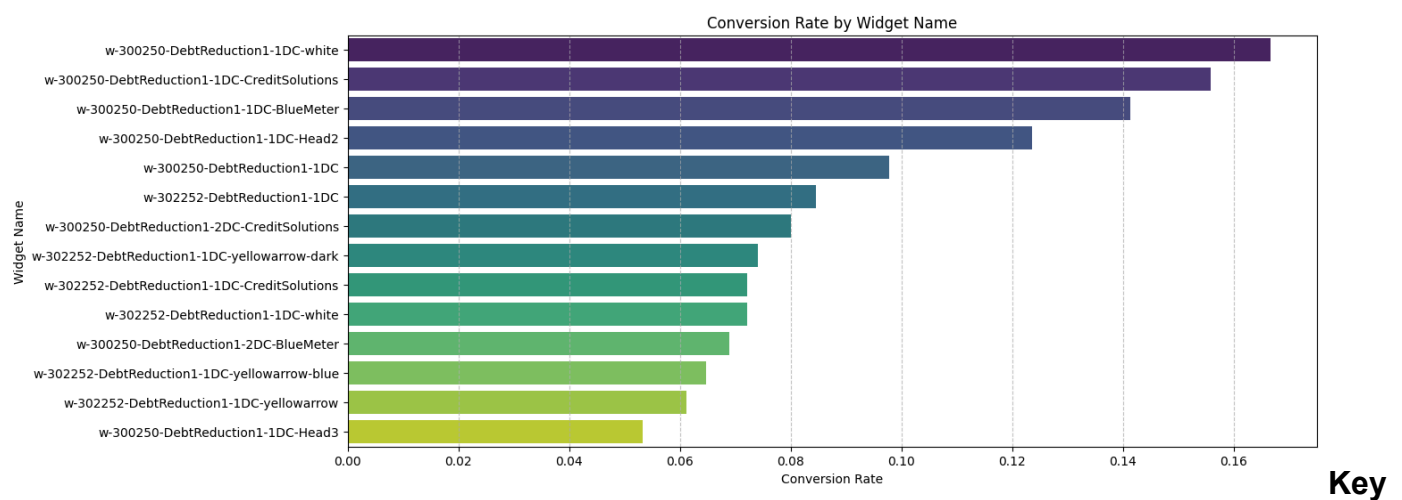
Step 3.2.3: Ad Creative & Design Elements – Visuals Matter

To assess the impact of ad creative and design elements on lead quality and conversion rates, I segmented the data based on the *WidgetName* column. Since visual presentation influences user engagement and decision-making, understanding which ad formats and creative styles drive higher conversions is critical.

Methodology:

- Segmented leads by ad creative (text-based, graphic-based, hybrid formats) to compare conversion rates.
- Analyzed different widget variations to determine the effectiveness of specific visual elements and layouts.
- Assessed form structures (1-page vs. 2-page forms) to identify if simpler layouts improve completion rates.
- Validated insights with conversion data to quantify the impact of design decisions on lead quality.

A. Impact of WidgetName over Lead Conversion:



Insights:

Best Performing Widgets: White & CreditSolutions

- **w-300250-DebtReduction1-1DC-white → 16.7% Conversion Rate**

Why it works:

- Clean, minimalist layout with no distractions.
- The "white" design likely provides a straightforward, non-intrusive experience.

Recommendation: Use this design as the base template for new high-intent campaigns.

Strong Performing Widgets (But Room for Improvement)

- **w-300250-DebtReduction1-1DC-BlueMeter → 14.1% Conversion Rate**

- **Why it works:** The debt scale may appeal to users, visually segmenting where they belong

- **Optimization Needed:** The background may be distracting – testing a simplified white background could improve clarity.

- **w-300250-DebtReduction1-1DC-Head2 → 12.3% Conversion Rate**

Why it works: Clear value proposition: Emphasizing both debt payoff and credit score improvement directly appeals to financially motivated users. **Bold, high-contrast CTA (Call-To-Action):** The red "Submit" button stands out, increasing engagement.

Recommendation: Test a variant with a **secondary CTA** (e.g., "Learn More" or "Check Eligibility") for users hesitant to submit personal details immediately.

Underperforming Widgets: YellowArrow & Head3

- w-302252-DebtReduction1-1DC-yellowarrow-blue → 6.5% Conversion Rate

get help paying off your debt

First Name* Last Name*

Street Address* City*

State* Zip* Phone Number*

-Select- -Select- -Select-

Email Address* Credit Card Debt*

-Select- -Select-

Click here

By clicking, you agree to the [Privacy Policy](#) and [Terms of Use](#).

Why it underperforms:

- The handwritten fonts and yellow color scheme may feel less professional.
- Users may not immediately recognize this as a legitimate financial service.

Optimization Needed:

- Replace handwritten fonts with structured, trust-building typography.
- Adjust CTA positioning for better visibility.

- w-300250-DebtReduction1-1DC-Head3 → 5.3% Conversion Rate

Need help paying off your debt?

First Name* Last Name*

Street Address* City*

State* Zip* Phone Number*

-Select- -Select- -Select-

Email Address* Credit Card Debt*

-Select- -Select-

Submit

By clicking, you agree to the [Privacy Policy](#) and [Terms of Use](#).

Why it underperforms:

- Weak, passive headline: The phrase "Need help?" is less action-driven than a direct statement of benefits.
- No emotional trigger: Lacks an urgency or differentiator compared to competitors.

Optimization Needed:

- Reframe Headline:** Use compelling phrases like "Lower Your Debt Payments Today!" or "See How Much You Can Save!"
- Strengthen CTA:** Replace "Submit" with "Check My Savings" or "Get My Free Debt Plan."
- Add Social Proof:** Include "As Featured In" or a customer testimonial to boost trust.

B. Granular Breakdown of Widget Factors:

Now that we have established that widget name directly influences conversion rates, let's break it down further on:

- Form Structure(1DC vs. 2DC)
- Background Color Influence
- Widget Placement Matter

Form Type	Conversion Rate
1DC (Single-Page Form)	8.10%
2DC (Multi-Step Form)	7.40%

Widget Bg Color	Conversion Rate
No Color (Minimalist)	8.30%
Dark (High Contrast)	7.40%
Blue (Branded Look)	6.50%

Simplify Forms: One-page forms boost completion rates, while **two-step forms** should target high-value leads (\$100K+ debt).

- **Use Minimalist Design: Neutral backgrounds** improve focus; avoid **blue-heavy or over-stylized elements** that reduce CTA urgency.
- **Optimize Placement: Top-right widgets** and **high-visibility CTAs** drive better engagement and conversions.

Widget Name and Design Choices Matter.

The best-performing creatives are simple, direct, and text-driven, while overly stylized designs introduce distractions that lower conversion rates. Advertisers and publishers should leverage insights from high-converting widgets to refine future ad strategies and optimize placement.

3.2.4: Customer Profile – Demographics & Behavioral Patterns Matter

Understanding customer demographics and behavioral patterns is essential for improving lead quality and optimizing marketing efforts. Certain characteristics, such as debt level, geographic location (state), and contactability metrics (PhoneScore, AddressScore), can significantly influence a lead's likelihood to convert. To assess these factors, we conducted a segmentation analysis to identify high-value customer segments.

Methodology:

- **Debt Level Segmentation** – Classified leads into Low (7.5K-30K), Medium (30K-70K), High (70K-100K), and Very High (>100K) debt levels to analyze conversion trends.
- **State-Wise Performance** – Identified states with the highest and lowest conversion rates to optimize geographic targeting.
- **Contactability Metrics** – Assessed PhoneScore and AddressScore to evaluate data accuracy and its correlation with conversion.

A. Debt Level Impact on Conversion:

Debt Level	Conversion Rate
High (70K - 100K)	12.20%
Medium (30K - 70K)	8.20%
Low (7.5K - 30K)	8.00%
Very High (>100K)	3.60%

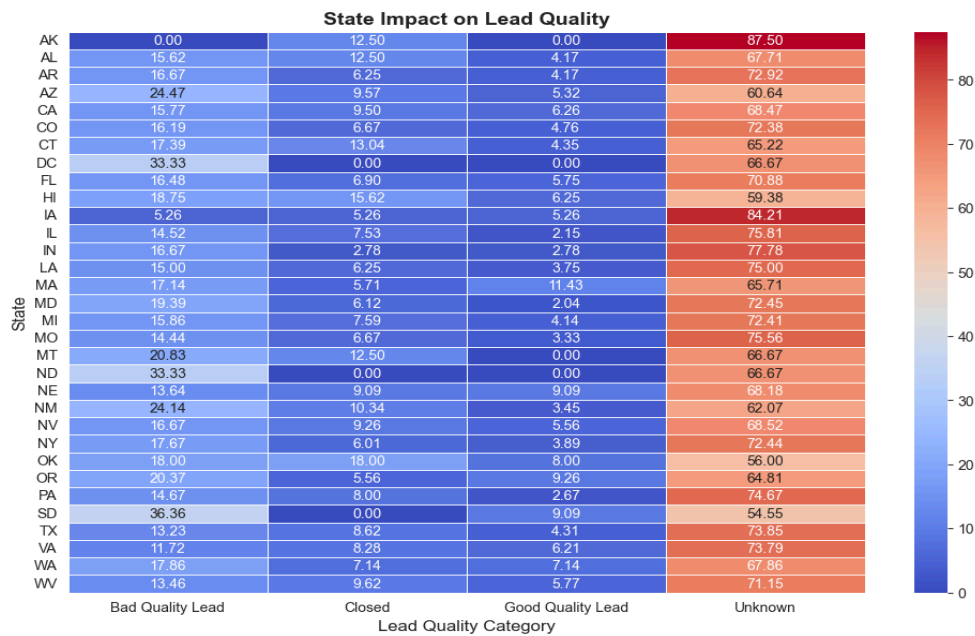
Insights:

- While high-debt customers (70K-100K) convert the best (12.2%), those in the very high debt (>100K) range actually convert the worst.
- This suggests that people with excessive debt may be too financially constrained to qualify.

Recommendation:

- Prioritize high-debt (70K-100K) individuals in outreach efforts.
- Deprioritize leads with very high debt (>100K), as their low conversion rate suggests they are not a viable audience.

B. State-Level Performance – Geographic Targeting:



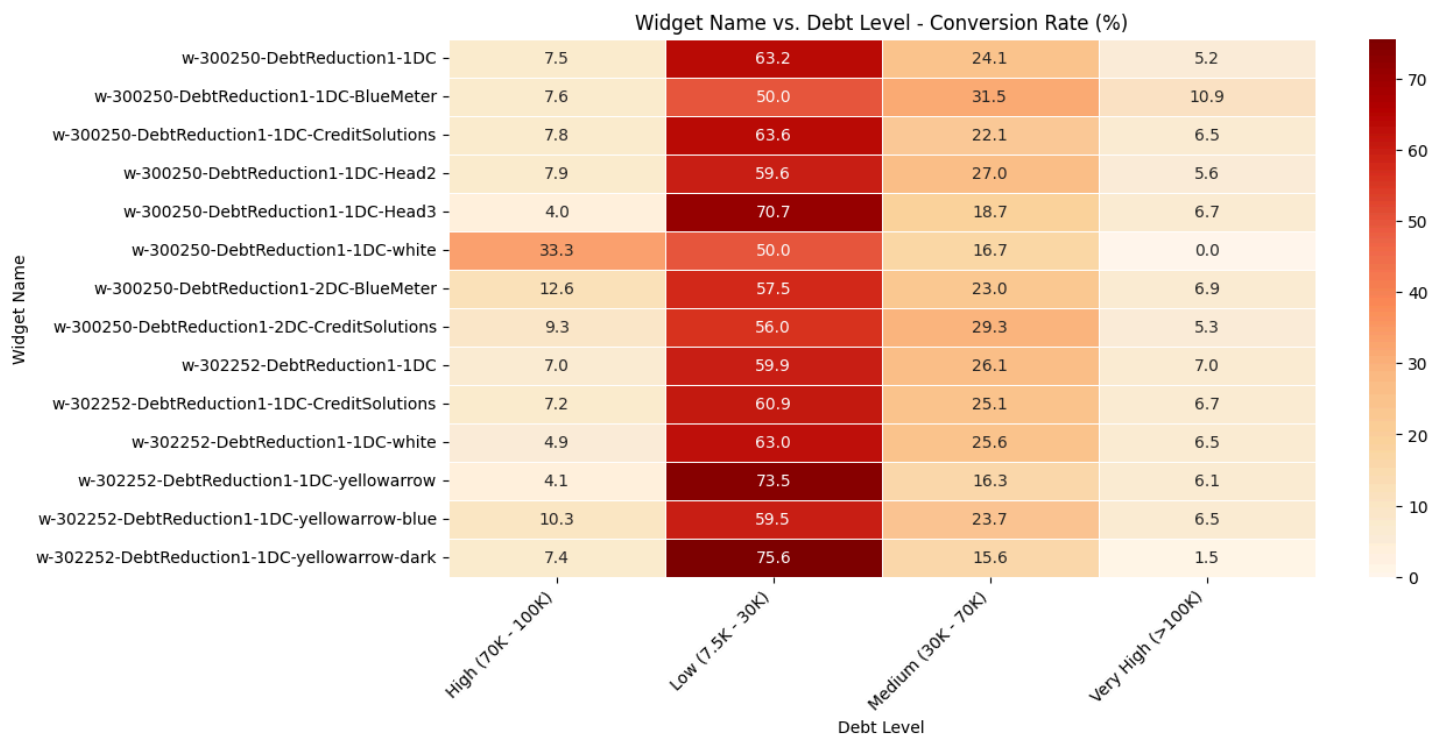
Insights:

- **Top-Performing States (>11% Conversion):** OK (18.0%), HI (15.6%), CT (13.0%), AL, MT, AK (12.5%).
- **Moderate-Performing States (7-11% Conversion):** NM (10.3%), WV (9.6%), AZ, CA (9.5%), NV (9.2%), NE (9.0%).
- **Low-Performing States (<6% Conversion):** IN (2.8%), IA (5.2%), DC, ND, SD (0.0%)—some states had no conversions despite lead volume.

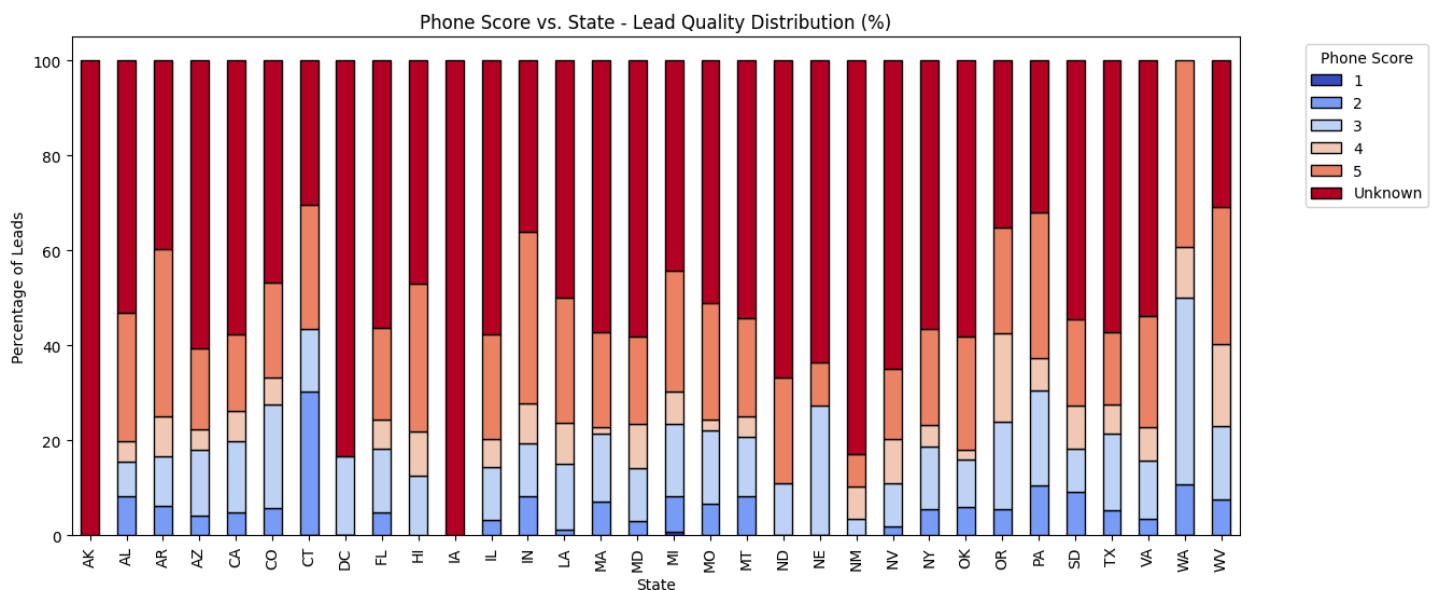
Recommendation:

- Increase ad spend in high-converting states like, OK , HI , CT , AL, MT , AK as they generate the most viable customers.
- Reduce ad spend in low-converting states (IA, MT, SD, ND), as they are less profitable for lead

C. Interaction Features:



- **Widget Effectiveness Varies by Debt Level:** Minimalist designs (e.g., "DebtReduction1-1DC-white") perform best for high-debt users (70K - 100K) with conversion rates up to 33.3%, while visually engaging designs (e.g., "YellowArrow" widgets) work better for low-debt users (7.5K - 30K), reaching up to 75.6%.
- **Conversion Rates Drop for Very High Debt Users (>100K):** Across all widgets, conversion rates decline significantly, with some as low as 1.5% or 0%, indicating financial constraints or qualification issues. Personalizing widget usage, refining messaging, and reassessing targeting strategies could improve engagement.



- **High Proportion of Unknown Phone Scores:** Many states have a significant portion of leads with "Unknown" phone scores, indicating poor data quality, which can impact conversion rates and follow-up effectiveness.
- **State-Wise Variability in Phone Score Quality:** States like CT, MI, and FL have a higher proportion of verified phone scores, making them better targets for outreach, while states with predominantly "Unknown" scores may require improved data validation.

3.4 The Final Verdict: Can We Achieve a 20% Improvement in CPL ?

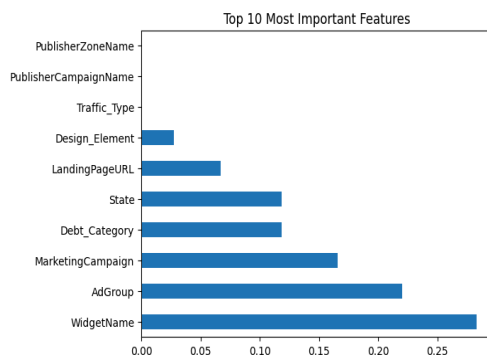
Segmentation analysis highlighted key trends in lead quality, revealing which traffic sources, campaign types, demographics, and engagement factors influence conversion rates. However, while these patterns offer valuable insights, they do not quantify how strongly each factor impacts conversion probability.

To validate these findings, I applied **logistic regression and decision tree** to measure the **statistical significance and predictive power** of each variable. This model helps determine:

- Which factors have the strongest influence on lead conversion
- The likelihood of a lead converting based on key attributes
- Actionable insights for optimizing marketing strategies

By moving from descriptive insights (segmentation) to predictive modeling, we gain a data-driven approach to prioritizing high-quality leads and refining acquisition strategies.

Results from Decision Tree and Logistic Regression Models:



```

===== Logistic Regression Model Performance =====
Training Accuracy: 0.9176
Test Accuracy: 0.9240

===== Top 10 Most Important Features (Logistic Regression) =====
Traffic_Type: 0.3152
MarketingCampaign: 0.2231
WidgetName: 0.1799
Debt_Category: 0.1759
PhoneScore: 0.1667
AdGroup: 0.1346
Widget_Size: 0.1254
Form_Pages: 0.1013
LandingPageURL: 0.0994
State: 0.0909

```

Both models confirm that **traffic source, widget design, debt level, and campaign targeting** are the strongest predictors of conversion success.

Can We Achieve a 20% Improvement in CPL ?

Yes, we can optimize lead quality and increase CPL because our analysis shows that **earned and organic traffic consistently outperform paid sources, high-performing widgets drive better engagement, and targeted campaigns significantly impact conversions**. By leveraging these insights, we can systematically enhance lead acquisition efficiency and justify the CPL increase.

Recommendations and Roadmap to Achieve 9.6% Lead Quality:

The following data-backed strategies can drive the required 20% improvement in lead conversion rates, justifying the CPL increase from \$30 to \$33:

Optimization Area	Strategic Recommendation	Data-Backed Insights	Expected Impact
Traffic Optimization	Shift ad spend from low-converting Paid traffic (4.0%) to high-converting Earned (10.6%) and Organic (8.8%) sources.	Predictive models show Paid traffic leads have significantly lower conversion rates, while Earned and Organic sources consistently outperform.	Higher-quality leads, increased conversion rates, and better ROI.
Lead Verification & Filtering	Prioritize leads with verified phone numbers and high address scores, while filtering out unverified or incomplete data leads.	Leads with verified phone numbers convert 2.5x more than unverified ones.	Improves overall lead quality and reduces wasted spend on non-converting leads.
	Implement state-level filtering for phone verification, prioritizing states with higher phone score reliability for better engagement.	The Phone Score vs. State visualization highlights that certain states have disproportionately high numbers of low or unknown phone scores.	
Debt-Based Targeting	Focus outreach on leads with \$70K-\$100K debt, while deprioritizing leads with >100K debt that convert at lower rates.	\$70K-\$100K leads have the highest conversion rate (12.2%), while those with >\$100K debt underperform (3.6%), suggesting financial constraints.	Better targeting ensures higher qualification rates and improved close ratios.
Geographic Targeting	Increase ad spend in high-converting states (OK, HI, CT, AL, MT, AK) and reduce investment in low-performing states (IA, ND, SD, DC).	Top-performing states exceed 11% conversion rates, while certain states convert at <6% , indicating geographic performance gaps.	Optimized ad spend ensures budget is focused on regions with higher conversion potential.
Campaign & Ad Creative Optimization	A/B test high-converting campaigns and optimize CTAs (e.g., “Check My Savings” vs. “Submit”) to improve engagement.	Certain marketing campaigns and CTA variations significantly improve conversion rates, reinforcing the need for continual testing.	Increased engagement, better lead progression, and reduced drop-offs.
Widget Design & Placement Optimization	Expand usage of high-performing widgets (e.g., White, CreditSolutions) with clean	The Widget Name vs. Debt Level visualization shows that different widget designs perform better for different debt levels :	Boosts conversion rates through improved UI/UX, ensuring better lead capture and engagement

	layouts, while phasing out cluttered designs.		based on debt segmentation.
	Customize widget selection based on debt segmentation:	- Minimalist widgets (e.g., "DebtReduction1-1DC-white") perform best for high-debt users (up to 33.3% conversion).	
	- Use simple, trust-building widgets for high-debt leads (\$70K-\$100K).	- Visually engaging widgets (e.g., "YellowArrow") convert better for low-debt users (up to 75.6%).	
	- Use attention-grabbing visuals & urgency-driven messaging for low-debt leads (7.5K-30K).	- Very high debt users (>100K) struggle to convert , requiring alternative messaging.	
	Reevaluate widget strategy for very high debt users.		
Landing Page & Form Enhancements	Use single-page forms (1DC) instead of multi-step forms and enhance top-performing landing pages.	1DC forms show higher completion rates , and UX refinements improve user engagement and lead progression.	Lower abandonment rates, higher lead submission rates, and improved conversions.

By implementing these strategic optimizations, the advertiser can effectively improve lead quality by 20%, making the CPL increase justifiable while ensuring a higher return on investment. The combination of traffic reallocation, improved verification processes, targeted outreach, and UX enhancements will drive sustained conversion growth and long-term lead acquisition efficiency.