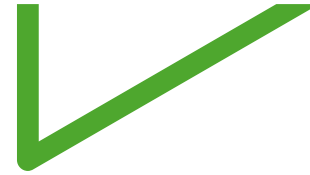# Growth Analytics Challenge

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Agenda

Analyzing Sales Funnel Data

- Monthly + Funnel view
- Seasonality view
- Cost Per Acquisition

Paid Marketing Channel Analysis

- CTR (click-through rate)
- Customer Acquisition
- KPI overview
- Cost-Conversion Funnel overview
- Recommendations

General Questions

- Data
  - Outliers and Missing Data
  - Quality and Recommendations
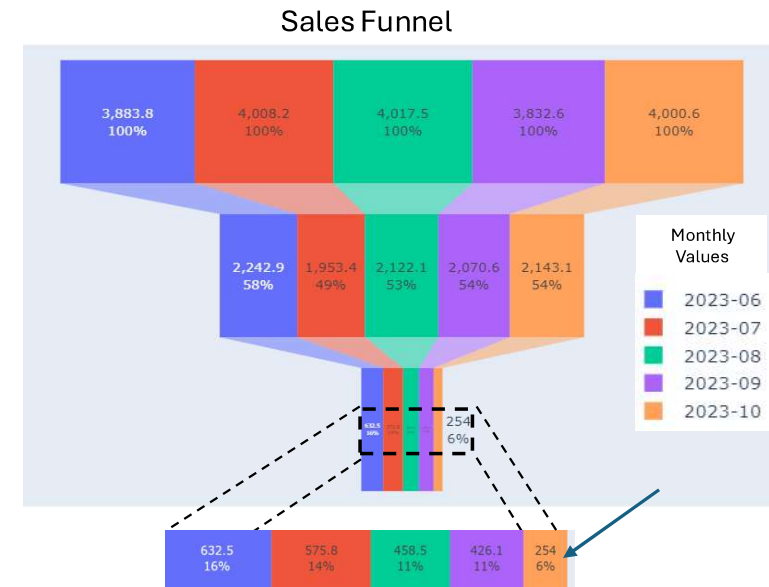- Marketing Attribution Model

Monthly + Funnel view

Improve Closing: Sales input stays consistent but the Closing declines.

Monthly metric trends
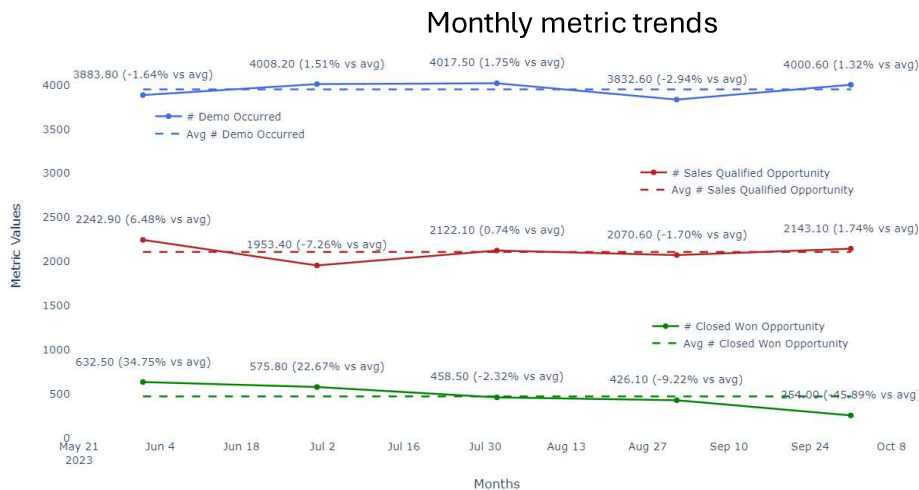
Demo Occurred

Sales Qualified Opportunities

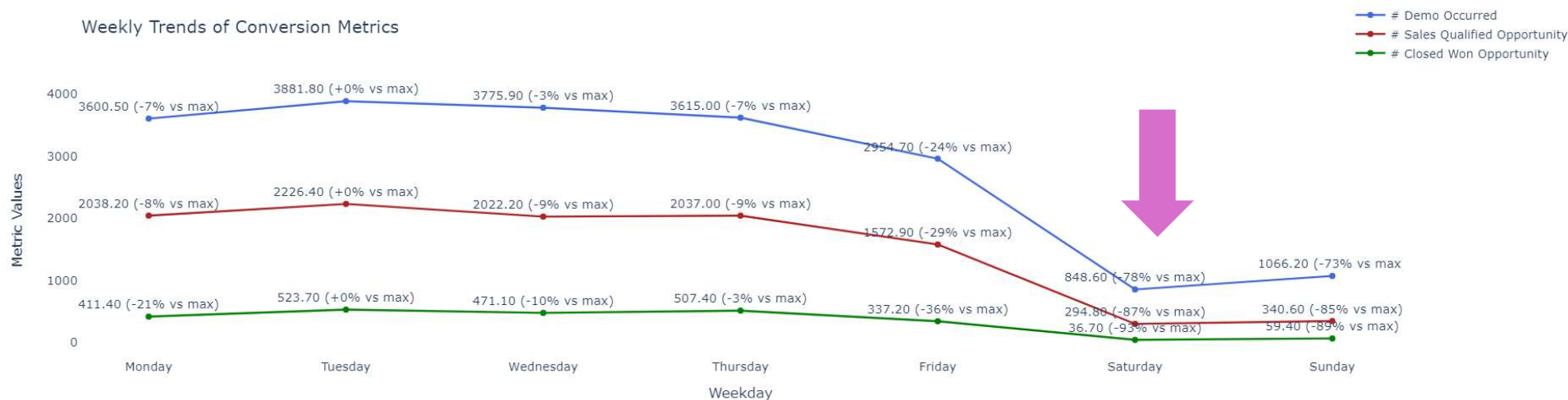Closed Won Opportunities

Sales Funnel

✓ Both **Demo Occurrences** and **Sales Qualified Opportunities** metrics shows **good stability** (small variability vs average), indicating a **consistency** on the funnel engagement with little variation.

✗ **Closed Won Opportunities:**
There's a noticeable **declining trend** and **conversion ratio** in the **last months**.

Seasonality view

Focus on Weekdays: The **weekends** have consistently show a **lower volume of Activity**.

Weekly Trends of Conversion Metrics

Legend:
- # Demo Occurred
- # Sales Qualified Opportunity
- # Closed Won Opportunity

Metric Values (y-axis), Weekday (x-axis)

Demo Occurred:
- Monday: 3600.50 (-7% vs max)
- Tuesday: 3881.80 (+0% vs max)
- Wednesday: 3775.90 (-3% vs max)
- Thursday: 3615.00 (-7% vs max)
- Friday: 2954.70 (-24% vs max)
- Saturday: 848.60 (-78% vs max)
- Sunday: 1066.20 (-73% vs max)

Sales Qualified Opportunity:
- Monday: 2038.20 (-8% vs max)
- Tuesday: 2226.40 (+0% vs max)
- Wednesday: 2022.20 (-9% vs max)
- Thursday: 2037.00 (-9% vs max)
- Friday: 1572.90 (-29% vs max)
- Saturday: 294.80 (-87% vs max)
- Sunday: 340.60 (-85% vs max)

Closed Won Opportunity:
- Monday: 411.40 (-21% vs max)
- Tuesday: 523.70 (+0% vs max)
- Wednesday: 471.10 (-10% vs max)
- Thursday: 507.40 (-3% vs max)
- Friday: 337.20 (-36% vs max)
- Saturday: 36.70 (-93% vs max)
- Sunday: 59.40 (-89% vs max)

✖ The weekends show a lower volume of activity on all 3 stages, this should be related to the client behavior on regarding tools for HR outside working days.

✖ Please note that the proportion are even worst on the weekends (Demo-to-Close:12% on weekdays vs 5% on weekends)

CTR (click-through rate)

Significant fluctuations on BING : Google tends to be best performant overall.
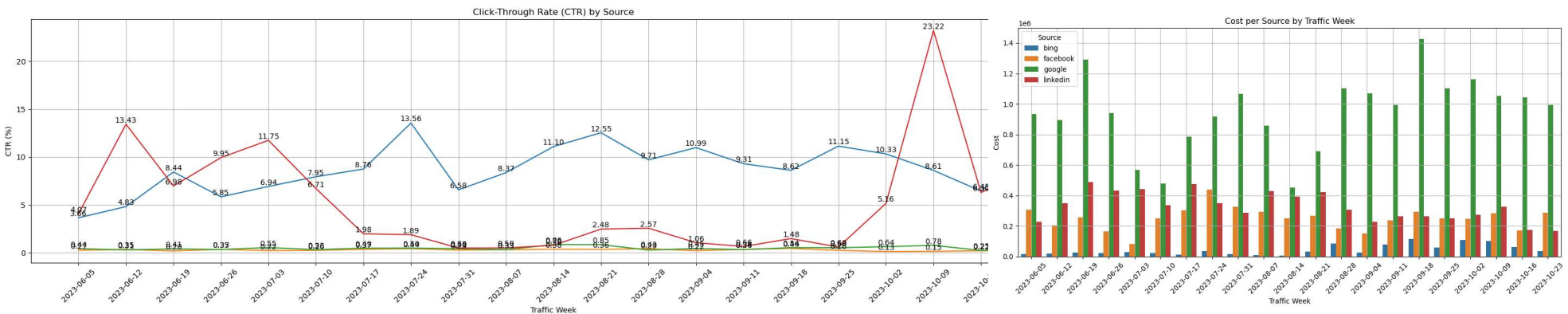
> Google CTR is the most stable and best performer overall.

> It also receives the highest investment and should continue as it (check CAC slide).

> BING CTR's seem to have outstanding starts, however, please note that Bing cost volumes are relatively small, making the fluctuations less attractive, since they could be due to random chance.

Cost per Acquisition

Focus on google, period: During the funnel, not many survive to pay back with buyers.
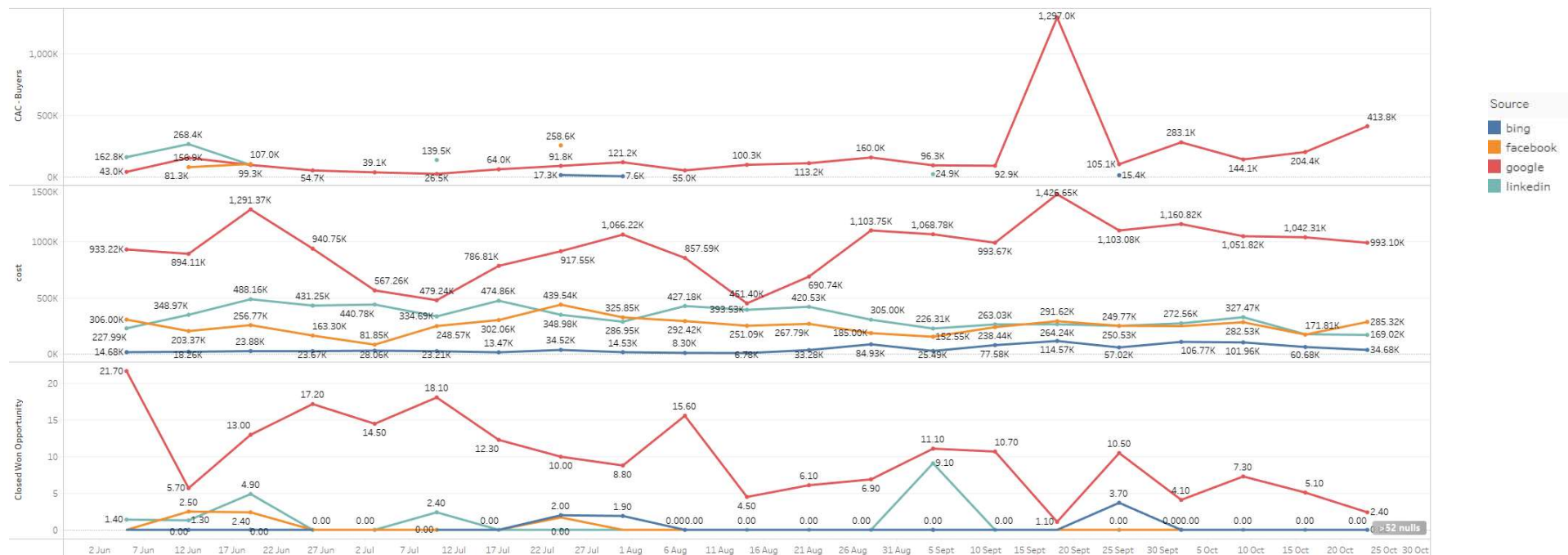
The CAC (cost/acquired users[buyers]) **is extremely high**.
This shows a reduced profitability, low ROI, hard scalability and ultimately cash flow challenges.
Recommendation: Find other sources of acquisition + close: facebook and scale back: bing and linkedin.

KPI Overview

Choose a strategy: Are we exploring or taking profits?

If our company wants to enter new markets, explore/test different acquisition tools, or gain experience in unfamiliar terrain, an **exploratory perspective** is essential in the initial phase. This approach allows us to maximize market share and visibility. The primary Key Performance Indicators (KPIs) to focus on during this period are Impressions, Click-Through Rate (CTR), market share, Customer Acquisition Rate (CAR), Customer Lifetime Value (CLV), and brand awareness.

If our company requires cash, aims to leverage the current situation for future expansion, or simply seeks to increase revenues, an **exploitative perspective** becomes necessary. The main KPIs in this scenario include Customer Acquisition Cost (CAC) to the buyer, margins, cost reductions, and overall Marketing Return on Investment (ROI).

About Effectiveness:

At the end what we need is new customers, that stay and become ambassadors of our tool so the investments become less and the acquisition becomes organic. Thus, higher customer acquisition by organic, long LTV, and high active users in our platform.

Marketing Attribution

What is and why?: Models that help understand effectiveness of marketing channels

The key point is to know how to assign (or 'attribute') analytically the stages that helped people to buy the product the most, so allocating resources becomes more effectively.

My approach in this is using ML, more specifically a MMM bayesian regression, since I currently work in a very big model that uses this approach, the tools I use for this is:

- Stan : for bayesian regression modeling and calculation)
- Python : for data wrangling
- Tableaux : for sharing results

Outliers and Missing Data

Missing Data:

Conversion missing values
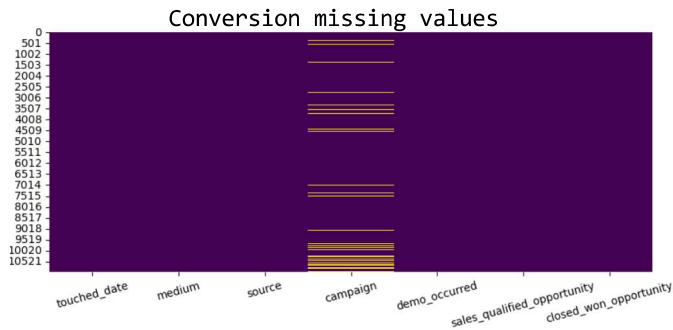
- **Paid Plateform**: No missing values.
- **Conversion**: Field 'campaign' has 1127 missing values. (This could be due to the lack of campaign name and not the missing of campaign name.)
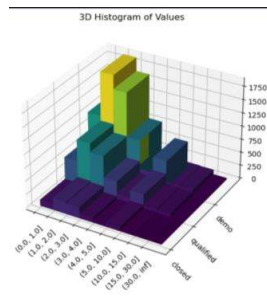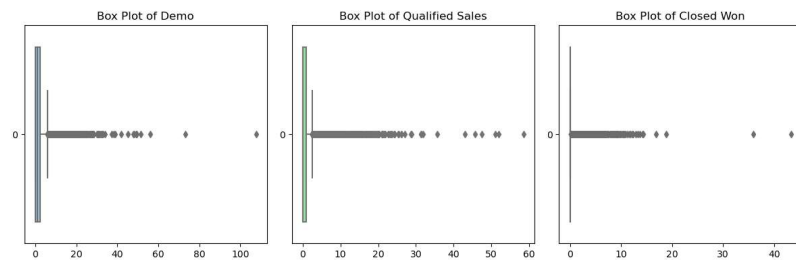
Handling Recommendations:
Depending on the usage, imputation is recommended (using the most used value aka 'mode') base on the groupping.
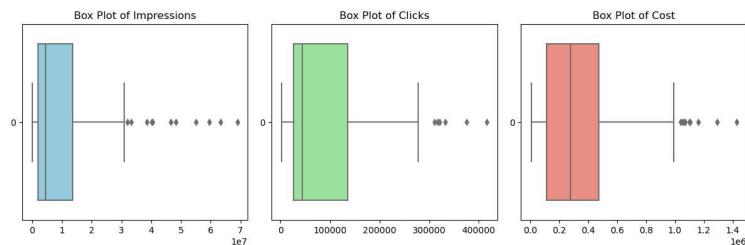
Example: For a missing value on field 'campaign', the most frequent value with the same 'medium' and 'source' in the year-month date "2023-08" was "nam-t1_acq_searchbrand_google_search_broad-__all".

Outliers:

Conversion:

Box Plot of Demo | Box Plot of Qualified Sales | Box Plot of Closed Won

3D Histogram of Values

Paid Plateform:

Box Plot of Impressions | Box Plot of Clicks | Box Plot of Cost

- **Paid Plateform**: Few outliers, pretty much in line.

- **Conversion**: Many outliers, this is due that most of the entries are between 2 and 3 counts (see 3D-histogram), making the upper bound threshold very low and thus having a big amount (around 10-12%) of outliers.

Analyzing
Sales Funnel
Data

Paid Marketing
Channel
Analysis

General
Questions

Data Quality and Recommendations

Enforce Quality Checks: Numerous entries lack consistency and require proper treatment.

FILE> Conversion Data, by columns:

1) **utm-medium:**
   - Field does not follow a strict structure.
   - Field does not follow the same naming as paid plateform data.
   - Pure Numeric types should not be allowed, as they give no information.
   - Field has invalid items such as 'pdf','sponsor[���]..'

2) **utm-source:**
   - The structure seems to be a bit better, still needs work, such filtering. (example: 'utm_source=peoplemanagingpeople)
   - Pure Numeric types (including key-numeric values) should not be allowed, as they give no information to the current user.

3) **utm-campaign:**
   - Seems to have a standard structure (Source-Campaign-Medium-Term-Content: example emea-t1a_acq_searchbrand_google_search_all-fr-__all)
   - Not consistent. ('ghg_rwanda')

Recommendations: A list of attributes of data entities should be established and Quality checks must be implemented.

FILE> Paid Platform Data:

1) **cost:**
   - Field should be numeric and ready to use.
   - The symbol "$" or "eur" should be in another field if necessary (i.e.: 'currency').
   - Field should not contain "$" nor "," only "." for floats values.

Recommendations: Besides the column naming and the Dollards sign, the data is of good quality.