SMU-X ACCT 414: ACCOUNTING ANALYTICS CAPSTONE

PROJECT STATEMENT

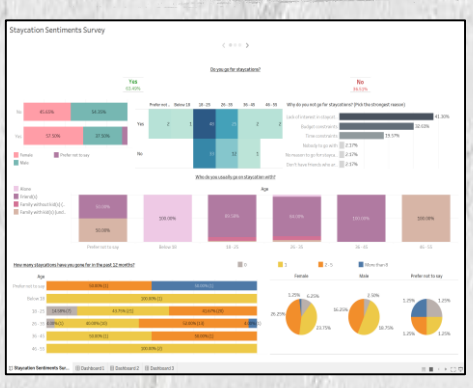
Lloyd's Inn is a 34-room boutique hotel located in the heart of Singapore. The team has been presented with two issues:

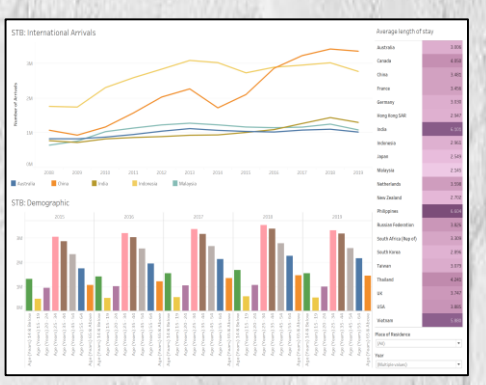
1. Develop a **forecasting revenue management model** to create a **data-driven pricing strategy**
2. Conduct an analysis to gain insights to re-direct guests towards **direct booking** and away from Online Travel Agencies (OTAs)

ISSUES IDENTIFIED

1. Pricing based on gut feeling
2. Difficulty in retrieving data for analysis
3. Partial manual data entry
4. Limited information on guest preferences

ANALYSIS OF INDUSTRY & GUESTS





FORECASTING ALGORITHMS

Models	MAE	RMSE	MAPE	MASE
ARMA(2,2)	3.092772	3.398971	3.471817	0.9108566
Prophet	3.302815	3.919781	3.679214	0.9727165
Holt-Winters	3.561512	4.085009	3.975807	1.048906
NNETAR	3.689914	4.149924	4.194895	1.141455
TBATS	4.959638	5.159256	4.912575	1.187282
LSTM	5.198294	4.920752	4.810587	1.179858
GARCH	8.081231	9.114985	9.284552	2.91489

ARMA(2,2) had the least errors → Used to forecast demand

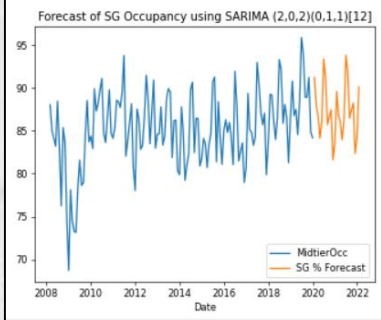
PRICING MODEL

Multiple Linear Regression Model

	ME	RMSE	MAE	MPE	MAPE
Test set	3.25	37.1	24.1	-1.05	11.4

D.R.E.A.M.

Forecasting Module



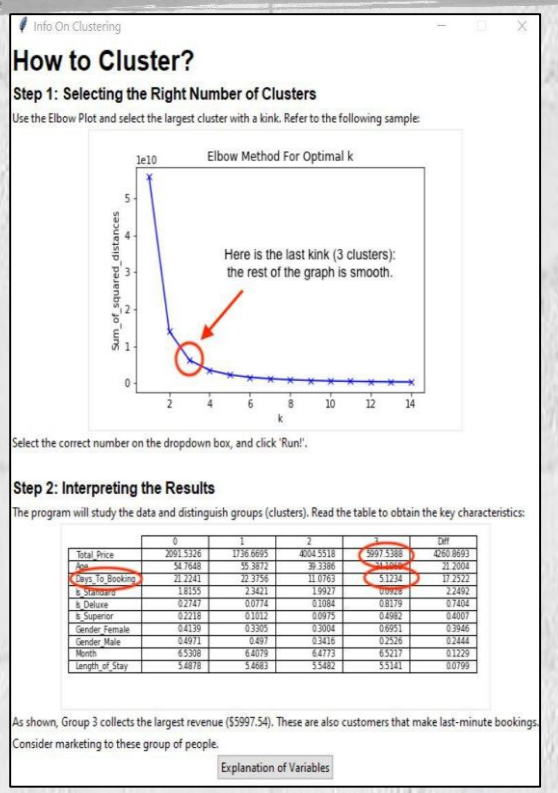
Forecasted Graph

	Date	SG % Forecast
0	2020-02-01	91.20072147922573
1	2020-03-01	88.00418082670289
2	2020-04-01	86.6599639105643
3	2020-05-01	84.13326978247665
4	2020-06-01	86.11741888030033
5	2020-07-01	93.36337857353004
6	2020-08-01	91.31127037217335
7	2020-09-01	85.71610281224162
8	2020-10-01	86.62330872554233
9	2020-11-01	87.43303224970728
10	2020-12-01	81.62420750756941
11	2021-01-01	83.55304625185443
12	2021-02-01	89.57943626471102
13	2021-03-01	86.90429144504115
14	2021-04-01	86.04605420136537
15	2021-05-01	83.9472011820839
16	2021-06-01	86.28635471672492
17	2021-07-01	93.80712710315284
18	2021-08-01	91.94863198831493
19	2021-09-01	86.47002961153619
20	2021-10-01	87.42479493340517
21	2021-11-01	88.22374758937755
22	2021-12-01	82.35796002354296
23	2022-01-01	84.19621559097247
24	2022-02-01	90.11055357058748

UNSUPERVISED LEARNING: CLUSTERING

KAMILA Clustering: Balances contribution of continuous & categorical variables

Equip client with the necessary analytical skills to further drive their business strategies



Features:

- **Error-catching** mechanisms
- **Retrieval** and cancellation of records
- **Forecast** Singapore's occupancy rate
- **Clustering** analysis of hotel guests
- **Suggest** pricing of hotel rooms
- **Automated** data-entry

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