PROJECT REPORT

PROJECT TITLE: University Admit Eligibility Predictor

TEAM ID: PNT2022TMID14436

TEAM MEMBERS:

Sanosh S

Sai Krishna Raj
Mohan

Sai Sathish D

Arun Prakash

1. INTRODUCTION

1.1 Project Overview

In the present conditions, students regularly have difficulty findinga fitting institution to pursue higher studies based on their profile. There are some advisory administrations and online apps that recommend universities but they ask huge consultancy fees and online apps are not accurate. So, the aim of this research is to develop a model that predict the percentage of chances into the university accurately. This model provides also the analysis of scores versus chance of prediction based on historical data so that students can understand whether their profile is suitable or not. The proposed model uses linear regression and random forestalgorithms but cat boost algorithm is giving highest accuracy.

1.2 Purpose

The primary purpose of the University Admit Eligibility Predictor is to help the student to find the chance to get their desired University and the percentage of getting them inside the University with surity. This give them a fair idea about their admission chances in a particular university. This analysis should also help students who are currently preparing or will be preparing to get a better idea.

2. LITERATURE SURVEY

2.1 Existing problem

Decision making by applying data mining methods is being used in many service organizations. Educational bodies gradually started to use the business intelligence techniques to identify the current progress in their institutions. Numerous factors which have an impact in academia will be vivid to the educationalists while applying data mining techniques on the academic data. By employing the data mining methodologies, we could identify different patterns which aid institutions to take strategic decisions to improve the students' academic performance. Potential graduate students will have a dilemma on identifying the universities for their post graduate admissions and on the other hand an average graduate student would be uncertain on getting post graduate admission in a reputed university based on their academic scores. In this study, we applied the classification techniques such as Logistic Regression, KNN Classification, Support Vector Classification, Naive Bayes Classification, Decision Tree Classification and Random Forest Classification on the given academic admission dataset.

2.2 References

[1] Selvaprabu Jeganathan, Saravanan Parthasarathy and P. M. Ashok Kumar, "PREDICTING THE POST GRADUATE ADMISSIONS USING CLASSIFICATION TECHNIQUES"

[2] Akkem Yaganteeswarudu, "MULTI DISEASE PREDICTION MODEL BYUSING MACHINE LEARNING AND FLASK API"

[3] A. Sivasangari, V. Shivani, Y. Bindhu, D. Deepa, R. Vignesh, ":

PREDICTION PROBABILITY OF GETTING AN ADMISSION INTO A UNIVERSITYUSING ML"

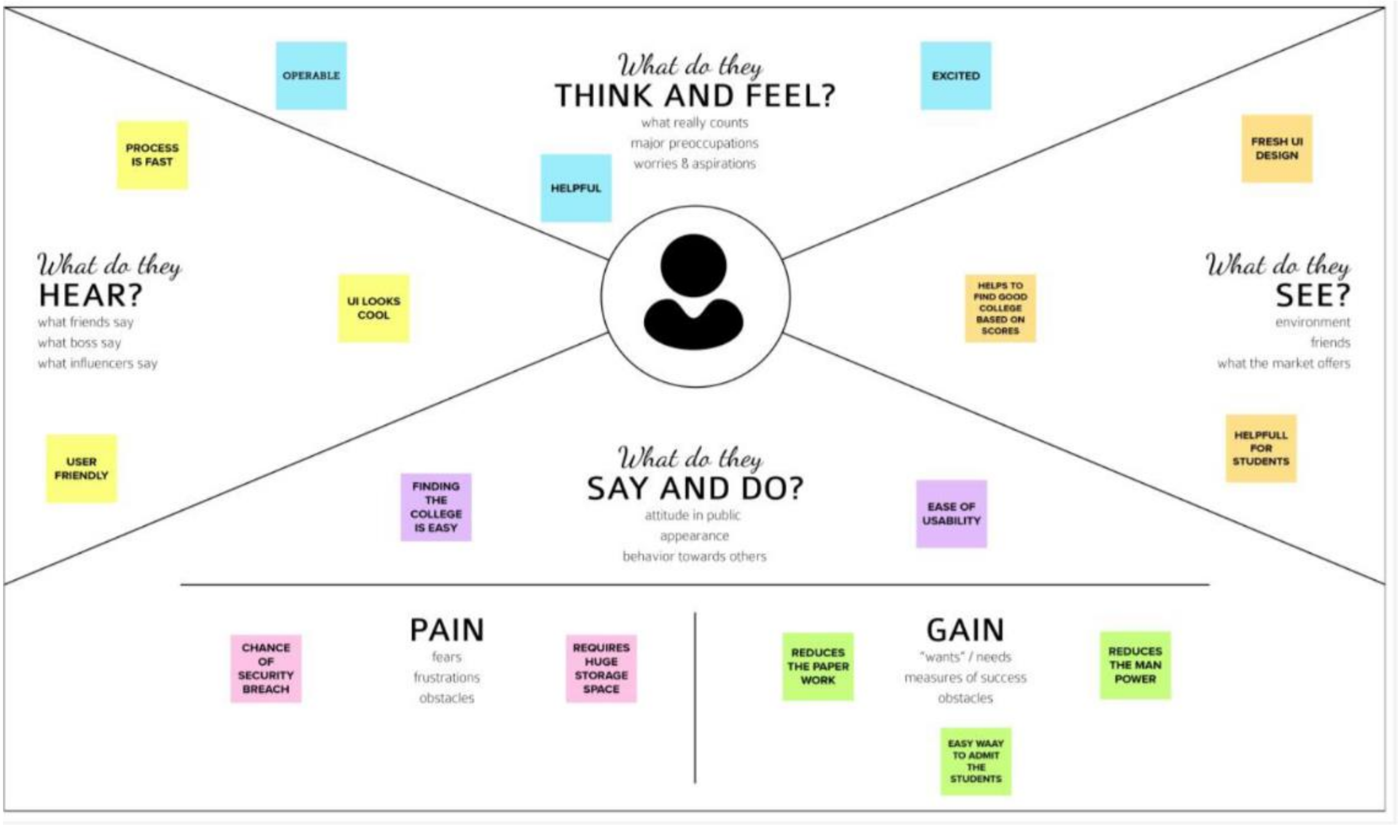
[4] S. Sridhar, S. Mootha and S. Kolagati, "A UNIVERSITY ADMISSIONPREDICTION SYSTEM USING STACKED ENSEMBLE LEARNING"

2.3 Problem Statement Definition

Students are often worried about their chances of admission to University. The aim of this project is to help students in shortlisting universities with their profiles. The predicted output gives them a fair idea about their admission chances in a particular university. This analysis should also help students who are currently preparing or will be preparing to get a better idea.

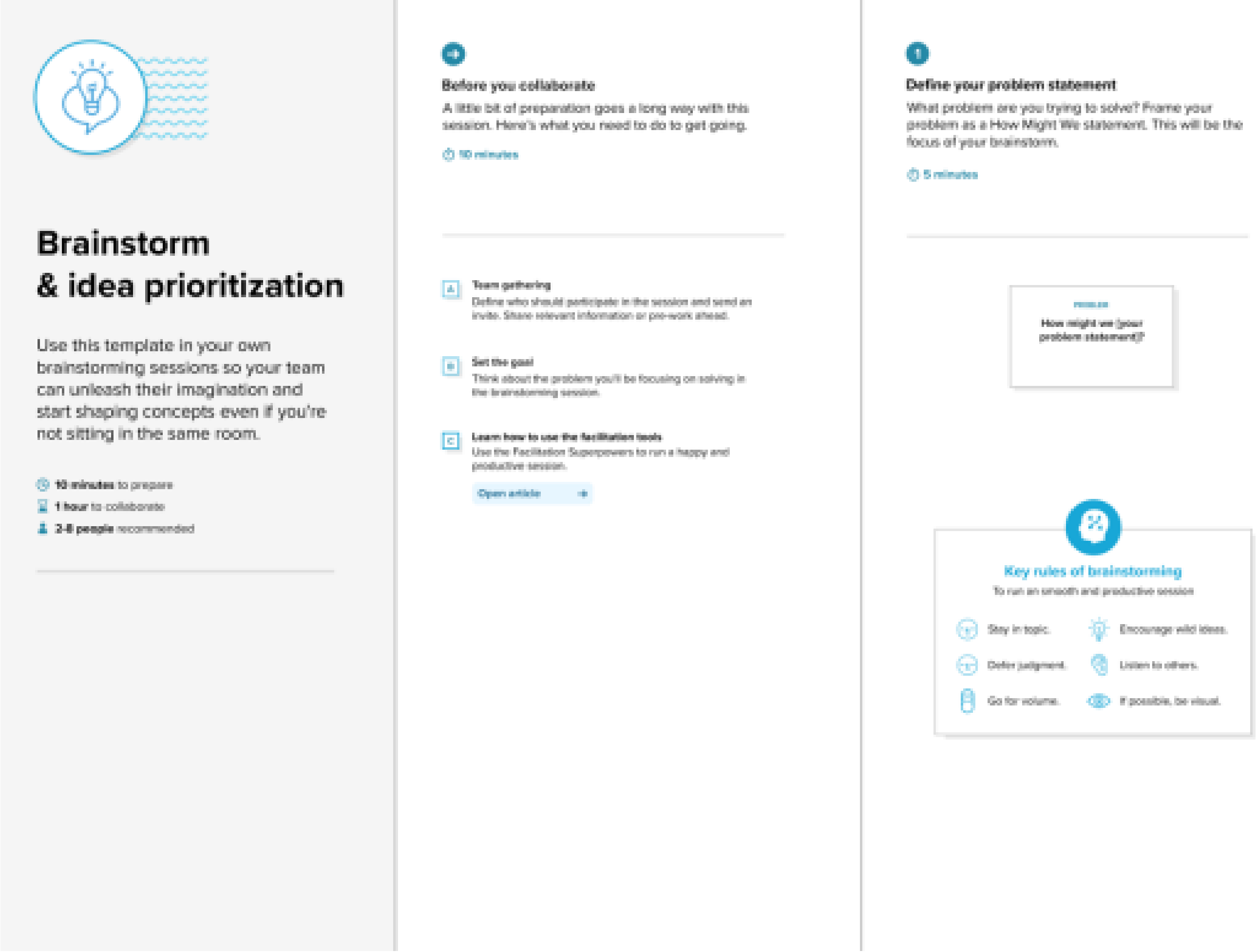
3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming

Ideation & Brainstorming3.3



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**
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B **Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.

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

Open article →

1 **Define your problem statement**

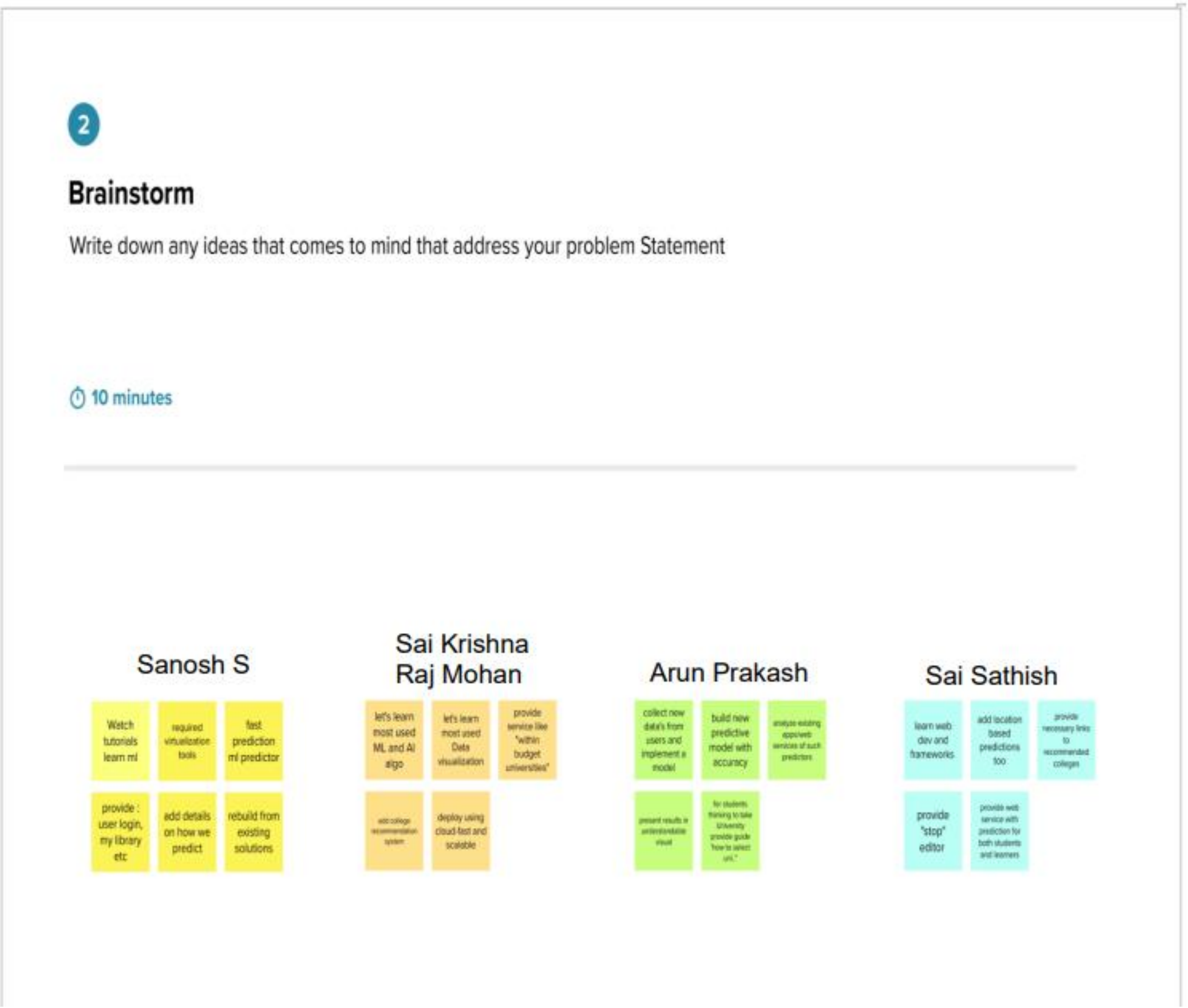
What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

PROBLEM
How might we [your problem statement]?

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.



2

Brainstorm

Write down any ideas that comes to mind that address your problem Statement

10 minutes

Sanosh S

- Watch tutorials learn ml
- required virtualization tools
- fast prediction ml predictor
- provide : user login, my library etc
- add details on how we predict
- rebuild from existing solutions

Sai Krishna Raj Mohan

- let's learn most used ML and AI algo
- let's learn most used Data visualization
- provide service like "within budget universities"
- add college recommendation system
- deploy using cloud-fast and scalable

Arun Prakash

- collect new data's from users and implement a model
- build new predictive model with accuracy
- analyze existing apps/web services of such predictors
- present results in understandable visual
- for students thinking to take University provide guide "how to select uni."

Sai Sathish

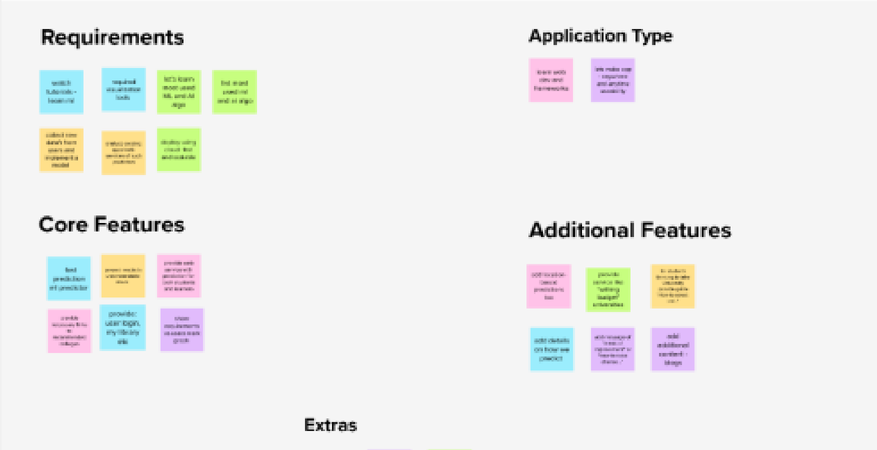
- learn web dev and frameworks
- add location based predictions too
- provide necessary links to recommended colleges
- provide "stop" editor
- provide web service with prediction for both students and learners

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, 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

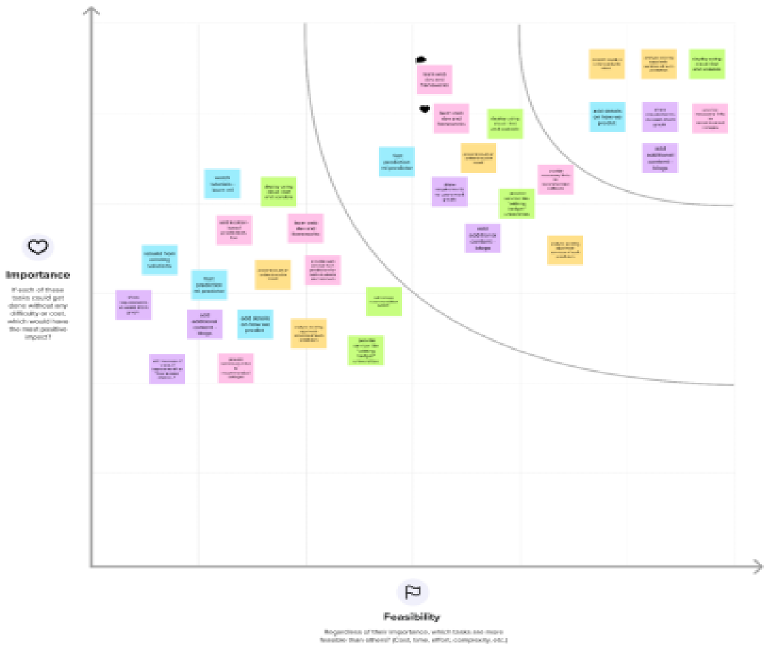

Requirements
watch tutorials - learn ml
required visualization tools
let's learn most used ML and AI algo
list most used ml and ai algo
Application Type
learn web dev and frameworks
Core Features
best prediction of predictor
provide user login, my library etc
Additional Features
provide service like "editing budget" universities
add details on how we predict
add additional content - blogs
Extras

4

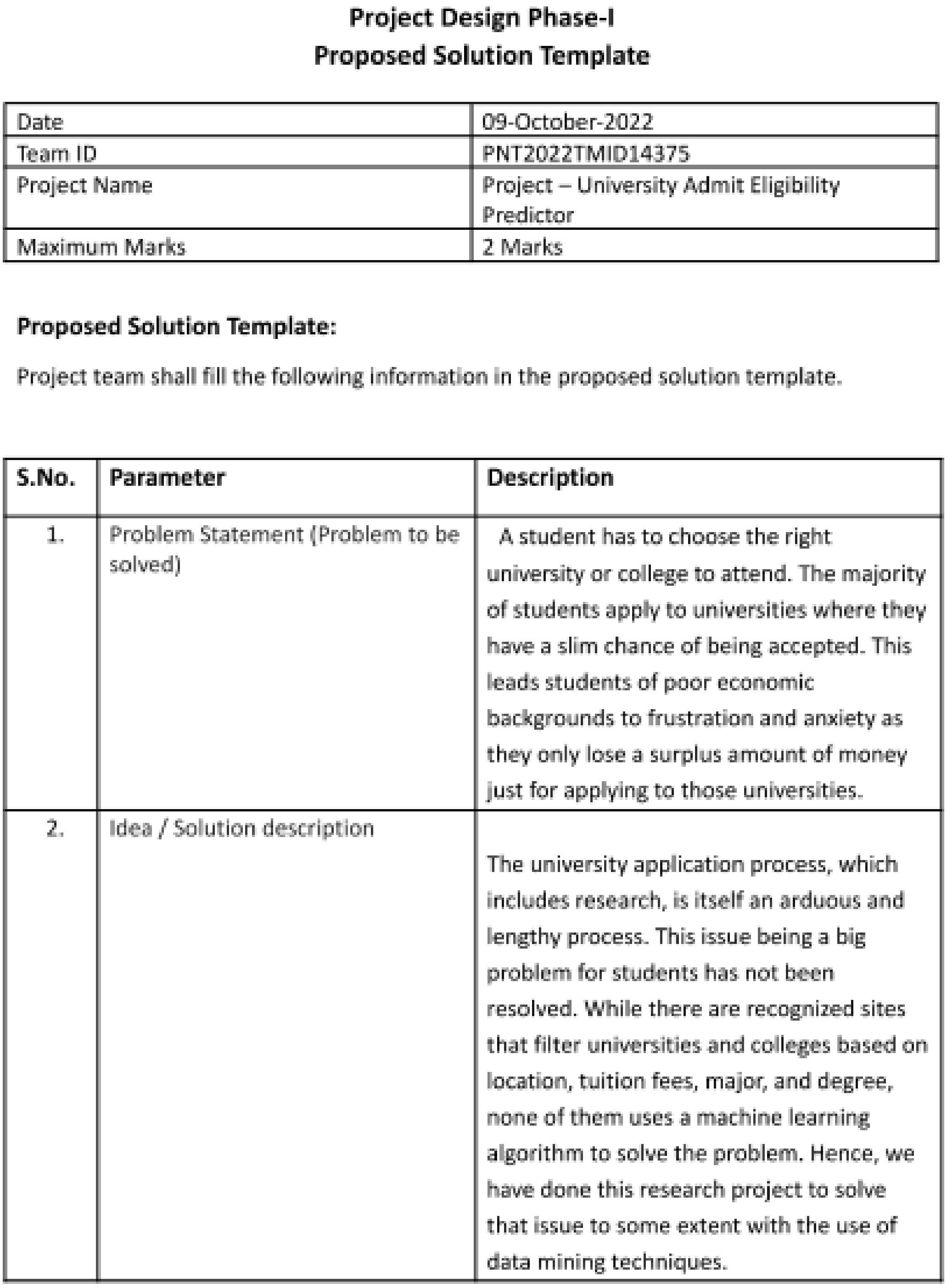
Prioritize

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



3.3 Proposed Solution



Project Design Phase-I
Proposed Solution Template

Date	09-October-2022
Team ID	PNT2022TMID14375
Project Name	Project – University Admit Eligibility Predictor
Maximum Marks	2 Marks

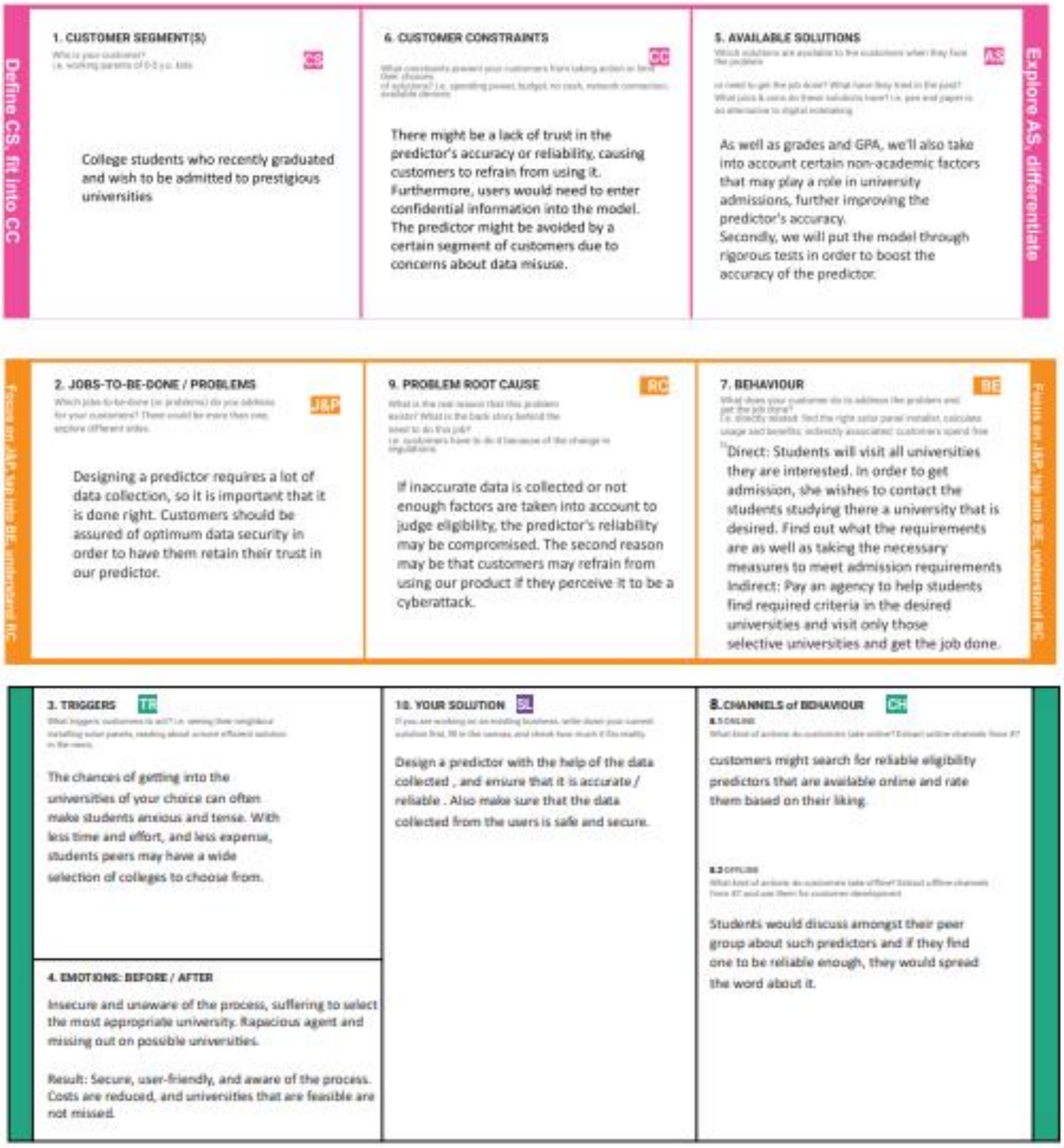
Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	A student has to choose the right university or college to attend. The majority of students apply to universities where they have a slim chance of being accepted. This leads students of poor economic backgrounds to frustration and anxiety as they only lose a surplus amount of money just for applying to those universities.
2.	Idea / Solution description	The university application process, which includes research, is itself an arduous and lengthy process. This issue being a big problem for students has not been resolved. While there are recognized sites that filter universities and colleges based on location, tuition fees, major, and degree, none of them uses a machine learning algorithm to solve the problem. Hence, we have done this research project to solve that issue to some extent with the use of data mining techniques.

3.	Novelty / Uniqueness	In addition to the application process itself being a challenging one, students require a great deal of dedication and effort to complete the overall application process. If students were relieved from the step of selecting the best colleges and universities to apply to, it would definitely make their life easier.
4.	Social Impact / Customer Satisfaction	Graduates who might be confused about their future with respect to university admissions can benefit from this predictor. Students can apply to universities based on their chances of eligibility.
5.	Business Model (Revenue Model)	Financially, this project could benefit from the students' admission fees but they may want to select their college in advance. However, that is what this project does for prediction. In this project, this problem has been addressed by modeling a recommender system based on various classification algorithms. The required data was obtained from thegradcafe.com. The data set was used to train various models and one optimal model and some similar property-bearing universities were recommended so that a student's chances of getting into the university were maximized.
6.	Scalability of the Solution	In this project, this problem has been addressed by modelling a recommender system based on various classification algorithms. To predict the best University for a student, his or her GPA, GRE (Verbal and Quant) Score, and TOEFL Score are used as attributes. K nearest neighbour has been applied to predict best University and K means clustering has been used to find more similar universities. Support Vector Machine and Random forest has been used to predict the admission chance of particular student on specific University.

3.4 Problem Solution fit



Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Who is your customer?
i.e. working parents of 0-5 y.o. kids

College students who recently graduated and wish to be admitted to prestigious universities

6. CUSTOMER CONSTRAINTS CC

What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices

There might be a lack of trust in the predictor's accuracy or reliability, causing customers to refrain from using it. Furthermore, users would need to enter confidential information into the model. The predictor might be avoided by a certain segment of customers due to concerns about data misuse.

5. AVAILABLE SOLUTIONS AS

Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking

As well as grades and GPA, we'll also take into account certain non-academic factors that may play a role in university admissions, further improving the predictor's accuracy.
Secondly, we will put the model through rigorous tests in order to boost the accuracy of the predictor.

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS J&P

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

Designing a predictor requires a lot of data collection, so it is important that it is done right. Customers should be assured of optimum data security in order to have them retain their trust in our predictor.

9. PROBLEM ROOT CAUSE RC

What is the real reason that this problem exists? What is the back story behind the need to do this job?
i.e. customers have to do it because of the change in regulations.

If inaccurate data is collected or not enough factors are taken into account to judge eligibility, the predictor's reliability may be compromised. The second reason may be that customers may refrain from using our product if they perceive it to be a cyberattack.

7. BEHAVIOUR BE

What does your customer do to address the problem and get the job done?
i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free

"Direct: Students will visit all universities they are interested. In order to get admission, she wishes to contact the students studying there a university that is desired. Find out what the requirements are as well as taking the necessary measures to meet admission requirements
Indirect: Pay an agency to help students find required criteria in the desired universities and visit only those selective universities and get the job done.

Focus on J&P, tap into BE, understand RC

3. TRIGGERS TR

What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.

The chances of getting into the universities of your choice can often make students anxious and tense. With less time and effort, and less expense, students peers may have a wide selection of colleges to choose from.

4. EMOTIONS: BEFORE / AFTER

Insecure and unaware of the process, suffering to select the most appropriate university. Rapacious agent and missing out on possible universities.

Result: Secure, user-friendly, and aware of the process. Costs are reduced, and universities that are feasible are not missed.

10. YOUR SOLUTION SL

If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality.

Design a predictor with the help of the data collected , and ensure that it is accurate / reliable . Also make sure that the data collected from the users is safe and secure.

8. CHANNELS of BEHAVIOUR CH

8.1 ONLINE
What kind of actions do customers take online? Extract online channels from #7

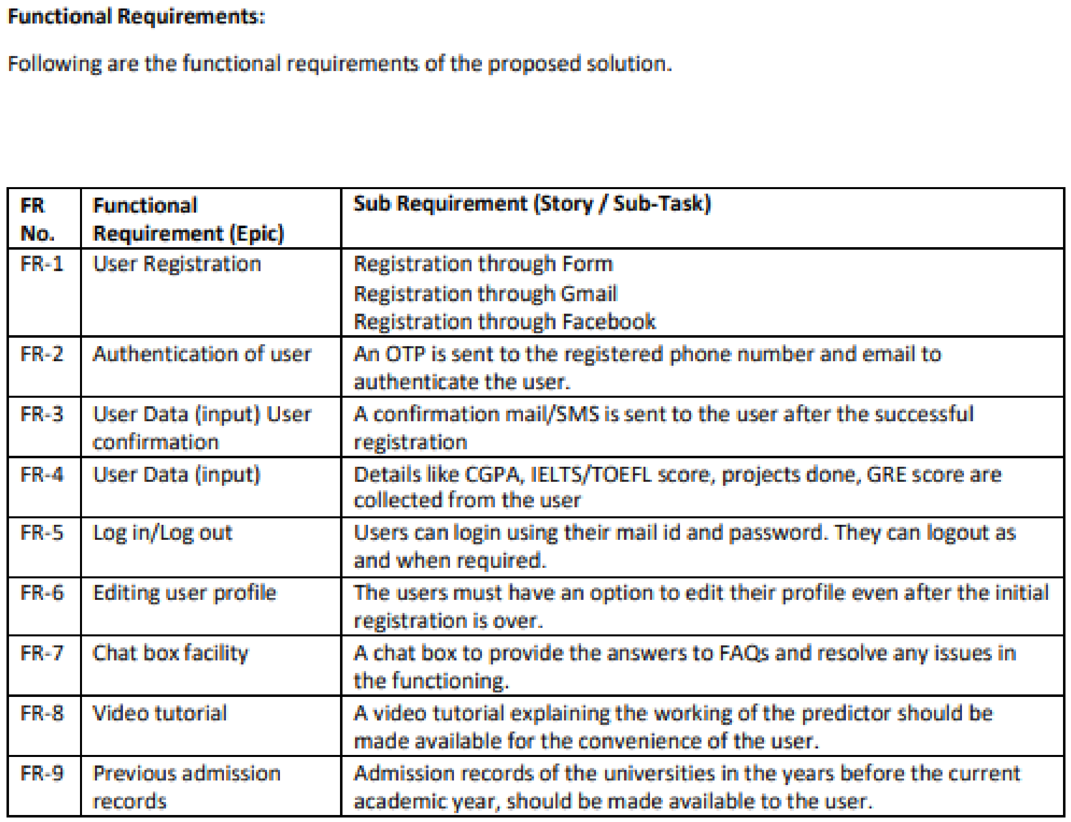
customers might search for reliable eligibility predictors that are available online and rate them based on their liking.

8.2 OFFLINE
What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development

Students would discuss amongst their peer group about such predictors and if they find one to be reliable enough, they would spread the word about it.

4. REQUIREMENT ANALYSIS

4.1 Functional requirement

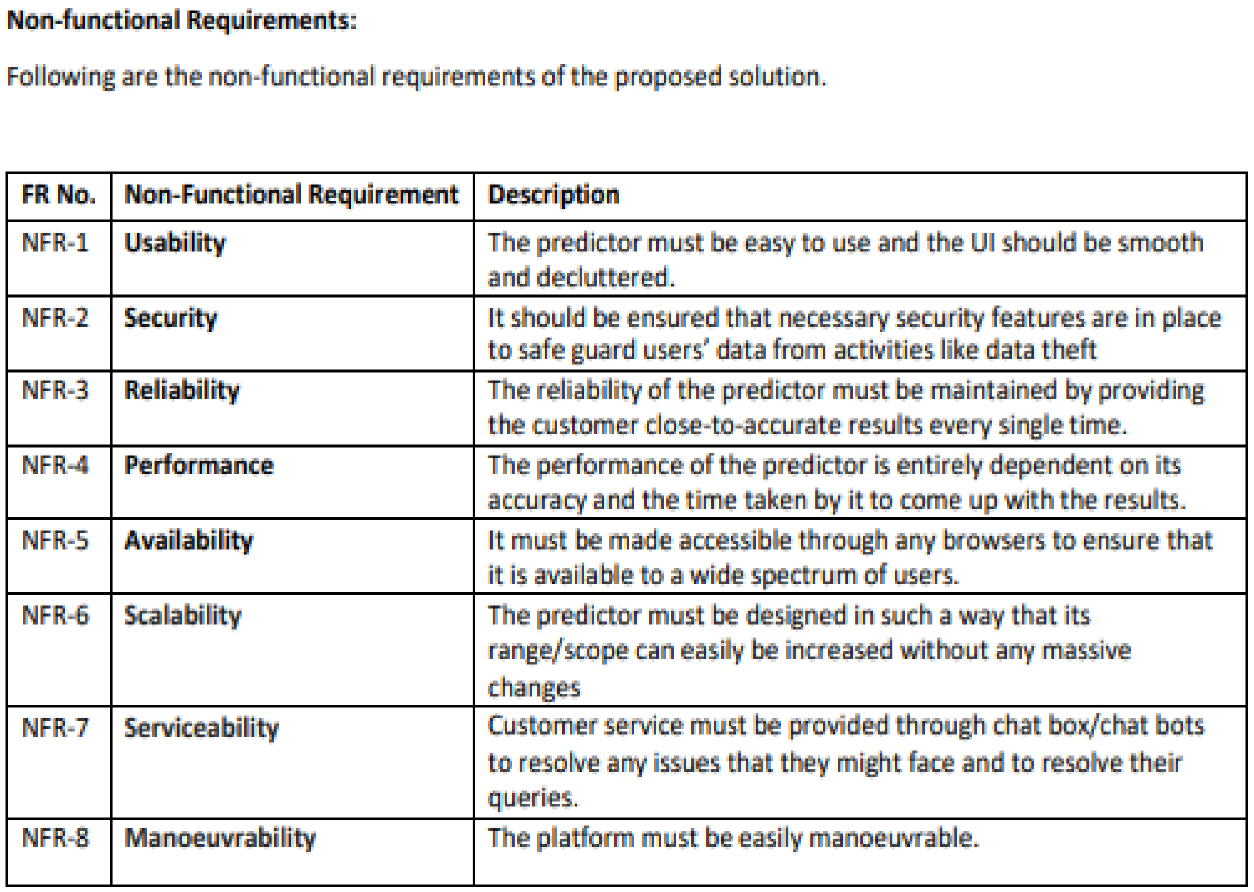


Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through Facebook
FR-2	Authentication of user	An OTP is sent to the registered phone number and email to authenticate the user.
FR-3	User Data (input) User confirmation	A confirmation mail/SMS is sent to the user after the successful registration
FR-4	User Data (input)	Details like CGPA, IELTS/TOEFL score, projects done, GRE score are collected from the user
FR-5	Log in/Log out	Users can login using their mail id and password. They can logout as and when required.
FR-6	Editing user profile	The users must have an option to edit their profile even after the initial registration is over.
FR-7	Chat box facility	A chat box to provide the answers to FAQs and resolve any issues in the functioning.
FR-8	Video tutorial	A video tutorial explaining the working of the predictor should be made available for the convenience of the user.
FR-9	Previous admission records	Admission records of the universities in the years before the current academic year, should be made available to the user.

4.2 Non-Functional requirements



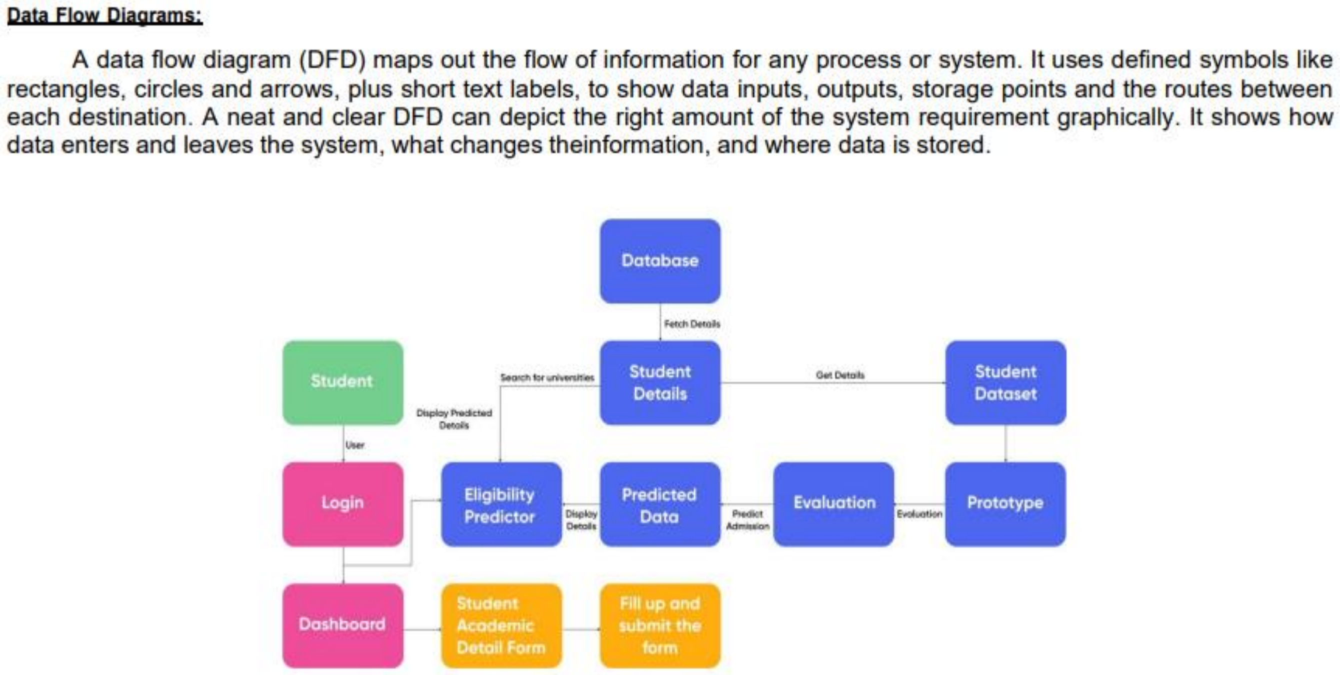
Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The predictor must be easy to use and the UI should be smooth and decluttered.
NFR-2	**Security**	It should be ensured that necessary security features are in place to safe guard users' data from activities like data theft
NFR-3	**Reliability**	The reliability of the predictor must be maintained by providing the customer close-to-accurate results every single time.
NFR-4	**Performance**	The performance of the predictor is entirely dependent on its accuracy and the time taken by it to come up with the results.
NFR-5	**Availability**	It must be made accessible through any browsers to ensure that it is available to a wide spectrum of users.
NFR-6	**Scalability**	The predictor must be designed in such a way that its range/scope can easily be increased without any massive changes
NFR-7	**Serviceability**	Customer service must be provided through chat box/chat bots to resolve any issues that they might face and to resolve their queries.
NFR-8	**Manoeuvrability**	The platform must be easily manoeuvrable.

5. PROJECT DESIGN

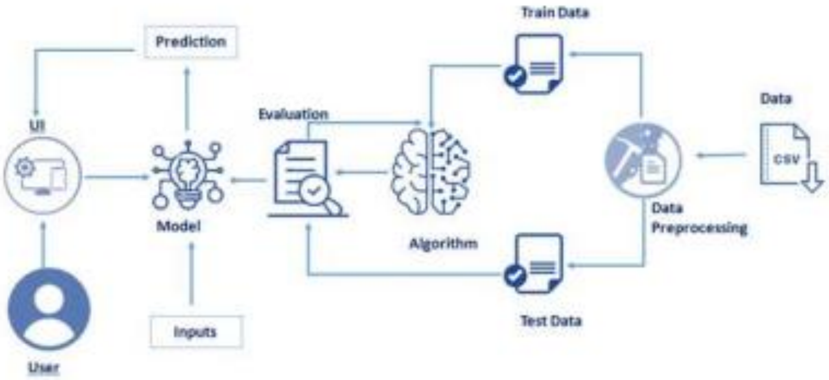
5.1 Data Flow Diagrams



Data Flow Diagrams:

A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes theinformation, and where data is stored.

5.2 Solution & Technical Architecture



Technical Architecture

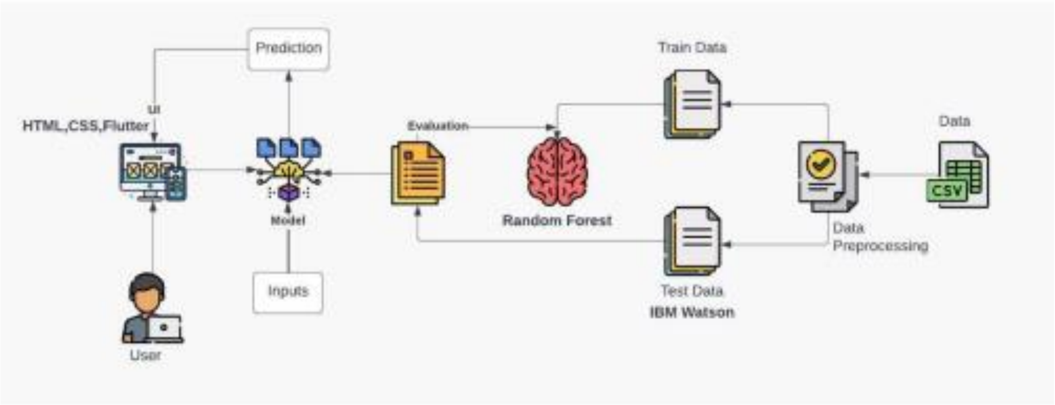


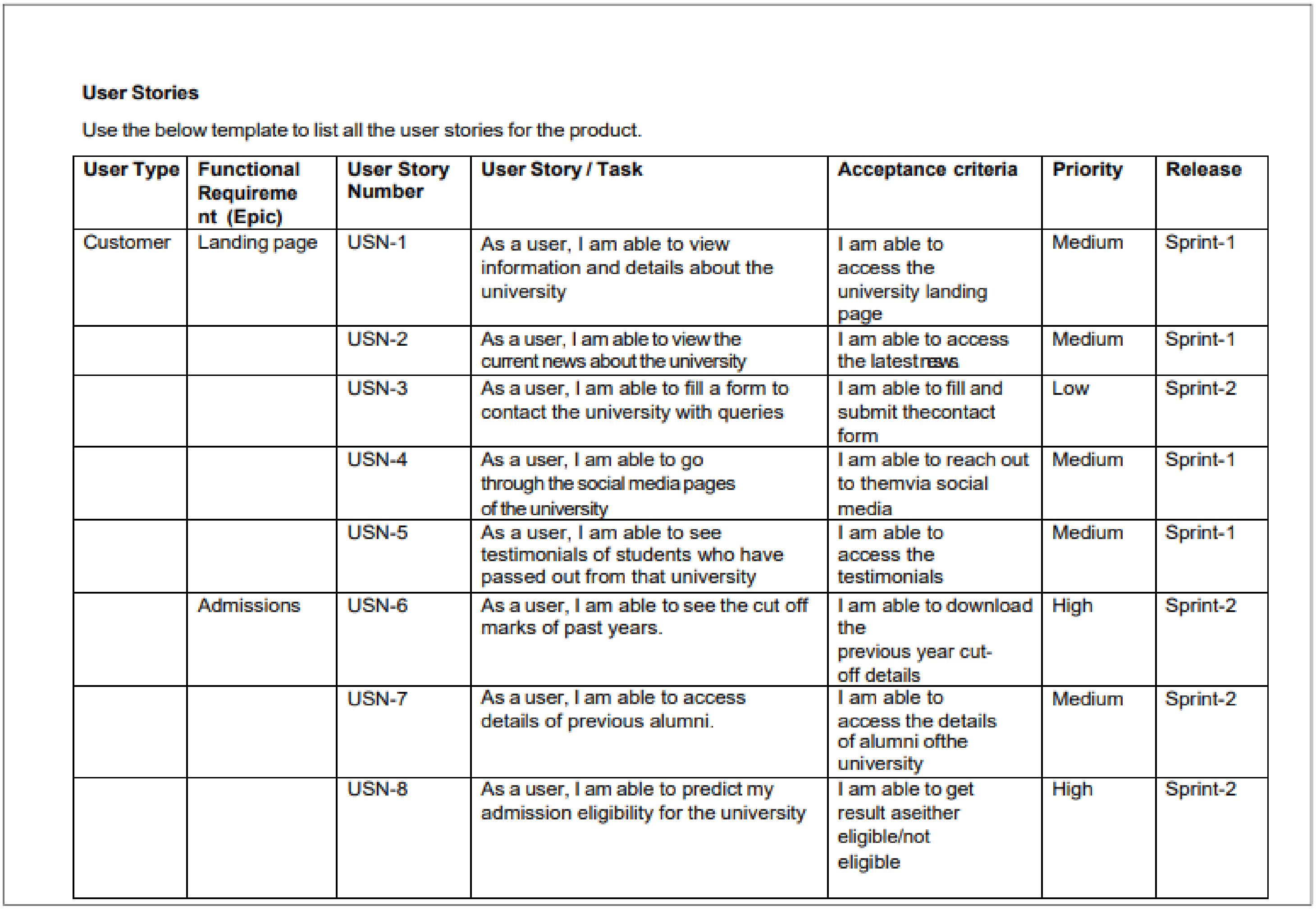
Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1	User Interface	How user interacts with application and its features.	HTML, CSS, JavaScript etc.
2	Application Logic-1	The user fills the data into his profile which is then fed into the model to calculate the chances	Python [Jupyter]
3	Application Logic-2	The model predicts the eligibility chances of the user for different universities based on the input data	IBM Watson STT, Python
4	Database	Data of the names of the universities and their corresponding cut-offs and exam scores for admission	Imported through pandas in a csv format
5	Machine Learning Model	Predicts the output using the ML algorithm	KNN, Decision tree, Random Forest, etc.
6	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud	IBM cloud, local cloud

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Python for backend and Flask for front end	Python, Flask
2.	Security Implementations	To ensure the security of the data provided by the user	Encryption, OWASP
3.	Scalable Architecture	The model is scalable in nature because its scope can be increased easily.	Random forest ML algorithm, Logistic regression
4.	Availability	The model is available to anyone, anywhere, anytime	IBM load balancer
5.	Performance	The chances are predicted with a greater accuracy	Random forest ML algorithm

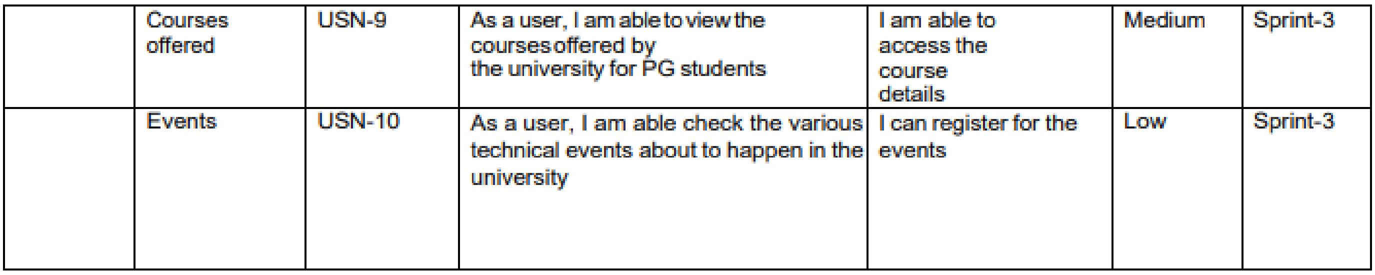
5.3 User Stories



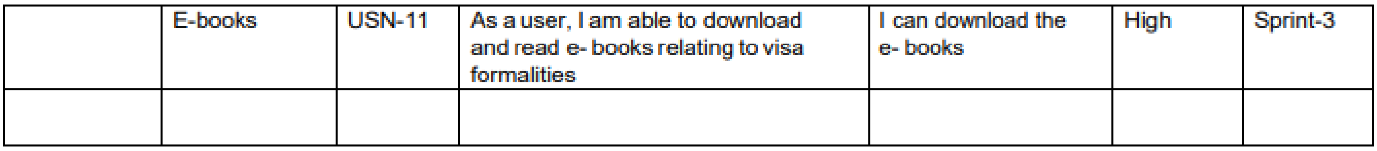
User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer	Landing page	USN-1	As a user, I am able to view information and details about the university	I am able to access the university landing page	Medium	Sprint-1
		USN-2	As a user, I am able to view the current news about the university	I am able to access the latestnews	Medium	Sprint-1
		USN-3	As a user, I am able to fill a form to contact the university with queries	I am able to fill and submit thecontact form	Low	Sprint-2
		USN-4	As a user, I am able to go through the social media pages of the university	I am able to reach out to themvia social media	Medium	Sprint-1
		USN-5	As a user, I am able to see testimonials of students who have passed out from that university	I am able to access the testimonials	Medium	Sprint-1
	Admissions	USN-6	As a user, I am able to see the cut off marks of past years.	I am able to download the previous year cut-off details	High	Sprint-2
		USN-7	As a user, I am able to access details of previous alumni.	I am able to access the details of alumni ofthe university	Medium	Sprint-2
		USN-8	As a user, I am able to predict my admission eligibility for the university	I am able to get result aseither eligible/not eligible	High	Sprint-2



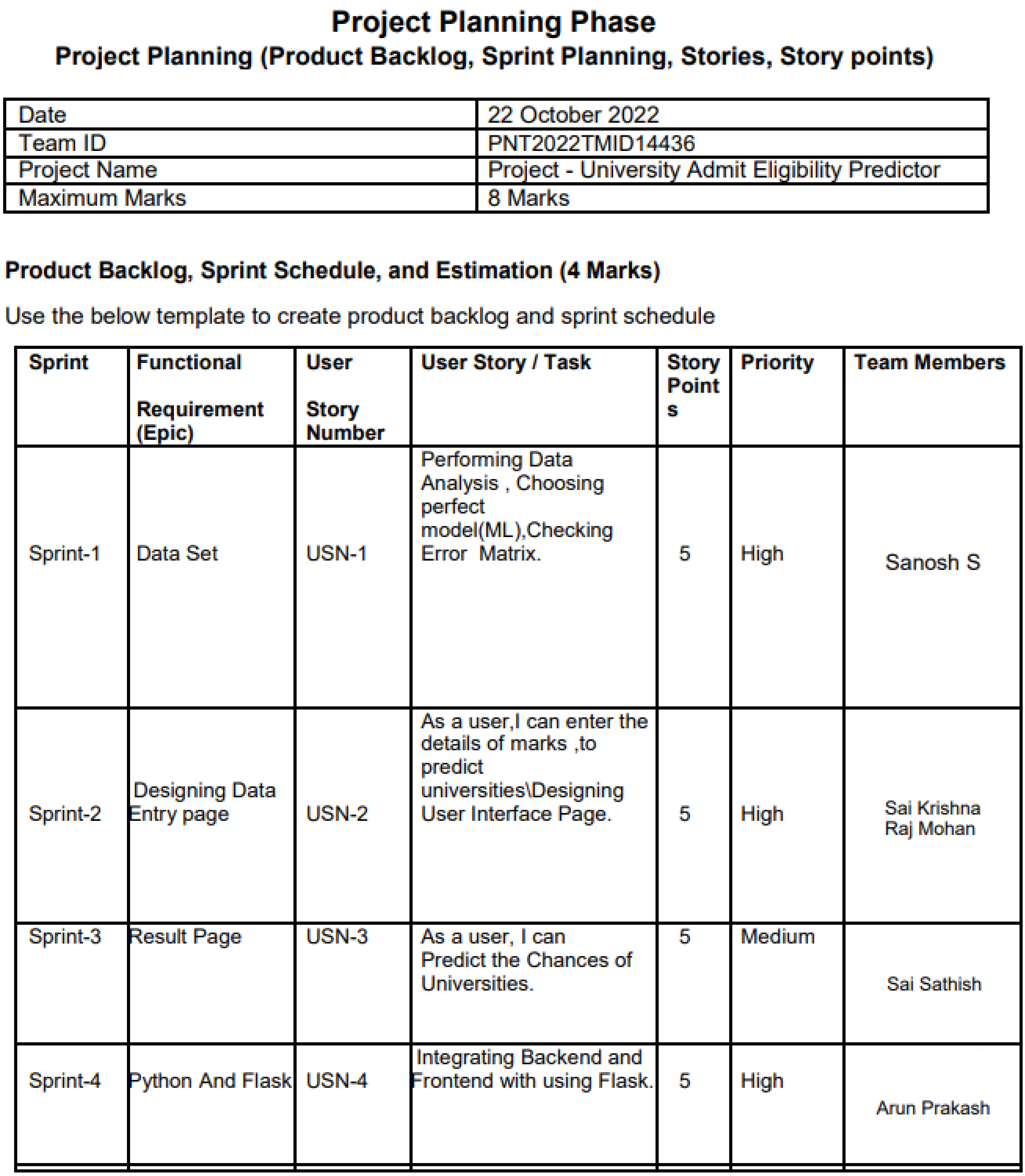
	Courses offered	USN-9	As a user, I am able to view the courses offered by the university for PG students	I am able to access the course details	Medium	Sprint-3
	Events	USN-10	As a user, I am able check the various technical events about to happen in the university	I can register for the events	Low	Sprint-3



	E-books	USN-11	As a user, I am able to download and read e- books relating to visa formalities	I can download the e- books	High	Sprint-3

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation



Project Planning Phase

Project Planning (Product Backlog, Sprint Planning, Stories, Story points)

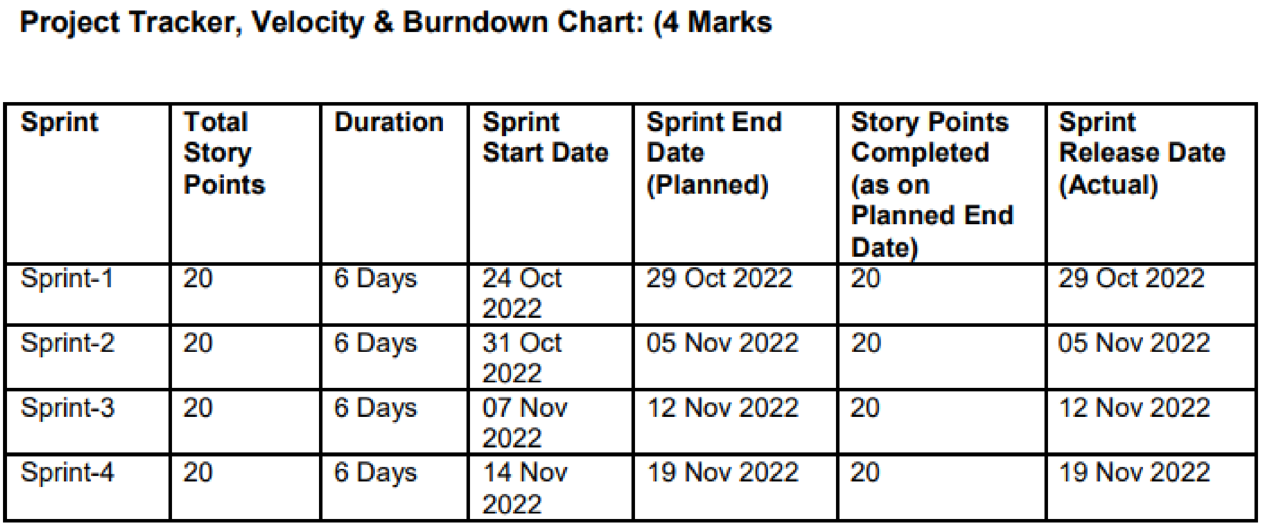
Date	22 October 2022
Team ID	PNT2022TMID14436
Project Name	Project - University Admit Eligibility Predictor
Maximum Marks	8 Marks

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

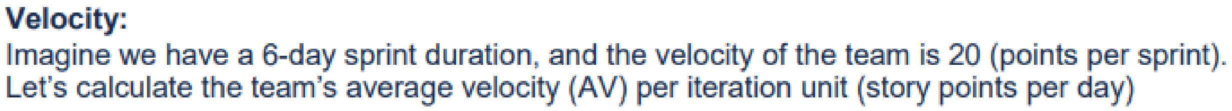
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Set	USN-1	Performing Data Analysis , Choosing perfect model(ML),Checking Error Matrix.	5	High	Sanosh S
Sprint-2	Designing Data Entry page	USN-2	As a user,I can enter the details of marks ,to predict universities\Designing User Interface Page.	5	High	Sai Krishna Raj Mohan
Sprint-3	Result Page	USN-3	As a user, I can Predict the Chances of Universities.	5	Medium	Sai Sathish
Sprint-4	Python And Flask	USN-4	Integrating Backend and Frontend with using Flask.	5	High	Arun Prakash

6.3 Sprint Delivery Schedule



Project Tracker, Velocity & Burndown Chart: (4 Marks

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022



Velocity:

Imagine we have a 6-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

AV= SPRINT DURATION / VELOCITY = 20/6 =3.33

7. CODING & SOLUTIONING

7.1 Feature 1

- IBM Watson Platform
- Web UI
- Python Code
- HTML
- CSS
- JS

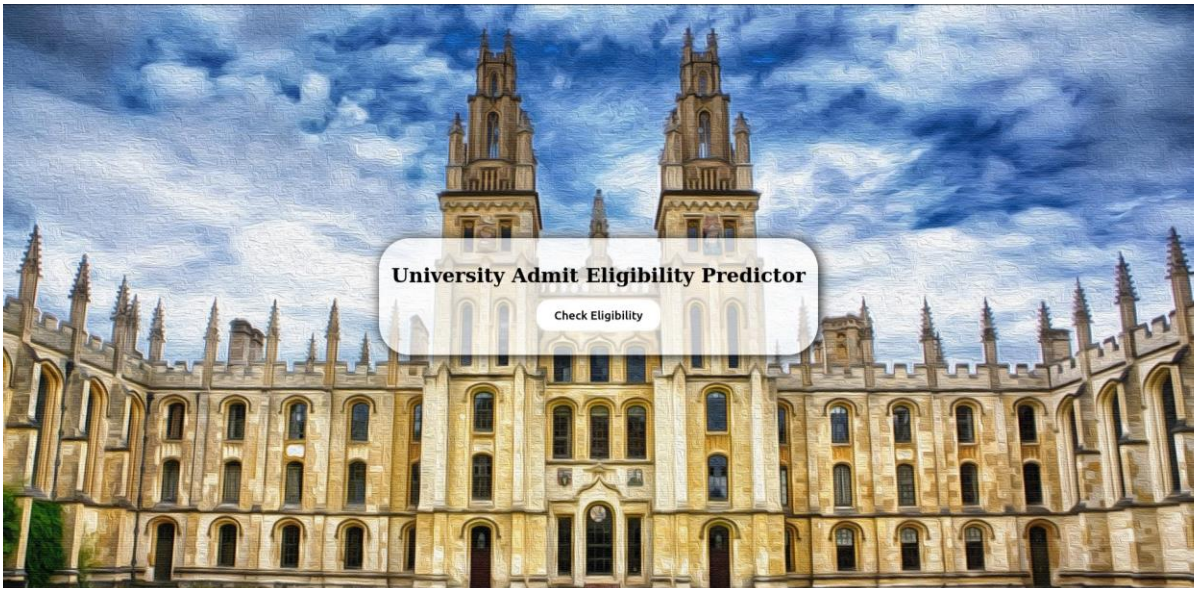
7.2 Feature 2

- Index
- Chance
- Nochance
- Demo2

8. TESTING AND RESULTS

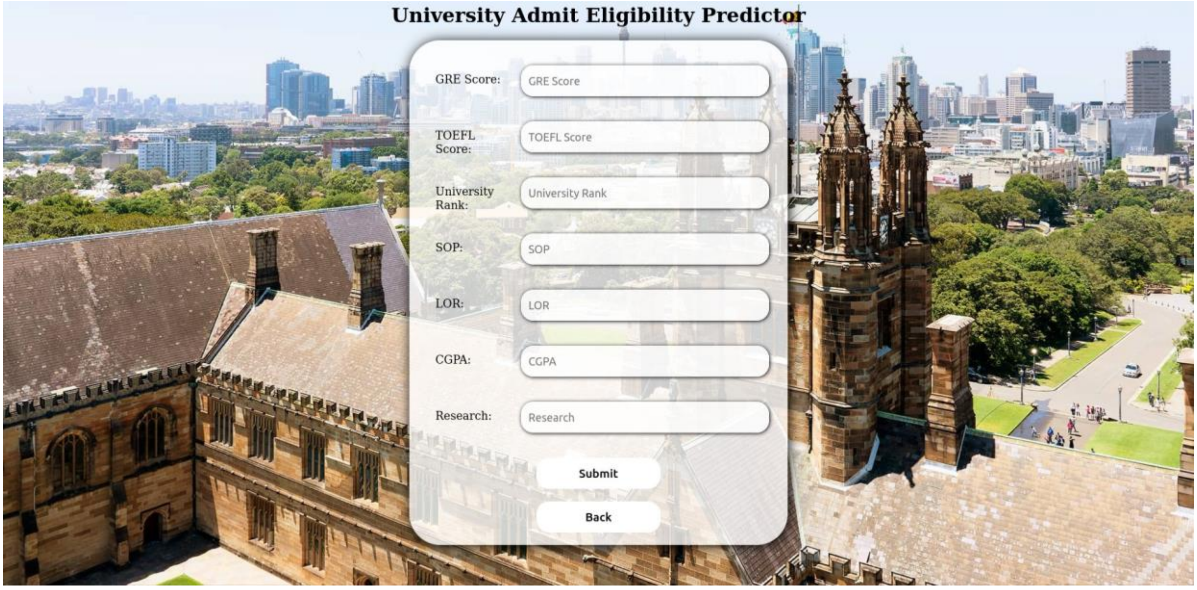
8.1 Test Cases

TEST CASE 1



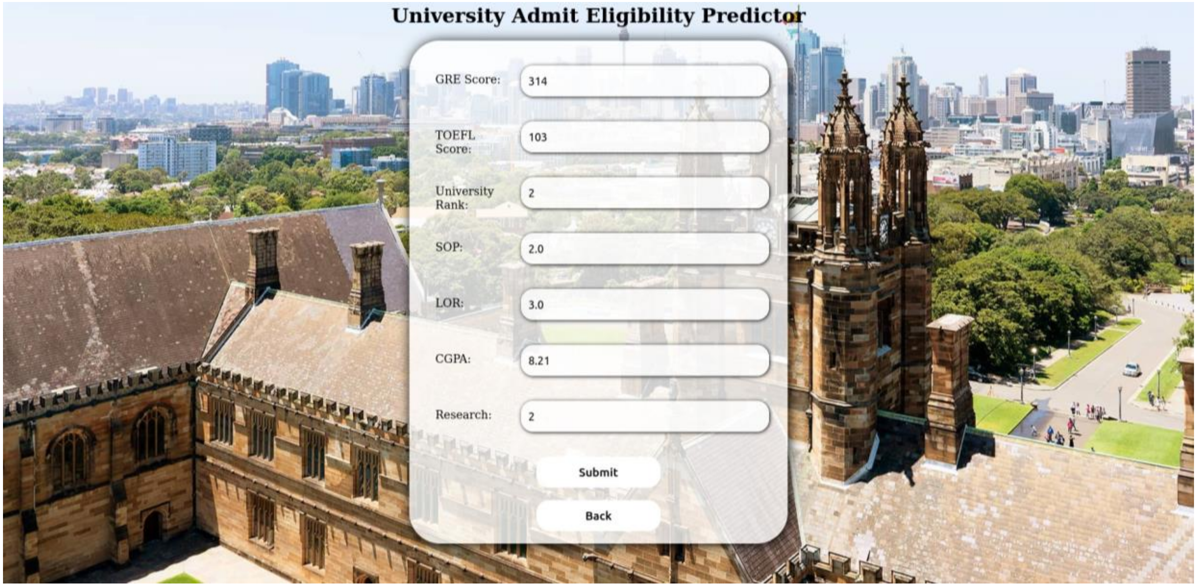
University Admit Eligibility Predictor

TEST CASE 2



University Admit Eligibility Predictor

TEST CASE 3



University Admit Eligibility Predictor

GRE Score: 314

TOEFL Score: 103

University Rank: 2

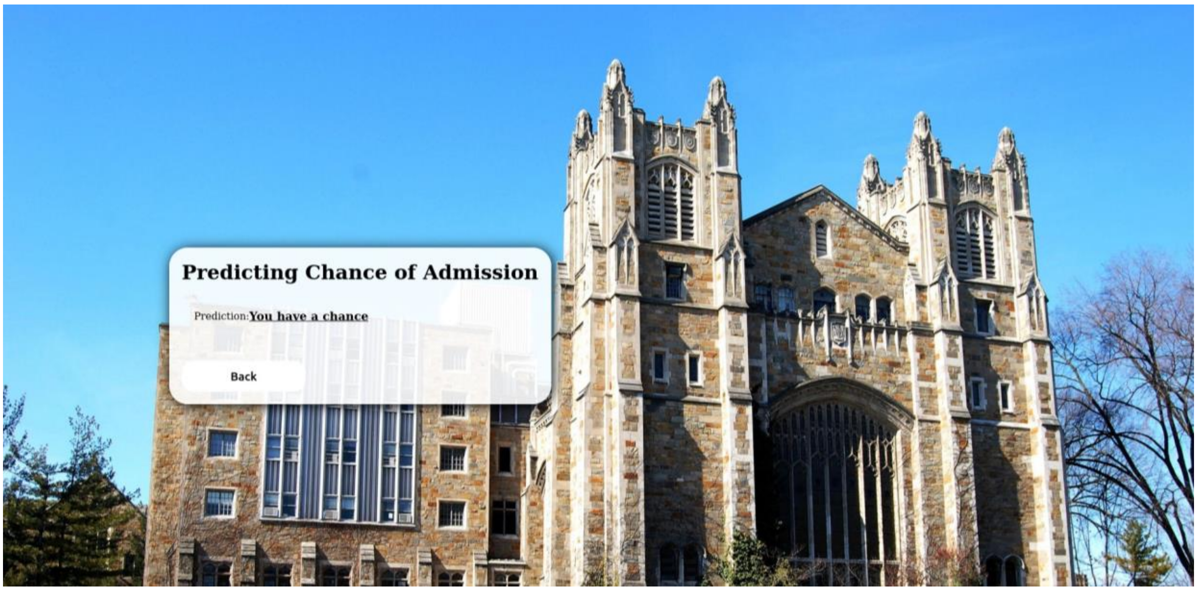
SOP: 2.0

LOR: 3.0

CGPA: 8.21

Research: 2

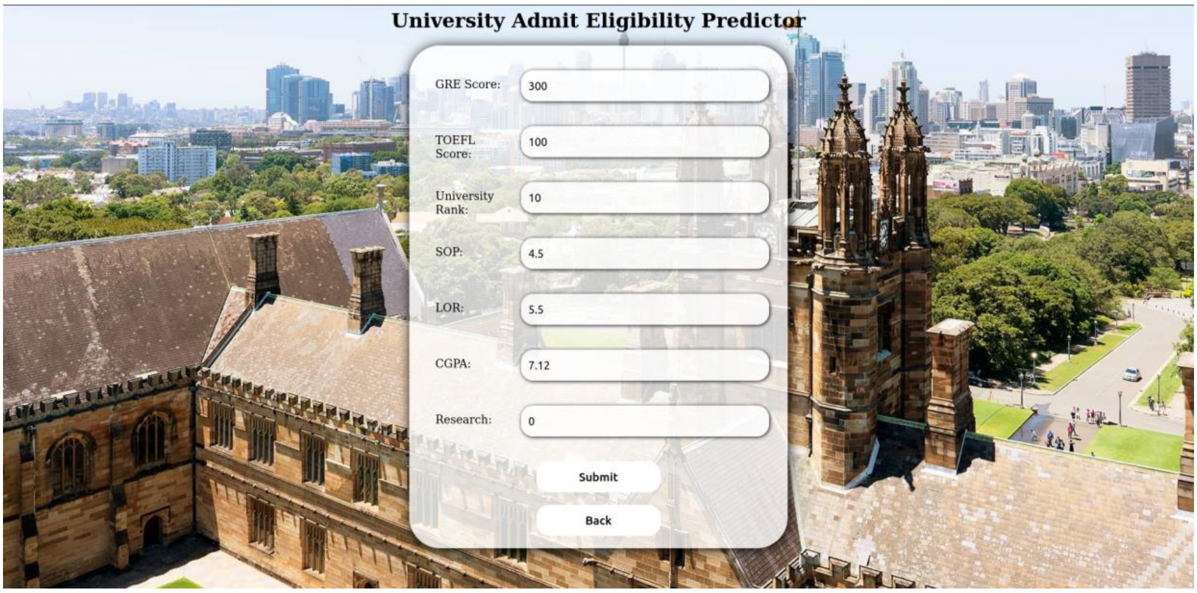
TEST CASE 4



Predicting Chance of Admission

Prediction: You have a chance

TEST CASE 5



University Admit Eligibility Predictor

GRE Score: 300

TOEFL Score: 100

University Rank: 10

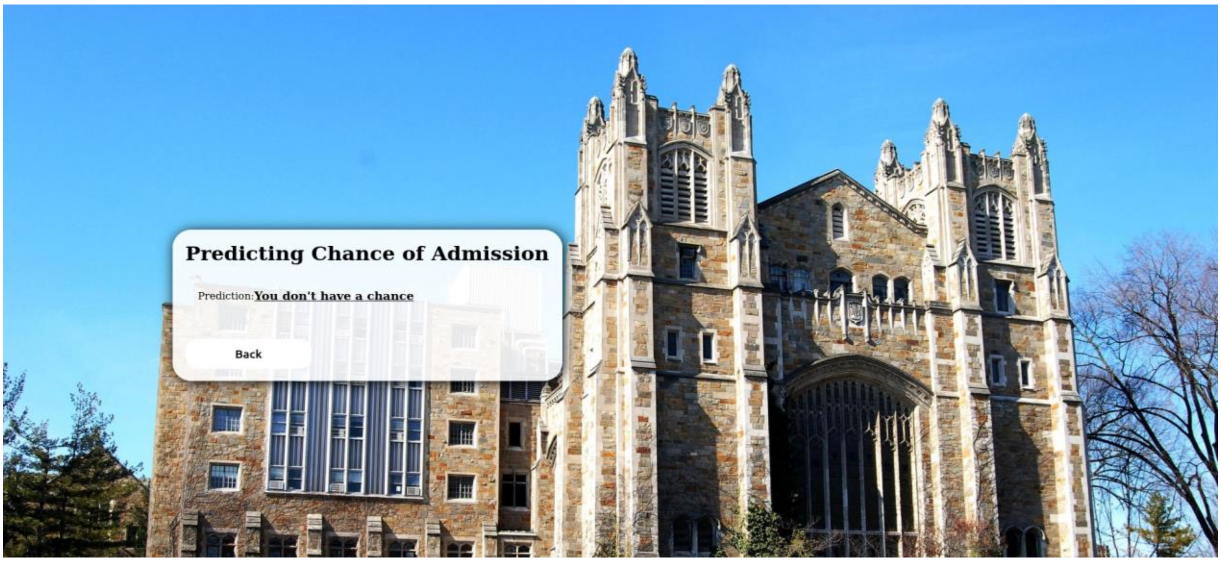
SOP: 4.5

LOR: 5.5

CGPA: 7.12

Research: 0

TEST CASE 6


Predicting Chance of Admission

Prediction:You don't have a chance

9. ADVANTAGES

- Easy prediction of University based on the scores secured.
- It helps student for making decision for choosing the right college.
- It avoids data redundancy and inconsistency.

10. DISADVANTAGES

- Only few selected university are available for the prediction.
- A system will provide inaccurate result if data entered incorrectly.

11. CONCLUSION

In University Admit Eligibility Predictor students can register with their personal as well as marks details for predicting the admission in the colleges and administrator can allot the seats for thr students.

12. FUTURE SCOPE

In the updated version of this software, it will contain features that we can select more number of universities for prediction and the system will provide correct results even if the data has been entered wrong.

13. APPENDIX

13.1 Source Code

```
from flask import Flask, render_template, request
import requests



API_KEY = "QTGabxzpqAyJDRG4AG1fjkymj3xr54Xz6-bMMK0v9WGt"
token_response                                                          =
    requests.post('https://iam.cloud.ibm.com/identity/token',
    data={"apikey":  API_KEY, "grant_type":  'urn:ibm:params:oauth:grant-
    type:apikey'})
mltoken = token_response.json()["access_token"]
header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' +
    mltoken}

app = Flask(_name_, static_url_path='')
@app.route('/')
def index():
   return render_template('index.html')

@app.route('/checkEligibility') def
checkEligibility():
   return render_template('Demo2.html')

@app.route('/predict', methods=['POST'])
def predict():
   greScore = int(request.form['greScore'])
   toeflScore = int(request.form['toeflScore'])
   univRank = int(request.form['univRank'])
   sop = float(request.form['sop'])
   lor = float(request.form['lor'])
   cgpa = float(request.form['cgpa'])
   research = int(request.form['research'])
     array_of_input_fields = ['greScore', 'toeflScore', 'univRank', 'sop',
    'lor','cgpa', 'research']
    array_of_values_to_be_scored = [greScore, toeflScore, univRank,
    sop,lor, cgpa, research]
       payload_scoring = {"input_data": [{"fields": [array_of_input_fields],
    "values": [array_of_values_to_be_scored]}]}
                     response_scoring = requests.post(https://us-
   south.ml.cloud.ibm.com/ml/v4/deployments/250158a7-805d-4e74-aecf-
   920a293e52e7/predictions?version=2022-11-18', json=payload_scoring,
   headers={'Authorization': 'Bearer ' + mltoken}) predictions =
   response_scoring.json()
   prediction = predictions['predictions'][0]['values'][0][0]

   if prediction:
      return render_template('chance.html')
   else:
      return render_template('noChance.html')


if__name__== "_main_":
   app.run()
```

13.2 GitHub

https://github.com/IBM-EPBL/IBM-Project-37384-1660306809

13.3 Project Demo Link

https://drive.google.com/file/d/18ZLJY0kvhNIkctmTY1mZnEWP6emGSuy6/view?usp=share_link