DAIS-E

DRIVEN BY AI FOR SUSTAINABLE EXISTENCE

RAIMA JOSEPH

FEYNN LABS INTERN

ABSTRACT

As the global community deals with the escalating crisis of environmental degradation, it is necessary to look for solutions that re-balance the earth's ecosystem with its habitation. In the previous report, a brief overview of DAIS-E and its importance was given. The report delves into the fact that the application idea bridges the gap between eco-friendly alternatives and technology.

This report gives a detailed overview about the proposed application prototype and its features such as viability and monetization. The features mentioned are the product's feasibility, viability and monetization.

PROTOTYPE SELECTION

The idea of DAIS-E was brought about by the pressing problem:

We are currently in a period which is characterized by growing environmental concerns and awareness about sustainable existence. The difficulties faced by companies making eco-friendly products are the lack of recommendations and schedules to offer to the public. This is where DAIS-E comes into play. DAIS-E helps businesses to actively support the community.

FEASIBILITY

With the advancements in technology and by making use of currently existing technologies such as computer vision and machine learning to detect objects, a well-defined team with similar objectives can be developed. With a team for each core feature, the features can be implemented efficiently. In short term duration, by leveraging existing technologies, the development of DAIS-E can be employed soon.
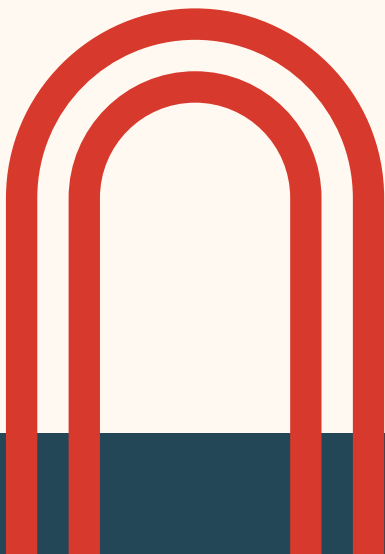
VIABILITY

The growing market for sustainable development and eco-conscious living deems DAIS-E as a long-term relevant service or application. The focus on real-time recommendations and user-engagement enhances viability in the long run. With the SDG also having a timeline till 2030, the validity and credibility of the application must be relevant till the next few decades or so.

MONETISATION

For direct monetisation strategies, partnerships and sponsorships can have collaborations with brands. Freemium models can be released for the experience of essential features and later on, a premium version can be rolled out for personalized insights and generation of revenue.

For collaborated brands, behaviour insights can have charges based on different products or popularity. This also leaves an availability of direct revenue.

In short, DAIS-E is not only feasible for short term but also has relevance in the long term due to its aligned trends with the environmentalism and sustainable existence.
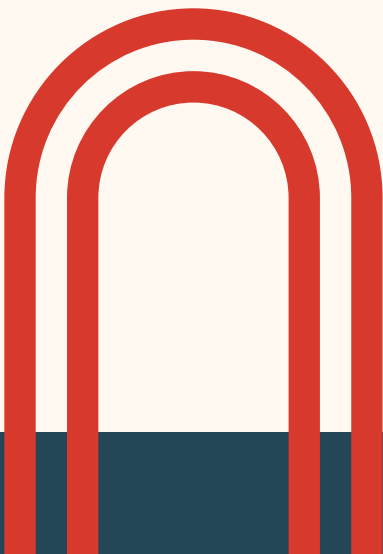
MARKET NEED ASSESSMENT

Studies have shown that about 90% of the global consumers have shifted their shopping behaviour towards buying and using sustainable products. For businesses, clients are now using reused, renewed and recycled objects and materials. The market and customer need are growing popularly as more and more awareness is created regarding an eco-friendly lifestyle. In terms of businesses, by leveraging customer engagement and competitor advantage, the scope enlarges.
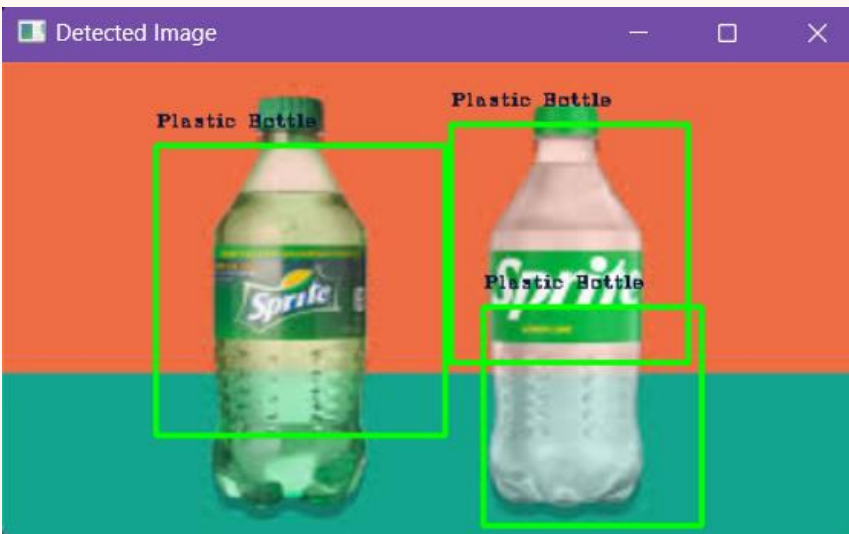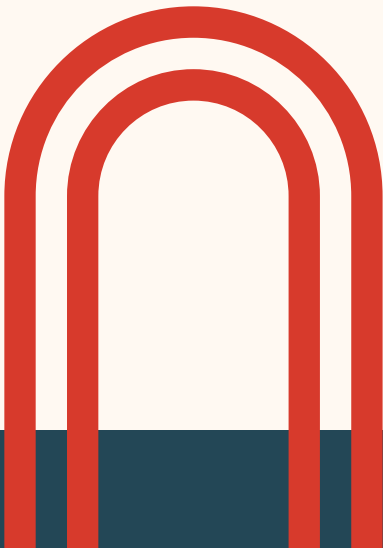
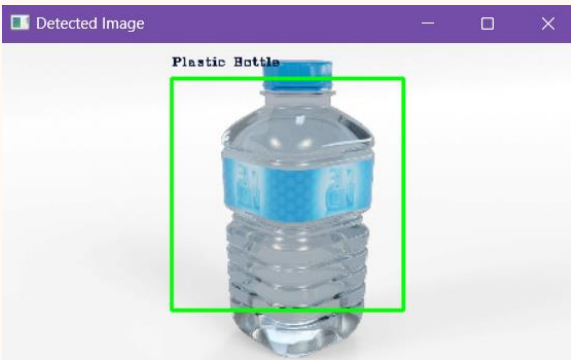## PROTOTYPE SNIPPETS

Figure 1: Detected Image
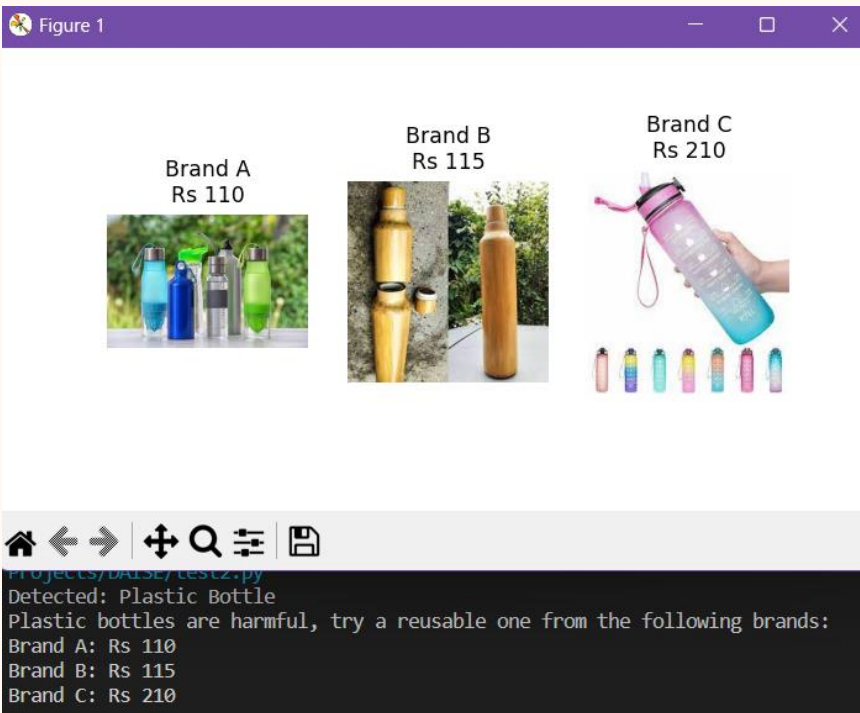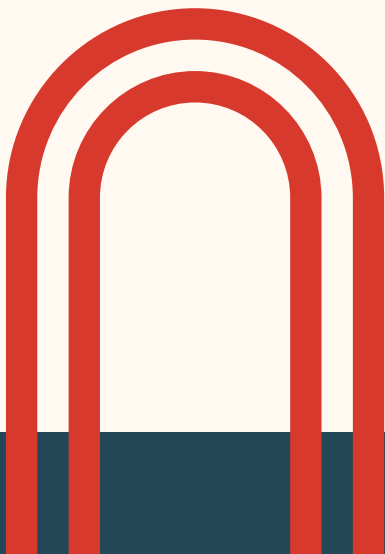
Figure 2 Detected Image

Figure 3: Alternatives Displayed with Brands and Rates

PROTOTYPE DESCRIPTION

As the snippets are from a test prototype to explain a simple working of the application, the code has no databases or storage as of now. The application of the code involved training a Haar Cascade Classifier for Plastic Bottles that contained more than 100 downloaded images for both positive and negative classes.
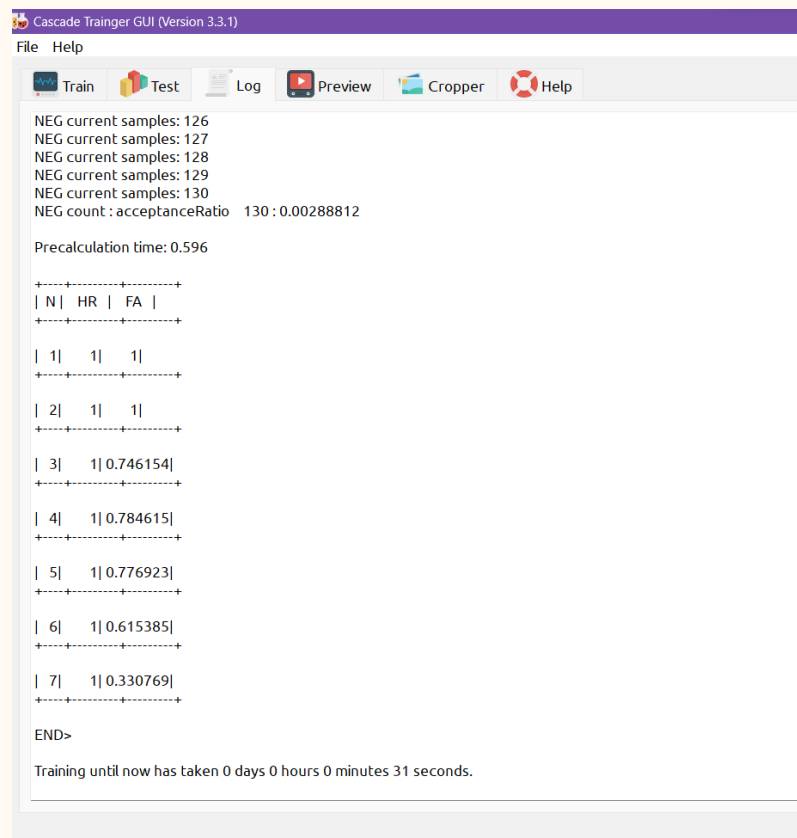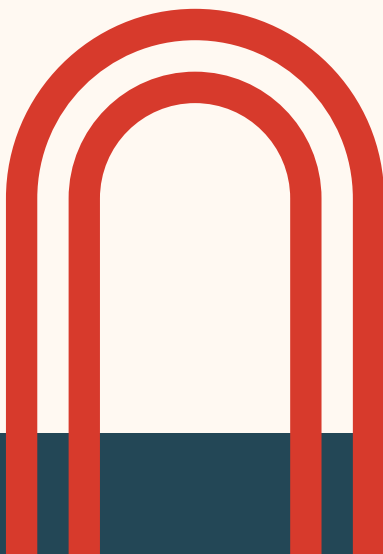

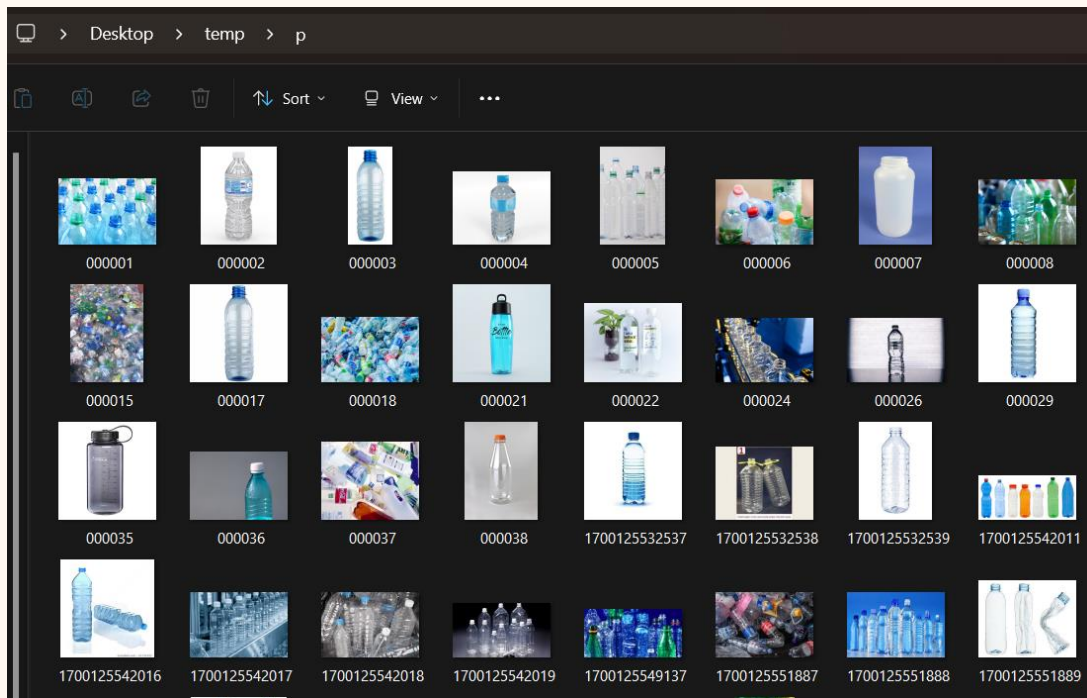*Figure 4 Cascade Classifier GUI for Training*

Figure 5 Positive Images for Plastic Bottle

The program intends to scan an image taken by the user through a prospective application for DAIS-E and detect anything harmful to the environment and recommend alternatives by the help of partner eco-friendly brands.

This prototype detects any plastic bottles and recommends three brands and their rates to the user. The original model can also have data statistics for user enhancement which may be used by brands for product marketing.
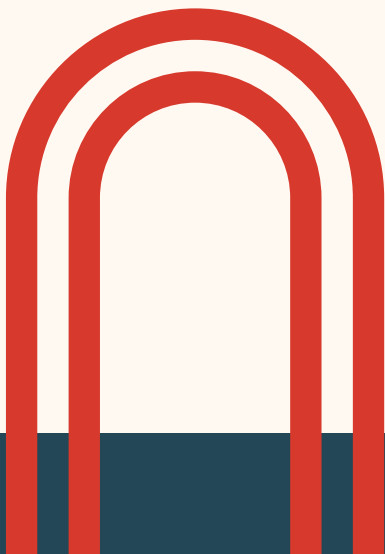
```python
Projects > DAISE >  test2.py > ...
 3    import matplotlib.pyplot as plt
 4
 5    # Load the pre-trained cascade classifier for plastic bottles
 6    bottle_cascade = cv2.CascadeClassifier(
 7        r"C:\Users\gummi\Desktop\temp\classifier\cascade.xml")
 8
 9    img = cv2.imread(r"C:\Users\gummi\Desktop\temp\p\000004.jpg")
10    resized = cv2.resize(img, (450, 250))
11    gray = cv2.cvtColor(resized, cv2.COLOR_BGR2GRAY)
12
13    #Plastic bottles detection.
14    bottles = bottle_cascade.detectMultiScale(
15        gray, scaleFactor=1.2, minNeighbors=5, minSize=(90, 90))
16
17    if len(bottles) > 0:
18        for (x, y, w, h) in bottles:
19            resized = cv2.rectangle(resized, (x, y), (x+w, y+h), (0, 255, 0), 2)
20            label = 'Plastic Bottle'
21            cv2.putText(resized, label, (x, y-10),
22                        cv2.FONT_HERSHEY_COMPLEX_SMALL, 0.5, (55, 20, 10), 1)
23            print(f'Detected: {label}')
24
25        # Displaying recommendation message in the terminal
26        print("Plastic bottles are harmful, try a reusable one from the following brands:")
27
28        brands_info = [
29            ("Brand A", "Rs 110"),
30            ("Brand B", "Rs 115"),
31            ("Brand C", "Rs 210"),    ]
32
33        # Display brands and costs in the terminal
34        for brand, cost in brands_info:
35            print(f"{brand}: {cost}")
```

Figure 6 Program Snippet for Basic Detection and Suggestion

The above snippet of code takes a scanned image from my folder and detects any plastic bottles to recommend three eco-friendly brands. On a broadscale, the application will have the following workflow:
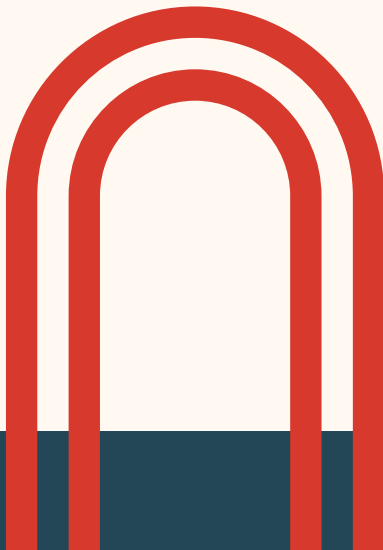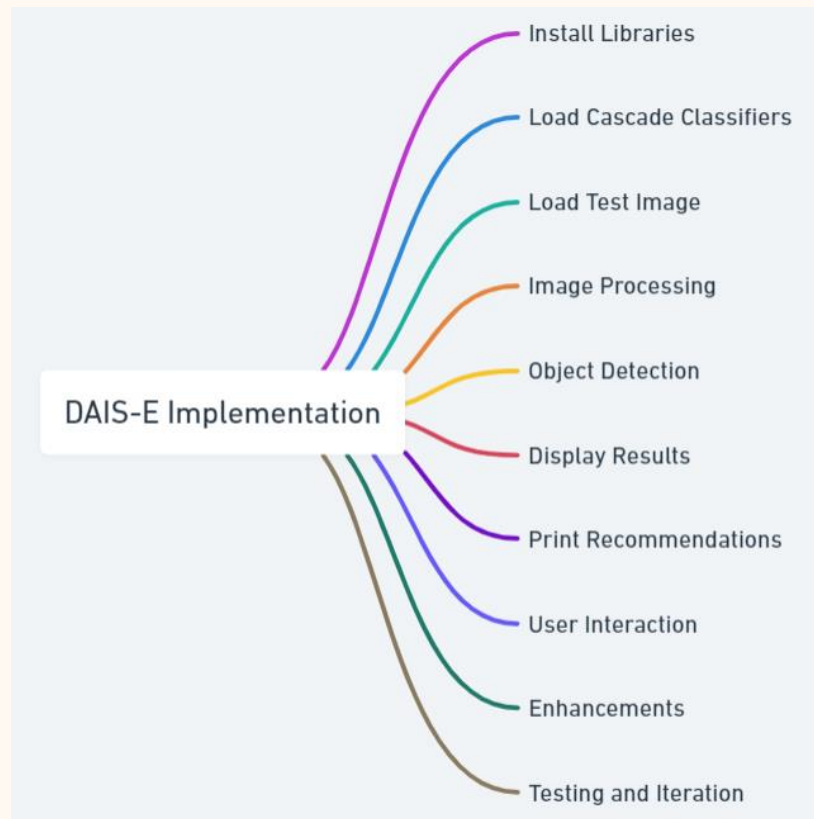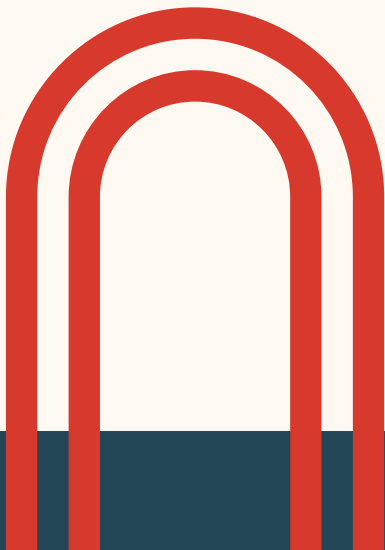
Figure 7 Implementation Workflow

BUSINESS MODEL GENERATION

Business model refers to a company's plan for making a profit. For DAIS-E, various components are key to create a marketing plan.

- Audience and Market Segmentation: Based on gathered surveys and data, consumers behaviour and trends can help in segmentation analysis of the market. Demographics, preferences, and environmental awareness of the public needs to be assessed.

- User needs assessment and expectations: A market research must be conducted to understand user choices and expectations. Additionally, the rise or growth of the sustainability trends must be noted.

- Articulating uniqueness to partners and customers: Emphasising on real-time product recommendations and its very noble cause. Collaborating with eco-friendly brands and all vegan/eco food companies.

- Monitoring and adapting to changing trends. Aligning product recommendations with customer reviews and dynamics.
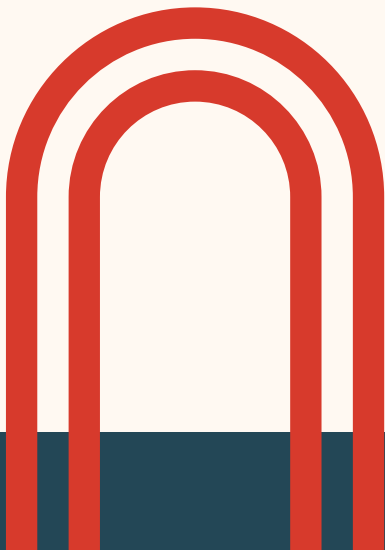
MONETISATION MODELS AND STRATEGIES

Freemium model and an upgraded or enhanced feature specific premium model can be rolled out once the final application is ready. Advanced insights for users and customer behaviour data can be charged and these can be used to roll in targeted promotions.

MARKET FOCUS

The application has a specifically Environmental Business growth. Urban users with high Regard for sustainability and countries promoting SDG and the cause would align with the Trends. DAIS-E falls under the eco-friendly technological industry, also broadly known as Green Tech.

Taking the example of Tesla as a Car Company, the market growth for the brand has seen substantial growth. The popularity of EVs has contributed largely to the company's market. Elon Musk has also been vocal about Tesla's mission to reduce carbon emission which also promoted the growth of clean energy with respect to clean energy.
There was a surge in the company's stock market when Gigafactories were launched promoting electric vehicles and batteries. (2019-2020)
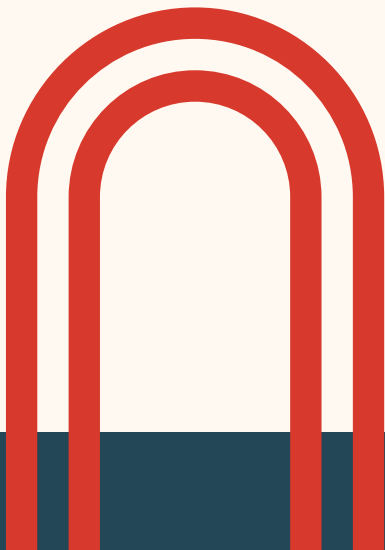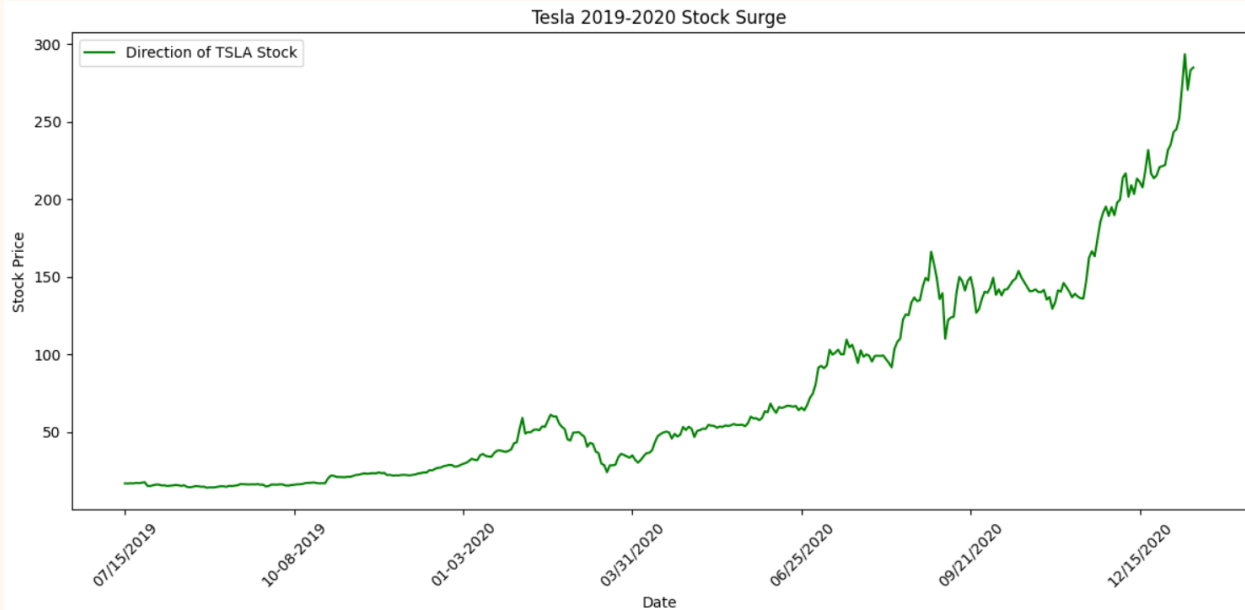
Figure 8 Trends for Eco Change in Tesla

GREEN TECH STOCKS (Similar to DAIS-E)

Green energy stocks are brands or companies involved in using technology and science in promoting renewable sources. DAIS-E is not directly a green technology company but it enhances marketing for the green brands.

Beyond Meat (BYND) is a company that produces plant-based meat substitutes, and it operates in the broader context of promoting sustainability through alternative food options. While Beyond Meat and DAIS-E serve different purposes, they share a common thread of promoting environmentally friendly choices.
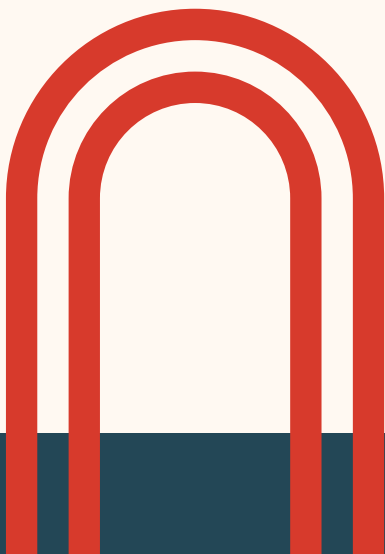
The addition of Consumer Awareness and Alternative Eco-Friendly choices available and promoted are similar to the functionalities of DAIS-E.

In the context of the ups and downs with the trends of sustainability, green technology and eco-Friendly stocks would have frequent uptrends and downtrends, which would not cause huge Losses.

Figure 9 Stock Trend for Beyond Meat for past few Months

The data or historical quotes for BYND Inc. was taken real-time from the YFinance library of Python and the LSTM Model was employed using the SKLearn Preprocessing Models.
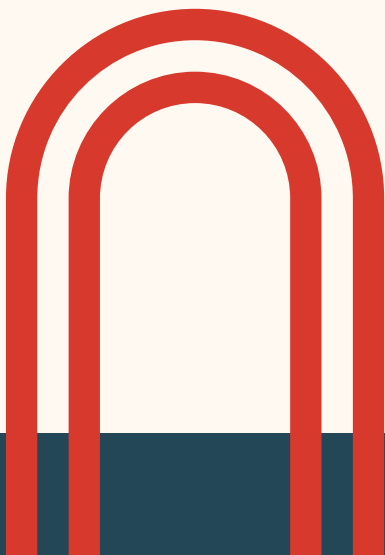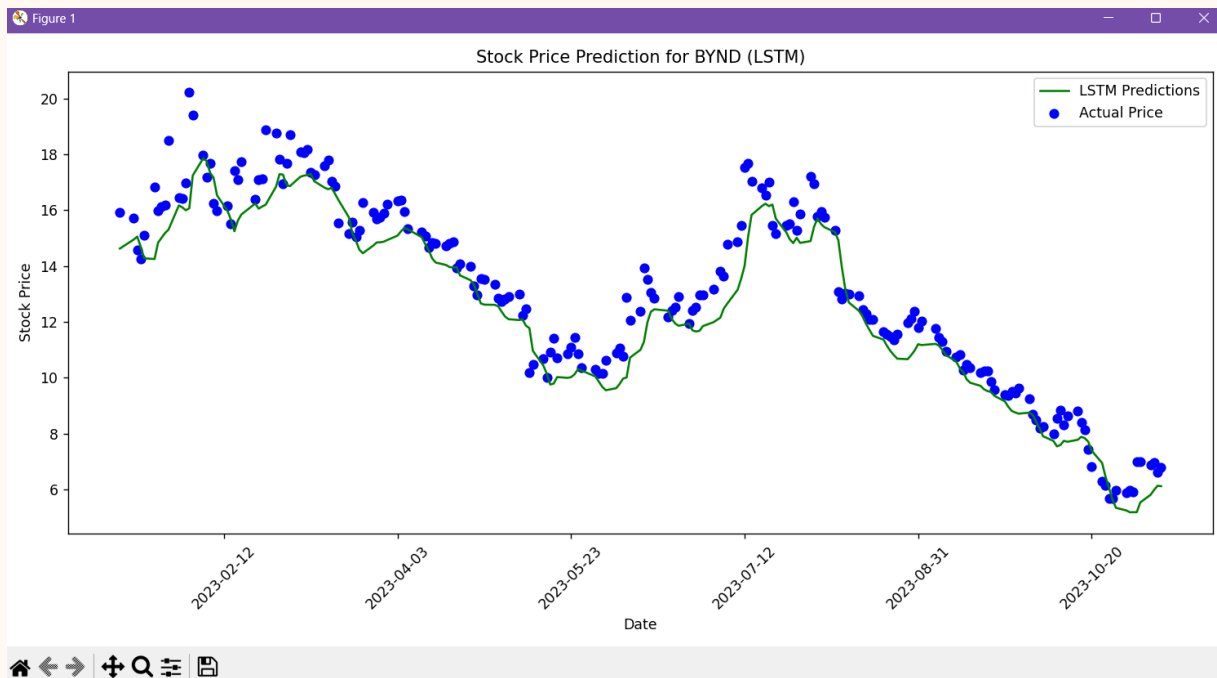
Figure 10 LSTM Stock Predictions for BYND

```
35   #For the Beyond Meat company.
36   sym=['BYND']
37   start_date = '2019-07-01' #5 years of historical data.
38   prediction_date='2023-06-01'
39   end_date = '2023-11-10' #Taking one year.
40   look_back = 60   #Number of past days to consider for LSTM input.
41
42   #Data retreival using YFinance.
43   data=stock_data(sym,start_date,end_date)['Close'].values.reshape(-1
44   dataD=stock_data(sym,start_date,end_date)
45   print ('\nSample data for %s:'% (sym))
46   print (dataD.head(5) )
```

Figure 11 Data Preparation by YFinance
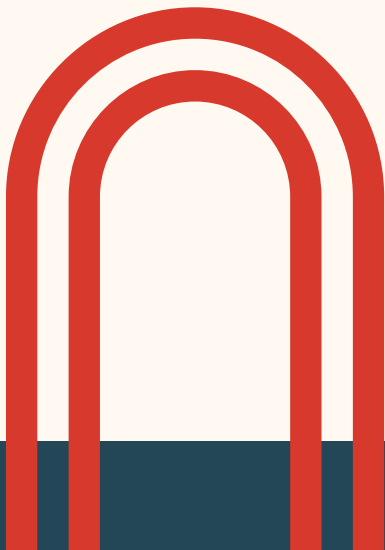
```
#Beyond Meat Data Scaling and Model fitting.
scaler=MinMaxScaler()
data=scaler.fit_transform(data)
x_lstm,y_lstm=lstm_dataset(data,look_back)
print ('\nScaled dataset:\n',data[:5])

train_size=math.ceil(len(x_lstm)*0.8)
x_train_lstm, x_test_lstm=x_lstm[:train_size],x_lstm[train_size:]
y_train_lstm, y_test_lstm=y_lstm[:train_size],y_lstm[train_size:]
X_train_lstm = x_train_lstm.reshape(x_train_lstm.shape[0], look_back, 1)
X_test_lstm = x_test_lstm.reshape(x_test_lstm.shape[0], look_back, 1)

model_lstm=Sequential() #Linear stack of layers for the model.
model_lstm.add(LSTM(50,input_shape=(look_back,1)))
model_lstm.add(Dense(1))
model_lstm.compile(loss='mean_squared_error',optimizer='adam')
model_lstm.fit(x_train_lstm,y_train_lstm,epochs=100,batch_size=32,verbose=1)
input_shape = model_lstm.layers[0].input_shape
print("\nExpected input shape of LSTM model:", input_shape)

#Prediction and visualization.
```

Figure 12 LSTM Model Training and Predicting

From the statistics, we can see that although the company has had stock surges in the past year, there have also been losses. However, the statistics also prove that recently, the company has been doing well for the past couple of months. The predictions done by the LSTM model are for the past year, including the month of November. Hence, similarly we can perform a similar prediction for related eco-brands.
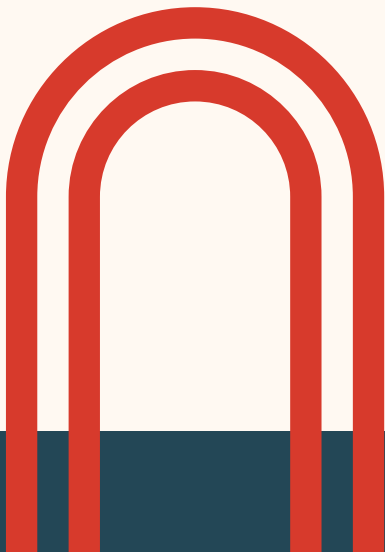
FINANCIAL EQUATION MODELLING

Equations for total profit and pricing to find the overall sales can form an overall

Financial equation. For DAIS-E, as the revenue and profit come from the

Products purchased from eco-brands and the customer and client support,

Total Revenue=Num. of Users*Average Price per Sale

The costs would also involve advertisement and recommendations based on

Preferences as well as the development of the application.

Total Cost=Development Cost + Promotional Costs

*Net Profit = sum (Gross Profit, Partnerships Revenue, Analytical Services)*

Gross Profit=Total Revenue- (Maintenance Cost +Varying Costs*Num. of Users)

Variable costs include expenses such as Data Construction or obtaining cost,

Customer support costs, Server costs and Partnership advertising costs.

Net Profit can then be represented as:

y= (Num. of Users*Avg. Price) - (Maintenance Cost+ Variable Cost * Number of Users)) + Partnership/Collab Revenue + Analytical Services

In short, the financial equation provides a mathematical way of representing the

Key features that would be involved in DAIS-E's revenue and profit.
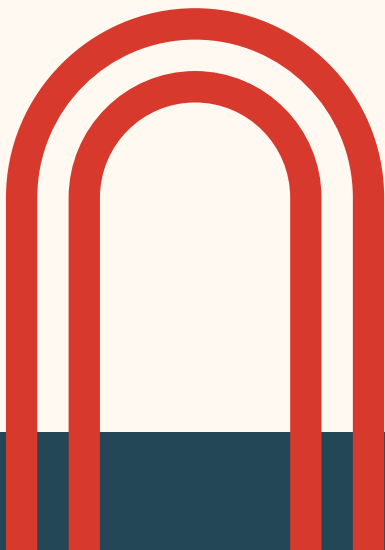
CONCLUSION

In this report, DAIS-E was given a financial and developmental outlook. The prototype was built in order to show a basic model of how the scanner would work and recommend items based on the harmfulness to the environment. Its business model involves gaining revenue from both in-app statistics and partner brands. The financial equation captures key components of the net profit of the company.

Although the green-tech industry has fluctuating trends, as long as DAIS-E markets brands, a steady rise plotted linearly may be expected.

In a nutshell, DAIS-E uses advancements in computer science to help businesses and contribute to itself as well.