Defect Management System

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Executive Summary

- Classical case of NLP Classification Task.
- 81% Accuracy(on new data) with tuning the Hyper parameters.
- In Description has few clusters/similarity. Seems like these were bongs to specific scenario of Defect/Intent.
- Similarity in Invalid defect comments as well.
- Traditional ML Models were overfitting for the given small of Data.
- Topic model embeddings were also poor results.
- Intent recognition Deep Learning Models performed poorly, need to fine tuned.
- For generating comment text for Invalid defects, we need to collect more data and with proper Text.

Process Flow

Input Description, Priority, Product Category

Input Data from GUI

Supervised

Traditional ML Models

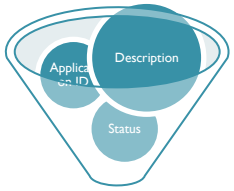
scikit learn

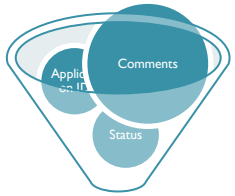
TensorFlow

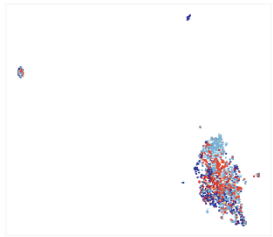
Deep learning Models

Classification

Un Supervised







Clustering/
Intent Recognition

FEEDBACK

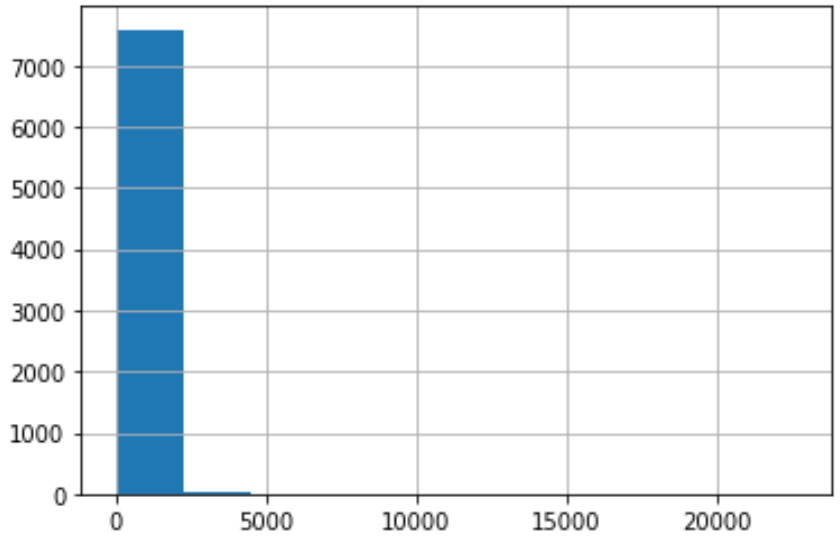
Deployment

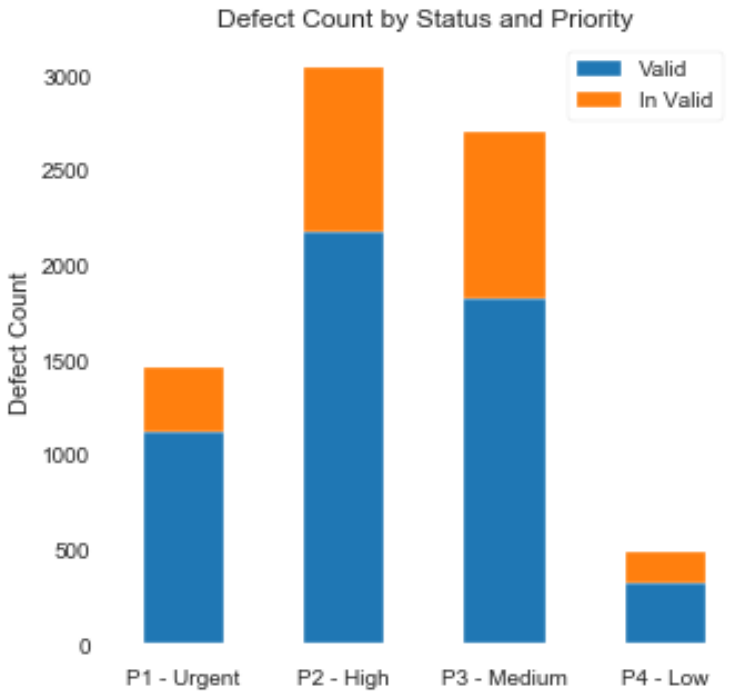
Flask

Valid - 80%
In Valid - 20%

Exploratory Data Analysis

- Average defect Description length is 550 and Max is 22k.
- Oversampled with Valid Defects (70-30)

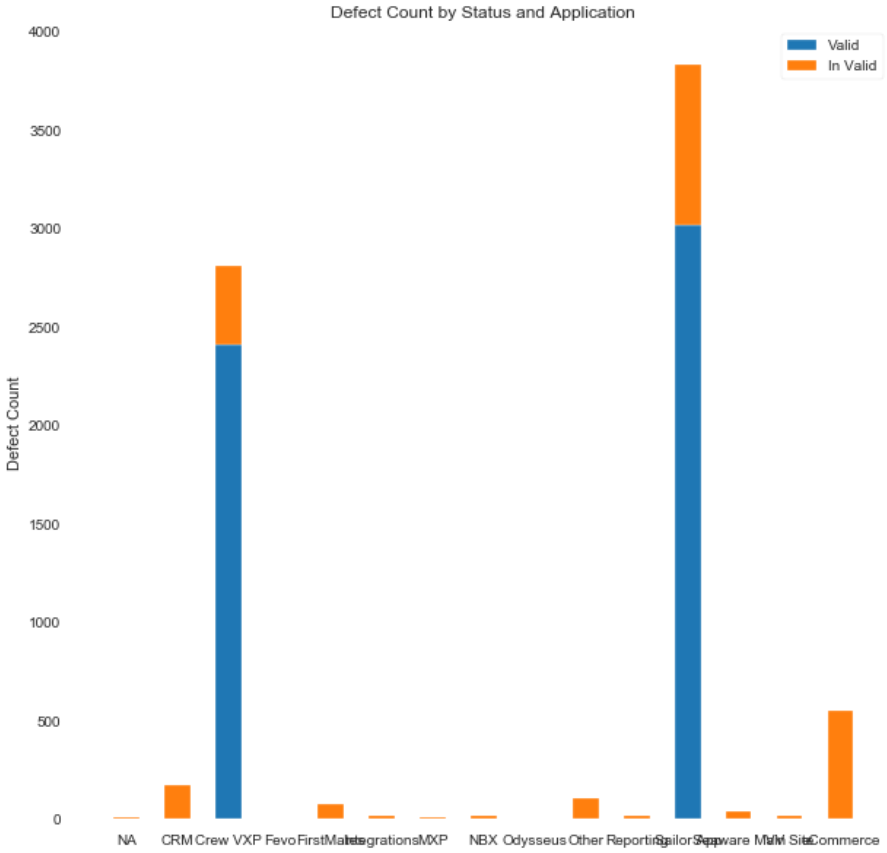




- No correlation between priority and status.
- Proportional distribution.

Cont

- Top 2 application accounts for 86% of defects.
- Only 2 Application have Valid Defects.
- Application info is highly correlated with Status output.
- This might be sampling error.

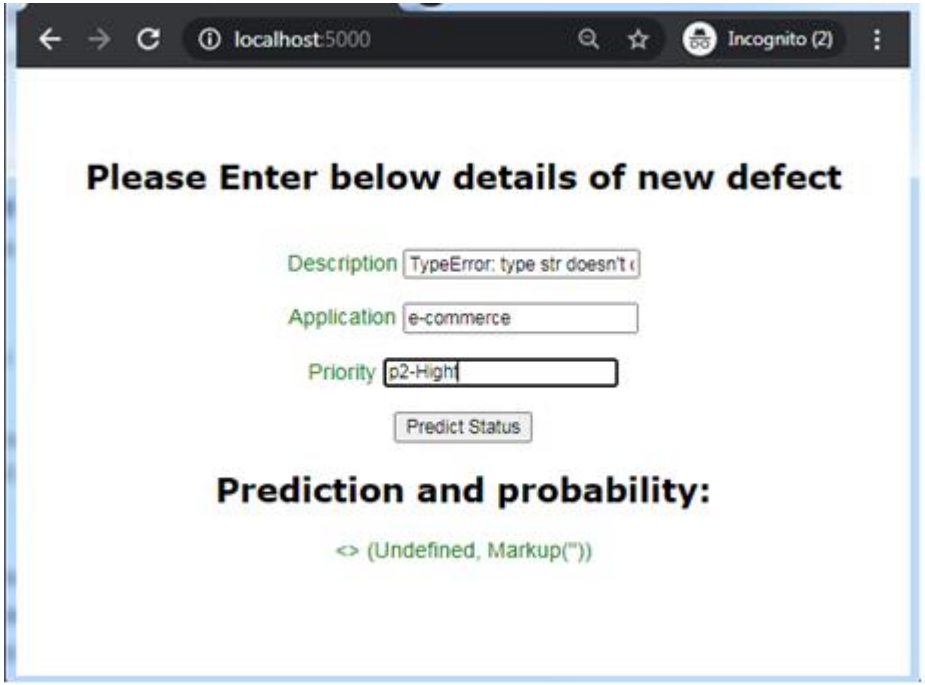


Classification

- Traditional ML Algorithms are overfitting on Description text Data
- Naïve Bayes performs better in Capturing the maximum information/generalized bias.
- Priority feature hasn't improved the metrics.
- Application info is biased.
- Context embeddings(LDA) were also performing poorly.
- Deep Learning Models (BERT), hasn't shown good results (tried initial modeling)

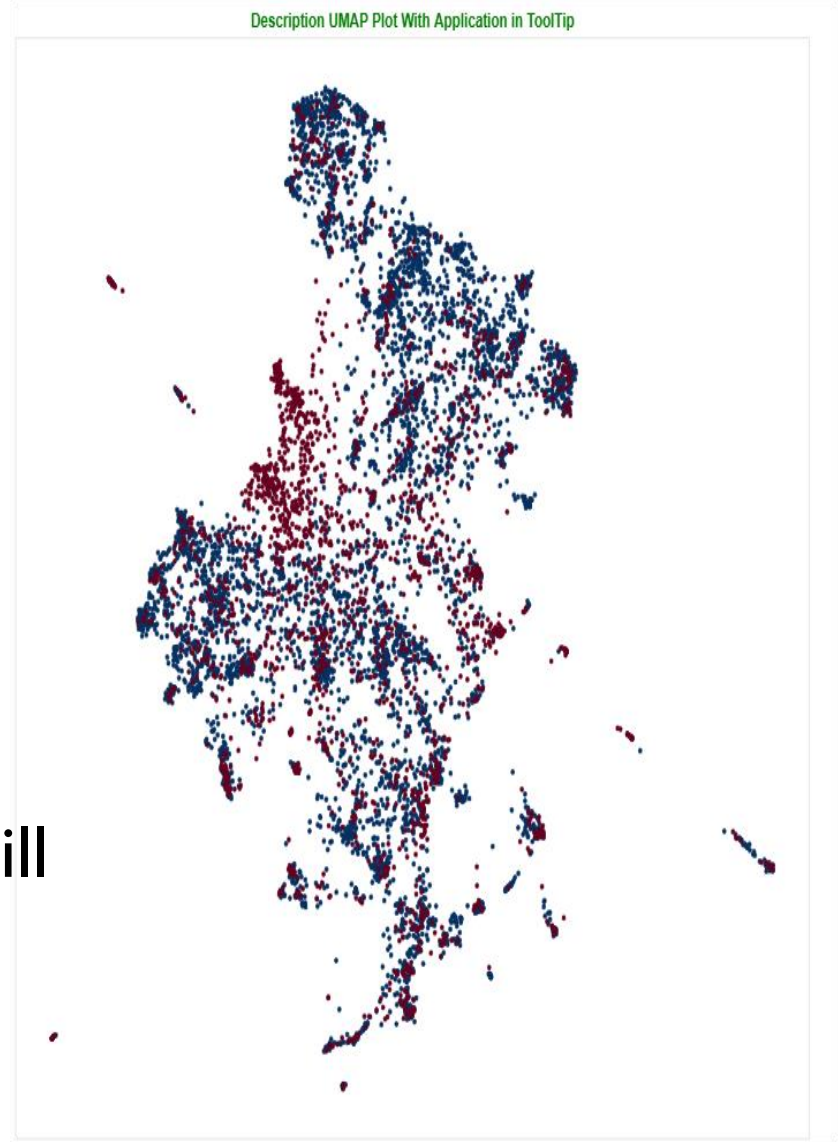
Deployment

- Deployed Naïve Bayes Model.
- Takes Description, Application Name and Priority info.
- Predicts Defect status and probability of classification.



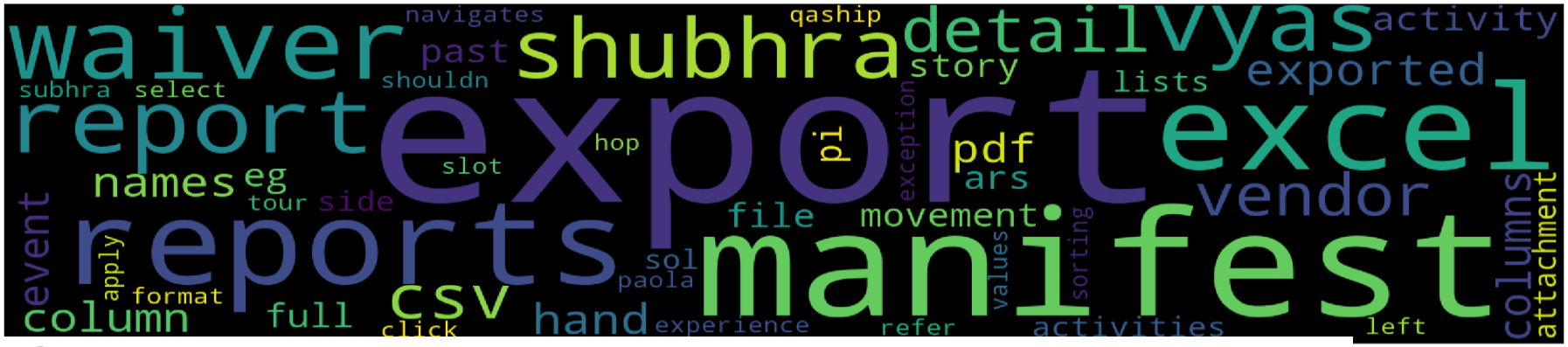
Clustering Analysis

- Description text has intuition for Valid and In Valid Defect.
- Clusters are of same Application and/ Priority.
- Business Knowledge and Cluster info help in better classification models.
- Top2Vec and Clustering will add more value.



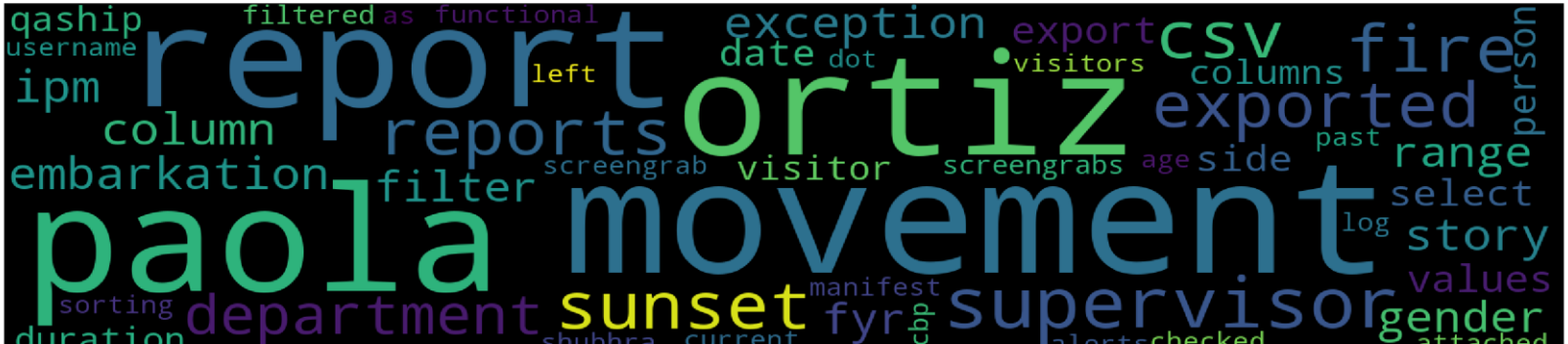
Top2Vec - Wordcloud of Duplicate

Topic 13



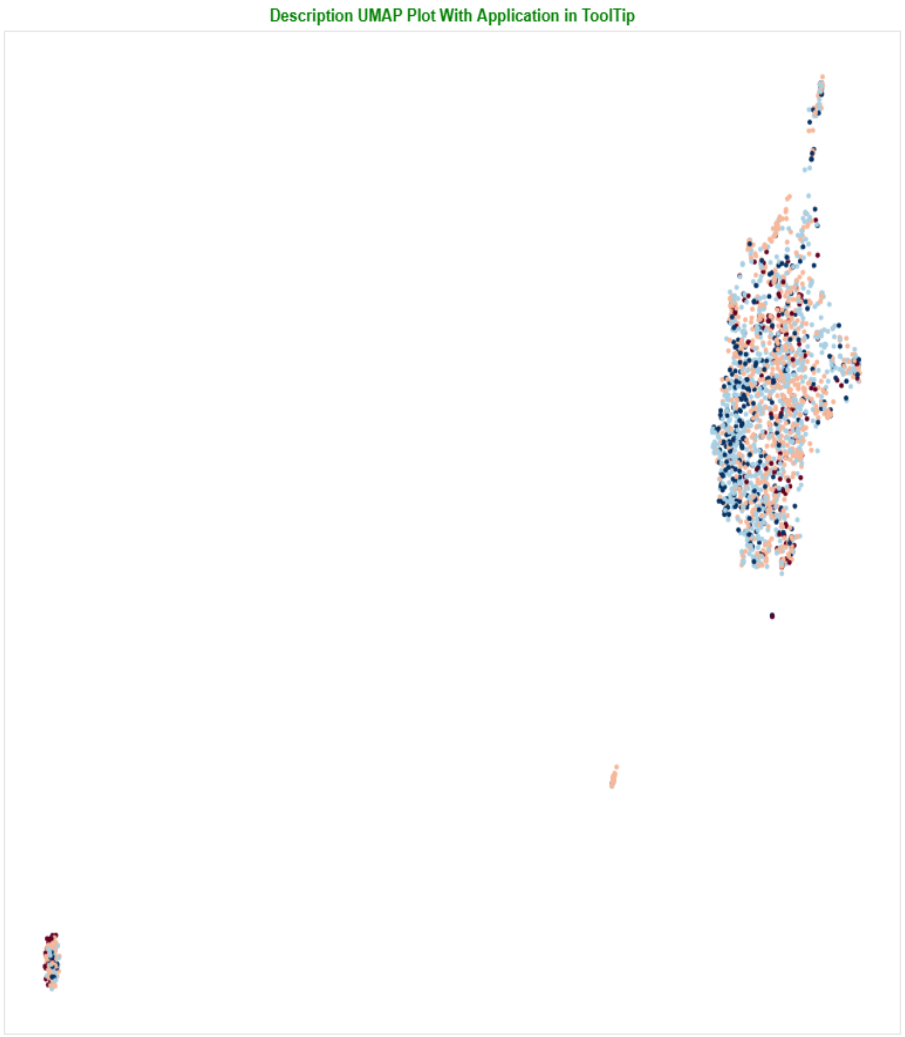
Topic 73

Topic 56



Comment Text

- Patterns in comment text.
- Color code with priority and Application info in tooltip.
- Helps in comment text generation



Recommendations

- Collect more Defects data for better results.
- Label proper/reasonable comments for Invalid Defects.

Queries..?

Thank you..!