



Hotel Booking



Team 1



1

Introduction

The value of the travel bookings industry

\$1.6 trillion

Economic output generated from
global travel bookings (2017)

24.3%

Bookings via 3rd party
services (2018)

>4%

CAGR growth
from 2009 to 2017



Booming travel bookings industry

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Booming travel bookings industry

Technology can bring the travel bookings industry to greater heights

25%

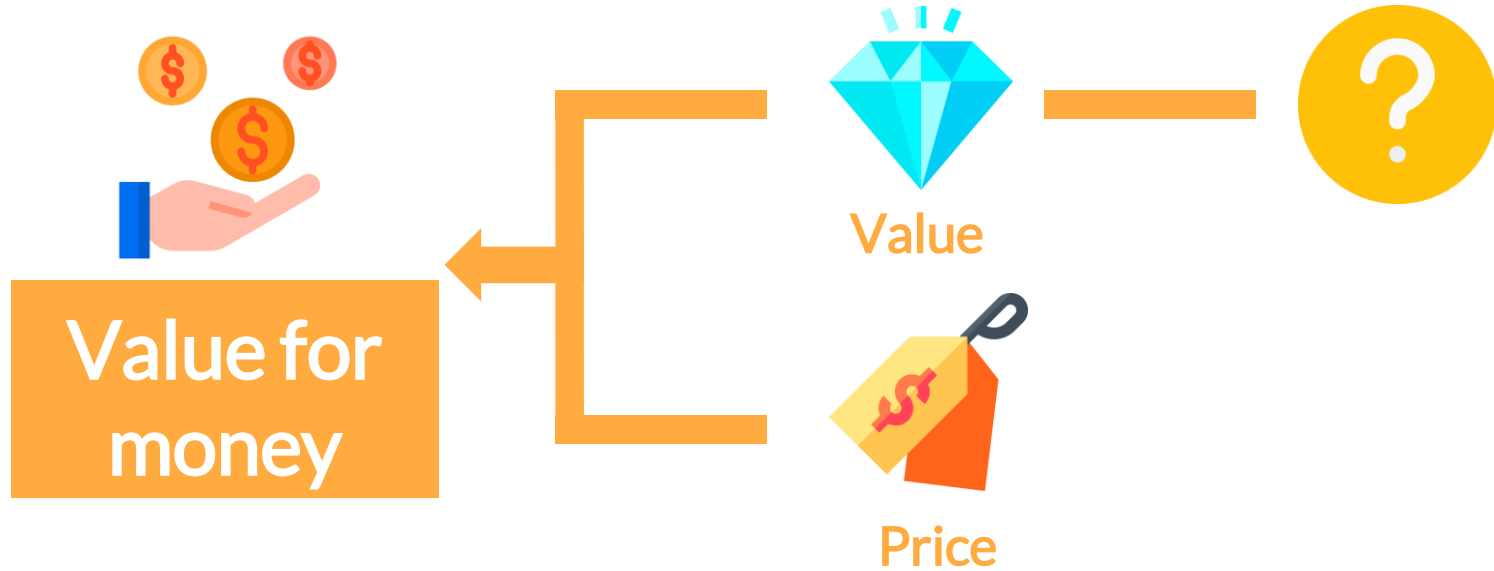


1/4 of all Hospitality and leisure CEOs think **technology** will **significantly impact** the way they operate in the next five years

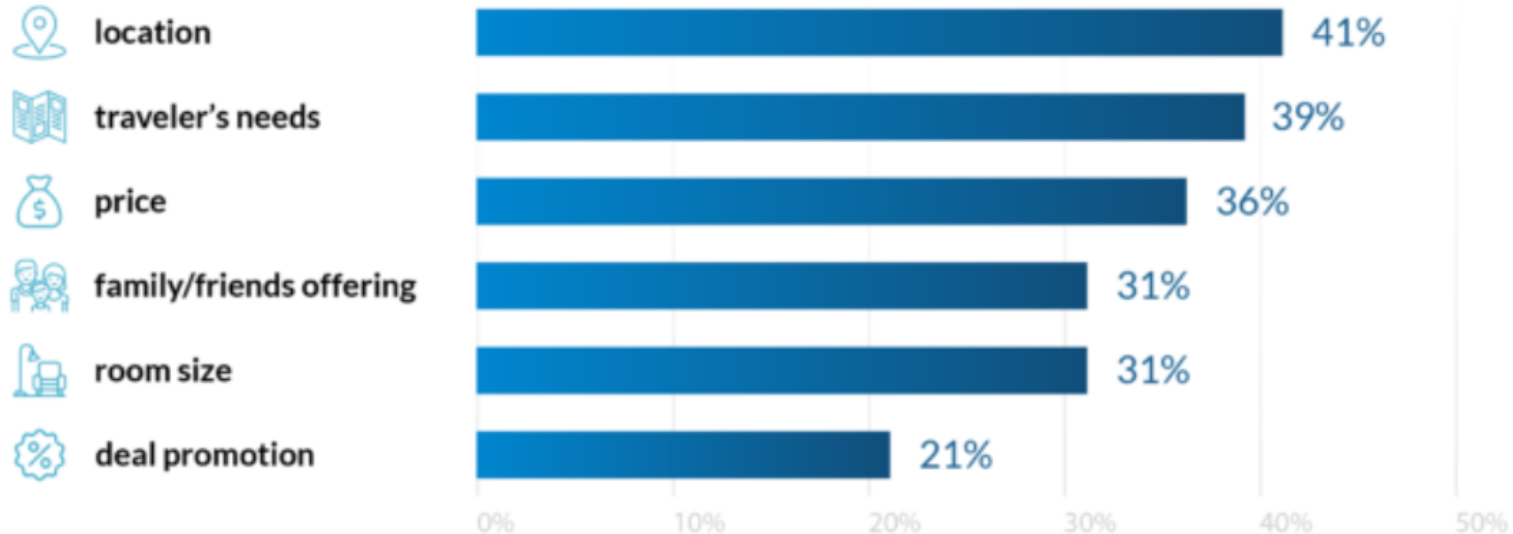


81% of travellers want **greater digital customer experience**

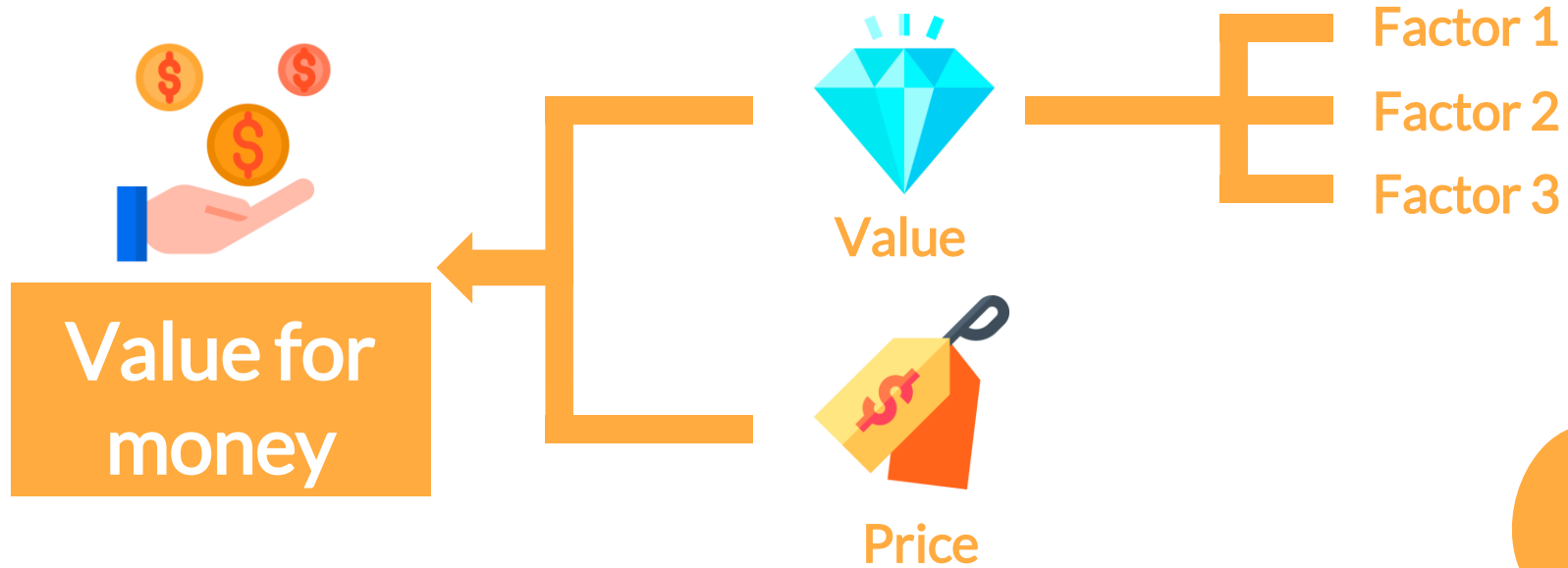
“Value for money” is the value of a hotel to its price



Expedia Group identified 6 main factors influencing consumers' accommodation decisions



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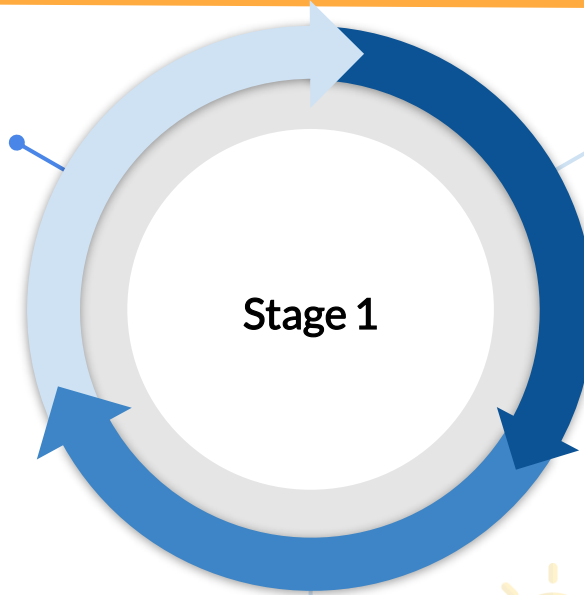


We propose a hotel recommendation system comprising 3 key stages



Web Scraping

- Scraping for key hotel variables
- 2 separate phases



Modelling

- Weightage-based
- Recommends Top 5 value-for-money hotels



Consolidation



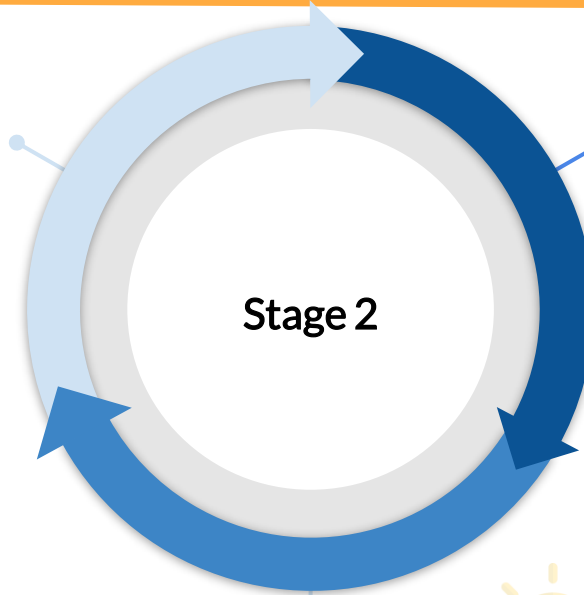
Additional insights useful for the consumer

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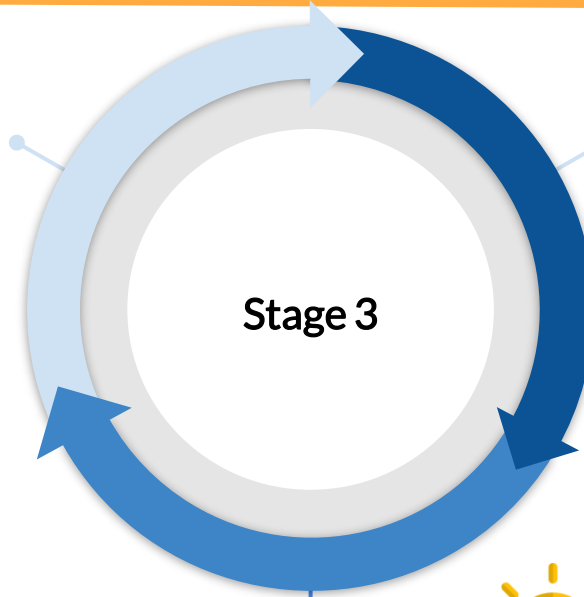
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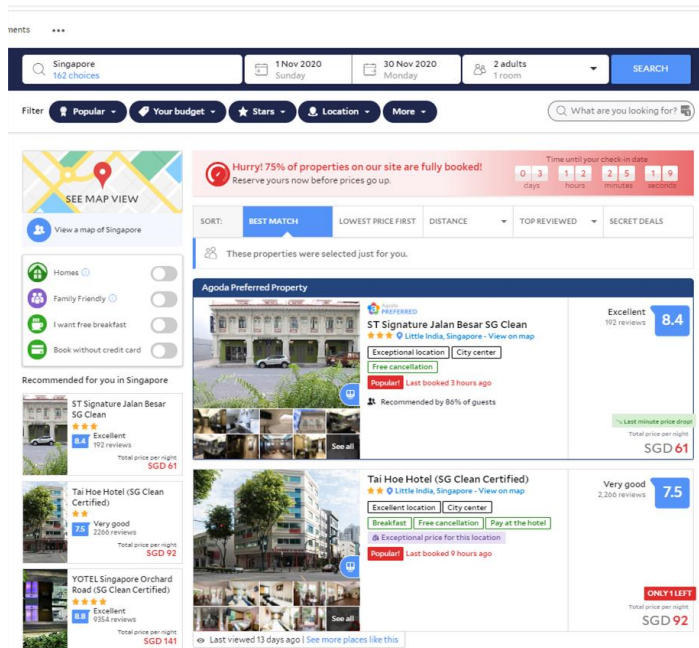


2

Web Scrapping

Scraping considerations

- Segmented search list
- Interactive web page



Scraping phases

1. Scraping AGODA search lists
 - a. Get URL for individual hotels
 - b. Get daily price data
2. Scraping individual hotels pages
 - a. Use URL list from step 1
 - b. Get more detailed information on each hotel



SORT:

BEST MATCH

LOWEST PRICE
FIRST

DISTANCE



TOP REVIEWED

SECRET DEALS



These properties were selected just for you.

Agoda Preferred Property



ST Signature Jalan Besar SG Clean



Little India, Singapore - [View on map](#)

Exceptional location

City center

Free cancellation



Popular! Last booked 3 hours ago



Recommended by 86% of guests



See all

Excellent
192 reviews

8.4

Last minute price drop!

Total price per night

SGD 61

CSV of URLs dfclean_1adult.csv

	A	B	C	D	E	F
1	hotel_name	link	reviews	score	star	short_name
2	M Social Singapore	https://www.agoda.com/en-us/m-	6553	8.2	4	m-social-singapore
3	YOTEL Singapore Orchard Road (SG Clean Certified)	https://www.agoda.com/en-us/yot	9313	8.8	0	yotel-singapore-orchard-road
4	Hotel G Singapore (SG Clean Certified)	https://www.agoda.com/en-us/ho	8124	8.4	0	hotel-g-singapore
5	Resorts World Sentosa - Hotel Michael (SG Clean Certified)	https://www.agoda.com/en-us/res	5228	8.1	5	resorts-world-sentosa-hotel-michael
6	Pan Pacific Serviced Suites Beach Road (SG Clean Certified)	https://www.agoda.com/en-us/pa	4813	8.8	0	pan-pacific-serviced-suites-beach-road-singapore
7	Hotel Boss	https://www.agoda.com/en-us/ho	14023	7.8	0	hotel-boss
8	Carlton Hotel Singapore - SG Clean Certified	https://www.agoda.com/en-us/car	28366	8.5	0	carlton-hotel-singapore
9	Goodwood Park Hotel (SG Clean Certified)	https://www.agoda.com/en-us/go	6453	8.6	5	goodwood-park-hotel
10	PARKROYAL on Beach Road Singapore (SG Clean Certified)	https://www.agoda.com/en-us/pa	7409	8.3	0	parkroyal-on-beach-road-singapore
11	InterContinental Singapore (SG Clean Certified)	https://www.agoda.com/en-us/int	2485	8.8	5	intercontinental-singapore
12	Amara Sanctuary Resort Sentosa (SG Clean Certified)	https://www.agoda.com/en-us/am	7239	7.6	0	amara-sanctuary-resort-sentosa
13	lyf Funan Singapore	https://www.agoda.com/en-us/lyf	917	8.7	4	lyf-funan-singapore
14	Hilton Singapore (SG Clean Certified)	https://www.agoda.com/en-us/hilt	1575	8.3	0	hilton-singapore_6
15	Capri by Fraser - Changi City (SG Clean Certified, Staycation approved)	https://www.agoda.com/en-us/cap	6801	8.6	0	capri-by-fraser-changi-city
16	YOTELAIR Singapore Changi Airport at Jewel (SG Clean Certified)	https://www.agoda.com/en-us/yot	2260	8.2	0	yotelair-singapore-changi-airport_2
17	Marina Bay Sands (SG Clean Certified)	https://www.agoda.com/en-us/ma	48854	8.7	0	marina-bay-sands
18	One Farrer Hotel (SG Clean)	https://www.agoda.com/en-us/one	6640	9	0	one-farrer-hotel
19	Resorts World Sentosa - Equarius Hotel (SG Clean Certified)	https://www.agoda.com/en-us/res	6074	8.3	5	resorts-world-sentosa-equarius-hotel
20	Amara Singapore (SG Clean Certified)	https://www.agoda.com/en-us/am	7862	8	0	amara-singapore
21	Hotel Soloha @ Chinatown (SG Clean)	https://www.agoda.com/en-us/chi	351	8.8	0	chinatown-hotel-singapore
22	Hotel Mono - (SG Clean Certified)	https://www.agoda.com/en-us/ho	1745	8.4	3	hotel-mono
23	Mandarin Orchard Singapore - SG Clean Certified	https://www.agoda.com/en-us/ma	27977	8.4	0	mandarin-orchard-singapore
24	The Quay Hotel	https://www.agoda.com/en-us/the	3296	8.2	0	the-quay-hotel_2

Daily Price Data

	A	B	C	D	E	F	G	H	I	J	K	L
1		1/11/2020	2/11/2020	3/11/2020	4/11/2020	5/11/2020	6/11/2020	7/11/2020	8/11/2020	9/11/2020	10/11/2020	11/11/2020
2	5footway.inn Project Chinatown	22	27	27	27	22	22	22	22	22	22	22
3	AMOY by Far East Hospitality (SG Clean Certified)	231	257	257					231	244	244	244
4	Adler Hostel											
5	Aerotel Transit Hotel, Terminal 1		247		247						247	
6	Aliwal Park Hotel	67	62	61	62	62	66	59	59	55	55	55
7	Amara Sanctuary Resort Sentosa (SG Clean Certified)	403	300	359	359	359			327	318	326	320
8	Amara Singapore (SG Clean Certified)	213	228	228	228	228	248		222	222	222	222
9	Amber Hotel Katong		90	90	90	90	90	100			90	
10	Amrise Hotel	63		54		67	71	69	70		71	
11	Andaz Singapore - A Concept by Hyatt (SG Clean Certified)		435		459		518		471	459	471	447
12	Aqueen Hotel Balestier		140	133		133				133		133
13	Aqueen Hotel Lavender (SG Clean, Staycation Approved)			86	89	87	88	81	84	82	83	82
14	Aqueen Hotel Paya Lebar (SG Clean, Staycation Approved)	114	114	114	114	114			153	153	153	153
15	Arcadia Hotel		100		100						100	
16	Arianna Hotel	59	53	75	71			75	75			
17	Artion Boutique Hotel (SG Clean Certified)	102	102	102	102	102	104	109	101	101	101	101
18	Ascott Orchard Singapore (SG Clean Certified)	270	270	270	288							
19	Ascott Raffles Place Singapore	306	306	306	306	306	306		306	306	306	306

Phase 2: Scraping Each Hotel URL

- Iterate through the URLs in previous CSV
- Scrape for additional features
- Assume first room option selected
- Combine all relevant information into one CSV



Features Scraped in Each Hotel Website

Property Type	Gym	Bathtub
Number of Hotel Stars	Swimming Pool	Balcony
Cleanliness	Carpark	Kitchen
Distance to Mall	Airport Transfer	TV
Distance to MRT	Breakfast	Internet
Early Check-in (before 3pm)	Hygiene+ (Covid-19 Measures)	Air-Conditioning
Late Check-out (after 12pm)		Ironing
Pay Later	24h Front Desk	Non-Smoking
Free Cancellation	Laundry Service	



7 room types | 23 room offers

Prices include taxes & fees

Hurry up! 1 room type has already sold out for your dates!

Deluxe Mayfair Room

Popular choice! Last booked 7 hours ago

Exceptional **9.0**
Room comfort & quality



[Room photos and details](#)

Bed preference (if available)

☐ 1 king bed

☐ 2 single beds

Free Wi-Fi

Room size: 31 m²/334 ft²

Spacious room

Garden view

Balcony/terrace

Non-smoking

Shower and bathtub

[+ See all room facilities](#)

Benefits

Lowest price available!

Your price includes:

Pay at the hotel

Free Wi-Fi

Free cancellation before November 28, 2020

Sleeps



Price per night

SGD 282

Total price per night

Rooms

1

Most booked

[Reserve](#)

NO RISK!
No cancellation fee

Our last 4 rooms!

Your price includes:

Parking

Pay nothing until November 26, 2020

Free Wi-Fi

Free cancellation before November 28, 2020



SGD 282

Total price per night

Add extra bed(s)
+ SGD 0

0

[Reserve](#)

NO RISK!
No cancellation fee

It only takes 2 minutes

Our last 5 rooms!

Overall rating:

8.3

Excellent

1,578 reviews

Cleanliness 8.6

Facilities 8.0

Location 9.0

[Read all reviews >](#)

What travelers say they love:

Big rooms, excellent location

 **Therese M.** from Philippines
Business traveler



Situated in the heart of Orchard Road, Singapore's popular entertainment and shopping district, **Hilton Singapore (SG Clean Certified)** is close to both ION Orchard and Takashimaya shopping centres. This award-winning Singapore hotel is a convenient 20-minute drive from Singapore Changi International Airport and close to Singapore's popular attractions.

Stay active during your stay at this Singapore hotel. Swim laps in the rooftop pool, work out in the 24-hour fully equipped fitness center, or indulge in rejuvenating beauty treatments. Enjoy shopping in luxury boutiques without leaving the hotel in the two-storey Hilton Shopping Gallery.

Indulge in 6 innovative dining options available at the hotel. Try Opus Bar & Grill's signature prime cuts that are dry aged in-house and grilled over an open-flame charcoal grill. For authentic Italian cuisine, the award-winning rooftop Italian restaurant, il Cielo is known for its high culinary standards using seasonal produce. Located on the rooftop floor, Sky Bar is the perfect oasis to relax over drinks while taking in sunset views of the city. Revitalize with a variety of wholesome dishes and freshly-blended juices from Verde Kitchen. For the sweet-toothed ones, D9 Cakery offers an impressive six-meter showcase of delicious cakes, pastries, and more.



Languages spoken

English

Chinese [Mandarin]

French

Hindi

Indonesian

Japanese

Korean

Malay

Thai



Internet access

Free Wi-Fi in all rooms!

Wi-Fi in public areas



Things to do, ways to relax

Fitness center

Hot tub

Swimming pool [outdoor]

Ticket services

Tours



Cleanliness and safety

First aid kit

Hand sanitizer

Staff trained in safety protocol

Protective screens in common areas

Safe dining setup

Temperature check for guests and staff

Physical distancing of at least 1 meter



Fitness & recreation

Game room



Dining, drinking, and snacking

Bar

Room service

Restaurants

Grocery delivery



Services and conveniences

Cash withdrawal

Concierge

Contactless check-in/out

Convenience store

Currency exchange

Daily housekeeping

Doorman

Dry cleaning

Food delivery

Laundry service

Library

Luggage storage

Safety deposit boxes

Shops

Smoking area

Nearest essentials



Airports

Singapore Changi Airport (SIN) -
Singapore
16.2 km • 19 minutes

Hang Nadim Airport (BTH) -
Indonesia
34.9 km



Public transportation

Bugis MRT Station
270 m • 4 minutes

Bencoolen MRT Station
520 m • 10 minutes



Hospital or clinic

Raffles Hospital
340 m • 4 minutes



Shopping

Clarke Quay
1.3 km



Convenience store

On-site



Cash withdrawal

ATM on-site

Distances shown are straight-line distances on the map. Actual travel distances may vary.

Show less

Some helpful facts

Check-in/Check-out

Check-in from: 15:00

Check-out until: 12:00

See availability

Getting around

Distance from city center: 2.00 Km

Travel time to airport (minutes): 20

Extras

Breakfast charge (unless included in room price): 47 SGD

The property

Non-smoking rooms/floors: Yes

Number of bars/lounges: 1

Number of floors: 16

Number of restaurants: 3

Number of rooms : 403

Room voltage: 220

Year property opened: 1995

Most recent renovation: 2016

Show less ▲

Property announcements

Please note that rooms and public spaces are newly renovated as of February 2016.

Show less ▲

Name and Type	Daily Price (if applicable)	Relevant Features
---------------	-----------------------------	-------------------

[illegible]



A diagram illustrating a feedback loop. A large, hand-drawn rounded rectangle contains the text "Modelling & Testing". An arrow starts from the bottom right corner of the rectangle, loops around the right side, and points back to the top left corner. A wavy line is drawn on the top horizontal segment of the arrow. In the top left corner, outside the rectangle, is an orange rounded square containing a closing curly brace "}". A small circle is located on the left vertical line of the rectangle, and a dashed line extends downwards from it.

}

Modelling &
Testing

Inputs & Filtering

1. Date

1Nov - 30Nov

2. Hotel Types

1. Hotel
2. Resort
3. Serviced Apartment
4. Hostel
5. Capsule
6. Entire Apartment
7. Boat/cruise
8. Resort villa

3. Top 3/28 Features & Weights

1. Price
2. No. of reviews
3. Score
4. Number of Star
5. Review score
6. Cleanliness
7. Distance from MRT/ Mall
8. 20 Services & Facilities

Scoring

Feature Types

1. Boolean

2. Continuous:

lower value is better

3. Continuous:

higher value is better

$$\text{Score} = (\text{Feature 1} * \text{Weight 1})$$

$$+ (\text{Feature 2} * \text{Weight 2})$$

$$+ (\text{Feature 3} * \text{Weight 3})$$

$$\text{Value-to-Price Ratio} = \text{Score} / \text{Price}$$

Hotel	Wifi	Price	Price 'Rank'	No. of Reviews	Reviews 'Rank'
A	1	60	3	800	3
B	1	150	2	430	2
C	0	180	1	205	1

Modelling

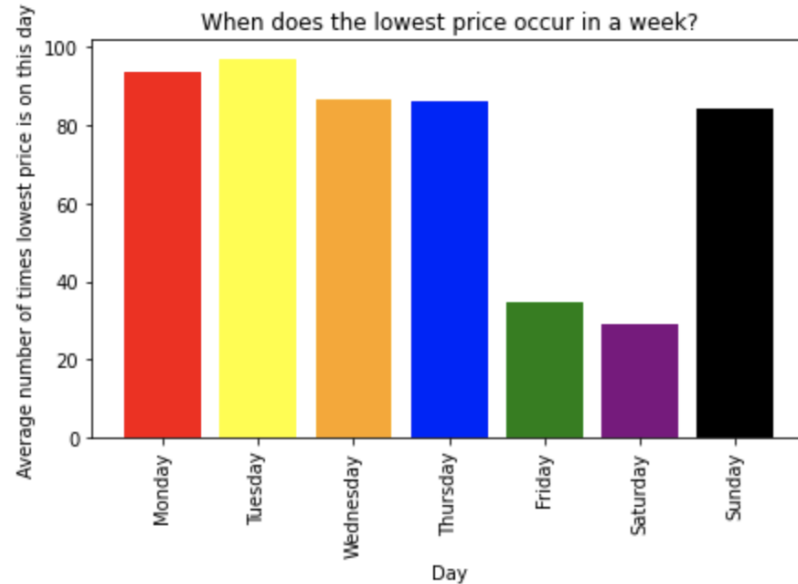
Top 5 Hotels Recommended For You

Name	Property Type	Price	Score	Value_to_Price ratio	no. of reviews	score
S Inn Clarke Quay	Hostel	19	111.4	5.9	579	7.8
S Inn Chinatown	Hostel	21	123.4	5.9	1392	8
5footway.inn Project Chinatown	Hostel	22	130	5.9	3626	7.7

4

Insights

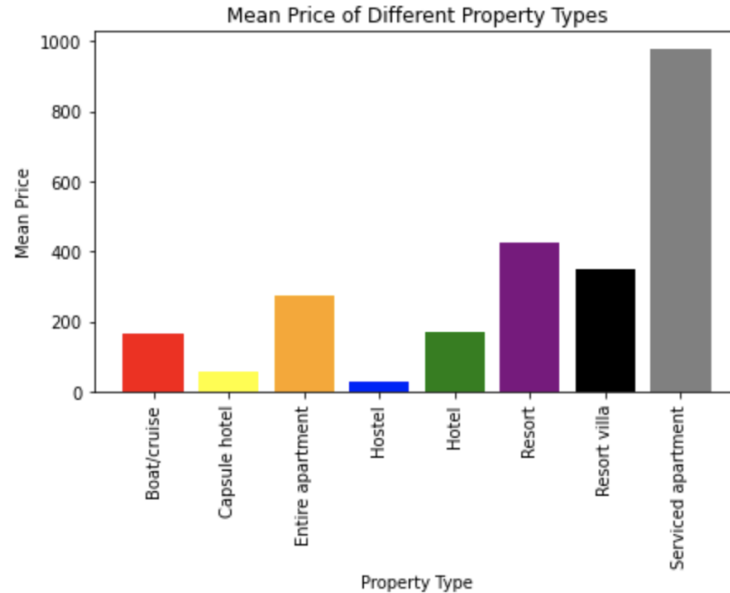
Insight #1



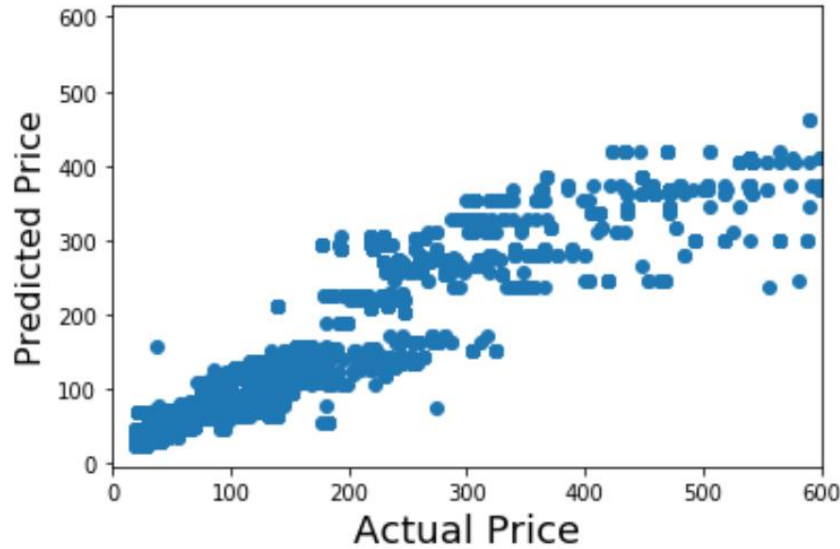
- Find the number of times the lowest price of the month occurred on a particular day of the week
- To avoid a higher price, we should avoid booking accommodations on Fridays and Saturdays

Insight #2

- Find the mean price of different property types
- Serviced apartments are generally more expensive than the rest
- Hostels and capsule hotels are the cheapest among the property types



Insight #3



- Understanding if hotels are overpriced or underpriced
- Based on the scatter plot, hotels tend to be **overpriced**



A hand-drawn diagram consisting of a large rounded rectangle with a black border. In the top-left corner, there is an orange rounded square callout containing the number '5'. An arrow points from the top-right of the orange callout to the top-left of the main rectangle. Another arrow points from the bottom-right of the main rectangle back to the top-left of the orange callout, creating a loop. The text 'Future Improvements' is centered inside the main rectangle. The drawing is done in a sketchy, hand-drawn style with black lines and an orange color.

5

Future
Improvements

Future Improvements

#1

Allow for budget input to filter the range of prices

#2

Use NLP and network sentiment analysis to derive insights from the hotel reviews



Thanks!

Any questions?

