Predict Clicked Ads Customer Classification by using Machine Learning

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Dedicated entry-level data scientist with analytical and experimental background of Physics. My graduation 2023, a pivotal year marked by significant advancements in artificial intelligence with the introduction of GPT-4 and other generative AI models, has fueled my curiosity and excitement to delve into the field of data. I have comprehensive grasp of data science methodology from business understanding to modelling process with proficiency in **Python, SQL, Tableau, Power BI, Looker Studio and other tools** related to data analytics workflow from several coursework and bootcamps.

Business Recommendation & Simulation

Business Recommendation

❑ Optimize Ad Placement for Active Internet Users

Users who heavily utilize the internet are typically less responsive to ads which could be due to ad fatigue or a situation where they are exposed to a higher volume of ads. Over time, they may become tired or "fatigued" of seeing advertisements, leading to decreased responsiveness. To enhance ad performance, optimizing ad placement for users with lower internet usage or devising strategies to make ads more noticeable to this demographic, such as employing captivating visuals or distinctive offers, could be explored.

❑ Site Content Personalization

Given that users are more likely to click on ads when spending less time on our site, it becomes crucial to focus on content personalization and enhancing user engagement. Customizing content to maintain user interest without overwhelming them is key. This can involve strategies such as recommending relevant content and leveraging user data to tailor the user experience.

For more details, you can view the Jupyter notebook here.

Business Recommendation

❑ Age-Targeted Advertising

Given the higher engagement levels observed among older demographics, it's strategic to refine our ad campaigns to resonate more effectively with this audience segment. This could involve crafting messaging and visuals that reflect the life experiences and preferences typical of older age groups. Additionally, leveraging insights from market research to identify products or services that align with the needs and aspirations of this demographic can enhance the effectiveness of our advertising efforts.

❑ Income-Level Advertising

Areas with lower income levels often exhibit higher ad click rates. Thus, creating ad campaigns with budget-friendly offerings that cater to individuals with lower incomes could be beneficial. Additionally, adjusting the ad messaging to emphasize cost-effective solutions may further enhance effectiveness.

Business Simulation – Context and Assumption

```
1  df['Clicked on Ad'].value_counts()
✓ 0.0s

Clicked on Ad
0    500
1    500
Name: count, dtype: int64
```

The initial condition (before model implementation) indicates that there are 50% of customers/users who do not click on the ads targeted to them. This is certainly disadvantageous for the company because it will increase the cost incurred by the company in displaying those ads on a platform.

In this case, the total profit obtained by the company before and after model implementation will be calculated. Previously, several assumptions will be made such as:

- Cost per Advertisement : Rp.6,000
- Revenue per Ad clicked: Rp.15,000

Reference for above number :

- https://www.semrush.com/blog/google-ads-cost/
- https://www.businessofapps.com/ads/cpc/research/cpc-rates/

Business Recommendation & Simulation

Business Simulation – Before Model Implementation

- **No. Users Advertised**

All User = 1000

- **Ad Click Rate**

500/1000 = 50%

- **Total Cost**

No. Users Advertised x Cost per Ad = 1000 x 6000 = Rp.6,000,000

- **Total Revenue**

Click Rate x No. Users Advertised x Revenue per Ad Clicked = 0.5 x 1000 x 15000 = Rp.7,500,000

- **Total Profit**

Total Revenue - Total Cost = Rp.1,500,000

Business Simulation – After Model Implementation

- **No. Users Advertised**

Accuracy x All original user = 0.973 x 1,000 = 973

- **Ad Click Rate**

(Precision x 1000)/No. Users Advertised = 0.972 x 1000 / 973 = 99.8%

- **Total Cost**

No. Users Advertised x Cost per Ad = 1000 x 6000 = Rp.6,000,000

- **Total Revenue**

Click Rate x No. Users Advertised x Revenue per Ad Clicked = 0.998 x 973 x 15000 = Rp.14,565,810

- **Total Profit**

Total Revenue - Total Cost = Rp.8,727,810

➢ **Conclusion**

We can see that with model implementation click rate is up from 50% to 99.8%, and similarly profit is up from Rp.1,500,000 to Rp.8,727,810 (**581.8% increase**).