#### **BIA Final Project**

By Catherine Heng Koh Jia Xuan Orson Teng Rachel Tan

[Batch 9, Group 3]





#### **INCREASE TOTAL REVENUE USING ANALYTICAL MODELS**







# DATA EXPLORATION

# **01** EXPLORATION | DEFINITIONS

Defining coupon session time and user session time

#### **Coupon Session Time**

A measure of a user's interest in a specific coupon

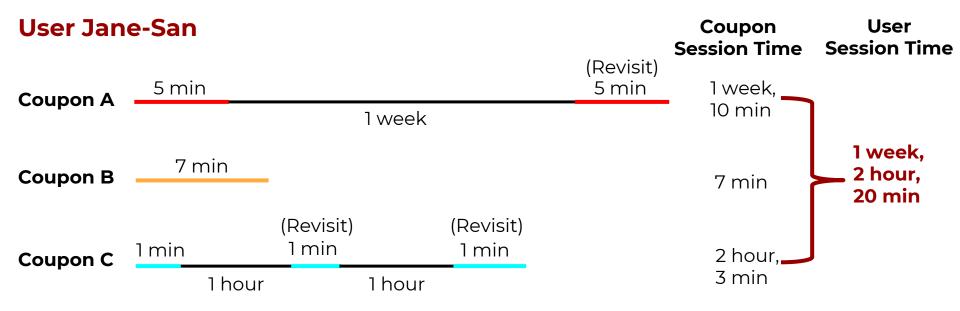
#### **User Session Time**

Sum of total time a user spends viewing each coupon

A measure of user's interest in the coupons of Ponpare

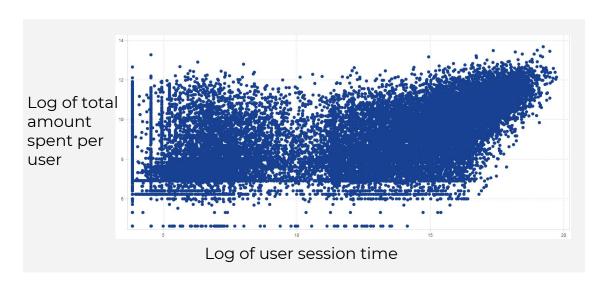
# **01** EXPLORATION | DEFINITIONS

Defining coupon session time and user session time



# **01** EXPLORATION | SCATTER PLOT

Different browsing & spending patterns across different users

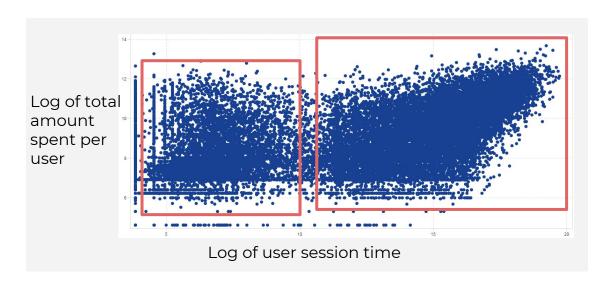


 Total amount spent per user and total session time per user shows weak positive correlation.

**Coefficient Correlation: 0.55** 

# **01** EXPLORATION | SCATTER PLOT

Different browsing & spending patterns across different users

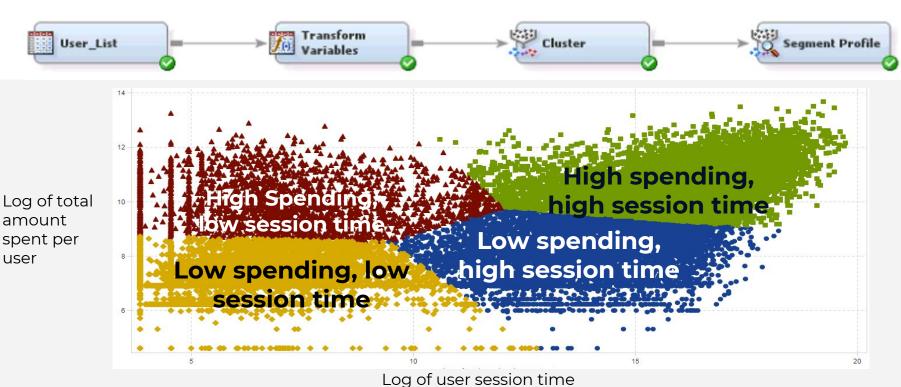


- Total amount spent per user and total session time per user shows weak positive correlation.
- This suggest distinct segments of customers displaying differing browsing and spending behaviours

**Coefficient Correlation: 0.55** 

# **01** EXPLORATION | CLUSTER ANALYSIS

Clustering customers into different segments





# **BUSINESS**PROBLEM & OBJECTIVE

# 02 PROBLEM |

Problem with current business strategies



- Purchase and browsing behaviour varies across the user population
- Require more customized strategies for different segments of users

# **02** PROBLEM | BUSINESS OBJECTIVE

Objective of our project



Provide more relevant strategies to target Ponpare customers based on their browsing and spending habits to increase coupon sales and customer loyalty



Secure sufficient amount of coupons to meet expected increases in purchases from implementing demand side strategies





## FINDINGS AND ANALYSIS

Cluster analysis Segment Profiling Market Basket Analysis Decision Tree

# 03 FINDINGS | CLUSTER ANALYSIS

Customer segmentation

Spending (SP) **Decisive** Cash Cows High SP, Low SE High SP, High SE 11% 35% Uninterested **Bargain Hunters** Low SP, High SE Low SP, Low SE 24% 30%

Session Time (SE)

# 03 FINDINGS | CLUSTER ANALYSIS

Summary of overall cluster characteristics

**Bargain Hunters** 1.0 day

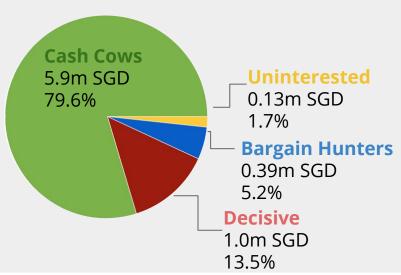
Average coupon session time per user

Cash Cows
1.8 days

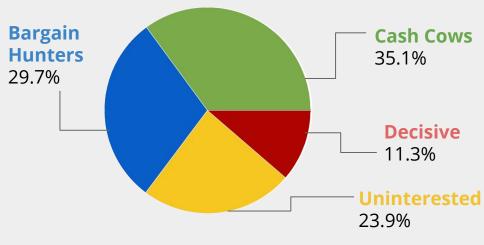
**Decisive** 18 mins

**Uninterested** 9 mins

#### **Total Revenue Per Cluster (SGD)**



#### Percentage of users per cluster



# 03 FINDINGS | CLUSTER ANALYSIS

Summary of overall cluster characteristics

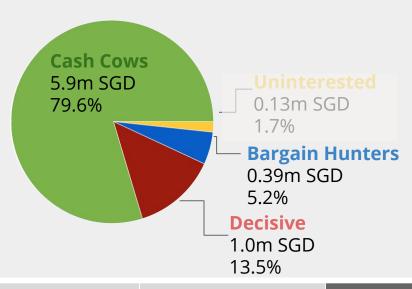
Bargain Hunters 1.0 day Average coupon session time per user

Cash Cows
1.8 days

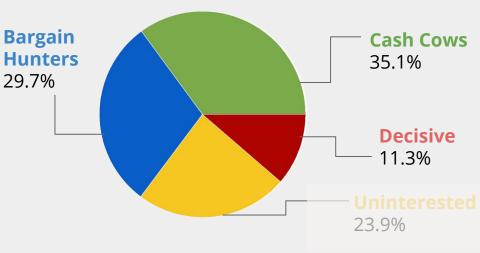
**Decisive** 18 mins

**Uninterested** 9 mins

#### **Total Revenue Per Cluster (SGD)**

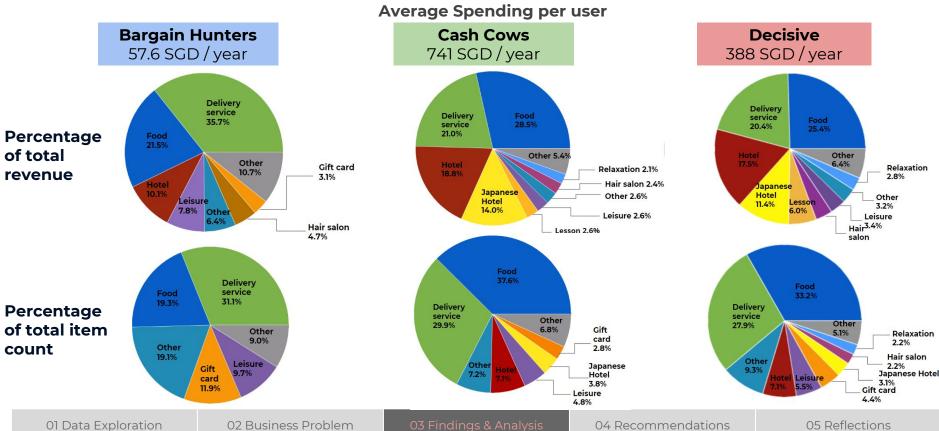


#### Percentage of users per cluster



# 03 FINDINGS | CLUSTER PROFILING

Differences in each cluster



# 03 FINDINGS | CLUSTER PROFILING

Grouping coupons into bins within a product category based on price range

	Low	Mid	High
Beauty	<2990	2990-3979	≥3980
Class	<3980	3980-6979	≥6980
Correspondence course	<2980	2980-19799	≥19800
Delivery service	<1200	1200-1979	≥1980
Event	<450	450	>450
Food	<1250	1250-2249	≥2250
Gift card	<101	101-998	≥999
Guest house	<4000	4000-12499	≥12500
Hair salon	<3600	3600-4499	≥4500
Health and medical	<3980	3980-8799	≥8800
Hotel	<4900	4900-7999	≥8000
Japanese hotel	<7500	7500-10499	≥10500
Japanse guest house	<6825	6825-10799	≥10800
Leisure	<850	850-1449	≥1450
Lesson	<6300	6300-12979	≥12980
Lodge	<7350	7350-9799	≥9800
Nail and eye salon	<2980	2980-3799	≥3800
Other	<100	100-979	≥980
Public hotel	<5950	5950-6649	≥6650
Relaxation	<2400	2400-3099	≥3100
Resort inn	<5500	5500-8979	≥8980
Spa	<2400	2400-3299	≥3300
Vacation rental	<4500	4500-6649	≥6650
Web service	<500	500-989	≥990

All coupons within each category are binned into 3 groups based on price range

#### **Example of binning food coupons**

#### Original food coupons

Price range: 100 - 100,000 Yen (1.20 - 120 SGD)

#### **Binned food coupons**

Food (Low): 100 - <1250 Yen (1.20 - 15 SGD)

(<33.3 percentile)

Food (Mid): 1250 - <2250 Yen (15 - 28 SGD)

(33.3 - 66.7 percentile)

Food (High): 2250 - 100,000 Yen (28 - 120 SGD)

(> 66.7 percentile)

# 03 FINDINGS | CLUSTER PROFILING

Summary of purchase preferences of each segment

#### **Bargain Hunters**

# Bargain Hunters One-Way Frequency Results

The FREQ Procedure

discount_price_type	Frequency	Percent
Other (Low)	13869	16.26
Delivery service (Low)	10804	12.67
Delivery service (Mid)	10032	11.76
Gift card (Low)	9051	10.61
Food (Low)	7610	8.92
Delivery service (High)	5533	6.49
Other (Mid)	4517	5.30
Food (Mid)	3363	3.94
Gift card (Mid)	3050	3.58
Other (High)	2349	2.75
Leisure (Mid)	2242	2.63
Leisure (Low)	2197	2.58

#### **Cash Cows**

#### Cash Cows One-way Frequency Results

The FREQ Procedure

discount_price_type	Frequency	Percent
Delivery service (Mid)	602101	14.00
Delivery service (Low)	505983	11.77
Food (Mid)	476350	11.08
Delivery service (High)	475720	11.07
Food (Low)	433053	10.07
Food (High)	419709	9.76
Other (Low)	130267	3.03
Other (Mid)	115991	2.70
Other (High)	107552	2.50
Hotel (Mid)	104914	2.44
Hotel (High)	97518	2.27
Hotel (Low)	93951	2.19

#### Decisive

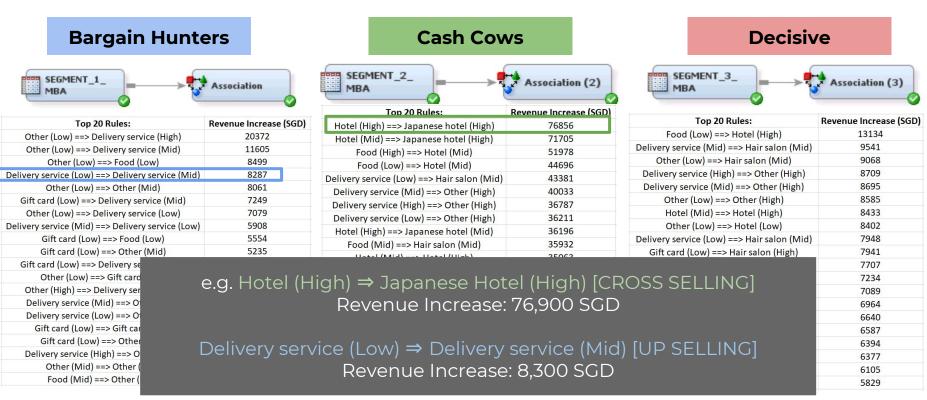
#### Decisive One-Way Frequency Results

The FREQ Procedure

discount_price_type	Frequency	Percent
Delivery service (Mid)	71536	13.01
Delivery service (Low)	61897	11.26
Food (Mid)	58614	10.66
Delivery service (High)	57671	10.49
Food (High)	50858	9.25
Food (Low)	50235	9.14
Other (Low)	23237	4.23
Other (Mid)	17598	3.20
Gift card (Low)	16187	2.94
Other (High)	15746	2.86
Hotel (Low)	11048	2.01
Hotel (Mid)	10702	1.95

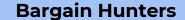
# **03** FINDINGS | MARKET BASKET ANALYSIS (MBA)

Finding top MBA rules for each segment



# **03** FINDINGS | MARKET BASKET ANALYSIS (MBA)

Finding top MBA rules for each segment



#### Cash Cows

#### Decisive



Top 20 Rules:	Revenue Increase (SGD)
Other (Low) ==> Delivery service (High)	20372
Other (Low) ==> Delivery service (Mid)	11605
Other (Low) ==> Food (Low)	8499
Delivery service (Low) ==> Delivery service (Mid)	8287
Other (Low) ==> Other (Mid)	8061
Gift card (Low) ==> Delivery service (Mid)	7249
Other (Low) ==> Delivery service (Low)	7079
Delivery service (Mid) ==> Delivery service (Low)	5908
Gift card (Low) ==> Food (Low)	5554
Gift card (Low) ==> Other (Mid)	5235
Gift card (Low) ==> Delivery service (Low)	4603
Other (Low) ==> Gift card (Mid)	2785
Other (High) ==> Delivery service (Mid)	2734
Delivery service (Mid) ==> Other (Low)	2180
Delivery service (Low) ==> Other (Low)	1850

SEGMENT_2_ MBA	Association (2)

Top 20 Rules:	Revenue Increase (SGD)		
Hotel (High) ==> Japanese hotel (High)	76856		
Hotel (Mid) ==> Japanese hotel (High)	71705		
Food (High) ==> Hotel (Mid)	51978		
Food (Low) ==> Hotel (Mid)	44696		
Delivery service (Low) ==> Hair salon (Mid)	43381		
Delivery service (Mid) ==> Other (High)	40033		
Delivery service (High) ==> Other (High)	36787		
Delivery service (Low) ==> Other (High)	36211		
Hotel (High) ==> Japanese hotel (Mid)	36196		
Food (Mid) ==> Hair salon (Mid)	35932		
Hotel (Mid) ==> Hotel (High)	35063		
Other (Low) ==> Hair salon (Mid)	34799		
Food (Mid) ==> Leisure (High)	33314		
Hotel (Mid) ==> Japanese hotel (Mid)	32771		
Food (Mid) ==> Hotel (Low)	31508		
Food (High) ==> Leisure (High)	31386		

SEGMENT_3_ MBA	<b>}</b> →₩	Association (3)
	_	_

Top 20 Rules:	Revenue Increase (SGI		
Food (Low) ==> Hotel (High)	13134		
Delivery service (Mid) ==> Hair salon (Mid)	9541		
Other (Low) ==> Hair salon (Mid)	9068		
Delivery service (High) ==> Other (High)	8709		
Delivery service (Mid) ==> Other (High)	8695		
Other (Low) ==> Other (High)	8585		
Hotel (Mid) ==> Hotel (High)	8433		
Other (Low) ==> Hotel (Low)	8402		
Delivery service (Low) ==> Hair salon (Mid)	7948		
Gift card (Low) ==> Hair salon (High)	7941		
Food (Low) ==> Hotel (Mid)	7707		
Delivery service (Low) ==> Hotel (Low)	7234		
Delivery service (Low) ==> Other (High)	7089		
Hotel (Low) ==> Hotel (High)	6964		
Food (Mid) ==> Hair salon (Mid)	6640		
	6587		
nked according to	6394		

Different rules generated for each segment, each ranked according to expected revenue increase from the rule. The top 20 rules are selected.

01 Data Exploration

Gift card (Low) ==> Gift card (Low) ==> Other

Delivery service (High) ==> O

Other (Mid) ==> Other

Food (Mid) ==> Other

02 Business Problem

03 Findings & Analysis

04 Recommendations

05 Reflections

6377

6105

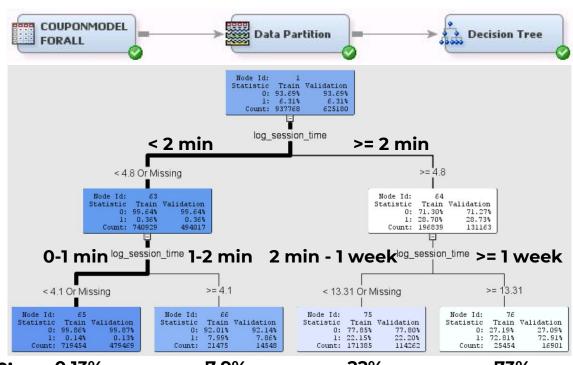
5829

# **03** FINDINGS | DECISION TREE

Coupon session time analysis

Besides analysing spending habits in each segment, we can also analyse their browsing habits

There is a distinct range of coupon session time which a user has a high likelihood of purchasing a coupon



**Probability of purchase:** 

0.13%

7.9%

**22**%

**73**%

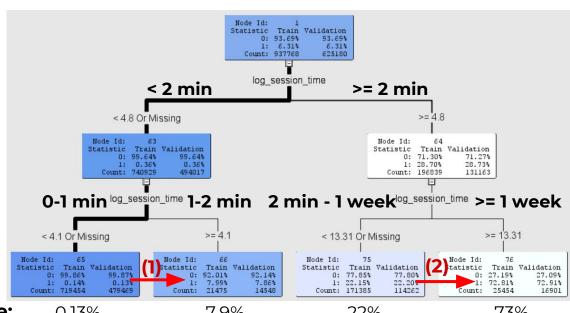
# **03** FINDINGS | DECISION TREE

Coupon session time analysis

#### Aim:

(1) Improve the user experience to allow them to find coupons they are interested in (and will look at for over 1 minute)

(2) Remind people to revisit coupon they are interested in



**Probability of Purchase:** 

0.13%

7.9%

22%

73%

**Percentage of Views:** 

Not interested 77%

Considering 2.3%

Interested 18%

Very Interested 2.7%



## **RECOMMENDATION**

Recommendation overview

#### **Recommended coupon list**







- Horizontal scrolling
- Comparison page

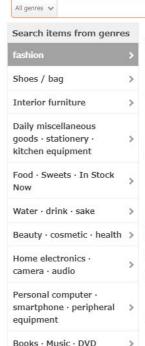
#### Improve the website to

- Target consumer segments better
- Improve shopper experience

Home Page 🏠



Welcome, Jane-San



#### Recommended for you



兵庫 安藤忠雄設計。全室スイートのリゾートホテル... SAYO STAR RESORT



<del>21,000円</del> **9,980円** 

52% OFF



大阪/心斎橋 特望の再登場。この時期限定のいくら... ホテル日航大阪 カフェレストランセリーナ



dデリバリー | 200円分の割引クーポン+10%ポイ...

340+枚購入済

Q Search for

+ Detail

150円

ホテル日航大阪 カフェレス... 4,290円 から 2,800円 1,000+枚購入済 35% OFF



コン the TOSHI 1 アロマボディトリートメント60分 i市・1km 6,600円 から 3,300円



**ケンタッキーフライドチキン**[A] KFCカード10,000円分(500円お得)



バリ 1室2名分/ガーデンスイート/3泊朝.. Katamama

10,000円 から 9,500F

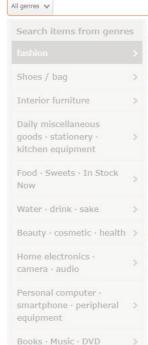
5% OF Seminyak

から 131,692円

Home Page 🏠



Welcome, Jane-San



#### Recommended for you



安藤忠雄設計。全室スイートのリゾートホテル... SAYO STAR RESORT

SAYO STAR RESORT 150+枚購入溶

21.000円 9.980円

52% OFF

Users who looked at the coupon between 2 mins and up to 1 week are interested in the coupon, but only 23% of them purchased the coupon

Q Search for

+ Detail

Increase the purchase rate to 73% by reminding them of the coupon that was viewed in the previous session using the recommended coupon list

12 the TOSHI 】アロマボディトリートメント60分 6.600円 から 3.300円 4.1 \*\*\* \* (1,678)

ケンタッキーフライドチキン 【A】KFCカード10,000円分(500円お得) 10 000円 tv5 9.500F

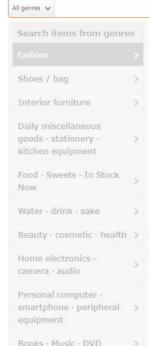
バリ 1室2名分/ガーデンスイート/3泊朝... Katamama

から 131,692円

Home Page 🏠



Welcome, Jane-San



#### Recommended for you



兵庫 安藤忠雄設計。全室スイートのリゾートホテル... SAYO STAR RESORT

SAYO STAR RESORT 150+枚購入済 <del>21,000円</del> **9,980円** 



Jane-San revisited the same hotel coupon over 2 days ⇒ **Significant session time** ⇒ Coupon is recommended

340+枚購入済

Q Search for

150円

ホテル日航大阪 カフェレス... 4,290円 から 2,800円

Purpose of recommendation:
Allow Jane to view coupons she is **more interested in** 

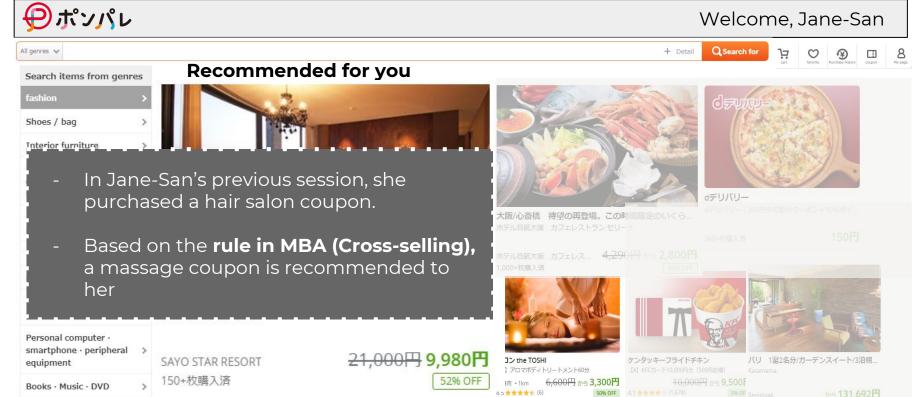
1 アロマボディトリートメント60分 i市・1km 6,600円 から**3,300円** 

[A] KFCカード10,000円分(500円お得) 10,000円 から 9,50

Katamama 500F

უნ **131,692** 

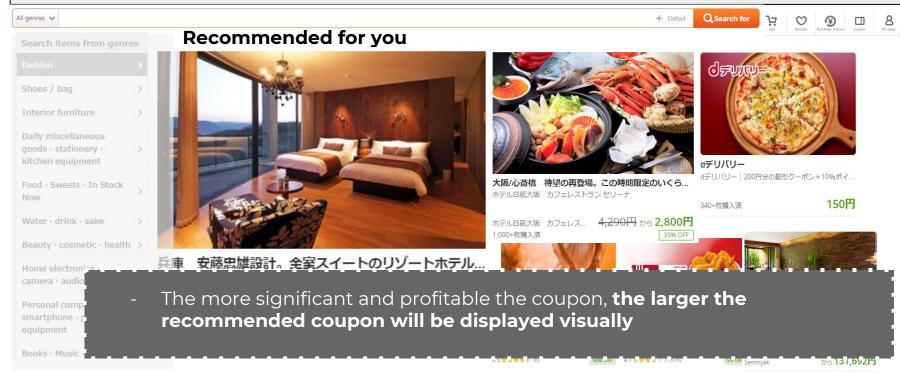
Home Page 🏠



Home Page 🏠



Welcome, Jane-San



Browsing Mode



Welcome, Jane-San



9,800 🖰

To buy!

figure as a gift

LIMITED TIME SALE

3 days 07: 48: 42

Number of purchases 130 or more

(a) (b) (b) (c) (c) (d)

Hotel Seihai home page

#### Other Recommendations



Aichi All day Fare / All rooms that wish for Ise Bay ... Hotel Receia Minamichi-dori

Hotel Receia Minamichi-dori
10+ sheets purchased

11,040 円



Shizuoka Ise Shrimp, Kinema Taima etc. Luxury m... Hotel Minamisoso

**9,900** 円

Hotel Minamisoso

NOTES ON USE

Browsing Mode



Welcome, Jane-San



9,800 🖪

To buy!

- Recommended coupons on the side panel
- Coupons recently viewed in the current session have significant session time
- Based on the rule in MBA (Up-selling), recommend coupons of a higher price range from the same category

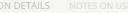


+Add to comparison



Hotel Minamisoso

**9,900** ⊞





01 Data Exploration

02 Business Problem

03 Findings & Analysis

05 Reflections



Other Recommendations

Up-selling

Hotel Receia Minamichi-dori

11,040円



Shizuoka Ise Shrimp, Kinema Taima etc. Luxury m.

Hotel Minamisoso

Browsing Mode



Welcome, Jane-San



張









+Add to comparison

10,800 □

**Other Recommendations** 

- Currently, there is shorter viewing time ⇒ Users are seeing redundant things ⇒ So they close the session
- 77% of views are < 1min, with a purchase rate of 0.13%
- Make our website more user friendly by having the horizontal scrolling so as to increase their session time
- Quickly find coupons they are more interested in

Shizuoka Ise Shrimp, Kinema Taima etc. Luxury m... Hotel Minamisoso

Hotel Minamisoso 40+ sheets purchase 9,900 🖰

COUPON DETAILS

NOTES ON USE

Browsing Mode







9,800 🖽



To buy!

figure as a gift

LIMITED TIME SALE

3 days 07: 48: 42

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Hotel Seihai home page

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Hotel Minamisoso

9,900 🖰

COUPON DETAILS NOTES ON USE

02 Business Problem

03 Findings & Analysis

05 Reflections

Comparison Page



#### Welcome, Jane-San











COUPON DETAILS NOTES ON USE

[Use period] ~ May 31 (Fri) of 2019 [Exemption date] January 12, 13, 23, 24 February 5 - 9 - 10 - 12 March 5 - 12 April 2 - 3, 9, 10, 16, 17, 23 - 25 April 27 - May 8 May May 7, 8, 14, 15, 21, 22, 28, 29

[Required separate fee] Bath tax 150 circle about / name Idate of use by an additional cost1

March 21, 22 days, March 24-29 days, March 31, Friday, Sunday and public holidays other than the use of blackout dates: available plus 2.160 ven /

use Saturday excepting excluded day: plus 5,400 yen / available in name

#### Features of coupons

- . Charged outdoor bath "Jade" or
- · Shrimp Ise Shrimp, Abalone, Seasonal
- etc. Ocean Fortune · Retro pure tatami mat room with
- relaxing tatami mat which wants Suruga bay and flower clock · Also in the middle of the morning a
- large public bath with sourced sauce & outdoor bath
- · Approximately 90 minutes by car from Tomin - Numazu IC / 40 free parking

# 羅 单 重 愈 To buy!

COUPON DETAILS NOTES ON USE

[Expiration date] ~ April 19 (Fri) of 2019

[Exclusion date] Saturday, pre-holiday, full occupancy day, December 28 -

[Required separately fee] Bath tax: 150 yen

\* For availability and reservations, please refer to the reservation form (For smaho users click here )

#### ■ Plan Name

Groupup Winter Season - New Wing (Seiyama Kan or Shimizu Kan) Japanese style room 10 tatami mats and over 1 night 2 meals - Dinner Including alcohol All you can drink Special course with C course

New building / Seizan pavilion

# Features of coupons

- · Sourced hanging sludge which springs from the hometown of 100,000 tsubo.
- · Southern Kita Koto Eastern Shima Ten thousand hot springs will be put in with a bathing passport
- · Biking with evening and breakfast. All-
- you-can-drink at dinner for 60 minutes · New building promise! Relaxation Japanese-style room with 10 tatami mats to 18 tatami mats with bath toilet
- · About 40 minutes by bus from Nakanojo station of IR Agawa line, end point "Shima Onsen" Eyes / There is free parking







COUPON DETAILS NOTES ON USE ■ Usage date [Use deadline] ~ February 28, 2019

(Use exclusion date) December 28 - January 3. Other occupied days

[Required additional fee] Bathing tax 150 yen

[Use day Separate day and public holiday: Plus 3,000 yen / name available [ Option Plus ¥ 2,200 / name (Saturday, no reception on the day before the

\* Please tell us the hope of the option at the time of reservation.

Ise no Yuki, luxurious packing, privilege saving

Sea side room / Shrimp Ise shrimp and bream boat etc. / Outdoor bath / 11 benefits / Half board

#### Features of coupons

- · Also famous as Yuji lodging, Ise Bay and open-air bath looking for couple
- . Ocean view rooms. Early check in at 14
- · Soup of Ise shrimp · Sasae · Chicken poppers and so on, Soup of Ise!
- . Karaoke, coffee, supper, etc., nice . It is approximately 20 minutes by car
- to Ise shrine. About 10 minutes on foot to the couple rock

\* Depending on the date of use. there is a possibility that additional expenses may be required. For details, please check the usage neriod column

01 Data Exploration





Welcome, Jane-San

Credit Card details		Purchase Summary			
	Add a credit or debit ca	rd for a safer & faster buying experience			Oat Rice Set Meal with Organic Soya Drink for 1 Person \$\$7.50 \$\$5.20
Name on card *		Card Number *		Redeemable at	
				B1-07, One Raffles F	Place or 9 other locations
Expiry Month *	Expiry Year *		CVC *	Redeem from Today until March 29	9, 2019
MM	YYYY		CVC		
				Quantity	- 1 +
	a verification transaction. It will be will not be charged this amount	Norton	PAY NOW	Total Price	\$\$7.50 <b>\$\$5.20</b>
		powered by VeriSign		Amount Payable	\$\$5.20

Others also purchased these

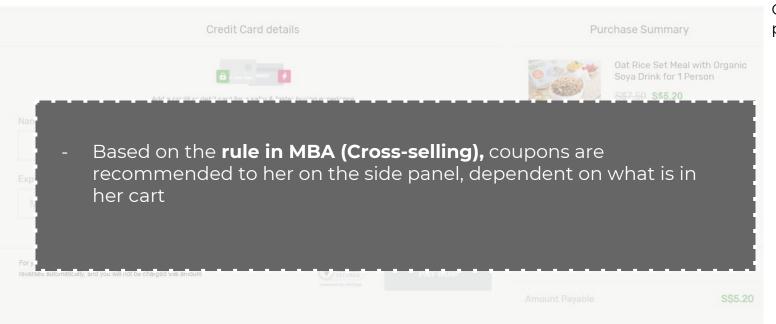


# **04** CONCLUSION | RECOMMENDATION





Welcome, Jane-San



# Others also purchased these



# **04** RECOMMENDATION| LIAISING WITH VENDORS

Based on MBA analysis, majority of increased demand is in high value products like **Hotel**, **Hair Salon**, **Leisure** and **Other** as we target high spending customers

**Delivery service**, **Gift Card** and **Food** also have potential for growth for low and middle spending customers

Work with vendors to get increased number of coupons for current range of products in these categories

Product Type	Estimated Increase in Quantity
Other	5,540
Hair Salon	3,540
Hotel	3,090
Delivery Service	2,330
Leisure	1,310
Japanese Hotel	980
Gift Card	730
Food	630

01 Data Exploration

### **04** SUMMARY

4 distinct groups of users with different purchase and browsing behaviour



Target 3 out of 4 groups : due to higher potential profitability (Cash cows, bargain hunters, decisive)



All 3 groups purchase different proportions of different products at different price points



#### Recommendations:

- Coupon recommendation
- 2. Website interface enhancements



Generated decision
tree to find significant
timing after which
user's probability of
purchase increases
significantly.



Perform market basket analysis on 3 groups to get respective associated products for cross selling and upselling Thank you for your time and attention



