

Clicked Ads Analyst Using Machine Learning

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To see full code, click [here](#)

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01

Business Understanding

Problem Statement

"A company in Indonesia wants to know the effectiveness of an advertisement that they run, this is important for the company so they can find out how much achievement the advertisements marketed they can attract customers to see advertisements.

By processing historical advertisement data and finding insights and patterns that occur, it can help companies determine marketing targets, the focus of this case is to create a machine learning classification model that functions to determine the right target customers "

Goals

Create a machine learning model that can detect potential users to convert or interested in an advertisement. So that we can optimize the cost of advertising on digital platforms.



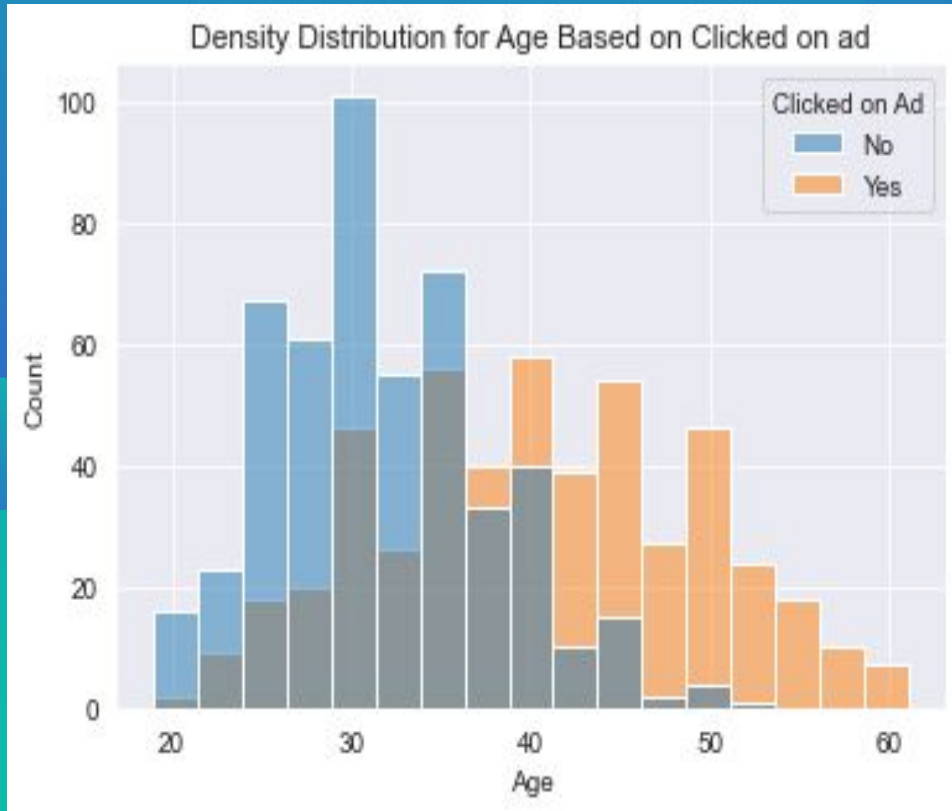
02

Exploratory Data Analyst

Data Overview

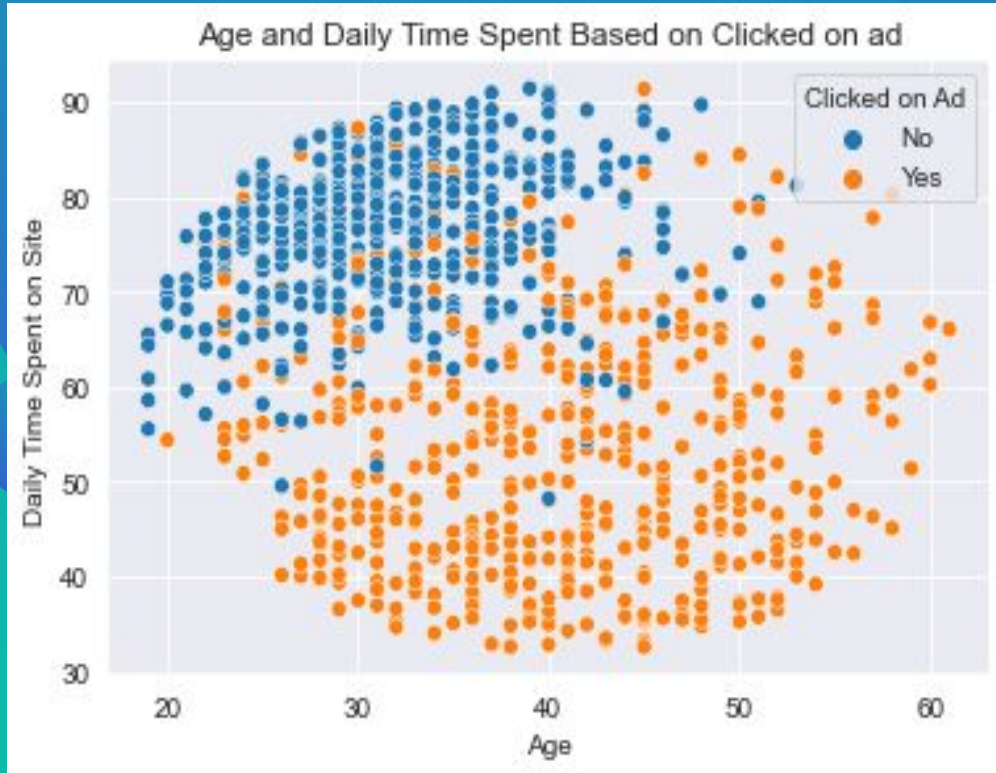
Variable	Description
Daily Time Spent On Site	Length stay on site in minutes
Age	User Age
Area Income	Income User
Daily Internet Usage	Daily internet usage
Male	User Gender
Tlimestamp	Time user visit the website
Clicked on Ad	Ads clicked by user
City	City user
Province	Province
Category	Product Category

Insight From Data



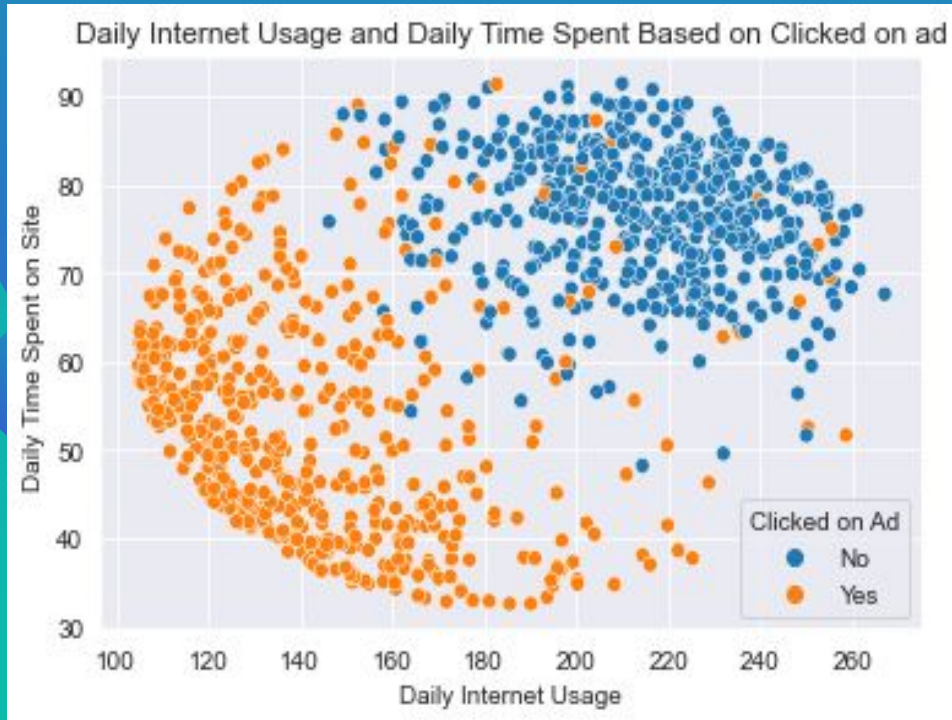
Based on the picture beside, it can be seen that users who are over 40 years old tend to like advertisements compared to users who are under 40 years old.

Insight From Data



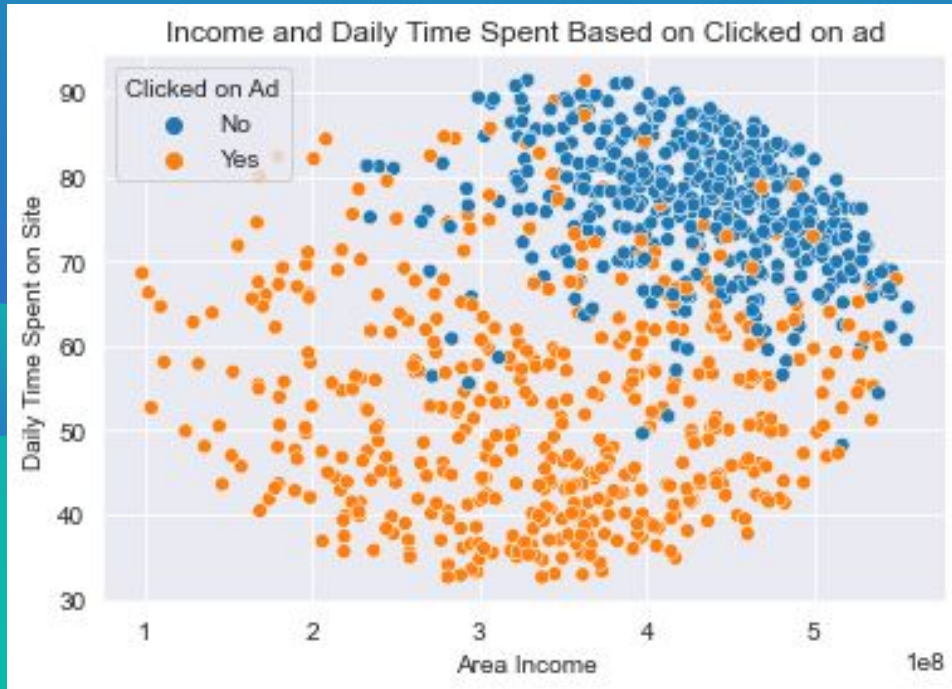
Users under the age of 40 who spend more time on the website are less likely to be interested in advertising.

Insight From Data



Users who have daily internet usage are less likely to like advertisements compared to those who have longer daily internet usage.

Insight From Data



Based on the plot, there are 2 segments that define users, namely low income users and high income users.

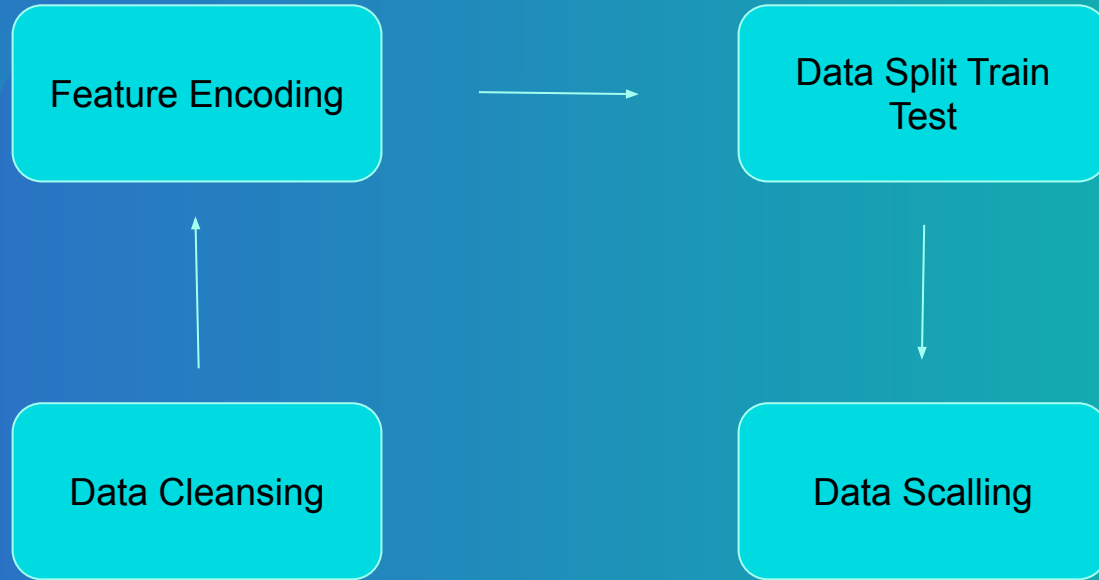
Low Income users tend to be interested in advertisements while High Income users tend not to be interested in advertisements.



03

model Machine Learning

Data Preparation



Data Modelling

Model	Accuracy (Train)	Accuracy (Test)	Precision (Train)	Precision (Test)	Recall (Train)	Recall (Test)
Decision Tree	1.00	0.64	1.00	0.62	1.00	0.78
Random Forest	0.97	0.93	0.97	0.93	0.97	0.94
XGBoost	0.99	0.94	0.99	0.95	0.98	0.94

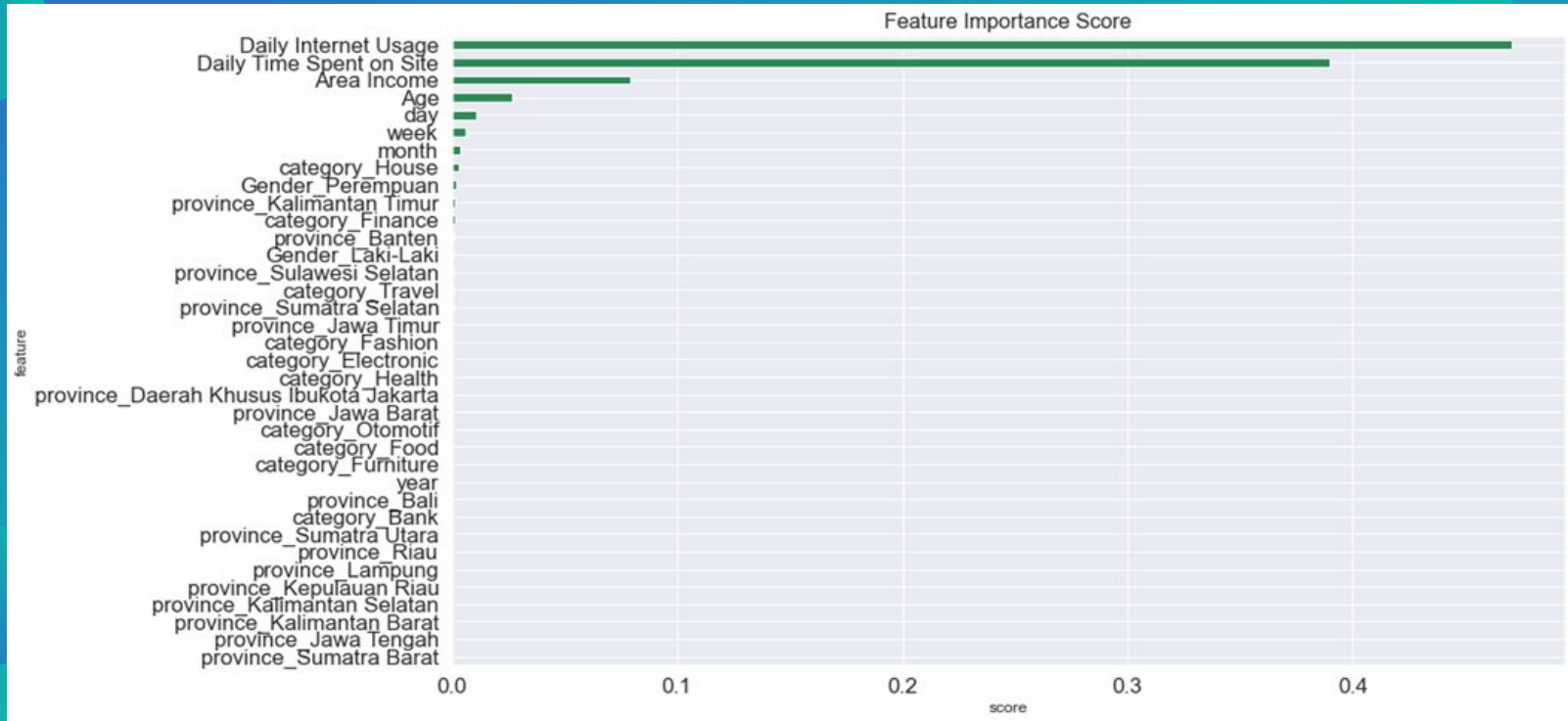
Based on the results obtained after creating the model, XGBoost is the model chosen because it has the Recall Train and Recall Test values with the least difference compared to other models.

Confusion Metrics



For this case, we used Recall..

Feature Importance



Features Daily Internet Usage, Daily Time Spent on Site, Area Income, Age have the highest score of feature importance compared to other features.



04

Recommendation

Based on Data, we can conclude that:

1. The data we get has 2 user segments, namely the upper class user segment and the lower class user segment.
 - The upper class has the criteria of frequently using the internet, frequently visiting the website of a product, having a relatively young age and high income.
 - The lower class has the opposite nature.
2. Users with lower economic class tend to be more easily attracted to click products on digital ads.
3. Users who are very heavy in using the internet are even more difficult to be given advertising because they may already be used to digital ads.
4. Parents are a potential market for the digital market.

Business takeaway:

1. We can use a more unique method (soft selling) so that it is less visible to advertise by users.
2. Use mainstream content (simple but a topic of conversation) in order to attract users with lower class segments.