I.   INTRODUCTION

Following the 4.0 Industry Revolution, industries of all fields witnessed unprecedented changes in their working and operation process. Advertisement is no exception. Just 20 years ago, the most popular places we encountered an advertisement were still on the TV, banners or posters held out of the street. Recently, the methods have changed when the Internet and social media became a much cheaper way to advertise. Not only more beneficial with regards to the expenses, online advertisements make it easier for the industries to collect and analyze customers' data, which generates useful insights in understanding their customers' preference and behaviors. With those insights, the industries can establish the appropriate and effective advertisements with the right target audience and other factors in order to increase the industry' sales.

In this report, I would look at an advertisement – click on ad dataset of 1000 customers from January 2016 to July 2016. This dataset, while records customers' behavior of whether clicking on the Ad or not, also includes their demographic data (gender, country, city, area income) and other behaviors (daily time spent on site, daily internet usage, time that they clicked on Ad or closed the window). This is very interesting because we can have many observations and insights about our audience target.

II.   OBSERVATION

In regards to all of the customers, the majority of customers were from 25 to 34 years old, which occupied more than 40% of the total users. The second place belongs to the 35-44 age group, which represented 30% of the total. That means more than 70% of the total users were from 25 to 44 years old. Meanwhile, there were very few customers from the 18-24 and 55-64 age group (less than 10% for both groups) (Figure 1).
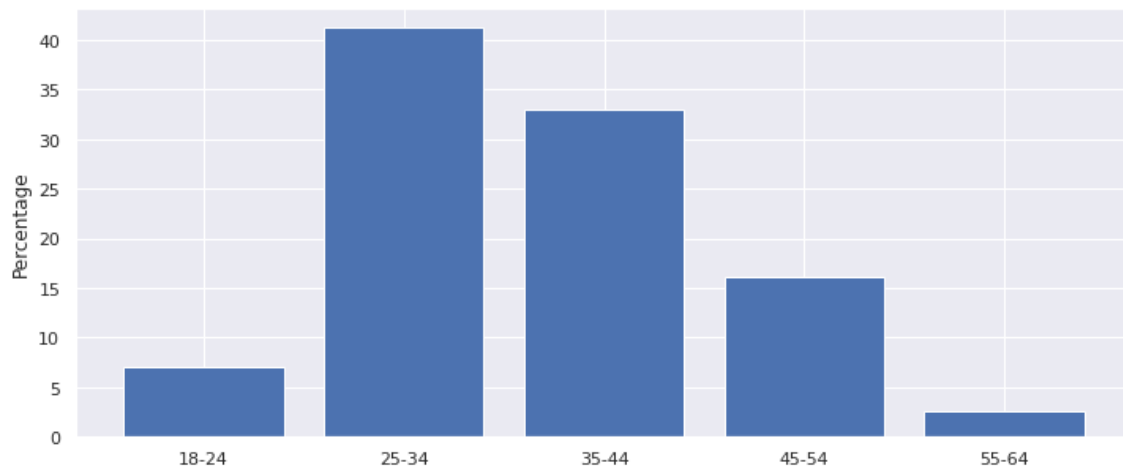
Figure 1: Percentage Of Users by Age (2016)

However, when it comes to users that actually click on the ads, the 25-34 group were not dominant anymore. Instead, among 50% of the total click-on-Ad users, users in the 35-44 age group had the highest tendency to click on ads, comprising 38.8% (Figure 2).
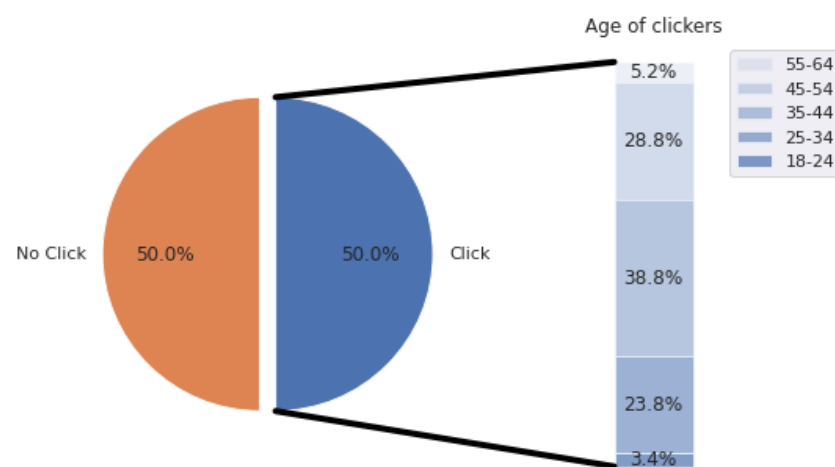

Figure 2: Click-on-Ad Users Shares by Age

From the two figures above, it is obvious that the number of elderly people participating in online activities was much fewer than the young people. However, it is interesting to point out that once they participated, they engaged a lot with ads. Most ad – clickers belong to the 45 and above groups. To be more specific, all of the users in the eldest group (55-65) clicked on the Ad. Similarly, in the 45 – 54 group, there were 144 click–on–Ad users as opposed to 17 not-click-on-Ad ones. In

contrast, there were only 119 youngsters clicking on ads compared to 293 ones who did not click in the 25-34 group. In other words, the older people were, the more likely they would click on the ads (Figure 3).
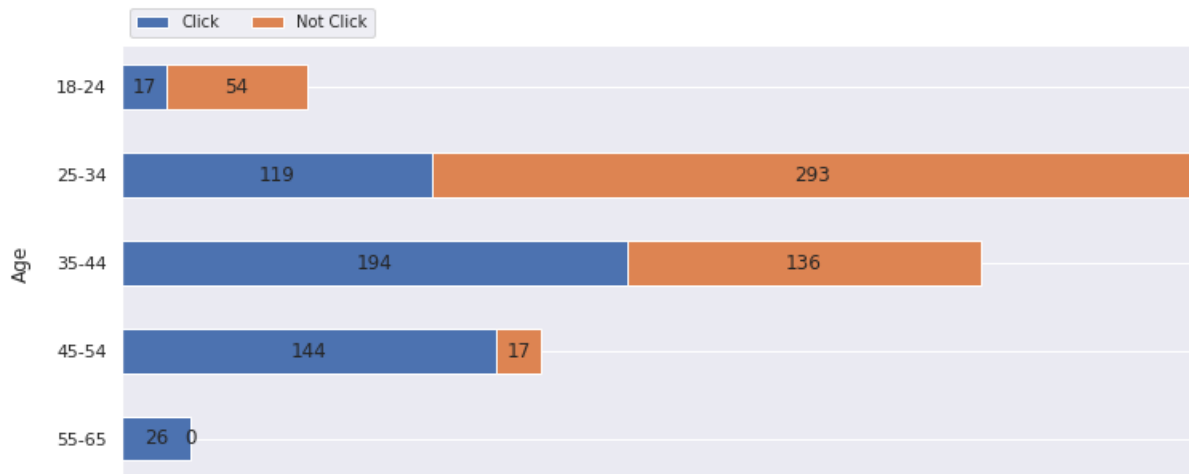

Figure 3: Number of Users Click/No Click by Age

Let's take gender into consideration as well. In general, with every age group, women had the tendency to click more on the Ad compared to the men. However, the differences were not significant (Figure 4).
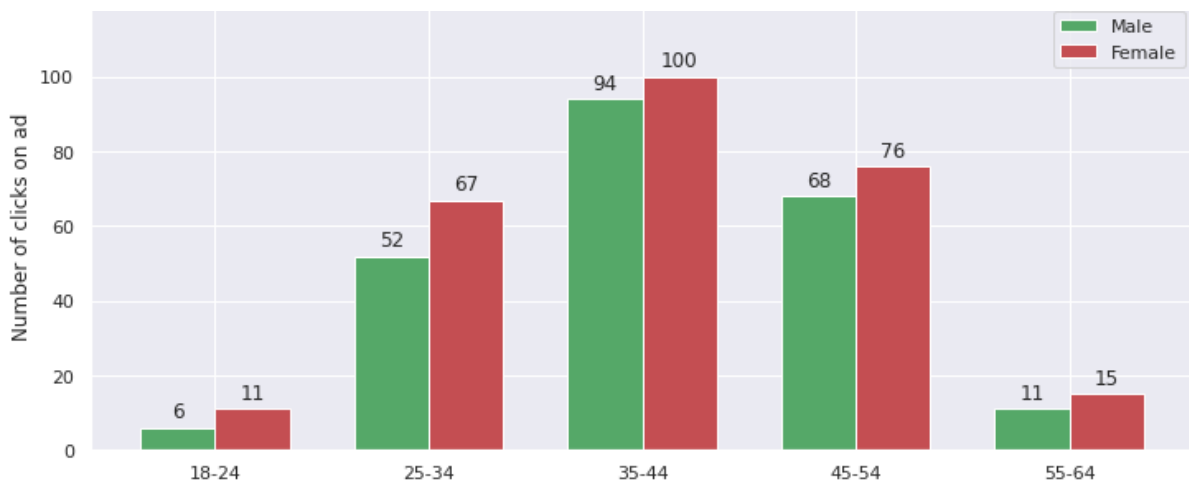

Figure 4: Number of Click-on-Ad Users by Age and Gender

Among the countries, Australia, Turkey and Ethiopia shared the first rank with 7 click-on-ads users in each country. Overall, with 7 as the highest number of clickers, there were no countries with an overwhelming number of clicks.
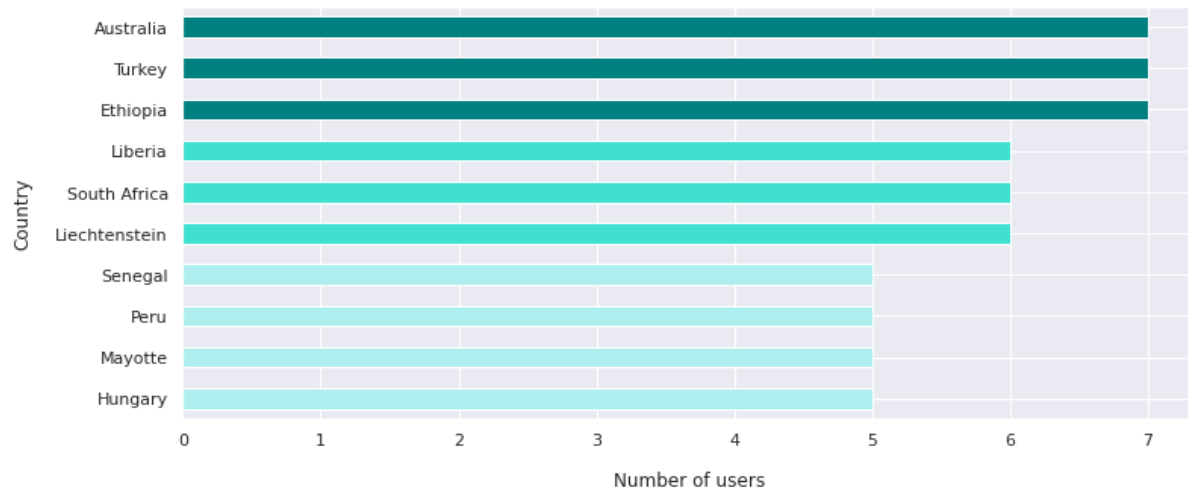

Figure 5: Top 10 Countries with Highest Users Click

It is interesting to witness that people who spend more time on the internet would be less likely to click on the Ad. Likewise, this also applied with the daily time spent on site. People with higher income also clicked less (Figure 6).
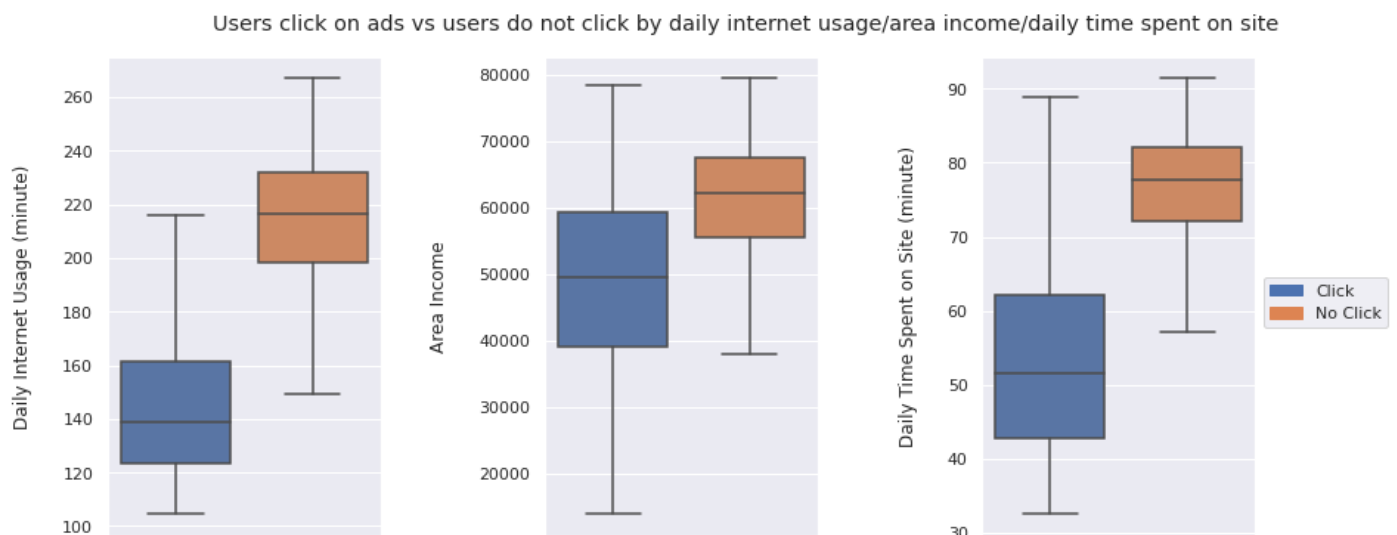

Figure 6: Click-on-Ad Users vs No-Click-on-Ad Users
by Daily Internet Usage – Area Income – Daily Time Spent on Site

Besides the demographic, it is also important to look into the time that customers are most likely to click on the ads. Observing the two below graphs, 9:00, 11:00 and after 18:00 would be a great time to display advertisements (Figure 7). Besides, regarding the weekdays, Wednesday, Thursday and Sunday would be the wise choices (Figure 8).
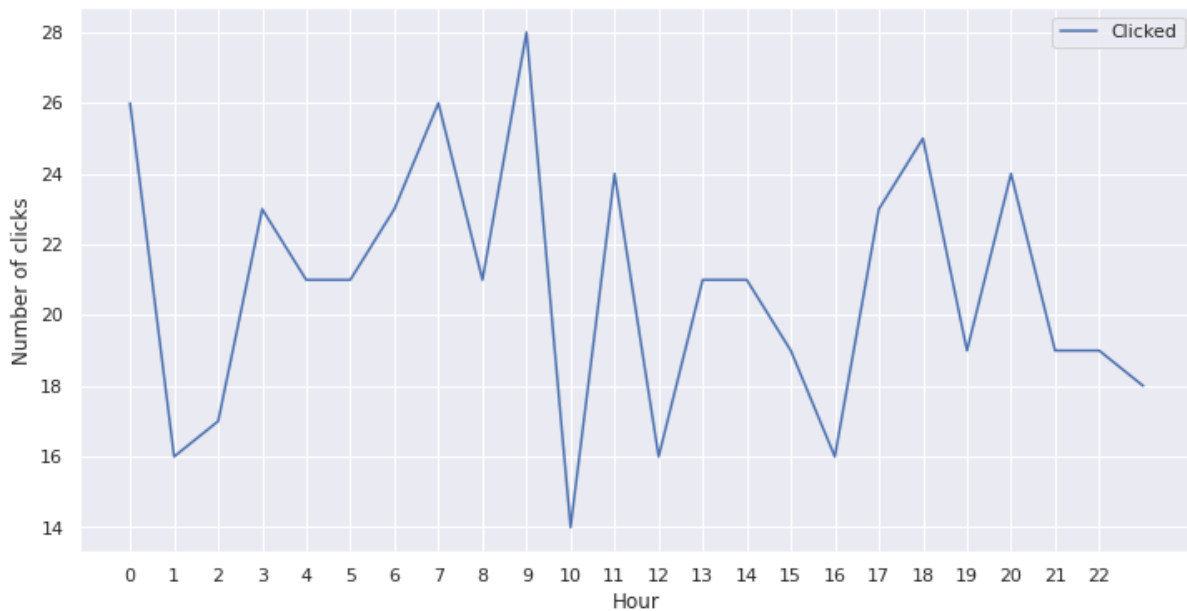

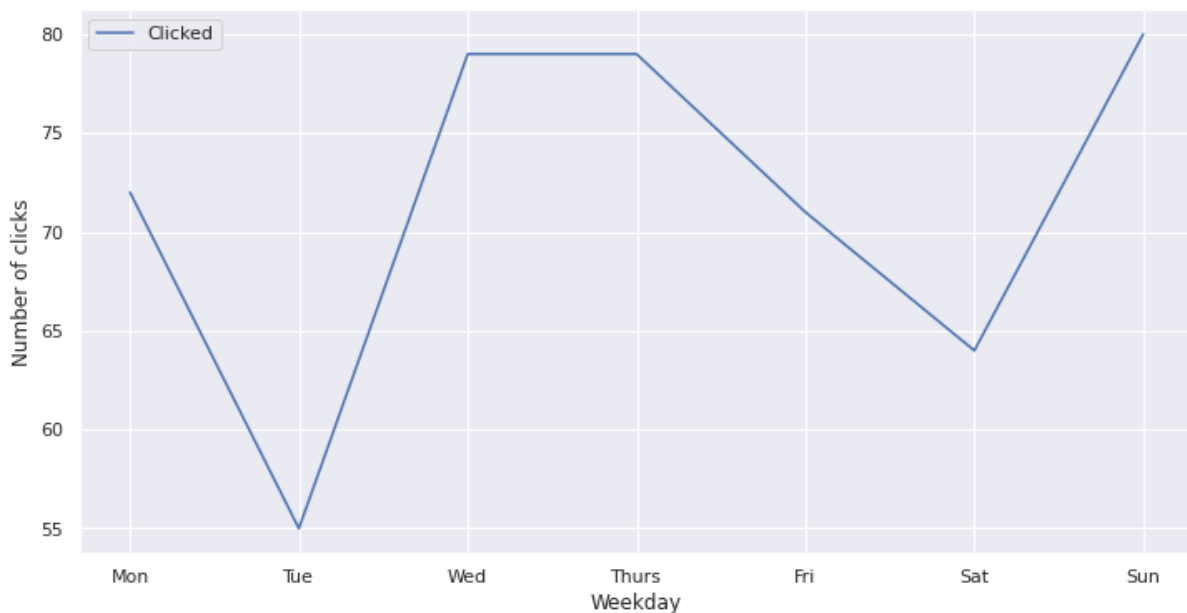**Figure 7: Number of Click on Ad by Hour**

Figure 8: Number of Click on Ad by Weekday

To track the performance of advertisements via the number of clicks throughout the months, let's observe the graph below. During the time analyzed, there was a downward trend in the number of clicks. In the first six months, there was a fluctuating tendency but the statistics were always nearly 70 and above. But the pattern then witnesses a dramatic decline, resulting in only 50 total clicks in July 2016 (Figure 9).
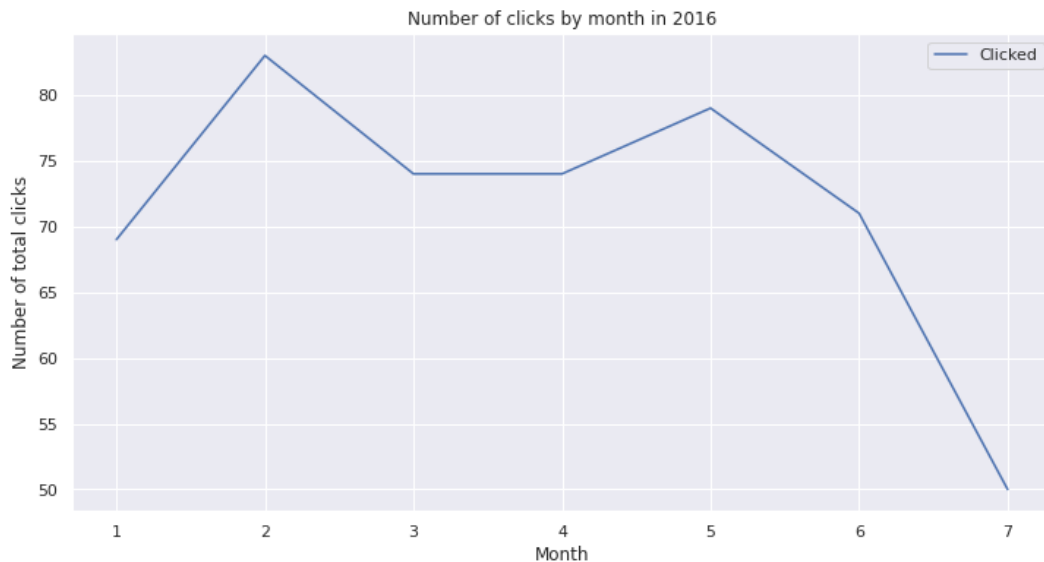

Figure 9: Number of clicks from January to July (2016)

Though the number of clicks observed a decline, the click-through-rate during the surveyed period witnessed a slight increase (Figure 10).
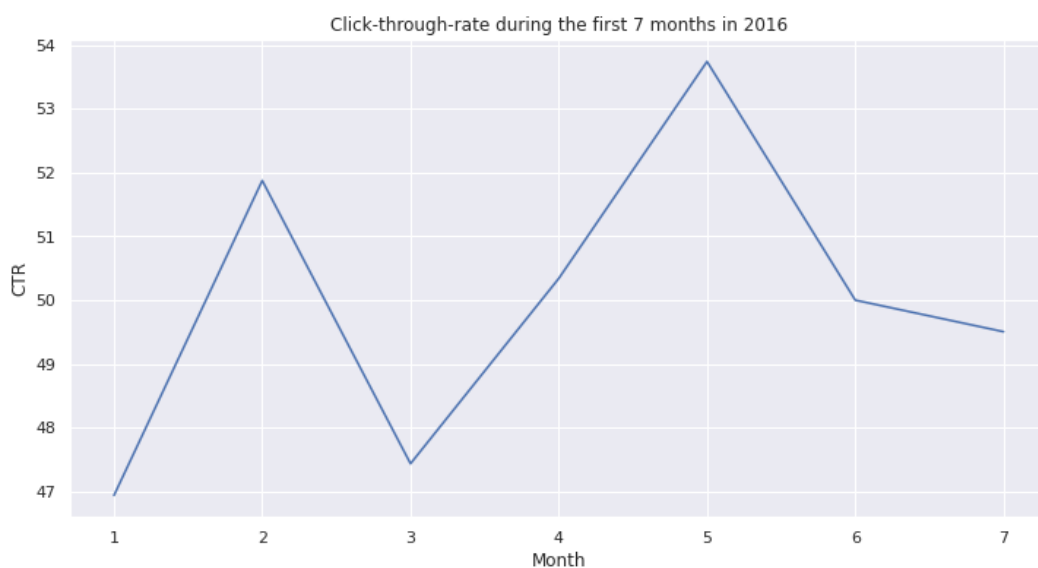

Figure 10: Click-through-rate from January to July (2016)

III. CONCLUSION

In general, people from the 25 – 34 age group were the most potential customers as they shared the highest percentage. However, the older groups were more likely to be attracted by the advertisements. It also has shown that women had more tendency to pay attention to the advertisement than their counterpart. Regarding where users lived, there were no significant differences between countries. However, the area income did correlate with the tendency of ad-clicking negatively. This also applied with the amount of online time of the users. That is to say, there are many things that need to be taken into consideration in order to deliver an efficient advertisement, the first step is to understand the customers, both demographic and behaviors.