# RADAR

## Smart Stock Market assistance

Varad Gandhi , 22/01/2023

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# Problem Breakdown

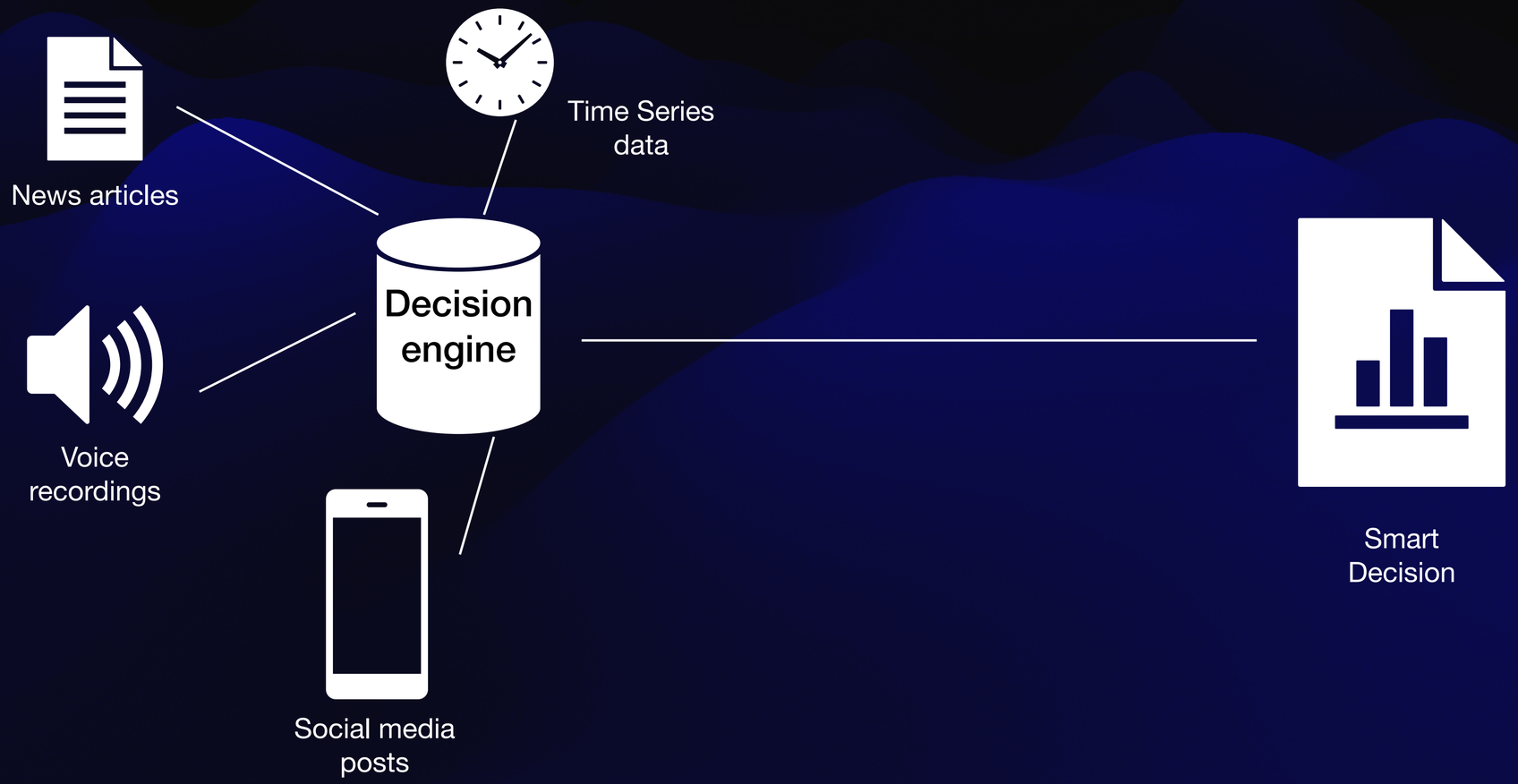
The overall problem of lack of informed decisions in stock trading can be broken down into two parts which is-

- Creating an assistive Technology which takes up the news, social media posts and the stock trader’s interviews in order to make a proper informed decision on the buy/selling of stocks

- Integrating it with the application in order to arrange the stocks accordingly in order to get the best stocks with the best returns in the future.

# The Model

The overall functionality can be shown through the following diagram-



# Technologies used

The basic technologies used for demonstrating how the look and feel of the app would be are-

- Flutter- For demonstrating how the application would look like which would demonstrate the ease of use of the application
- NLP - Used to demonstrate sentiment analysis in order to make informed decision on the stock to trade for.

# NLP for Smart Stock Trading

In order to identify whether the stock is going to thrive or not, many prediction algorithms are used wherein the past history is taken into account for predication.

The overall scenario being that a lot many times, the overall prediction is not accurate only on past data.

External factors do affect the stock price-

- Overall company performance
- Current market trends
- Social media sentiments

# NLP for Smart Stock Trading

The solution proposed considers all the factors before coming to a conclusion in order to assist the traders for better decision making-

1. Extracting titles from web pages and analysing them through NLP for understanding the sentiments regarding a particular stock.

2. Extracting tweets, and using NLP to understand the sentiments of the people towards the company.

3. Listening to podcasts regarding stock market and analysing the sentiments of the experts in order to process data and provide expert analysis.

# News Articles analysis

News titles extracted using ‘pygoogle news’

Converting a text into a vector form of word frequencies

Stop word removal

Creating a corpus in order to analyse the data in order to segregate the phrases into positive or negative sentiments

# Tweets analysis

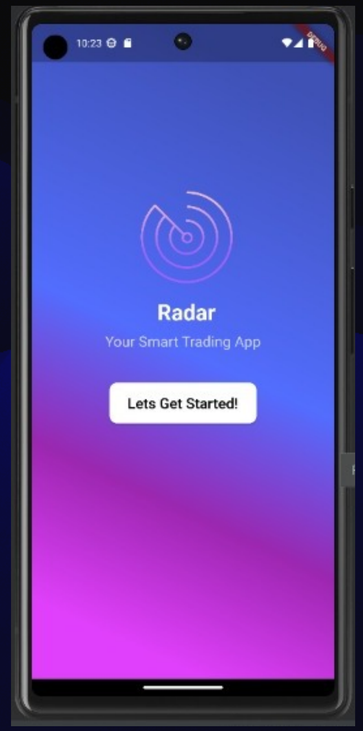
Extracting tweets from API

Converting a text into a vector form of word frequencies

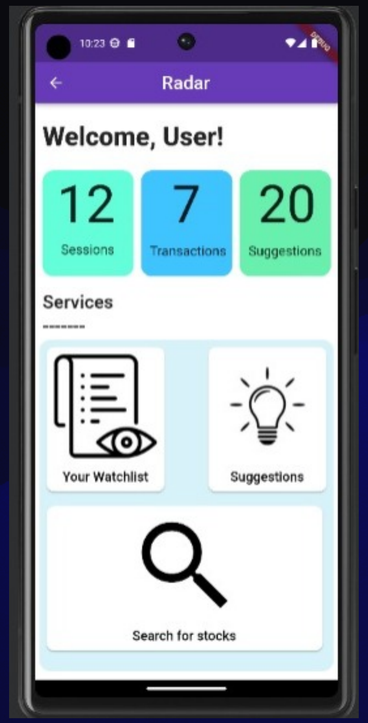
Stop word removal & Counter vectorisation

Using ML model to train the data and performing sentiment analysis

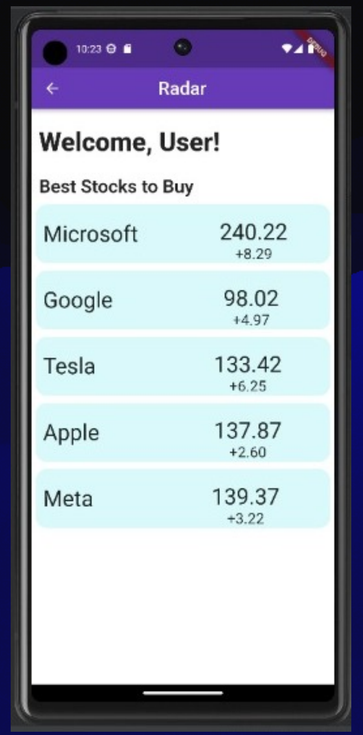
# Flutter




Welcome Screen




Home Screen




Stock suggestions

# NLP in Action

NLP is used to identify and tag the words which are important to identify the sentiment.

```
[ ] nltk.download('stopwords')

    [nltk_data] Downloading package stopwords to /root/nltk_data...
    [nltk_data]   Unzipping corpora/stopwords.zip.
    True

[ ] corpus=[]
    for i in range(len(data)):
        words=data.iloc[i,0]
        words=re.sub('[^a-zA-Z]',' ',words)
        words=words.lower()
        words=words.split()
        words=[PorterStemmer().stem(word) for word in words if word not in set(stopwords.words('english'))]
        corpus.append(' '.join(words))

    vec=CountVectorizer(max_features=5000)
    X=vec.fit_transform(corpus).toarray()

[ ] y=data['Sentiment']

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

[ ] X_train.shape,y_train.shape,X_test.shape,y_test.shape

    ((4053, 5000), (4053,), (1738, 5000), (1738,))

[ ] random=RandomForestClassifier(n_estimators=250,max_depth=None)
    random.fit(X_train,y_train)
```

```
[ ] random=RandomForestClassifier(n_estimators=250,max_depth=None)
    random.fit(X_train,y_train)
    y_pred=random.predict(X_test)

[ ] accuracy_score(y_test,y_pred)

    0.7871116225546605

[ ] sns.heatmap(confusion_matrix(y_test,y_pred),annot=True,fmt='.0f')

    <matplotlib.axes._subplots.AxesSubplot at 0x7f4f41ea7d30>
```

# Audio sentiment analysis

Using audio files in a folder and converting it into wav folder.

Resampling folder into required frequency

Using speech to text transcription algorithm

Extracting the text file and perform sentiment analysis using NLP and ML approaches

# Conclusion

A thorough analysis was done on how to build an application which can be helpful to the assist the users in order to make informed decisions while considering all the external factors regarding stock trading.