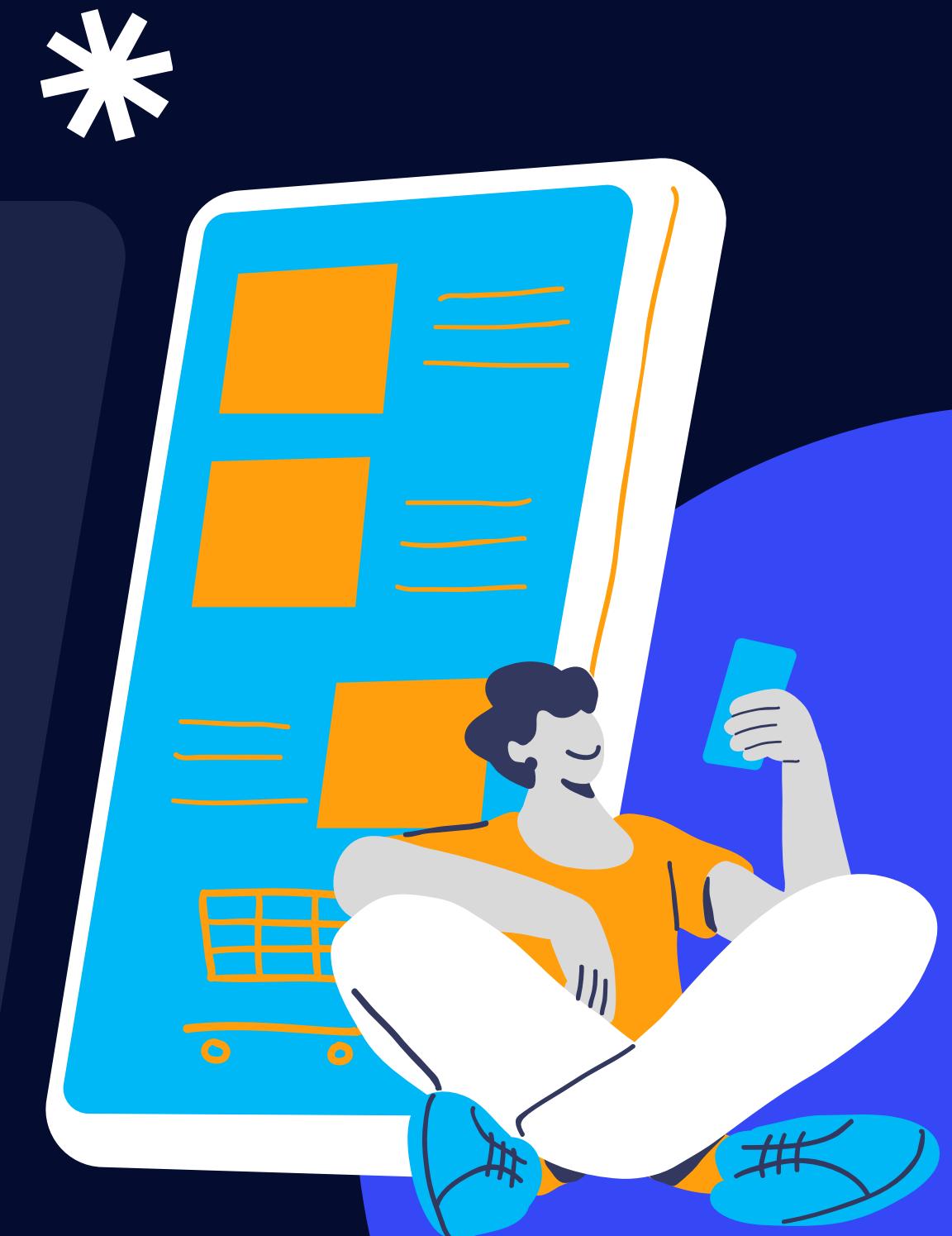


# E-commerce Analytics Pro

“Navigating the Future of Online  
Shopping”(2021-2024)



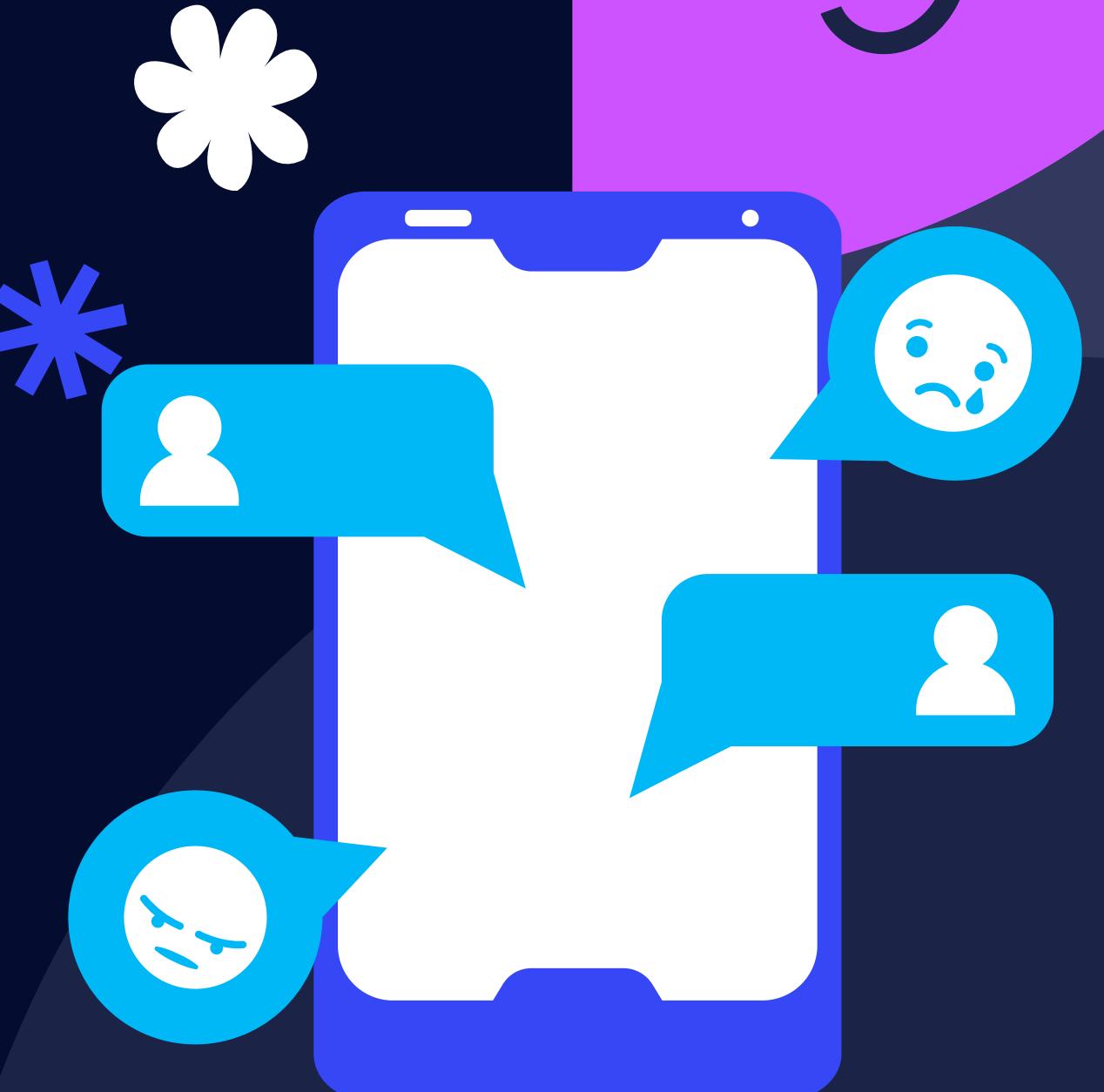
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# 1- Objectives & Key Metrics

## CORE OBJECTIVES:

- Analyze 12+ marketing channels performance
- Optimize cost-efficiency and ROI
- Identify actionable opportunities to reduce customer acquisition costs.
- Guide strategic budget allocation



# 2- Data Dictionary

age	gender	city	region	income	category	subcate	price	quantity	discount	final_am	payment	customer	marketin	marketin
50	Male	Luxor	Upper E	5374	Health	Personal	678	8	0	5424	Bank Tran	Budget	No Camp	Print
63	Female	Tanta	Delta	7235	Health	Pharmac	482	8	0	-3856	Credit Card	Regular	No Camp	Outdoor
51	Female	Sohag	Upper E	4565	Electroni	Gaming	6753	1	14	5807.58	Credit Card	Budget	Holiday	Direct
42	Female	Sharm El Red Sea	Red Sea	9278	Health	Supplie	361	6	0	2166	Gift Card	Regular	No Camp	Referral
38	Female	Giza	Greater C	9345	Electroni	Smartph	3148	3	33	-6327.5	Buy Now	Regular	New Year	Direct
66	Male	Luxor	Upper E	7752	Automoti	Tools	698	1	29	495.58	Credit Card	Regular	Flash Sale	Outdoor
68	Male	Sharm El Red Sea	Red Sea	9381	Clothing	Formal	952	3	42	1656.48	Credit Card	Premium	Flash Sale	Referral
28	Male	Giza	Greater C	13302	Electroni	Gaming	7285	1	0	7285	Digital Wallet	Premium	No Camp	Referral
21	Male	Luxor	Upper E	2941	Sports	Outdoor	570	3	13	1487.7	Digital Wallet	First-time	Black Fri	TV
34	Female	Mansour	Delta	4163	Clothing	Shoes	648	2	28	933.12	Cash on Deli	First-time	Flash Sale	Influencer
55	Male	Sohag	Upper E	8876	Food	Organic	134	6	12	-707.52	Debit Card	Regular	Ramadan	Direct
44	Male	Port Saïd	Suez Ca	11156	Books	Children	233	3	37	440.37	Credit Card	Premium	Holiday	Social Media
49	Female	Sharm El Red Sea	Red Sea	9255	Books	Fiction	130	1	25	97.5	Mobile Wallet	Premium	Mother's Day	TV
48	Female	Zagazig	Delta	7880	Travel	Electroni	1482	2	0	2964	Bank Transfer	Regular	No Camp	TV
31	Female	Suez	Suez Ca	8700	Beauty	Fragrance	273	4	0	1092	Bank Transfer	Regular	No Camp	Affiliate
58	Female	Giza	Greater C	15878	Software	Security	1256	1	8	1155.52	Credit Card	Premium	Back to School	Email
54	Female	Alexandria	Alexandria	14569	Health	Supplie	230	1	0	230	Mobile Wallet	Premium	No Camp	Affiliate
26	Male	Ismailia	Suez Ca	6748	Electroni	Cameras	3708	3	7	10345.3	Mobile Wallet	Regular	Holiday	Outdoor
25	Female	Zagazig	Delta	7570	Travel	Guides	409	1	27	298.57	Mobile Wallet	Regular	Spring Sale	TV
33	Male	Sharm El Red Sea	Red Sea	6748	Home & Tools		353	3	0	1059	Buy Now	Regular	No Camp	Print
35	Female	Sharm El Red Sea	Red Sea	5146	Beauty	Fragrance	797	7	0	5579	Bank Transfer	Budget	No Camp	Outdoor
49	Female	Cairo	Greater C	11712	Travel	Comfort	579	3	38	1076.94	Mobile Wallet	Premium	Black Friday	Email
37	Male	Zagazig	Delta	6921	Books	Children	182	2	37	229.32	Digital Wallet	Budget	Black Friday	Affiliate
38	Male	Mansour	Delta	4891	Electroni	Gaming	9060	2	36	11596.8	Digital Wallet	Budget	Black Friday	Outdoor
66	Male	Suez	Suez Ca	10818	Books	Educatio	434	2	12	763.84	Cash on Deli	Regular	Flash Sale	Search Engine
44	Male	Giza	Greater C	11842	Sports	Apparel	1291	3	0	3873	Credit Card	Premium	No Camp	Direct
41	Female	Luxor	Upper E	8138	Automoti	Accesso	1351	3	0	4053	Digital Wallet	Regular	No Camp	Affiliate
38	Male	Tanta	Delta	6062	Health	Medical	369	6	0	2214	Bank Transfer	Regular	No Camp	Affiliate
53	Female	Mansour	Delta	6976	Software	Business	1480	1	0	1480	Debit Card	Budget	No Camp	Email
68	Male	Ismailia	Suez Ca	10863	Health	Medical	493	6	30	2070.6	Cash on Deli	Regular	Flash Sale	Outdoor
33	Male	Alexandria	Alexandria	10863	Books	Non-Fict	291	1	0	291	Credit Card	VIP	No Camp	Mobile App

## Temporal Data:

date (order date), month, year (trend analysis), day\_of\_week (weekday vs weekend behavior)

## Customer Information:

customer\_id (unique ID), age, gender (demographics), region (location), customer\_segment (New, Loyal, High-Value)

## Transaction Data:

order\_id (unique order), price, quantity, final\_amount (after discount), category (product type)

## Revenue Metrics:

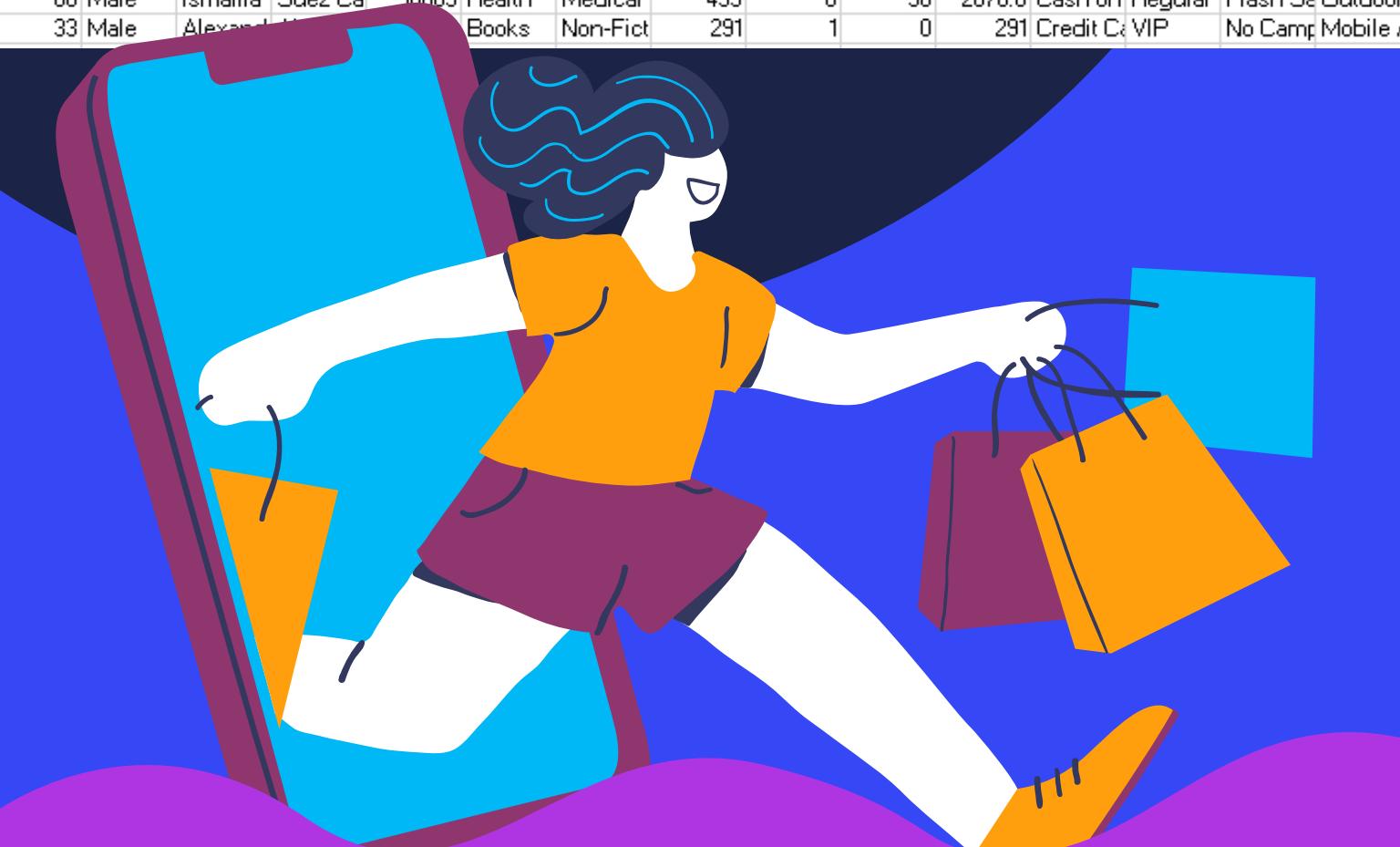
gross\_revenue (before discount), net\_revenue (after discount), discount\_amount (value given)

## Marketing Data:

marketing\_channel (Email, Social, Search), marketing\_campaign (campaign source), acquisition\_source (Organic, Paid, Referral)

## Performance Metrics:

conversion\_rate (% of visitors who bought), roi (return on investment), customer\_lifetime\_value (total expected profit), retention\_score (likelihood to stay), satisfaction\_rating (1–5), returned (refund status), device\_type (mobile vs desktop)



# 3-Data Cleaning & Type Fixing

- Missing and invalid values were cleaned to ensure consistent and accurate analysis.
- Essential fields (price, quantity, final\_amount) were validated and corrected.
- Numeric fields and date fields were converted into proper data types to enable accurate revenue and time-based calculations
- **Outlier Evaluation**
- IQR method was applied to detect outliers in price, income, and quantity.
- Outliers were confirmed to be valid business variations, not errors .
- No values were removed or corrected, preserving the integrity of the dataset.



# 4-KPI Insights & Business Performance

## Category & Channel Performance

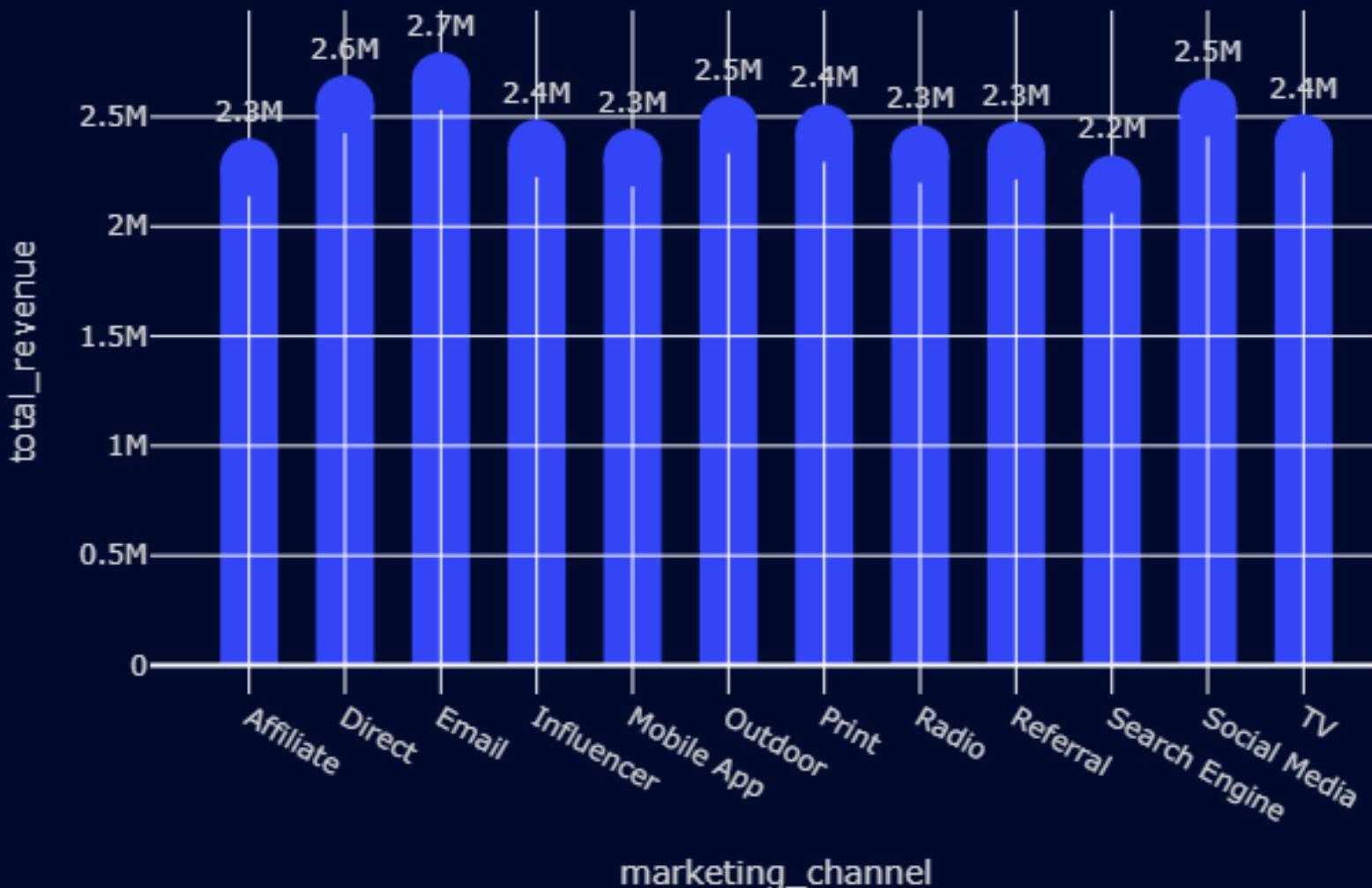
- Electronics category generated the highest revenue, showing strong customer demand for high-value products.
- Email was the best-performing marketing channel, while Direct traffic achieved the highest customer conversions. Regional Insights
- Upper Egypt generated the highest revenue, outperforming Greater Cairo a strong indication of untapped market potential.
- Delta and Suez Canal regions also showed strong and consistent revenue growth. Growth Insights
- Monthly revenue shows a strong upward trend, supported by consistent month over-month growth.
- Customer conversions increased significantly over time, reflecting effective marketing and customer acquisition strategies. Overall Business Outlook
- The combined performance across categories, channels, and regions indicates strong business expansion with high scalability potential.



# 5-Channel performance analysis

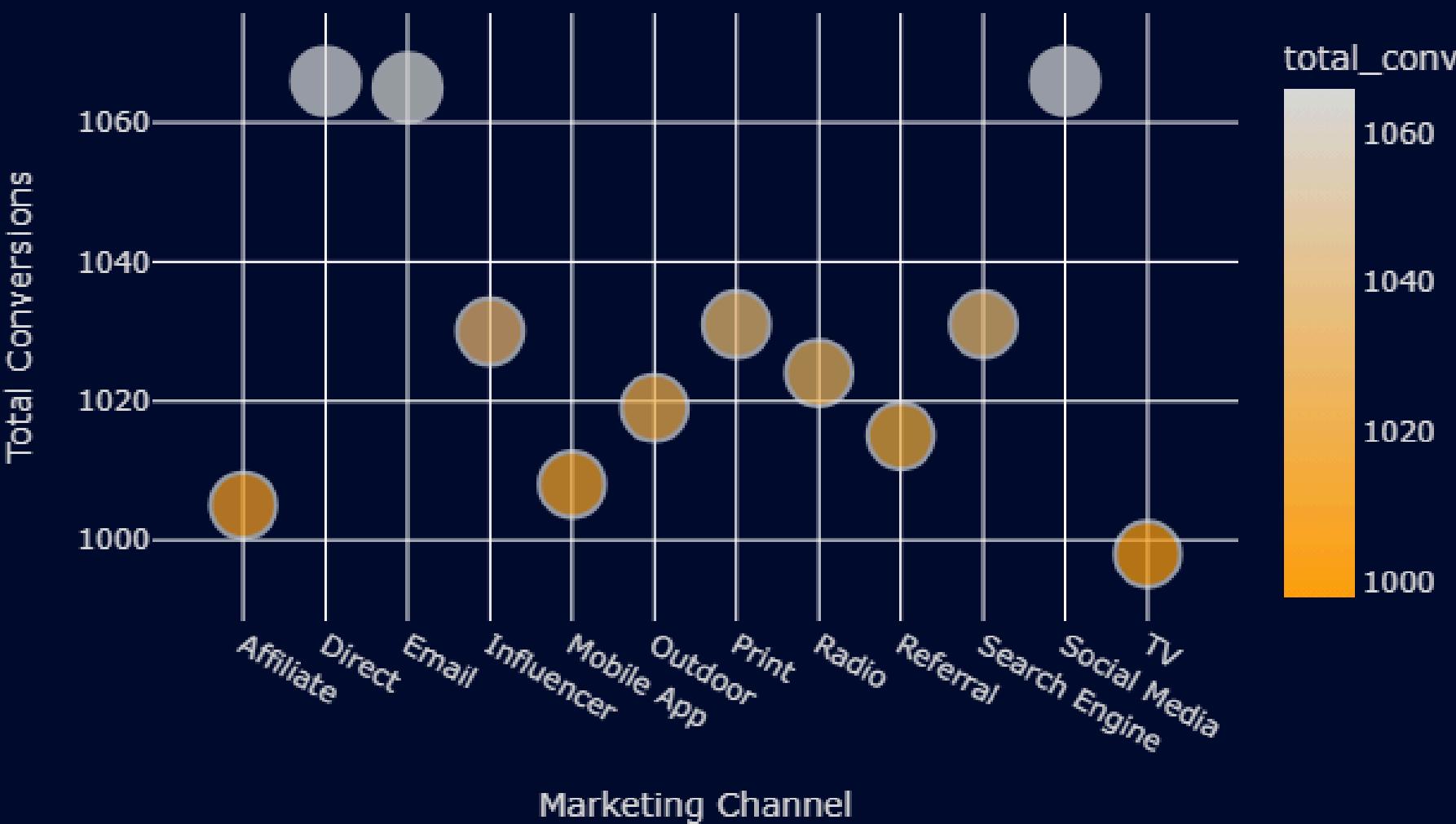
## Total Revenue per marketing channel

- Top Performer: "Email Marketing leads the pack, achieving the highest revenue (\$2.66M) and the highest Return on Investment (ROI 140.6%), making it the most profitable and efficient channel."
- Highest Volume (Acquisition): "Direct and Social Media channels are the top drivers for customer acquisition, recording the highest order volume (1,066 conversions each) while generating strong revenue exceeding \$2.5M."
- Lowest Performer: "Search Engine ranked last in terms of revenue (\$2.19M) and also recorded the lowest ROI (112.7%), indicating a need to review its paid advertising strategy."
- Stability of Traditional Channels: "Traditional channels such as Outdoor, Print, and TV show very consistent and stable performance, with ROIs ranging between 120% and 127%, proving them to be reliable support channels."
- 



# Total conversions per channel

- A. Top Performer: "Email Marketing leads the pack, achieving the highest revenue (2.66M) and the highest Return on Investment (ROI 140.6%), making it the most profitable and efficient channel in this campaign."
- B. Highest Volume (Acquisition & Reach): "Direct and Social Media channels are the primary sources for customer acquisition, recording the highest order volume (1,066 orders each), while generating strong revenue exceeding 2.5M, reflecting strong Brand Awareness."
- C. Lowest Performer: "Search Engine ranked last in terms of revenue (2.19M) and also recorded the lowest ROI (112.7%), indicating a need to review the current keyword strategy (SEO/SEM)."
- D. Consistent Performance (Traditional Channels): "Traditional channels such as Outdoor, Print, and TV show very consistent and stable performance, yielding ROIs ranging between 120% and 127%, proving them to be reliable support channels."



# Total Spend per Channel

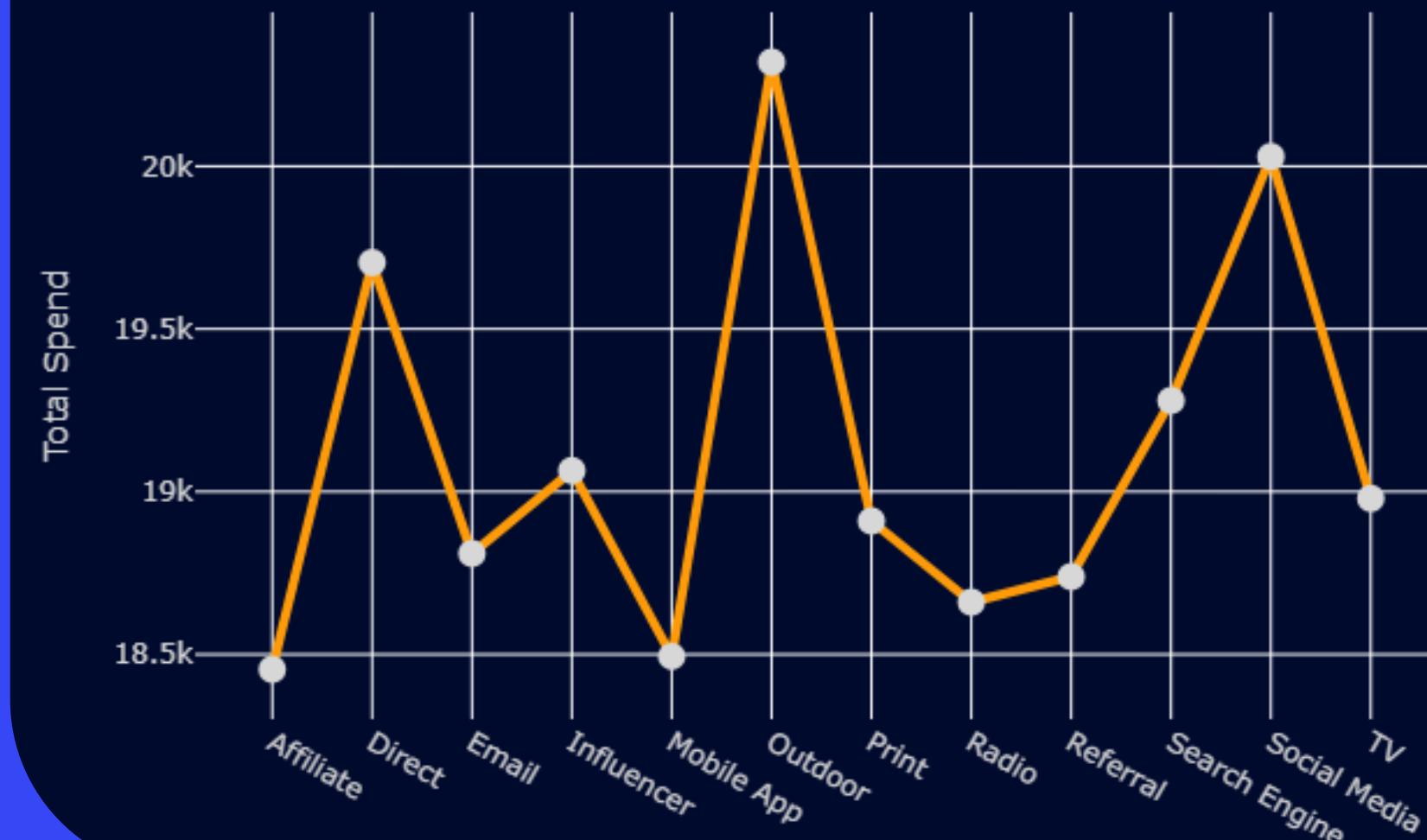
A. Top Performer: "Email Marketing leads the pack, achieving the highest revenue (2.66M) and the highest Return on Investment (ROI 140.6%), establishing it as the most profitable and efficient channel in this campaign."

B. Highest Volume (Acquisition & Reach): "Direct and Social Media channels are the primary sources for customer acquisition, recording the highest order volume (1,066 orders each) while generating strong revenue exceeding 2.5M, reflecting robust Brand Awareness."

C. Lowest Performer: "Search Engine ranked last in terms of revenue (2.19M) and also recorded the lowest ROI (112.7%), indicating a critical need to review the current keyword strategy (SEO/SEM)."

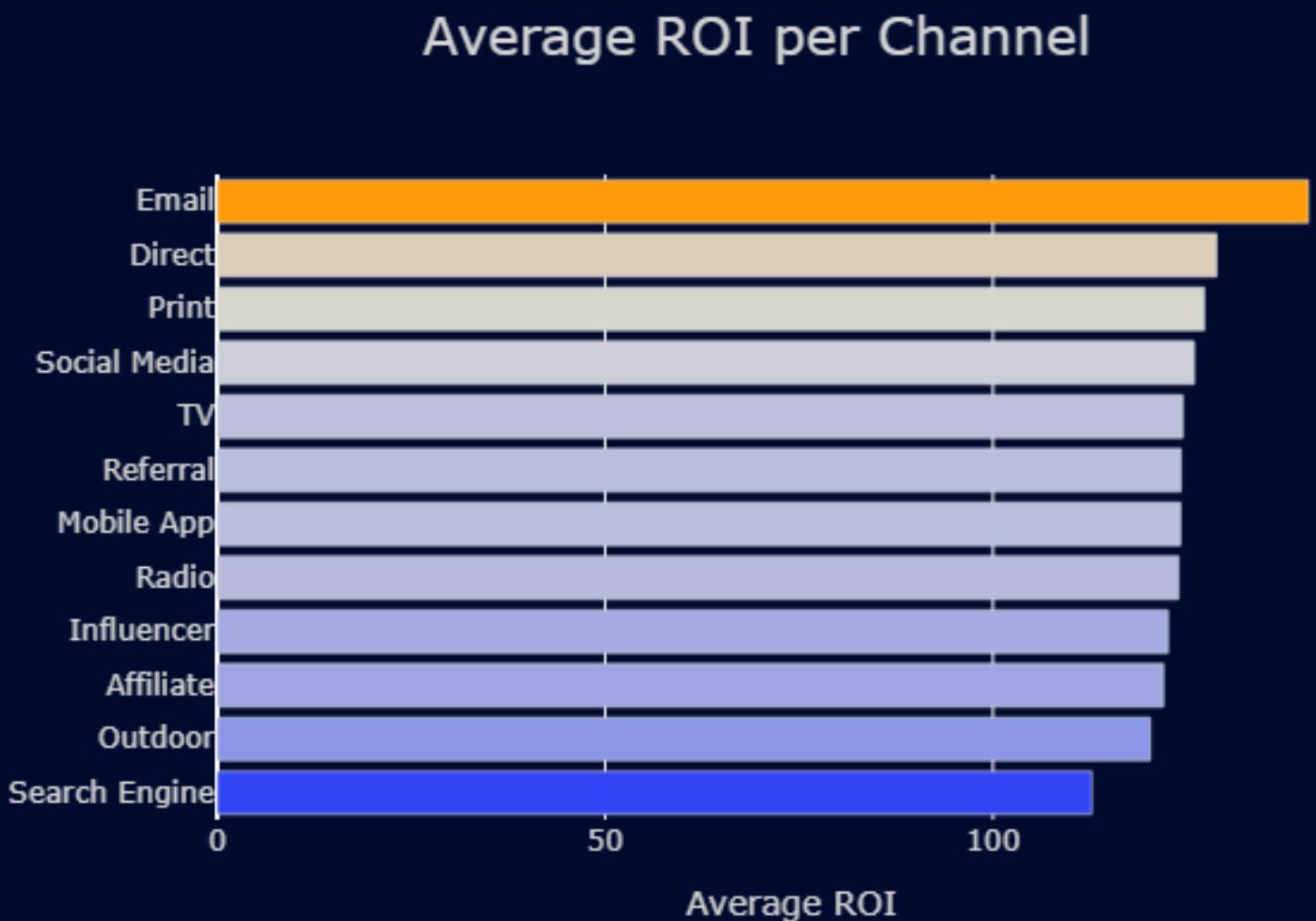
D. Consistent Performance (Traditional Channels): "Traditional channels such as Outdoor, Print, and TV demonstrate highly consistent and stable performance, yielding ROIs ranging between 120% and 127%, proving them to be reliable support channels."

Total Spend per Channel



# Average ROI per Channel

1. Customer Acquisition Volume: "Direct and Social Media channels dominate the landscape in terms of order volume. Each channel generated 1,066 customers (the absolute highest), making them critical for expanding the Customer Base."
2. Cost Analysis: "Data reveals that Outdoor advertising had the Highest Spend among all channels. However, its ROI of 120% is lower than more cost-effective channels like Email and Print, suggesting a need to review its budget allocation."
3. Lowest Performance: "Search Engine requires urgent intervention, having recorded the lowest revenue (2.19M) and the lowest ROI (112.7%). Additionally, TV recorded the lowest number of conversions (998 orders), indicating weak effectiveness in closing sales."



# 6-Time trends analysis

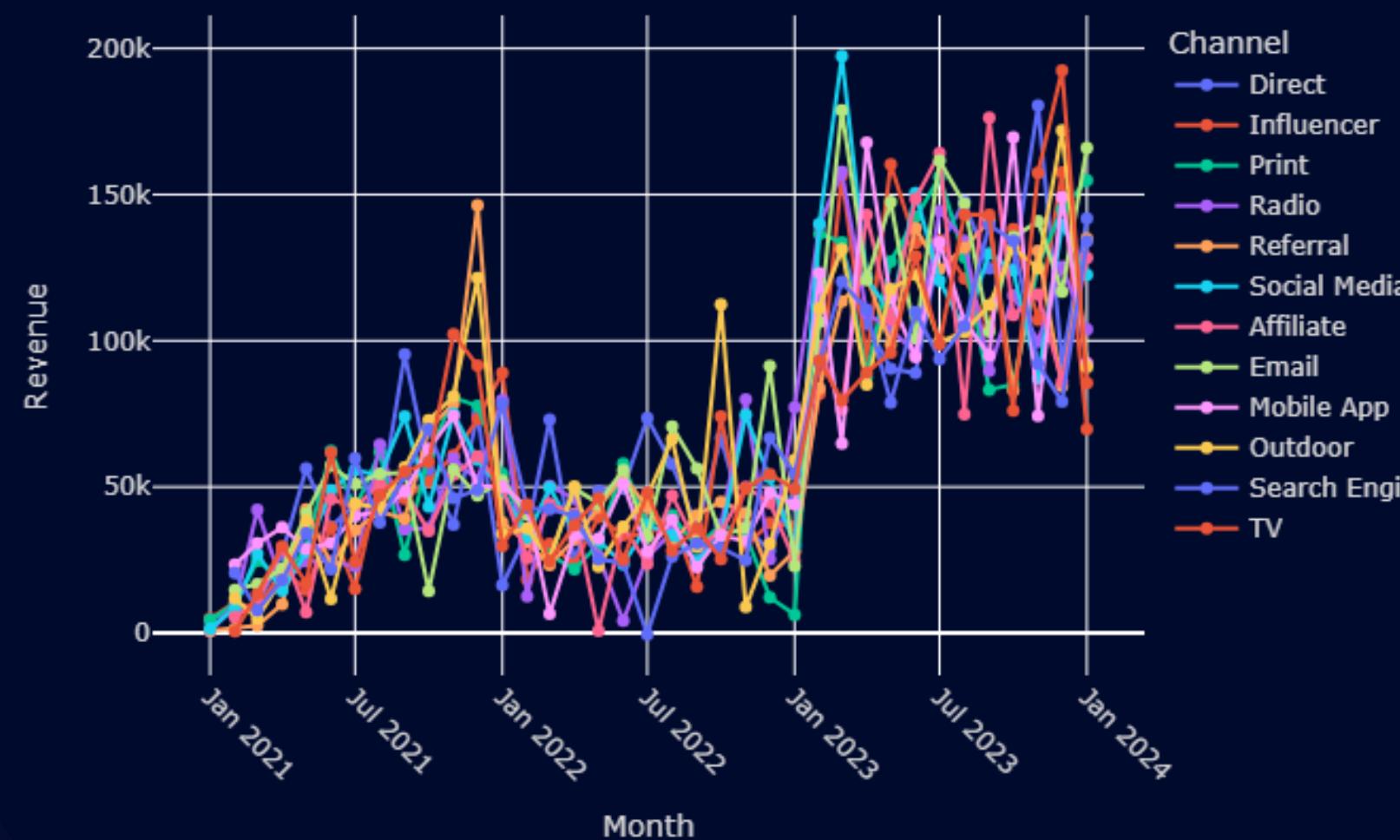
## Monthly Revenue by Channel

**Insight:** All marketing channels show a strong upward trend from 2021 to 2024, with revenue increasing significantly over time.

**Key Observation:** The Email channel consistently generates the highest total revenue across the time period, making it the most valuable channel for revenue generation.

**Pattern:** Revenue across all channels shows a rapid growth phase starting from mid-2021, stabilizing at higher levels by 2023-2024.

Monthly Revenue Trends by Marketing Channel



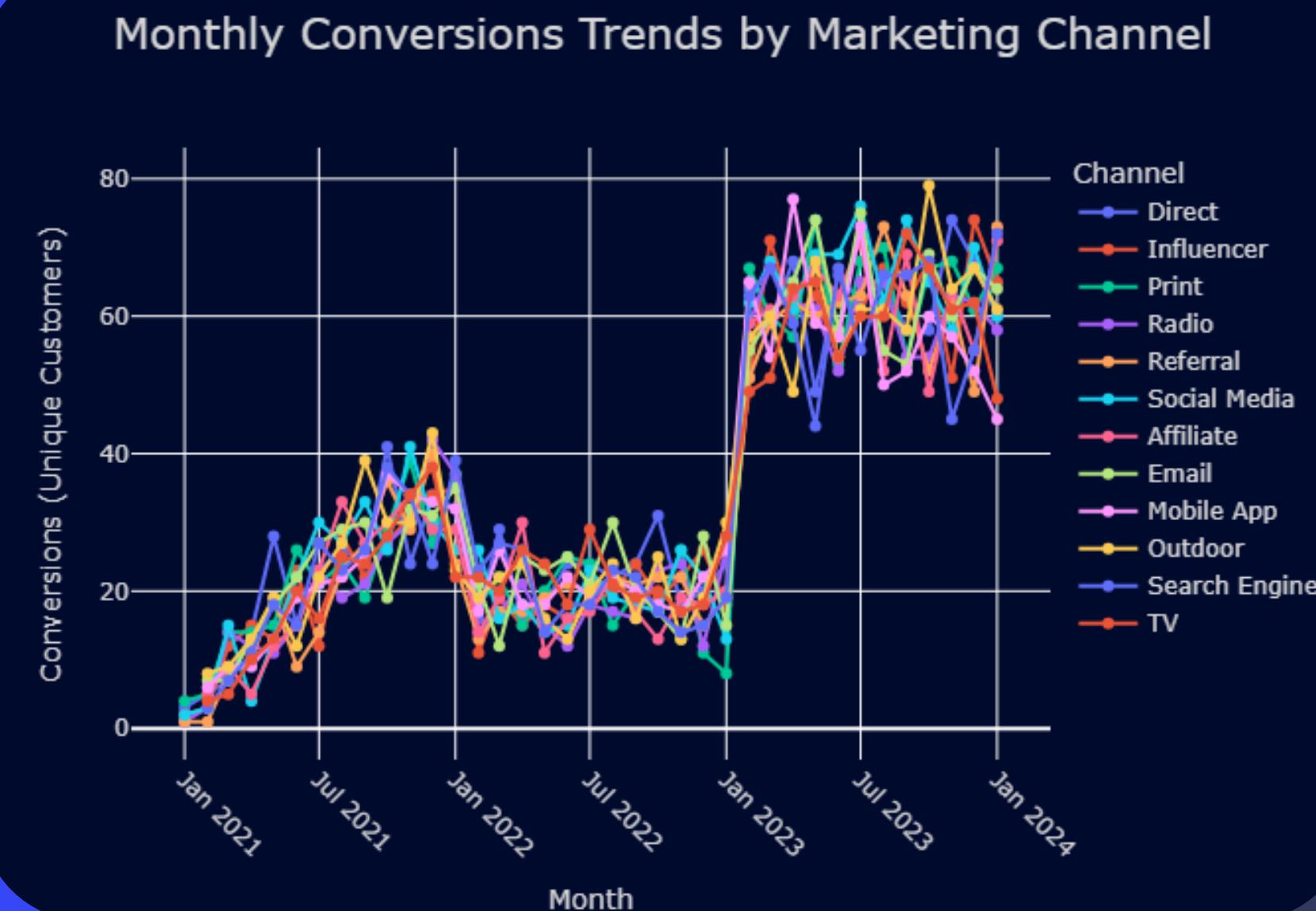
# Monthly Conversions by Channel



**Insight:** Customer acquisition (conversions) mirrors the revenue trend, showing steady growth across all channels.

**Key Observation:** The Direct channel leads in total conversions, indicating strong organic customer engagement.

**Pattern:** All channels show similar seasonality patterns, suggesting external factors (holidays, promotions) affect all channels equally.

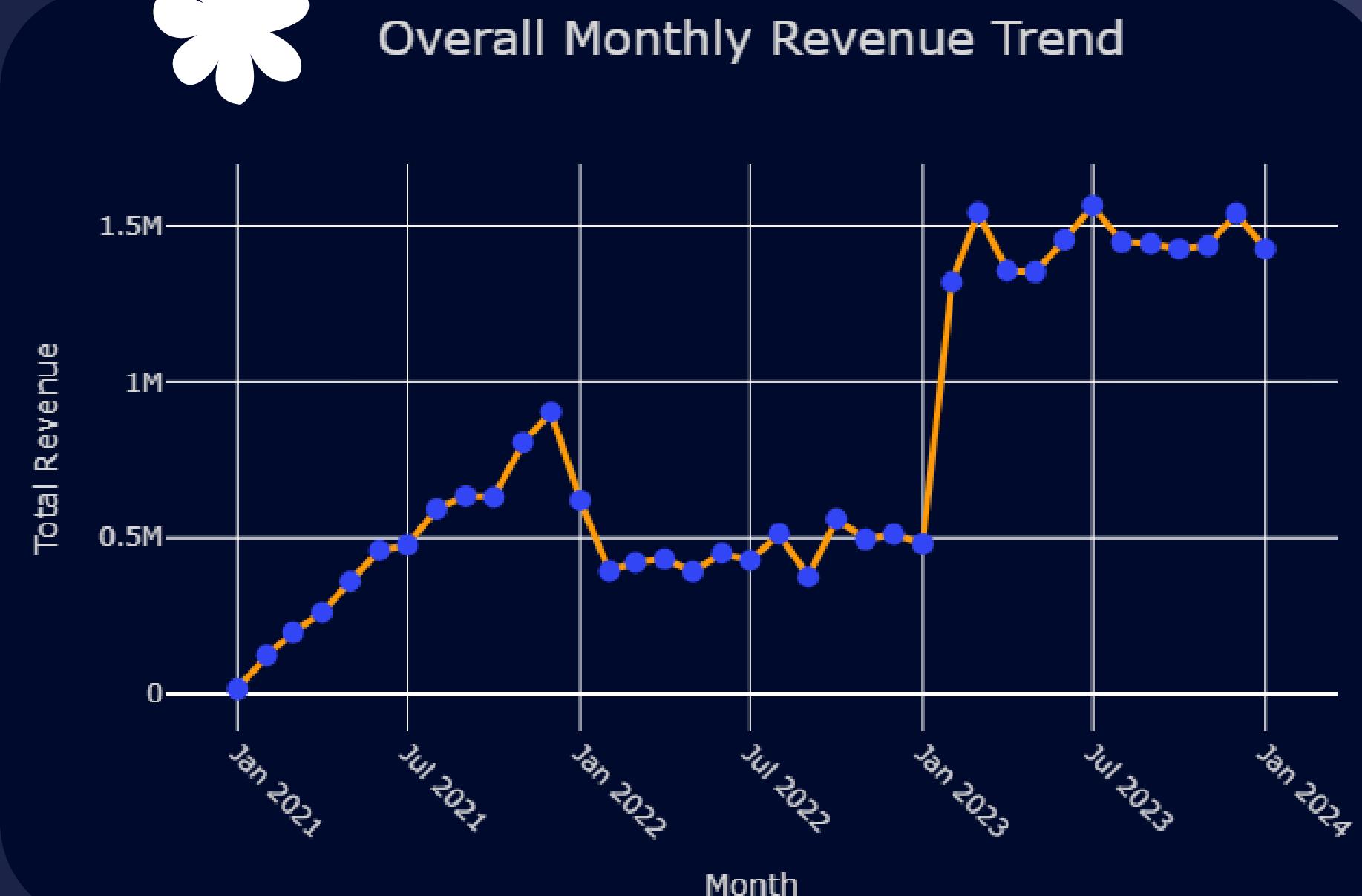


# Overall Monthly Revenue Trend

**Insight:** Total monthly revenue grew from \$16,734 (Jan 2021) to over \$1M+ per month by 2023-2024.

**Peak Performance:** July 2023 achieved the highest revenue at \$1,563,867.

**Growth Rate:** An extraordinary +8,414% revenue growth from the first to the last month, indicating explosive business expansion.

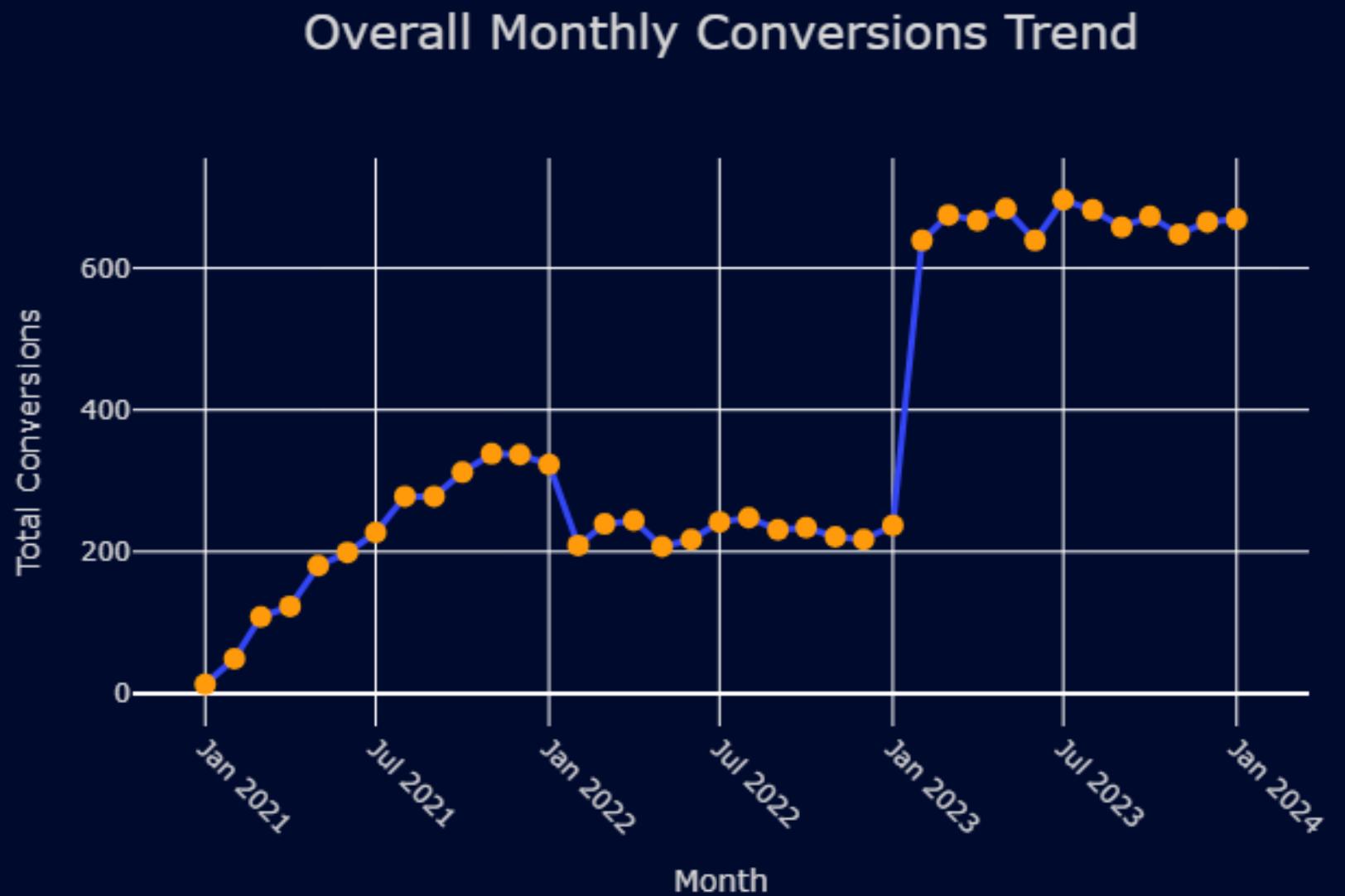


# Overall Monthly Conversions Trend

Insight: Monthly conversions grew from 13 customers (Jan 2021) to 500+ customers per month by 2023-2024.

**Peak Performance:** July 2023 had the highest conversions with 696 unique customers.

**Growth Rate:** A +5,046% growth in customer conversions, showing strong customer acquisition success.



# **7-Cost efficiency and spend impact**

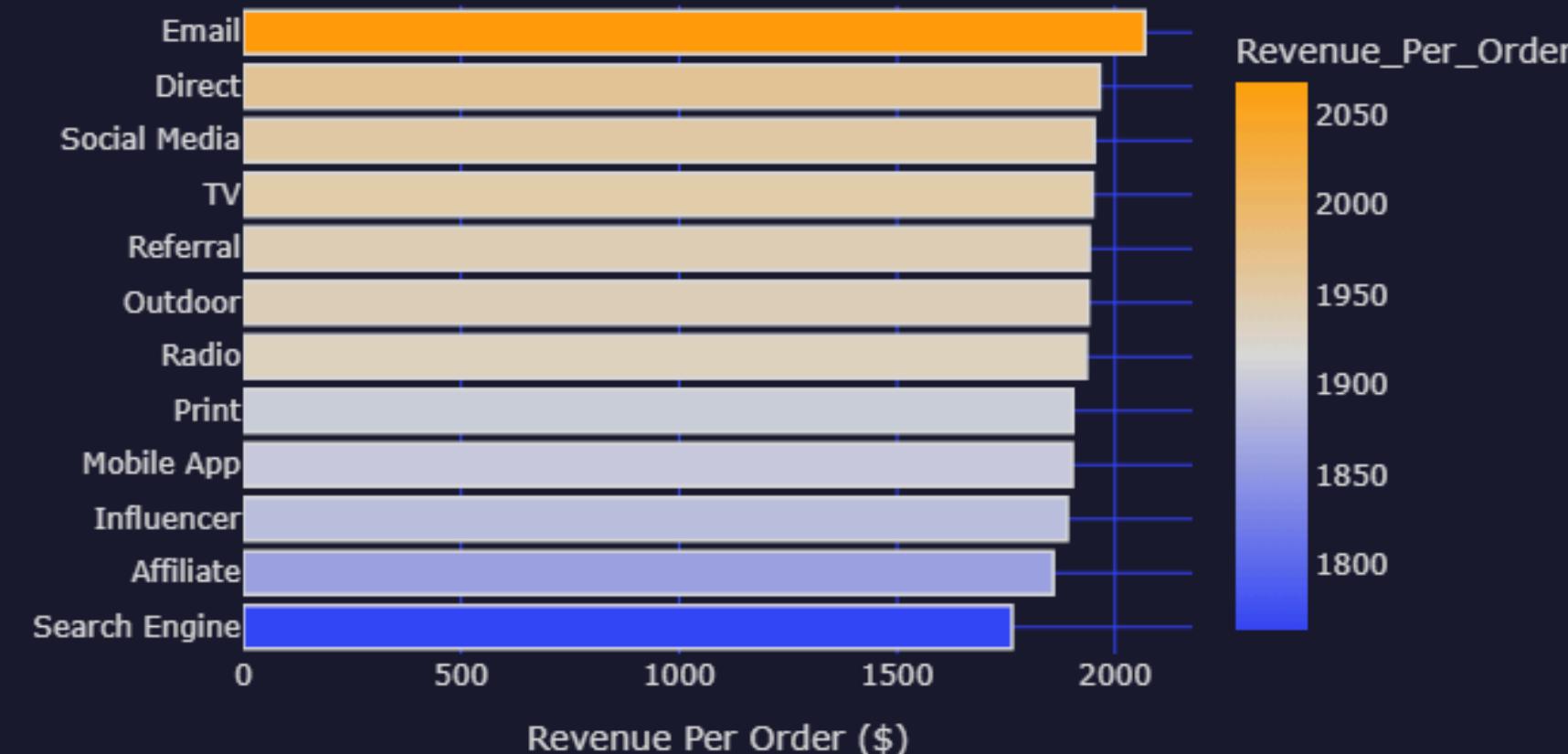
## Revenue Per Order by Channel

Insight: Email delivers the highest revenue per order, clearly outperforming all other marketing channels and making it the strongest driver of value per transaction.

Key Observation: Direct and Social Media follow closely behind Email, forming a high-performing group of channels with above-average revenue per order.

Pattern: Most remaining channels cluster in a tight band around a similar revenue-per-order level, while Search Engine and Affiliate sit at the bottom, indicating consistently weaker monetization.

Revenue Per Order by Channel - Dark Mode



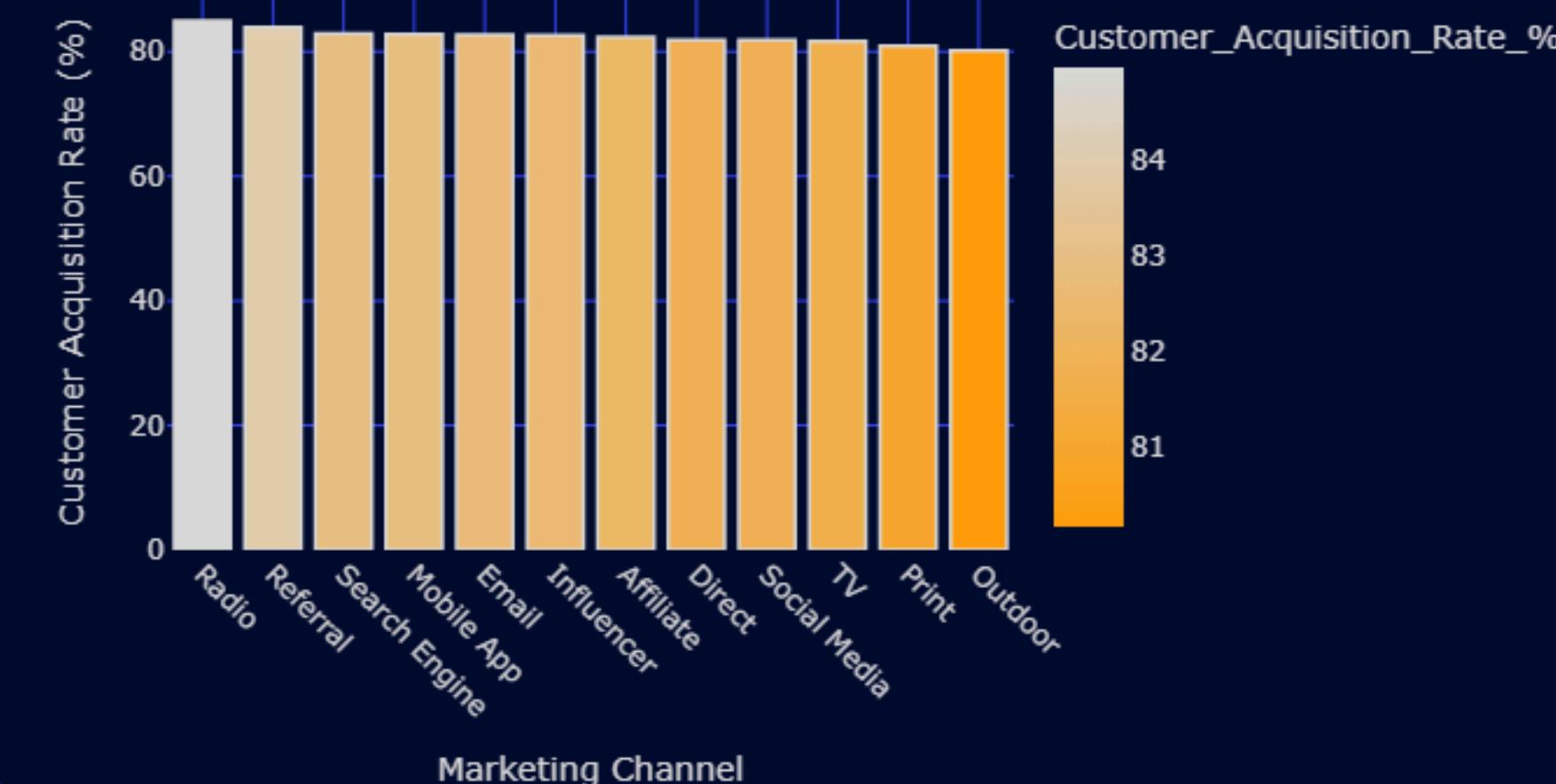
# Customer Acquisition Rate by Channel

Insight: Radio and Referral achieve the highest customer acquisition rates, making them the strongest channels for turning prospects into customers.

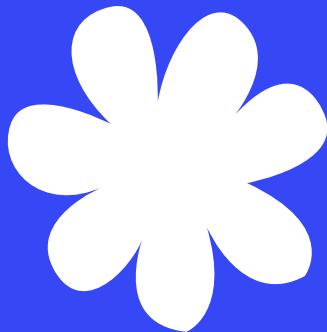
Key Observation: Almost all marketing channels perform in a very tight band around 80–85% acquisition rate, which means acquisition efficiency is broadly similar across the mix.

Pattern: Outdoor and Print consistently sit at the lower end of the acquisition range, while top channels like Radio, Referral, and Search Engine stay at the upper edge of the distribution.

Customer Acquisition Rate by Channel - Dark Mode



# Channel Efficiency Ranking



Insight: Email is the most efficient marketing channel overall, achieving the highest efficiency score and delivering the best balance of revenue and conversions.

Key Observation: Radio, Direct, Referral, and Social Media form a strong second tier with very similar efficiency scores, meaning they are also reliable choices for budget allocation.

Pattern: Most remaining channels cluster in a narrow efficiency band below the leaders, with Affiliate and Search Engine consistently at the bottom of the ranking, indicating weaker marketing performance.



Channel Efficiency Ranking - Dark Mode

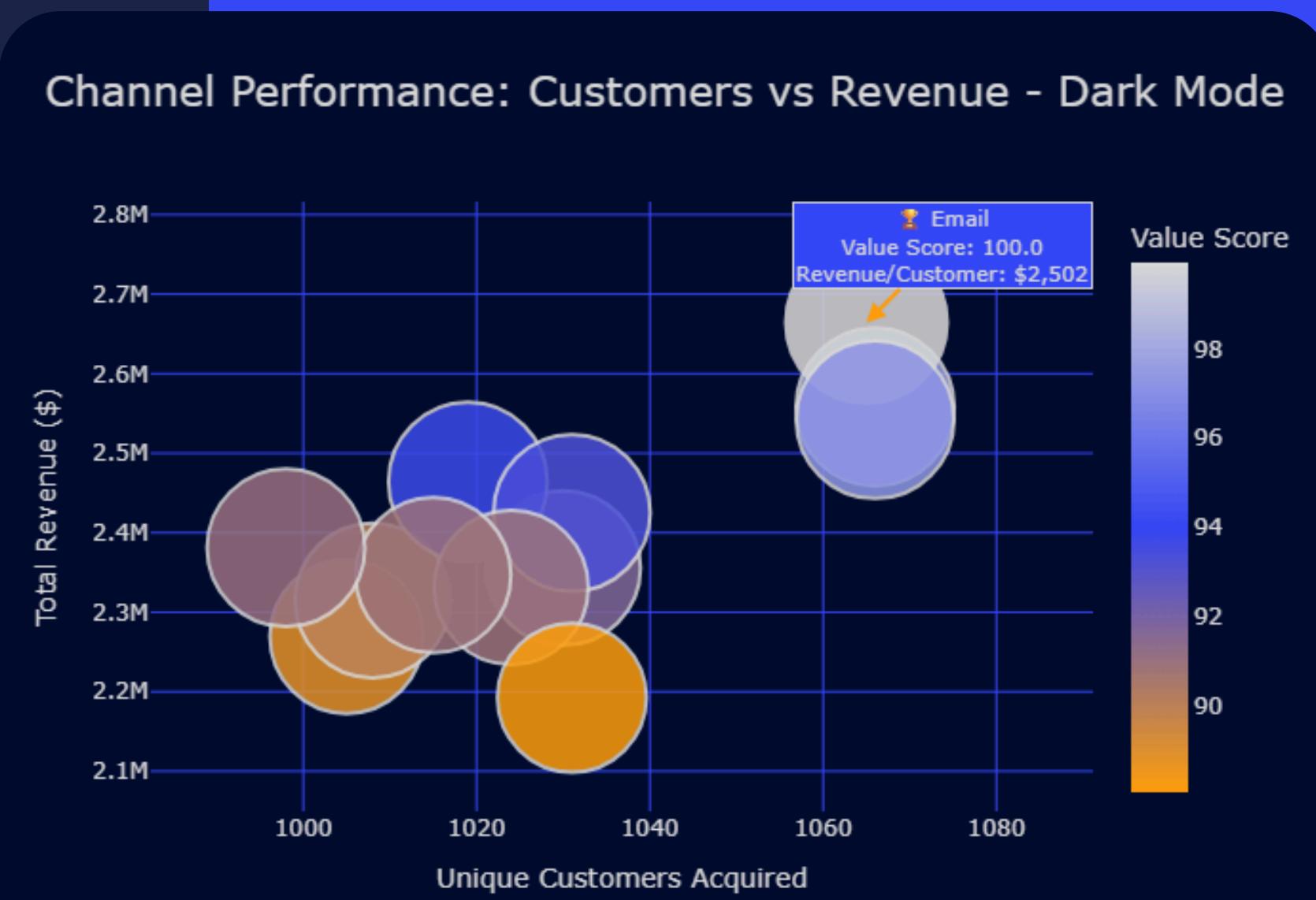


# Channel Performance: Revenue vs Customer

**Insight:** Email delivers the strongest overall value, combining one of the highest revenue levels with one of the highest unique-customer counts, making it the most balanced high-performance channel on the chart.

**Key Observation:** Channels with similar customer volumes do not always generate the same revenue, showing that some channels (like Email) monetize each customer much better than others with comparable reach.

**Pattern:** Most channels cluster in the middle of the plot with moderate revenue and customer counts, while only a few bubbles break away toward the top-right, indicating truly high-value acquisition performance.

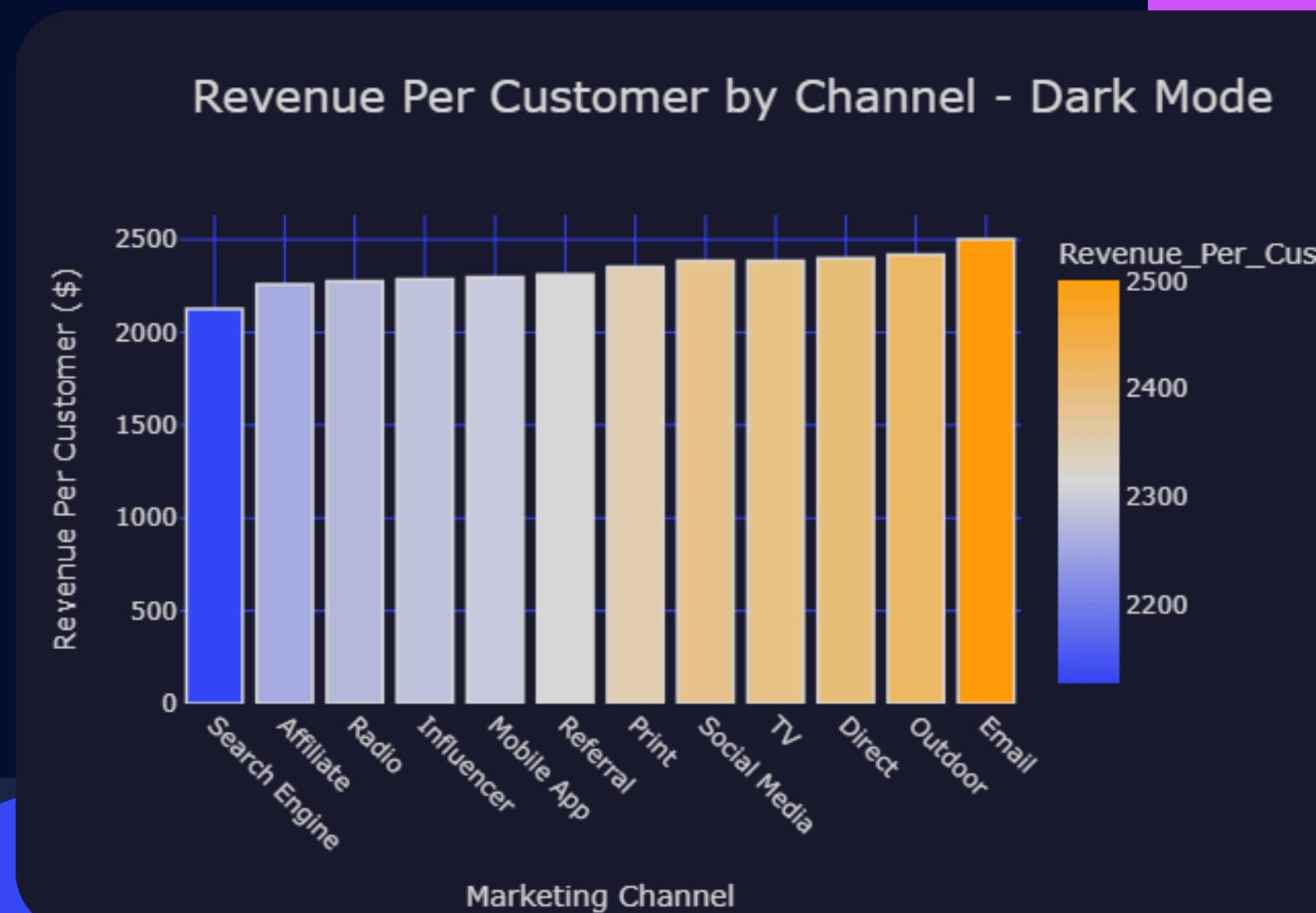


# Revenue Per Customer by Channel

**Insight:** Email generates the highest revenue per customer, making it the strongest channel for monetizing each acquired user.

**Key Observation:** Outdoor and Direct also deliver above-average revenue per customer, forming a solid high-value group just behind Email.

**Pattern:** Most other channels cluster tightly in the 2,200–2,400 range, while Search Engine lags at the bottom, indicating weaker revenue per customer compared to the rest.



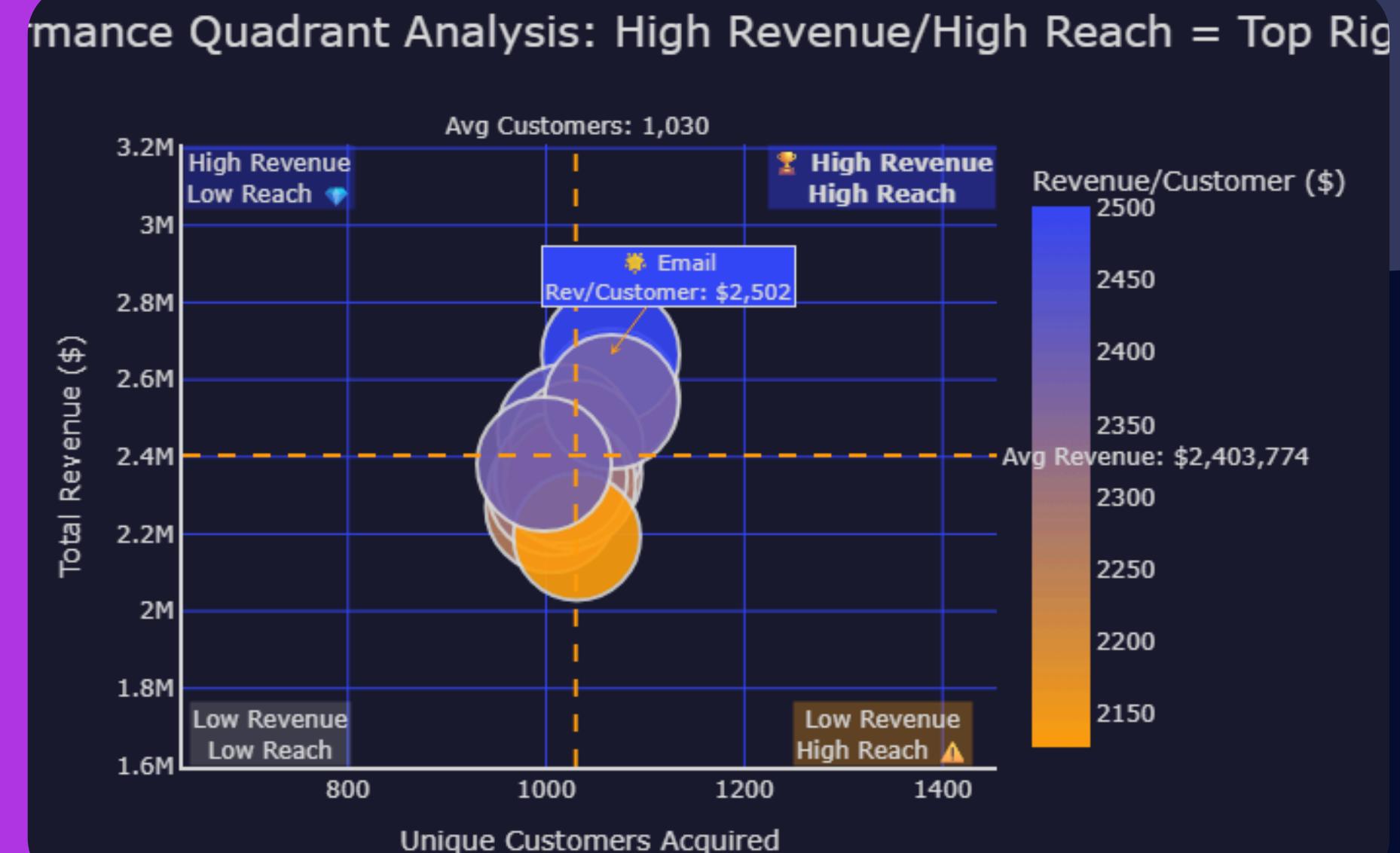
# Performance Quadrant Analysis:

## High Revenue/High Reach = Top Right

**Insight:** Email sits firmly in the high-revenue / high-reach quadrant, delivering both above-average total revenue and above-average unique customers, making it the top-priority channel for scaling.

**Key Observation:** Several channels fall into the “high revenue, low reach” or “low revenue, high reach” zones, indicating opportunities either to broaden reach for profitable channels or to improve monetization where reach is already strong.

**Pattern:** Most channels cluster around the quadrant center near the average revenue and customer thresholds, while only a few bubbles break into the top-right area, highlighting how rare truly high-value, high-reach channels are.



# 8-STRATEGIC RECOMMENDATIONS

- **Invest More in Search & Email:** Increase spend on Search Engine and Email; they bring the best mix of profit and efficiency compared to other channels.
- **Reduce Budget on TV / Low-Efficiency Channels:** Gradually cut budget from TV and any channels with high cost per conversion, and reallocate this spend to the best-performing digital channels.
- **Double Down on High-Value Regions & Segments:** Prioritize Upper Egypt and high-value customer segments with tailored offers, since they generate stronger revenue and growth than other regions.
- **Shift Focus from Volume to Profitability:** Accept paying more per click or per customer on channels that deliver higher lifetime value, rather than optimizing only for cheap traffic.
- **Establish a Monthly Performance Review:** Set a fixed monthly review to track ROI, cost per conversion, and customer growth by channel, and adjust the marketing mix based on data, not intuition.



# Thank You \*

