The Machine Learning Canvas (v0.4)

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Decisions

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

Better understand the motivations behinds sentiment

Address negative feedback to take appropriate actions

Providing best experiences for customers

ML task

Input, output to predict, type of problem.

Input: Unstructured text

Output: sentiment of customers (positive, negative)

Problem type: Classification

Value Propositions

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

What: Predicting sentiment of customers expressed in amazon product reviews.

Why:

1.Allow the product marketing team to gauge the customer satisfaction level and to take appropriate actions to address negative feedback

2.Track purchase intent: understand when, where, and how consumers comment about purchasing product or category, and track changes over time.

3.Analyze product launch response:
Determine what motivated consumers to buy and find ideas for how company can be more impactful in the future.

4.Benchmark against competitors

Who: Customers

Data Sources

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

Amazon product review data (Health and Person care)

User database

Reviews database

Social networks

Collecting Data

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

- **Initially: active learning using data from new customer reviews for the health and person care products on amazon.**
- **Internal, manual labelling**

  When explicitly requested

  Randomly selected reviews everyday (as many as allowed for a budget of $x/days)

Making Predictions

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

- **New product reviews data available**
- **Monthly scoring**

Offline Evaluation

Methods and metrics to evaluate the system before deployment.

Trains model with data up until 1 week ago. Compare sentiment on last week's data.

Gain of correct, automated decision = save cost of manual decision

Compare results and assess performance with historical data

Cost of FN (when reviews sentiment positive/negative)

Cost of FP (smaller)

Features

Input representations extracted from raw data sources.

1. **Content of review: ratings, text, length, capitals…**
2. **Other prediction sentiments, emotion, etc.**
3. **User: basic info, previous buying, # of reviews. Product being reviewed.**
4. **Similarity with previous reviews (total scores)**
5. **Additional features added, based on domain understanding**

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?

One model per category

Somewhat adversarial setting

Keep on learning

Every week we updated the model by adding all the data from last week. We allow a day for this

Live Evaluation and Monitoring

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

Every week

- **Average customer satisfaction**
- **#customer complaints**
- **#manual reviews**

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