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Task 1.1: Analysis Strategy

I will apply the methodology which is structured, integrated in business KPIs, customer behavior, and cost efficiency of understanding CRM integration effectiveness.

The points that need to followed for the methodology of analysis:

1. Evaluation Methodology of Success in Integration:

a. Performance Metrics Analysis: Identify marketing effectiveness of source, use campaign impression metrics, leads and cost efficient.
b. Metrics from the Customer's View: Volume of new customers, distribution on tier of subscription, churn risk, and customer lifetime value through platforms by CRM tools.
c. Attribution of Revenue: Attribution of revenue data to sources of acquisition in computing short and long term financial value.
d. Return on Investment: Identify ROI of any single platform in comparison to development investment, marketing, and ongoing expenses.

2. Key Assumption and Limitations:

a. Attribution is Linear: It means revenue is attributed directly back to the source of acquisition itself, and there is absolutely no cross-platform effect.
b. Predictive Churn Risk: The churn risk score in 'customer_lifecycle.csv' is believed to be an effective future indicator
c. Cost Granularity: It is assumed that recurring costs occur at a monthly operational life of a post-campaign.
d. Time Frame Uniformity: Every single platform assumed to have an enough runtime to show performance, although variable campaign length will be normalized.

3. Addressing Data Quality Issues:

a. Missing Values: Apply necessary actions like imputation or removal to check if there are any nulls in columns.
b. Consistent Dataset and Data types: For time series analysis, making sure the data fields and numeric fields are in valid formats.
c. Outlier Handling: Examine and review data outliers in the revenue and cost datasets. Check if any observations should be removed or kept.

Task 1.2: KPI Framework

Following are the KPI categories i.e. used to measure the key success of each CRM Integration:

1. Revenue metrics:

a. Total Revenue per Platform: Sum each CRM of all revenue from customers
b. Customer Lifetime Value: Multiple the sum of revenue to date per customer and average customer life span.
c. Average Revenue per User: Average customer revenue earned in each CRM
d. New Customer Acquired: Count the number of customers per CRM platform.
e. Conversion Time: Average number of days it takes customers to convert.
f. Churn Rate: Calculate percentage of high churn risk score.

2. Cost-Effectiveness Metrics

a. Cost per Lead: Total number of leads generated divide by cost of campaign
b. Customer Acquisition Cost: To calculate CAC, total number of investment per platform divide by number of customers acquired.
c. Return on Investment: The ratio i.e. used to estimate the effectiveness of an investment or to compare the effectiveness of a multiple of the same kind of investments

3. Strategic Value Indicators

a. Engagement Score: Average the feature usage score per CRM-acquired customer
b. Referrals Made: Indicate platform stickiness and customer advocacy
c. Support Ticked Volume: Apply product friction

Above all KPIs used to assess short term campaign success and long term customer value, that helps to find which CRM integrations will give the largest overall return.

Task 1.3: Evaluation Framework

Following are the evaluation framework i.e. used to compare the CRM integrations fairly.

1. Account for different Launch Dates

a. Normalized Metrics: Normalize the metrics like revenue, leads and ROI based on number of active campaign months.
b. Monthly Averages: Compare platforms with different durations by calculating average monthly performance.

2. Performance Comparison Factors

a. Retention Indicators: Include churn risk and active status to access customer stickiness beyond acquisition volume
b. Subscription Tier Distribution: Weight the customers by subscription level since higher tier customers drive more revenue.

3. Metric Weighting Approach

Following are the weighted score model to evaluate each CRM:

Metric Category	Weight (%)
Revenue Metrics	40 %
Customer Acquisition and Retention	25%
Cost Effectiveness	20%
Strategic Value	15%

Note:

Ranking: Rank the platform based on their composite performance scores.

These framework ensures a fair comparison of all CRM platforms, that will account for both financial and strategic performance dimensions.

Part 2: Data Analysis

Task 2.1: Data Exploration

1. Key insights from initial data exploration for every csv file

a. **Customer acquisition:** This file includes the information on how and when each customer was acquired.
   - Total Customers: 1,844
   - Key Fields: acquisition source, company size, industry, initial_subscription_tier, trial_to_paid_days, is_active

b. **Campaign_costs:** This file contains the information of CRM level cost breakdown
   - 8 entries (one per CRM platform)
   - Key Fields: development_cost, marketing_spend, partnership_fees, etc.

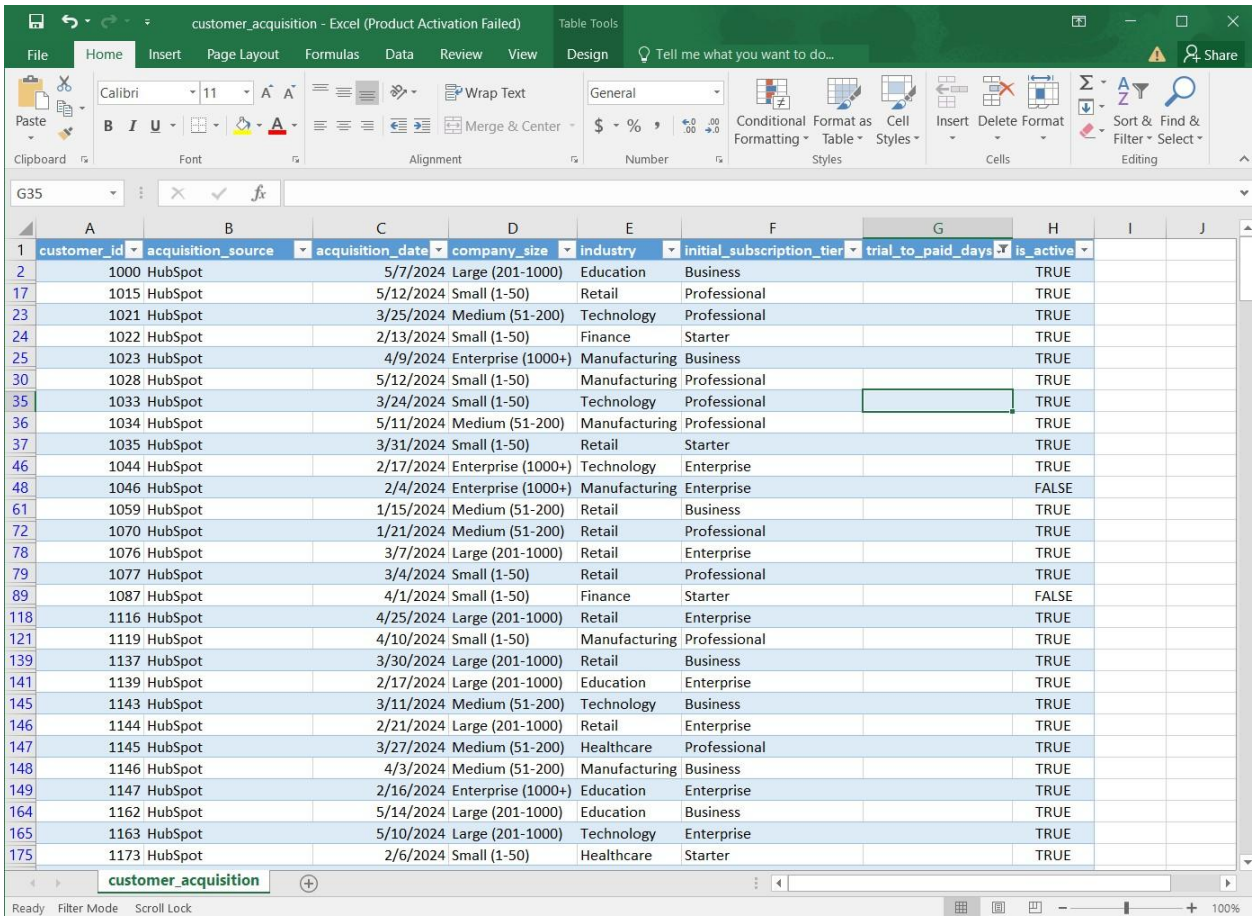
c. **Customer_lifecycle:** This file contains the information of lifetime metrics for customers per acquisition_source
   - Total Customers: 1,445
   - Key Fields: total_revenue_to_date, months_active, avg_monthly_revenue

d. **Integration_Campaign:** This file contains metadata for campaign
   - Total Campaign: 8
   - Fields: Crm_platform, start_date, end_date, campaign_type, budget_usd, etc.

e. **Revenue_Subscriptions:** Monthly revenue records per customer Key Fields:
   - Monthly_revenue: How much revenue a customer generated in a specific month
   - Subscription_tier: Subscription Type (Starter, Professional, etc.)

2. Data Quality Observations

- In Customer_lifecycle file, there are missing values in the trail_to_paid_days column.



customer_acquisition - Excel (Product Activation Failed)

customer_id	acquisition_source	acquisition_date	company_size	industry	initial_subscription_tier	trial_to_paid_days	is_active
1000	HubSpot	5/7/2024	Large (201-1000)	Education	Business		TRUE
1015	HubSpot	5/12/2024	Small (1-50)	Retail	Professional		TRUE
1021	HubSpot	3/25/2024	Medium (51-200)	Technology	Professional		TRUE
1022	HubSpot	2/13/2024	Small (1-50)	Finance	Starter		TRUE
1023	HubSpot	4/9/2024	Enterprise (1000+)	Manufacturing	Business		TRUE
1028	HubSpot	5/12/2024	Small (1-50)	Manufacturing	Professional		TRUE
1033	HubSpot	3/24/2024	Small (1-50)	Technology	Professional		TRUE
1034	HubSpot	5/11/2024	Medium (51-200)	Manufacturing	Professional		TRUE
1035	HubSpot	3/31/2024	Small (1-50)	Retail	Starter		TRUE
1044	HubSpot	2/17/2024	Enterprise (1000+)	Technology	Enterprise		TRUE
1046	HubSpot	2/4/2024	Enterprise (1000+)	Manufacturing	Enterprise		FALSE
1059	HubSpot	1/15/2024	Medium (51-200)	Retail	Business		TRUE
1070	HubSpot	1/21/2024	Medium (51-200)	Retail	Professional		TRUE
1076	HubSpot	3/7/2024	Large (201-1000)	Retail	Enterprise		TRUE
1077	HubSpot	3/4/2024	Small (1-50)	Retail	Professional		TRUE
1087	HubSpot	4/1/2024	Small (1-50)	Finance	Starter		FALSE
1116	HubSpot	4/25/2024	Large (201-1000)	Retail	Enterprise		TRUE
1119	HubSpot	4/10/2024	Small (1-50)	Manufacturing	Professional		TRUE
1137	HubSpot	3/30/2024	Large (201-1000)	Retail	Business		TRUE
1139	HubSpot	2/17/2024	Large (201-1000)	Education	Enterprise		TRUE
1143	HubSpot	3/11/2024	Medium (51-200)	Technology	Business		TRUE
1144	HubSpot	2/21/2024	Large (201-1000)	Retail	Enterprise		TRUE
1145	HubSpot	3/27/2024	Medium (51-200)	Healthcare	Professional		TRUE
1146	HubSpot	4/3/2024	Medium (51-200)	Manufacturing	Business		TRUE
1147	HubSpot	2/16/2024	Enterprise (1000+)	Education	Enterprise		TRUE
1162	HubSpot	5/14/2024	Large (201-1000)	Education	Business		TRUE
1163	HubSpot	5/10/2024	Large (201-1000)	Technology	Enterprise		TRUE
1173	HubSpot	2/6/2024	Small (1-50)	Healthcare	Starter		TRUE

And there are no missing data in other files

- Columns related to money (monthly_revenue, total_investment, etc.) and performance (leads_generated, clicks) are complete so we don't need to clean these fields before doing calculations like revenue, ROI, etc.

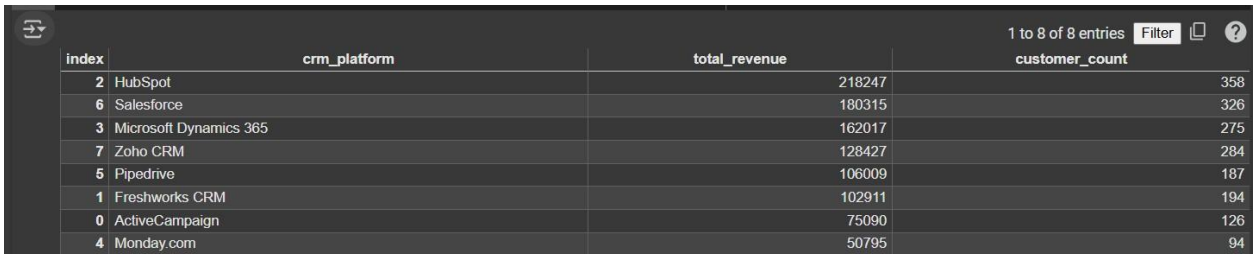
- **Keys:**
  - Each dataset uses crm_platform (HubSpot, Pipedrive, etc.) to track integration performance and marketing.
  - This column i.e. acquisition_source/crm_platform in the datasets are effectively used to link the customer data back to the campaign and cost information. Also, allow us to join and compare campaign metrics, cost data, customer performance on the basis of CRM platform level.
  - Customer_id field is the unique identifier for each customer and it is presented in multiple datasets:
    - Customer_acquisition.csv
    - Revenue_subscriptions.csv
    - Customer_lifecycle.csv

3. Relationships between datasets

Source Table	Linked To	Key to link
Customer_acquisition	Every dataset	Customer_id, acquisition_source
Revenue_subscriptions	Lifecycle and acquisition	Customer_id, acquisition_source
Customer_lifecycle	Revenue, acquisition and churn risk score	Customer_id
Integration_campaigns	Campaign_costs	Crm_platform
Campaign_costs	Revenue and Campaign	Crm_platform

Task 2.2: Performance Analysis

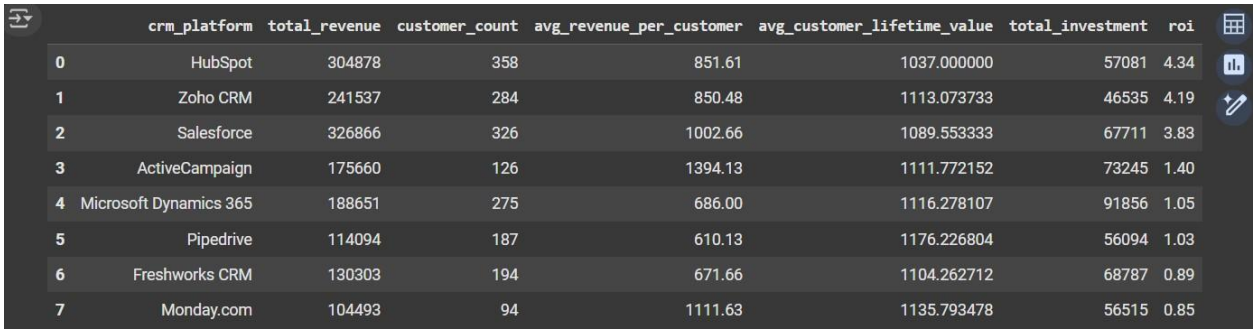
1. Calculation:



1 to 8 of 8 entries Filter

index	crm_platform	total_revenue	customer_count
2	HubSpot	218247	358
6	Salesforce	180315	326
3	Microsoft Dynamics 365	162017	275
7	Zoho CRM	128427	284
5	Pipedrive	106009	187
1	Freshworks CRM	102911	194
0	ActiveCampaign	75090	126
4	Monday.com	50795	94

This table shows the total_revenue and customer_count per crm_platform



	crm_platform	total_revenue	customer_count	avg_revenue_per_customer	avg_customer_lifetime_value	total_investment	roi
0	HubSpot	304878	358	851.61	1037.000000	57081	4.34
1	Zoho CRM	241537	284	850.48	1113.073733	46535	4.19
2	Salesforce	326866	326	1002.66	1089.553333	67711	3.83
3	ActiveCampaign	175660	126	1394.13	1111.772152	73245	1.40
4	Microsoft Dynamics 365	188651	275	686.00	1116.278107	91856	1.05
5	Pipedrive	114094	187	610.13	1176.226804	56094	1.03
6	Freshworks CRM	130303	194	671.66	1104.262712	68787	0.89
7	Monday.com	104493	94	1111.63	1135.793478	56515	0.85

Based on financial and customer performance, the above table shows the detailed evaluation of each CRM platform with their ARPC, CLV, ROI and total investment.

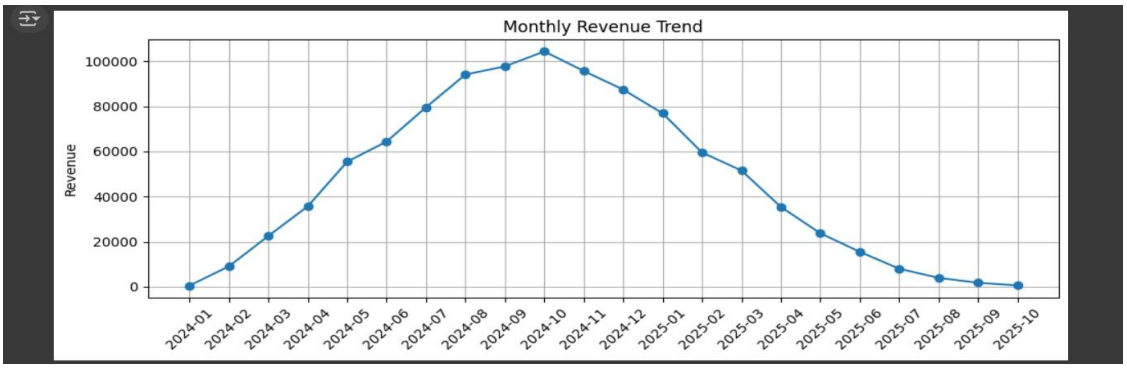
subscription_tier	Business	Enterprise	Professional	Starter
crm_platform				
ActiveCampaign	47	47	18	14
Freshworks CRM	85	44	41	24
HubSpot	133	103	82	40
Microsoft Dynamics 365	93	79	68	35
Monday.com	39	20	25	10
Pipedrive	73	43	45	26
Salesforce	127	74	87	38
Zoho CRM	108	65	73	38

This table shows the calculation of total number of subscription tier based on CRM platforms.

	crm_platform	total_customers	active_customers	active_rate
0	ActiveCampaign	126	108	0.86
1	Freshworks CRM	194	171	0.88
2	HubSpot	358	324	0.91
3	Microsoft Dynamics 365	275	241	0.88
4	Monday.com	94	84	0.89
5	Pipedrive	187	168	0.90
6	Salesforce	326	288	0.88
7	Zoho CRM	284	249	0.88

Above table shows the active retention rate per CRM platform

- Identify top and bottom performers based on Return on Investment ○ Top Performers
  - HubSpot: Best performer overall – strong revenue and highest ROI
  - Zoho CRM: Efficient Investment to return ratio with solid customer and revenue
  - SalesForce: Good performance and strong ROI ○ Bottom Performers
  - Monday.com: 0.85 ROI, underperforming relative to others
  - Freshworks CRM: 0.89 ROI, slightly better than Monday.com but still below average than others
- Analyze trends and patterns



The above chart shows a consistent upward trend, for the successful customer acquisition and retention efforts based on the CRM platforms over 12-month period.

Task 2.3: Revenue Attribution

- Calculation of Customer lifetime value by acquisition source

	crm_platform	total_customers	total_revenue	avg_clv
5	Pipedrive	97	114094	1176.23
4	Monday.com	92	104493	1135.79
3	Microsoft Dynamics 365	169	188651	1116.28
7	Zoho CRM	217	241537	1113.07
0	ActiveCampaign	158	175660	1111.77
1	Freshworks CRM	118	130303	1104.26
6	Salesforce	300	326866	1089.55
2	HubSpot	294	304878	1037.00

This table shows the average customer lifetime value based on acquisition source. After analysis, we can conclude:

○ Pipedrive has the highest CLV ○ HubSpot and Salesforce has the highest total revenue.

- Analyze Subscription tier distribution

subscription_tier	crm_platform	Business	Enterprise	Professional	Starter
0	ActiveCampaign	247	201	140	82
1	Freshworks CRM	354	258	196	171
2	HubSpot	637	638	382	196
3	Microsoft Dynamics 365	480	429	416	158
4	Monday.com	169	135	94	57
5	Pipedrive	331	294	205	91
6	Salesforce	572	476	427	130
7	Zoho CRM	388	350	297	98

After analysis, we can conclude that:
-- HubSpot and Salesforce have the highest tier subscriptions like Business and Enterprise.

- Calculation of ROI for each integration campaign

	crm_platform	total_revenue	total_investment	roi
2	HubSpot	304878	57081	4.34
7	Zoho CRM	241537	46535	4.19
6	Salesforce	326866	67711	3.83
0	ActiveCampaign	175660	73245	1.40
3	Microsoft Dynamics 365	188651	91856	1.05
5	Pipedrive	114094	56094	1.03
1	Freshworks CRM	130303	68787	0.89
4	Monday.com	104493	56515	0.85

- **Top 3 Performers:** HubSpot, Zoho CRM, Salesforce
- **Bottom 3 Performers:** Monday.com, Freshworks CRM, Pipedrive

Task 2.4: Insights and Patterns

1. Identifying key insights and patterns:

- **Which customer segments are most valuable?**
  - Let's analyze via company_size, industry and initial_subscription_tier and group them by average customer lifetime revenue from customer_lifecycle ○ By Company Size:

	company_size	customer_count	avg_lifetime_revenue	total_revenue
0	Enterprise (1000+)	367	1120.68	411288
1	Large (201-1000)	378	1106.05	418088
2	Medium (51-200)	345	1095.95	378102
3	Small (1-50)	355	1067.62	379004

- Enterprise has the highest average revenue.
  - **By Industry:**

	industry	customer_count	avg_lifetime_revenue	total_revenue
4	Retail	250	1134.00	283501
2	Healthcare	252	1122.56	282885
3	Manufacturing	226	1093.84	247208
1	Finance	243	1091.31	265189
0	Education	249	1086.51	270541
5	Technology	225	1054.04	237158

- Retail and Healthcare customers have the highest revenue per user ○ **By Initial Subscription Tier**

	initial_subscription_tier	customer_count	avg_lifetime_revenue	total_revenue
1	Enterprise	373	1116.12	416313
0	Business	549	1111.53	610229
2	Professional	344	1071.77	368689
3	Starter	179	1068.44	191251

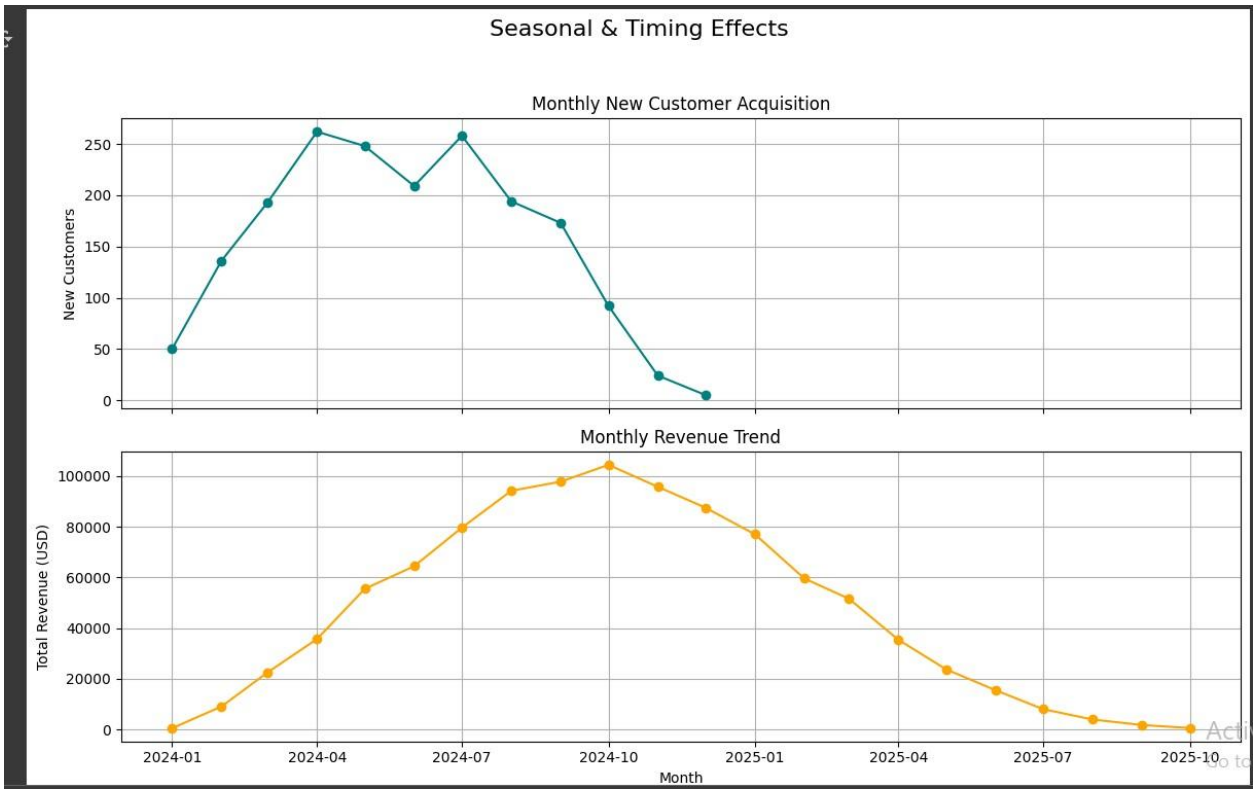
- Enterprise and Business generate the most value per user ■ Business has the highest total revenue

- **What factors correlate with higher revenue?**

Factor	Correlation with Revenue
feature_usage_score	0.03
churn_risk_score	0.03
last_login_days_ago	0.02
referrals_made	-0.01
support_tickets_count	-0.02

  - All correlation coefficients are very close to 0, that means weak linear relationships which conclude that revenue is likely to be influenced more by external factors than usage metrics alone.

- **Are there seasonal or timing effects?**
    - Let's analyze trends over time using
        - acquisition_date from customer_acquisition.csv file.
        - revenue_date and monthly_revenue from revenue_subscriptions.csv file.
    - Need to conclude from "Number of new customers acquired per month" and "Monthly total revenue trends"



Analysis part from the line plot:

Acquisition part

-- I have conclude that KrispCall had a strong acquisition phase between March and July 2024

-- Many campaigns launched early 2024

Revenue part

-- Natural decline in 2025 due to No new campaign, and customer churn --

Revenue lags behind acquisition after Oct 2024

Part 3: Reporting & Recommendations

Task 3.1: Executive Summary

Over the last 12 months, KrispCall established 8 major CRM platform integration. All of the above analysis aims to assess how those integrations have succeed in terms of financial metrics, customer lifetime value, acquisition and ROI.

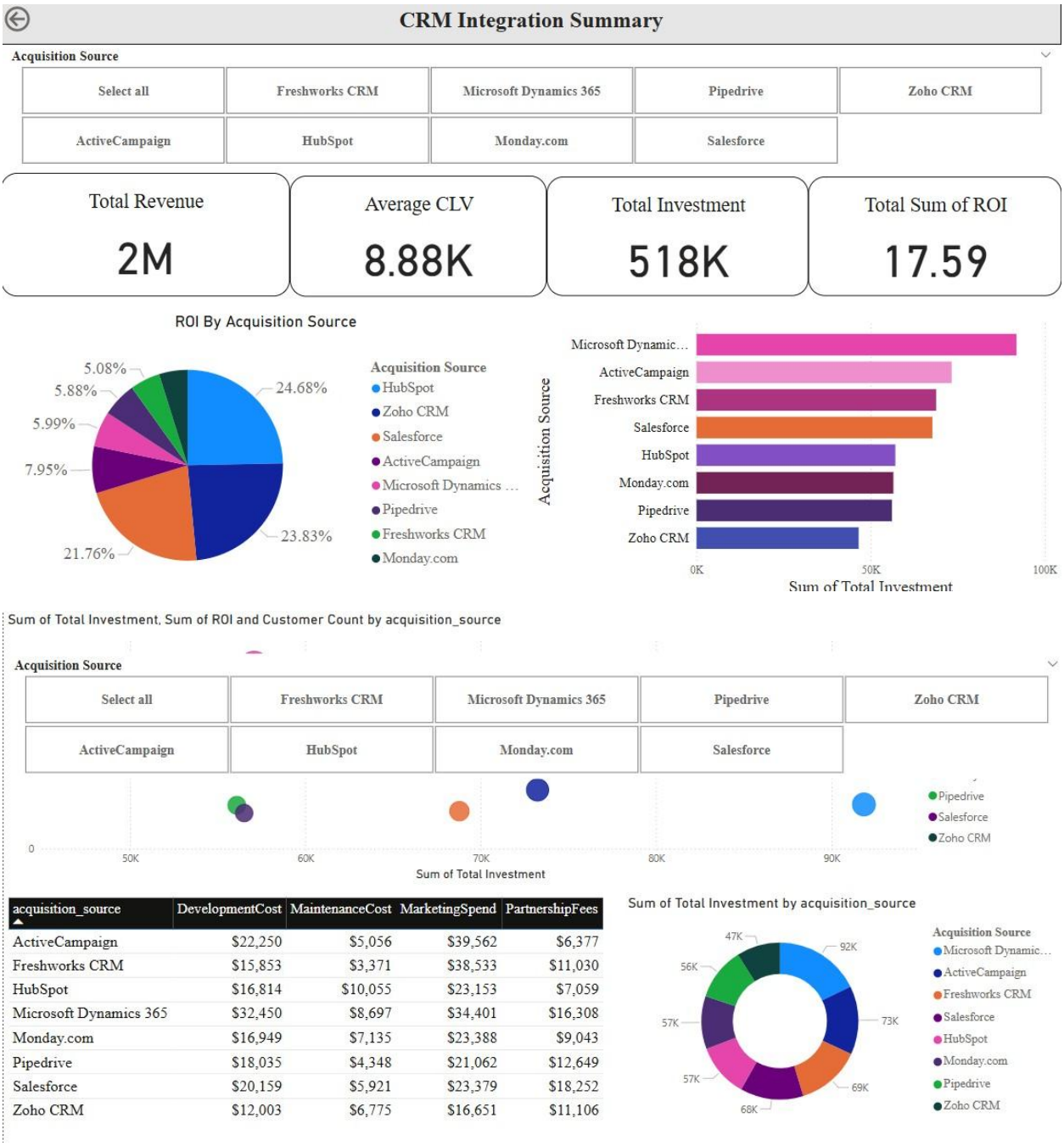
This analysis has concluded that the top three best performers CRM platforms are HubSpot, Zoho CRM and Salesforce, these platforms excel in total revenue, customer acquisition, and ROI (Return on Investment). HubSpot has the highest ROI i.e 4.34, driven by its large number of user and strong conversion to high tier subscriptions whereas Zoho CRM has the exceptional cost efficiency with an ROI of 4.19 and average customer lifetime value. Due to sustained customer engagement, Salesforce is the third best performer CRM platform with more costly and consistent contribution of high revenue.

On the other hand, bottom performers are Monday.com and Freshworks CRM. Monday.com has failed to generate sufficient revenue relative for the investment due to the lowest ROI i.e. 0.85. However, Freshworks CRM, showed the limited customer growth with ROI of 0.89. That's why, these two platforms may require reevaluation of integration strategy.

In the terms of timing effects, Revenue trends naturally decline due to no new campaign and customer churn and also the customer acquisition peaked between March and July 2024. Overall, KrispCall's CRM integrations expressed positive ROI across most of the platforms indicating the investing in strategic partnerships which conclude that focusing on high-performing CRMs and refinement of underperforming campaigns will be critical for maximizing the value in future.

Task 3.2: Dashboard Concept

□ Dashboard:



acquisition_source	DevelopmentCost	MaintenanceCost	MarketingSpend	PartnershipFees
ActiveCampaign	$22,250	$5,056	$39,562	$6,377
Freshworks CRM	$15,853	$3,371	$38,533	$11,030
HubSpot	$16,814	$10,055	$23,153	$7,059
Microsoft Dynamics 365	$32,450	$8,697	$34,401	$16,308
Monday.com	$16,949	$7,135	$23,388	$9,043
Pipedrive	$18,035	$4,348	$21,062	$12,649
Salesforce	$20,159	$5,921	$23,379	$18,252
Zoho CRM	$12,003	$6,775	$16,651	$11,106

Based on the above dashboard, the main goal of this analysis is to provide actionable insights into the performance and ROI of various CRM platform integrations. Stakeholders can evaluate and monitor the cost efficiency and platform wise performance.

Dashboard 1st part:

- **Cards (Top-Level Metrics)** ○ **Visual Type:** Card visuals
    - **Metrics**
        - Total Revenue: This card shows the cumulative revenue attribute of all acquisition source
        - Average CLV: Average revenue per customer (Customer Lifetime Value)
        - Total Investment: Sum of all the investments across every CRM platforms
        - Total ROI: Sum of all ROI values across platforms

  These card visuals help the stakeholders for a quick performance across CRM platforms

- **ROI by Acquisition Source**

    - **Visual Type:** Pie Chart
    - **Metrics**
        - Total percentage of contribution of each CRM Source to ROI
        - This visual helps the marketing heads and Product Managers to evaluate strategic investment impact.

- **Investment by Acquisition Source**

    - **Visual Type:** Stacked bar chart
    - **Metrics**
        - Total Investment per CRM Platform, shows the comparison of CRM costs.
        - Helps to evaluate the cost distribution and potential overspending to the financial controllers and Business Analysts

Dashboard 2nd part:

- **ROI vs Total Investment**

    - **Visual Type:** Scatter Plot
    - **Metrics**
        - X-axis: Total Investment
        - Y-axis: ROI
        - Bubble Size: Customer Count

  This visual helps in identifying which CRM platform provides the high ROI for relatively low investments and helps to the Strategy teams and Decision-Makers

- **Detailed Cost Breakdown Table**

    - **Visual Type:** Table ○ **Metrics**
        - Platform wise breakdown of: Development Cost
    - Maintenance Cost
    - Marketing Spend
    - Partnership Fees

- This visual is useful for auditing and identifying the heavy cost CRM platforms to Technical and Financial stakeholders.

- **Investment Distribution by CRM**

- Visual Type: Donut Chart ▪
  Metrics:
    - Proportional share of total investment per CRM source
    - Helps for the budget tracking and resource allocation based on CRM source investment mainly for Finance teams

Task 3.3: Strategic Recommendations

Which integrations to prioritize for additional investment?

- After Analysis, we need to prioritize top three best performers CRM platforms (HubSpot, Zoho CRM and Salesforce). As HubSpot has the highest ROI of 4.34 with strong revenue generation and high share of Business and Enterprise customers so further investment will be low-risk and high reward. On the other hand, Zoho CRM has high Customer lifetime Value, also demonstrate exceptional cost-efficiency, that means additional investment could enhance customer acquisition and expand market reach. Beside these two platforms, further investment should be focus on retaining high value clients and upselling premium tiers for Salesforce CRM since it generates consistently high revenue despite with higher costs.

Which integrations need optimization or reconsideration?

- Bottom two performers CRM platform need optimization and refinement since, Monday.com has the lowest ROI of 0.85 and weak customer acquisition. So, this platform integration should be reviewed for better performance and also consider repositioning the campaign and reduce investment on these type of CRM platform. Similarly to Monday.com, Freshworks also shows the underwhelming ROI of 0.89, investigation on product-market and targeting campaign must be reconsidered on this CRM platform.

Next Steps for Integration Strategy Suggestion

- As a next step in the integration strategy, KrispCall should refine its customer target by leveraging insights from high value segments. From the above analysis, Enterprise clients and customers in the Retail and Healthcare industries exhibit high lifetime revenue that indicates strong alignment with KrispCall's offerings. In the current analysis, feature usage and referrals showed weak correlation, improvement in the product engagement and user retention via

strategies like onboarding optimization and loyalty programs to contribute for the long term value and reduce the churn over time must be next steps.

□ Resource allocation recommendations

- Increase the resource allocation and development budgets and integration marketing to the top performer CRM (Hub Spot, Zoo CRM, and Salesforce) and these CRM platforms must be prioritized since investment on this platform are low risk and high rewards.
- Reduce investment to the low ROI platforms (Monday.com, Fresh works) unless there would be improved performance is demonstrated.

Python Code for analysis:

```
import zipfile
import os
import pandas as pd

zip_path = "Assessment_data.zip"
extract_dir = "assessment_data"

with zipfile.ZipFile(zip_path, 'r') as zip_ref:
    zip_ref.extractall(extract_dir)

campaign_costs = pd.read_csv(f"{extract_dir}/campaign_costs.csv")
customer_lifecycle = pd.read_csv(f"{extract_dir}/customer_lifecycle.csv")
revenue_subscriptions = pd.read_csv(f"{extract_dir}/revenue_subscriptions.csv")
customer_acquisition = pd.read_csv(f"{extract_dir}/customer_acquisition.csv")
integration_campaigns = pd.read_csv(f"{extract_dir}/integration_campaigns.csv")

revenue_merged = pd.merge(
    revenue_subscriptions,
    customer_acquisition[['customer_id', 'acquisition_source']],
    on='customer_id',
    how='left',
    suffixes=('', '_acq')
)

revenue_merged.drop(columns=['acquisition_source_acq'], inplace=True)
revenue_by_crm = customer_lifecycle.groupby('acquisition_source')['total_revenue_to_date'].sum().reset_index()
revenue_by_crm.columns = ['crm_platform', 'total_revenue']

customers_by_crm = customer_acquisition.groupby('acquisition_source')['customer_id'].nunique().reset_index()
customers_by_crm.columns = ['crm_platform', 'customer_count']

performance_df = pd.merge(revenue_by_crm, customers_by_crm, on='crm_platform')
performance_df.sort_values(by='total_revenue', ascending=False)
```

```
          crm_platform  total_revenue  customer_count
```

Result:

	crm_platform	total_revenue	customer_count
6	Salesforce	326866	326
2	HubSpot	304878	358
7	Zoho CRM	241537	284
3	Microsoft Dynamics 365	188651	275
0	ActiveCampaign	175660	126
1	Freshworks CRM	130303	194
5	Pipedrive	114094	187
4	Monday.com	104493	94

```
performance_df['avg_revenue_per_customer'] = (
    performance_df['total_revenue'] / performance_df['customer_count']
).round(2)

clv_by_crm = customer_lifecycle.groupby('acquisition_source')['total_revenue_to_date'].mean().reset_index()
clv_by_crm.columns = ['crm_platform', 'avg_customer_lifetime_value']

performance_df = pd.merge(performance_df, clv_by_crm, on='crm_platform')
performance_df = pd.merge(performance_df, campaign_costs[['crm_platform', 'total_investment']], on='crm_platform')

performance_df['roi'] = (
    (performance_df['total_revenue'] - performance_df['total_investment']) / performance_df['total_investment']
).round(2)

performance_df_sorted = performance_df.sort_values(by='roi', ascending=False)
performance_df_sorted.reset_index(drop=True, inplace=True)
performance_df_sorted
```

Result:

	crm_platform	total_revenue	customer_count	avg_revenue_per_customer	avg_customer_lifetime_value	total_investment	roi
0	HubSpot	304878	358	851.61	1037.000000	57081	4.34
1	Zoho CRM	241537	284	850.48	1113.073733	46535	4.19
2	Salesforce	326866	326	1002.66	1089.553333	67711	3.83
3	ActiveCampaign	175660	126	1394.13	1111.772152	73245	1.40
4	Microsoft Dynamics 365	188651	275	686.00	1116.278107	91856	1.05
5	Pipedrive	114094	187	610.13	1176.226804	56094	1.03
6	Freshworks CRM	130303	194	671.66	1104.262712	68787	0.89
7	Monday.com	104493	94	1111.63	1135.793478	56515	0.85

```
tier_dist = customer_acquisition.groupby(['acquisition_source', 'initial_subscription_tier'])['customer_id'] \.count().reset_index()
tier_dist.columns = ['crm_platform', 'subscription_tier', 'count']
tier_pivot = tier_dist.pivot(index='crm_platform', columns='subscription_tier', values='count').fillna(0).astype(int)
print(tier_pivot)
```

```
subscription_tier       Business  Enterprise  Professional  Starter
crm_platform
ActiveCampaign                47          47            18       14
Freshworks CRM                85          44            41       24
HubSpot                      133         103            82       40
Microsoft Dynamics 365        93          79            68       35
Monday.com                    39          20            25       10
Pipedrive                     73          43            45       26
Salesforce                   127          74            87       38
Zoho CRM                     108          65            73       38
```

```python
active_counts = customer_acquisition.groupby('acquisition_source')['is_active'].agg(
    total_customers='count',
    active_customers='sum'
).reset_index()

active_counts['active_rate'] = (active_counts['active_customers'] / active_counts['total_customers']).round(2)
active_counts.rename(columns={'acquisition_source': 'crm_platform'}, inplace=True)
print(active_counts)
```

```
            crm_platform  total_customers  active_customers  active_rate
0          ActiveCampaign              126               108         0.86
1          Freshworks CRM              194               171         0.88
2                 HubSpot              358               324         0.91
3  Microsoft Dynamics 365              275               241         0.88
4              Monday.com               94                84         0.89
5               Pipedrive              187               168         0.90
6              Salesforce              326               288         0.88
7                Zoho CRM              284               249         0.88
```

```python
revenue_subscriptions['revenue_date'] = pd.to_datetime(revenue_subscriptions['revenue_date'])
revenue_subscriptions['month'] = revenue_subscriptions['revenue_date'].dt.to_period('M')
monthly_revenue = revenue_subscriptions.groupby('month')['monthly_revenue'].sum().reset_index()
import matplotlib.pyplot as plt
plt.figure(figsize=(10, 4))
plt.plot(monthly_revenue['month'].astype(str), monthly_revenue['monthly_revenue'], marker='o')
plt.xticks(rotation=45)
plt.title('Monthly Revenue Trend')
plt.ylabel('Revenue')
plt.grid(True)
plt.tight_layout()
plt.show()
```

```
clv_by_crm = customer_lifecycle.groupby('acquisition_source').agg(
    total_customers=('customer_id', 'count'),
    total_revenue=('total_revenue_to_date', 'sum'),
    avg_clv=('total_revenue_to_date', 'mean')
).reset_index().rename(columns={'acquisition_source': 'crm_platform'})
```

```
tier_distribution = revenue_subscriptions.groupby(['acquisition_source', 'subscription_tier']).size().unstack(fill_value=0)
tier_distribution.index.name = 'crm_platform'
tier_distribution.reset_index(inplace=True)
```

```
revenue_per_crm = customer_lifecycle.groupby('acquisition_source')['total_revenue_to_date'].sum().reset_index()
revenue_per_crm.columns = ['crm_platform', 'total_revenue']
```

```
roi_df = pd.merge(revenue_per_crm, campaign_costs[['crm_platform', 'total_investment']], on='crm_platform')
roi_df['roi'] = (roi_df['total_revenue'] - roi_df['total_investment']) / roi_df['total_investment']
```

```
summary_df = pd.merge(clv_by_crm, roi_df, on='crm_platform')
summary_with_tiers = pd.merge(summary_df, tier_distribution, on='crm_platform', how='left')
summary_with_tiers.sort_values(by='roi', ascending=False, inplace=True)
summary_with_tiers.reset_index(drop=True, inplace=True)
summary_with_tiers.round(2)
```

	crm_platform	avg_customer_lifetime_value	total_revenue	total_investment	roi	Business	Enterprise	Professional	Starter
0	HubSpot	1037.00	304878	57081	4.34	637	638	382	196
1	Zoho CRM	1113.07	241537	46535	4.19	388	350	297	98
2	Salesforce	1089.55	326866	67711	3.83	572	476	427	130
3	ActiveCampaign	1111.77	175660	73245	1.40	247	201	140	82
4	Microsoft Dynamics 365	1116.28	188651	91856	1.05	480	429	416	158
5	Pipedrive	1176.23	114094	56094	1.03	331	294	205	91
6	Freshworks CRM	1104.26	130303	68787	0.89	354	258	196	171
7	Monday.com	1135.79	104493	56515	0.85	169	135	94	57

```
revenue_per_crm = customer_lifecycle.groupby('acquisition_source')['total_revenue_to_date'].sum().reset_index()
revenue_per_crm.columns = ['crm_platform', 'total_revenue']
roi_table = pd.merge(revenue_per_crm, campaign_costs[['crm_platform', 'total_investment']], on='crm_platform')
roi_table['roi'] = (roi_table['total_revenue'] - roi_table['total_investment']) / roi_table['total_investment']
roi_table = roi_table.sort_values(by='roi', ascending=False).round(2)
roi_table
```

	crm_platform	total_revenue	total_investment	roi
2	HubSpot	304878	57081	4.34
7	Zoho CRM	241537	46535	4.19
6	Salesforce	326866	67711	3.83
0	ActiveCampaign	175660	73245	1.40
3	Microsoft Dynamics 365	188651	91856	1.05
5	Pipedrive	114094	56094	1.03
1	Freshworks CRM	130303	68787	0.89
4	Monday.com	104493	56515	0.85

```python
import matplotlib.pyplot as plt
acquisition_trend['acquisition_month'] = acquisition_trend['acquisition_month'].dt.to_timestamp()
monthly_revenue_trend['revenue_month'] = monthly_revenue_trend['revenue_month'].dt.to_timestamp()
fig, axes = plt.subplots(2, 1, figsize=(12, 8), sharex=True)
fig.suptitle("Seasonal & Timing Effects", fontsize=16)
axes[0].plot(acquisition_trend['acquisition_month'], acquisition_trend['new_customers'], marker='o', color='teal')
axes[0].set_title("Monthly New Customer Acquisition")
axes[0].set_ylabel("New Customers")
axes[0].grid(True)
axes[1].plot(monthly_revenue_trend['revenue_month'], monthly_revenue_trend['monthly_revenue'], marker='o', color='orange')
axes[1].set_title("Monthly Revenue Trend")
axes[1].set_ylabel("Total Revenue (USD)")
axes[1].set_xlabel("Month")
axes[1].grid(True)
plt.tight_layout(rect=[0, 0.03, 1, 0.95])
plt.show()
```