

A person is seen from behind, sitting in a small, narrow wooden boat on a calm, turquoise river. The river is surrounded by dense tropical forest with many palm trees. The water reflects the surrounding greenery. The overall scene is peaceful and scenic.

Trips&Travel.com Holiday Package Recommendation

By Power Rangers

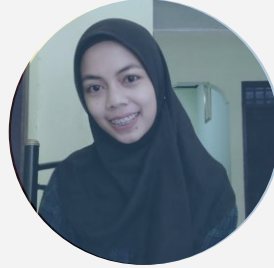
Data Scientist



**Dwirany Dian
Audry**



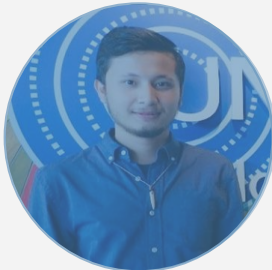
**Talenta
Nanda**



**Mega Dwi
Astuti**

Our Team

Business Team



Ichwan



Avinska Valeria

By Power
Rangers

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**By Power
Rangers**



01

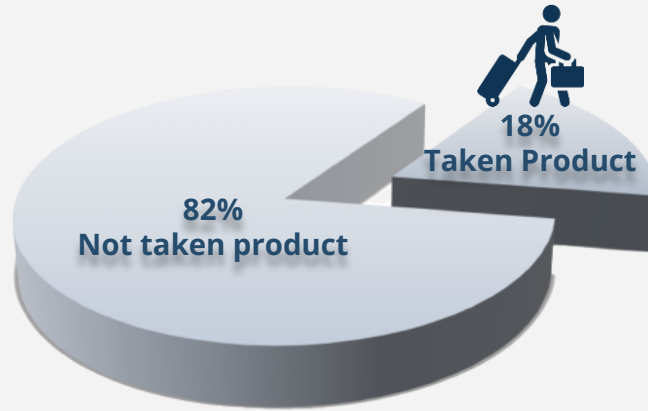
Project
Background



Trips & Travel.Com

is a company that provides holiday packages such as: Basic, Standard, Deluxe, Super Deluxe, King

Looking at the data of the last year, the marketing cost is quite high while only 18% of the customers purchased the packages. They loss 3.968 customers because customers were contacted randomly



Project
Background



Problem Statement

82% customer not taken holiday packages because they were contacted randomly

Goal

Increase sales of Trips & Travel.Com Holiday Packages

Objectives

- Create system to predict potential customer to support Wellness Tourism Package sales
- Determine customer segmentation of the available packages
- Implement new marketing strategies

Project
Background

A person's hands are shown typing on a laptop keyboard. The laptop screen displays a data visualization interface with a sidebar on the left and a main area showing a map and a circular chart. The entire image has a blue tint and a semi-transparent white box in the center containing the text.

Data Preprocessing

02

Dataset



Customer Profile

CustomerID
Age
CityTier
Occupation
Gender
PreferredPropertyStar
MaritalStatus
Passport
OwnCar
Designation
MonthlyIncome



Feature

TypeofContact
DurationofPitch
NumberofPersonVisiting
NumberofFollowups
ProductPitched
NumberofTrips
PitchSatisfactionScore
NumberofChildrenVisiting



Target

ProdTaken



Business Metrics

Number of Product Taken
Average Sales Pitch Satisfaction
Number of Person Taking Trip

Data
Preprocessing

Missing Value

Handle null values:
with mean

- Age
- MonthlyIncome
- DurationOfPitch,
NumberOfTrips

with mode

- NumberOfFollowups
- PreferredPropertyStar
- NumberOfChildrenVisiting
- TypeofContact

DurationOfPitch	251
MonthlyIncome	233
Age	226
NumberOfTrips	140
NumberOfChildrenVisiting	66
NumberOfFollowups	45
PreferredPropertyStar	26
TypeofContact	25
Passport	0
MaritalStatus	0
ProductPitched	0
Designation	0
NumberOfPersonVisiting	0
Gender	0
Occupation	0
PitchSatisfactionScore	0
CityTier	0
OwnCar	0
ProdTaken	0
CustomerID	0

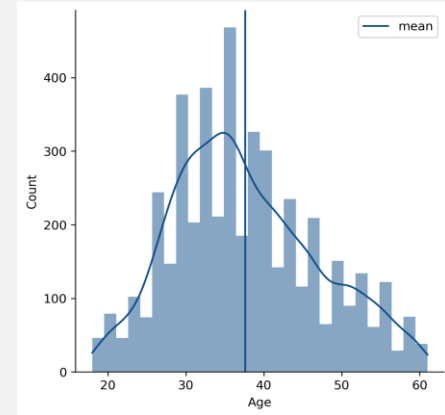
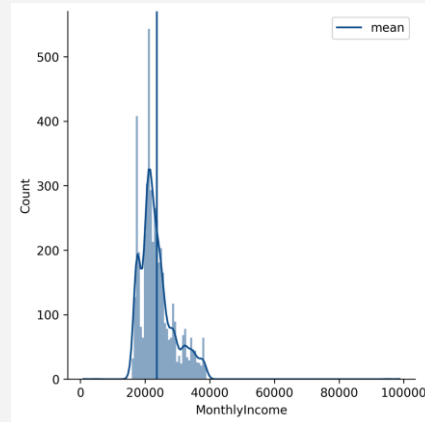
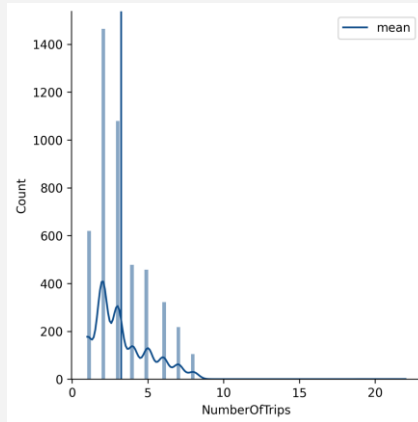
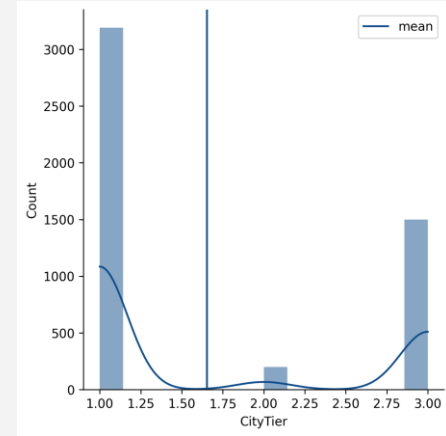
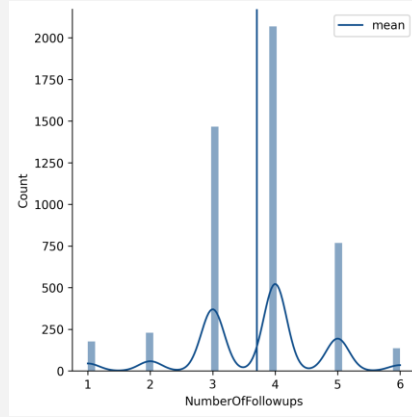
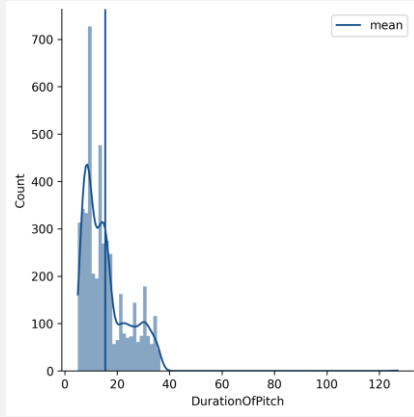
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Feature Selection

- Designation
- Passport
- City Tier
- Marital status
- Occupation
- Monthly Income
- Age
- Preferred Property
- Gender
- Duration of Pitch
- Number of trips
- Number of follow up
- Pitch Satisfaction
- Type of Contact
- Product Pitch

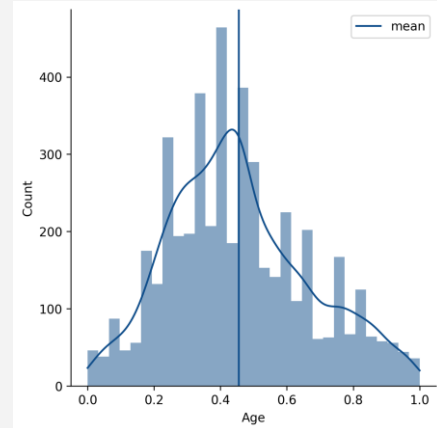
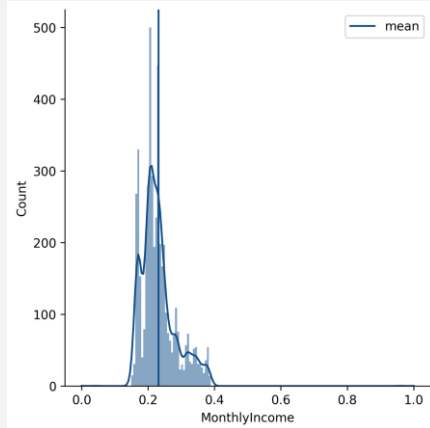
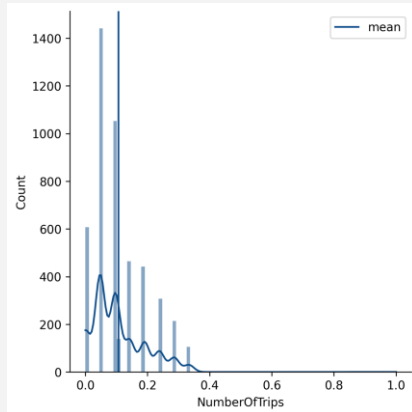
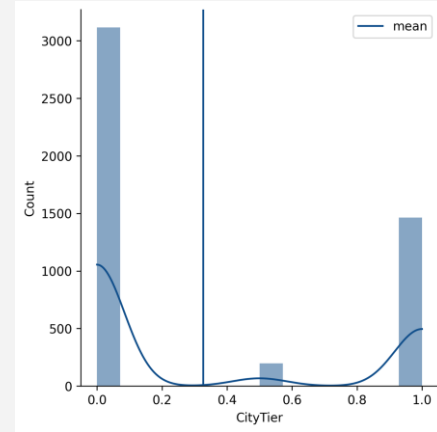
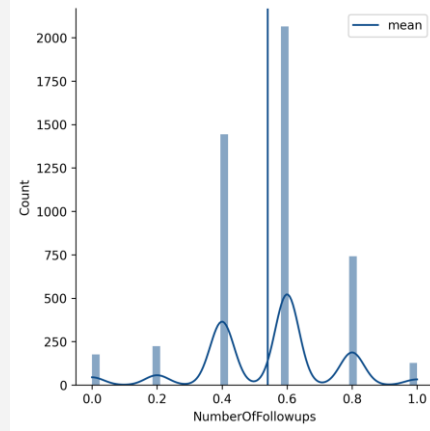
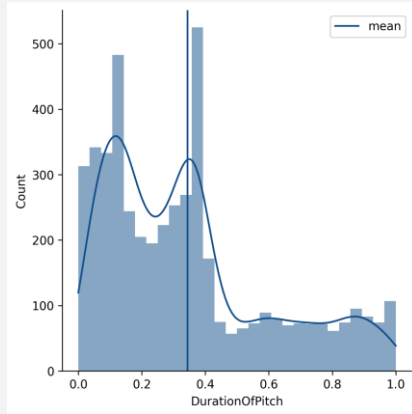
Data
Preprocessing

Data Distribution - Before Normalization & Handle Outliers



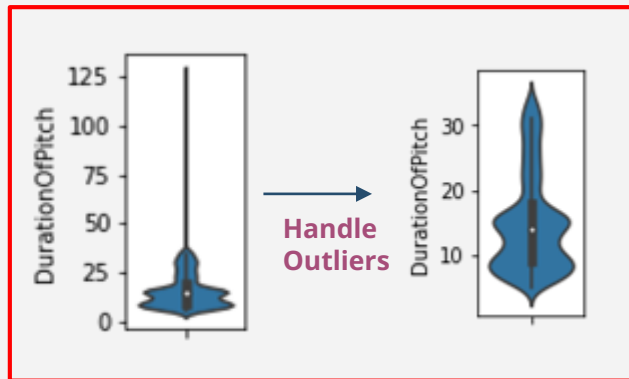
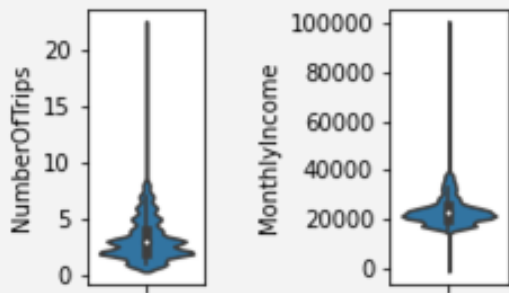
Data
Processing

Data Distribution - After Normalization & Handle Outliers



Data
ssing

Outliers



Handle outliers on **DurationOfPitch** with IQR Method because we assume the number is not necessary, while on **MonthlyIncome** & **NumberOfTrips** are valid

Normalization

Transform skewed distribution feature's value into the same scales with **MinMaxScaler**

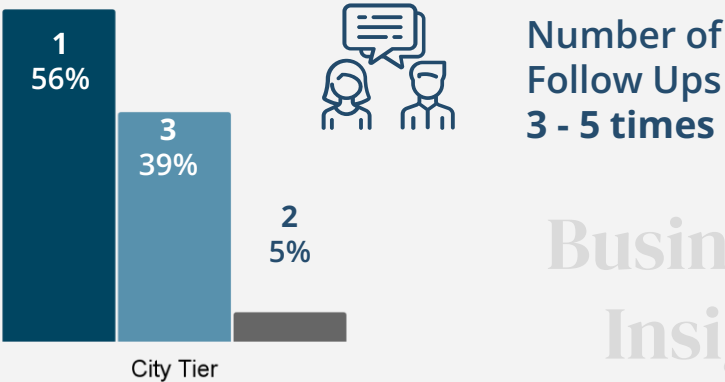
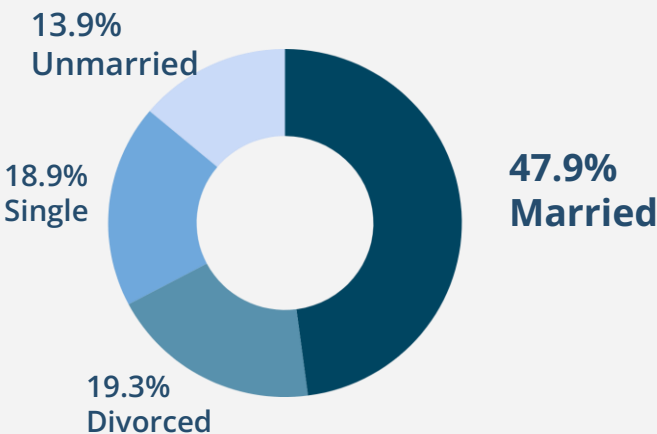
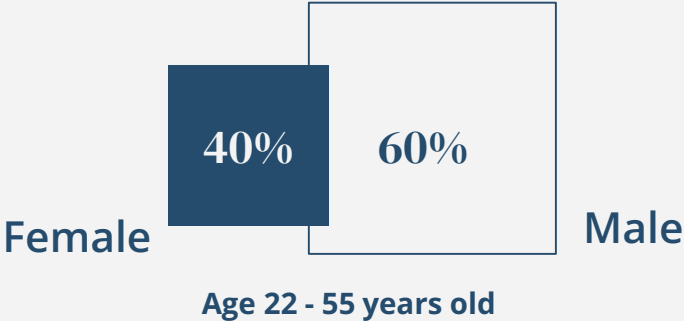
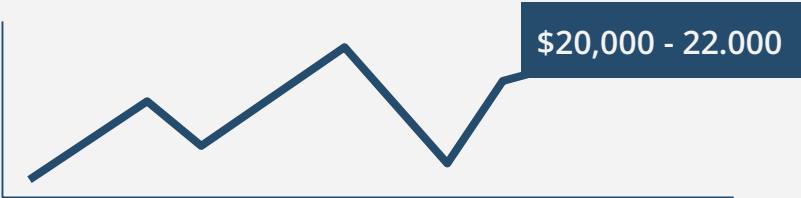
Feature Engineering

Label encoding on Gender and hot encoding on Occupation, MaritalStatus and Designation

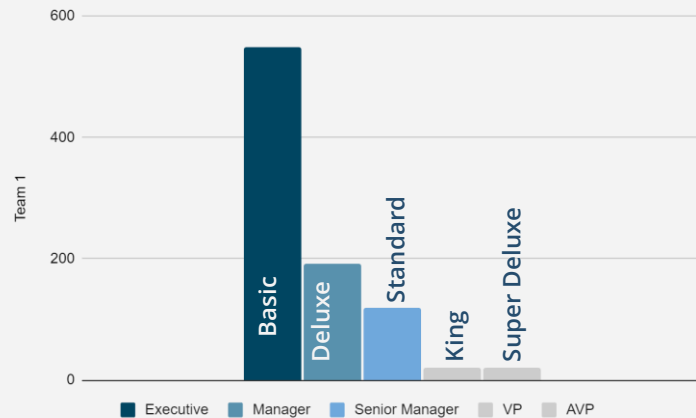
Data
Preprocessing

Product Taken Customer Behavior

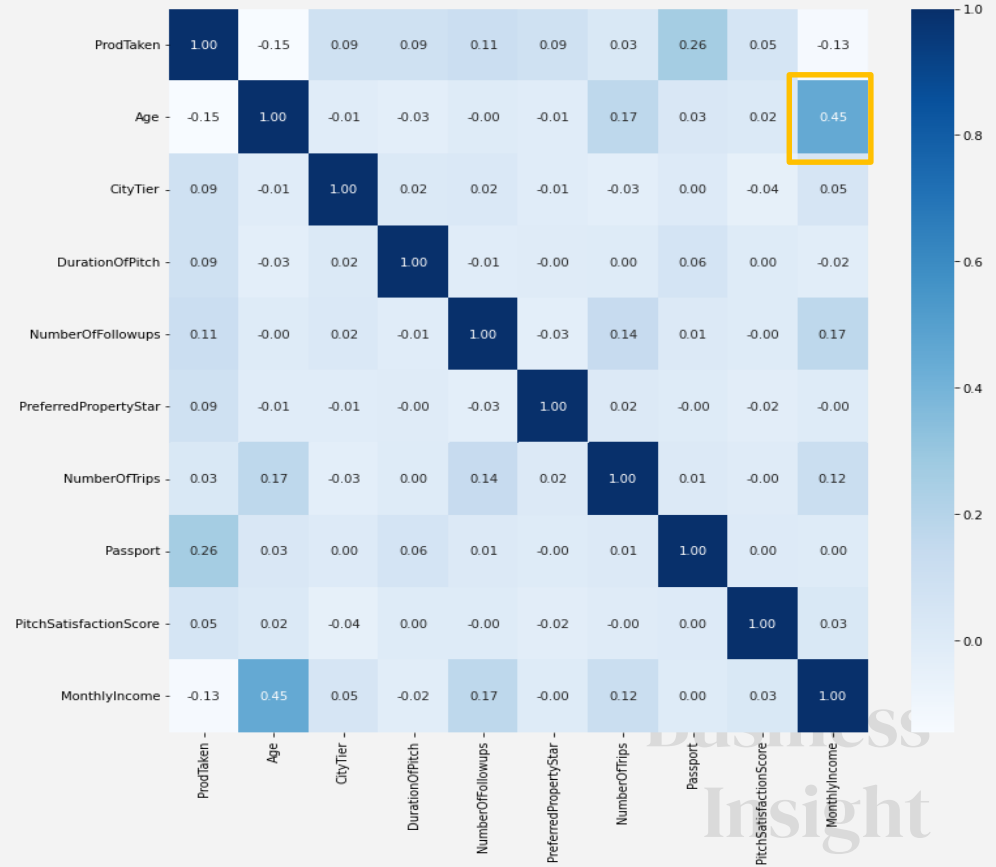
Average Monthly Income



Business
Insight



Feature Correlation





**Modeling &
Evaluation**

03

Train – Test Split

Ratio 3:1 for modeling

Class Imbalance

SMOTE Method with ProdTaken 0 and 1 become 2591 : 2591 (1:1)

Modeling

- ☐ Logistic Regression
- ☐ K Nearest Neighbor
- ☐ Decision Tree
- ☐ Random Forest
- ☐ Adaboost
- ☐ XGBoost
- ☐ Stacking

With **Hyperparameter Tuning**

Evaluation

Accuracy	Recall	Precision
F Score	ROC-AUC	

Modeling & Evaluation

Top 3 Modeling

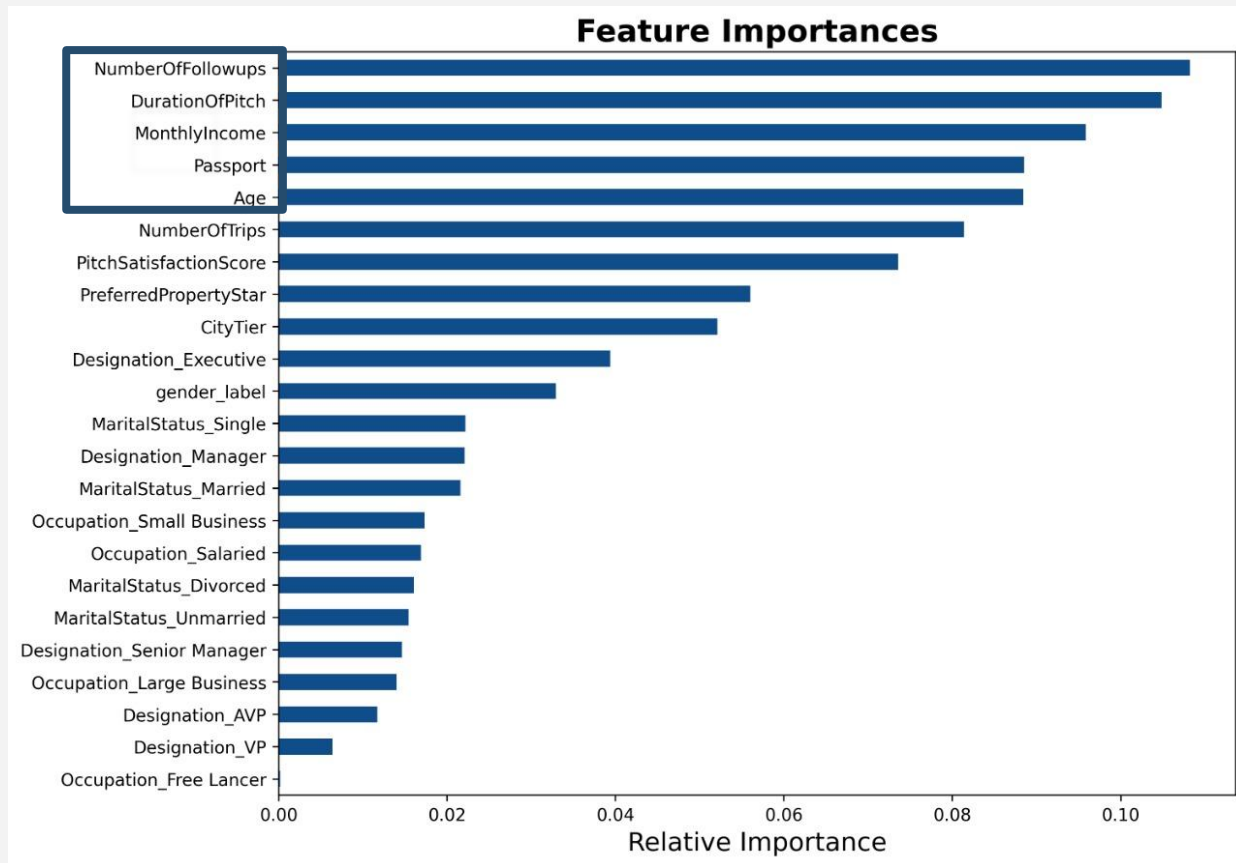
	Model	Train_Accuracy	Test_Accuracy	Train_Recall	Test_Recall	Train_Precision	Test_Precision	Train_F1	Test_F1
7	Random Forest - RandomizedSearchCV	0.999807	0.927136	1.000000	0.738562	0.999614	0.862595	0.999807	0.795775
6	Random Forest	1.000000	0.916457	1.000000	0.699346	1.000000	0.839216	1.000000	0.762923
12	Stacking	0.999421	0.926508	0.998842	0.794118	1.000000	0.818182	0.999421	0.805970

Confusion Matrix

Model	True Positive	True Negative	False Positive	False Negative
Random Forest - Hyperparameter Tuning	14.20 %	78.52 %	2.26 %	5.03 %
Random Forest	13.44 %	78.52 %	2.58 %	5.78 %
Stacking	15.08 %	77.45 %	3.33 %	4.15 %

Modeling & Evaluation

Feature Importance





**Business
Recommendation**

04

Business Recommendation



For Sales Team:

- The effective Number of Follow Ups is **3 - 5 times** with
Duration of Pitch **9 - 22 minutes**
- Provide **additional services** for making passport

Customer Segmentation

Wellness Tourism

28 – 41 years old
Single & Married
Male
City Tier 1 and 3
Salaried
Executive
18000 – 23000 USD

Basic

26 – 37 years old
Single
Male
City Tier 1
Salaried
Executive
17000 – 21000 USD

Standard

32 – 44 years old
Married
Male
City Tier 3
Small Business
Manager
20000 – 24000 USD

**NEW
PACKAGE**

Business Recommendation

Customer Segmentation

Deluxe	Super Deluxe	King
32 - 44 years old Married Male City Tier 3 Small Business Manager 20000 - 24000 USD	40 - 45 years old Single Male City Tier 3 Salaried AVP 28000 - 31000 USD	42 -56 years old Single Female City Tier 1 Small Business VP 34000 - 38000 USD

Business
Recommendation

Business Strategy



Optimize Social Media

Instagram (Target Age: 26-30)
Youtube (Target Age: 26 - 35)
Facebook (Target Age: 30-56)
Email Marketing



Product Proposal

- Actively offer Proposal Business, specially before holiday.
- Promotion time for those who are already married: on long holidays (eg Eid or Christmas)
- If single, offer product after peak season



Actively Join Exhibition

Actively join family travel Exhibition

Recommendation

Product Taken Simulation

Bali Tour Packages 5 Days and 4 Nights Tours Price :
Price With Hotel : IDR 4.150.000 / person

<https://www.baligoldentour.com/bali-tour-packages-5-days-4-nights.php>

Before modeling:

18% (18 of 100 person) customer taken product:

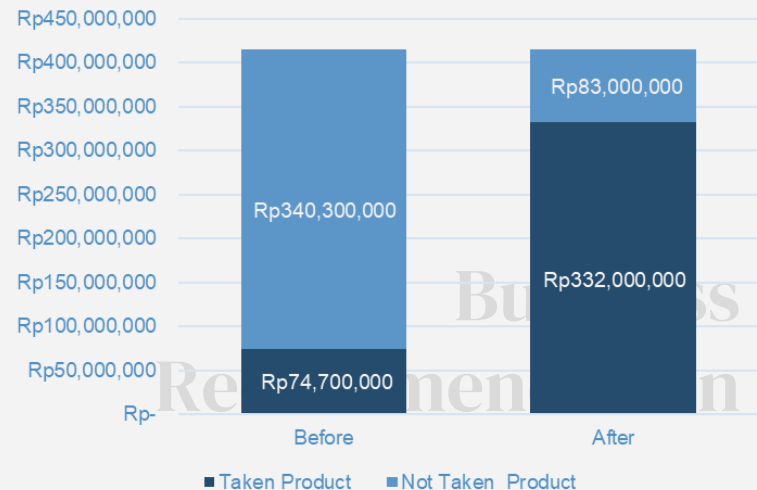
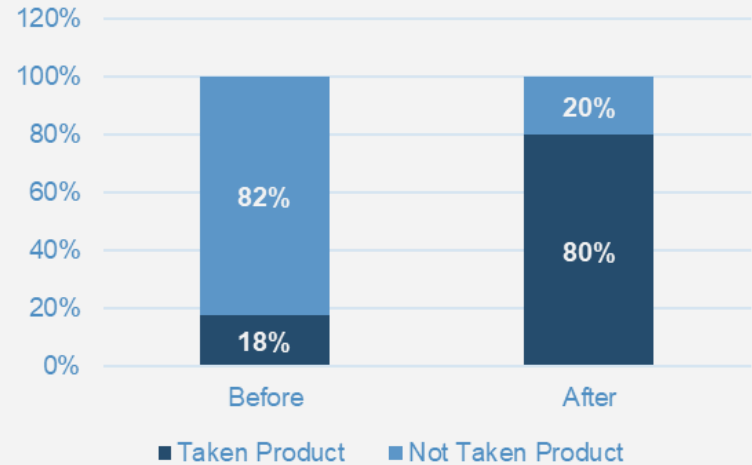
Customer = 100
ProdTaken = 18
Revenue = 18 x Rp.4.150.000
= Rp. 74.700.000

After modeling:

Precision 86%, we choose 70-80% of 100 customer taken product:

- # Customer = 100
ProdTaken = 70
Revenue = 70 x Rp.4.150.000
= Rp. 290.500.000
- ProdTaken = 80
Revenue = 80 x Rp.4.150.000
= Rp. 332.000.000

Sales Increase 288 - 344%



Executive Summary

Project Background

82% customer not taken holiday packages because they were contacted randomly, so we need to increase sales of Trips & Travel.Com Holiday Packages with:

- Create system to predict potential customer to support Wellness Tourism Package sales
- Determine customer segmentation of the available packages
- Implement new marketing strategies

Data Preparation

Data cleansing, feature selection, handle outliers, feature engineering & normalization

Modeling & Evaluation

11 Models tested with Precision as Evaluation Target to **reduce False Positive**. Turns out smallest False Positive goes to **Random Forest - Hyperparameter Tuning model with 2.26% and Precision 86%**

Business Recommendation

Business Recommendation

For Sales Team:

- The effective Number of Follow Ups is 3 - 5 times with Duration of Pitch 9 - 22 minutes
- Provide additional services for making passport

For Marketing Team:

- Contact customer by their behavior of segmentation of packages

Product Taken Simulation

Sales increase about **288 - 344%**

An aerial view of a person in a small, narrow boat navigating a calm river that flows through a dense tropical forest. The river's water is a clear, vibrant turquoise color, reflecting the surrounding lush greenery. The forest is composed of numerous tall palm trees with large, feathery fronds that create a thick canopy. The person in the boat is seen from behind, wearing a light-colored shirt and a blue cap, and is using a long pole to maneuver the vessel. The overall atmosphere is serene and peaceful. The text "Thank you" is centered in the middle of the image in a white, serif font. In the bottom right corner, the text "By Power Rangers" is written in a smaller, white, sans-serif font. There are also two white L-shaped corner brackets: one in the top right corner and one in the bottom left corner.

Thank you

By Power Rangers