

# STRATEGIC AD-SPEND OPTIMIZATION FOR SKYLINE DESIGN

Enhancing Digital Spending through Data-Driven Insights

**MGT 599: Analysis of Business Capstone**

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DePaul University | Spring 2024

# INTRODUCTION

## Project Description



### OVERVIEW

This project focuses on enhancing Skyline Design's digital advertising strategies through data-driven insights and advanced analytics.



### OBJECTIVE

To optimize ad spend, improve engagement, and increase conversion rates. Specifically, we have worked on increasing the number of clicks by optimizing the ad spend.

## Importance of the Project

### CONTEXT



In the competitive architectural glass market, effective digital advertising is crucial for engaging key customer demographics and maximizing ROI.

### CHALLENGE

Despite significant investments, current strategies have not effectively targeted or engaged key audiences, leading to suboptimal performance.

# PROBLEM STATEMENT

## Current Situation

Skyline Design is **facing challenges** with its **digital advertising strategies**. Despite significant investments, the current **ad campaigns** have **not effectively reached or engaged** key customer demographics.

## Main Issue

The **inefficient allocation of advertising resources** has led to **suboptimal engagement rates** and **high customer acquisition costs**.

## Key Points

### I. Inefficient Allocation of Advertising Resources:

- Budget allocation is suboptimal, leading to inefficiencies.
- Targeting of high-potential customer segments is inadequate.

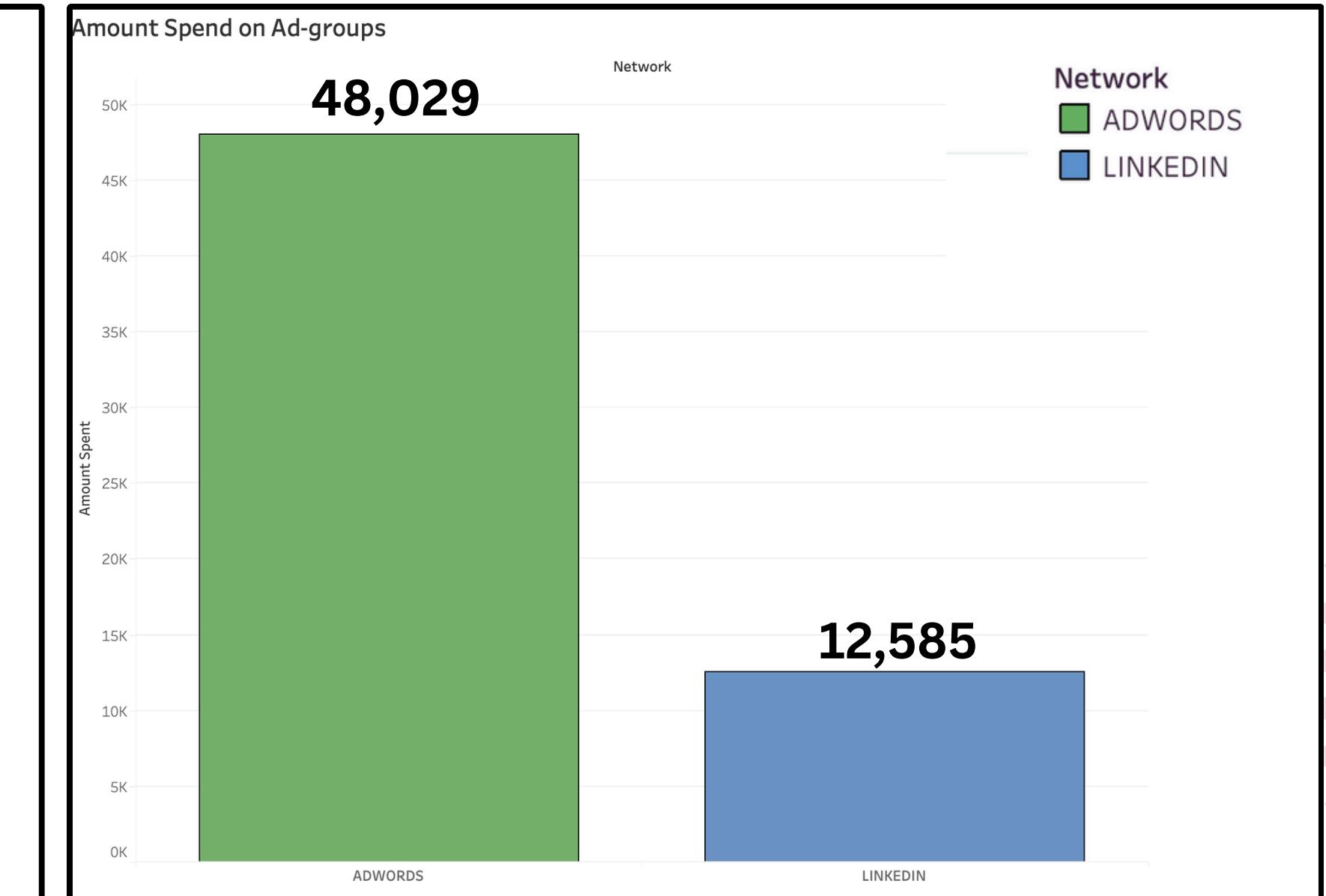
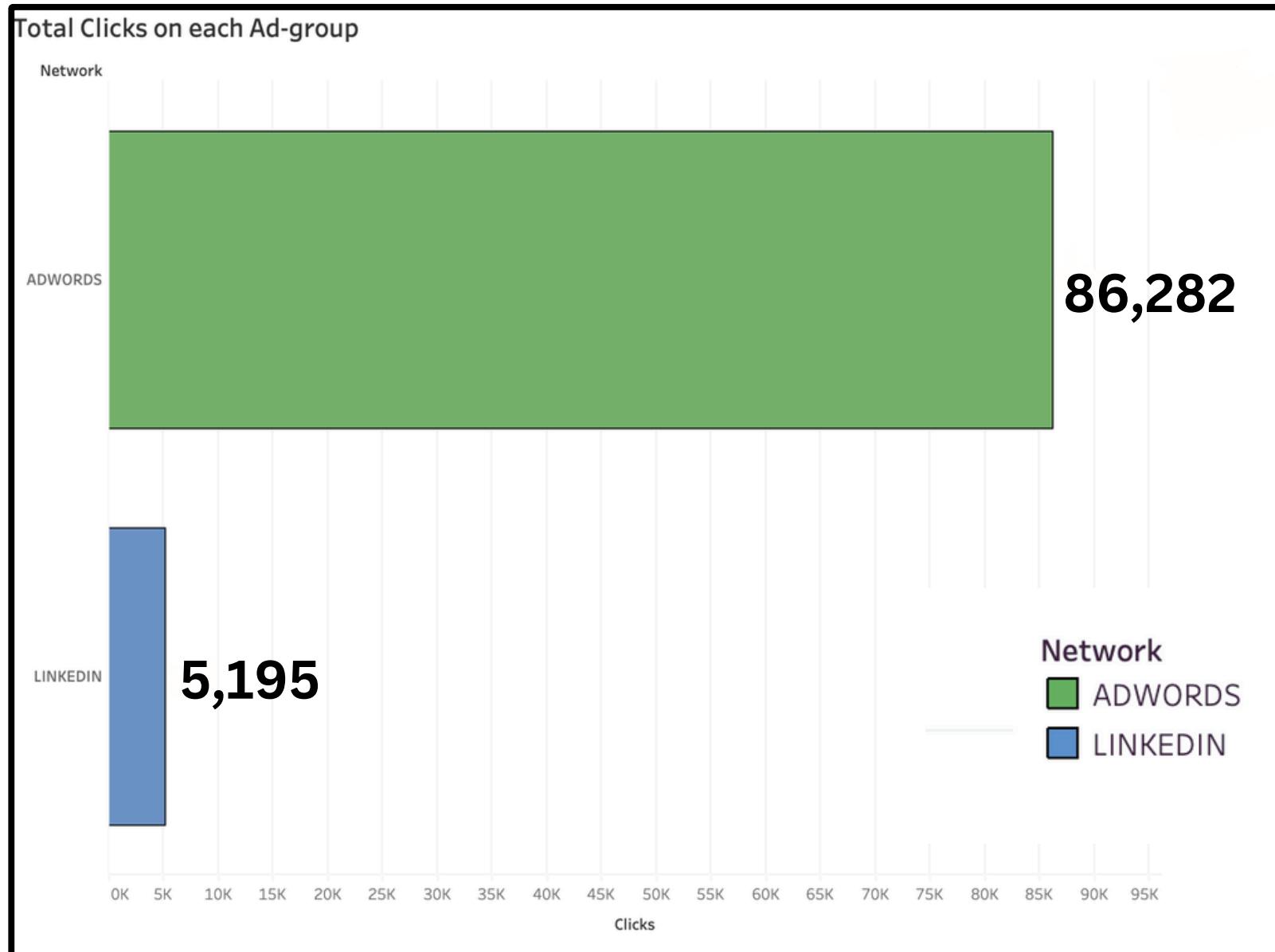
### 2. Low Engagement Rates:

- Campaigns exhibit low click-through and conversion rates.
- Advertisements fail to sufficiently engage or resonate with the target audience.

### 3. High Customer Acquisition Costs:

- Inefficient resource allocation and low engagement result in high acquisition costs, diminishing overall ROI.

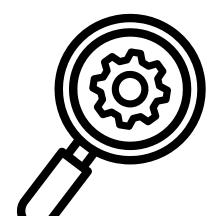
# ANALYSIS OF CURRENT AD-GROUPS



 Total Clicks:  
AdWords: **86,282**  
LinkedIn: **5,195**

Cost per Click (CPC):  
AdWords: **Approx. \$0.56/click**  
LinkedIn: **Approx. \$2.42/click**

Spending Analysis:  
AdWords Spend: **\$48,029**  
LinkedIn Spend: **\$12,585**



# ANALYSIS OF CURRENT AD-GROUPS

## Contrast in Conversion Outcomes for AdWords and LinkedIn Campaigns

### Impressions Distribution

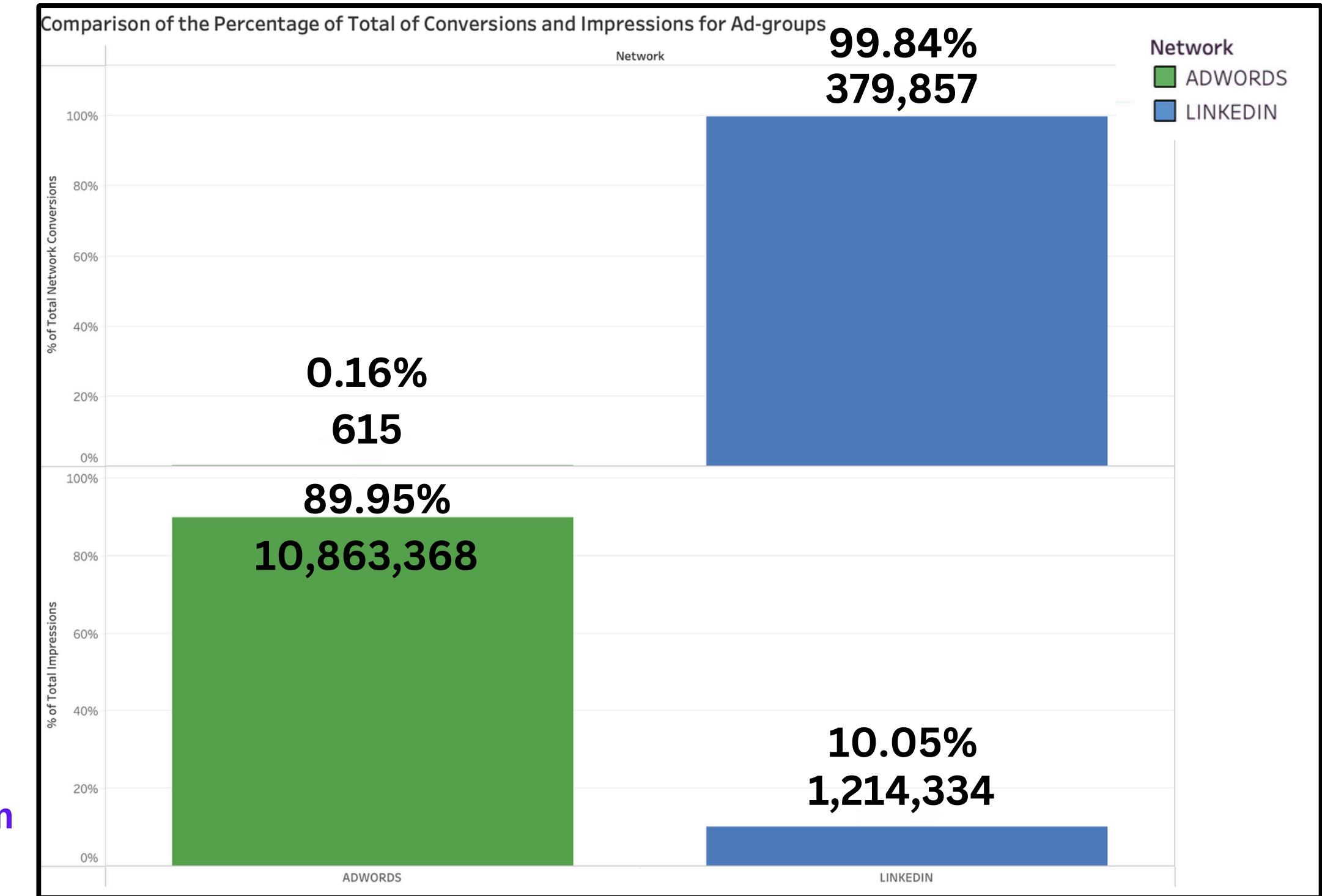
- AdWords: **10.86 million impressions**, **89.95% of total.**
- LinkedIn: **1.21 million impressions**, **10.05% of total.**

### Conversions Distribution

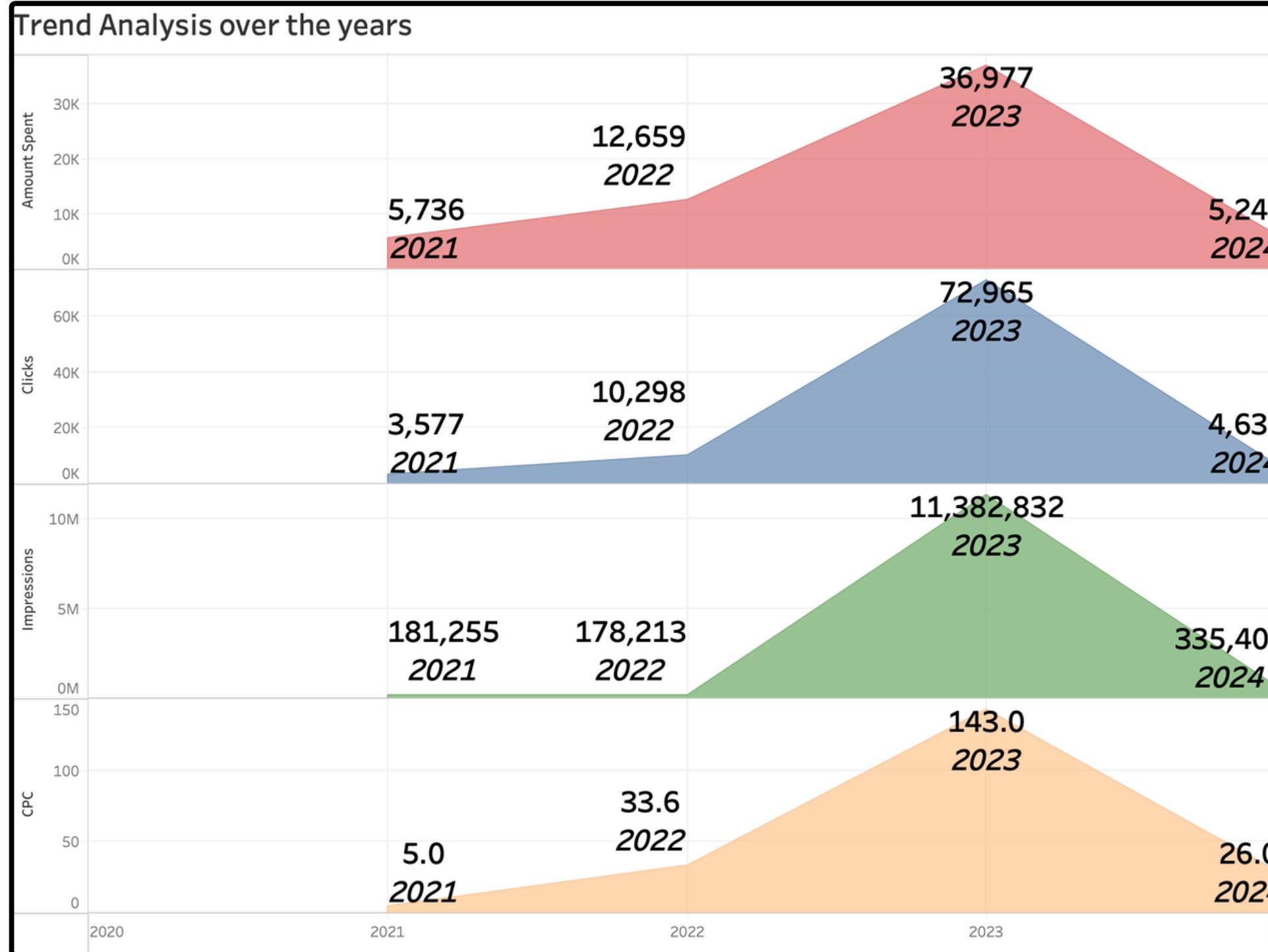
- LinkedIn: Exceptional at **379,857 conversions**, **99.84% of total.**
- AdWords: Only **615 conversions**, **0.16% of total.**

### Strategies for Improvement

- Refine AdWords: **Enhance targeting precision.**
- Experiment: **Initiate A/B testing on AdWords.**
- Invest More in LinkedIn: **Redirect budget towards LinkedIn.**
- Leverage LinkedIn Tactics: **Apply effective LinkedIn strategies to AdWords.**



# ANALYSIS OF CURRENT AD-CAMPAIGNS



- SPENDING CHANGES:** Reached nearly **\$37K** in **2023**, sharp drop to **5.2k** by **mid-2024**
- CLICK TRENDS:** Peaked at **72.9K** in **2023**, reduced to **4.6K** by **mid-2024**
- IMPRESSIONS PEAK:** **11.38M** in **2023**, sharp drop to **335.4k** by **mid-2024**
- CPC VARIATIONS:** Increased from **\$5.0** in **2021** to **\$143.0** in **2023**; decreased to **\$26.0** by **mid-2024**

# ANALYSIS OF CURRENT AD-CAMPAIGNS

## TOP PERFORMING CAMPAIGNS:

### I. Glassboards Traffic:

- High Expenditure with valuable engagement
- Amount Spent: \$28,278
- Total Clicks: 15,242

### 2. Pilot | Search | Glass:

- Cost-efficient with effective engagement
- Amount Spent: \$5,969
- Total Clicks: 4,317

## UNDERPERFORMING CAMPAIGNS:

### I. LCG Smart Glass Campaign:

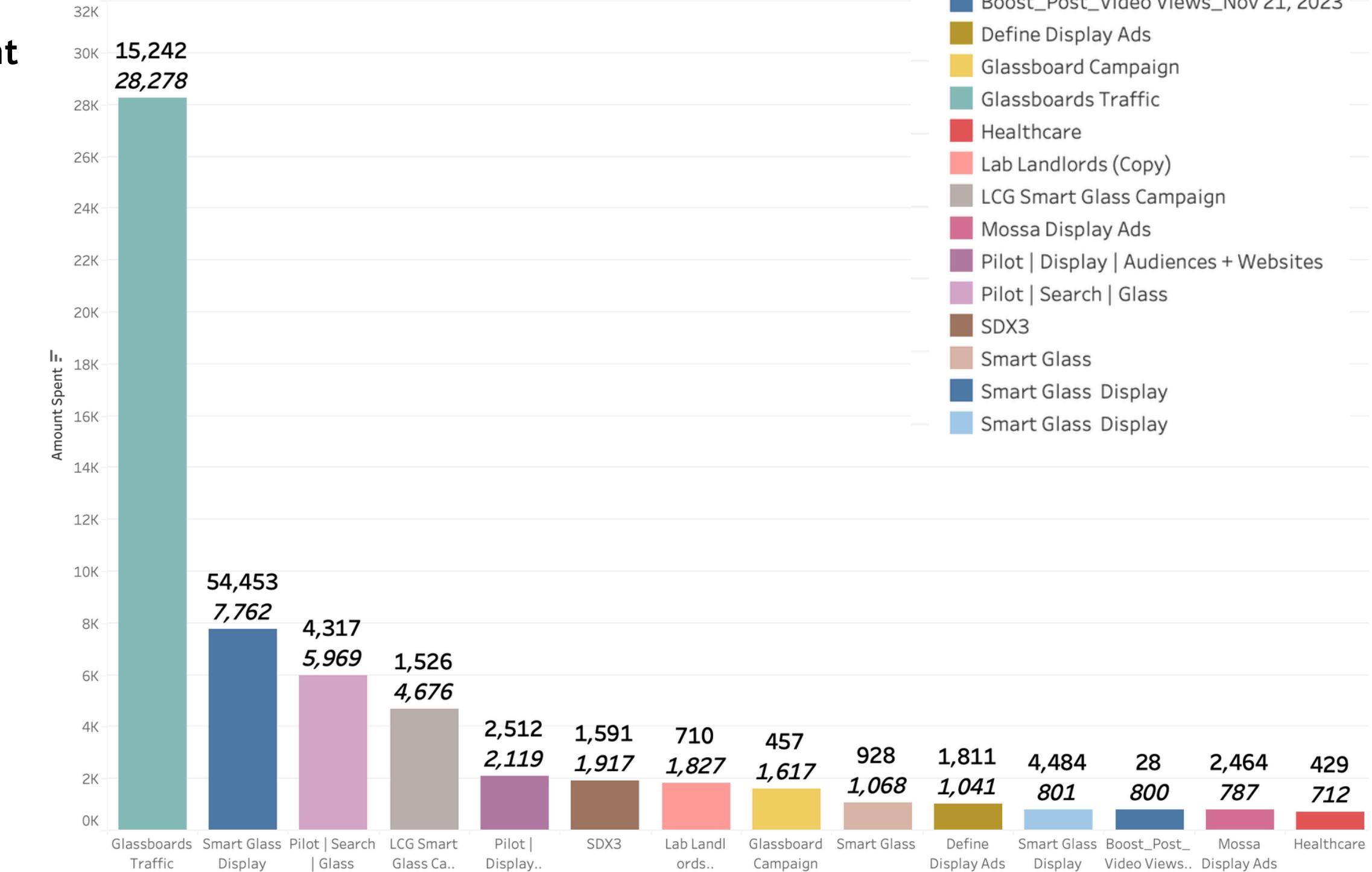
- Lower clicks despite significant spending
- Amount Spent: \$4,676
- Total Clicks: 1,526

### 2. Smart Glass Display:

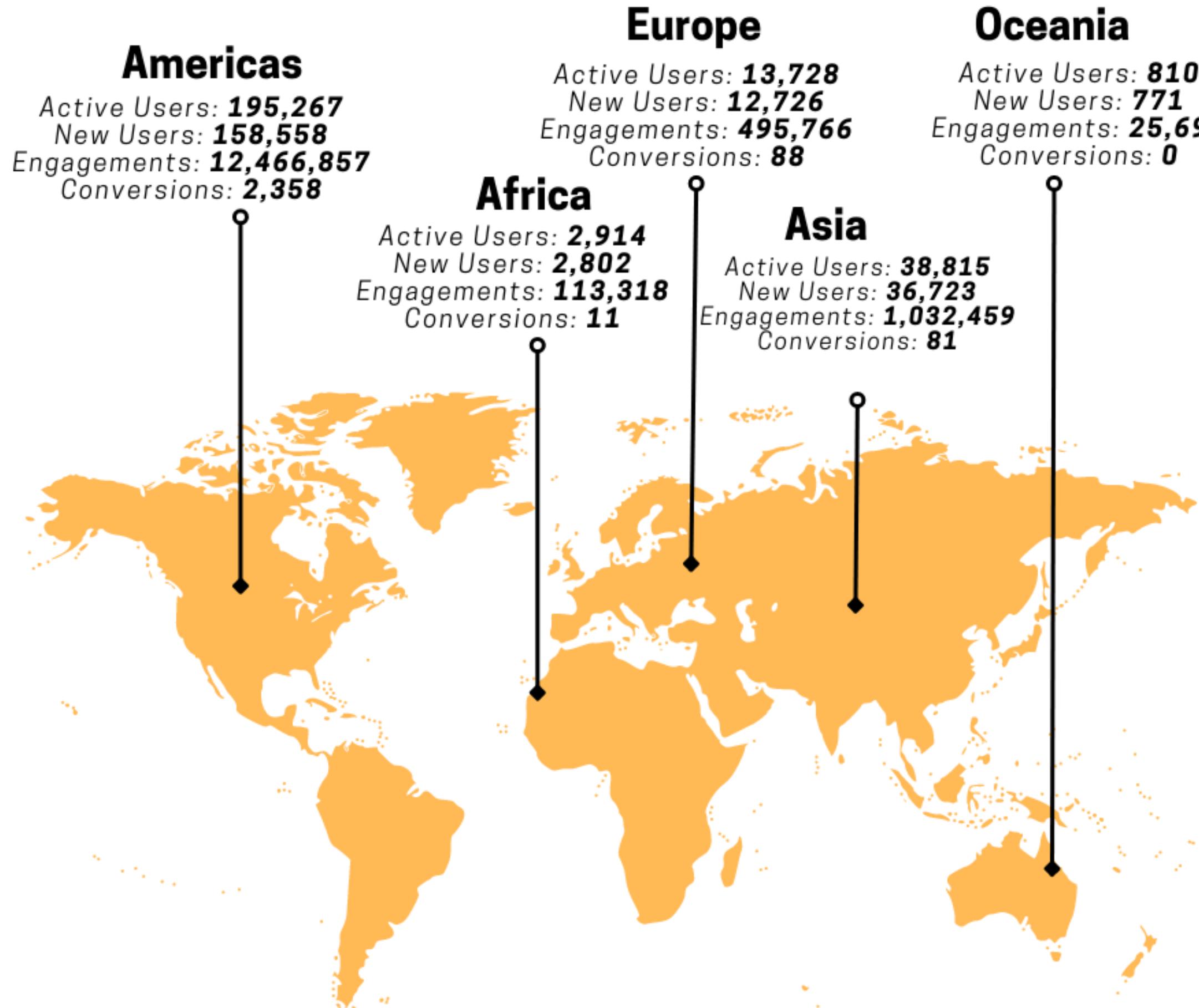
- High cost with low efficiency in ad spend
- Amount Spent: \$7,762
- Total Clicks: 54,453

Total Amount Spend on each Campaign over the years

Top 14 Campaign



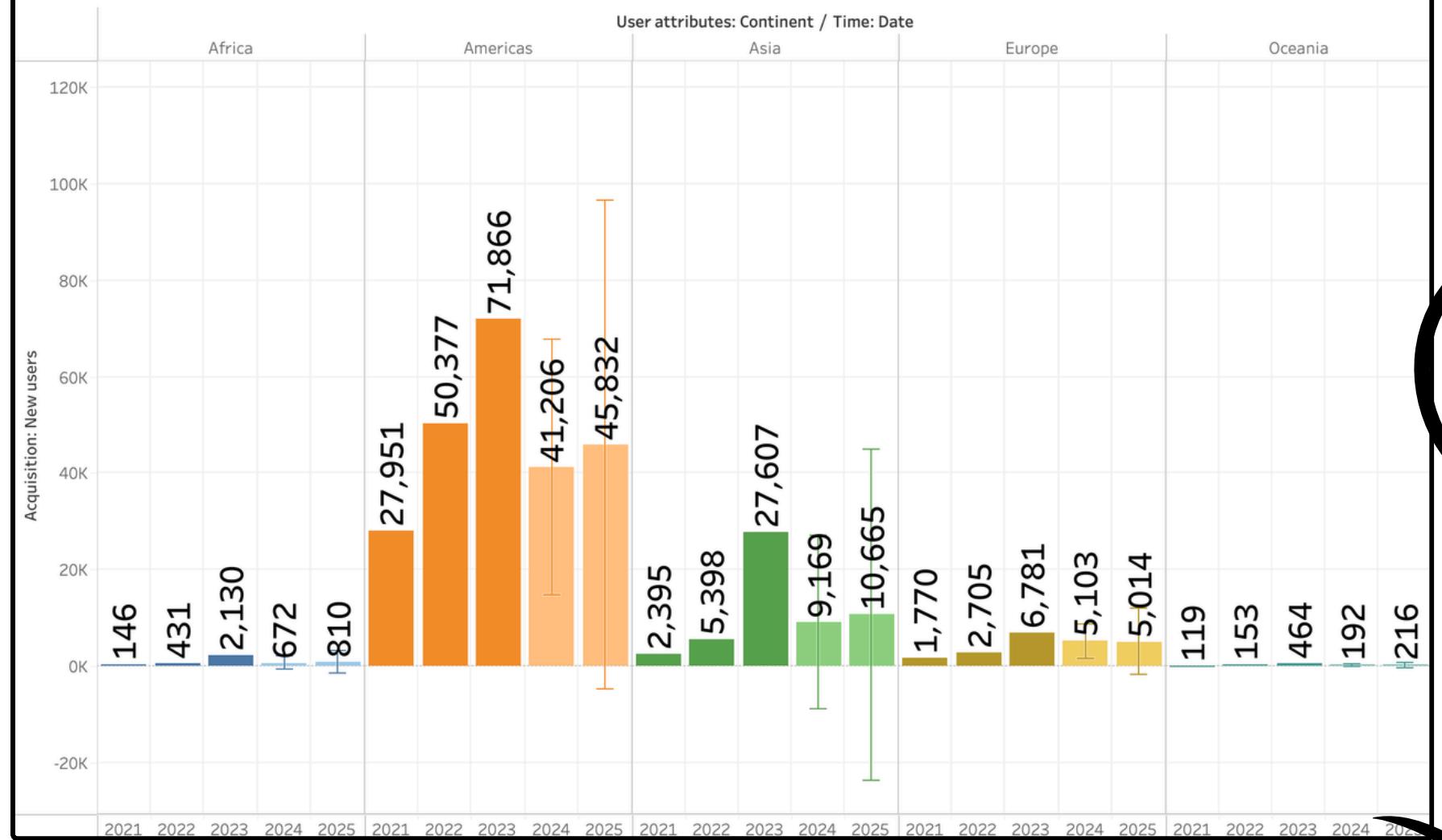
# GLOBAL USER DEMOGRAPHICS AND CONVERSION OVERVIEW



- **AMERICAS**: Strong user engagement indicates effective marketing strategies.
- **ASIA**: High engagement with low conversions calls for improved conversion tactics.
- **AFRICA**: High engagement but low conversions desire a need for targeted marketing strategies.
- **EUROPE**: Consistent engagement suggests room for targeted improvements.
- **OCEANIA**: Low user and conversion rates highlight the need for strategic reassessment.

# PROJECTED USER DEMOGRAPHIC TRENDS THROUGH 2025

Projected Trends in New User Acquisition by Continent Through 2025



AFRICA: Gradual upward trend in new users

AMERICAS: Significant growth expected by 2025

ASIA: Doubling of new users forecasted by 2025

EUROPE: Steady, moderate growth in new users

OCEANIA: Slow, positive growth trend in 2025

AMERICAS: Continued user growth anticipated

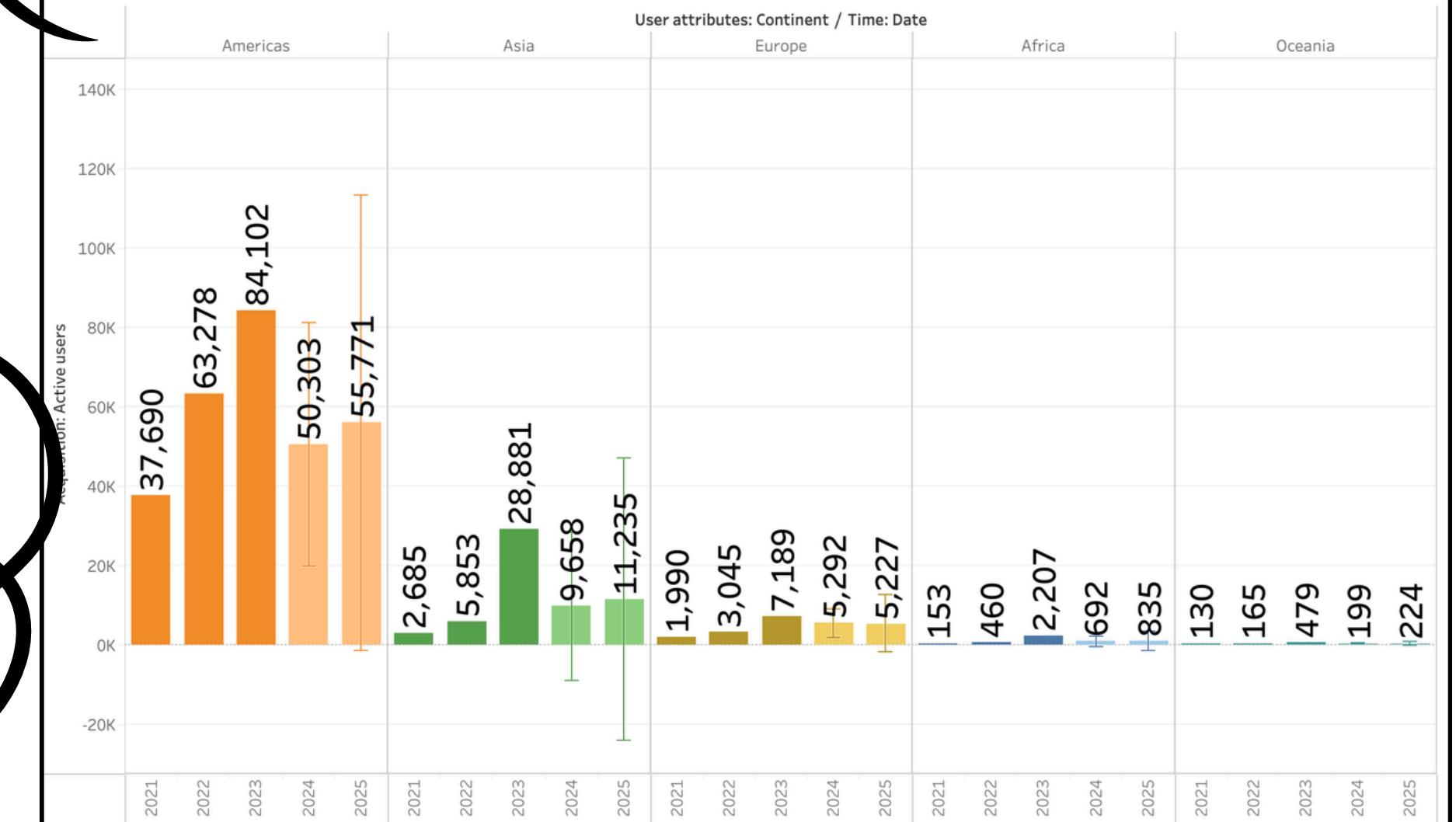
ASIA: Expected to double its active users by 2025

EUROPE: Steady increase in users projected

AFRICA: Incremental user growth forecasted

OCEANIA: Minimal growth; needs strategic boost

Projected Trends in Active User Acquisition by Continent Through 2025



# ENGAGEMENT INSIGHTS AND GROWTH STRATEGIES

## AFRICA

Growth stabilizes at 245 (2025),  
range: 50-450.  
Needs sustained strategies.

## AMERICAS

Peaks at 962 (2023), stabilizes at 622  
(2025), range: 500-750.  
Mature market, requires innovation.

## ASIA

Highest growth, stabilizes at 1180 (2025),  
range: 1000-1350.  
Key target region.

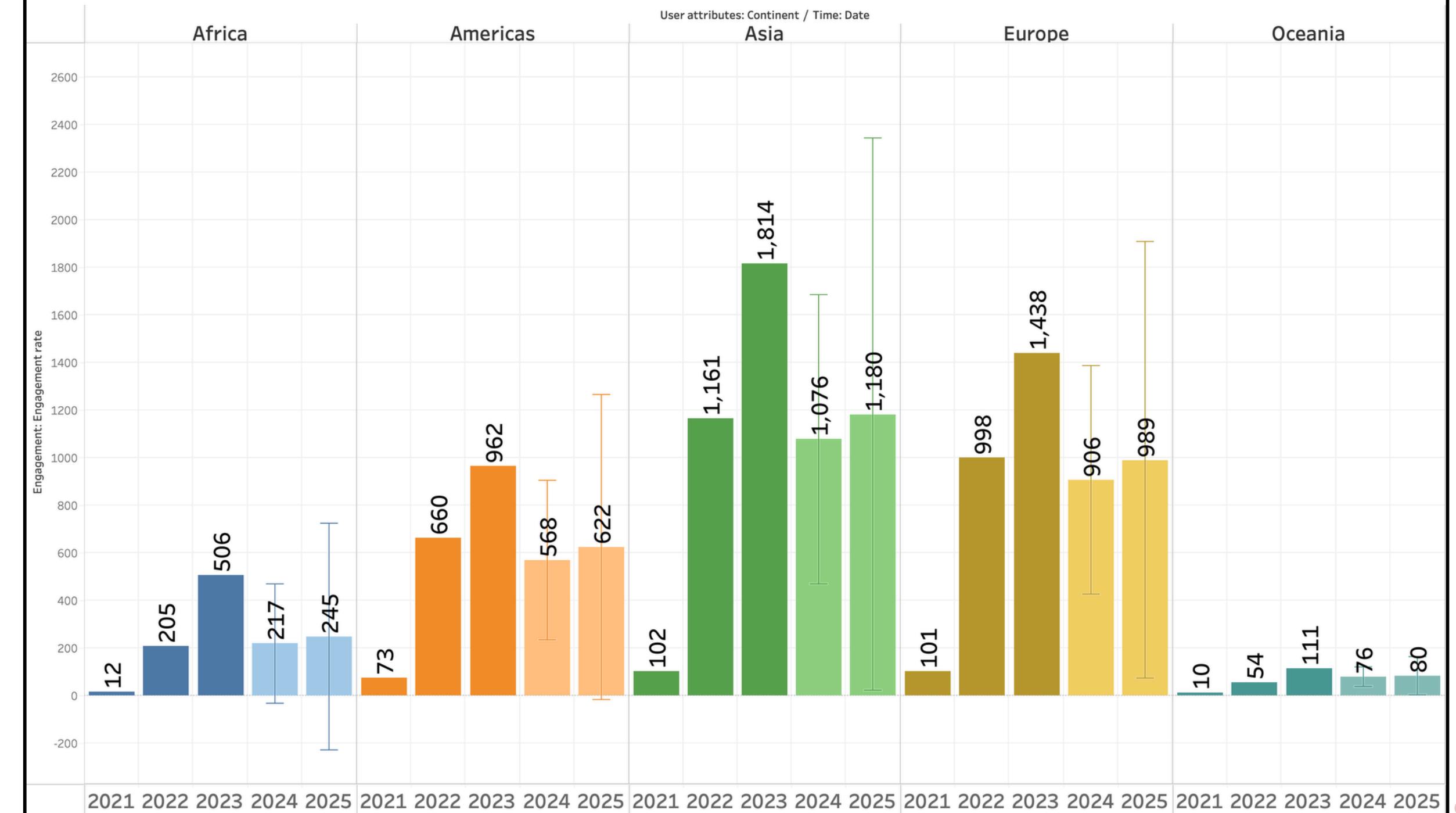
## EUROPE

Consistent growth, stabilizes at 989  
(2025), range: 800-1200.  
Focus on sustainability and premium  
content.

## OCEANIA

Modest growth, stabilizes at 80 (2025),  
range: 60-100.  
Niche opportunities.

Projected Trends in Engagement Rates by Continent Through 2025



# OPTIMIZING AD SPEND

```
> model1 <- lm(Clicks ~ Amount_Spent + CPC + CTR + Impressions, data = traindata)
> summary(model1)
```

Call:  
`lm(formula = Clicks ~ Amount_Spent + CPC + CTR + Impressions,  
 data = traindata)`

Residuals:  

Min	1Q	Median	3Q	Max
-1053.76	-5.55	-5.55	-5.55	1307.70

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	5.548e+00	1.297e+01	0.428	0.669
Amount_Spent	3.530e-01	1.416e-02	24.920	< 2e-16 ***
CPC	-2.389e+01	4.586e+00	-5.209	4.96e-07 ***
CTR	1.492e+01	2.172e+00	6.867	9.27e-11 ***
Impressions	5.143e-03	1.942e-05	264.819	< 2e-16 ***

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 160.3 on 188 degrees of freedom  
 Multiple R-squared: 0.9984, Adjusted R-squared: 0.9983  
 F-statistic: 2.883e+04 on 4 and 188 DF, p-value: < 2.2e-16

```
> vif(model1)
Amount_Spent          CPC           CTR      Impressions
1.525003        1.041374  1.021385  1.473834
```

- Ad Spend: Spending more increases clicks.
- CPC: Higher costs lead to fewer clicks.
- CTR: Better ad engagement boosts clicks.
- Impressions: More visibility slightly increases clicks.

Near-perfect (0.9984), indicating excellent model fit.

Collinearity Check: Low VIF values (<5) for all predictors indicate minimal multicollinearity, ensuring reliable estimates.

```
> cat("Training Data RMSE:", train_rmse, "\n")
```

Training Data RMSE: 158.2439

```
> cat("Test Data RMSE:", test_rmse, "\n")
```

Test Data RMSE: 165.288

Close between training (158.24) and testing (165.29), ensuring model consistency.

```
> # Print the results
> print(model_cv)
Linear Regression
```

193 samples  
 4 predictor

No pre-processing  
 Resampling: Cross-Validated (10 fold)  
 Summary of sample sizes: 173, 174, 174, 174, 174, 175, ...  
 Resampling results:

RMSE	Rsquared	MAE
277.587	0.8130475	94.47012

## Cross-Validation Method:

Used 10-fold cross-validation to test model reliability across different data subsets.

## Key Performance Metrics:

- 1.RMSE: 277.587, shows average prediction error in clicks.
- 2.R-squared: 0.813, 81.3% of clicks variation is explained by the model.
- 3.MAE: 94.47012, average absolute error in click predictions.

# OPTIMIZING AD SPEND

Campaign	Amount Spend	Predicted Clicks	Efficiency	New Budget	Minimum Budget	Maximum Budget
Glassboards Traffic	12064.39	5769	0.4782	18096.59	9651.51	18096.59
Smart Glass Display	7761.72	54438	7.0136	11642.58	6209.38	11642.58
Pilot   Search   Glass	4661.14	2666	0.5719	6059.48	3262.80	6059.48
LCG Smart Glass Campaign	3082.24	1751	0.5682	2009.73	2157.57	3698.69
Lab Landlords (Copy)	1827.03	2173	1.1896	300.00	913.52	2009.73
Pilot   Display   Audiences + Websites	1400.67	1114	0.7955	1175.34	100.00	300.00
Smart Glass	1068.49	527	0.4932	1249.18	801.37	1175.34
Define Display Ads	1040.98	1447	1.3898	1500.00	520.49	1249.18
Boost_Post_Video Views_Nov 21, 2023	1280.00	2	0.0015	1280.00	1280.00	1500.00
Healthcare	712.12	377	0.5296	783.33	356.06	783.33
Glassboard Campaign	668.31	386	0.5779	1336.62	668.31	1336.62
Mossa Display Ads	666.80	835	1.2521	733.48	400.08	733.48
The After-Party	355.70	164	0.4602	391.27	177.85	391.27
Brand Awareness // Skyline Design	330.00	2	0.0057	391.27	440.00	880.00
Glassboards - OH & IN	188.66	163	0.8652	880.00	200.00	400.00
Boost_Post_Website Visits_May 26, 2023	180.00	105	0.5824	400.00	50.00	100.00
Boosted Video // LCG Smart Glass Sample	645.00	3	0.0046	100.00	645.00	1290.00
Boost_Post_Website Visits_Apr 20, 2023	75.00	107	1.4315	1290.00	105.00	210.00
Boosted // Blog - Choosing the Best Material for Your Architectural Project: Why Glass Outshines Resin	50.00	66	1.3148	210.00	50.00	130.00
Writable Glass Markerboards	1.00	6	5.9010	130.00	1.00	50.00
Mossa Display Ads #2	1.00	6	5.9010	50.00	1.00	50.00
Landlord Labs in MA & CA	1.00	6	5.9010	50.00	1.00	50.00
SDX3	1.00	6	5.9010	50.00	1.00	50.00
<b>Total</b>	<b>38062.25</b>	<b>71997.13523</b>	<b>43.12971133</b>	<b>27992.9265</b>	<b>52186.285</b>	<b>52186.29</b>

## Efficiency Analysis:

- Cost per Click reduced by 9.16%, from \$0.55 to \$0.50
- Achieved greater cost efficiency, optimizing budget use.

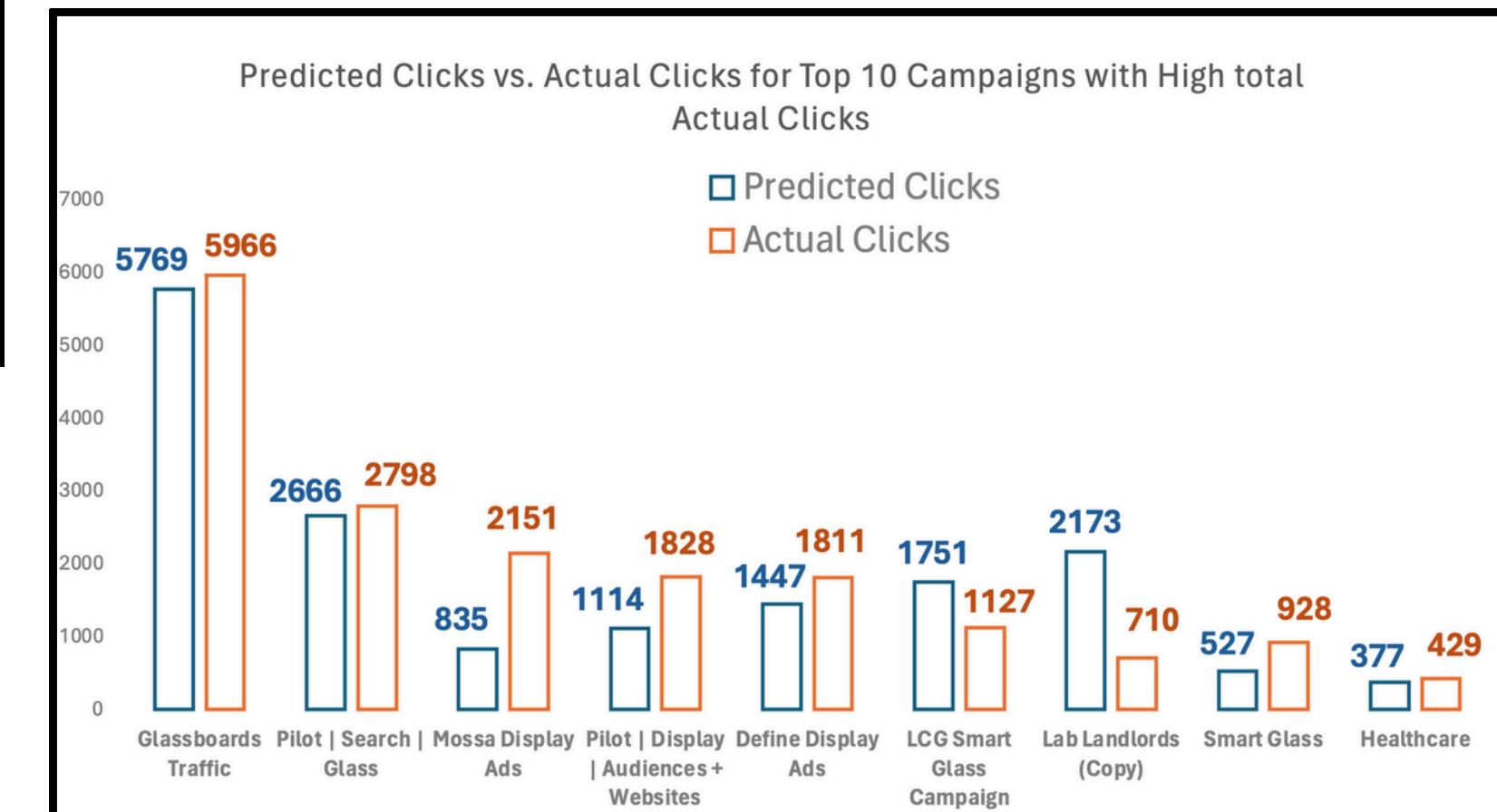
Total Predicted Clicks
105178
Total Budget
52186.29

## Financial and Engagement Overview:

- Initial Budget: \$38,062.25;
- Initial Predicted Clicks: 69,079
- Revised Budget: \$52,186.29;
- Revised Predicted Clicks: 105,178

## Budget and Impact:

- Budget increased by 38.18%, capturing more market opportunities.
- Predicted clicks increased by 52.24%, enhancing user engagement.



# RECOMMENDATIONS

1. **Optimize Keyword Strategy:** Use specific, trending keywords to improve ad relevance and performance.
2. **Highlight Sustainability Efforts:** Emphasize the company's green initiatives in all ad campaigns.
3. **Reallocate Budget:** Redirect funds from underperforming campaigns to high-ROI ones, especially LinkedIn.
4. **Analyze Ad Platforms:** Conduct detailed analysis to optimize investment in AdWords and LinkedIn.
5. **Enhance Ad Content:** Create ad creatives featuring sustainability themes to attract eco-conscious consumers.
6. **Implement Real-Time Analytics:** Use advanced tools to monitor and adjust ad spend dynamically.
7. **Utilize A/B Testing:** Test different ad creatives to identify the most effective designs and messages.
8. **Leverage Video Ads:** Integrate video ads into the strategy to boost engagement rates.
9. **Implement Remarketing:** Re-engage users who interacted with previous ads but did not convert.
10. **Focus on High-Conversion Channels:** Invest more in channels with high conversion rates, like LinkedIn.
11. **Target Regional Growth:** Increase marketing efforts in high-potential regions like Asia and Africa.
12. **Personalize Campaigns:** Tailor ads to regional preferences and cultural nuances.
13. **Optimize Website Regionally:** Enhance website performance for different regions, focusing on local SEO.

# CONCLUSION

- **Ad Engagement Increase:** Achieved a 52% increase in predicted clicks (from 69,079 to 105,178).
- **Cost Efficiency:** Reduced cost per click by 9.16% (from \$0.55 to \$0.50).
- **Budget Optimization:** Increased budget from \$38,062.25 to \$52,186.29, resulting in improved performance.
- **Higher Click-Through Rates:** Improved targeting and reallocation of budget to high-ROI campaigns.
- **Sustainability Focus:** Highlighted green initiatives to attract eco-conscious consumers.
- **Data-Driven Decision-Making:** Demonstrated the strategic value of analytics in optimizing ad spend and engagement.
- **Foundation for Future Campaigns:** Established a robust framework for continued growth and improved ROI.

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# THANK YOU

**Presented By : Anasuya Sikdar, Tsungyen Chen,  
Deep Parikh, Manu Johnson Varghese**

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# APPENDIX

# INTRODUCTION

1

**Founded:** In 1983 by Charlie Rizzo, Current CEO: Vipul Bhagat

2

**Products:** Specializes in Decorative Glass, Glassboards, Smart Glass, Laminated Glass, Exterior Glass, Glass Backer, Art Glass, and Glass Film

3

**Innovation:** Incorporates cutting-edge design and technology in products

4

**Sustainability:** Committed to eco-friendly materials and sustainable practices

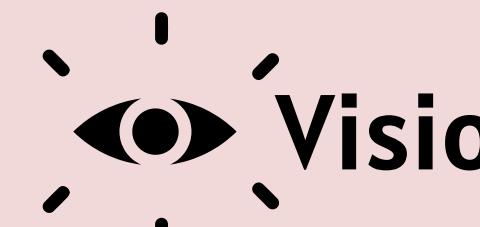
5

**Collaborations:** Works with well-known artists and designers

6

**Sectors Served:** Targets Corporate, Healthcare, Hospitality, and Transportation sectors

# VISION AND MISSION



## Vision

Skyline Design aspires to lead in the innovation and creation of architectural glass that enhances both environmental sustainability and aesthetic appeal, transforming spaces into works of art.



## Mission

Committed to excellence, Skyline Design strives to produce superior quality glass products that integrate unique artistic collaborations and eco-friendly practices, catering to both the aesthetic and practical needs of their diverse clientele.

# STRATEGIC FORMULATION

## STRENGTHS

- Collaborative artistry
- Eco-conscious products
- Customizable range

## OPPORTUNITIES

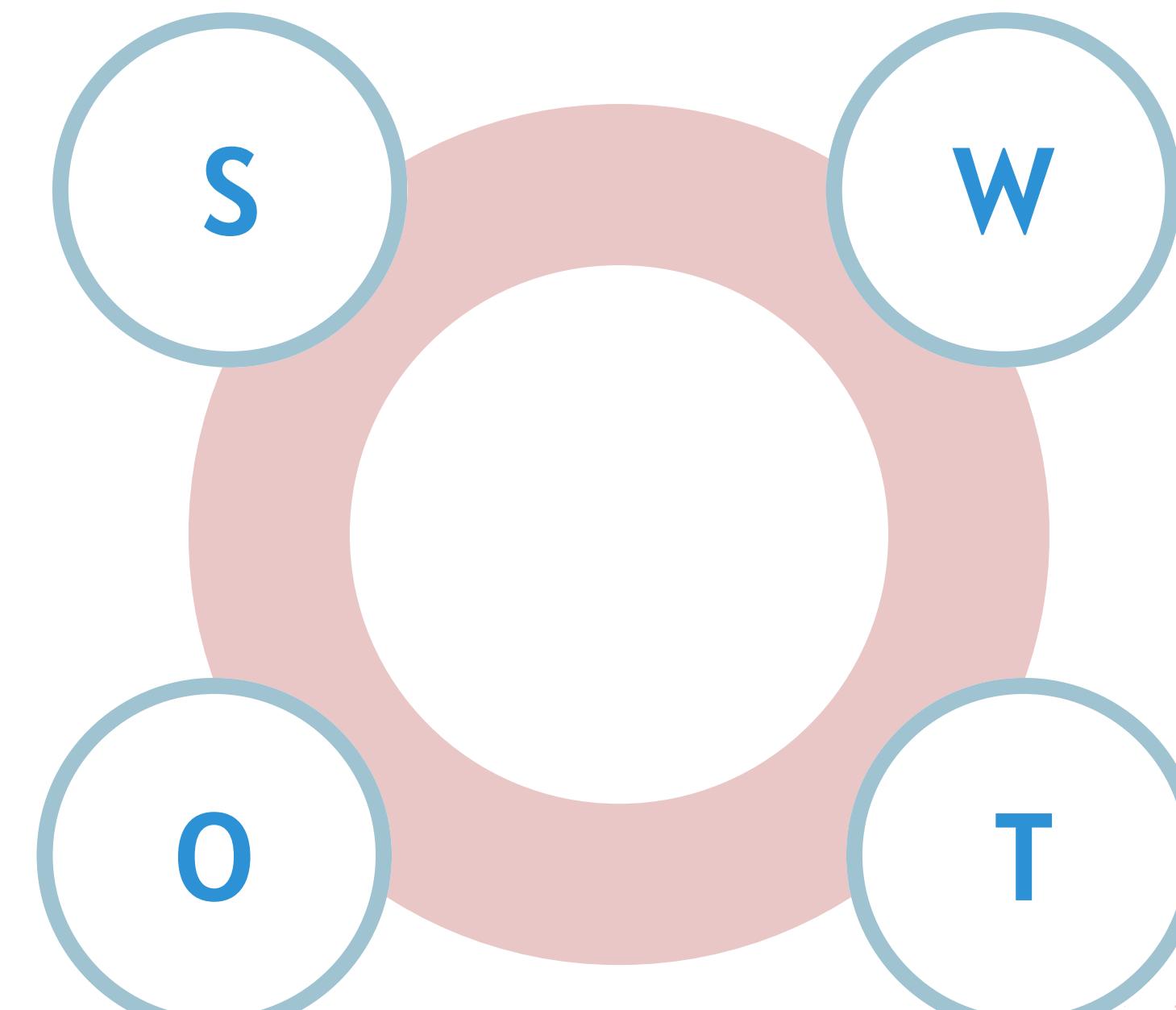
- Eco-material trend
- Smart glass innovation

## WEAKNESSES

- Niche market focus
- Higher sustainable costs

## THREATS

- Strong market rivals
- Material cost volatility



# STRATEGIC OBJECTIVE

## I. Data-Driven Decision Making

- Utilize insights from detailed reports of past ad campaigns to inform future advertising strategies.

## 3. Budget Optimization

- Reallocate the advertising budget to maximize efficiency, ensuring funds are directed towards channels and strategies that yield the best results.

## 2. Enhanced Customer Targeting

- Analyze interaction data to identify key customer segments that are most responsive to the ads.

## 4. Engagement and Response Improvement

- Aim to increase the number of people who click on and respond to our ads by at least 25% over the next six months.

# DATA ANALYSIS METHODS

## DATA PROCESSING AND ANALYSIS

- Excel: Data Cleaning, Descriptive Statistics, Data Compilation
- R Programming: Predictive Modeling, Simulation and Optimization, Statistical Analysis
- Tableau: Data Visualization, Customer Demographics, Ad group Analysis

