

# Task 0

## Data leaning

- Data cleaning & transformations
- Joins

Growth Analytics Challenge



# To start, some Data Cleaning and Transformations were required

## Missings

- Only the **Conversion.[Utm Campaign]** column had missing values.

```
d['Channel key'] = d['Utm Channel'].str.upper()  
                  + '-' + d['Utm Source'].str.upper()  
d['Utm Campaign'].fillna(d['Channel key'],  
                        inplace=True)
```

## Data Transformations

- The **region** column didn't exist and had to be created based on using AI
- The **[Utm Medium]** column lacked standardized naming conventions (e.g., "FB" vs. "Facebook").
- The **[Utm Channel]** column was generated using AI to better classify the Medium

```
def categorize_channel(channel):  
    if any(x in channel for x in ['SEARCH', 'CPC-SEARCH', 'CPM', 'SPONSORED', 'PPC']):  
        return 'Paid-Search'  
    elif any(x in channel for x in ['EMAIL', 'NEWSLETTER', 'SEQUENCE', 'NURTURE']):  
        return 'Email Marketing & Newsletters'  
    elif any(x in channel for x in ['SOCIAL', 'FACEBOOK', 'LINKEDIN', 'INSTAGRAM',  
    'ZALO', 'CPC-SOCIAL']):  
        return 'Paid-Social'  
    ...  
    return 'Referrals & Partnerships'  
    elif any(x in channel for x in ['SURVEY', 'SELF-SIGNUP', 'APP', 'NONPAID', 'OTHER',  
    'ALL', 'LINKTREE']):  
        return 'Organic, Outbound & Other'  
    elif any(x in channel for x in ['ASHBY REC OPS', 'EDDY', 'AE', 'KRISTOPHER', 'LEA',  
    'JONATHAN', 'FP']):  
        return 'Organic, Outbound & Other'  
    else:  
        return 'Organic, Outbound & Other'
```

[Complete code here](#)

## Joins

**From table**  
Paid

# Clicks	# Impressions	Key	Traffic Week	Utm Medium	Utm Source
21954	4881796	PAID-SOCIAL-LINKEDIN	Monday, Oct...	paid-social	linkedin
15776	6335386	PAID-SOCIAL-LINKEDIN	Monday, Oct...	paid-social	linkedin
35009	4485024	PAID-SOCIAL-LINKEDIN	Monday, Oct...	paid-social	linkedin

**To table**  
Deel\_Conversion

Campaign	Channel	Channel key	Demo	Medium	Medium Std
EMEA-T1-AC...	Paid-Social	PAID-SOCIAL-LINKEDIN	0	PAID-SOCIAL	PAID-SOCIAL
EMEA-T1B-A...	Paid-Social	PAID-SOCIAL-LINKEDIN	0	PAID-SOCIAL	PAID-SOCIAL
EMEA-T1B-E...	Paid-Social	PAID-SOCIAL-LINKEDIN	0	PAID-SOCIAL	PAID-SOCIAL

**Cardinality**  
Many to many (\*:\*)

**Cross-filter direction**  
Both

☒ Make this relationship active

☒ Apply security filter in both directions

# Task 1

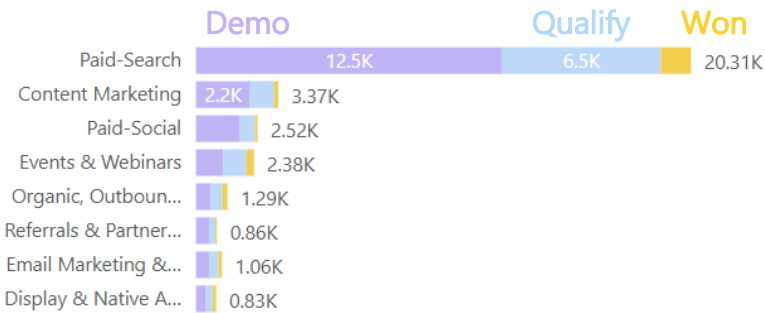
## Analyzing Sales Funnel Data

- Top/under-performing campaigns
- Sales Funnel & Conversion Rates
- Seasonality

Growth Analytics Challenge

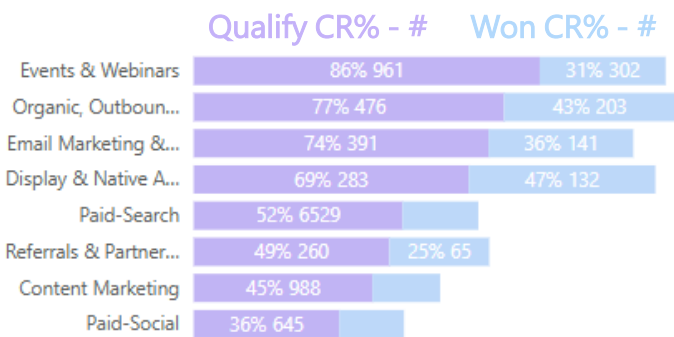
Paid-Search generates over the 50% of the sales, while Events and Webinars are the most effective in conversions

Leads by Acquisition Channel



Search generates ~60% of Demos & MQL and ~50% of Sales

Stage Funnel – Conversion rates



Events and Webinars with high conversion rates driving sales, mainly from:

Top sources for events

Channel	Source	Demo	CR_Qualify	Qualify	CR_Won	Won
Events & Webinars	hosted-deel-event	220	90%	198	56%	110
Events & Webinars	tradeshow-sponsorship	512	84%	428	22%	93
Events & Webinars	webinar	126	108%	136	32%	44
Events & Webinars	deel-hosted-event	42	138%	58	40%	23
Events & Webinars	event	146	64%	93	14%	13

Top events

Source	Campaign	CR_Qualify	Qualify	CR_Won	Won
hosted-deel-event	EMEA-T1A-FR-ENGAGE-EVE...	141%	64	50%	32
hosted-deel-event	EMEA-T1A-GB-AWARE-EVEN...	235%	38	79%	30
deel-hosted-event	NAN	138%	58	40%	23
webinar	WW-ACQ-PROSP-WEBINAR-...	103%	46	38%	17
hosted-deel-event	LATAM-T1-BR-ENGAGE-EVE...	94%	18	61%	11

Top 5 sources for sales

Channel	Source	Demo	Qualify	CR_Qualify	Won	CR_Won
Paid-Search	google	11,912	6,223	52%	1,160	19%
Display & Native Ads	in-app	190	207	109%	122	59%
Events & Webinars	hosted-deel-event	220	198	90%	110	56%
Content Marketing	peoplemanagingpeople	1,609	582	36%	109	19%
Events & Webinars	tradeshow-sponsorship	512	428	84%	93	22%

Google, in-app and hosted events were the campaigns that brought more sales

Bottom 5 underperforming channels by region

Channel	Region	Demo	CR_Qualify	Qualify	CR_Won	Won
Email Marketing & Newsletters	NAM	1	0%	0	0%	0
Referrals & Partnerships	LATAM	10	0%	0	0%	0
Paid-Social	LATAM	430	7%	31	27%	8
Display & Native Ads	UNKNOWN	7	12%	1	0%	0
Display & Native Ads	LATAM	89	16%	15	45%	7

Social, Referrals and Ads Underperforming in LATAM

Analyzing the funnel by regions, we see that **APAC, LATAM & AFRICA** campaigns are **not bringing qualify leads**

Region	Demo	Qualify	CR_Qualify	Won	CR_Won
NAM	5,665	3,168	56%	590	19%
EMEA	5,462	3,028	55%	548	18%
UNKNOWN	2,915	1,863	64%	663	36%
GLOBAL	2,594	1,251	48%	337	27%
APAC	1,508	674	45%	91	14%
LATAM	1,311	493	38%	115	23%
AFRICA	287	55	19%	3	5%
<b>Total</b>	<b>19,742</b>	<b>10,532</b>	<b>53%</b>	<b>2,347</b>	<b>22%</b>

### By Region

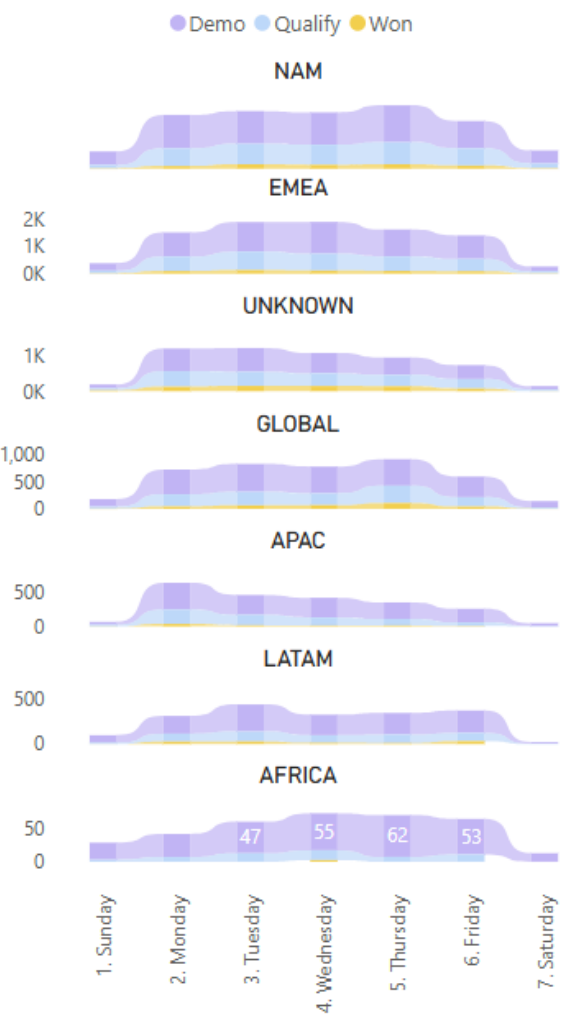
- APAC, LATAM and AFRICA campaigns are not bringing good qualified leads
- Global and "Unknow" campaigns have good closing rates in Display Ads, Organic and Events

Channel	Demo	Qualify	CR_Qualify	Won	CR_Won
Paid-Search	12,543	6,529	52%	1,234	19%
Events & Webinars	1,114	961	86%	302	31%
Organic, Outbound & Other	615	476	77%	203	43%
Content Marketing	2,217	988	45%	167	17%
Email Marketing & Newsletters	532	391	74%	141	36%
Display & Native Ads	413	283	69%	132	47%
Paid-Social	1,776	645	36%	104	16%
Referrals & Partnerships	533	260	49%	65	25%
<b>Total</b>	<b>19,742</b>	<b>10,532</b>	<b>53%</b>	<b>2,347</b>	<b>22%</b>

### By Channel

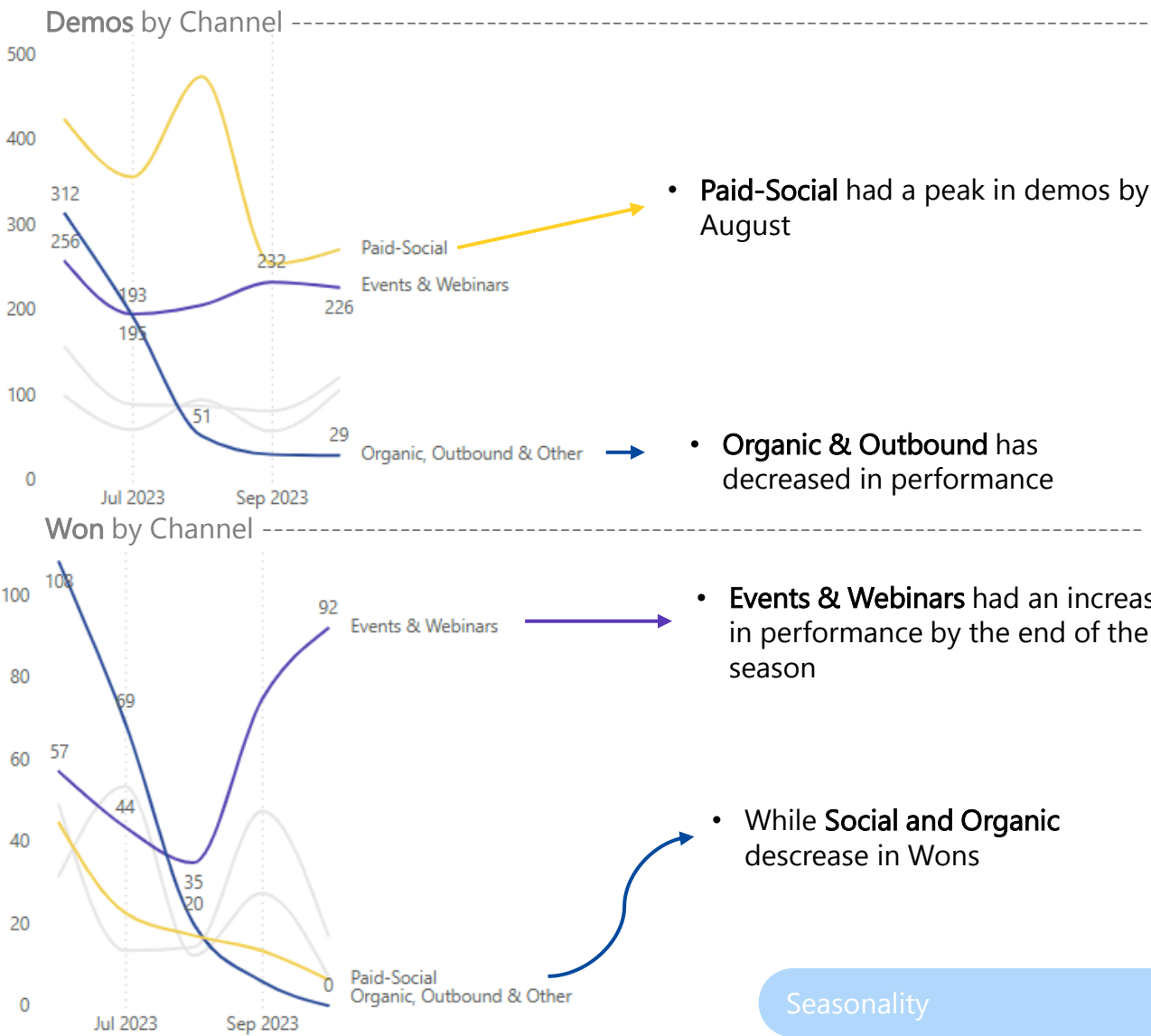
- Events & Webinars performing well especially in NAM and EMEA

# Seasonality by **workdays** across the regions



In overall, the marketing campaigns perform better on the workdays.

# & Trends by **marketing channel** (Excluding Paid-Search)



# Task 2

## Paid Marketing Channel Analytics

- CTR by Channel and trends
- CPA by Medium and Source
- Budget allocation by channel

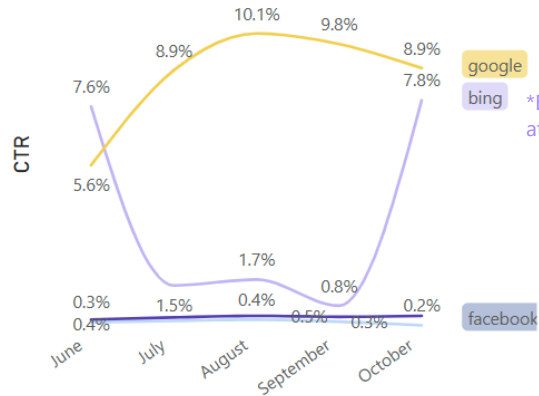
Growth Analytics Challenge



Google (Search) had 8.7% CTR driving more conversions,  
while Facebook (Social) reached +800M views increasing the awareness

Google has the higher CTR

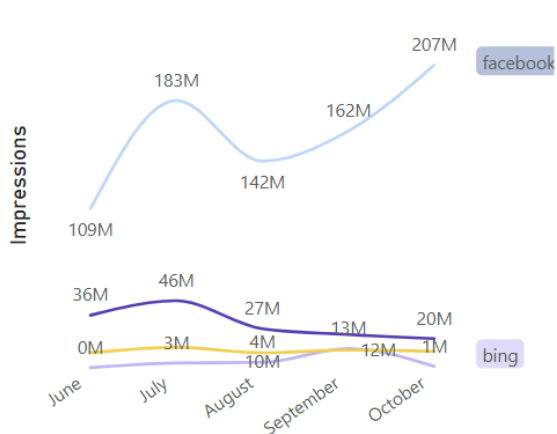
● bing ● facebook ● google ● linkedin



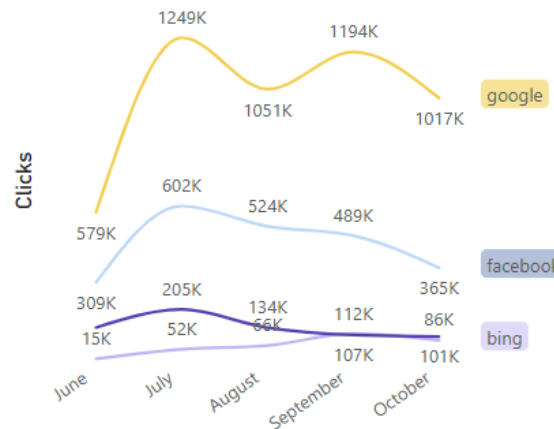
\*Bing fluctuations: Possible wrong clicks window attribution, outliers or errors in the data

Facebook had the best reach & good quantity of clicks with low CPC

● bing ● facebook ● google ● linkedin



● bing ● facebook ● google ● linkedin



## Search vs Social

### Intent and Audience Difference

- Users are actively searching for HR & payroll solutions.
- Targets **keywords**, meaning users **already**
- Are shown **passively** to people scrolling their feed
- Broader and less intent-driven

### Marketing Objective

- Are more direct and **conversion-oriented**
- Higher reach and focused on **awareness**

### Recommendations

- Keep bidding on **high-intent keywords**
- Use **retargeting** (show ads to people who visited Deel's site but didn't convert)
- Optimize for lead gen forms instead of link clicks.



**Google (Search)** is the most effective channel for CPA,  
while **LinkedIn** is very expensive with a CPC of \$10



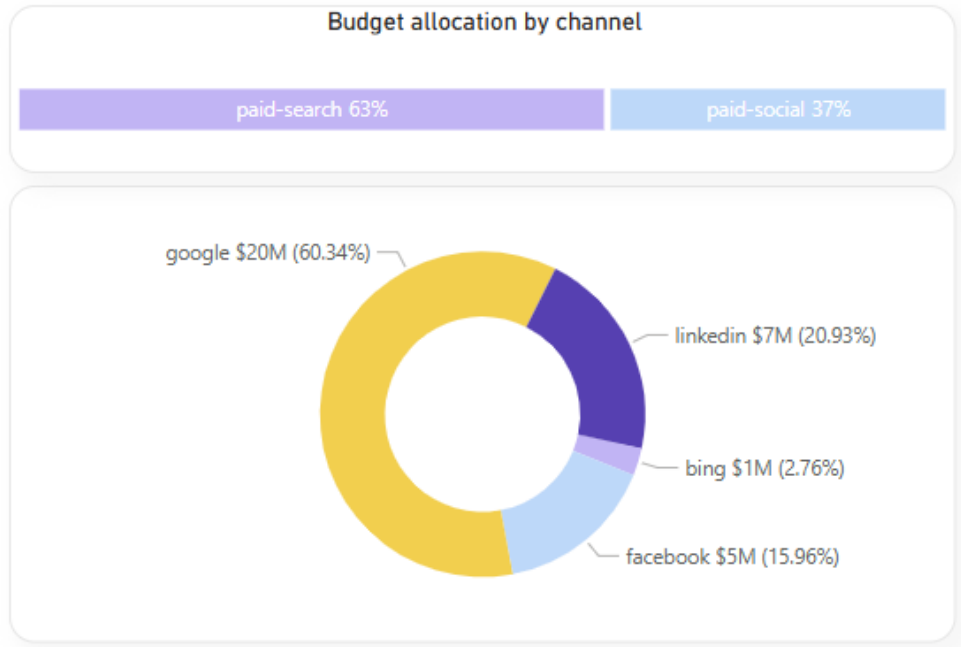
Campaigns performance by source

Medium	Source	Cost	CPC	CTR	Impressions	CPM	CPA_D	CPA_Q
paid-search	google	\$ 19.8 M	\$3.9	8.7%	58.3 M	\$340	\$1,664	\$3,185
paid-search	bing	\$ 0.9 M	\$2.7	1.5%	21.7 M	\$42	\$2,050	\$4,888
paid-social	facebook	\$ 5.2 M	\$2.3	0.3%	803.1 M	\$7	\$4,164	\$15,111
paid-social	linkedin	\$ 6.9 M	\$10.1	0.4%	151.7 M	\$45	\$13,622	\$23,420

- What is the **definition CPA for Deal?**
  - We assumed **Cost Per Demo** (CPA\_D), since CPA\_Qualify or CPA\_Sale were out of the benchmark
- **Google** and **Bing** have the most effective CPA, due to their good CTR and tailored audience
- **Facebook** and **LinkedIn** had better CPM (Cost per Mil-Impressions), with a great reach making them **ideal** for awareness
- **Facebook** has a very low CTR, but a high CPC. Meaning it brings a lot of impressions, but also good clicks for the cost.
- **LinkedIn** has a very high CPC, making it inefficient

# LinkedIn campaigns underperform despite a high investment, while Facebook looks more promising

## Current Scenario



## Campaigns performance by source

Medium	Source	Cost	CPC	CTR	Impressions	CPM	CPA_D	CPA_Q
paid-search	google	\$ 19.8 M	\$3.9	8.7%	58.3 M	\$340	\$1,664	\$3,185
paid-search	bing	\$ 0.9 M	\$2.7	1.5%	21.7 M	\$42	\$2,050	\$4,888
paid-social	facebook	\$ 5.2 M	\$2.3	0.3%	803.1 M	\$7	\$4,164	\$15,111
paid-social	linkedin	\$ 6.9 M	\$10.1	0.4%	151.7 M	\$45	\$13,622	\$23,420

## Insights

- LinkedIn has a very **high CPC** of \$10 (vs \$4 – Others), and therefore higher CPA
- (Search) Bing doesn't perform as good as Google in CTR (1.5% vs 8%), but has a **better CPM** (\$42 vs \$340) showing it can have a good reach.
- Facebook is having the highest reach and great CPC.

## Recommendations

- Reduce significantly the spend in LinkedIn.  
(Or test changing the Audience/Marketing Objective)
- Increase the spend in Facebook
- Consider to launch a retargeting campaign in Facebook, with Deel.com visitors to increase conversions.
- Consider to mix the audience reached with Facebook, to launch a specific consideration campaign in Search

# Task 3

## General Questions

- Data quality – Missings / Outliers?
- Attribution models
- Recommendations

Growth Analytics Challenge



# General Questions

## Missings

- Only the **Conversion.[Utm Campaign]** column had missing values.
  - These were filled using a combination of 'Source' + 'Medium' data to retain some campaign-related information.
- In general, missing values (if numeric) can be filled using the average or median, depending on the data distribution. In some cases, when multiple columns in the same row have missing values, it is better to remove those rows.

## Data Quality

- The **region** column didn't exist and had to be created based on keywords from the campaign name, which may introduce data inaccuracies.
- The **[Utm Medium]** column lacked standardized naming conventions (e.g., "FB" vs. "Facebook").
- The **[Utm Channel]** column was generated using AI to better classify the Medium into standard marketing channels.
- Column names did not adhere to data governance standards.

## Outliers

- Rather than traditional outliers, the **attribution window** for different stages (**Demo, Qualify, Won**) might be incorrect for some campaigns, impacting conversion rates. For example, cases where **#Won > #Demos** result in **CR > 100%**.
- Additionally, the attribution window for impressions and clicks seemed misaligned, causing data spikes.

# General Questions

## How Attribution Models works?

- Marketing attribution models are frameworks/methodologies used to determine how credit for conversions, is assigned to different marketing channels based on the different touchpoints during the customer's journey. Often, the customer interacts with multiple channels before converting.

## What attribution model do you propose for Deel? Why?

### Time-Decay Attribution (for conversion campaigns)

- It assigns more weight to the latest touchpoints, which tends to work better for companies with long sales cycles.
- There are multiple touchpoints that need to be considered during the customer journey, that deserves credit.
- However, I wouldn't discard the **U-Shaped attribution model**, since Deel's brand awareness is still growing, and is always important to respect the Marketing Funnel (Awareness, Consideration, Conversion), to increase the audience before targeting for sales.

# General Questions

## Key Takeaways

### Seasonality

- Is better to spend the budget during the workdays

### By Region

- LATAM, AFRICA and APAC are still not bringing qualify leads. It might be due to lack of performance, or the qualified audience is smaller in these markets.

### By Channel

- Events and Webinars performing well especially in NAM and EMEA
- Search generates ~60% of Demos & MQL and ~50% of Sales
- Paid-Search campaigns are better for conversions, while Paid-Social for awareness, traffic and prospecting.

### Budget Allocation Search vs Social

- LinkedIn campaigns underperform despite a high investment. LinkedIn has a very high CPC of \$10 (vs \$4 – Others), and therefore higher CPA
- Consider to reduce the spending in LinkedIn
- Consider to **launch a retargeting campaign in Facebook**, with Deel.com visitors to increase conversions.

# Thank you!



Sr Data Analyst

Daniel A.

[juandaniel190@gmail.com](mailto:juandaniel190@gmail.com)