**Context:**

This report shows a detailed summary of the results of the analysis for Marketing Spend Optimization, starting with data wrangling, features engineering, and continuing with deep analysis.

**Data preparation and normalization:**

* Some inconsistencies were found and flagged with a respective comment:
  + **Finding 1:**
    - 15 entries have been recorded for the year 2025.
    - *Decision:* This is considered an anomaly in the data and will be flagged as 'For Review' to keep the data as logical as possible.
  + **Finding 2:**
    - 3 `Opt-In Timestamp` with dates recorded but the `Opt-In` value is missing.
    - *Decision* `Opt-In` = Yes
  + **Finding 3:**
    - 2 `Opt-In` as No but there is a value in the `Opt-In Timestamp`.
    - *Decision*: This could indicate a discrepancy in data recording or a mistake during data entry and will be flagged as 'For Review' to keep the data as logical as possible.
  + **Finding 4:**
    - 4 `Opt-In` as No but no date for the `Opt-Out Timestamp`.
    - *Decision:* This could indicate a discrepancy in data recording or a mistake during data entry and will be flagged as 'For Review' to keep the data as logical as possible.
  + **Finding 5:**
    - 10 `Opt-In` as Yes but no date for the `Opt-In Timestamp`.
    - Decision: This could indicate a discrepancy in data recording or a mistake during data entry and will be flagged as 'For Review' to keep the data as logical as possible.
  + **Finding 6:**
    - 6 `Opt-In` is missing but no date for the `Opt-In Timestamp` nor `Opt-Out Timestamp`.
    - *Decision*: This could indicate a discrepancy in data recording or a mistake during data entry and will be flagged as 'For Review' to keep the data as logical as possible.
  + **Finding 7:**
    - 125 missing `Opt-In Source`:
    - *Decision*: As no source is identified and this represents 12.5% of the data, a new category will be created as 'Unknown'
* Data Format & Transformation:
  + **Data format:**
    - All columns seem to be in the right format; however, it is preferable to have the `Opt-In` column as a Boolean:
    - *Decision*: The `Opt-In` column will be transformed as `{'Yes': True, 'No': False}`.
  + **String cleaning:**
    - For the ‘Job Title’: Extra blank spaces, dots, and any other unnecessary chars were removed to have the values as standard as possible.
  + **Prospect Role:**
* Derived values:
  + **Prospect Role (Not available in original data):**
    - Since a categorization by keywords could give a good approximation, using LLM to do this task can offer better results as it can contextualize the job title and assign the most likely role based on its profile and responsibilities.
  + **Region (Not available in original data):**
    - Based on prospect’s country, the Region was assigned as a new variable.
  + **Interested flag (Not available in original data):**
    - All prospects that were not a ‘No show’ as flagged as ‘Interest’ = True, else False
  + **Stage of the funnel (Not available in original data):**
    - **Logic Statement:**
      * Since the data registers the stages that a prospect reaches. It could identify how far a prospect went through the campaign funnel. To achieve this, it was set up a numeric system to represent the stages of the funnel. Using this approach, we can easily quantify the progress of prospects through the funnel and now group them by campaign to summarize how many prospects are at each stage for each campaign.:
      * **Awareness:**
        + **No Shows**: Including no-shows here reflects that these individuals were initially reached and engaged enough to commit to an event or demo but did not follow through. This still counts towards the campaign's reach as these individuals were aware enough to take initial action.
        + **Responded**: These prospects have shown interest by engaging with some form of communication or preliminary call to action.
        + **Attended**: Including attended at this stage accounts for those who showed interest and took the step to engage more deeply.
        + **Registered**: This includes those who committed to a trial or a deeper form of engagement, indicating high awareness and interest.
      * **Interest:**
        + **Responded**: Prospects here have actively engaged by responding to communications or interactions initiated by the campaign.
        + **Attended**: Attendance at an event or demo shows a heightened level of interest, as prospects invest time to learn more.
        + **Registered**: Registration for further engagement, like a trial, shows a readiness to explore the product or service in their environment.
      * **Consideration:**
        + **Attended**: Their attendance at detailed demos or discussions indicates that they are seriously considering the benefits and applicability of the offering.
        + **Registered**: Moving from attending to registering shows a transition from considering to intending to test or use the product.
      * **Intent:**
        + **Registered**: This status is included here as it signifies a definitive action taken by the prospect to trial the product or service, indicating a strong intent to evaluate its suitability for their needs before a final decision.
  + **Additional KPIs & Scores:**
    - **Engagement** **Score**
      * Averages the transition rates between major funnel stages, providing a single, unified metric that reflects overall campaign effectiveness in terms of engagement depth.
      * Balances the contributions of reaching prospects, engaging them to show initial interest, and successfully driving them to deeper commitment levels.
      * This score is valuable for comparing different campaigns and understanding which are more effective in engaging prospects through the funnel.
    - **Full Mathematical Description**

Given:

**awareness\_count =** Total number of prospects who are aware of the campaign

**interest\_count =** Number of prospects who responded to the campaign

**consideration\_count =** Number of prospects who attended a demo or event

**intent\_count =** Number of prospects who registered for a trial or product

The formulas for the rates are:

|  |  |
| --- | --- |
| Interest Conversion Rate: |  |
| Consideration Conversion Rate: |  |
| Intent Conversion Rate: |  |
| **Engagement Score:** |  |

**Data Analysis:**

* Interest by role:

|  |  |
| --- | --- |
|  | What is the mix of practitioners, decision-makers, and executives that showed interest in the demo for the product?   * 75% of the prospects reached have a practitioner role. * 13% of the population reached are decision makers. |

* Best performer campaigns:

|  |  |  |  |
| --- | --- | --- | --- |
| **Region** | **Campaign Name** | **Reachability** | **Engagement** |
| **NORTHAM** | **Halloween Spooktacular** | 5 | 100% |
| **APAC** | **Annual Fall Clearance** | 4 | 100% |
| **EMEA** | **Spring Blowout Sale** | 3 | 100% |
| **LATAM** | **Annual Fall Clearance** | 3 | 100% |

* Best catalog opt-in driver sources:

50% of catalog opt-in was driven by 3 sources in each region where online services and referral programs stand out as main drivers.

* + **Summary tables**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **APAC** | **Opt-In Source** | **Impact** |  | **LATAM** | **Opt-In Source** | **Impact** |
| Online Purchase | 18% |  | Newsletter Subscription | 15% |
| Online Contest Entry | 18% |  | Referral Program | 15% |
| Social Media Campaign | 15% |  | Social Media Campaign | 14% |
|  |  |  |  |  |  |  |
| **EMEA** | **Opt-In Source** | **Impact** |  | **NORTHAM** | **Opt-In Source** | **Impact** |
| Referral Program | 16% |  | Newsletter Subscription | 15% |
| Online Contest Entry | 16% |  | Online Purchase | 15% |
| Online Purchase | 14% |  | Social Media Campaign | 14% |

* + **Pareto results:**

|  |  |
| --- | --- |
| A graph of blue squares with a red dotted line  Description automatically generated |  |
|  |  |

* Potential Patterns and Anomalies found:

|  |  |
| --- | --- |
|  | * Most prospects who responded, attended, or registered opted in to receive communications. * Even among those who were no-shows, a significant number had opted in. * This suggests that opting in is common among all stages of the prospect journey, including those who do not ultimately attend or register. The high opt-in rates across all statuses could indicate that opting in does not necessarily predict higher engagement or conversion. |

**Statistical Analysis:**

* Free trial sign-up:

A Machine Learning model (Random Forest) was developed to identify feature influence and importance related to free-trial sign-up:

* + **Influencing Features:**
    - **Seasonal Campaign Effectiveness:** Analysis underscores the impact of timely, **thematic campaigns** such as **'Annual Fall Clearance'** and **'Winter Clearance'**, highlighting the potency of **seasonal marketing in driving registrations**.
    - **Geographical Targeting:** The prominence of **'NORTHAM'** in the data signifies the importance of regional strategies and customer preferences in campaign success.
    - **Influence of Prospect Source:** While sources like **trade shows** and **referrals matter**, they rank behind campaign specifics, suggesting that how prospects are reached is secondary to the campaign content itself.
    - **Role-Based Impact:** The influence of the prospect's role, such as 'Practitioner' or 'Executive', although notable, is less critical compared to campaign and region factors.
  + **Actionable Insights:**
    - Leverage seasonal trends and regional preferences to tailor marketing campaigns.
    - Focus on high-impact campaigns while considering the regional context.
    - Continue engaging through trade shows and referrals but prioritize campaign innovation.
* Job Title and Interest correlation:
  + **Chi-square test:**
    - Analysis of potential correlation between the prospect’s job title vs **sign-up**, results showed that there is no statistical correlation suggesting that while job title might be a logical way to segment prospects, **it doesn't significantly dictate their interest in the product's trial sign-ups.**
    - **Chi-square statistic:** 379.8
    - **P-value:** 0.5
* Regional considerations:
  + **Chi-square test:**
    - Statistical results suggest that the region does not define if a prospect will register for a free trial sign-up.
    - **Chi-square statistic:** 0.51
    - **P-value:** 0.9

**Data Visualization:**

* Most Successful Marketing Campaigns:

60% of the marketing campaigns achieved more than 67% effectiveness (aware stage converted to Intent stage).

|  |
| --- |
| A screenshot of a computer  Description automatically generated |

* Prospect interest and engagement with the product:

|  |  |
| --- | --- |
|  | * The decision-maker role shows the lowest Intent Conversion Rate (ICR) with 43%. * Executive and Practitioner roles show ICR of 50% and 54% respectively. * The Engagement Score (ES) for all the roles shows a 52.9±0.7% which suggests that the final engagement remains stable across each of the prospect's roles. |
|  | Campaign Funnel dynamic simulation shows the behavior of the different roles across each stage of the campaign. A uniform reduction in the conversion by role can be inferred, which aligns with the final ES metric. |

* Differences in the prospect characteristics and behaviors between the most successful campaign and the rest:

|  |  |
| --- | --- |
|  | **Most Successful Campaign:**   * Annual Fall Clearance * All prospects reached the final stage of the marketing funnel, demonstrating full progression.   **Other Campaigns:**   * The average progression is significantly lower, at approximately 41.9% |
|  | * Advertisement is the dominant source for both, but the successful campaign had a higher proportion of referrals. |
|  | * The pie charts compare the role distributions, revealing that the most successful campaign had a higher proportion of executives and decision-makers compared to other campaigns. |
|  | * The most successful campaign achieved a perfect 100% opt-in rate, while the rate for other campaigns was slightly lower, at around 98%. |
|  | * The left pie chart for the most successful campaign shows a nearly even distribution across NORTHAM, APAC, LATAM, and EMEA. * The right pie chart shows that other campaigns have a stronger presence in NORTHAM, followed by EMEA. |

**Conclusions and recommendations:**

* **Engagement**:
  + Predominantly practitioners engaged, with substantial participation from decision-makers and executives.
* **Regional Campaign Highlights**:
  + NORTHAM's "Halloween Spooktacular" and APAC/LATAM's "Annual Fall Clearance" achieved 100% engagement, showcasing successful targeting.
* **Opt-In Dynamics**:
  + Online services and the power of referrals were confirmed as critical pathways, jointly accounting for half of the opt-ins.
* **Engagement vs. Conversion**:
  + Despite high interest across roles, the opt-in action did not consistently translate into higher funnel progression.
* **Data-Driven Insights**:
  + Neither job titles nor regional data alone predicted trial sign-ups, hinting at a multilayered decision-making process.
* **Strategic Success Indicators**:
  + The most effective campaigns featured a diverse regional reach and resonated well with upper management.
* **Funnel Effectiveness**:
  + "Annual Fall Clearance" stood out, demonstrating full funnel progression from awareness to intent, far exceeding other campaigns.
* **Maintain and enhance investment** in digital and referral marketing channels.
* **Consider A/B testing** for deeper insights and to refine campaign effectiveness.
* Some campaigns showed a high awareness rate, the strategy used can be analyzed to try to transform these prospects into registration by replicating the most successful campaigns approach.