Data Science

Portofolio

Mochamad Choiril Iman

About Me

Bachelor of Electrical Engineering from Brawijaya University with GPA 3.57/4.00. Experience with instrumentation, testing, programming, product development, electrical design etc. Loves new things and experience leading a team. Also have experience at data processing, data visualization, tools mastery (Ms. Excel, PostgreSQL, Python, Google Data Studio) and machine learning

Contact Us:

Mochamad Choiril Iman

moch.choiril.iman@gmail.com

085755388215

Tools Mastery

Electronics Design

CS EAGLE ARDUINO CV AVR isis Proteus

Data Processing

PostgreSQL python Data Studio

Latar Belakang Masalah

40%

Tingkat pembatalan hotel secara global

Penurunan revenue

Kebiasaan cancel

37%

Tingkat pembatalan hotel **di Portugal** (City Hotel & Resort Hotel)

Asumsi kerugian per tahun

Resort Hotel

25%

€ 484k

*Diambil dari kolom ADR

7 Miliar Rupiah

City Hotel

30%

€ 1,500k

*Diambil dari kolom ADR

23 Miliar Rupiah

Solusi?

CANCELLATION RATE PREDICTION

Target

Menurunkan cancellation rate

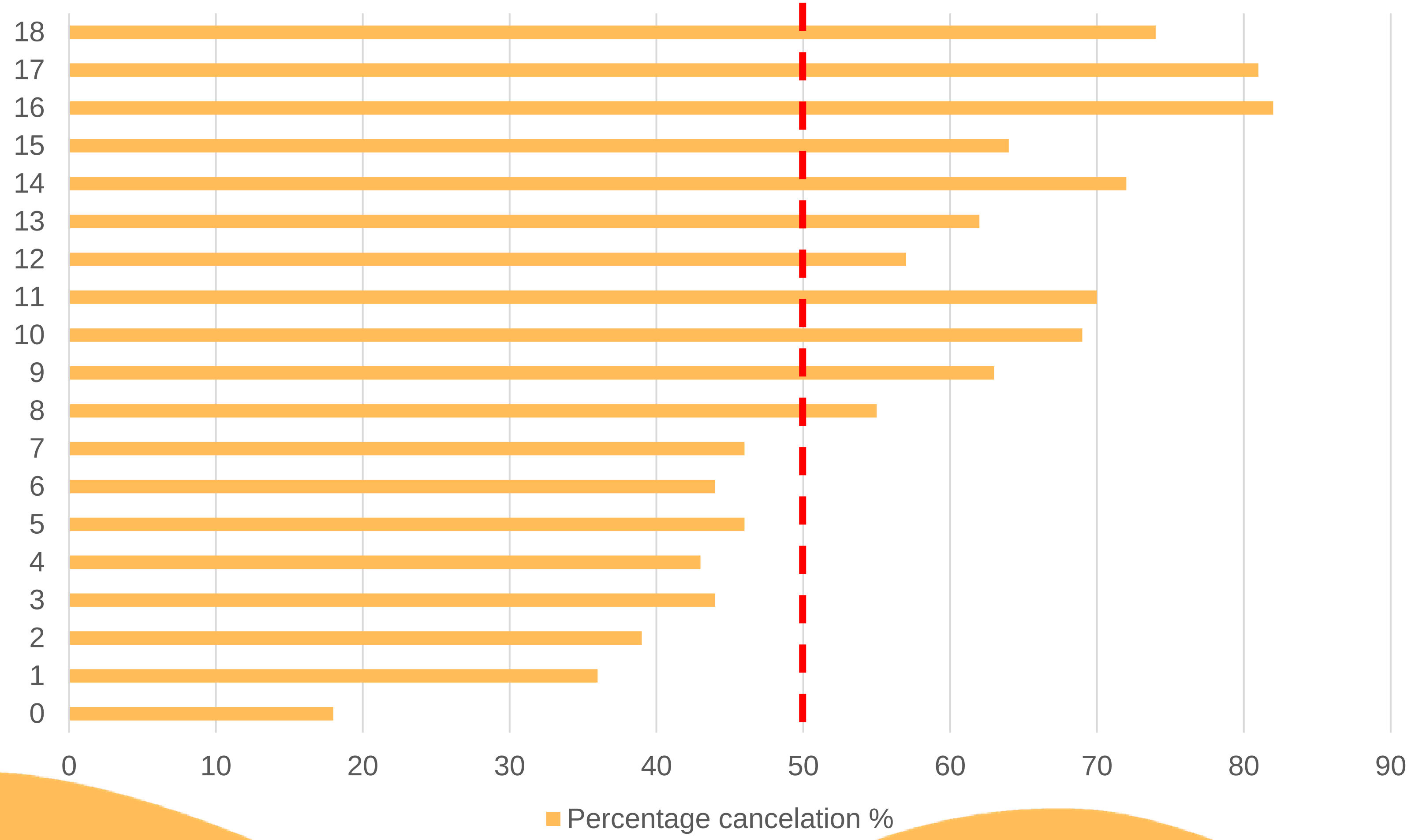
Cancellation rate

Business Metrics

Revenue

Exploratory Data Analyst

Lead time

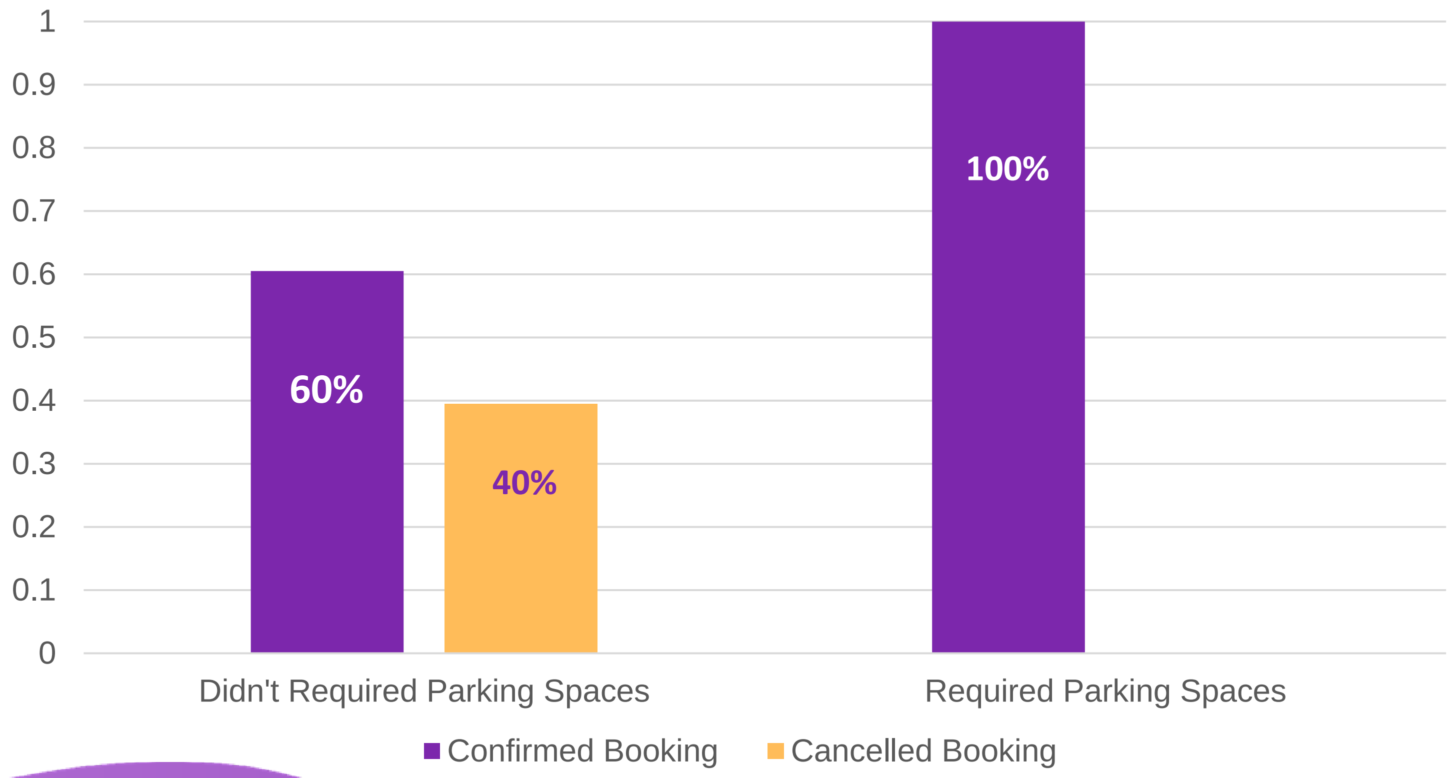


Pemesanan hotel dengan lead time lebih dari **7 bulan** memiliki peluang pembatalan lebih besar **(>50%)**

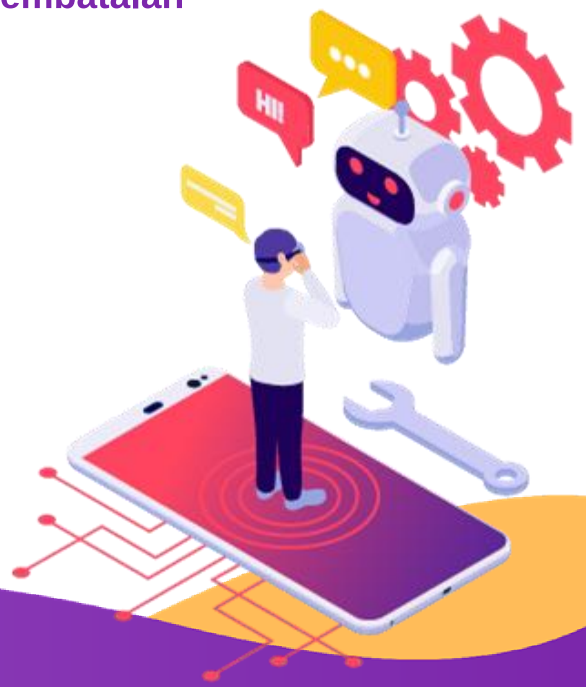
Semakin lama Lead time semakin tinggi kemungkinan pemesanan dibatalkan

Exploratory Data Analyst

Parking Space & Cancelled Rate

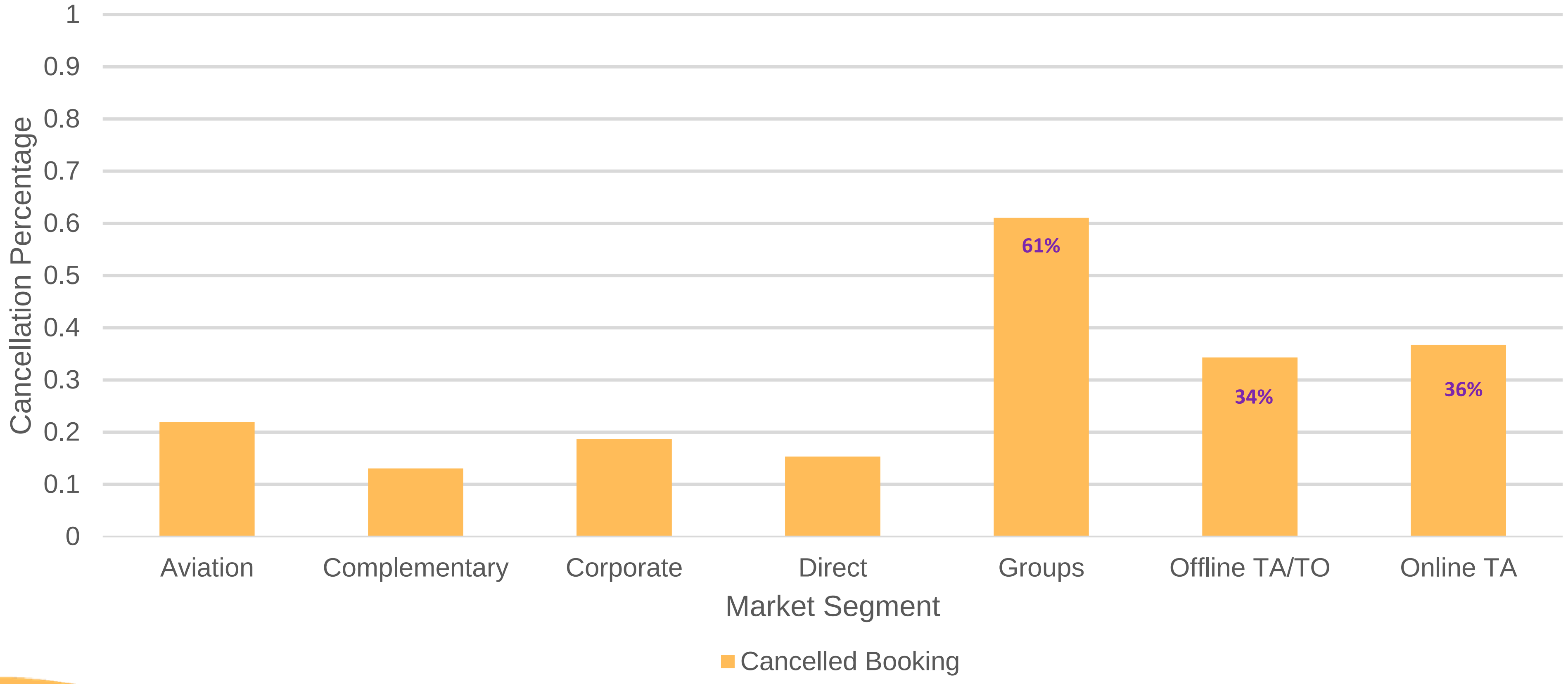


Pemesanan yang memerlukan tempat parkir tidak melakukan pembatalan pesanan



Exploratory Data Analyst

Cancellation rate by market segment

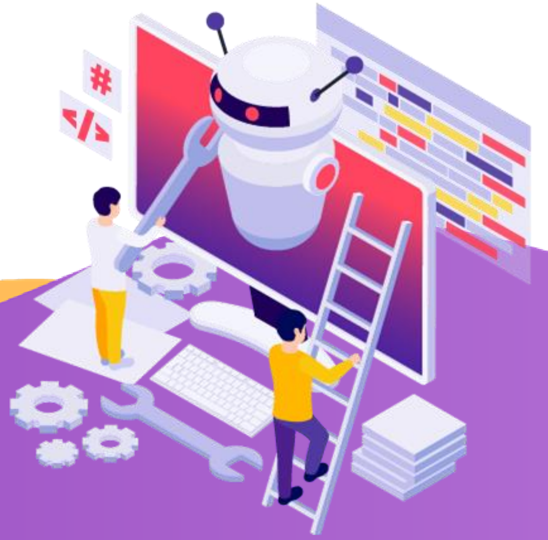


Berikut persentase tingkat pembatalan :

Groups 61% (tertinggi)

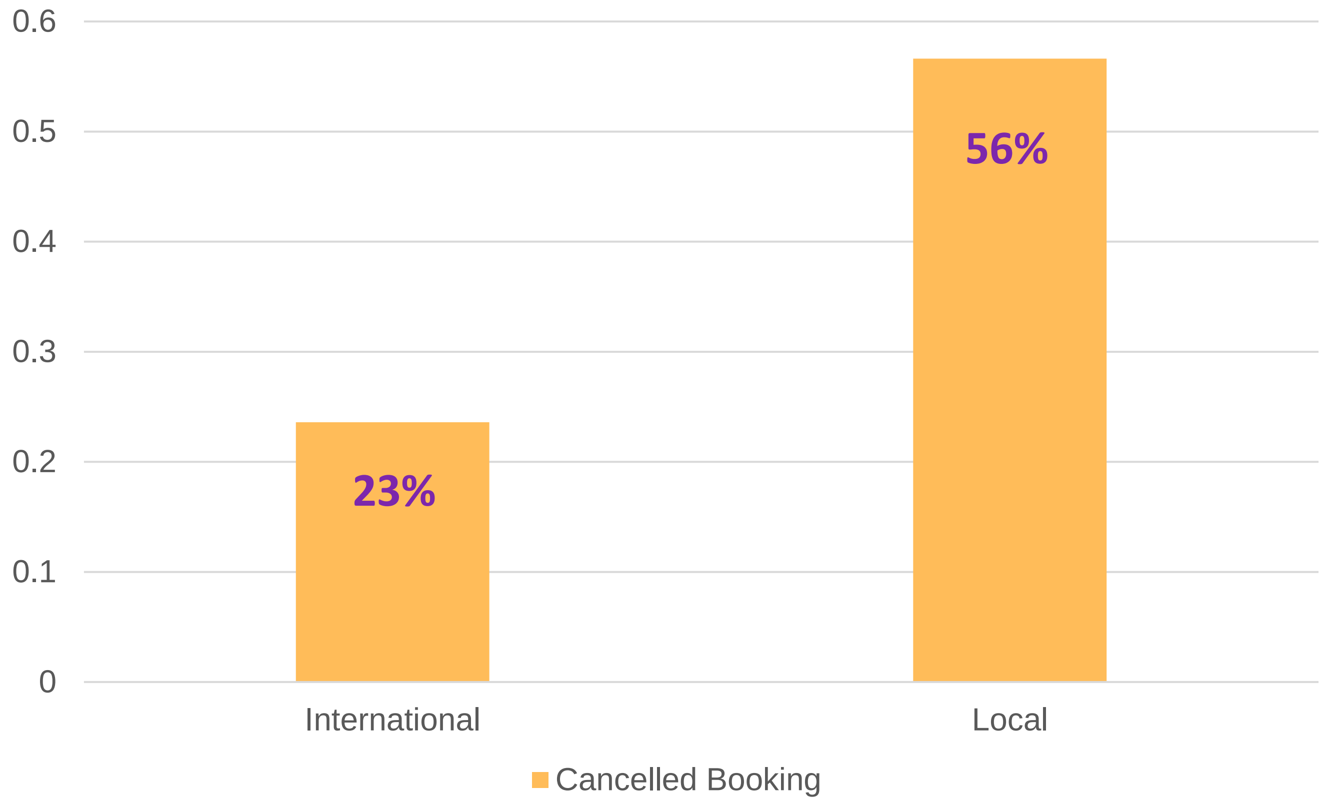
Aviation, Complementary, Corporate, Direct 18 - 22%

Travel Agent 34 - 36 %



Exploratory Data Analyst

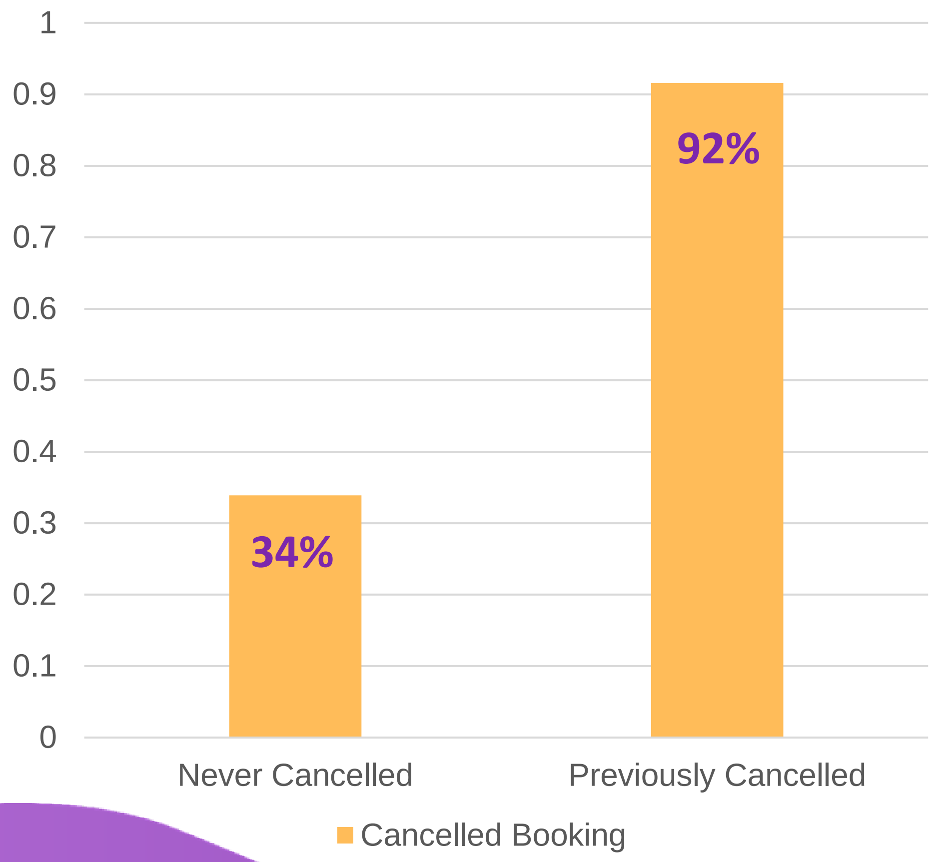
Guest location



Pemesan turis lokal memiliki kemungkinan lebih tinggi untuk pembatalan pemesanan

Exploratory Data Analyst

Cancellation rate for previously cancelled booking



Pemesan yang sebelumnya pernah melakukan pembatalan pemesanan, memiliki kemungkinan lebih tinggi untuk membatalkan pesanan nya

Data Cleansing and Pre Processing

Handle Missing Value

Company Drop
Agent Ada ID = 1, tidak ada = 0
Country Isi dengan nilai modus
Children Hapus baris yang tidak memiliki value

Handle Duplicated Value

Tidak ada duplicated value

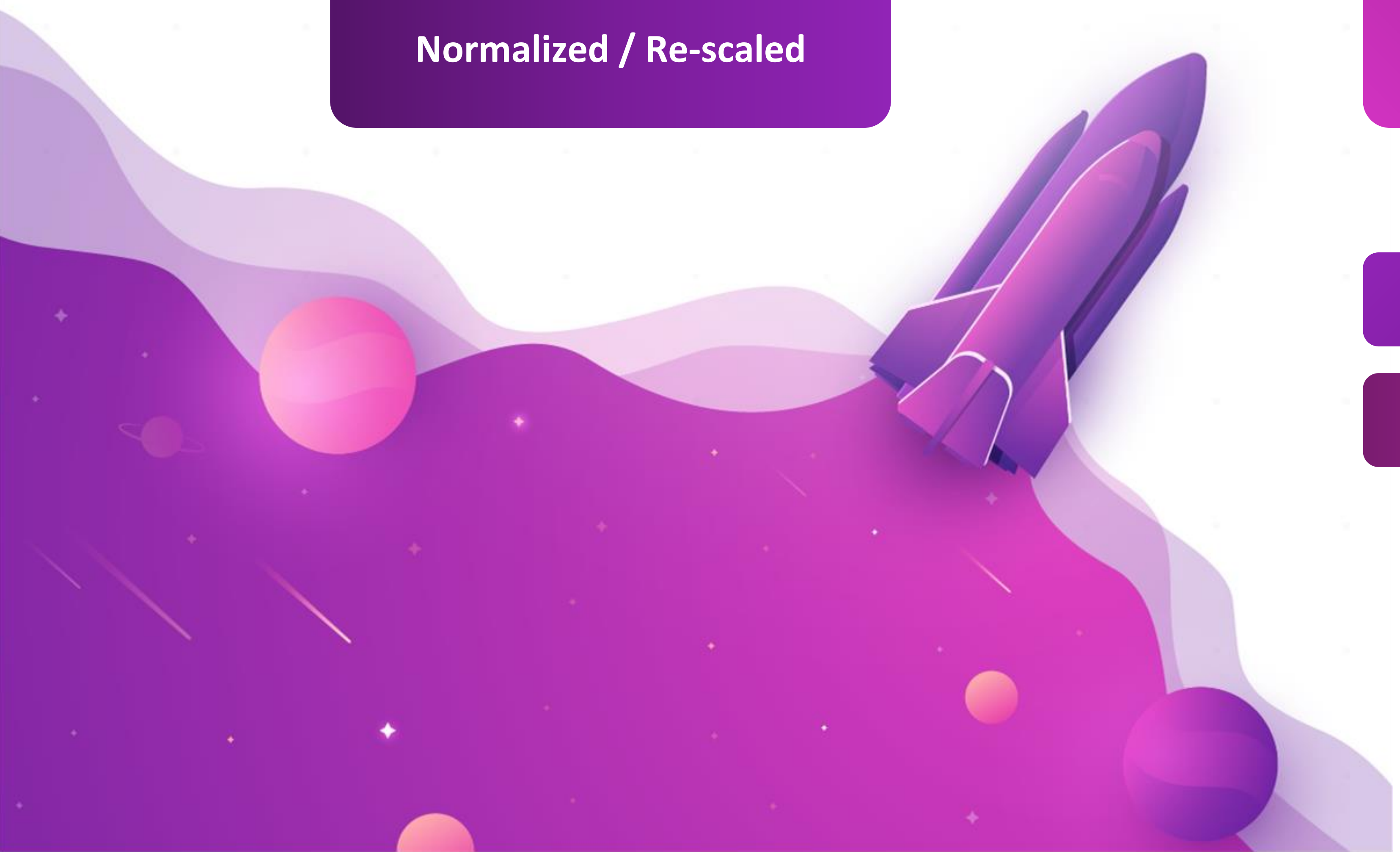
Handle Outlier

- Mengubah outlier menjadi batas atas (High Limit)
- Ganti nilai outlier dari feature yang memiliki nilai low limit dan high limit yang sama, menjadi nilai terdekat

Feature Engineering

Feature Transformation

Normalized / Re-scaled



Categorical Encoding

- Label encoding
- One hot encoding

Feature Engineering

Feature Extraction

stays in weekend night + stays in week night = **Total stays**

Adults + Children + Babies = **Total guest**

Children + Babies = **Kids**

Guest Location = Value menjadi local and internasional
Meal = Undifined diubah jadi SC (No Meal Package)
Market Segment = Undifined diganti jadi nilai modus

Feature Engineering

Feature Selection

Name

Email

Phone Number

Credit card

Children

Babies

Stay in weekend nights

Stay in week nights

119.390 rows
36 columns

BEFORE

119.386 rows
44 columns

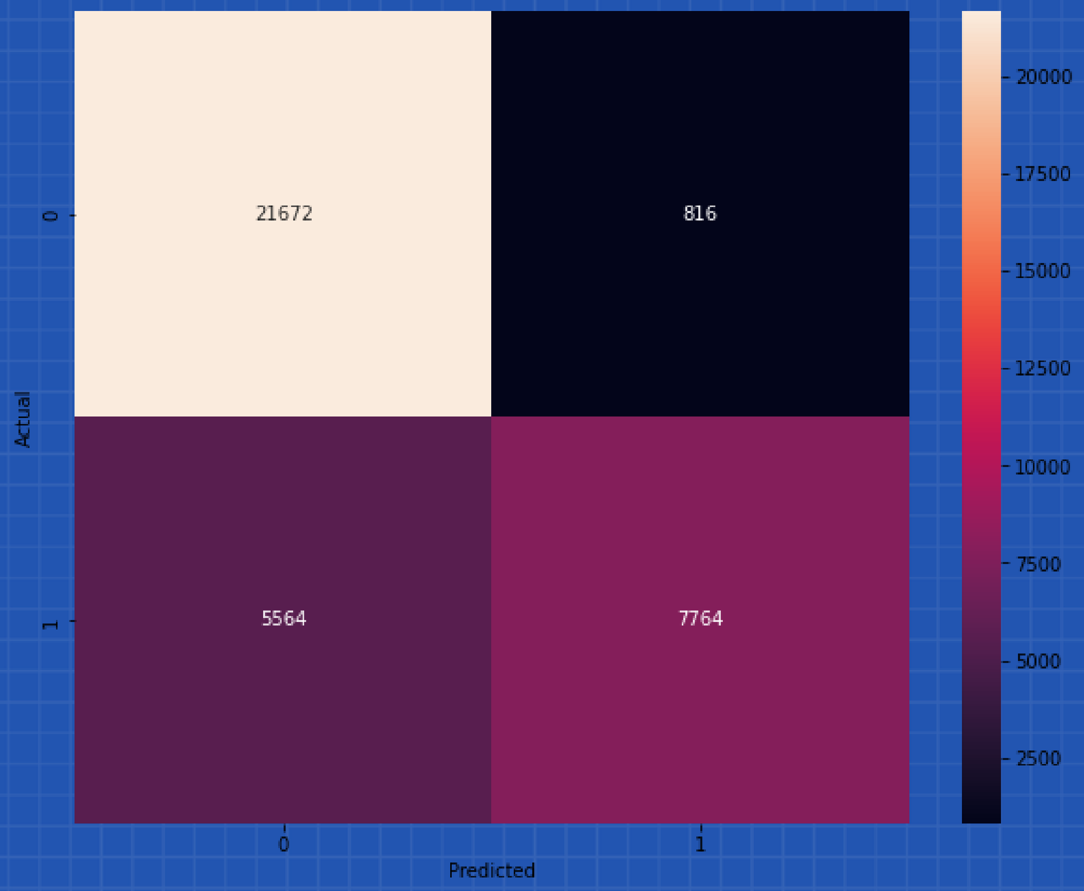
AFTER

Modelling

Modelling Selection

Algoritma	Accuracy	Precision	Recall	F1 – Score	AUC
Logistic Regression	80%	81%	62%	70%	88%
XGBoost	84%	83%	71%	77%	92%
KNN	84%	79%	76%	78%	90%
Adaboost	82%	81%	68%	74%	90%
LightGBM	82%	**91%**	58%	71%	90%
Random Forest	89%	88%	81%	84%	95%
Decision Tree	84%	79%	80%	79%	84%

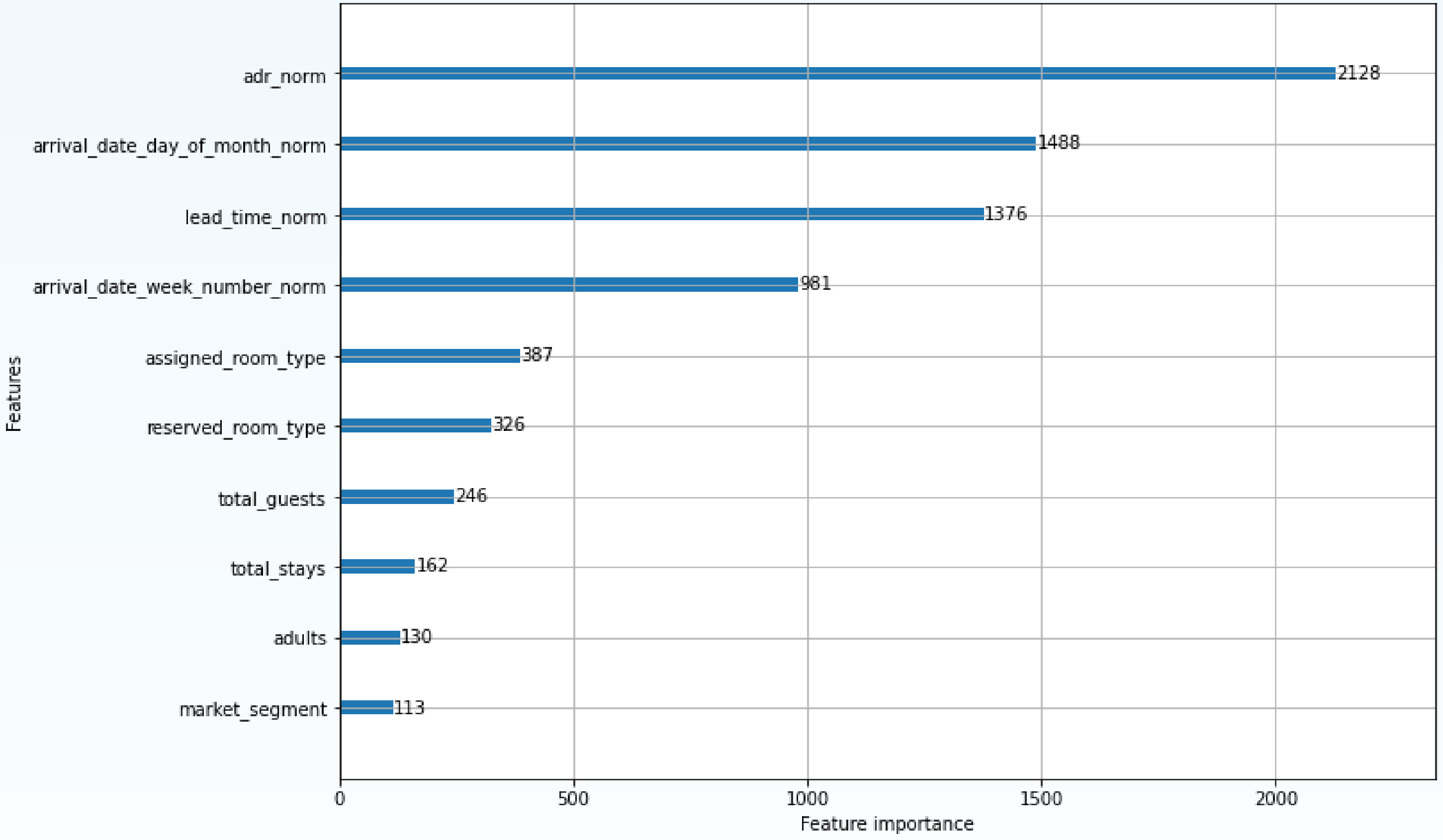
Confusion Matrix



Fokus pada predictive model yang paling bagus dalam menurunkan false positif

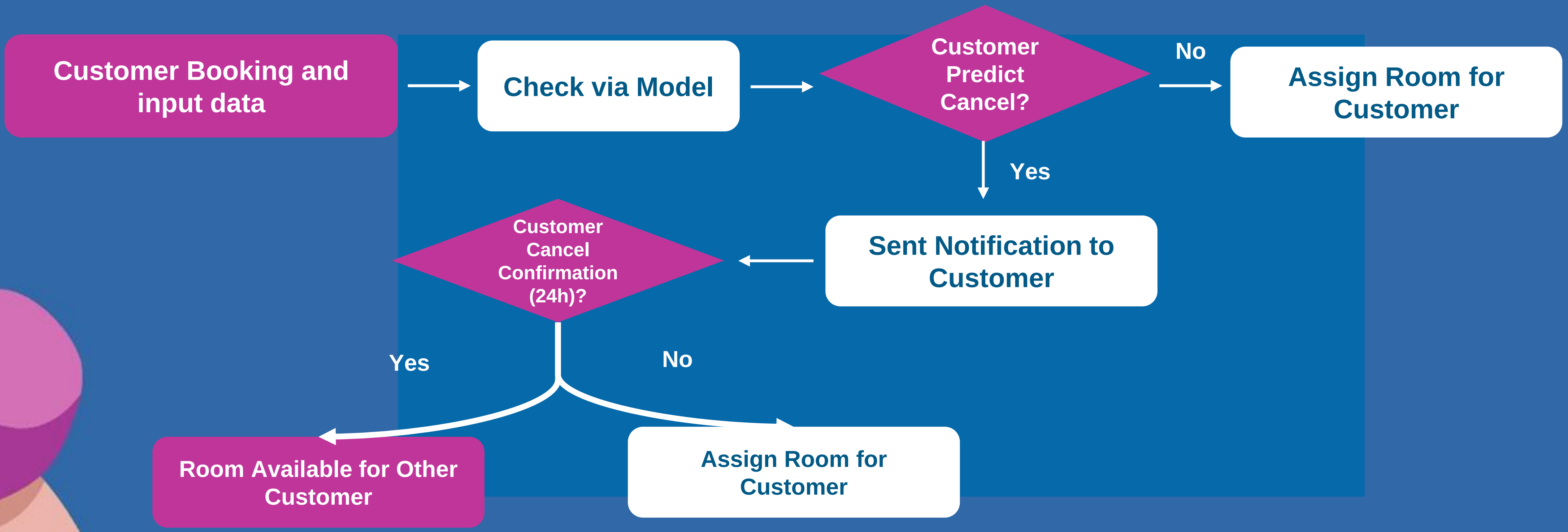
False Positif: Hasil prediksi customer melakukan cancellation tetapi kenyataanya customer tetap menginap

Feature importance



Feature yang paling berpengaruh terhadap cancelation adalah adr

Implementasi



*Free upgrade room jika customer tidak jadi melakukan cancel

Business recommendations

- Non refund policy applied if lead time > 210 days
- Check in Online
- VIP Parking/Vallet
- Phone reminder
- Special offer for local customer
- Hotel partnership
- Customer loyalty point
- Travel agent partnership

Simulation Result

Cancelation rate

37%

16%

Mengurangi potensi penurunan revenue

25%

16%

THANK YOU