CUSTOMER SUPPORT TICKET CLASSIFICATION

Enhancing Efficiency in Customer Inquiry Management

AGENDA

TOPICS COVERED

- INTRODUCTION
- METHODOLOGY
- PROCESS STEPS
- RESULTS AND OBSERVATIONS
- CONCLUSION

"TRANSFORMING CUSTOMER SUPPORT WITH INTELLIGENT TICKET CLASSIFICATION FOR FASTER, MORE EFFICIENT RESPONSES."

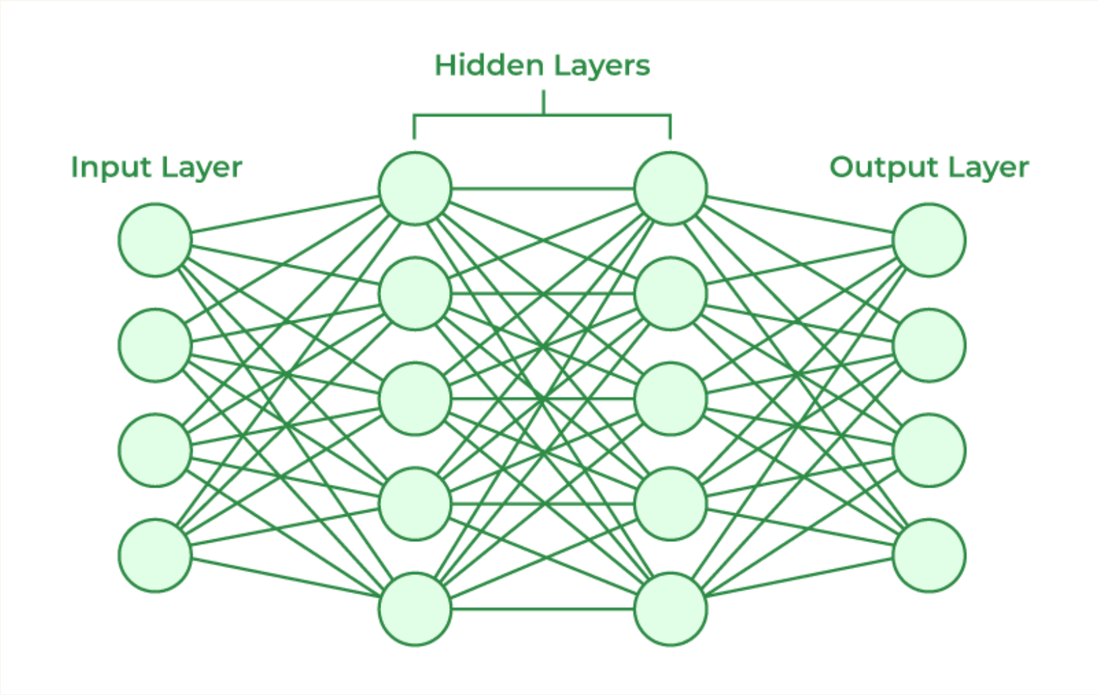
METHODOLOGY

- TOOLS & TECHNOLOGIES:
  Python, Pandas, NLTK, TensorFlow, Scikit-Learn, Seaborn, XGBoost

- DATA SOURCE:
  CSV dataset containing customer support ticket information.

- APPROACH:
  1. Data preprocessing: text cleaning, and augmentation with synonyms using WordNet.
  2. Model selection: A neural network with embedding, convolutional layers, and dropout for classification.

PROCESS



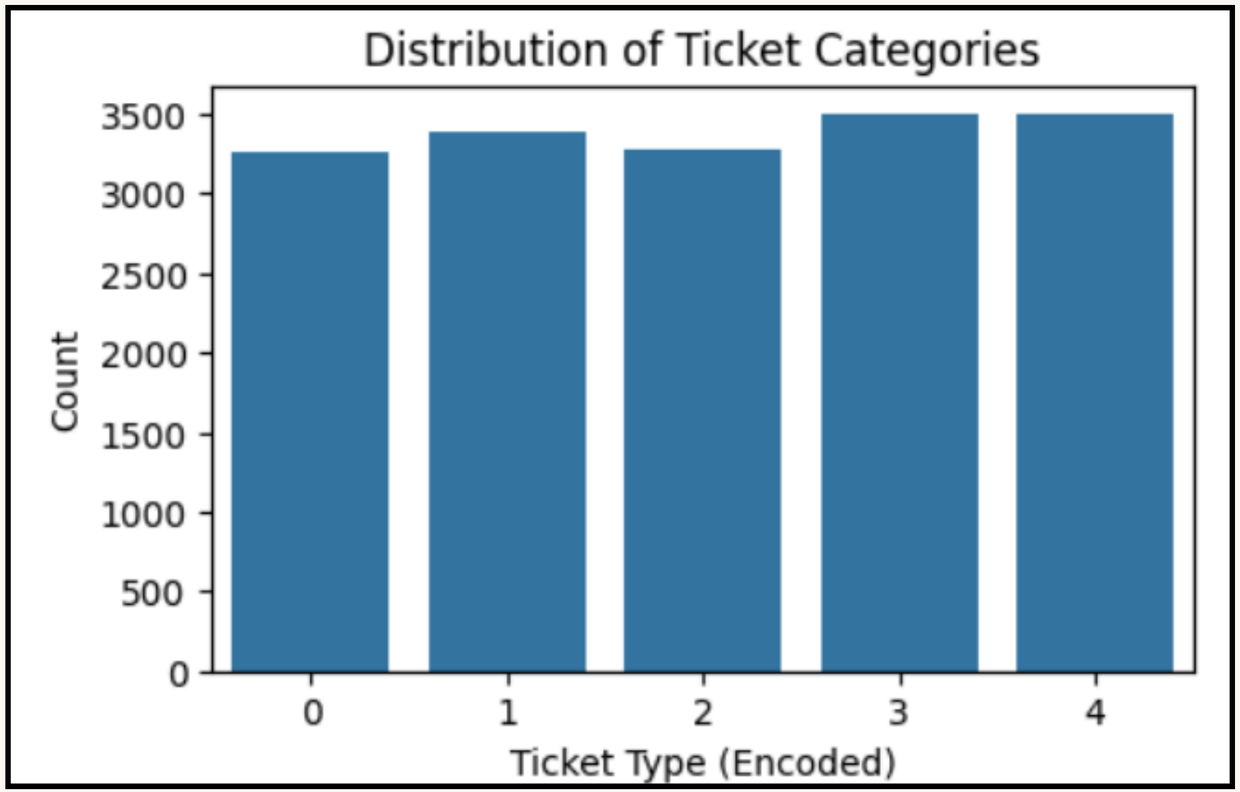
DATA PREPROCESSING

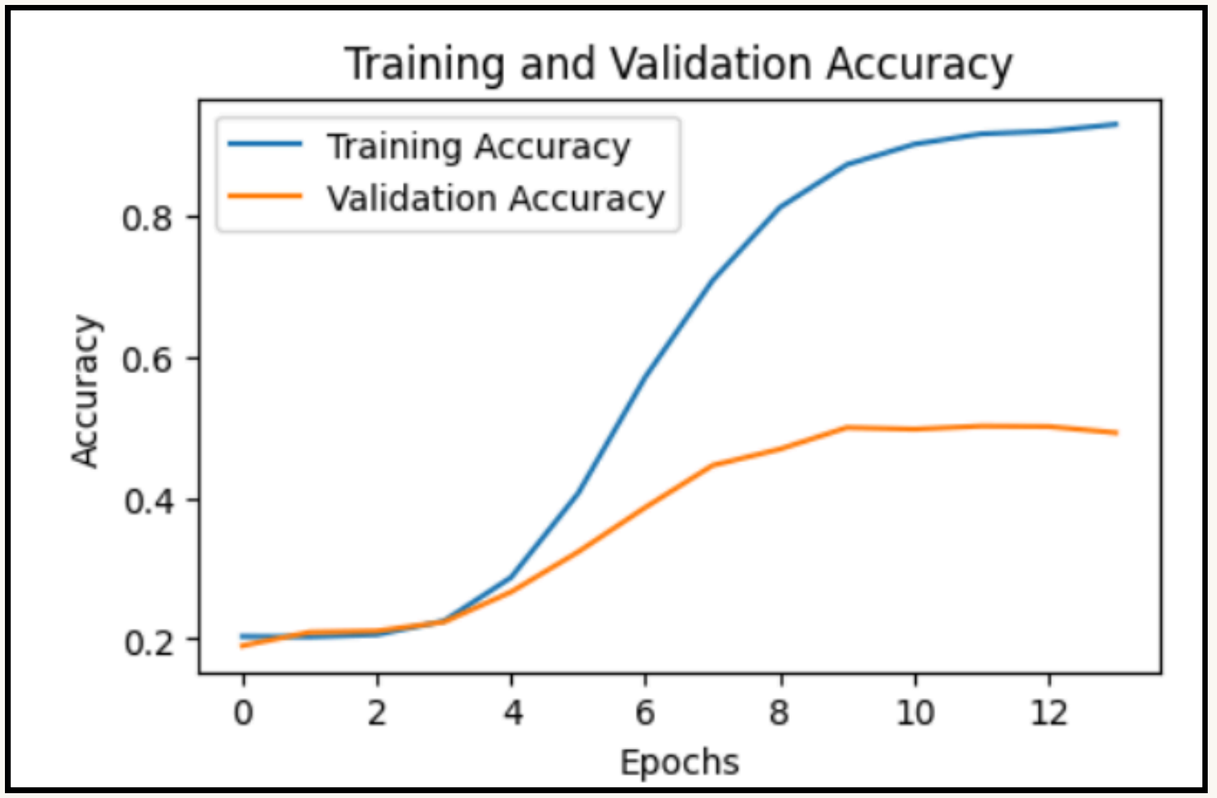
- Removing special characters, converting text to lowercase, and encoding ticket types.
- Synonym replacement to increase data diversity for better generalization.

MODEL DEVELOPMENT

- Tokenization and padding, embedding layer, Conv1D for feature extraction, dropout layers, and dense layers.
- Early stopping to prevent overfitting and improve training efficiency.

OUTPUT - VISUALIZATIONS





PERFORMANCE METRICS

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Epoch 2/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 27s 130ms/step - accuracy: 0.2040 - loss: 1.7562 - val_accuracy: 0.2096 - val_loss: 1.6145
Epoch 3/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 28s 130ms/step - accuracy: 0.2040 - loss: 1.6628 - val_accuracy: 0.2113 - val_loss: 1.6101
Epoch 4/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 29s 134ms/step - accuracy: 0.2232 - loss: 1.6185 - val_accuracy: 0.2240 - val_loss: 1.6023
Epoch 5/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 28s 130ms/step - accuracy: 0.2752 - loss: 1.5692 - val_accuracy: 0.2668 - val_loss: 1.5743
Epoch 6/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 27s 129ms/step - accuracy: 0.4032 - loss: 1.3690 - val_accuracy: 0.3238 - val_loss: 1.5449
Epoch 7/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 43s 138ms/step - accuracy: 0.5659 - loss: 1.0901 - val_accuracy: 0.3870 - val_loss: 1.5131
Epoch 8/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 46s 161ms/step - accuracy: 0.7109 - loss: 0.7897 - val_accuracy: 0.4466 - val_loss: 1.4886
Epoch 9/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 34s 130ms/step - accuracy: 0.8244 - loss: 0.5231 - val_accuracy: 0.4696 - val_loss: 1.5359
Epoch 10/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 27s 129ms/step - accuracy: 0.8828 - loss: 0.3660 - val_accuracy: 0.5003 - val_loss: 1.4642
Epoch 11/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 41s 130ms/step - accuracy: 0.9081 - loss: 0.2809 - val_accuracy: 0.4979 - val_loss: 1.5033
Epoch 12/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 27s 127ms/step - accuracy: 0.9209 - loss: 0.2365 - val_accuracy: 0.5024 - val_loss: 1.6913
Epoch 13/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 42s 132ms/step - accuracy: 0.9253 - loss: 0.2101 - val_accuracy: 0.5018 - val_loss: 1.6544
Epoch 14/20
212/212 ━━━━━━━━━━━━━━━━━━━━ 40s 129ms/step - accuracy: 0.9379 - loss: 0.1862 - val_accuracy: 0.4929 - val_loss: 1.6660
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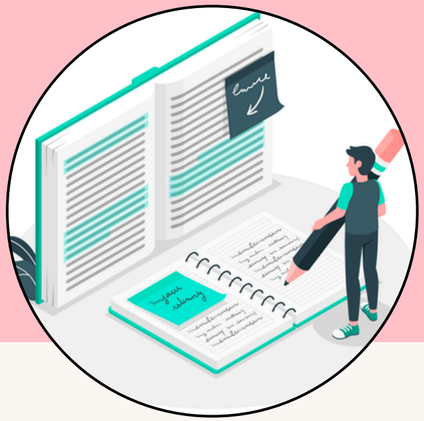
Sample Ticket Classification: Refund request

CONCLUSION



SUMMARY

Summarize the project's significance and effectiveness in classifying tickets.

CHALLENGES

Managing class imbalance and optimizing model complexity.

FUTURE WORK

Experiment with transformer models and explore additional data augmentation techniques.