

**PROJECT REPORT**

**CHATBOT AND MACHINE LEARNING FOR DATA CLASSIFICATION  
FOR JUZZ MARKETING**

**MASTER OF TECHNOLOGY IN INTELLIGENT SYSTEM  
MODULE: INTELLIGENT REASONING SYSTEM**

**BY: LAU XIANGMING  
STUDENT ID: A0267144A**

## Table of Contents

Executive Summary	4
Introduction	8
Project Planning & Design	8
Picture Flow Diagram	9
WhatsApp Chatbot	9
Sales Enquiry Handling	9
Complaint Handling	10
Database Classification	10
Overall Project Scope	11
Project Technicality	11
Juzz Marketing Website Link Scraping	11
Question Database	12
DialogFlow	13
User Category	13
Testing of the Juzz Chatbot Workflow	20
Integration with WhatsApp	26
Integrate with Google DialogFlow	27
Advertisement User Journey	28
Classify Database's Gender	30

Error Analysis	32
Monitoring of Bounce rate and Sales Conversion of Landing Page	34
Limitations of Juzz WhatsApp Chatbot	35
Limitations of Gender Classification	36
Future Works of Juzz WhatsApp Chatbot	36
Future Works of Juzz Gender Classification	36
References	37
Appendices	38

## **Executive Summary**

Juzz Marketing is a marketing agency that provides lead generation services to business owners, property agents and financial advisors. The website has multiple web pages that provide a lot of information about their lead generation services. However, when a user visits the website, they could get confused and have no idea what to look for. Although there is a lot of information in the website, the website is unstructured and there is no sitemap to assist in user navigation and users usually struggles to find the queries they wanted and eventually would need to request for a phone call or zoom meeting which is time consuming and unproductive for Juzz Staffs.

Based on the google analytics as shown in picture below, the website has a 4% bounce rate which means that for every 25 visitors who visited the website, 1 of them will exit the website after viewing 1 page. Whenever a user tries to WhatsApp Juzz for enquiry, it will take hours for them to reply due to manpower shortage. Juzz could be potentially losing customers due to this issue and we have to find possible solutions to fix this problem. Juzz also does not have a sitemap to assist user in the navigation.

## Google Analytics Home

Users

284

↓ 11.5%

Sessions

350

↓ 19.4%

Bounce Rate

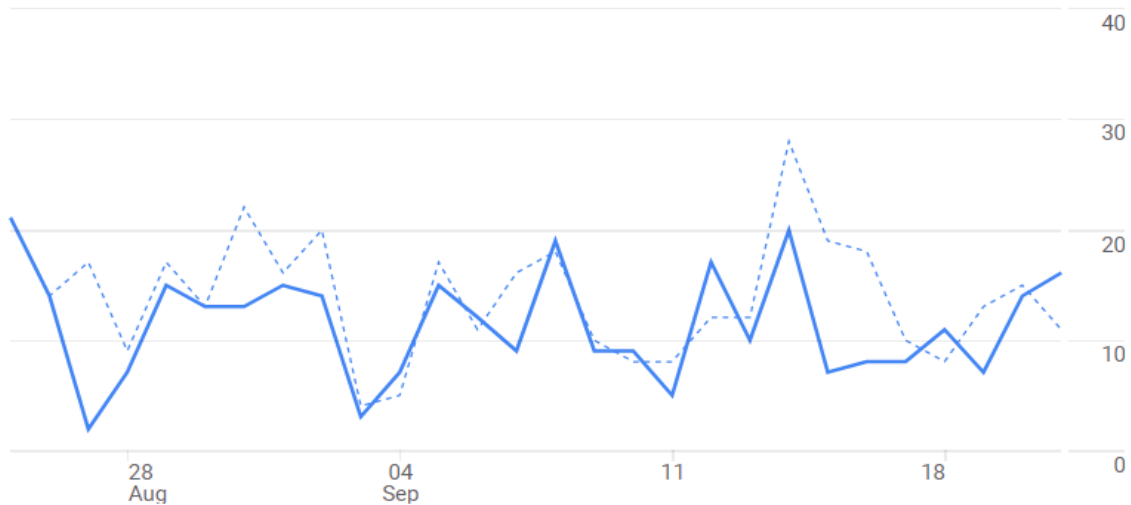
4%

↓ 8.6%

Session Duration

1m 23s

↓ 20.6%



Last 28 days ▼

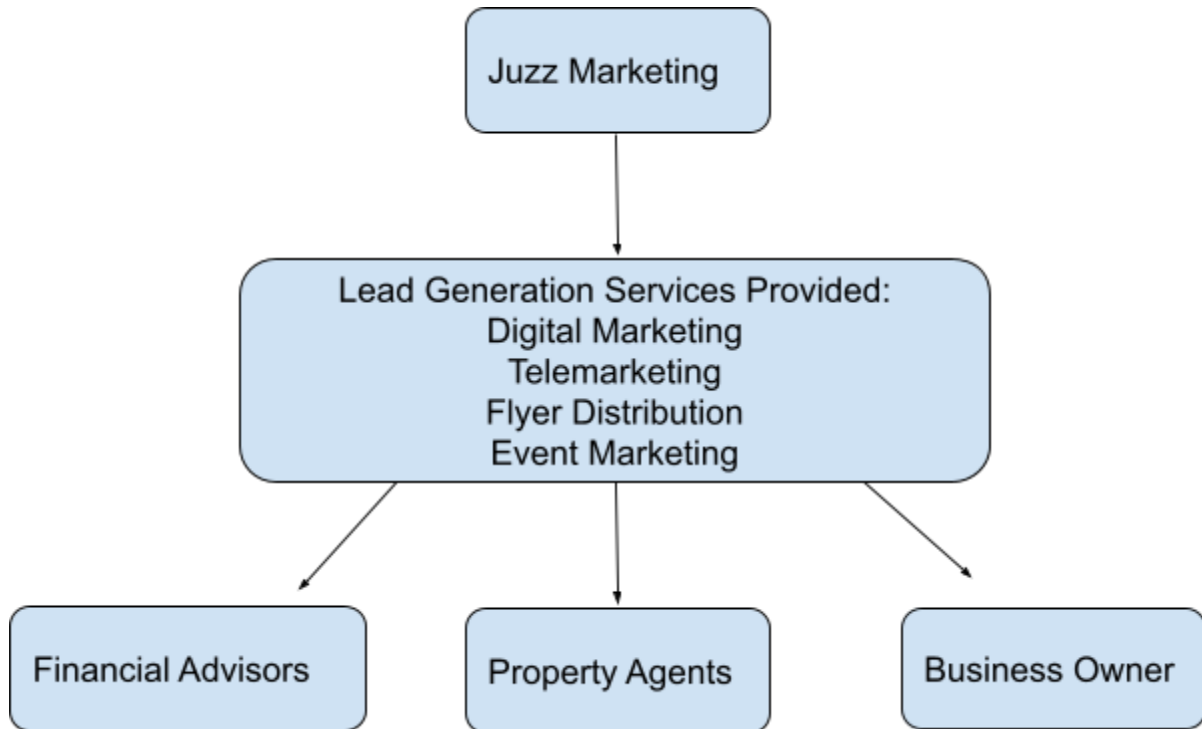
[AUDIENCE OVERVIEW >](#)

Juzz has a huge consumer database that consists of only name and mobile generated for its clients and wish to seek more meaningful information from this such as finding out their gender using artificial intelligence instead of manually input. There is a need to do gender classification because there may be some clients who like to target specific gender. Take for example, a facial spa that provides their services only to females may want to target all female customers only.

The services that Juzz Marketing provides are Digital Marketing, Telemarketing, Flyers Distribution and Event Marketing and its customers can be classified into 3 main categories - Financial advisors, Property Agents and Business Owners.

Juzz Chatbot is created to help solve this problem. When someone visits the website, Juzz Chatbot will interact with them and start to ask them questions. Google Dialog flow will be used to integrate with WhatsApp Business for the chatbot design.

## Juzz Services Chart



## **Introduction**

### **Objective of This Project**

The objective of this project is to design a chatbot in English using Google Dialogflow for Juzz Marketing to automate its WhatsApp Business enquiry messages and to use machine learning to help Juzz Marketing automate the gender classification of its consumer database that consists of only name and mobile which is currently done manually. The consumer database is generated from its lifestyle portal <https://upgradelifestyle.fun/> Juzz Marketing website URL is <https://juzzmarketingservices.com/> and it uses <https://upgradelifestyle.fun/> a lifestyle portal to generate leads for its clients. Juzz clients consist of business owners, property agents and financial advisors. Its consumer database will consist of members of the public from all walks of life who opt in to the lifestyle portal. And most of these consumers opt in their name and mobile without the gender. The reason why upgradelifestyle.fun only collects name and mobile is because when less data is required, the cost of conversion per lead will be lower. If consumers need to fill in a lot of info, less people will be willing to do so resulting in a higher cost per lead.

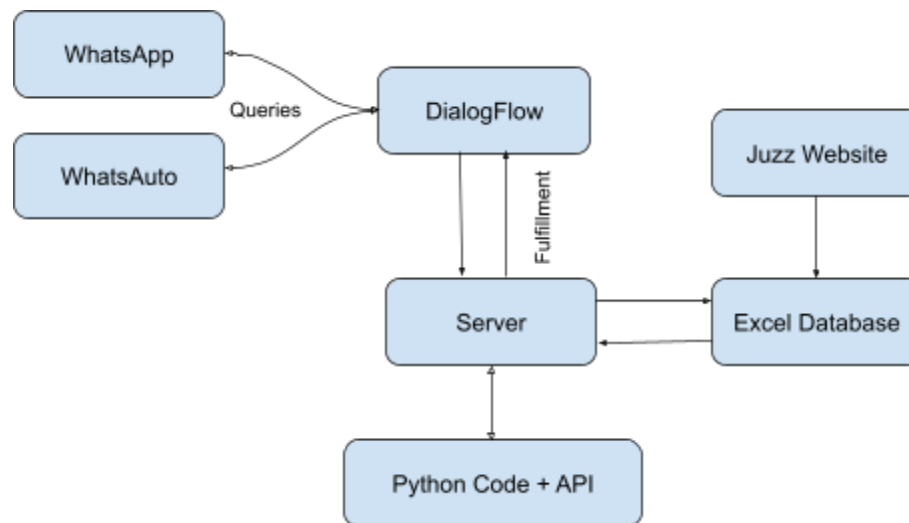
### **Project Planning & Design**

This project aims to solve 2 problems. Firstly, to automate WhatsApp Business replies on service enquiries by creating a chatbot using Google



DialogFlow. Secondly, to apply machine learning techniques to help Juzz classify its consumer database's gender into male and female that currently has only names and mobiles.

### **Picture Flow Diagram**



### **WhatsApp Chatbot**

The project planning starts from a thought. “ How can I apply what I have learned in NUS Intelligent Reasoning System modules to help Juzz Marketing solve its existing problems and use Artificial Intelligence to automate its workflow?”

### **Sales Enquiry Handling**

Juzz Marketing sales enquiries usually come in from WhatsApp and are currently manually replied by their internal staff. Due to their heavy workload, the WhatsApp messages are usually replied only after a couple

of hours or in the worst case scenario , the next working day. Juzz Chatbot is designed to help solve this problem- To help automate the WhatsApp chats so that the messages are replied within seconds instead of hours.

### **Complaint Handling**

Just like any lead generation companies, Juzz marketing is unable to guarantee that all the leads they generate are of good quality because when a lead opts in, it is out of their control whether the lead will become a potential customer. From time to time, Juzz Marketing will also receive complaints from customers. As humans contain emotions and cannot work 24/7, these complaints are not handled promptly and if Juzz employs a customer service officer who is hot tempered and starts a quarrel with clients, it can result in a loss of clients. As robots do not contain emotions and can work 24/7, it makes every sense for Juzz to automate this process and make complaint handling more effective.

### **Database Classification**

The database that Juzz Marketing generates for its client generally consists of only name and number only. It does not consist of other details such as gender. A staff will look at the name of the prospects and try to gauge whether it is a male or female and manually key into the database and this takes up a lot of time. Machine Learning is applied to help Juzz automate this process to improve efficiency.

## **Overall Project Scope**

1. The queries addressed by the chatbot will not be limited to just information accessible on Juzz website as it will consist of complaint handling standard operating procedures(SOP) which will not be appropriate to put inside the website.
2. The chatbot would be integrated to WhatsApp Business
3. The database gender classification will be analyzed and classified using Natural Language Processing(NLP) techniques.

## **Project Technicality**

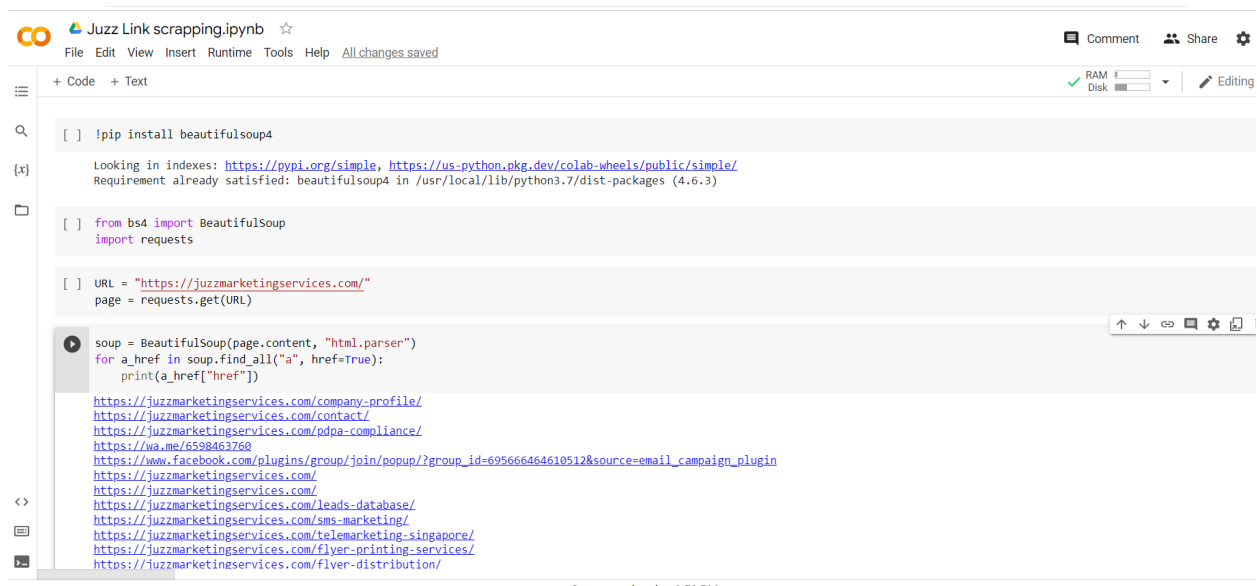
1. Beautiful soup is used to scrap the hyperlinks of Juzz Marketing in order to derive at the potential questions users will ask in WhatsApp Business. A total of 32 hyperlinks has been scrapped.
2. The scrapped information is used to build into potential questionnaires that potential users will ask
3. Google Dialog Flow NLP is used to process user intents
4. Machine Learning using Python is use to classify database
5. Chat History with 50 clients has been studied and recorded down for the design of Juzz Chatbot so that we can consider different phrases and utterances to train the intents of Google Dialog Flow.

## **Juzz Marketing Website Link Scraping**

Beautiful soup has been chosen to do website scrapping.. Beautiful Soup is a Python package for parsing HTML and XML documents. Beautiful library

has been imported into python to scrub the hyperlinks of Juzz Marketing website to ensure no links are missed out. The reason why beautiful soup is chosen for scraping of the website is because it is fast and handy to use and is suitable for smaller projects. The scrapper looked through the main website of Juzz Marketing [www.juzzmarketingservices.com](http://www.juzzmarketingservices.com) and searched for hyperlinks within. The process is reflected in picture 2 below.

Picture 2



```
!pip install beautifulsoup4

Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Requirement already satisfied: beautifulsoup4 in /usr/local/lib/python3.7/dist-packages (4.6.3)

from bs4 import BeautifulSoup
import requests

URL = "https://juzzmarketingservices.com/"
page = requests.get(URL)

soup = BeautifulSoup(page.content, "html.parser")
for a_href in soup.find_all("a", href=True):
    print(a_href["href"])

https://juzzmarketingservices.com/company-profile/
https://juzzmarketingservices.com/contact/
https://juzzmarketingservices.com/pdpa-compliance/
https://wa.me/6598463760
https://www.facebook.com/plugins/group/join/popup/?group_id=695666464610512&source=email_campaign_plugin
https://juzzmarketingservices.com/
https://juzzmarketingservices.com/leads-database/
https://juzzmarketingservices.com/sms-marketing/
https://juzzmarketingservices.com/telemarketing-singapore/
https://juzzmarketingservices.com/flyer-printing-services/
https://juzzmarketingservices.com/flyer-distribution/
```

## **Question Database**

After deriving the hyperlinks, a list of questions was then drafted to identify possible questions that users will potentially ask Juzz Chatbot. All the content of Juzz Marketing has been read through to understand what kind of information and data is available and for which of the 3 user types (Business Owners, Property agents or Financial Advisors) is the information meant for. Past conversation that users had with Juzz that was replied manually by one of Juzz Staffs was studied and sorted out to help

the team to design possible intents that potential customers will ask during an enquiry. A total of sample questions was coded to google dialogflow to map out possible user intents to ensure that jazzchatbot is able to answer most of the user queries.

## **DialogFlow**


### **User Category**

The user input(utterances) are processed by Google Dialog Flow and matched against the intent. “ Default Welcome Intent” are designed to handle the greeting utterance and “Default Fallback Intent” are designed to capture user inputs(utterance) which do not get matched to any other category. The chatbot needs to be able to identify the user type. The user types are basically classified into 3 main categories. They are businesses, property agent and financial advisors

- Businesses. This refers to all range of businesses from F&B to retail and to e-commerce except for property and insurance.
- Property Agents. There around 30,000 property agents in Singapore who conduct selling and renting of both commercial and residential properties
- Financial Advisors. There are around 20,000 financial advisors in Singapore. They provide financial planning in terms of wealth protection and wealth accumulation and estate planning to their clients

The welcome intent is shown in Picture 3 below. When someone sends a greeting utterance such as “Hi”. Google Dialog flow will ask them whether are they business owners, property agents or financial advisors.

Picture 3


Try it now

Agent

USER SAYS

COPY CURL

hi

 DEFAULT RESPONSE

▼

Hi! Thank you for contacting Juzz Marketing.  
Let me provide you some info so you can better understand our services. May I know if you are a Business Owner, a Property Agent, or a Financial Advisor?

INTENT

Default Welcome Intent

ACTION

input.welcome

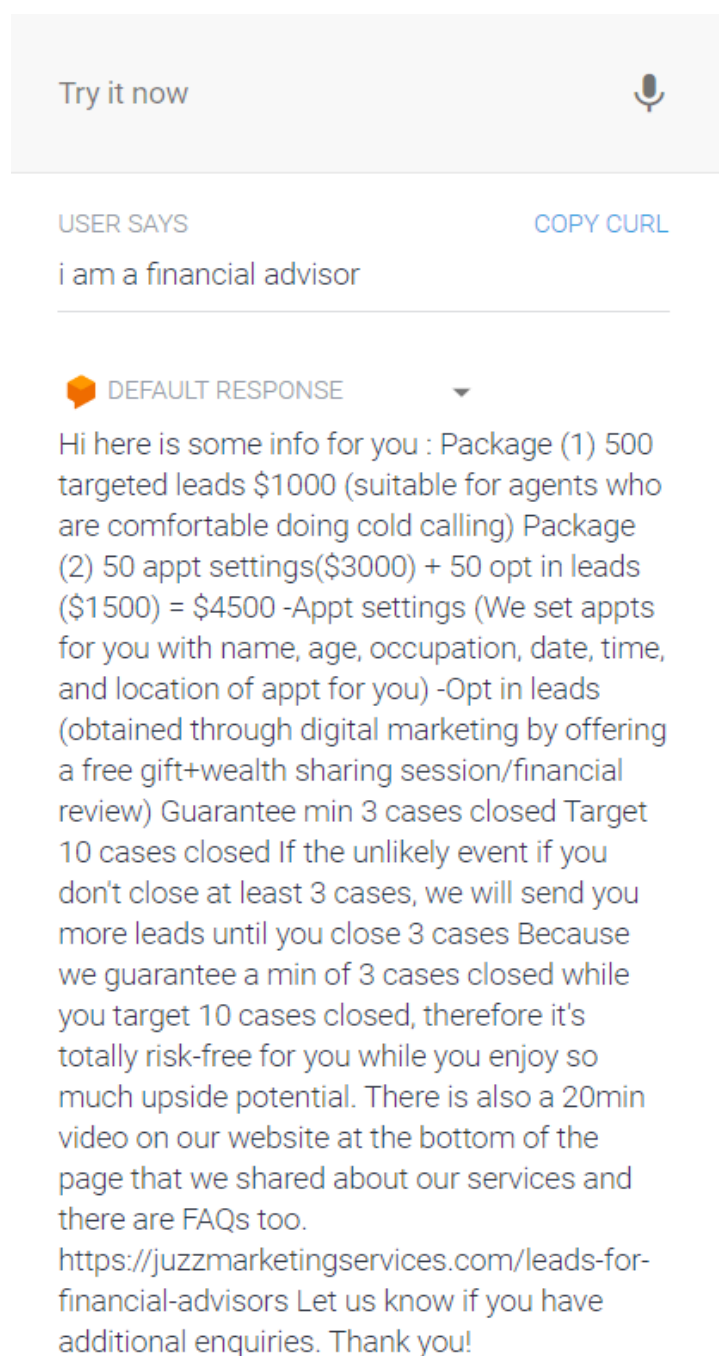
SENTIMENT

Query Score: 0.3

DIAGNOSTIC INFO

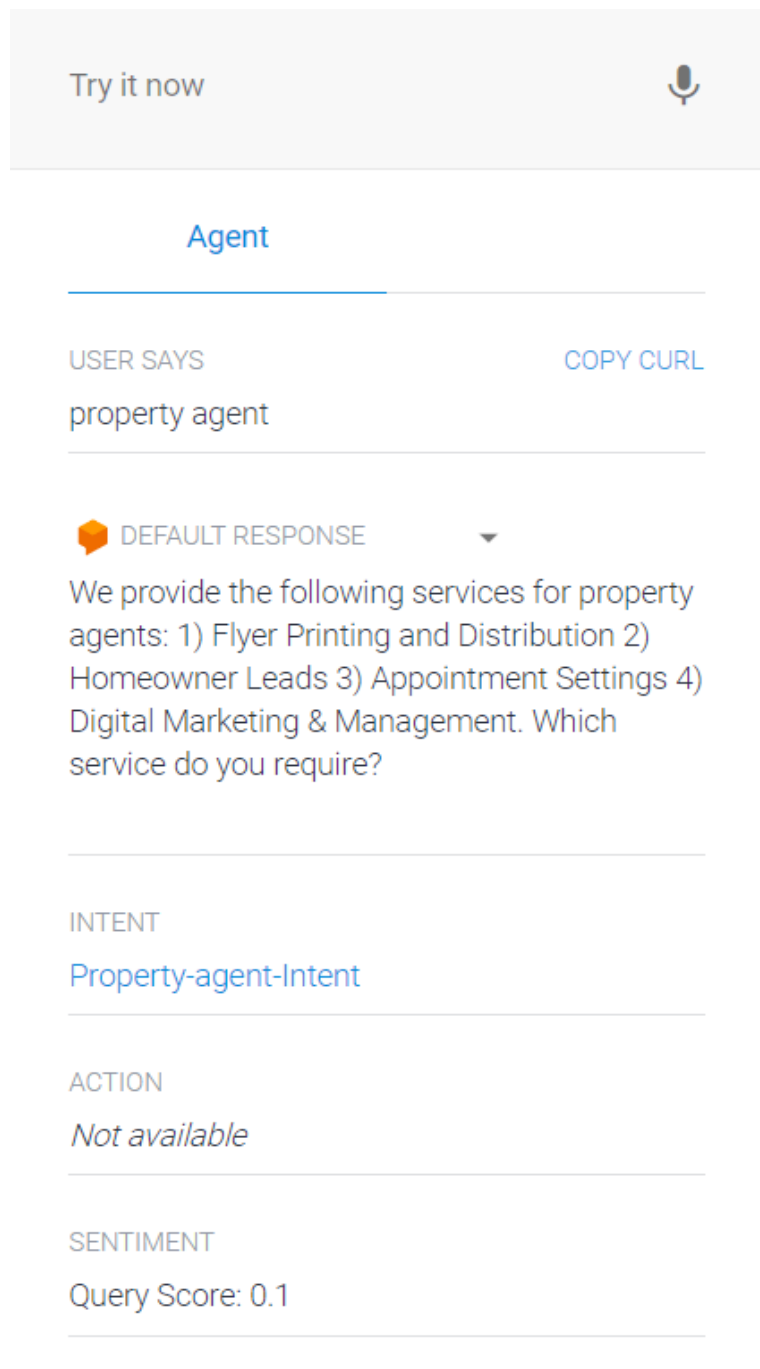
After identifying the User type, Juzz Chatbot will reply accordingly. Take for example, in Picture 4 below, the user replied “ i am a financial advisor” Juzz Chatbot will respond and provide the services and rates to the user.

Picture 4



If the user is a property agent, Jazz chatbot will reply accordingly. Take for example, in Picture 5 below, the user replied “ property agent” Jazz Chatbot will responses and provide the services and rates to the user.

Picture 5






When the user identifies himself as a property agent and keen on flyer distribution services, jazz Chatbot will reply with flyer distribution services details and rates to the user.

Picture 6

Try it now




Agent

USER SAYS

COPY CURL

flyer distribution

 DEFAULT RESPONSE

Here are the types of flyer distribution available. 1) HDB Letterbox \$39/1000 units 2) HDB Door-to-door \$59/1000 units 3) Landed/Industrial/Commercial/Shophouse Letterbox \$99/1000units 4) Carpark \$60/1000 units 5) Street/MRT/Bus Stop \$25/hr/150 flyers. This rate is for A4 size (157gsm) flyer & smaller with 5k minimum order quantity.

INTENT

flyer-distribution-intent

ACTION


*Not available*

SENTIMENT

Query Score: 0.0

A default intent has also been created to handle questions that users will ask but does not fall inside the intent already designed yet as shown in the picture below. Users will always ask questions out of the box such as “Who are you” or some people could message us wrongly such as “Where are you now?” Therefore a fallback intent is very important.

Try it now




Agent

USER SAYS

COPY CURL

who are you

 DEFAULT RESPONSE

▼

Sorry i didn't get that. I will ask our client servicing manager to contact you

CONTEXTS

RESET CONTEXTS

\_\_system\_counters\_\_

INTENT

Default Fallback Intent

ACTION

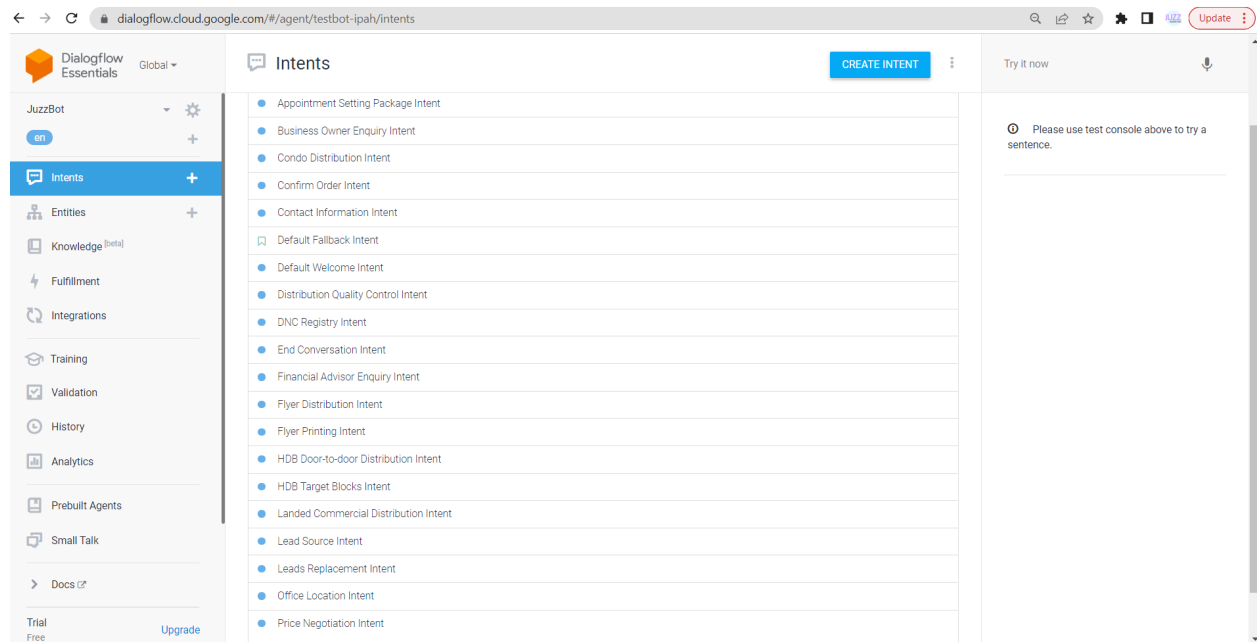
input.unknown

Analytic will be done on a regular basis as shown in the picture below to study the fallback intent to improve Juzz chatbot. The goal is to have as little fallback intent as possible and let Juzz Chatbot be automated.

The screenshot displays the Dialogflow Analytics interface. On the left is a sidebar with navigation options: TestBot, Intents, Entities, Knowledge, Fulfillment, Integrations, Training, Validation, History, Analytics (selected), Prebuilt Agents, and Small Talk. The main panel is titled 'Analytics' and shows a summary of statistics for all requests by intent. A table titled 'Summarized stats by intent' lists various intents with their respective sessions, interactions, and exit percentages. On the right, a 'Try it now' section shows a user input 'who are you' and the default response 'Sorry i didn't get that. I will ask our client servicing manager to contact you'. Below this, it shows the context '\_\_\_system\_counters\_\_\_', the intent 'Default Fallback Intent', the action 'input.unknown', and the sentiment 'Query Score: 0.1'. A 'DIAGNOSTIC INFO' button is also visible.

Name	Sessions	Interactions	Exit %
Default Fallback Intent	2	3	0.00 %
hdb_target_blocks	1	1	7.69 %
hdb-target-blocks-intent	3	6	23.08 %
flyer-distribution-intent	7	7	15.38 %
Default Welcome Intent	11	11	15.38 %
Property-agent-Intent	11	16	38.46 %
financial advisor enquiry-intent	1	1	0.00 %

Besides default and welcome intents the following intents were also programmed into google dialogueflow as well as shown in the picture below.



## **Testing of the Juzz Chatbot Workflow**

User: Hi hello

Juzz Chatbot: Hi! Thank you for contacting Juzz Marketing. Let me provide you with some information so you can better understand our services. May I know if you are a Business Owner, a Property Agent, or a Financial Advisor?

User: Financial Advisor

Juzz Chatbot: Hi, here is some information for you:

Package 1: 500 targeted leads \$1000 (suitable for agents who are comfortable doing cold calling)

Package 2: 50 appt settings(\$3000) + 50 opt in leads (\$1500) = \$4500  
(Appt settings; We set appts for you with name, age, occupation, date, time, and location of appt for you + Opt in leads; obtained through digital marketing by offering a free gift+wealth sharing session/financial review)

Both packages come with Guarantee min 3 cases closed. Target 10 cases closed. In the unlikely event if you don't close at least 3 cases, we will send you more leads until you close 3 cases. Because we guarantee a min of 3 cases closed while you target 10 cases closed, therefore it's totally risk-free for you while you enjoy so much upside potential.

Go to <https://juzzmarketingservices.com/leads-for-financial-advisors/> for additional information. Let us know if you have additional enquiries. Thank you!

User: Can zoom to share more?

Juzz Chatbot: Sure. May i know what's name?

User: Sandy

Juzz Chabot: Thanks, sandy! We are open for a 30-min zoom appointment every Tuesday and Thursday between 2pm and 6pm. You may book directly at our website <https://juzzmarketingservices.com/contact>

## Agent

---

USER SAYS

[COPY CURL](#)

hi hello

---



DEFAULT RESPONSE



Hi! Thank you for contacting Juzz Marketing.  
Let me provide you with some information so  
you can better understand our services. May I  
know if you are a Business Owner, a Property  
Agent, or a Financial Advisor?

USER SAYS

COPY CURL

financial advisor

---



DEFAULT RESPONSE



Hi, here is some information for you:

Package 1: 500 targeted leads \$1000 (suitable for agents who are comfortable doing cold calling)

Package 2: 50 appt settings(\$3000) + 50 opt in leads (\$1500) = \$4500 (Appt settings; We set appts for you with name, age, occupation, date, time, and location of appt for you + Opt in leads; obtained through digital marketing by offering a free gift+wealth sharing session/financial review)

Guarantee min 3 cases closed. Target 10 cases closed. If the unlikely event if you don't close at least 3 cases, we will send you more leads until you close 3 cases Because we guarantee a min of 3 cases closed while you target 10 cases closed, therefore it's totally risk-free for you while you enjoy so much upside potential.

Go to <https://juzzmarketingservices.com/leads-for-financial-advisors/> for additional information. Let us know if you have additional enquiries. Thank you!

## Agent

---

USER SAYS

[COPY CURL](#)

can do a zoom to share more

---



DEFAULT RESPONSE



Hi! Could you tell me your name?

---

CONTEXTS

[RESET CONTEXTS](#)

08b55f01-d5e8-4fa0-ac23-8f7eb92b6d6  
d\_id\_dialog\_context

zoom\_appointment\_intent\_dialog\_context

zoom\_appointment\_intent\_dialog\_params\_person\_name

\_\_system\_counters\_\_

---

INTENT

[Zoom Appointment Intent](#)



## Agent

---

USER SAYS

[COPY CURL](#)

sandy

---



DEFAULT RESPONSE



Thanks, sandy! We are open for a 30-min zoom appointment every Tuesday and Thursday between 2pm and 6pm. You may book directly at our website <https://juzzmarketingservices.com/contact>

---

INTENT

[Zoom Appointment Intent](#)

---

ACTION

*Not available*

PARAMETER

VALUE

person\_name

{ "name": "sandy" }

---

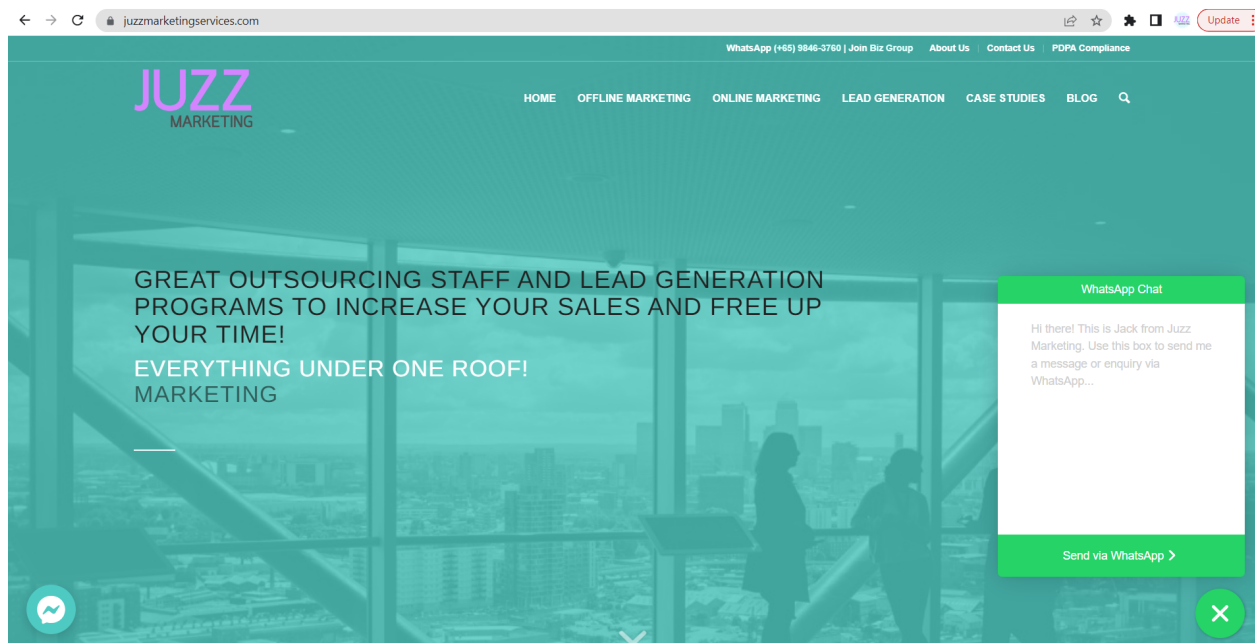
SENTIMENT

Query Score: 0.3

---

## **Integration with WhatsApp**

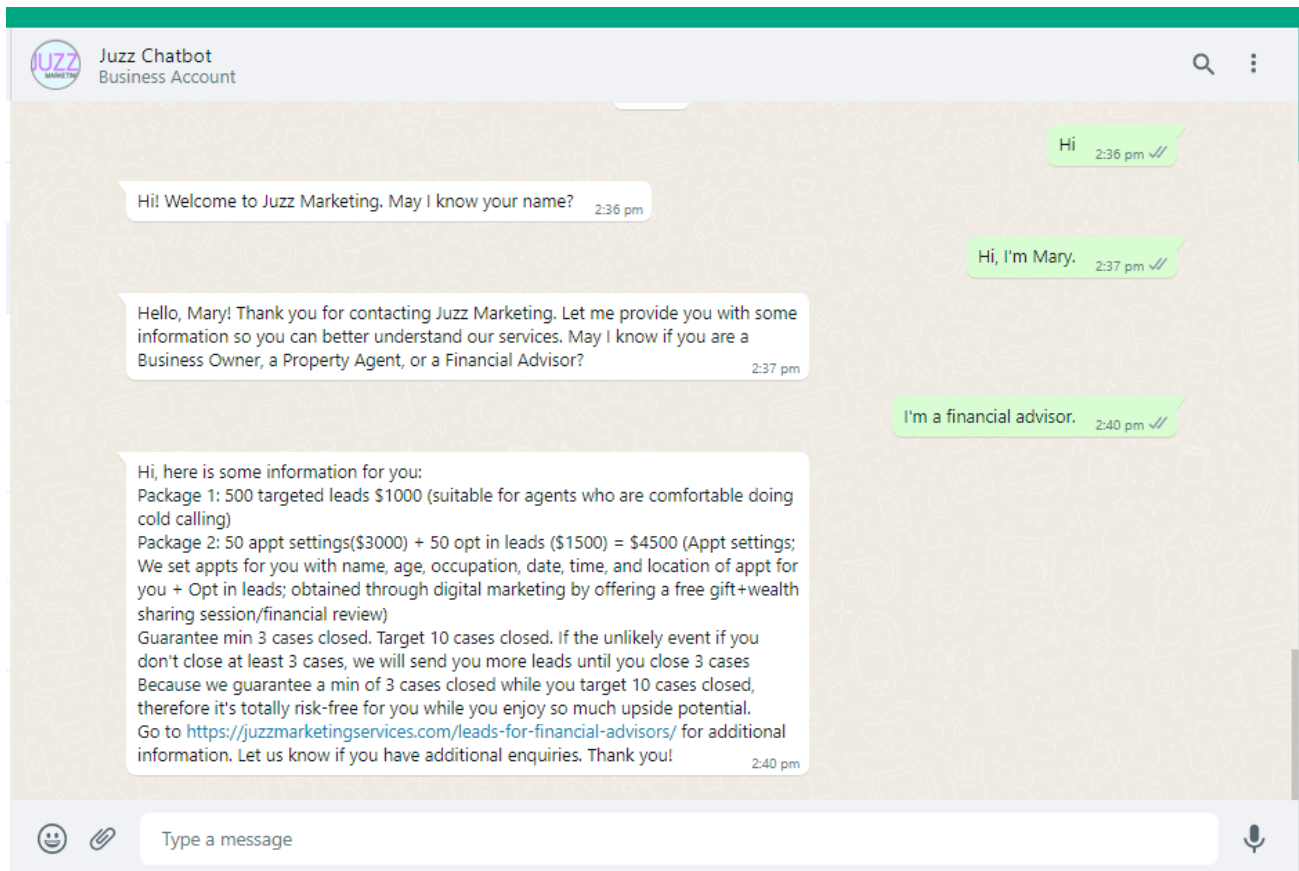
**For integration with WhatsApp Business, user just need to contact Juzz WhatsApp business mobile number by clicking on the whats app icon as shown in the screenshot below.**



**Alternatively, users such as business owners, property agents and financial advisors can also save Juzz WhatsApp business mobile number +6598463760 to their phone and search the Juzz WhatsApp Business mobile number on their WhatsApp App.**

**Once a user clicks on the whats app icon, the user will be able to interact with the chatbot as shown in the screenshot below.**

## WhatsApp Web Screenshot



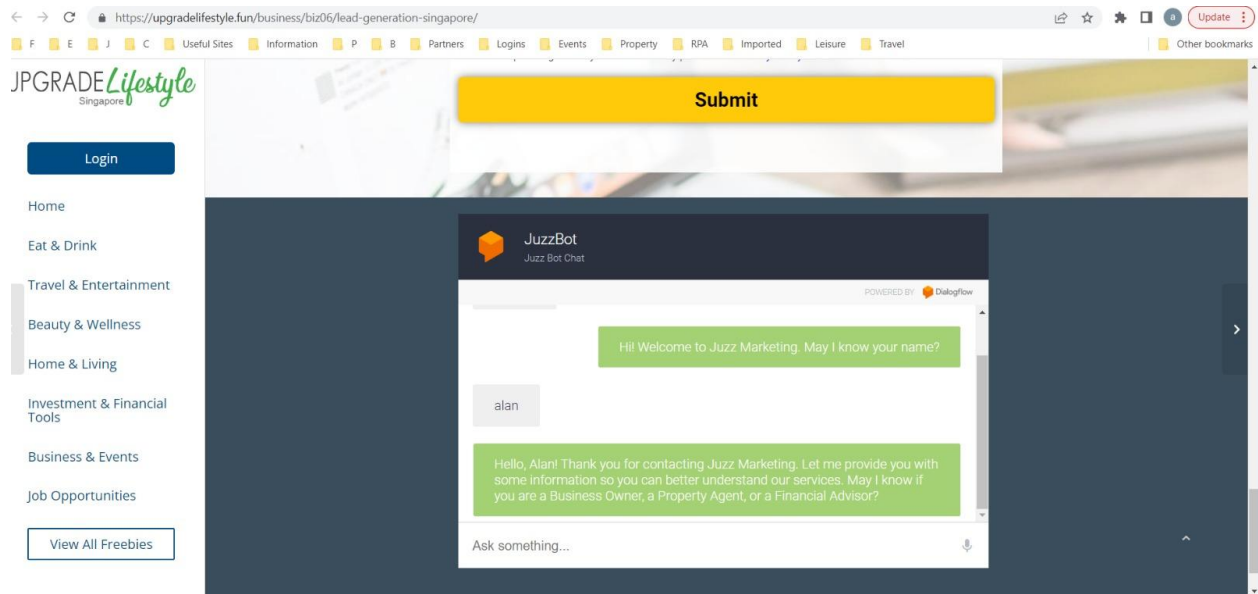
**Just like any normal conversation in WhatsApp, user may now start chatting with Juzz Chatbot.**

## Integrate With Google DialogFlow

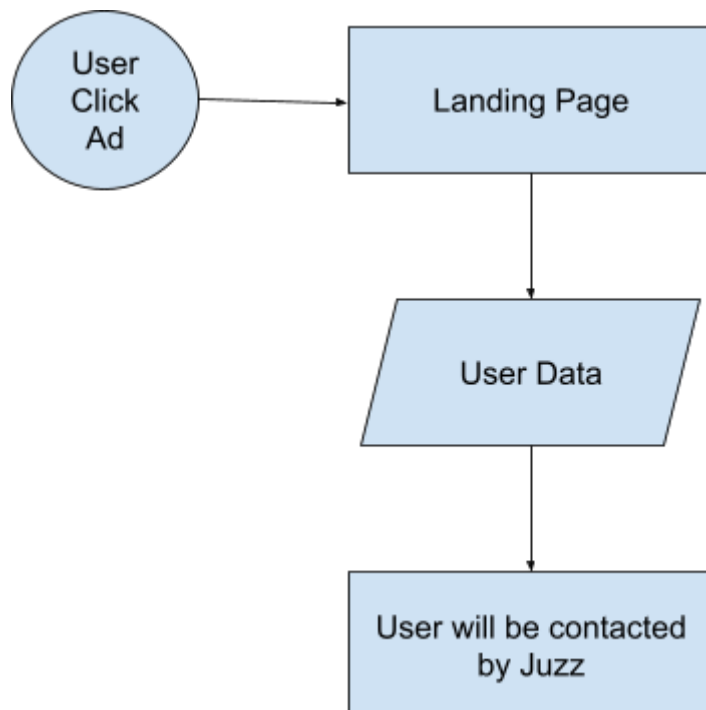
Juzz Marketing also uses [upgradelifestyle.fun](https://upgradelifestyle.fun) for lead generations to generate its potential clients such as financial advisors, property agents and business owners. It runs facebook ads to target business to business clients and uses

<https://upgradelifestyle.fun/business/biz06/lead-generation-singapore/>

as a landing page to generate leads for its business. Google DialogFlow has been integrated into this landing page too as shown in the screenshot below so that when users have some queries, google dialogflow can help to answer them.

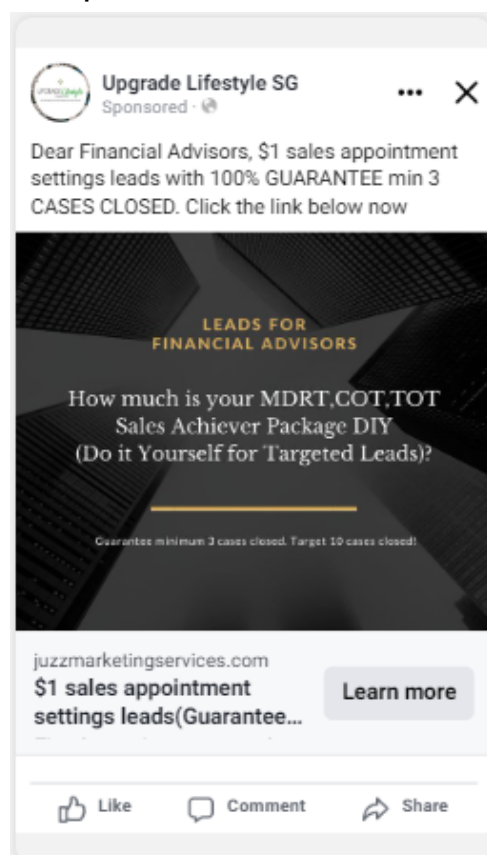


## **Advertisement User Journey**



1. User clicks advertisement
2. User will be redirected to a landing page  
<https://upgradelifestyle.fun/business/biz06/lead-generation-singapore/>
3. User will fill out the form and tick the privacy policy, disclaimer and terms & conditions
  - Privacy Policy  
<https://upgradelifestyle.fun/privacy-policy/>
  - Terms & Conditions  
<https://upgradelifestyle.fun/terms-conditions/>
  - Disclaimer  
<https://upgradelifestyle.fun/disclaimer/>
5. User proceed to submit the form
6. User will be contacted by Juzz Marketing

### Sample Advertisement



## Classify Database's Gender

The business goal is to classify Juzz's consumer database obtained from its lead generation website [www.upgradelifestyle.fun](http://www.upgradelifestyle.fun) and the only data feature that we have is the names. Machine Learning techniques have been used to classify Juzz Consumer Database into Male and Female that consists of only its names as shown in the picture below. Previously, it was done manually by one of Juzz employees. With Machine Learning, this can be done automatically within minutes while it can take up to hours for a human to do it. Count Vector has been used to transform the text into a vector on the basis of the frequency of each word that occurs in the entire text. Dict Vectorizer has also been used to transform lists of feature value mapping to the vectors. The dataset has been preprocessed to check for column name consistency and to check missing values. All females have been replaced as 0 and all males have been replaced to 1 to make it machine readable. Naive Bayes Classifier has been used for the classification of gender. The reason why Naive Bayes Classifier was selected is because it is easy and fast and it requires less training dataset in the prediction. It also assumes that the dataset is independent which holds true in this case.

```
[ ] # Sample2 Prediction
sample_name1 =["Peter"]
vect2 =cv.transform(sample_name1).toarray()
```

```
[ ] #Female is 0, Male is 1
clf.predict(vect2)

array([1])
```

```
[ ] # Sample3 Prediction
sample_name2 =["Jessie"]
vect3 =cv.transform(sample_name2).toarray()
```

```
[ ] #Female is 0, Male is 1
clf.predict(vect3)

array([0])
```

Based on the picture above, 3 random names were chosen to predict the gender. The first name chosen was “Mark” and it returns an array of 1 which means it has predicted that “Mark is male. This is accurate The second name that was chosen is “Peter” and it also returns an array of 1 which means it has predicted that “Peter” is a male. This is accurate too. The third name chosen was “Jessie” and it returns an array of 0 which means it has predicted that “Jessie is female. This is accurate too.

Moving forward, whenever Juzz has a name list that needs to predict gender. They do not have to do it manually anymore. Take for example, someone fills in the form at

<https://upgradelifestyle.fun/investment/biz05/dear-home-owners/> which consists of only name, e mail and mobile and does not contain the person’s gender, Juzz can use this model that is built to predict the name.

Your name

Your email

Mobile

The model managed to achieve an accuracy of 75.24% on the testing dataset and 100% accuracy on the training dataset as shown in the picture below based on the 2447 dataset provided. Previously, based on human manual prediction, it was only able to achieve a 50% accuracy. Therefore, using the model to predict the gender is still more accurate than using a

human to do manual prediction although there is room for improvement moving forward.

```
112] # Naive Bayes Classifier is used because it does not require large dataset and jazz only
      from sklearn.naive_bayes import MultinomialNB
      clf = MultinomialNB()
      clf.fit(X_train,y_train)
      clf.score(X_test,y_test)
```

0.7524752475247525

```
113] # Accuracy of our model
      print("Accuracy of Model",clf.score(X_test,y_test)*100,"%")
```

Accuracy of Model 75.24752475247524 %

```
#Accuracy of our model
print("Accuracy of model", clf.score(X_train,y_train)*100,"%")
```

Accuracy of model 92.42979242979243 %

## **Error Analysis**

Initially, only 100 dataset was used for testing and training and the model only managed to obtain an accuracy of 60.60% as shown in the picture below. After that, an error analysis was done to see if increasing the number of dataset could bring up the accuracy of the model. The dataset was later increased from 100 to 1000 and an accuracy of 68.18% was obtained. as shown in the picture below. The dataset was further increased to 10000 to see if this could future improve results. A final results of 75.24% was obtained.



```

] # Naive Bayes Classifier
  from sklearn.naive_bayes import MultinomialNB
  clf = MultinomialNB()
  clf.fit(X_train,y_train)
  clf.score(X_test,y_test)

```

0.6060606060606061

```

] # Accuracy of our model
  print("Accuracy of Model",clf.score(X_test,y_test)*100,"%")

```

Accuracy of Model 60.60606060606061 %

The testing dataset was initially 20% as shown in the picture below and it gives the model an accuracy of 72.44%. It was further increased to 30% and it gives the model an accuracy of 74.46%. 33.33% was finally selected as the optimum results giving an accuracy of 75.24% after testing for 35% which gives an accuracy of 74.91%.

```

✓ [20] X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.2,random_state = 42)

```

```

✓ [21] # Naive Bayes Classifier is used because it does not require large dataset and jazz only gives us 2447 dataset. It is fast and
      from sklearn.naive_bayes import MultinomialNB
      clf = MultinomialNB()
      clf.fit(X_train,y_train)
      clf.score(X_test,y_test)

```

0.7244897959183674

```

✓ # Accuracy of our model
  print("Accuracy of Model",clf.score(X_test,y_test)*100,"%")

```

Accuracy of Model 72.44897959183673 %

```

✓ X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.3,random_state = 42)

```

```

✓ [28] # Naive Bayes Classifier is used because it does not require large dataset and jazz only gives us 2447 dataset. It is fast and
      from sklearn.naive_bayes import MultinomialNB
      clf = MultinomialNB()
      clf.fit(X_train,y_train)
      clf.score(X_test,y_test)

```

0.7446373850868233

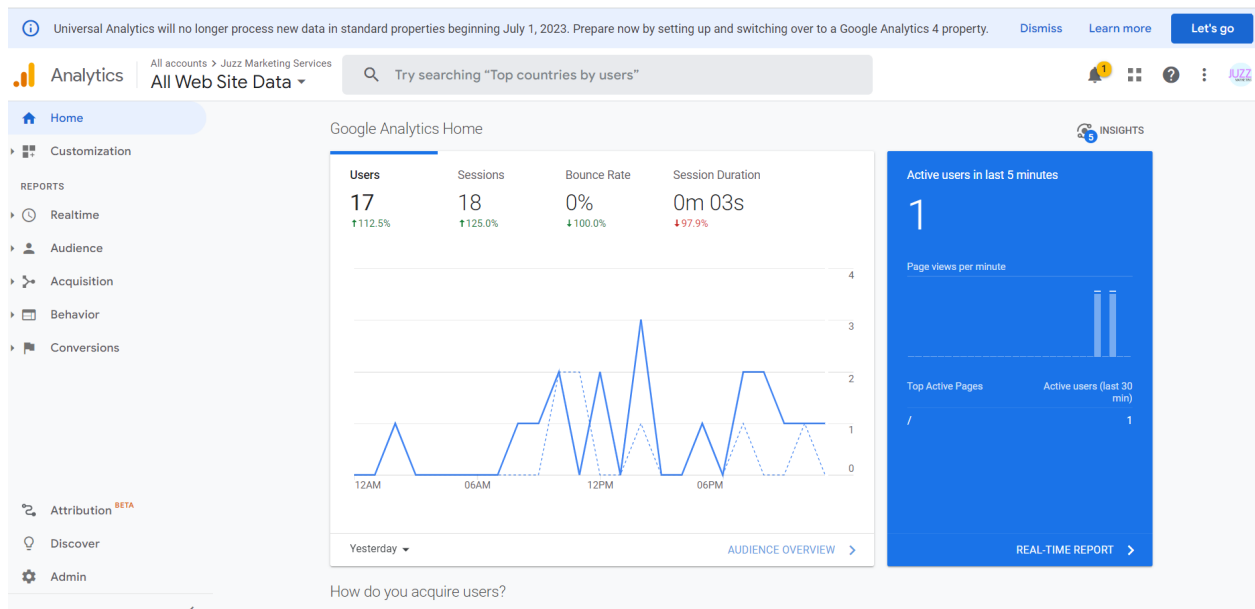
```
[30] X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.35, random_state = 42)
```

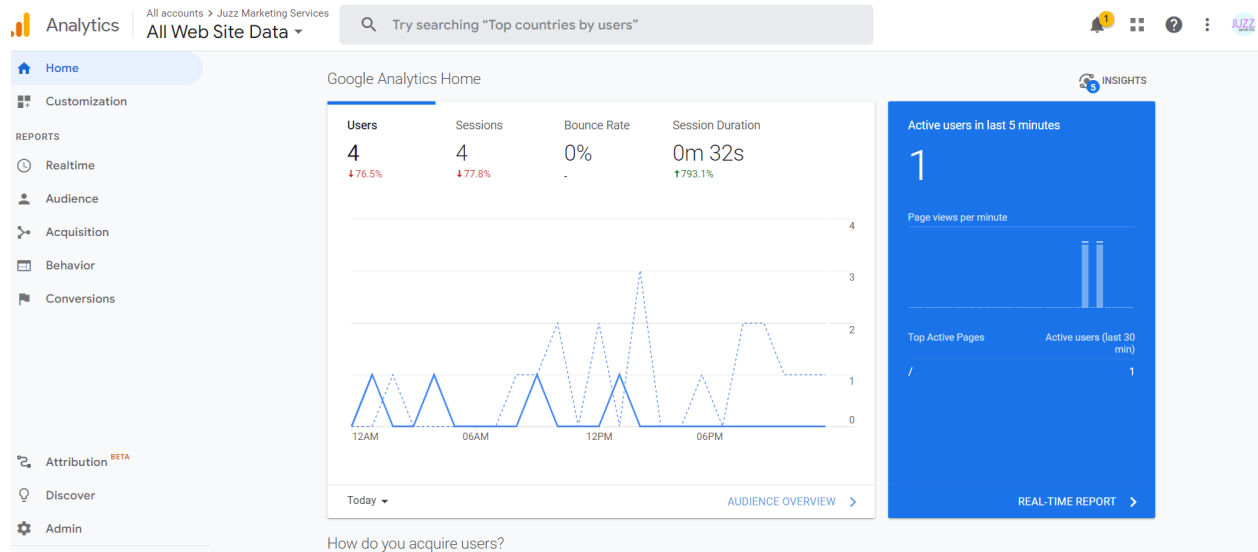
```
[31] # Naive Bayes Classifier is used because it does not require large dataset and jazz only gives us 2447 dataset. It is fast and can  
from sklearn.naive_bayes import MultinomialNB  
clf = MultinomialNB()  
clf.fit(X_train, y_train)  
clf.score(X_test, y_test)
```

0.7491248541423571

## Monitoring of Bounce rate and Sales Conversion of Landing Page

After automating Jazz WhatsApp chatbot, the website has managed to obtain a 0% WhatsApp bounce rate for the past 2 days as shown in the 2 screenshot below





However, this does not mean that 0% bounce rate will last forever. The monitoring of the bounce rate of Jazz Marketing website <https://juzzmarketingservices.com/> will be monitored on a monthly basis to ensure that the automation of whats app Jazz chatbot helps to reduce the bounce rate of the main website. The conversion of the landing page <https://upgradelifestyle.fun/business/biz06/lead-generation-singapore/> will also help to increase the number of leads generated

## **Limitations of Jazz WhatsApp Chatbot**

Some prospective customers may prefer to call in directly instead of sending a WhatsApp text. Currently the Chatbot does not have any voice recognition feature and therefore unable to pick up the phone call enquiries. Google dialog flow is only able to pick up the first word of non-trained inputs too.

## **Limitations of Gender Classification**

The dataset that Juzz gave to the project team is pretty small. Due to this small dataset, the machine may not have enough data to train and predict the model accurately. Currently the machine is also unable to predict names that are non Singaporean as the dataset uploaded for training comprises only of local Singaporean

## **Future Works of Juzz WhatsApp Chatbot**

- Training Corpus can be future increased for intent detection.
- To integrate voice recognition so that both WhatsApp text and phone enquiries can be attended.
- Integrate enquiries with Google Spreadsheets
- Integrate Google Calendar for appointment bookings

## **Future Works of Juzz Gender Classification**

More local Singaporean and foreigners data can be added to the training dataset to help the machine better predict the gender. Juzz also needs to include some foreign names as well because given Singapore's 5.6 million population, it has 1.3 Million foreigners. Some of the foreigners may opt in to [upgradelifestyle.fun](http://upgradelifestyle.fun) but currently their gender could not be classified accurately due to lack of foreign database. More training dataset needs to be fed into the model as well to increase the accuracy. As currently, its accuracy is only about 60% based on the test dataset.

## References

How to classify Gender by Name

<https://www.geeksforgeeks.org/python-gender-identification-by-name-using-nltk/>

Google Dialog Flow

<https://cloud.google.com/dataflow/docs/tutorials>

How to scrub data using Python beautiful soup

<https://realpython.com/beautiful-soup-web-scraper-python/>

Compare different machine learning classifiers using Python

<https://www.youtube.com/watch?v=QINjjSge65Y>

## Appendices

### Details of all defined Intents

1. Default Welcome Intent
  - a. O/P context: gotousercontext
2. GetUserTypeIntent
  - b. i/p context: gotousercontext
  - c. o/p context: awaiting usertype, defined usertype, gotousercontext
  - d. Entity: @UserType (Financial Advisor, Property Agent, Business Owner)
3. Financial Advisor Enquiry Intent
  - e. i/p context: none
  - f. o/p context: financialadvisor
  - g. Entity: UserType
4. Property Agent Enquiry Intent
  - h. i/p context: none
  - i. o/p context: propertyagent
  - j. Entity: UserType
5. Business Owner Enquiry Intent
  - k. i/p context: none
  - l. o/p context: businessowner
  - m. Entity: UserType
6. Flyer Distribution Intent
  - n. i/p context: none
  - o. o/p context: flyerdistribution

- p. Entity: ServiceType
- 7. Flyer Printing Intent
  - q. i/p context: none
  - r. o/p context: flyerprinting
  - s. Entity: none
- 8. Zoom Appointment Intent
  - t. i/p context: none
  - u. o/p context: zoomappointment
  - v. Entity: none
- 9. Confirm Order Intent
  - t. i/p context: none
  - u. o/p context: flyerdistribution, flyerprinting, appointmentssetting, digitalmarketing
  - v. Entity: sys.given-name, sys.phone-number, ServiceType
- 10. End Conversation Intent
  - w. i/p context: none
  - x. o/p context: flyerdistribution, flyerprinting, appointmentssetting, digitalmarketing
  - y. Entity: none