

TE - Mini Project: 2A Topic Approval Format

1. Name of students (group of 2):

- Sharma Nilesh Vinay (TEB243)
- Yadav Supriya Surendra (TEB261)

2. Guide Name: *Prof.* Shivani Awasthi.

3. Title of project: InboxGenie.

4. Project type: In-house or Industry collaboration: Inhouse.

5. Domain /Area of interest:

- a. Artificial Intelligence (AI)
- b. Natural Language Processing (NLP)
- c. Deep Learning for Text Classification
- d. Semantic Email Understanding
- e. Intent-based Information Filtering.

6. Abstract: InboxGenie is an AI-powered browser extension designed to combat email overload and boost productivity. It uses advanced NLP, ML, and Transformer-based deep learning to semantically classify emails by intent, even from the same sender. Key features include an Advanced Spam Filter, an Auto-Cleaner for automated email management, and a generative AI-powered Tone Changer for personalizing email drafts. Built with Python, JavaScript, Hugging Face Transformers, and MongoDB, InboxGenie incorporates adaptive and semi-supervised learning. It aims to provide a smarter, cleaner, and more efficient email experience through contextual understanding, personalization, and automation.

7. Problem statement (In a Paragraph): In today's digital world, email users are overwhelmed with the volume and variety of messages they receive every day. Most email systems still rely on basic filters or keyword-based rules that can't truly understand the intent behind a message. This becomes a problem especially when emails from the same sender serve different purposes for example, a promotional offer and a payment receipt from the same e-commerce site. Important emails often get buried under less relevant ones.

Users also face two other major challenges: manually deleting or sorting emails that don't matter, and spending time crafting replies in the right tone whether formal, friendly, or neutral. These tasks take time, reduce productivity, and aren't personalized. InboxGenie aims to solve these issues using AI. It classifies emails by intent, automatically cleans the inbox based on custom user rules, and rewrites replies in the user's chosen tone. While powerful, this system also brings challenges like handling different types of data, ensuring accuracy, adapting over time, and protecting user privacy.

8. Hardware/Software used:

- a. Frontend / Interface: Streamlit
- b. Model Development: Hugging Face Transformers, PyTorch, or TensorFlow, Python
- c. Natural Language Processing: spaCy, NLTK, Scikit-learn
- d. Database: MongoDB or SQLite
- e. Tools & Version Control : Git, GitHub

9. Research paper referred from good journals (at least 4 papers):

Sr.No.	Title and author	Year of publication	Advantages	Limitations
1	Active Learning for Text Classification: A Survey by B. Settles	2016	Discusses active learning strategies to reduce labeled data needs by selecting informative samples, highly relevant for resource-limited student projects.	Data efficiency, initial model, and unlabeled data quality are crucial for effectiveness, not architecture or semantic understanding.
2	A Survey of Email Classification Techniques by S. A. Al-Haddad et al.	2018	Comprehensive overview of traditional email classification (Naive Bayes, SVM) and feature engineering.	It only tells if an email is spam or not. It can't understand different reasons for emails from the same sender.
3	BERT: Pre-training of Deep Bidirectional Transformers for Language Understandin	2019	BERT is a Transformer-based model that achieves state-of-the-art NLP results through pre-training for deep	Fine-tuning needs a lot of GPU power and careful dataset prep for specific classification tasks..

	g by J. Devlin et al.		contextual understanding.	
4	Deep Learning for Text Classification: A Comprehensive Review by X. Minaee et al.	2021	Explores deep learning models (CNN, RNN, LSTM, Transformers) for text classification, highlighting their ability to capture complex patterns.	Obtaining large, labeled datasets is challenging for student projects.
5	Sentiment Analysis and Emotion Recognition: A Review Paper by S. B. K. et al.	2021	Analyzes sentiment and emotion, identifying author attitude (positive, negative, neutral) despite challenges like context, ambiguity, and slang.	Analyzes text for tone, but doesn't generate text with specific tones.

- Guide signature of approval with date:

(Prof. Shivani Awasthi)

- Signature of Group Members:

(Nilesh Sharma)

(Supriya Yadav)