PHASE – 1

Problem Definition and Design Thinking

Date	**28 September 2023**
Team Id	**Group 4**
Project Name	**Earthquake Prediction model using python**
Maximum Marks	

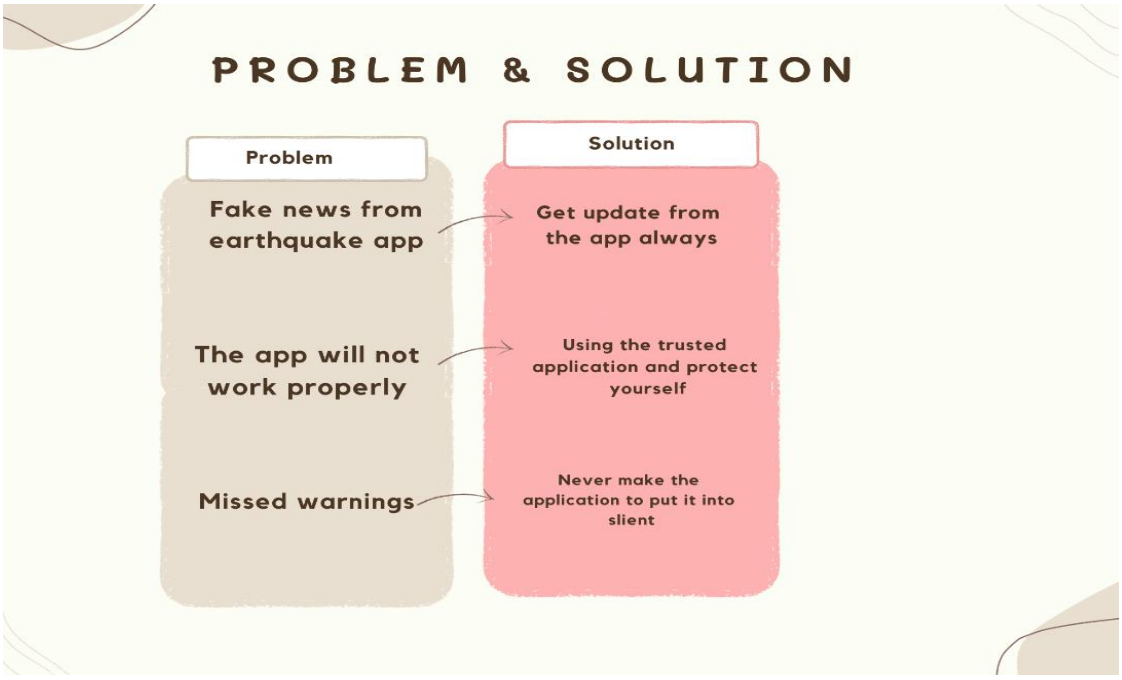
Abstract :

Earthquake is not the artificial intelligence, but artificial intelligence can be used to study and predict earthquakes. Earthquake prediction is a challenging task that requires analyzing large amounts of data and applying complex algorithms. In this project, we use Python, a popular programming language for data science, to create a machine learning model for earthquake prediction.

We use the PySpark library, which is a Python interface for Apache Spark, a distributed computing framework that can handle big data processing. We also use MongoDB for storing the database and Bokeh for data visualization. We use the Kaggle dataset of significant earthquakes from 1965 to 2016 as our training data and test our model on the 2017 data. We use the RandomForestRegressor algorithm, which is a supervised learning method that can handle nonlinear relationships and feature interactions.

Problem Definition :

- How can we improve the accuracy and reliability of earthquake prediction, using various data sources and methods, such as seismic activity, geology, precursors, artificial intelligence, and early warning systems ?.
- How can we develop and use an earthquake prediction app that can provide timely and helpful alerts and notifications, as well as useful and relevant information and education, to the users in high-risk areas, such as India ?.



PROBLEM & SOLUTION

Problem

Fake news from earthquake app

The app will not work properly

Missed warnings

Solution

Get update from the app always

Using the trusted application and protect yourself

Never make the application to put it into slient

Problem Statement(ps)	I am	I’m trying to	But	Because	Which makes me feel
Ps -1	User	Check for an earthquake in my area	I can’t get the right answer	Accuracy not correct	Dataset

Design Thinking :

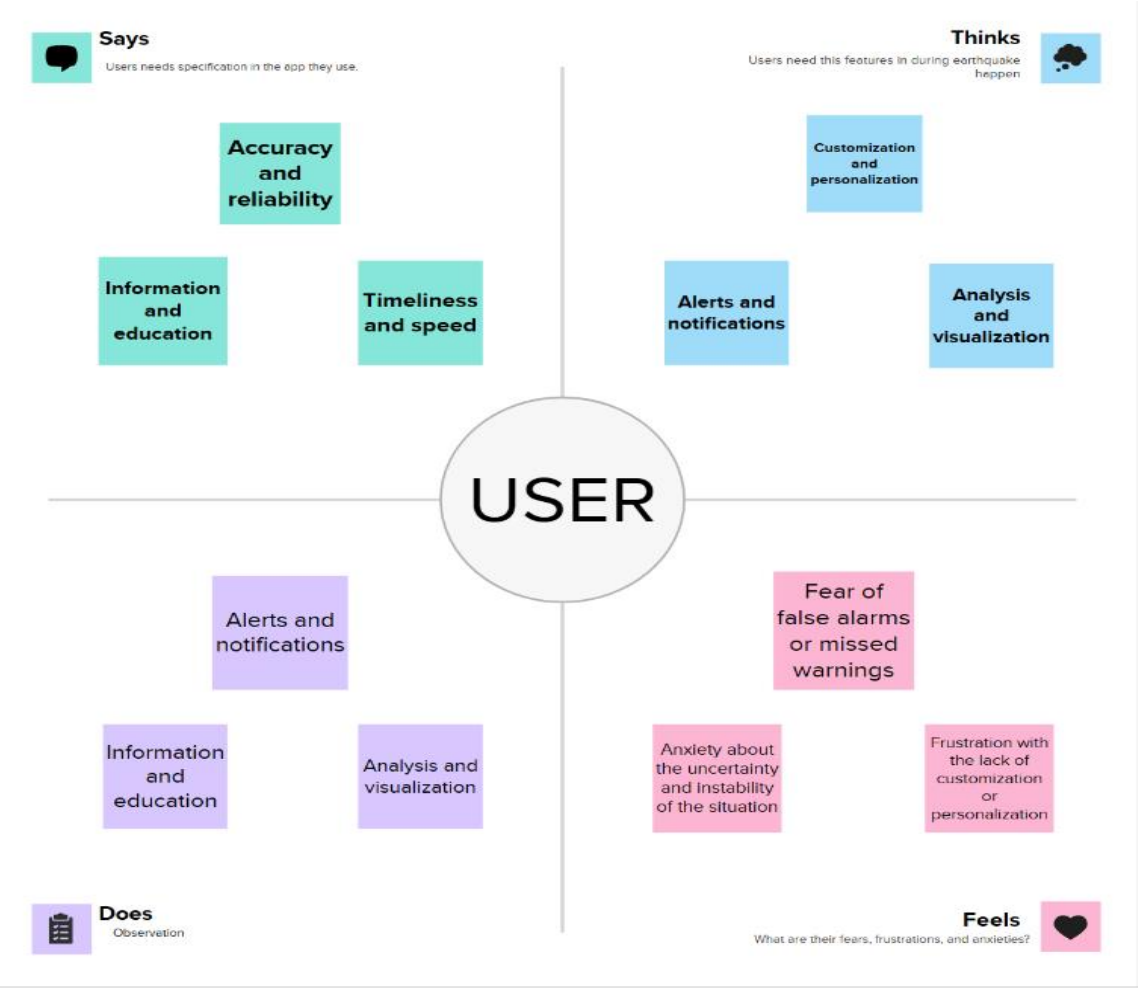
Empathize: The first step is to empathize with the people who are affected by earthquakes or who are at risk of experiencing them. This can involve conducting interviews, surveys, observations, and research to understand their needs, challenges, fears, and expectations. For example, one might ask questions like: How do people prepare for earthquakes? How do they cope with the aftermath? What kind of information and support do they need before, during, and after an earthquake?

Define: The next step is to define the problem or the opportunity that needs to be addressed. This can involve synthesizing the insights from the empathy stage and creating a clear and specific statement of the user’s needs and goals. For example, one might define the problem as: How might we provide accurate and timely earthquake predictions to help people reduce their risks and damages?

Ideate: The third step is to ideate or generate possible solutions to the problem. This can involve brainstorming, sketching, mind mapping, and other techniques to come up with a wide range of ideas that address the user’s needs and goals. For example, one might ideate solutions like: A mobile app that alerts users about potential earthquakes and provides guidance on what to do; A network of sensors that monitor seismic activity and send data to a cloud-based platform that analyzes and predicts earthquakes; A social media campaign that educates people about earthquake preparedness and safety tips.

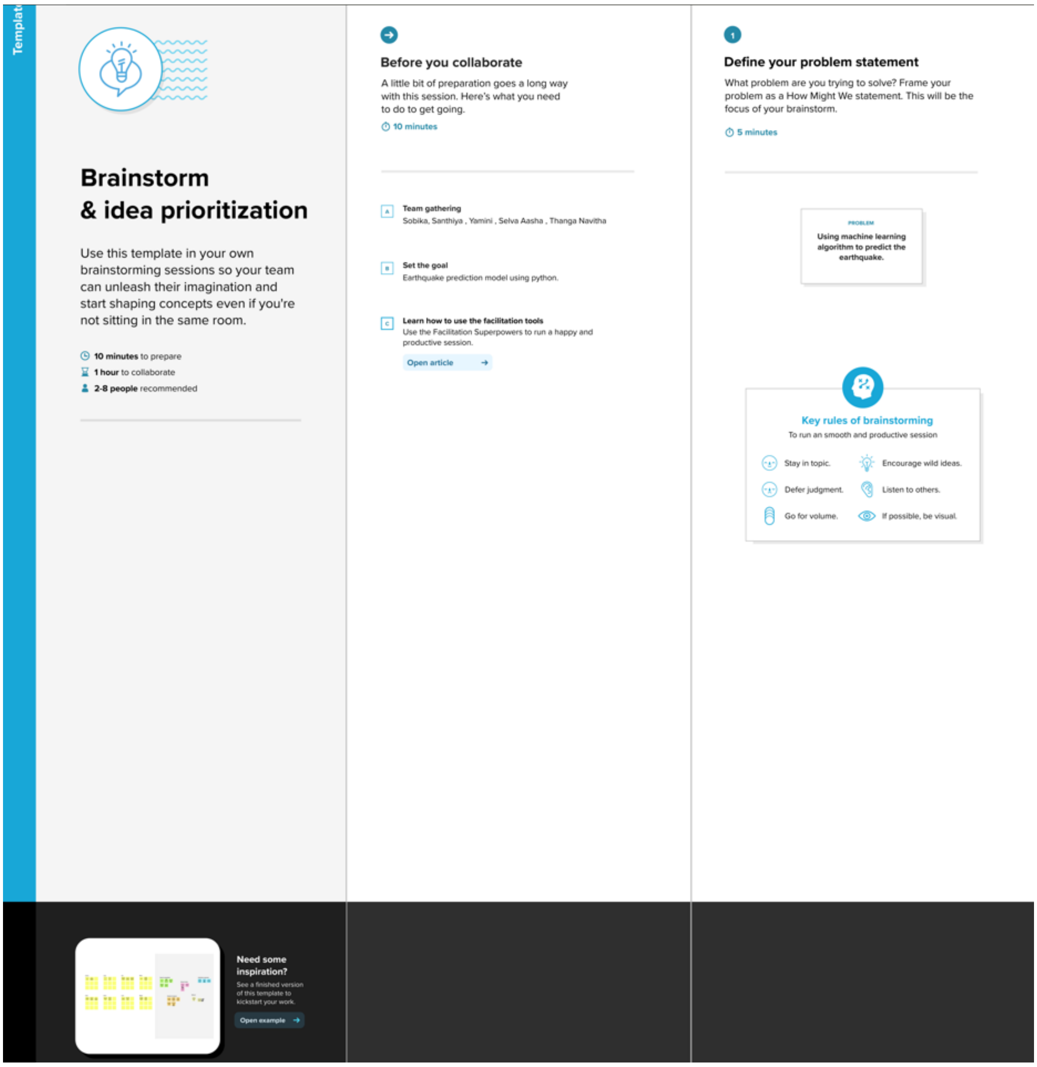
Prototype: The fourth step is to prototype or create a low-fidelity version of the selected solution that can be tested with the users. This can involve using paper, cardboard, wireframes, mockups, or other materials to build a simple representation of the solution that can demonstrate its main features and functions. For example, one might prototype a mobile app by using paper sketches or a wireframing tool to show how the app would look and work on a smartphone screen.

Test: The final step is to test or evaluate the prototype with the users and collect feedback. This can involve asking the users to interact with the prototype and observe their reactions, behaviors, and comments. The feedback can be used to identify the strengths and weaknesses of the solution and to make improvements or changes. For example, one might test a mobile app by asking the users to simulate a scenario where they receive an earthquake alert and follow the instructions on the app.


Says
Users needs specification in the app they use.
Thinks
Users need this features in during earthquake happen
Accuracy and reliability
Information and education
Timeliness and speed
Customization and personalization
Alerts and notifications
Analysis and visualization
USER
Alerts and notifications
Information and education
Analysis and visualization
Fear of false alarms or missed warnings
Anxiety about the uncertainty and instability of the situation
Frustration with the lack of customization or personalization
Does
Observation
Feels
What are their fears, frustrations, and anxieties?

BrainStroming :

Using machine learning to create a model for earthquake prediction[3]. This idea is based on using data from past earthquakes and other geophysical parameters to train a model that can learn the relationships between different factors and the probability of an earthquake occurrence.



Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

10 minutes to prepare
1 hour to collaborate
2-8 people recommended

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

A **Team gathering**
Sobika, Santhiya , Yamini , Selva Aasha , Thanga Navitha

B **Set the goal**
Earthquake prediction model using python.

C **Learn how to use the facilitation tools**
Use the Facilitation Superpowers to run a happy and productive session.

1

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

PROBLEM
Using machine learning algorithm to predict the earthquake.

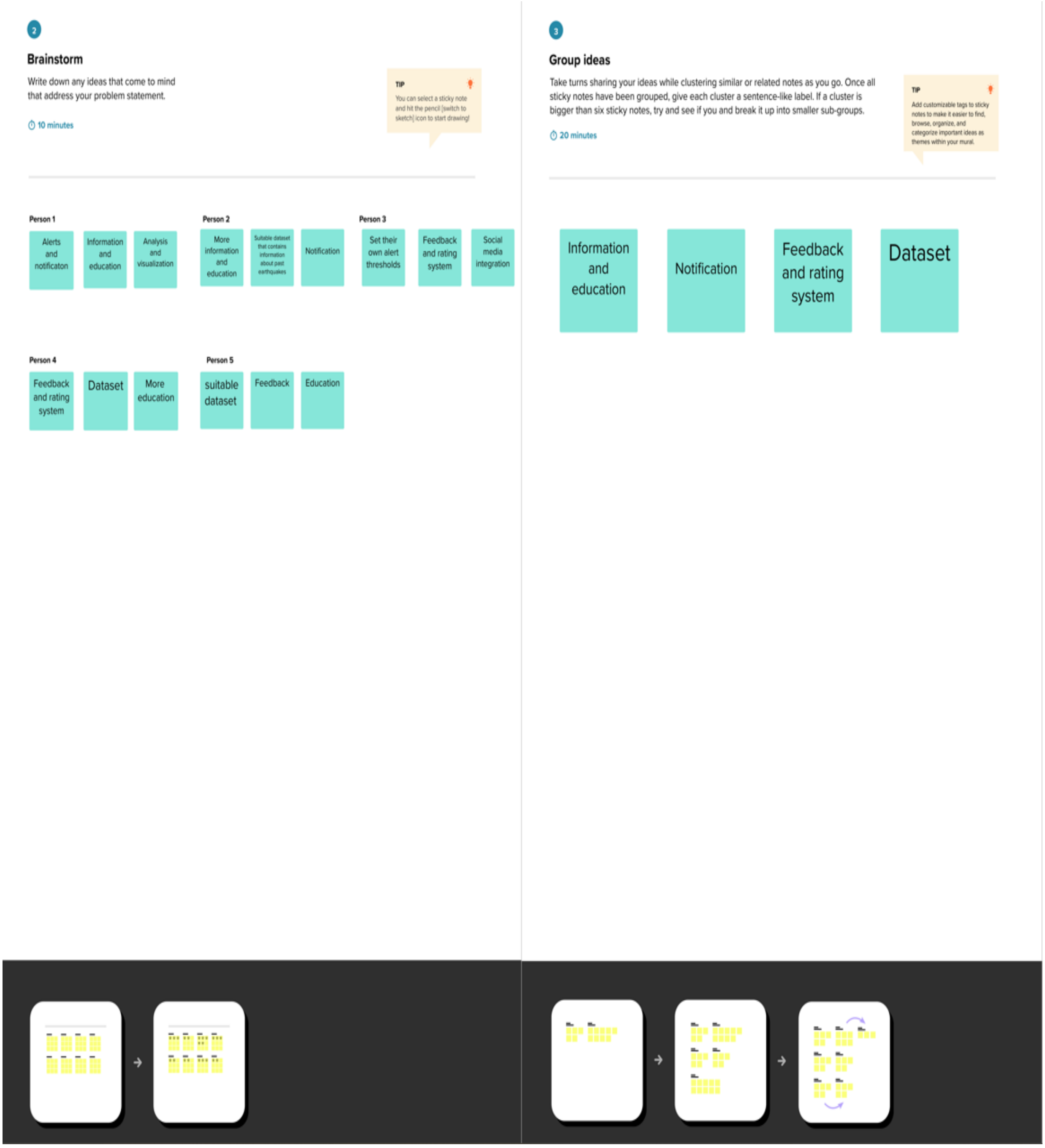
Key rules of brainstorming

To run an smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

Need some inspiration?

See a finished version of this template to kickstart your work.



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

- Alerts and notificaton
- Information and education
- Analysis and visualization

Person 2

- More information and education
- Suitable dataset that contains information about past earthquakes
- Notification

Person 3

- Set their own alert thresholds
- Feedback and rating system
- Social media integration

Person 4

- Feedback and rating system
- Dataset
- More education

Person 5

- suitable dataset
- Feedback
- Education

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.

- Information and education
- Notification
- Feedback and rating system
- Dataset

4

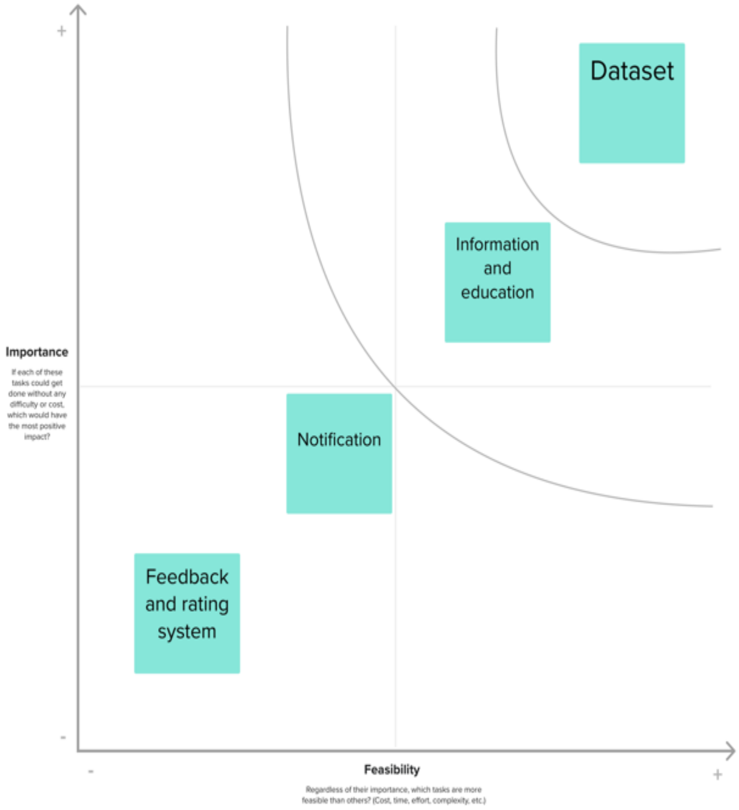
Prioritize

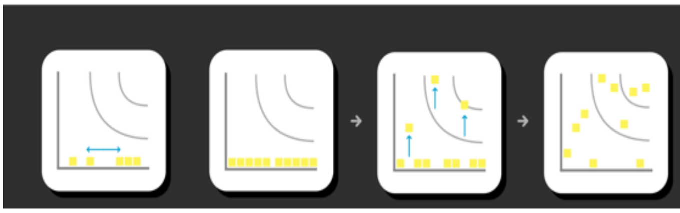
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

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.


+
Dataset
Information and education
Importance
If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?
Notification
Feedback and rating system
-
-
Feasibility
Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)
+



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