Phase-1

Problem definition and Design Thinking

Date	29 September 2023
Team Id	Group 4
Project Name	Building a Smarter AI-Powered Spam Classifier
Maximum Marks	

Abstract:

Spam emails continue to be a significant nuisance in today's digital communication landscape, wasting valuable time and resources. To combat this issue effectively, we propose the development of a smarter AI-powered spam classifier. This research aims to leverage advanced machine learning techniques, including deep learning and natural language processing, to create a more accurate and adaptive spam email detection system.

Our approach involves collecting and preprocessing a vast dataset of emails, both spam and legitimate, to train and fine-tune our AI model. We will employ state-of-the-art neural network architectures, such as recurrent neural networks (RNNs) and transformer models, to capture nuanced patterns and context within email content.

Problem Definition:

The task at hand is to develop a smarter AI-powered spam classifier, which can accurately and efficiently distinguish between spam and legitimate messages across various digital communication platforms, such as email, social media, or messaging apps. The goal is to enhance user experience by reducing the exposure to unwanted or malicious content while minimizing false positives to avoid blocking legitimate messages.

building a smarter AI-powered spam classifier requires a combination of advanced machine learning techniques, continuous monitoring, user feedback, and a commitment to adapt to changing spamming tactics to provide a safer and more enjoyable digital communication experience.

Problem Statement(ps)	I am	I'm Trying to	But	Because	Which makes me feel
Ps-1	User	Check message whether it is spam or not	I can't get the right answer	Accuracy Not correct	Safe and Secure

Design Thinking

Empathize:

- Understand the user's pain points related to spam emails.
- Gather feedback from users about their current spam classification experiences.
- Interview users to learn about their specific needs and challenges.

Define:

- Clearly define the problem statement: "How might we create a more effective spam classifier?"
- Identify key performance indicators (KPIs) for success, such as accuracy, false positives, and false negatives.

Ideate:

- Brainstorm potential solutions and features with a diverse team.
- Consider advanced techniques like deep learning, natural language processing (NLP), and machine learning algorithms.
- Explore how AI can adapt and learn over time to improve accuracy.

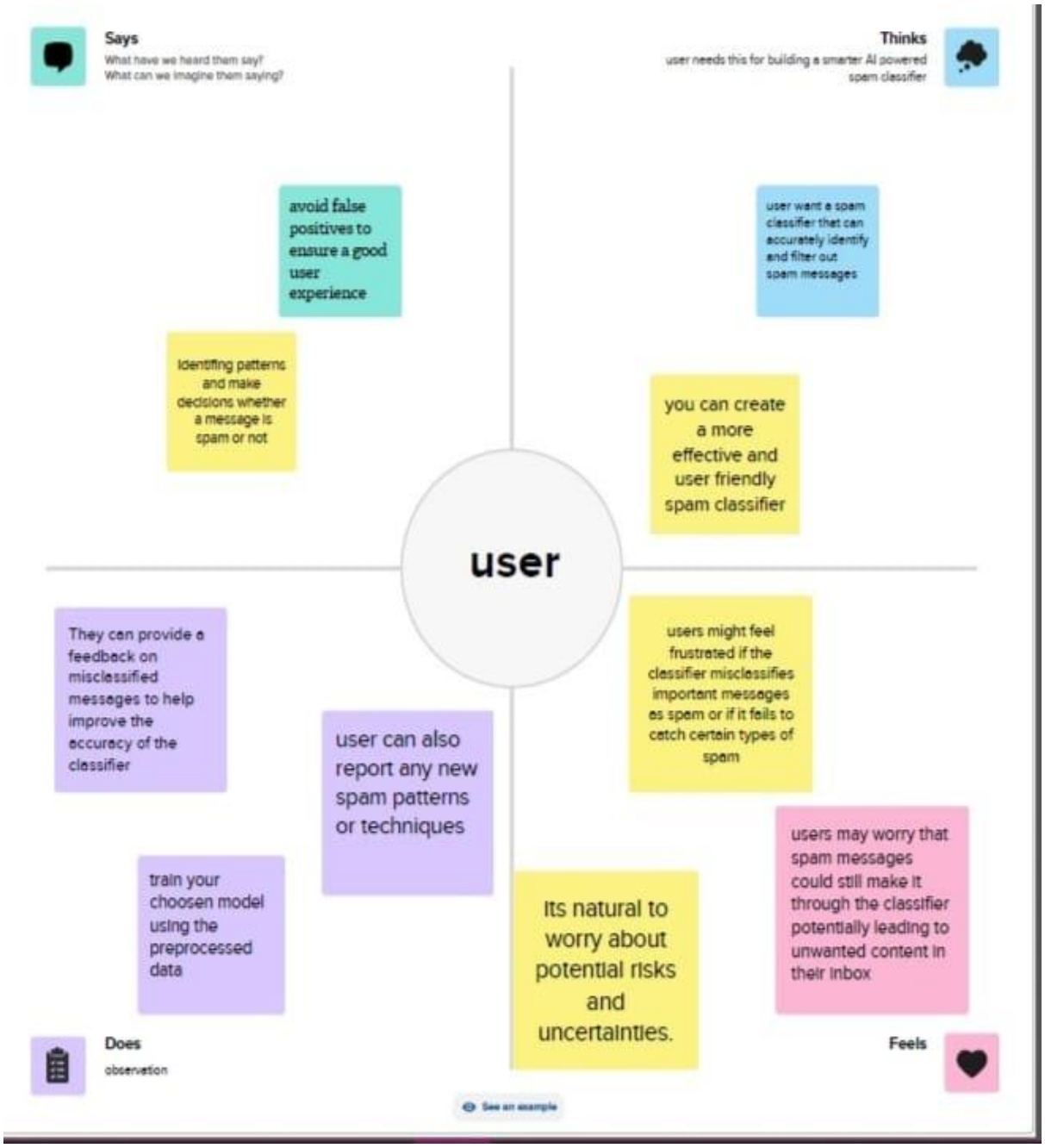
Prototype:

- Develop a prototype of the AI-powered spam classifier.

- Focus on the user interface and user experience for easy interaction.
- Use sample spam and non-spam emails for testing.

Test:

- Gather feedback from users on the prototype.
  Evaluate the accuracy and efficiency of the classifier.
- Make necessary adjustments and improvements based on user feedback and test results.



Brainstorming:

1.Data Collection and Labeling:

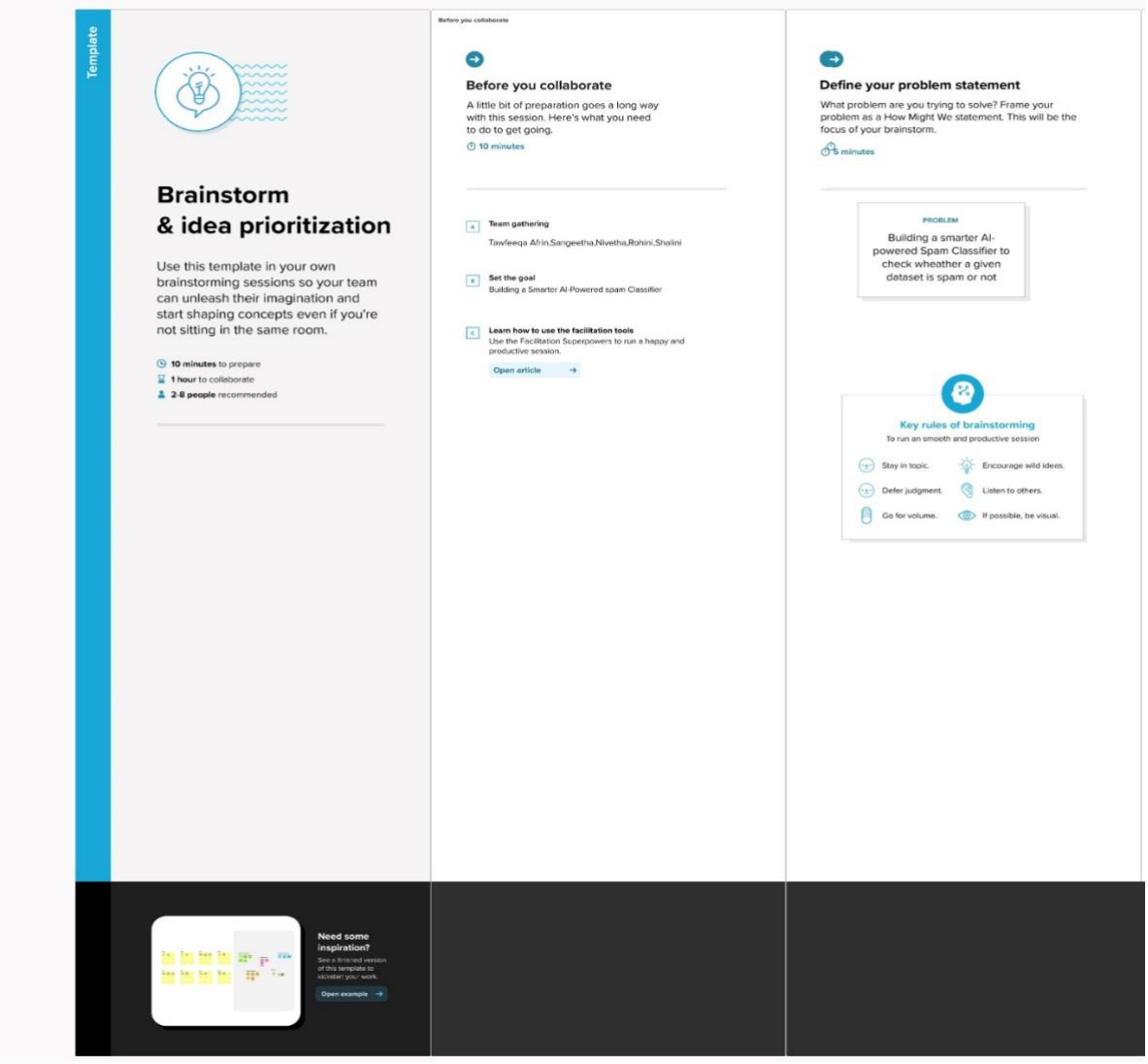
• Gather a diverse and extensive dataset of both spam and non-spam emails.

• Ensure accurate labeling of data to create a reliable training set.

2.Feature Engineering:

• Extract relevant features from emails, such as sender, subject, body content, links, attachments, and metadata.

• Consider using word embeddings, TF-IDF, or N-grams to represent text data.



2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP

You can select a sticky note and hit the pencil switch to sketch. Icon to start drawing!

Person 1

use machine learning algorithms

Train a data

Extract Relevant Featuress

Person 2

Continuously learn and acapt to new sam patterns

Retraining the model

Person 3

natural language processing

Ensemble methods

Person 4

Explore Unsupervised learning techiques like clustering

Domain specific featfeatures

Person 5

To implement cross Validation techniques

Analyze the temporal patterns of spam messages

Text Embeddings

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

TIP

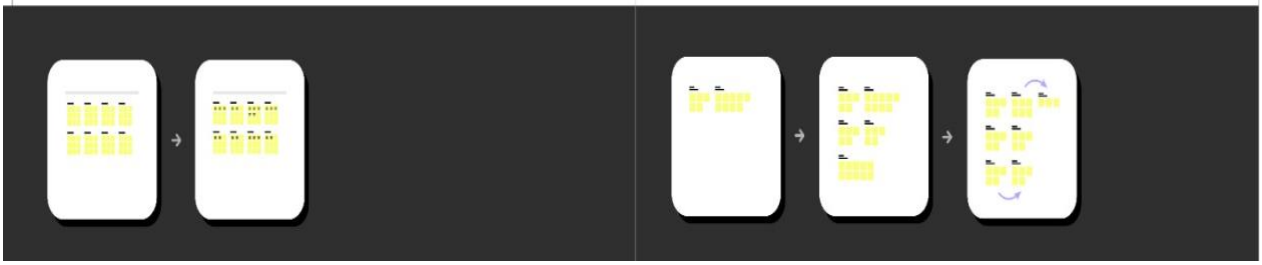
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

Use machine learning algorithms

To implement cross Validation techniques

Define Evaluation metrices like precision,recall and F1 score

Apply Regularization techniques,such as L1 and L2 regularization to prevent overfitting



4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

TIP

Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the **H key** on the keyboard.

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

A **Share the mural**
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

B **Export the mural**
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

Strategy blueprint
Define the components of a new idea or strategy.
Open the template →

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.
Open the template →

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →

Share template feedback