Executive Summary: Statistical Testing of Facebook Ads

Project Overview

A digital media specialist ran advertisements through Facebook's ad platform. I will analyze the statistical significance of the demographic data, focusing on age and gender. Additionally, I will examine the times of day when the ads receive the most views. I also plan to calculate the expected conversion rates using a 95% confidence interval.

Exploratory Data Analysis (EDA):

- I plan to create a variety of visualizations using Tableau and Python, including histograms, bar graphs, heat maps, and more.
- For statistical analysis, I will conduct a two-sample hypothesis test (z-test) for all demographics.
- I will also calculate a 95% confidence interval for expected lead conversions, impression to conversion rate, and click through rate.
- Additionally, explore the most viewed times in order to select the most efficient time for ad placement.

Data Acquisition & Preparation:

- Cleaned and formatted the data, removing any unnecessary columns and rows using Excel.
- Calculated the bounce rate and percentage..
- Planned to use a 95% confidence interval to estimate lead conversions.
- Additionally, I collaborated with the digital media specialist to gather relevant data from the platforms, including time and demographic information.

Results

- Males viewed the ad significantly more than females, in terms of reach and impressions, which was confirmed through statistical testing. There was some indication that the reach-to-impression ratio between genders may differ, the p-value of 0.08 suggests that further investigation is needed to draw firm conclusions.
- The age group 55-64 stood out as the most frequent viewers, with a significant 99% difference from the lowest group, indicating a strong preference for this demographic.
- The ad was most frequently seen during early morning hours, lunch breaks, and late afternoon, aligning with typical routines of the older demographic. However, due to the minor differences in impressions during the top viewing hours, more data is required to determine the most effective time for ad placements.
- Performed well in terms of conversion and click-through rates, surpassing industry averages. The 30% conversion rate is particularly notable, but the relatively low impression-to-conversion rate (1.4%).