SCHOOL OF COMPUTING
FACULTY OF ENGINEERING
UNIVERSITI TEKNOLOGI MALAYSIA

PSM 1 (SECJ 3032)
PROJECT PROPOSAL FORM

Session/Semester: 20222023/2

Instruction: Please complete and submit this form to the departmental PSM committee. The proposal must be reviewed by the supervisor before submission.

SECTION A: STUDENT INFORMATION

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Year/Course	3 SECJ		
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Proposal No. | 1 | *(Please follow your preference. Proposal No. 1 – the highest priority, followed by Proposal No. 2 Each student may propose a maximum of 2 topics).*
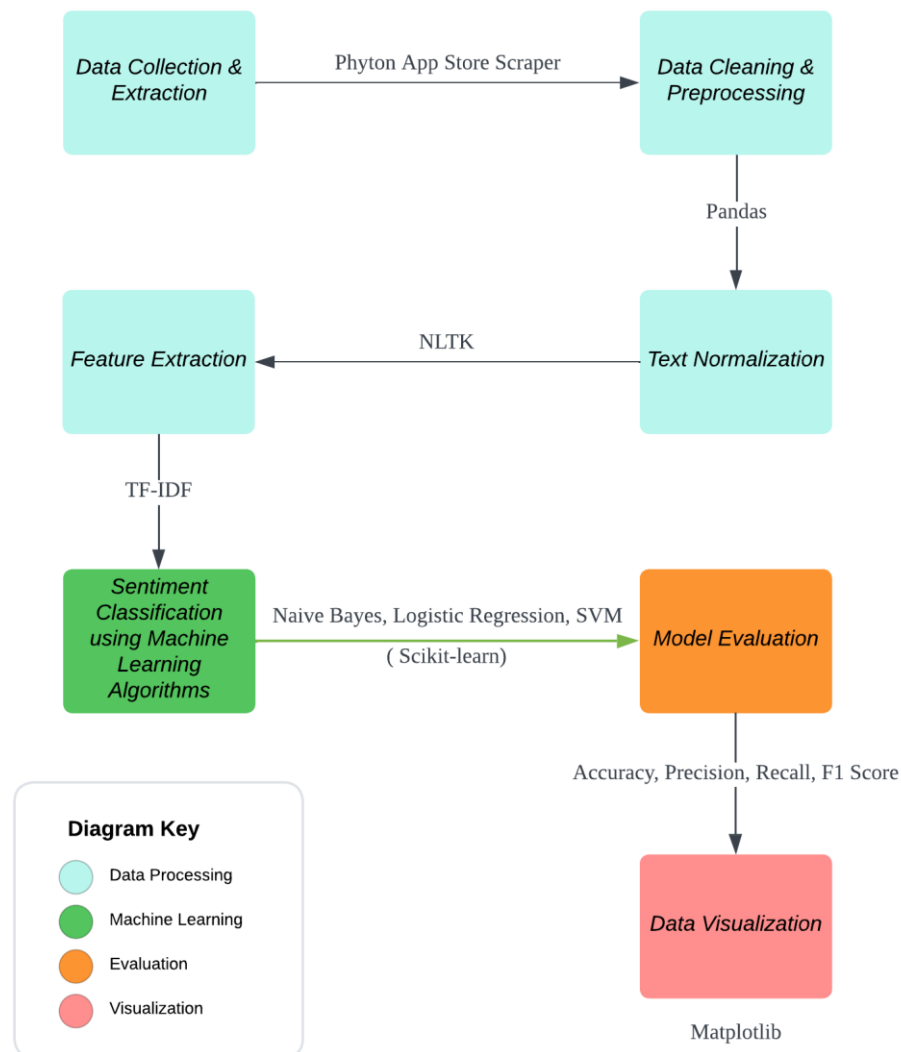
SECTION B: PROJECT DETAILS

Supervisor Name:	Associate Prof. Ts. Dr. Mohd Shahizan bin Othman
Project Title:	Sentiment Analysis of Customer Reviews Among Prominent E-Commerce Applications to Improve Product Development and Marketing Strategies

Problem Background and Proposed Solution:

In the highly competitive market landscape, it is essential for businesses to comprehend customer sentiment to enhance their products and marketing approaches. Customer reviews serve as a priceless resource, offering direct feedback from users about their experiences and perspectives on products or services. Examining these reviews enables businesses to pinpoint areas for improvement in product development and customize marketing strategies to better meet customer needs and preferences.

Nonetheless, customer reviews are typically unstructured text data, which makes systematic analysis and extracting actionable insights challenging. Furthermore, the vast number of reviews can be daunting, and manual analysis is labor-intensive and susceptible to bias. As a result, an automated solution for efficiently processing and analyzing customer reviews is vital for effectively utilizing this wealth of data.

The suggested solution involves creating a sentiment analysis system that uses machine learning methods to automatically categorize customer reviews into positive, negative, or neutral sentiment groups. This system will help businesses identify trends and patterns in customer sentiment, directing product development and marketing strategies based on data-driven insights. The project will encompass the following stages:

```
Data Collection &        Phyton App Store Scraper    Data Cleaning &
Extraction           ───────────────────────────►   Preprocessing
                                                          │
                                                        Pandas
                                                          ▼
Feature Extraction  ◄────────── NLTK ──────────    Text Normalization
       │
     TF-IDF
       ▼
Sentiment
Classification      Naive Bayes, Logistic Regression, SVM
using Machine       ──────────────────────────────────►   Model Evaluation
Learning                      ( Scikit-learn)                    │
Algorithms                                             Accuracy, Precision, Recall, F1 Score
                                                                ▼
                                                         Data Visualization

                                                            Matplotlib
```

Diagram Key

- ◯ Data Processing
- ◯ Machine Learning
- ◯ Evaluation
- ◯ Visualization

Objectives:

The objectives of this research are:

1. To develop an automated sentiment analysis system for customer reviews that can efficiently classify reviews into positive, negative, or neutral sentiment categories.

2. To evaluate and compare machine learning algorithms, such as Naïve Bayes, Logistic Regression and Support Vector Machines (SVM), for sentiment classification to determine the most effective model for the task.

3. To identify trends and patterns in customer sentiment by analyzing the classified reviews using data visualizations tools and provide insights that can guide product development and marketing strategies.

Scopes:

The scopes of this research are as follows:

1. The research will focus on sentiment analysis of customer reviews to improve product development and marketing strategies, using the Lazada app as the case study.

2. The target data source will be the Apple App Store, where customer reviews and ratings for the Lazada app will be collected using the Python App Store Scraper tool.

3. The study will mainly entail utilizing Python libraries and tools, including Pandas, NLTK, Scikit-learn, and Matplotlib, for tasks such as data preprocessing, text normalization, sentiment classification, and data visualization.

4. The machine learning algorithms employed for sentiment classification will be restricted to Naïve Bayes, Logistic Regression and Support Vector Machines (SVM), with an emphasis on identifying the most efficient model for the job.

5. The research will consider only English language reviews to ensure consistency and avoid potential challenges associated with multilingual sentiment analysis.

Project Requirements:

Software	**:** Jupyter Notebook, Phyton, Python App Store Scraper, Pandas NLTK, Scikit-learn, Matplotlib.
Hardware	**:** Windows 11, RAM 8GB, 2.60 GHz
Technology/Technique/ Method/Algorithm	**:** Data collection and extraction, data cleaning and preprocessing, text normalization, sentiment classification using machine learning algorithm, data visualization.
Network Elements	**:** Data access**,** internet connectivity.
Security Elements	**:** Data privacy, compliance with data protection regulations, ethical considerations, secure coding practices.

Project Type: *(Please tick one)*

[   ] System Development

[/] Research

Project Area:

Area   **:** Machine Learning - Natural Language Processing

SECTION C: STUDENT ACKNOWLEDGEMENT

I confirm that this project is:

[/] My own idea

[   ] Proposed by the supervisor…………………………………………………...

Date: ………………………   Student Signature: …………………………...

SECTION D: SUPERVISOR ACKNOWLEDGEMENT

I ………………………………………………………………………… confirm that I have reviewed this student's project proposal and therefore agree for the proposal to be submitted for evaluation.

Date   : …………………………   Signature   : …………………
                                        Official Stamp

SECTION E: EVALUATION PANEL APPROVAL

Outcome:
     [   ] Full Approval
     [   ] Conditional Approval (Minor)
     [   ] Conditional Approval (Major)
     [   ] Fail

Notes (*Please state reasons for conditional or failed approval*)

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Evaluation Panel:

     1. …………………………………………..

     2. …………………………………………..

Date: ………………………   Signature: …..…………………………

                            Name: …..………………………………….

SECTION F: FOR FACULTY COMMITTEE ONLY

Date Received: ……………………………….

Signature : ………………………………. (Official Stamp)