The Machine Learning Canvas (v0.4)

Decisions

How are predictions used to make decisions that provide the proposed value to the end-user?

Identifying the negative reviews will help in understanding the pain points of the customers

Identifying the top customers segment who are least satisfied with the product

Measure the change in sentiment to evaluate the effectiveness of interventions taken to improve customer experience and product

ML task

Input, output to predict, type of problem.

Input – Reviews Json file

Output – Sentiment classification (based on the review)

Type of problem: Binary classification (assumption: overall rating less than 3 is considered to be negative reviews)

Value Propositions

What are we trying to do for the end-user(s) of the predictive system? What objectives are we serving?

Helping a brand who sells health and personal care products on e-commerce platform identify the reasons behind negative reviews and take corrective actions to increase revenue by improving:

a)   Customer Experience
b)   Product

Data Sources

Which raw data sources can we use (internal and external)?

External: customer reviews for the health and personal care products sold on e-commerce platforms

Collecting Data

How do we get new data to learn from (inputs and outputs)?

Continuously collecting data from
- e-commerce platforms
- review sites

Making Predictions

When do we make predictions on new inputs? How long do we have to featurize a new input and make a prediction?

In supervised machine learning, the dataset would be split into test and train data. The model would be built on training data and will be predicted on the test data

This model can be tuned by adding pre-existing corpuses

Offline Evaluation

Methods and metrics to evaluate the system before deployment.

For evaluating the models

a) We will compare the out of sample performance metrics: confusion matrix, accuracy, precision, recall. AUC, ROC and F1 score for all the three machine learning models

b) In our model, we aim to predict whether a review is negative or not, so we label negative reviews as 1, and positive reviews as 0

From business perspective, our focus is to reduce false negatives (negative reviews incorrectly classified as positive reviews) and hence we would choose models with higher recall

Features

Input representations extracted from raw data sources.

- reviews (clean tokenized key words)
- helpfulness of reviews (if not available, use proxies such as "likes", "upvotes")

Building Models

When do we create/update models with new training data? How long do we have to featurize training inputs and create a model?

text analysis techniques: bag of words, word2Vec, Glove, TF-IDF

A set of supervised machine learning models

a) Logistic regression

b) Support vector machine

c) Random forest classifier

The above machine learning models will perform a binary classification i.e the outcome will be either a 0 or 1. Ensemble models are popular machine learning methods to handle non-linear relationships.

Live Evaluation and Monitoring

Methods and metrics to evaluate the system after deployment, and to quantify value creation.

Monitor model performance using new "unseen" data.

Compare model results with the real outcome

Evaluate performance based on metrics like accuracy, precision, recall, AUC, etc.

Monitor model drifts by manual labeling of sentiment for reviews periodically

Any feedback or suggestions? Email me at **louis@louisdorard.com**