

Exploring a Feasible Platform for Project Management



TEAM MEMBERS

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Co – Supervisor

Mrs. Buddhima Atthanayaka

Agenda

- Here we are introducing our research
- Here we are discussing about our objects
- Here we are explaining our individual components
- Here we are concluding our research presentation





Introduction

- Project management is the process of planning, organizing, and managing resources to achieve specific goals and objectives within a given timeframe and budget.
- Effective project management ensures successful project delivery, efficient resource utilization, and alignment with organizational goals.
- Proposed Solution: Feasible Platform for Web Application

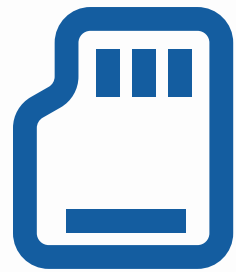
RESEARCH PROBLEM

- ▶ Why is an integrated platform necessary for effective project management?



MAIN OBJECTIVES

Evaluate the applicability and benefits of adopting agile project management practices for web application development.



Objective 01

Identify core APM principles and frameworks that can be implemented for web application projects



Objective 02

Develop a customized APM framework optimized for web application development life cycles. Provide recommendations for integration, adaptation, and continuous improvement of the APM framework for web teams

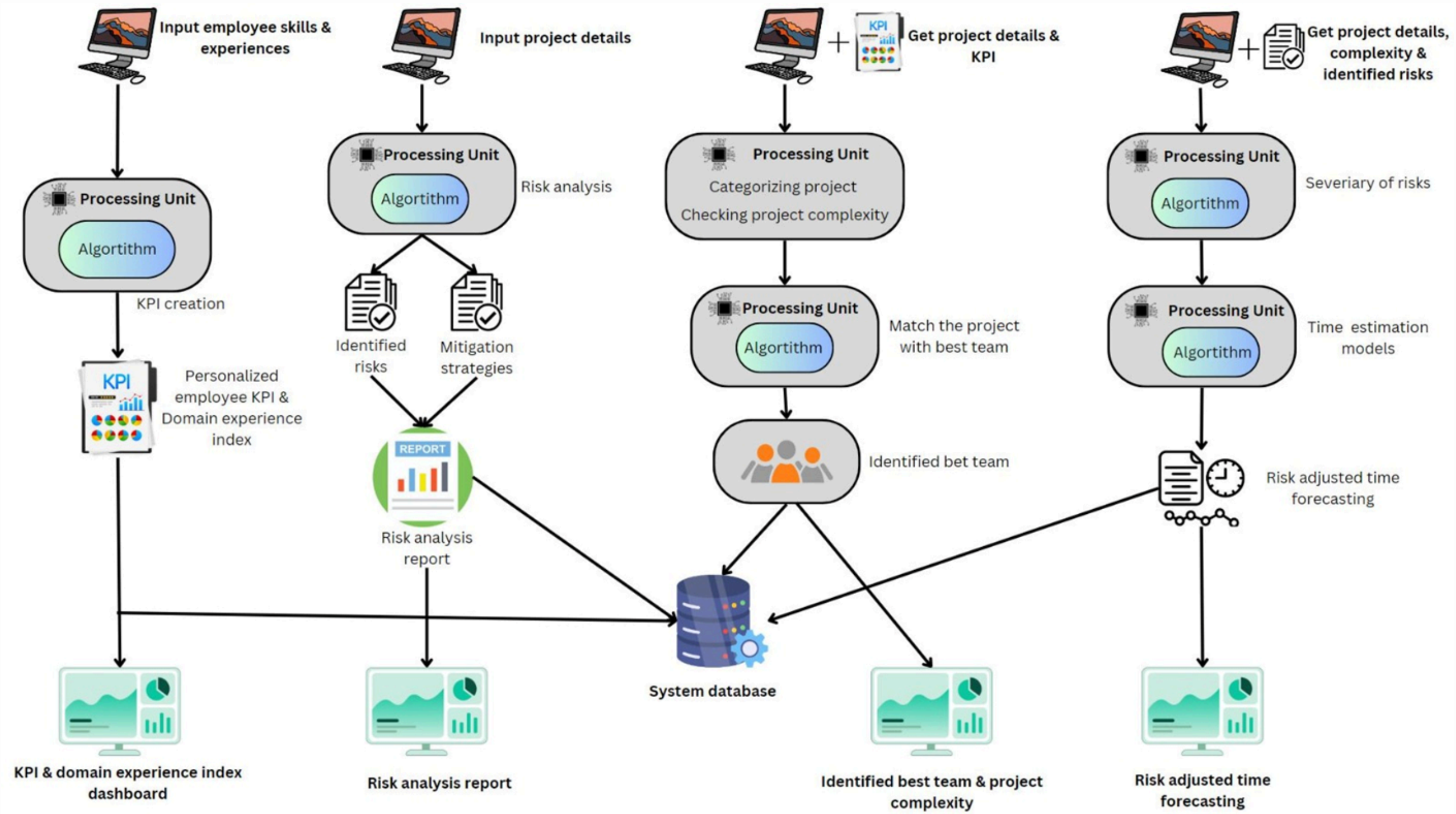


Objective 03

Review literature on current agile project management (APM) practices and frameworks used for software/web development.



SYSTEM DIAGRAM



Skill-based Employee KPI Generator

IT21073014 Pabasara J.D

Bachelor of Science (Hons) in Information Technology
Specializing in Information Systems Engineering
Component 01



The background of the slide is a photograph of an office environment. It shows several people working at their desks. On the left, a woman with curly hair is sitting at a desk with a laptop and a tablet. In the center, a man in a light blue shirt is sitting at a desk, looking at a laptop. On the right, a woman with long hair is sitting at a desk, also working. The desks are equipped with various office supplies like pens, paper, and water bottles. The overall atmosphere is professional and busy.

Introduction

- Automated systems that can generate customized KPIs based on employee skills and experience KPI needs to be develop based on the employee and different team.
- Monitor employee productivity and contribution.
- Key performance indicators (KPIs) are metrics that help quantify and track employee performance

RESEARCH QUESTION

- How to avoid time-consuming, low accuracy, and unrelated results by automating KPI generation?
- How to include employee skills and experiences rather than general KPI?
- How to create the right KPI based on skills, to effectively create tasks and develop skills?



Objectives

To develop an automated system for generating tailored KPIs for employees based on their skills and experience

Objective 01

Analyze various skills and experience required for different roles

Objective 02

Create a user-friendly interface for entering employee details

Objective 03

Generate customized KPI metrics and targets for each employee.

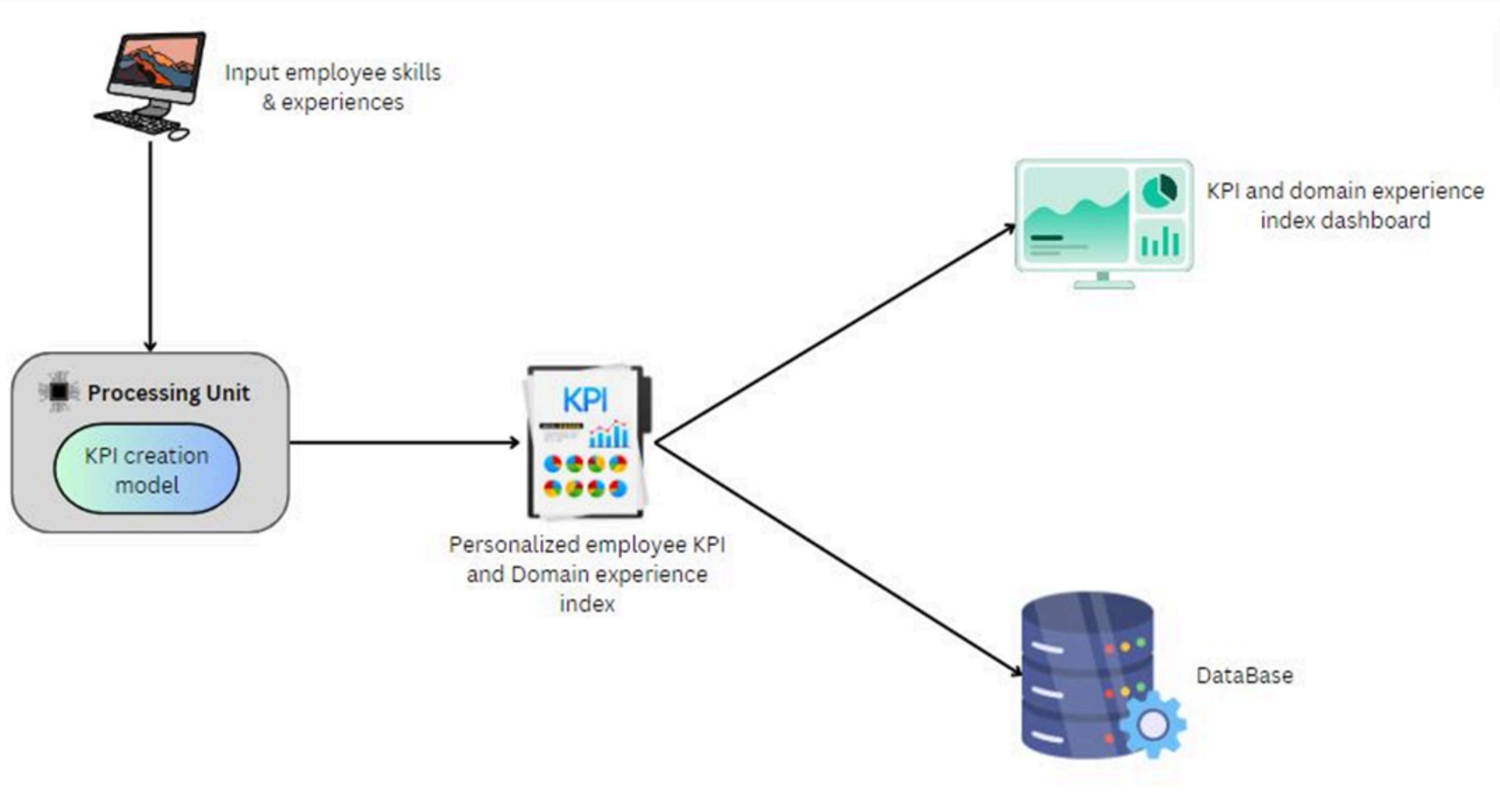


methodology

A separate weighted scoring table is created for each job role and a formula is created for it.



OVERVIEW DIAGRAM



TOOLS & TECHNOLOGIES

SYSTEM REQUIREMENTS

RAM (8GB)
Windows 10
200GB HDD

TECHNOLOGIES

REACT
MY SQL
spring-boot

HARDWARE

Laptop
Desktop

Software Requirments

IntelliJ
Postman

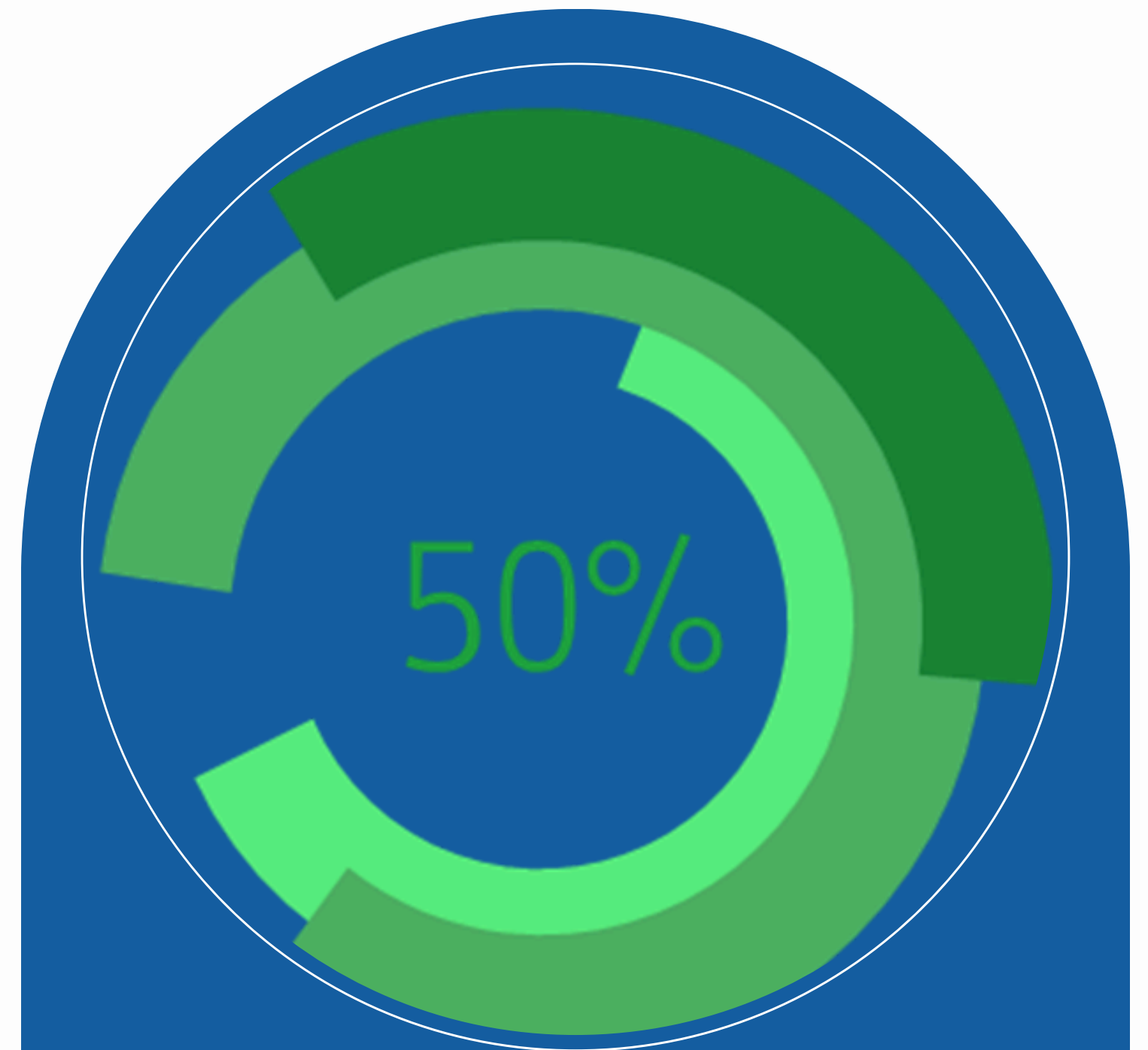
CURRENT PROGRESS

A survey has been conducted and a data report has been obtained about the relevant skills.

Create a data report about the minimum percentage expected for each

About 50% of the backend was created to generate KPI

Drawn UI for interface

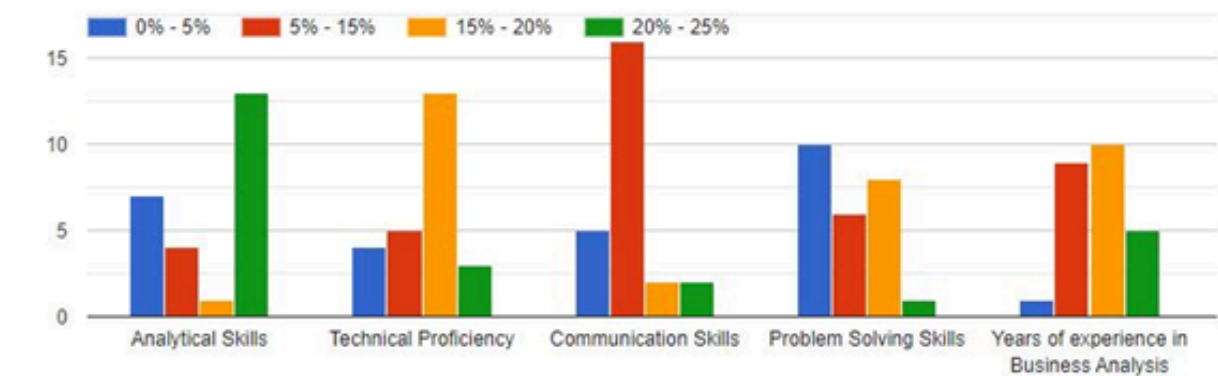


PROJECT EVIDENCE

Skill Dataset - Protected View - Saved to this PC				
File Home Insert Page Layout Formulas Data Review View Automate Help				
PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing				
	B	C	D	E
1		1. What is the name of your company? (Optional)	2. What is your current job position? (Optional)	3. What are the minimum educational qualifications expected? 3.1 What are the minimum skills expected from a software developer? 3.2 What are the minimum skills expected from a business analyst?
2	2/12/2024 19:33:29	MAS Legato	Junior Associate	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
3	2/13/2024 21:26:41	lb finance	junior executive	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
4	2/13/2024 22:54:26	Hayleys plc	Junior software engineer	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
5	2/13/2024 22:55:40	ARA Overseas Company	Business Analyst	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
6	3/14/2024 23:00:16	InnovaSoftworks	Software Quality Assurance	University degree or equivalent professional qualification Proficiency in programming languages., Internship or work experience as a software developer. Domain
7	3/15/2024 23:08:13	Hayleys	Project Manager	University degree or equivalent professional qualification Proficiency in programming languages., Internship or work experience as a software developer. Domain
8	3/15/2024 23:19:35			University degree or equivalent professional qualification Internship or work experience as a software developer. Domain
9	3/15/2024 23:50:32	Microsolution information system pvt ltd	System engineer	University degree or equivalent professional qualification Core computer science concepts knowledge., Knowledge of Linux/Unix, Tomcat, and Oracle. Domain
10	3/17/2024 3:05:03	LB	QA	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
11	3/19/2024 3:07:03		Business Analyst	Diploma Proficiency in programming languages., Core computer Domain
12	3/19/2024 6:20:19	1BT	QA Engineer	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
13	3/19/2024 8:43:07			University degree or equivalent professional qualification Internship or work experience as a software developer. Domain
14	3/21/2024 8:43:17	Hsenid mobile solution	Trainee data engineer	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
15	3/23/2024 13:55:26	Vyper Global	Graphic Design	University degree or equivalent professional qualification Internship or work experience as a software developer. Domain
16	3/23/2024 0:25:22	Sat technology	Network security engineer	University degree or equivalent professional qualification Knowledge of Linux/Unix, Tomcat, and Oracle. Domain
17	3/23/2024 0:30:42	SLIIT	student	University degree or equivalent professional qualification Core computer science concepts knowledge. Domain
18	3/25/2024 11:26:21	Dialog Axiata	BA	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
19	3/26/2024 3:45:15	Paragon software	Project Manager	University degree or equivalent professional qualification Proficiency in programming languages., Internship or work experience as a software developer. Domain
20	5/14/2024 4:20:00	MAS Legato	junior executive	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
21	3/27/2024 22:30:56		Junior Associate	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
22	3/28/2024 11:10:39	Hayleys plc	Project Manager	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
23	3/28/2024 0:35:15		System engineer	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
24	4/1/2024 13:18:12	Paragon	Associate ui/ux engineer	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
25	4/1/2024 15:40:26	LSEG	data engineer	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
26	4/2/2024 9:21:37	Refectline pvt ltd	software engineer trainee	University degree or equivalent professional qualification Proficiency in programming languages., Knowledge of c Domain
27	4/2/2024 11:41:57	MIT	DevOps Engineer	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
28	4/2/2024 13:33:51	Vyper Global	Business Analyst	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
29	4/2/2024 16:44:23	Dialog Axiata	Project Manager	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain
30	4/2/2024 19:15:15		junior executive	University degree or equivalent professional qualification Proficiency in programming languages., Core computer Domain

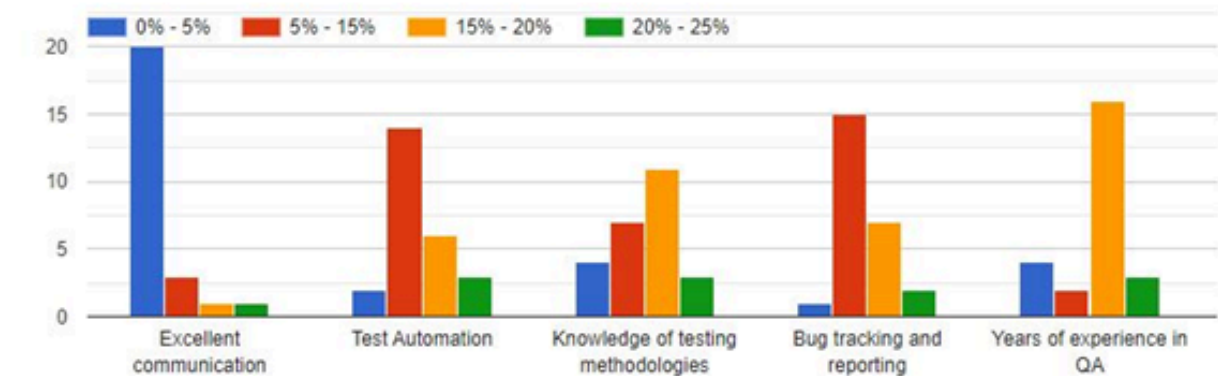
What percentage of the following skills, experience and education do you expect for the BA position?

Copy

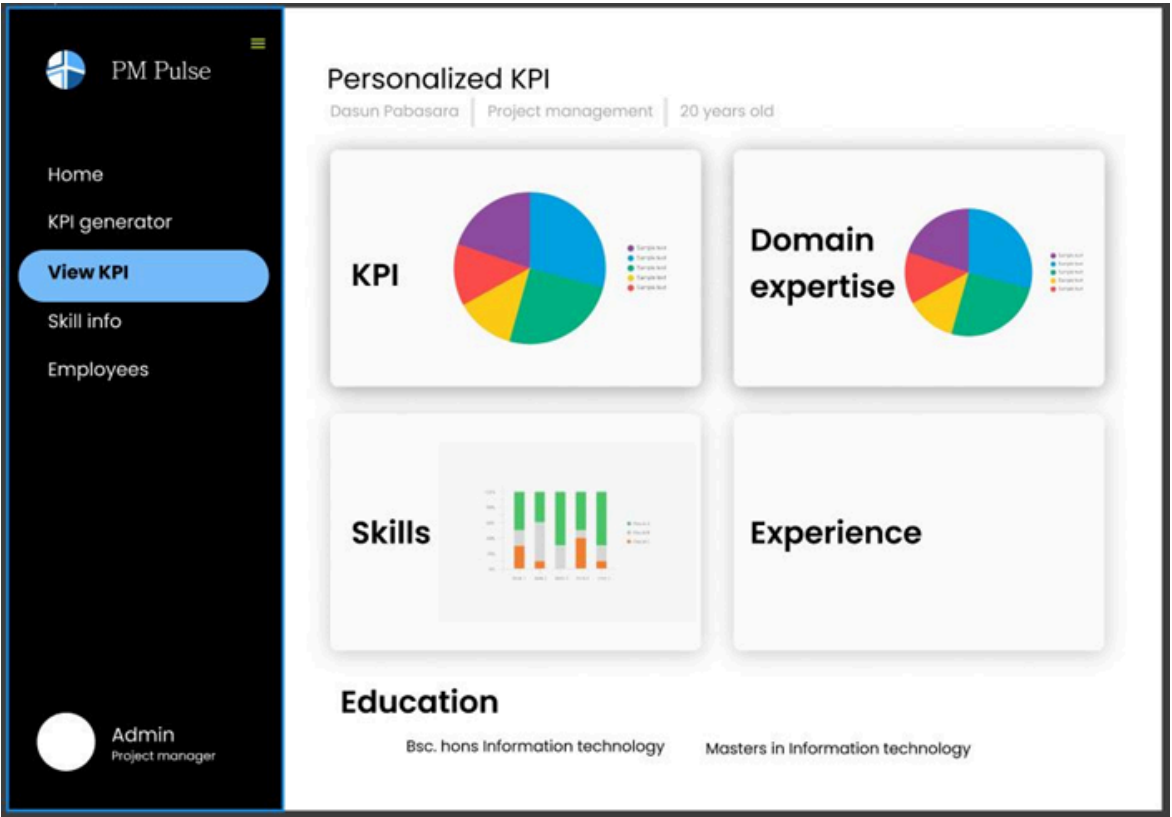


What percentage of the following skills, experience and education do you expect for the QA position?

Copy



Weighted Scoring Table - Saved to this PC																					
Master's Degree																					
Required Score																					
Criteria	Weight	BA1	BA2	BA3	BA4	Analytical Skills				Technical Skills (e.g., SQL, Excel)				Communication Skills				Problem-Solving Skills			
(Skills 50%)						Novice: 1	Intermediate: 3	Advanced: 5		Novice: 1	Intermediate: 3	Advanced: 5		Novice: 1	Intermediate: 3	Advanced: 5		Novice: 1	Intermediate: 3	Advanced: 5	
Analytical Skills	20%																				
Technical Proficiency	15%																				
Communication Skills	10%																				
Problem Solving Skills	5%																				
(Experiences 30%)						Years of Experience in Business Analysis				Experience of related industry				Leadership/Team lead experience							
Years of experience in Business Analysis	15%					1-2 years: 3	3-5 years: 5	5+ years: 7		1 industry: 3	2 industries: 5	3+ industries: 7		Non-Lead: 0	Leadership: 3						
Experience of related industry	10%																				
Leadership/Team lead experience	5%																				
(Education 20%)						Bachelor's Degree				Master's Degree											
Bachelor's Degree	10%					Unrelated field: 1	Related field: 3	Business/IT: 5		Unrelated field: 3	Related field: 5	Business/IT: 7									
Master's Degree	10%																				
Weighted Scores	100%																				
Required Score																					
Criteria	Weight	QA1	QA2	QA3	QA4	Excellent communication				Test Automation				Knowledge of Testing Methodologies (e.g., Agile, Waterfall)							
(Skills 40%)						Novice: 1	Intermediate: 3	Advanced: 5		Novice: 1	Intermediate: 3	Advanced: 5		Novice: 1	Intermediate: 3	Advanced: 5					
Excellent communication	5%																				
Test Automation	10%																				
Knowledge of testing methodologies	15%																				
Bug tracking and reporting	10%																				
Weighted Scores																					
(Experiences 30%)						Years of Experience in QA				Experience with Different Testing Tools				Leadership/Team lead experience							
Years of experience in Business Analysis	15%					1-2 years: 3	3-5 years: 5	5+ years: 7		1 industry: 3	2 industries: 5	3+ industries: 7		Non-Lead: 0	Leadership: 3						
Experience of related industry	10%																				
Leadership/Team lead experience	5%																				



PM Pulse

Home

KPI generator

View KPI

Skill info

Employees

Admin

Project manager

KPI Generator

Skill 1

Conditions

Skill 2

Conditions

Skill 3

Conditions

Skill 4

Conditions

Experience

Num of years

ADD

Bsc. hons Information Technology

☒

Masters in Information Technology

☐

Certificate for Information Technology

☒

Back

Clear

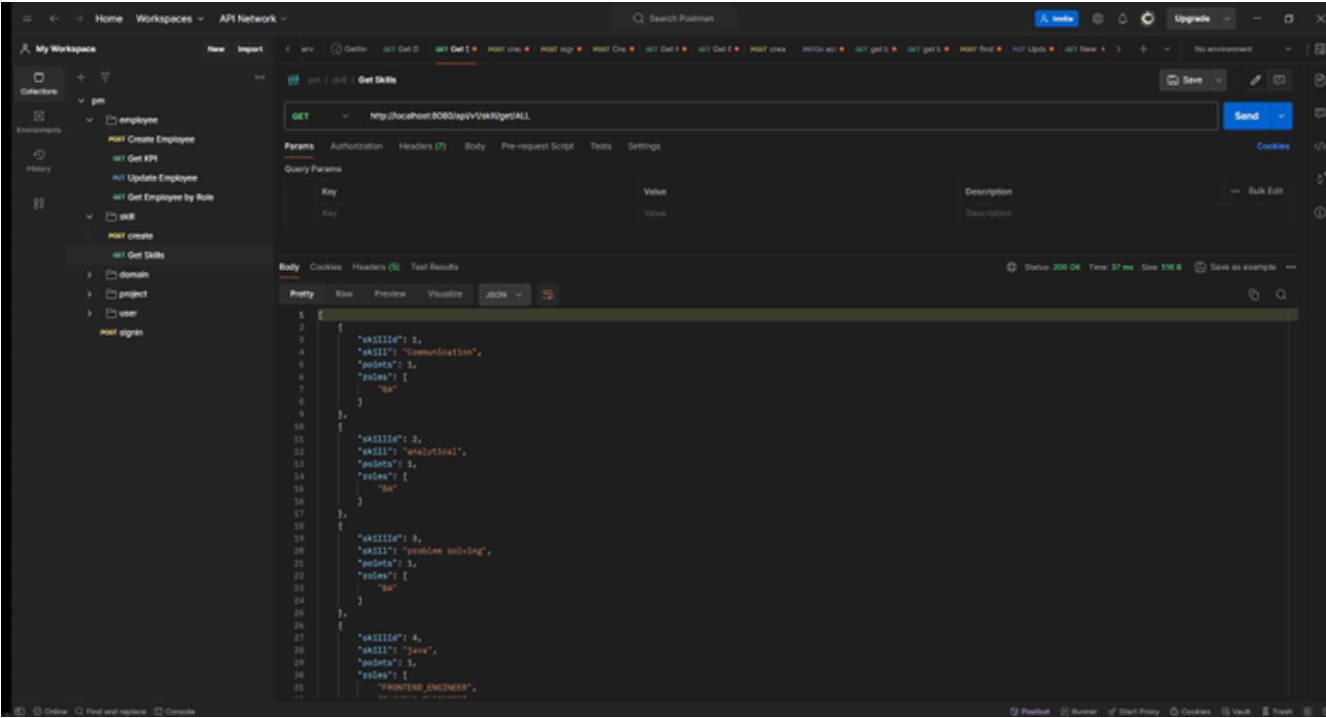
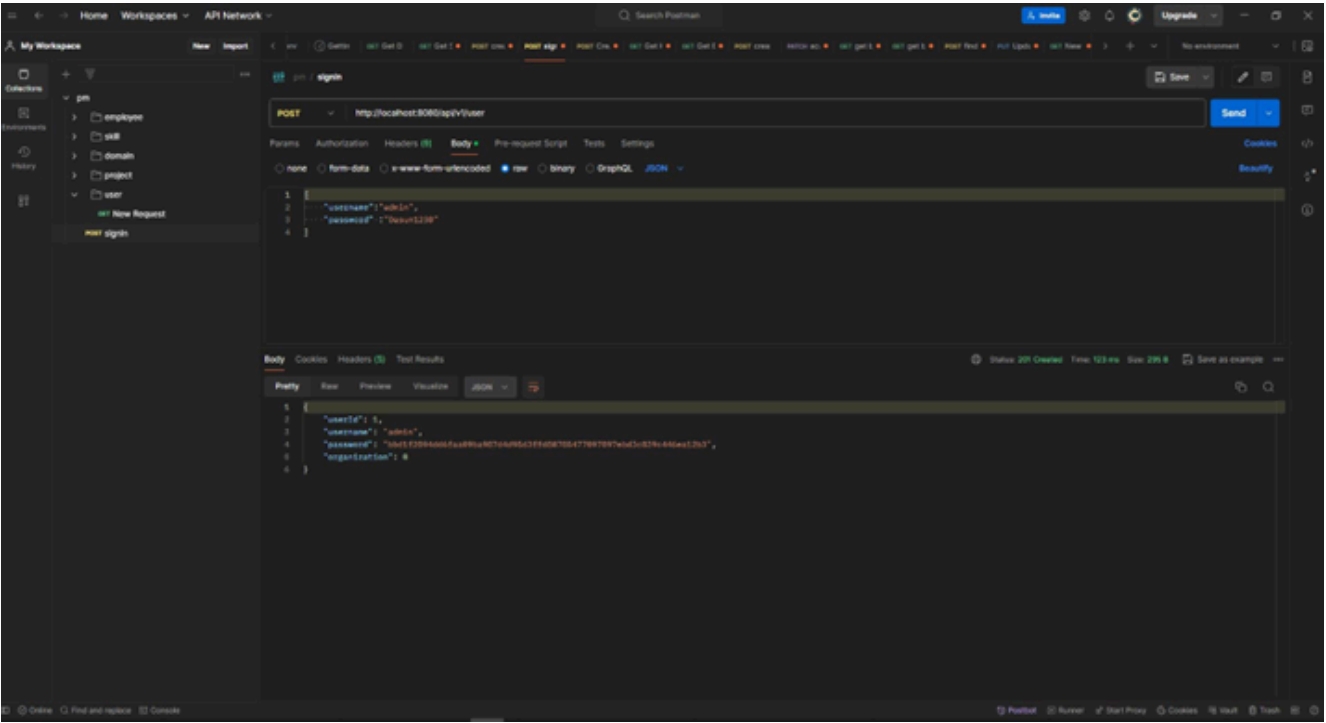
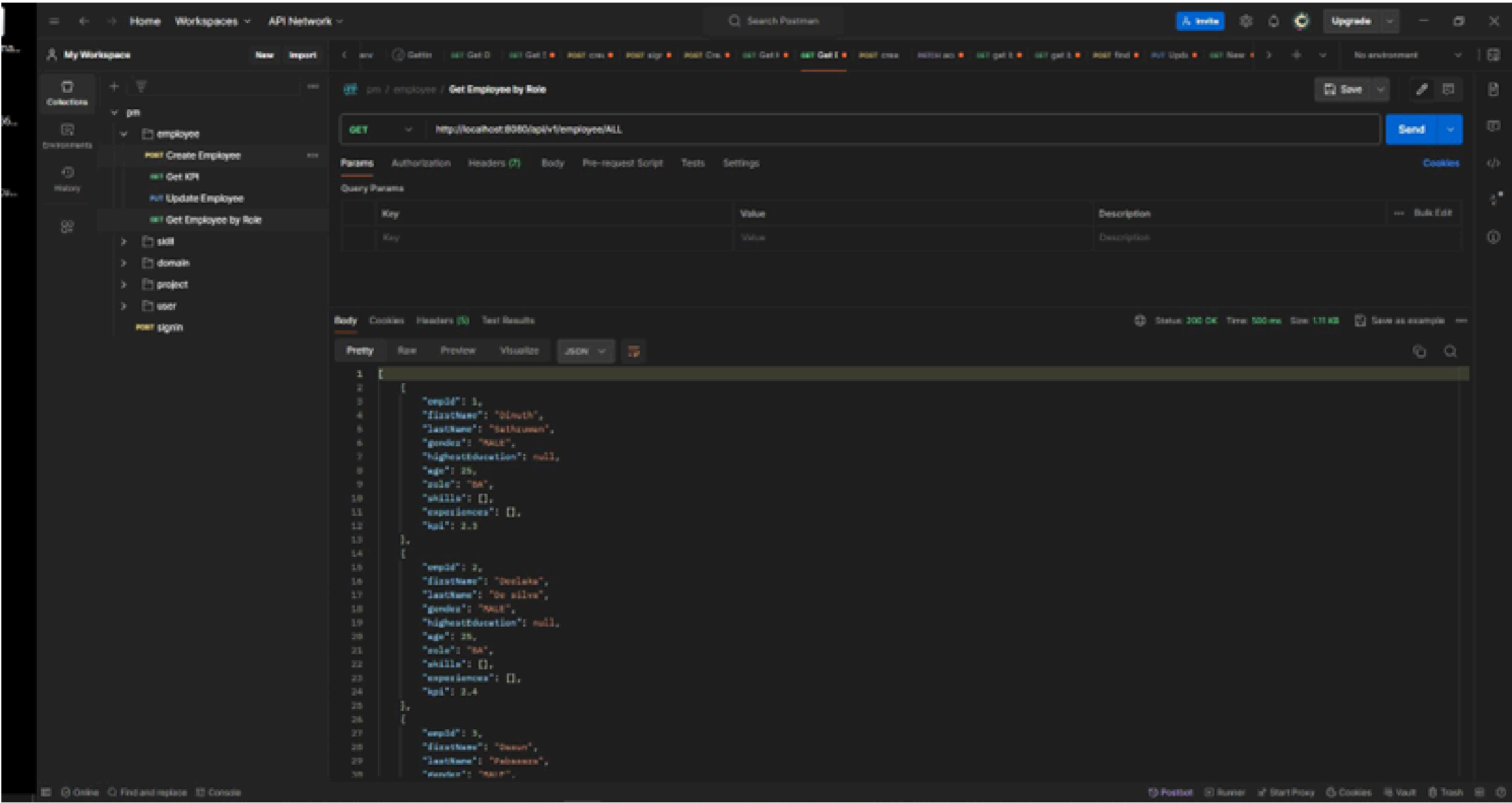
Next

```
ProjectManagementApplication
KpiGenerationUtil.java
public class KpiGenerationUtil {
    EmployeeRepo employeeRepo;

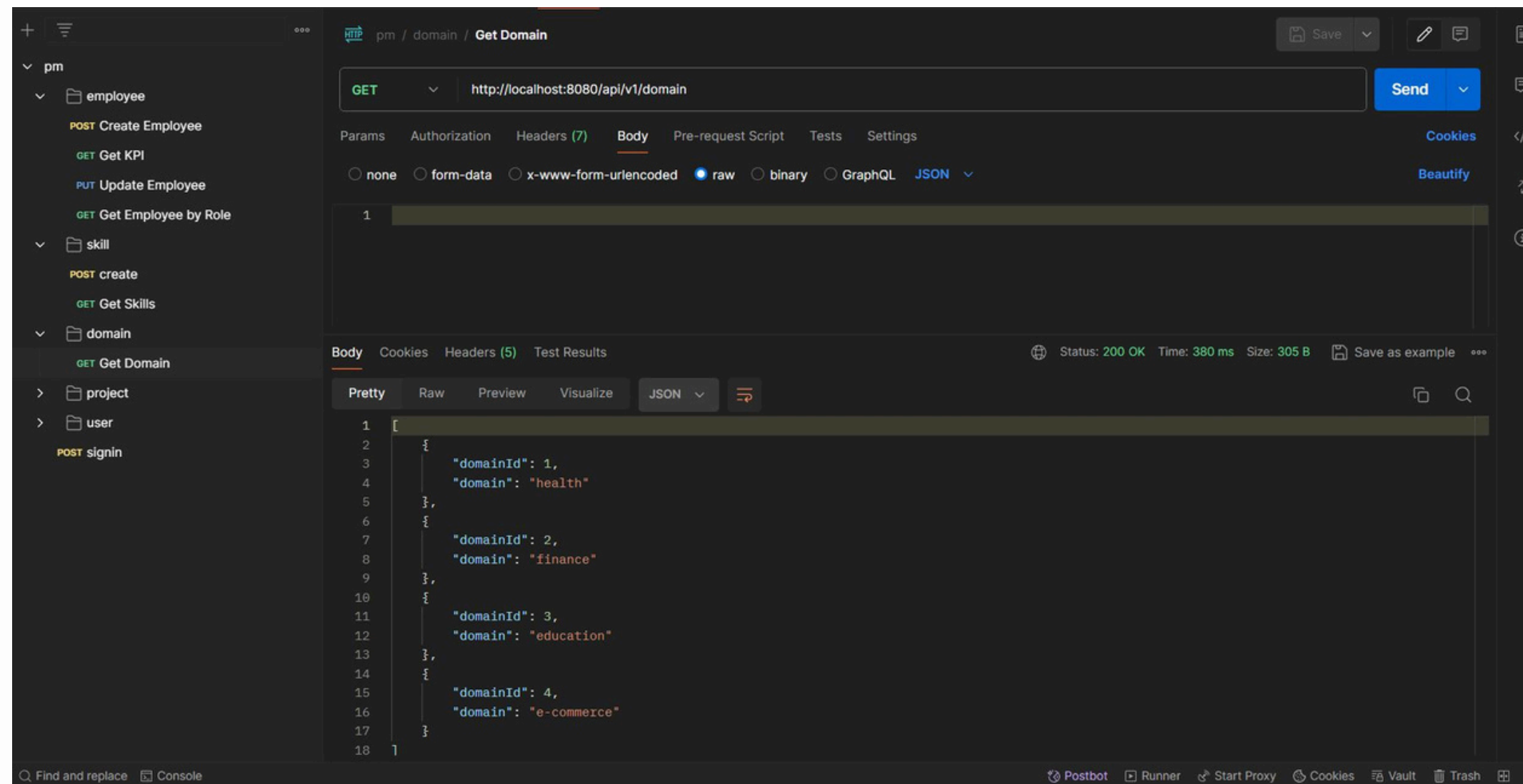
    public double generateKPI(long empId){
        int analytical = 0;
        int problemSolving = 0;
        int communication = 0;
        int tech = 0;
        int years = 0;
        int domain = 0;
        int education = 0;

        List<EmpSkillMap> skillsMap = empSkillRepo.findAllByEmpId(empId);
        List<EmpExpMap> expMap = empExpRepo.findAllByEmpId(empId);
        Employee emp = employeeRepo.findById(empId).orElseThrow();
        // Extract all skill IDs from EmpSkillMap
        Set<Long> skillIds = skillsMap.stream().map(EmpSkillMap::getSkillId).collect(Collectors.toSet());
        // Retrieve skills from skillRepo using all skill IDs at once
        List<Skill> skills = skillRepo.findAllById(skillIds); // Assuming findById() returns a list of Skill
        List<EmpSkillInfo> empSkillInfos = skillsMap.stream().flatMap(empSkillMap -> skills.stream().filter(skill -> empSkillMap.getSkillId() == skill.getSkillId()).map(skill -> new EmpSkillInfo(empSkillMap.getSkillId(), skill.getSkill(), skill.getPoints(), empSkillMap.getLevel())));
    }
}
```


API Testing



API Testing



```
1 {
2   "id": 5,
3   "firstName": "pabasara",
4   "lastName": "ganegoda",
5   "gender": "MALE",
6   "age": 25,
7   "role": "FULLSTACK_ENGINEER",
8   "experience": [{
9     "domainId": 4,
10    "months": 25
11  }],
12  "skills": [{
13    "skillId": 3,
14    "level": "ADVANCE"
15  },
16  {
17    "skillId": 5,
18    "level": "BEGINNER"
19  }]
20 }
```


FUTURE PROGRESS

Create a front end.

Establish the connection between the front end and backend.

Component Integration



REFERENCES

Terttiaavini, et al. "Development of a Decision Support System on Employee Performance Assessment Using Weighted Performance Indicators Method." International Journal of Information Engineering and Electronic Business, vol. 15, no. 3, 2023, p. 1, www.mecs-press.org/ijieeb/ijieeb-v15-n3/v15n3-1.html. Accessed 6 May 2024.

A. Smith, J. Doe, and C. Jones, "Automated Generation of Personalized Key Performance Indicators for Employees," in Proc. IEEE Conf. on Artificial Intelligence in Human Resources, Austin, TX, USA, 2023, pp. 45–50.

J. Lee, A. Kim, and M. Johnson, "Dynamic Key Performance Indicators: Updating in Real-Time Based on Skills Development," in Proc. IEEE Int. Conf. on Automation Science and Engineering, Tokyo, Japan, 2021, pp. 23–28.

M. Brown, C. Davis, and T. Miller, "Closing the Skills Gap: Employee Development Recommendations Based on Skills Analysis," in Proc. IEEE Int. Conf. on Data Mining Workshops, New Orleans, LA, USA, 2020, pp. 5–9.

S. Patel, R. Chen, and X. Wu, "Connecting the Dots: Linking Skills Data to Relevant Key Performance Indicators," in Proc. IEEE Int. Conf. on Big Data, Los Angeles, CA, USA, 2023, pp. 33–37.

K. Thompson, P. Shah, and V. Lee, "Incorporating Machine Learning in Employee KPI Recommendations," in Proc. IEEE Int. Conf. on Machine Learning and Applications, San Diego, CA, USA, 2024, pp. 15–20

Risk Identification of software projects and provide mitigation strategies

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Specializing in Information Systems Engineering
Component 02



The background of the slide is a photograph of an office environment. It shows several people working at their desks. On the left, a woman with curly hair is sitting at a desk with a laptop and a tablet. In the center, a man in a light blue shirt is sitting at a desk, looking at a laptop. On the right, a woman with long hair is sitting at a desk with a laptop and a water bottle. The desks are white, and the office has a modern, open-plan feel with grey cubicle walls.

Introduction

- Identify risk level and factors depend to the risk level mainly based on team, scope, timeline.
- Identify mitigation strategies for the risks before they affected the project outcomes.
- Automate and improve the risk management process and outcomes.

RESEARCH QUESTION

- How to accurately identify potential risks in project planning and execution?
- What effective mitigation strategies can be employed for different risk types?
- How can software project managers identify potential risks accurately and proactively?
- How can emerging technologies such as AI and machine learning be leveraged to enhance risk identification and mitigation in software development?



Objectives

o devise a comprehensive framework integrating risk identification and mitigation strategies tailored specifically for software development projects.

Objective 01

Analyze historical data to enhance risk assessment.

Objective 02

Identify project risks based on domain-specific data

Objective 03

Provide effective risk mitigation strategies

Objective 04

Create a user-friendly interface for entering project details

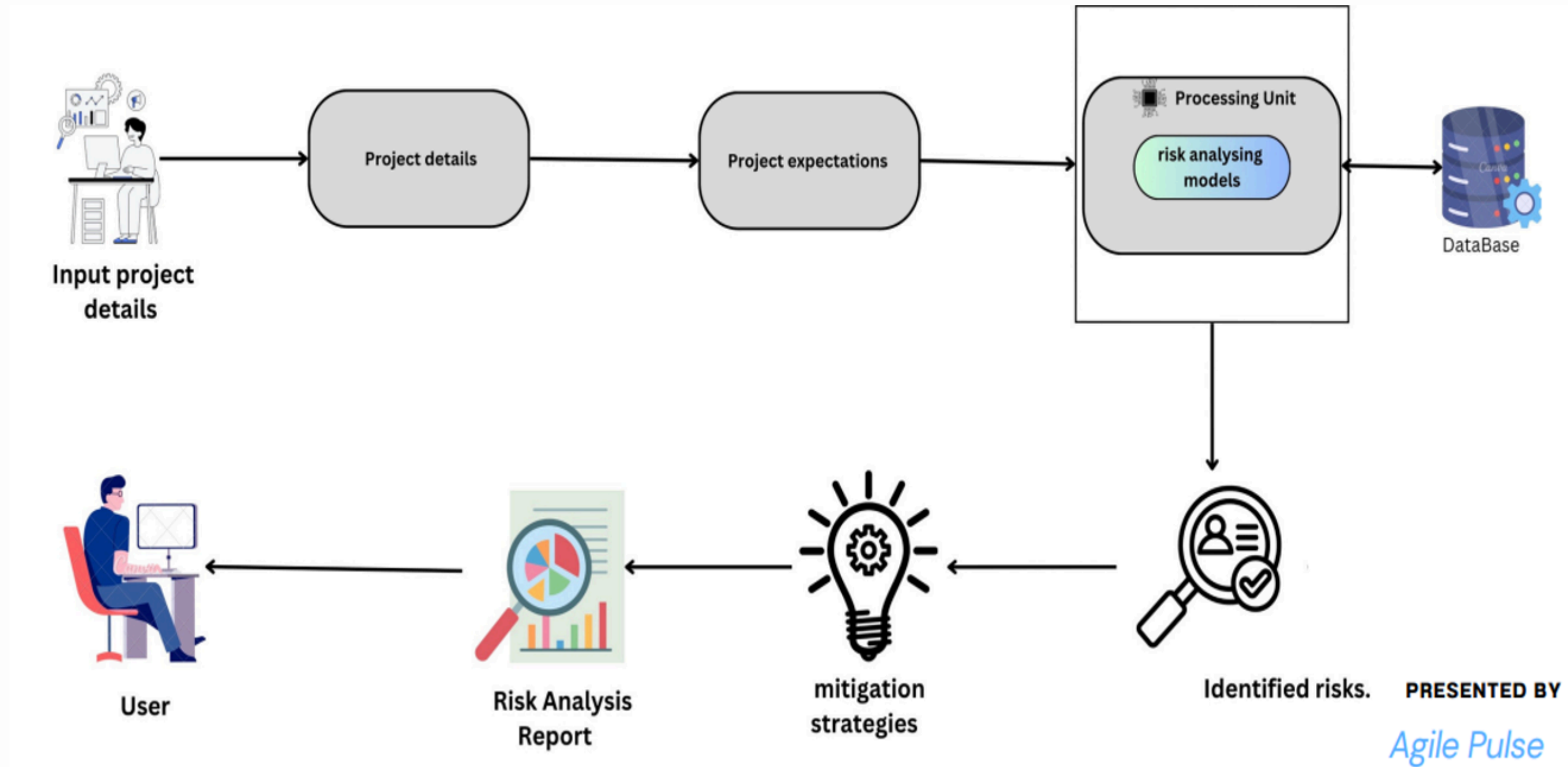


methodology

- Machine Learning and Predictive Analytics
- Update machine learning models with project data
- An algorithm was created to identify risk level and factors with mitigation strategies.



OVERVIEW DIAGRAM



TOOLS & TECHNOLOGIES

SYSTEM REQUIREMENTS

RAM (8GB)
Windows 10
200GB HDD

TECHNOLOGIES

React
MySQL
Spring-boot
python
Maven

HARDWARE

Laptop
Desktop

Software Requirements

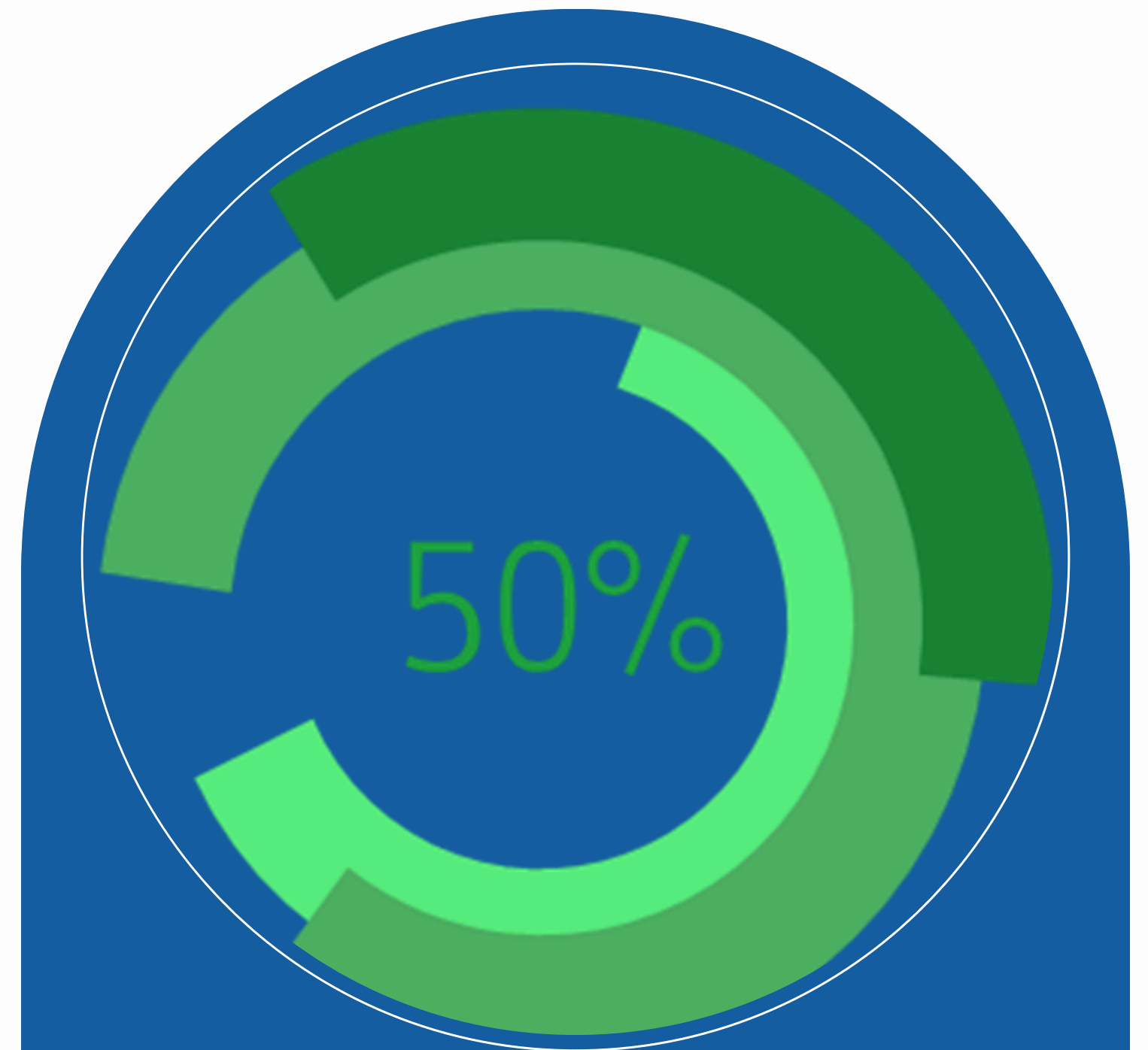
PyCharm
Postmen

CURRENT PROGRESS

A survey has been conducted and a data report has been obtained about the relevant risks.

About 50% of the backend was created to generate Risk Identification.

Drawn UI for interface



PROJECT EVIDENCE

Domain	Mobile	Desktop	Web	IoT	Days for Expected Timeline	Predicted Days to Deadline	Expected Team Size	Expected Budget	Risk
1	1	1	1	0	62	71	6	499944	3
1	1	1	1	0	110	112	6	95199	3
3	0	1	0	1	56	59	12	102271	2
3	1	1	0	1	167	155	5	205850	3
2	0	0	1	0	94	79	14	242834	1
2	0	0	0	1	64	70	11	167439	1
1	0	0	0	1	52	42	3	94414	1
1	1	0	1	1	30	13	4	115003	3
2	0	1	0	0	62	77	14	269391	1
2	0	1	0	1	96	98	9	393515	2
3	0	1	1	1	29	19	10	351561	3
2	1	0	0	1	145	149	6	297587	2
3	1	1	0	1	49	32	5	374613	3
2	1	1	0	1	73	54	1	153800	3
2	0	0	0	0	149	137	9	252166	1
2	0	1	1	0	142	160	14	308597	2
1	0	0	1	0	160	172	5	115969	1
1	0	1	1	1	63	62	8	419905	3
1	0	1	1	1	47	54	13	402733	3
2	0	1	0	1	85	91	9	482112	2
3	0	0	1	0	117	117	5	475771	1
2	1	1	1	1	99	112	4	48811	3
3	1	0	0	0	138	141	10	206558	1
2	0	0	1	0	121	102	14	31921	1
2	1	1	0	1	101	107	6	211067	3
3	0	1	0	0	47	35	3	147700	1
3	1	1	0	1	130	139	5	227817	3
2	0	0	1	0	42	31	9	176162	1
3	0	1	1	0	88	74	11	193718	2

BodyCookiesHeaders (5)Test Results

Status: 200 OKTime: 31 msSize: 406 BSave as example

PrettyRawPreviewVisualizeJSON

```
1 {
2   "factors": [
3     {
4       "Days for Expected Timeline": 0.06448694060303452,
5       "Domain": 0.019703680124363302,
6       "Expected Team Size": 0.04840929880353312,
7       "IoT": 0.17829061512776812,
8       "Predicted Days to Deadline": 0.056045212333275474
9     }
10  ],
11  "predicted_risk": "low risk"
12 }
```

BodyCookiesHeaders (5)Test Results

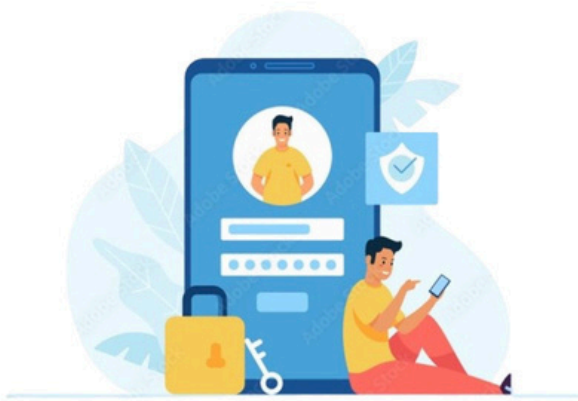
Status: 200 OKTime: 95 m

PrettyRawPreviewVisualizeJSON

```
1 {
2   "factors": [
3     {
4       "Days for Expected Timeline": 0.06448694060303452,
5       "Desktop": 0.19361591396652325,
6       "Domain": 0.019703680124363302,
7       "Expected Team Size": 0.04840929880353312,
8       "IoT": 0.17829061512776812,
9       "Mobile": 0.20554372319361716,
10      "Predicted Days to Deadline": 0.056045212333275474,
11      "Web": 0.1658392795896265
12    }
13  ],
14  "predicted_risk": "high risk"
15 }
```


Login page

PM Pulse



Welcome Back !

Login to continue

Username

Type your username here

Password

Type your password here

Forgot password ?

Log In

Already have an account .Continue here

Lorem ipsum dolor sit amet consectetur. Quam penatibus eget viverra tincidunt mattis elementum. Enim ut cras in est faucibus. Amet convallis suspendisse in aliquam at facilisi.

Form 01

PM Pulse

Home

Project Info

Admin
Project manager

Project info

Project information details

Project Id

Project Name

Objective

Expected budget

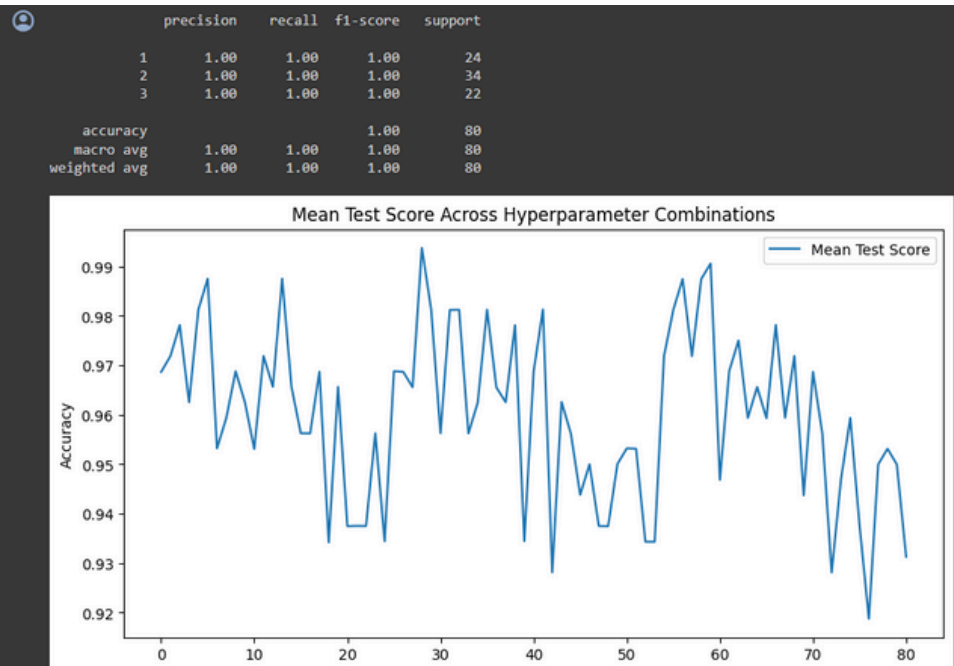
Expected timeline

Expected team size

Technology stack

Next

Clear



pm_flask Version control

Project

pm_flask ~/PycharmProjects/pm_flask

.venv

model

static

templates

app.py

requirements.txt

External Libraries

Scratches and Consoles

app.py

requirements.txt

```
1 from flask import Flask, request, jsonify
2 import joblib
3
4 app = Flask(__name__)
5
6 # Load the trained model
7 loaded_model = joblib.load('model/random_forest_model.pkl')
8
9 usage (1 dynamic)
10 @app.route('/risk/predict', methods=['POST'])
11 def predict():
12     data = request.get_json() # Get JSON data from request
13     sample_input = data['input'] # Extract input data from JSON
14
15     # Predict using the loaded model
16     predicted_risk = loaded_model.predict(sample_input)
17     risk = predicted_risk[0]
18     riskStatus = ""
19     if risk == 1:
20         riskStatus = "low risk"
21     elif risk == 2:
22         riskStatus = "Average risk"
23     else:
24         riskStatus = "high risk" # Return the predicted risk as JSON response
25
26     return jsonify({'predicted_risk': riskStatus})
```


 PM Pulse

Home

Project Info

Admin

Project manager

Project info

Project information details

Educational

E-commerce

Financial

Health

Back

Clear

Generate

Lorem ipsum dolor sit amet consectetur. Quam penatibus eget viverra tincidunt mattis elementum. Enim ut cras in est faucibus.

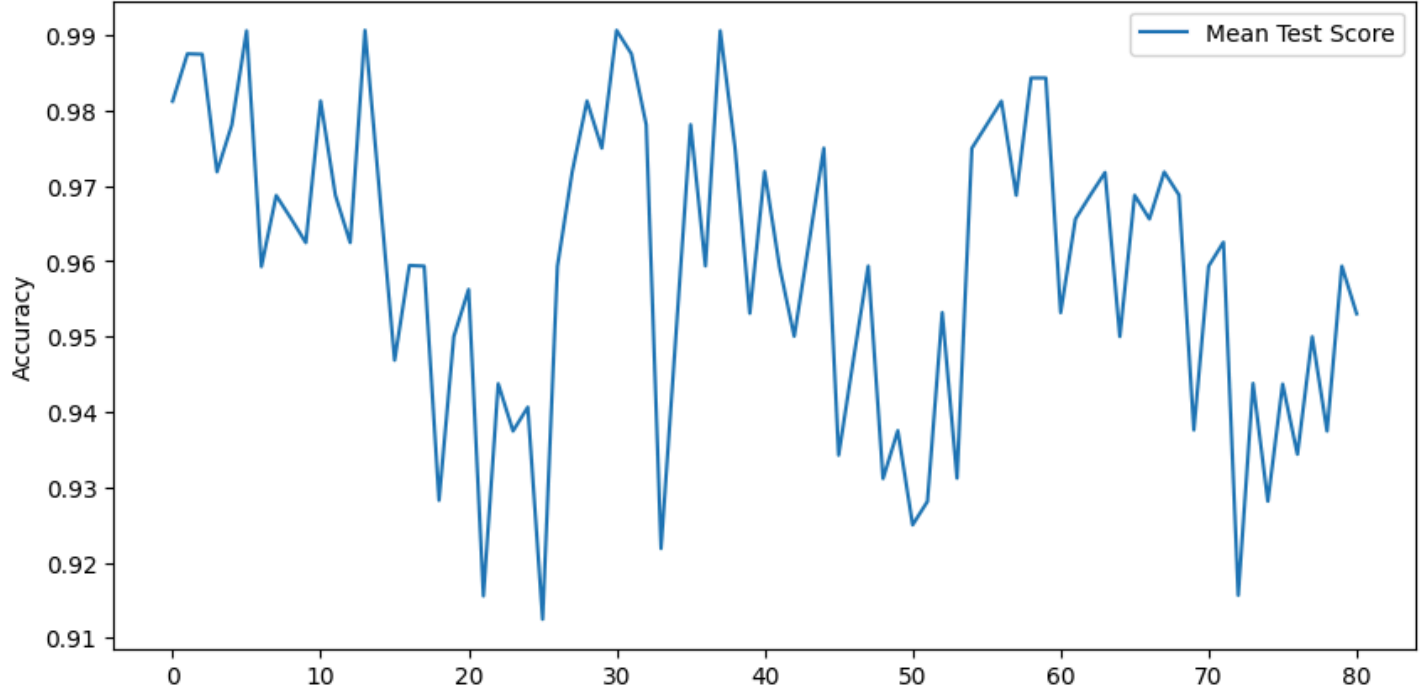
Amet convallis suspendisse in aliquam at facilisi.

Best Parameters: {'max_depth': None, 'min_samples_leaf': 2, 'min_samples_split': 5, 'n_estimators': 100}

Best Score: 0.9906542056074766

	precision	recall	f1-score	support
1	0.96	1.00	0.98	24
2	1.00	0.97	0.99	34
3	1.00	1.00	1.00	22
accuracy			0.99	80
macro avg	0.99	0.99	0.99	80
weighted avg	0.99	0.99	0.99	80

Mean Test Score Across Hyperparameter Combinations



Top three most important features:

Feature	Importance
1	0.017061

FUTURE PROGRESS

Create a front end.

Establish the connection between the front end and backend.

Component Integration



REFERENCES

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DYNAMIC PROJECT NAVIGATOR

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Component 03





Introduction

- This component aims to project categorization based on properties like type, scope, domain. It will map projects to key performance indicators and also the best team assign the automatically.

RESEARCH QUESTION

- How to optimally assign team members based on project requirements?
- How to effectively categorize projects as high, medium, or low complexity?



Objectives

- Automated Team Formation
- Project Complexity Categorization
- Continuous Improvement

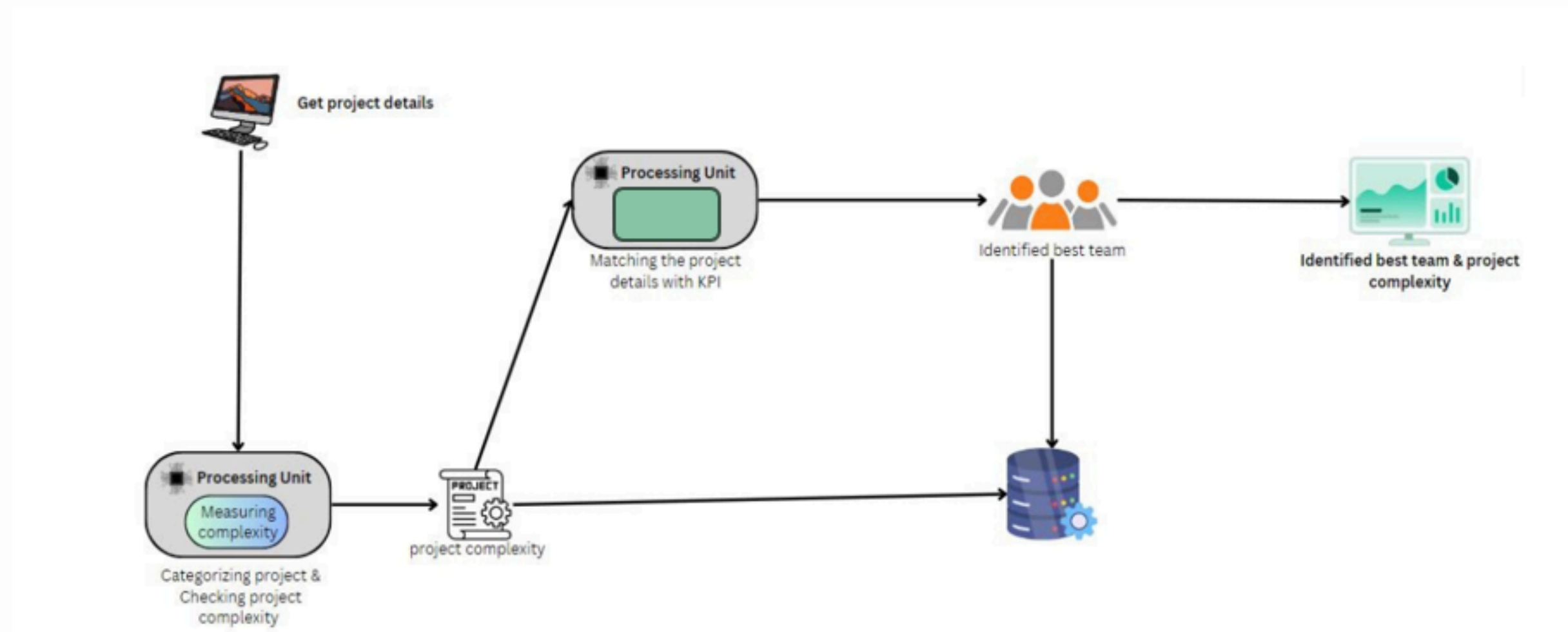


methodology

- Team Formation Algorithm
- Integration and Feedback Loop
- Project Complexity Categorization



OVERVIEW DIAGRAM



TOOLS & TECHNOLOGIES

SYSTEM REQUIREMENTS

RAM (8GB)
Windows 10

TECHNOLOGIES

REACT
MY SQL
spring-boot

HARDWARE

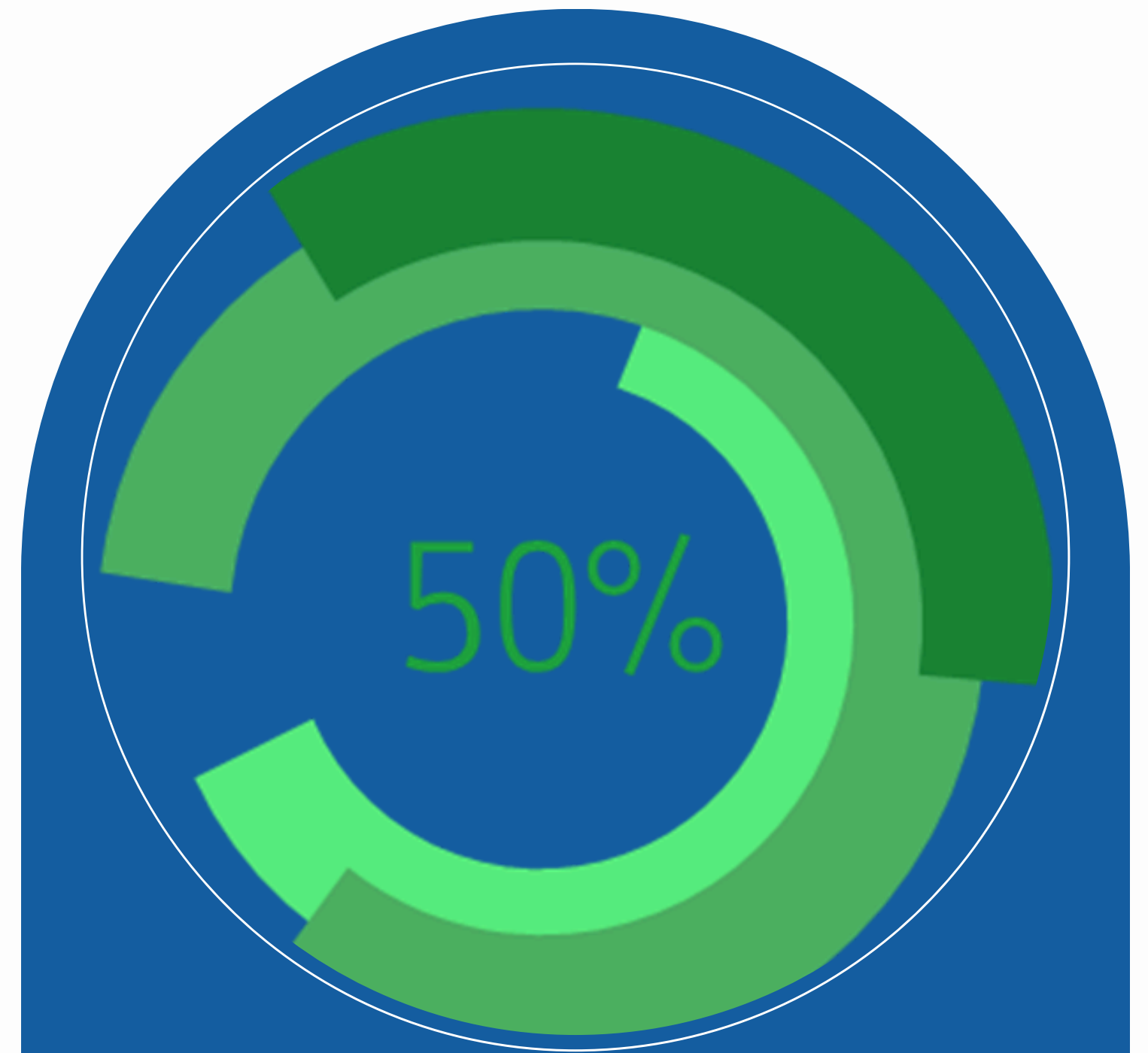
Laptop
Desktop

Software Requirments

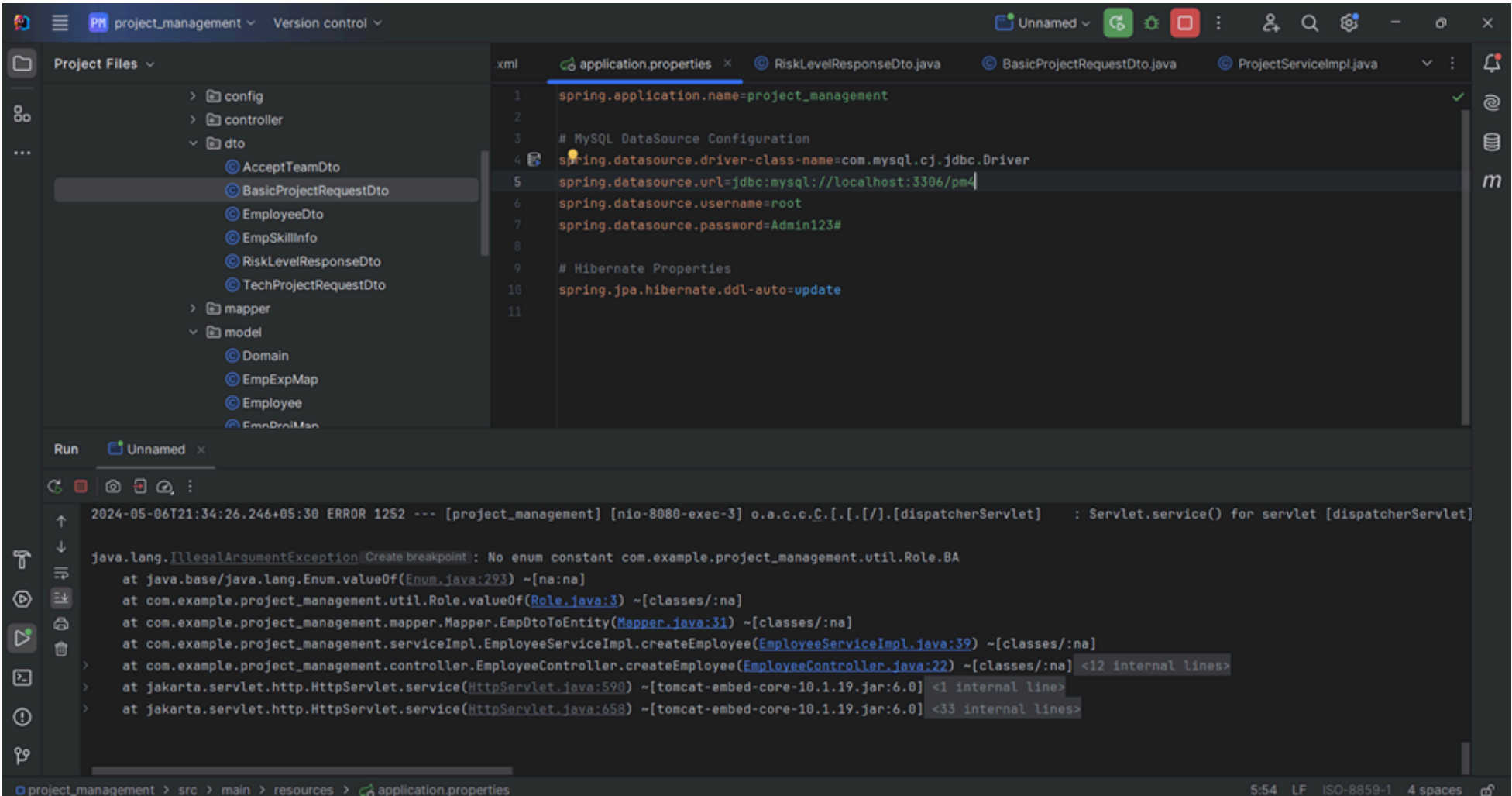
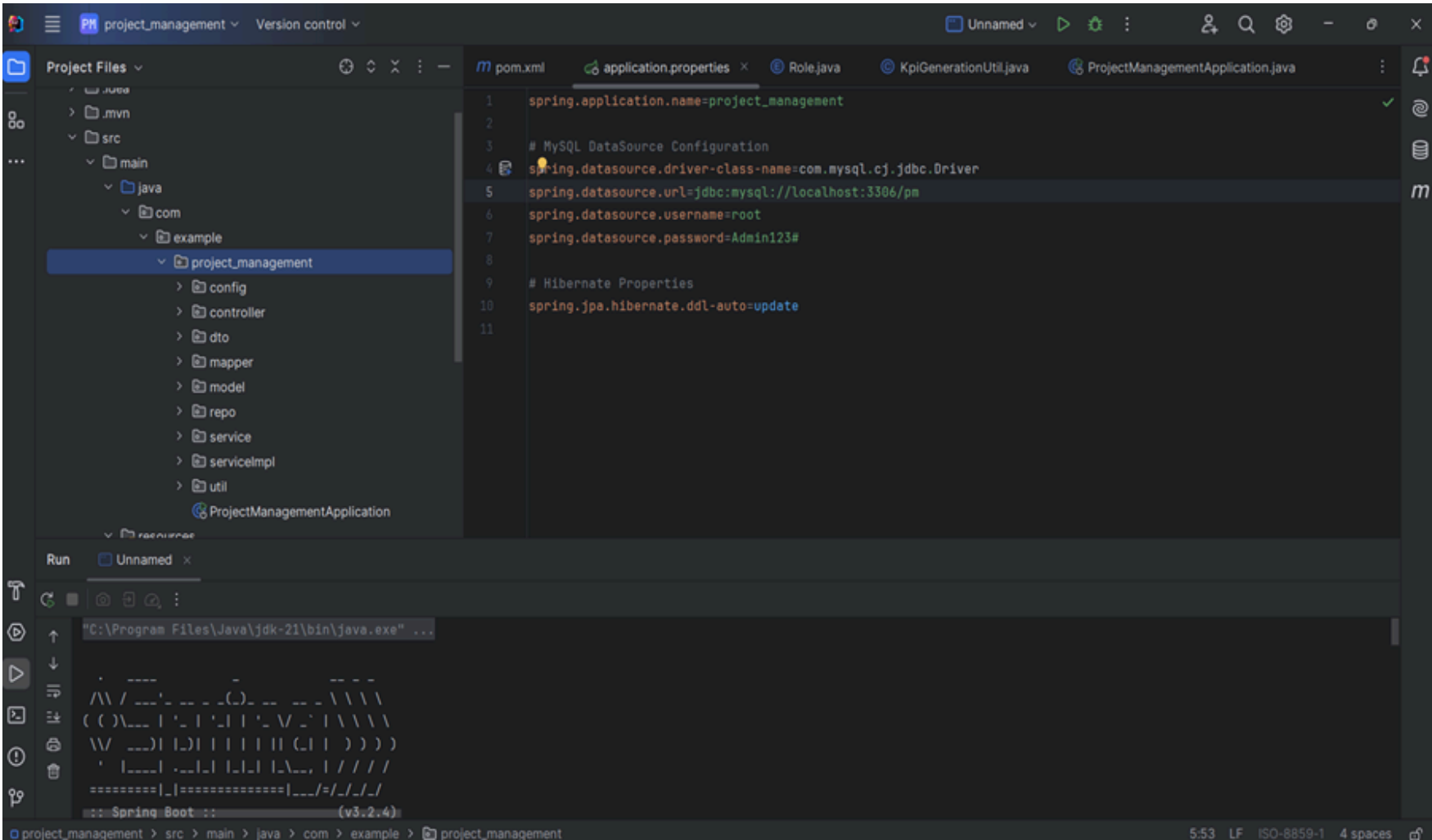
IntelliJ
Postman

CURRENT PROGRESS

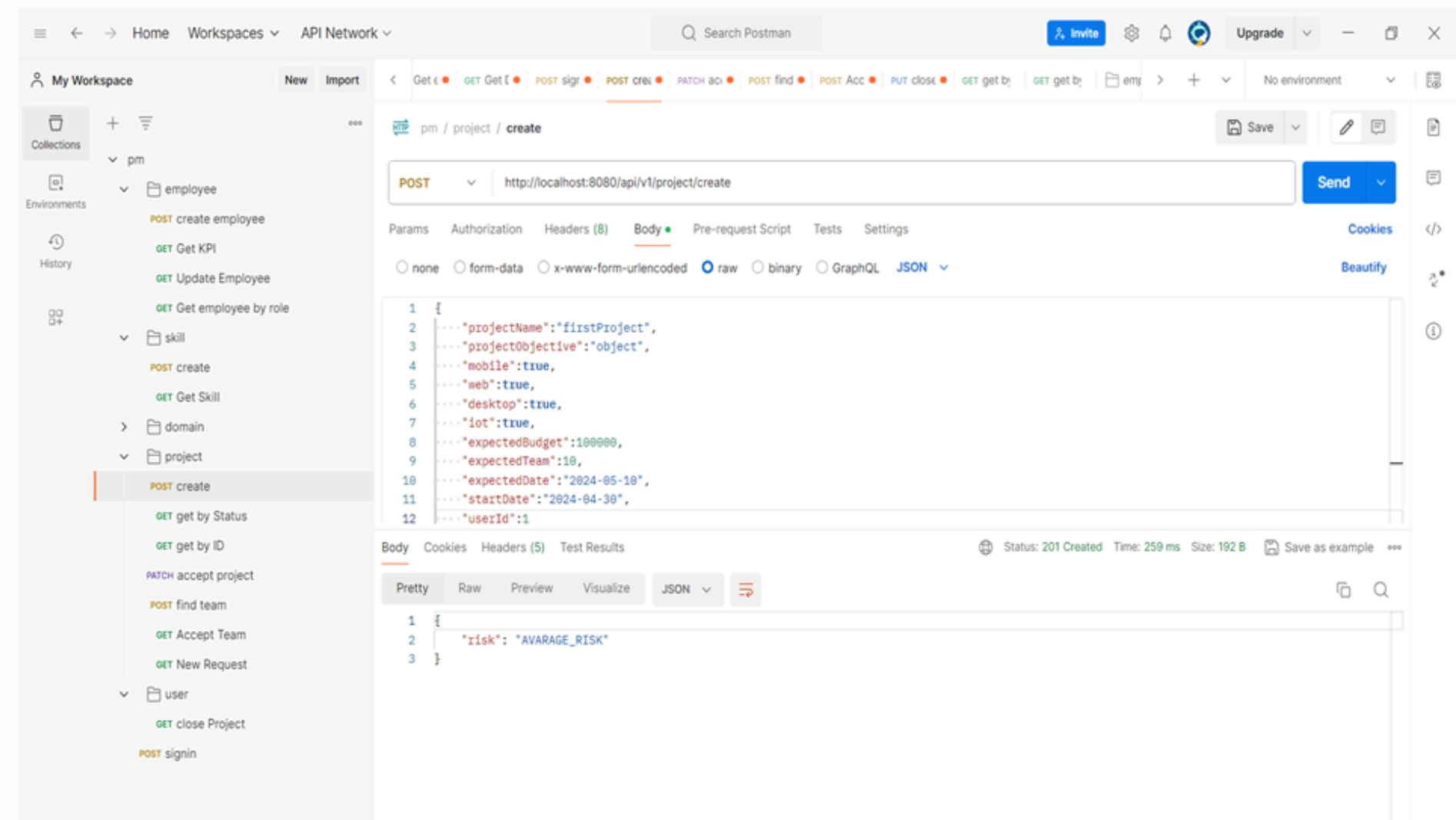
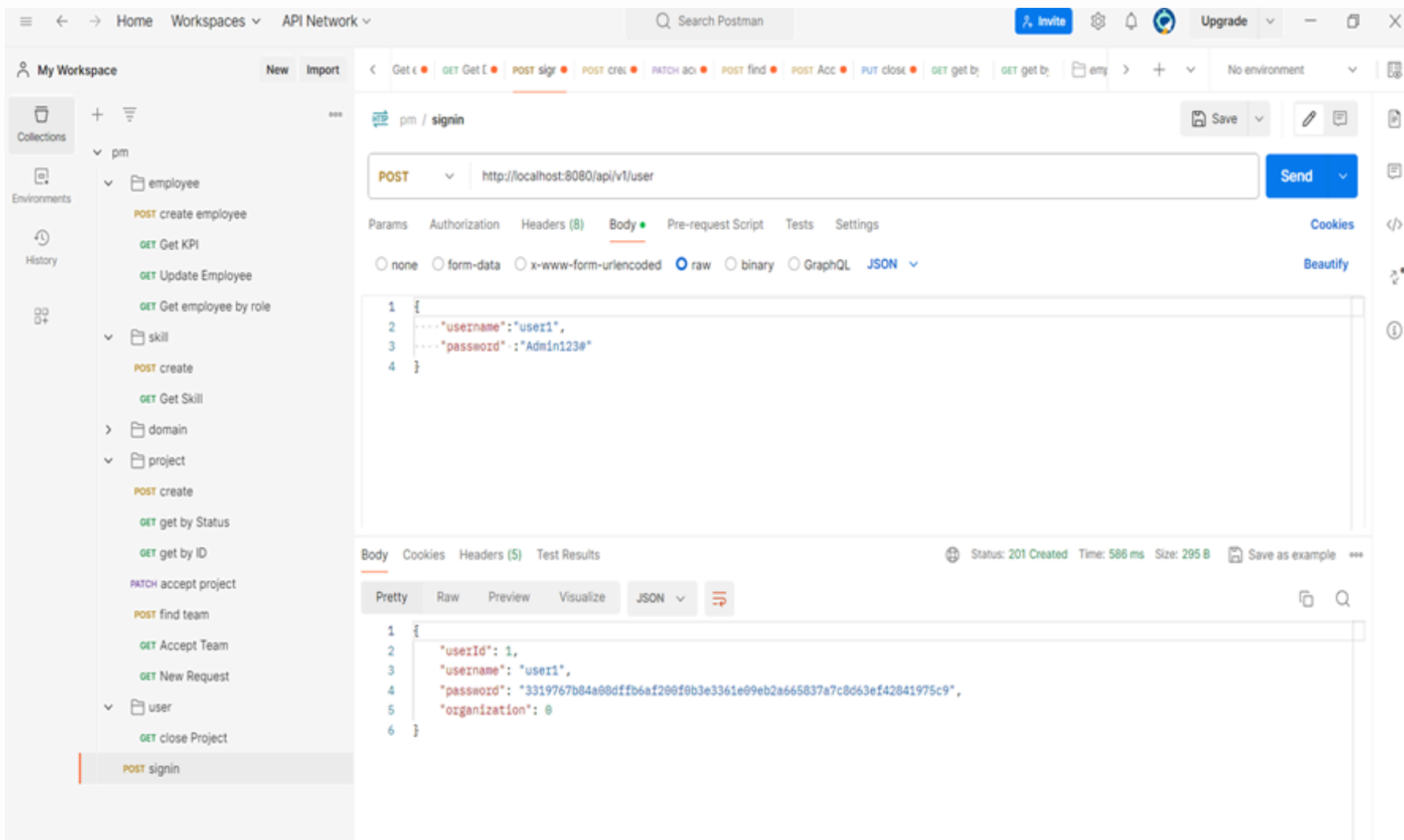
- Data gathering through the survey
- Backend completed
- API Testing

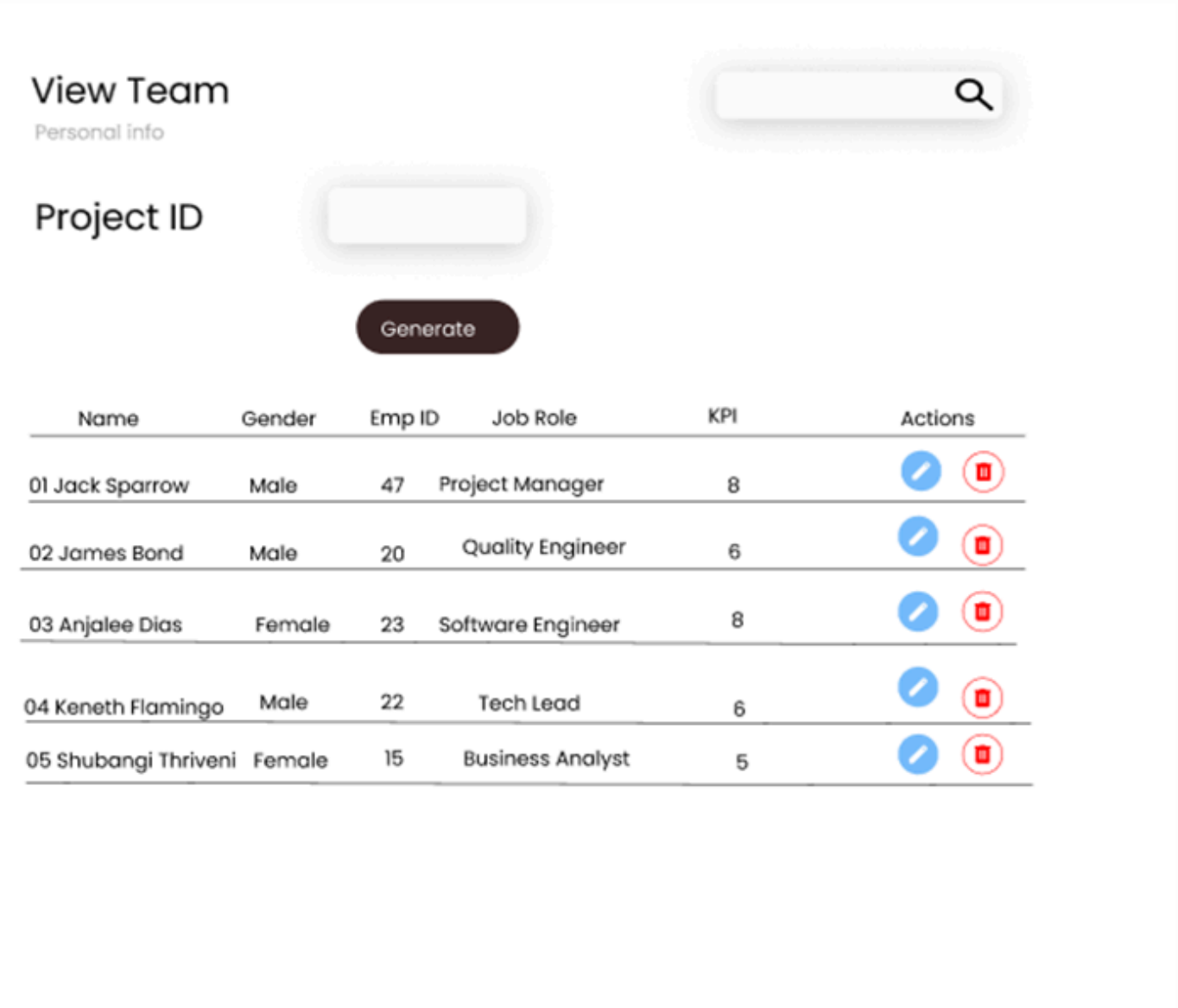
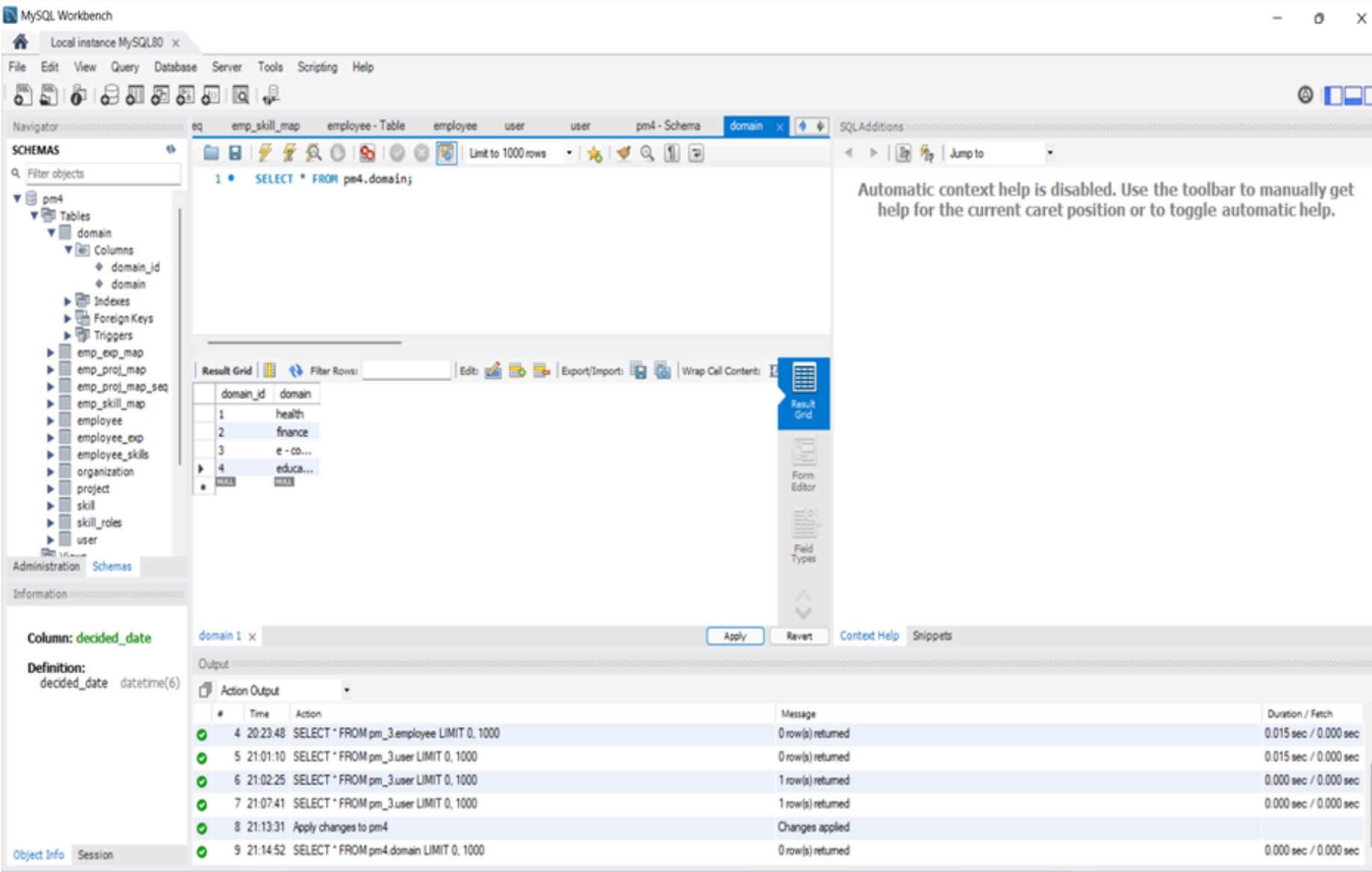


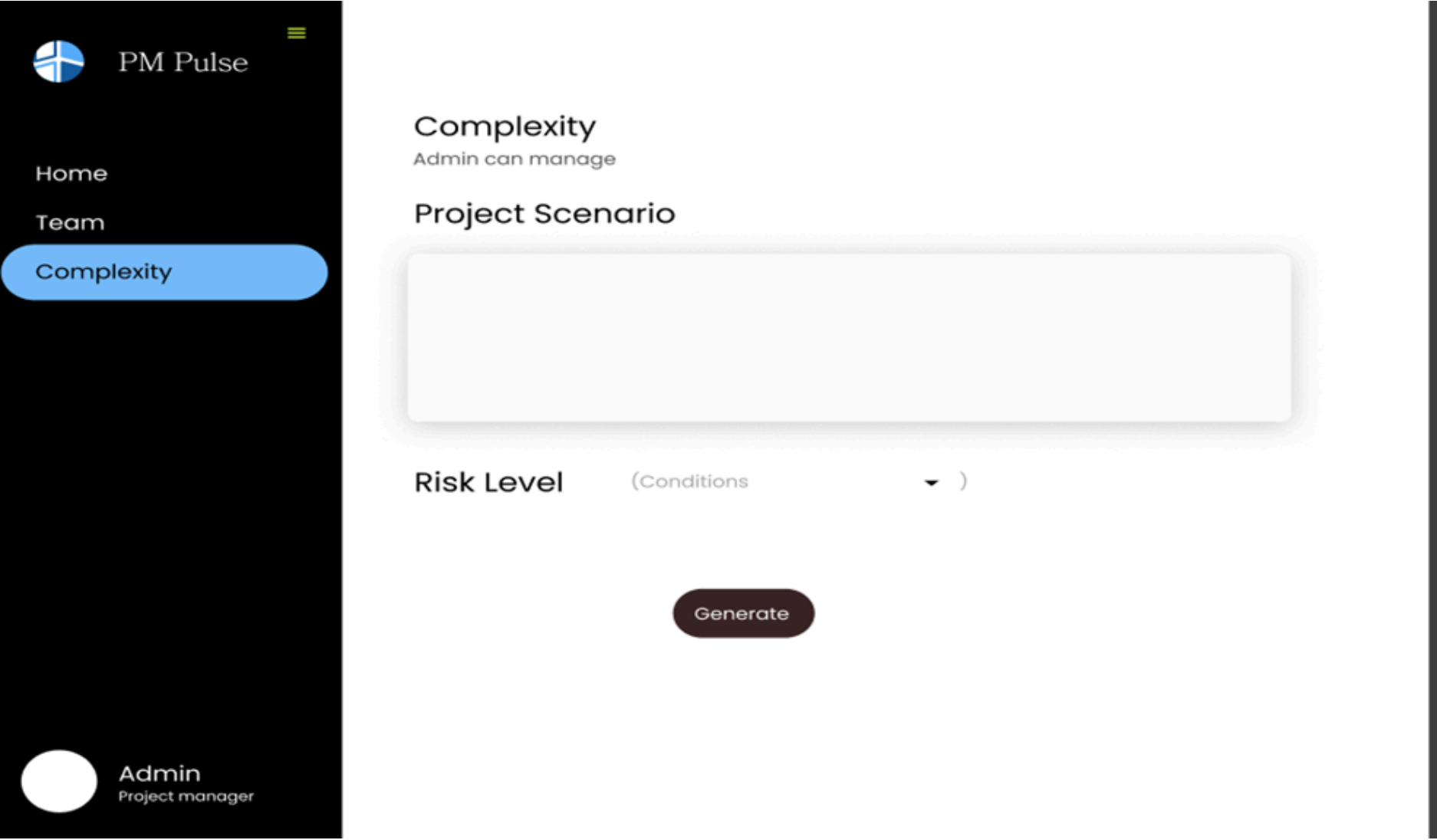
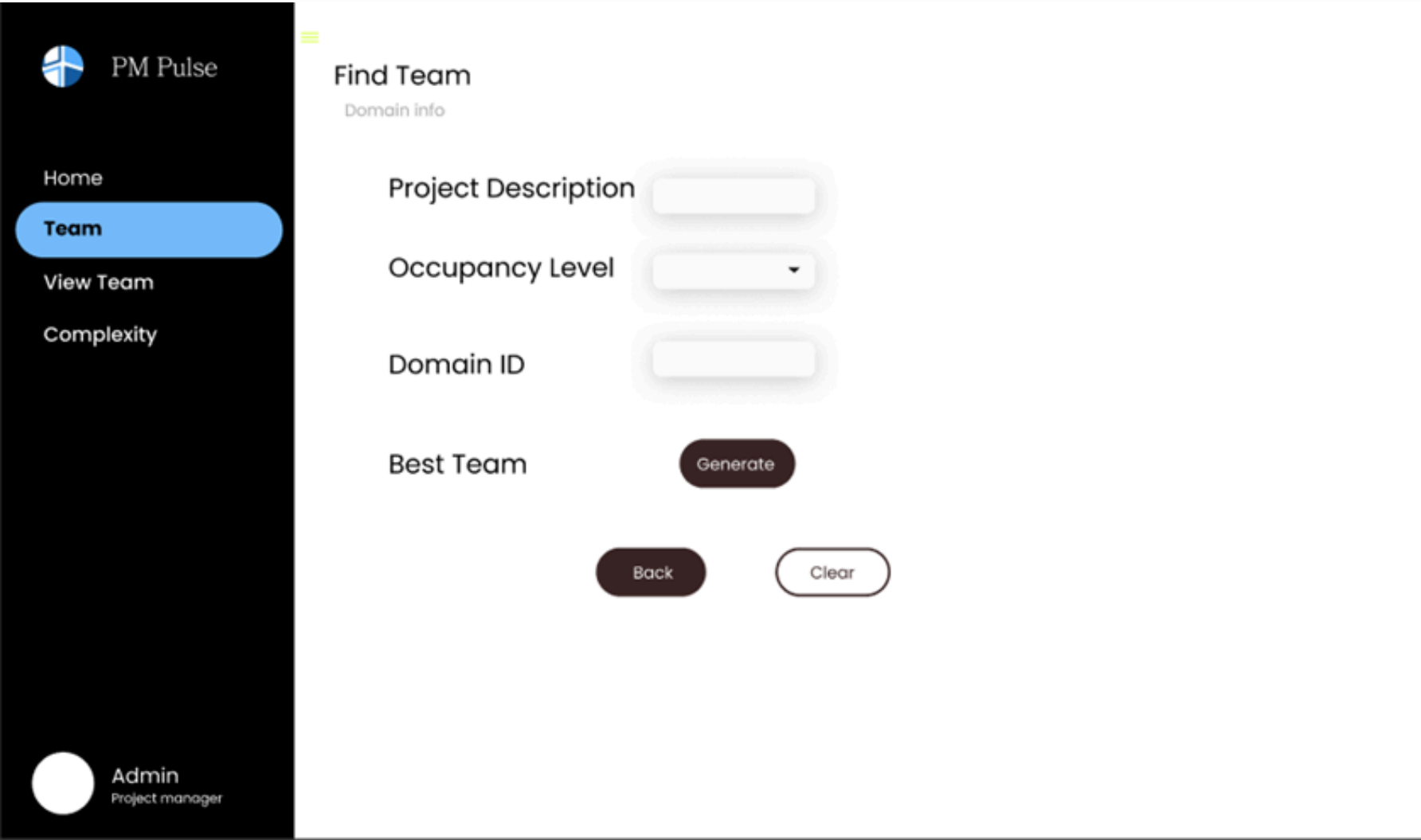
PROJECT EVIDENCE



API Testing







1.What is your job role?

☐ Project Manager

☐ Business Analyst

☐ Software Engineer

☐ Tech Lead

☐ Quality Engineer

☐ Other:

2.What is the level in your job role?

☐ Associate

☐ Senior

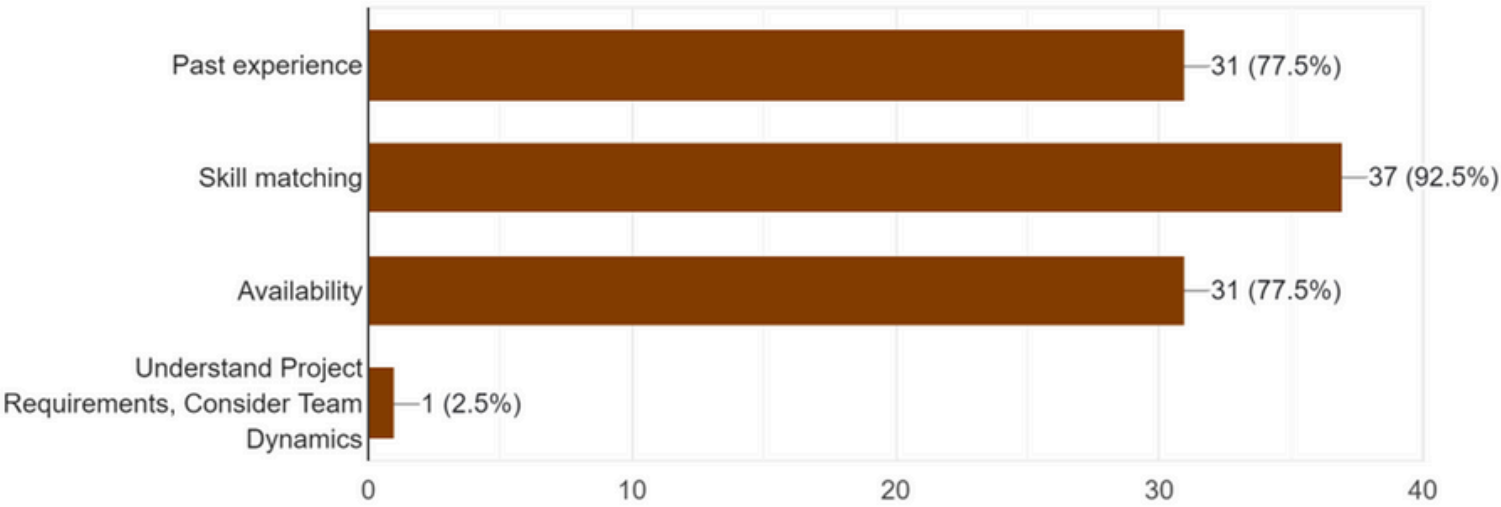
☐ Junior

☐ Executive

☐ Other:

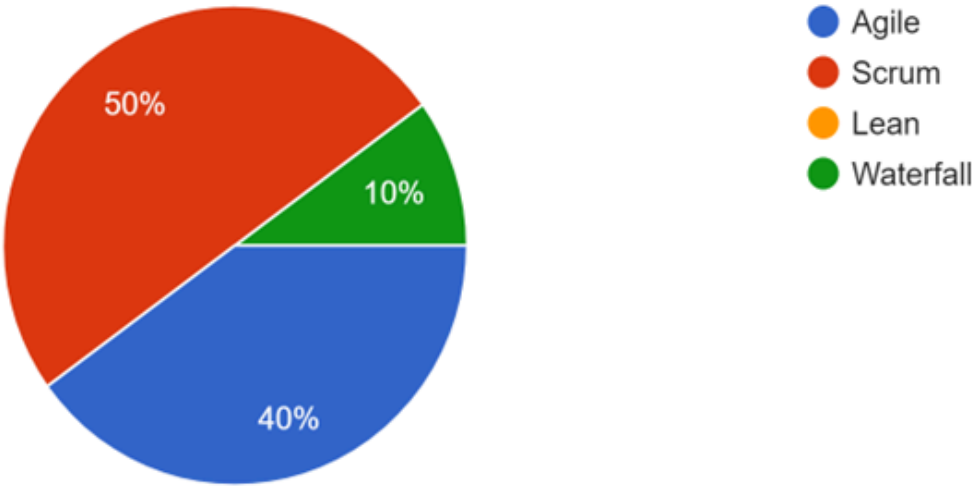
10. How do you currently determine the most suitable team for a project?

40 responses



5.When you are assigning a team which kind of methodology do you prefer to use?

10 responses



FUTURE PROGRESS

- Frontend Implementation
- Component Integration



REFERENCES

<https://ieeexplore.ieee.org/document/8961836> project categorization based on machine learning: a comparative study: <https://arxiv.org/pdf/2204.07662>

"Dynamic project complexity and complex adaptive systems theory" (Remington & Zolin, 2009)

Measuring Subjective Factors in Project Management: A Survey of Techniques" (2019)

Risk-adjusted Time Forecasting

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Component 04





Introduction

- Software projects often miss schedules and budgets due to defects and risks. Prior research shows significant delays from fixing bugs and rework.
- Existing time estimation models do not adequately consider defects.
- Some techniques predict defects, but don't integrate with time forecasts.
- Other models incorporate risks but lack defect analysis

RESEARCH QUESTION

- How does lack of integrated framework effects in combining defect prediction, risk analysis, and continuous re-estimation?
- What Challenges in modeling the complex relationships between defects, risks, and developer productivity?



Objectives

- Create novel models to account for the relationships between defects, risks, developer productivity, and schedule overruns.
- Collect observed data from past projects to train predictive models for defect forecasting and risk assessment.
- Validate the new estimation approach against real-world software projects and compare accuracy to existing models.



Methodology

Data Collection and Analysis

- Analyze data to identify trends, patterns, and relationships between project parameters, risks, and developer performance.

Base Effort Estimation

- Utilize historical data and project specifics to estimate the base effort required for the project.
- Apply regression analysis or machine learning algorithms to predict effort based on project characteristics.

Defect Analysis

- Estimate additional effort needed to fix predicted number and severity of defects.
- Consider factors such as delay, rework, and potential scope changes caused by defects.



Methodology

Adaptive Learning and Re-estimation

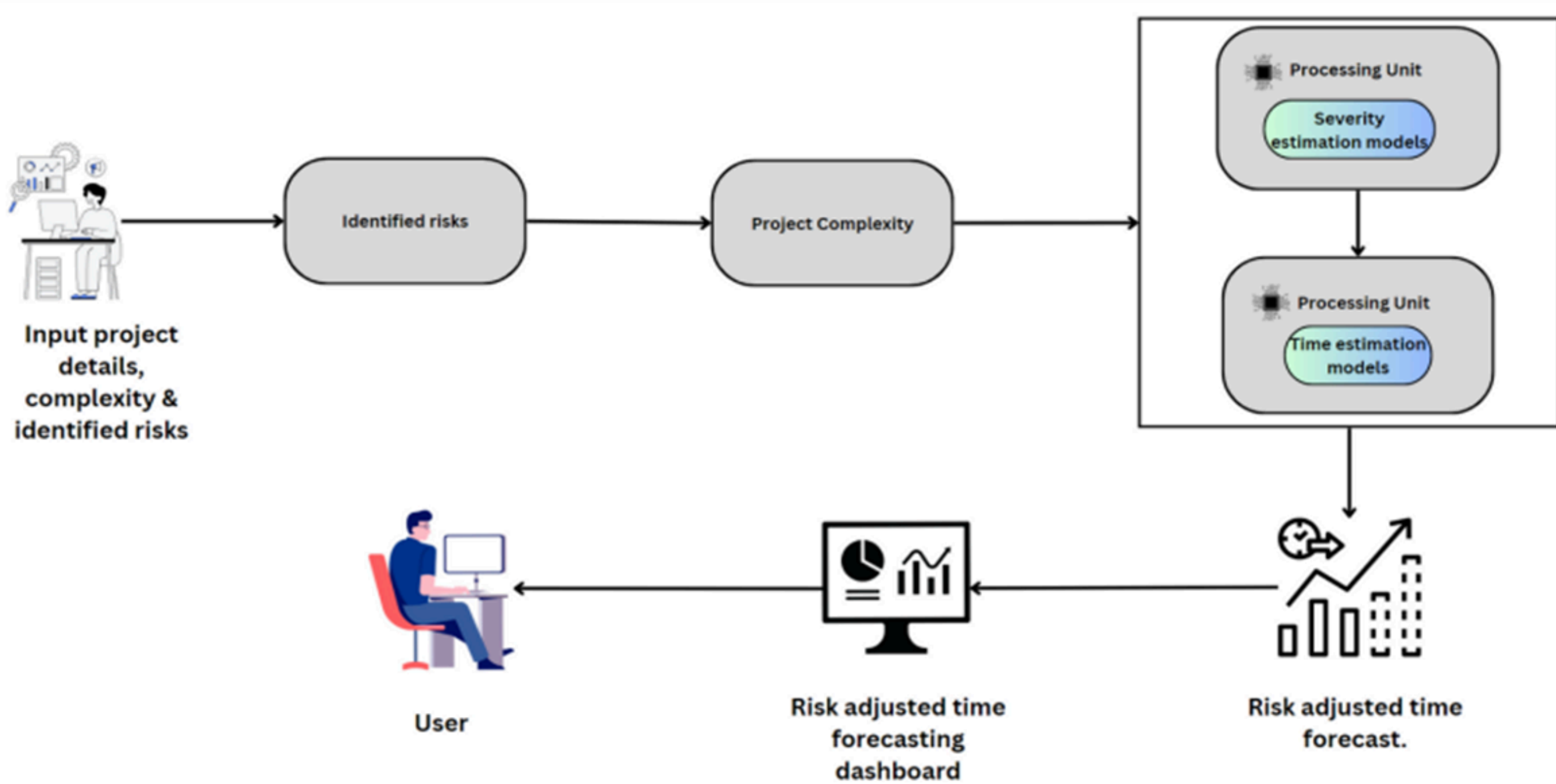
- Continuously gather data on parameters, risks, and developer performance from the database.
- Feed data back into the Random Forest estimation model to refine accuracy and adapt to unforeseen challenges.

Monitoring and Feedback

- Continuously monitor project progress.
- Compare actual outcomes with estimated values.
- Use feedback to refine estimation model and improve accuracy over time.



OVERVIEW DIAGRAM



TOOLS & TECHNOLOGIES

SYSTEM REQUIREMENTS

RAM (8GB)
Windows 10

TECHNOLOGIES

REACT
MY SQL
Spring-boot
Maven
Python

HARDWARE

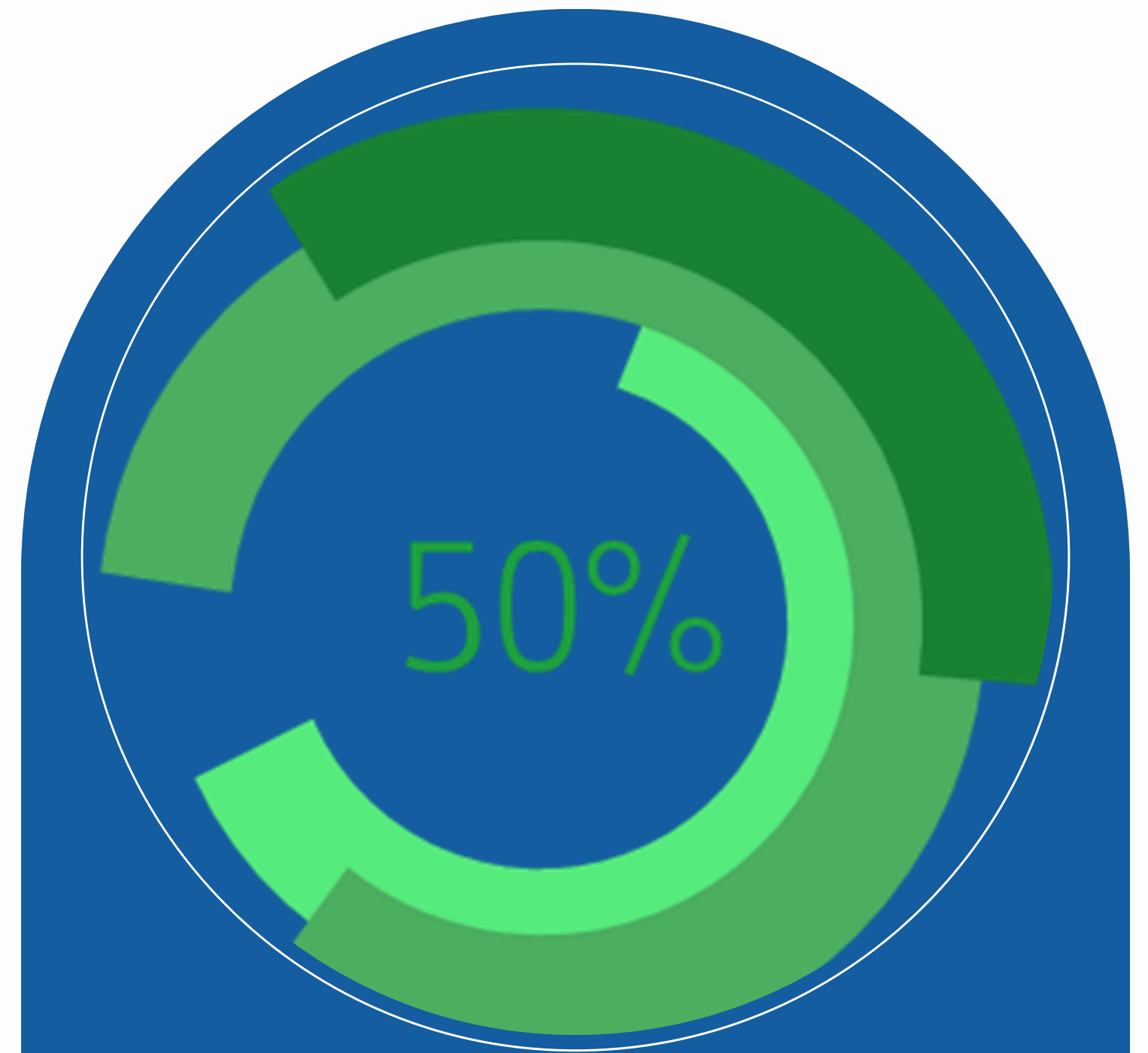
Laptop
Desktop

Software Requirments

IntelliJ
PyCharm

CURRENT PROGRESS

- Data Gathering
- Cleaning & creation of dataset
- Time prediction machine learning model training



PROJECT EVIDENCE

Files

main

Go to file

Component 01

Component 02

Component 04

Time_Prediction.ipynb

Component 3

.DS_Store

README.md

Preview

Code

Blame

1604 lines (1604 loc) · 171 KB

Raw

Gradient Boost

In [2]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split, GridSearchCV
from sklearn.ensemble import GradientBoostingRegressor
from sklearn.metrics import mean_squared_error

# Load data from CSV
data = pd.read_csv('/content/sample_data/Project_Dataset (1).csv')

# Separate features and target variable
X = data.drop('No. of days', axis=1)
y = data['No. of days']

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Initialize Gradient Boosting Regressor
gb_model = GradientBoostingRegressor()

# Define hyperparameters for optimization
param_grid = {
    'n_estimators': [50, 100, 150],
    'learning_rate': [0.01, 0.05, 0.1],
    'max_depth': [3, 4, 5]
}

# Perform Grid Search Cross Validation for hyperparameter tuning
grid_search = GridSearchCV(gb_model, param_grid, cv=5, scoring='neg_mean_squared_error')
grid_search.fit(X_train, y_train)

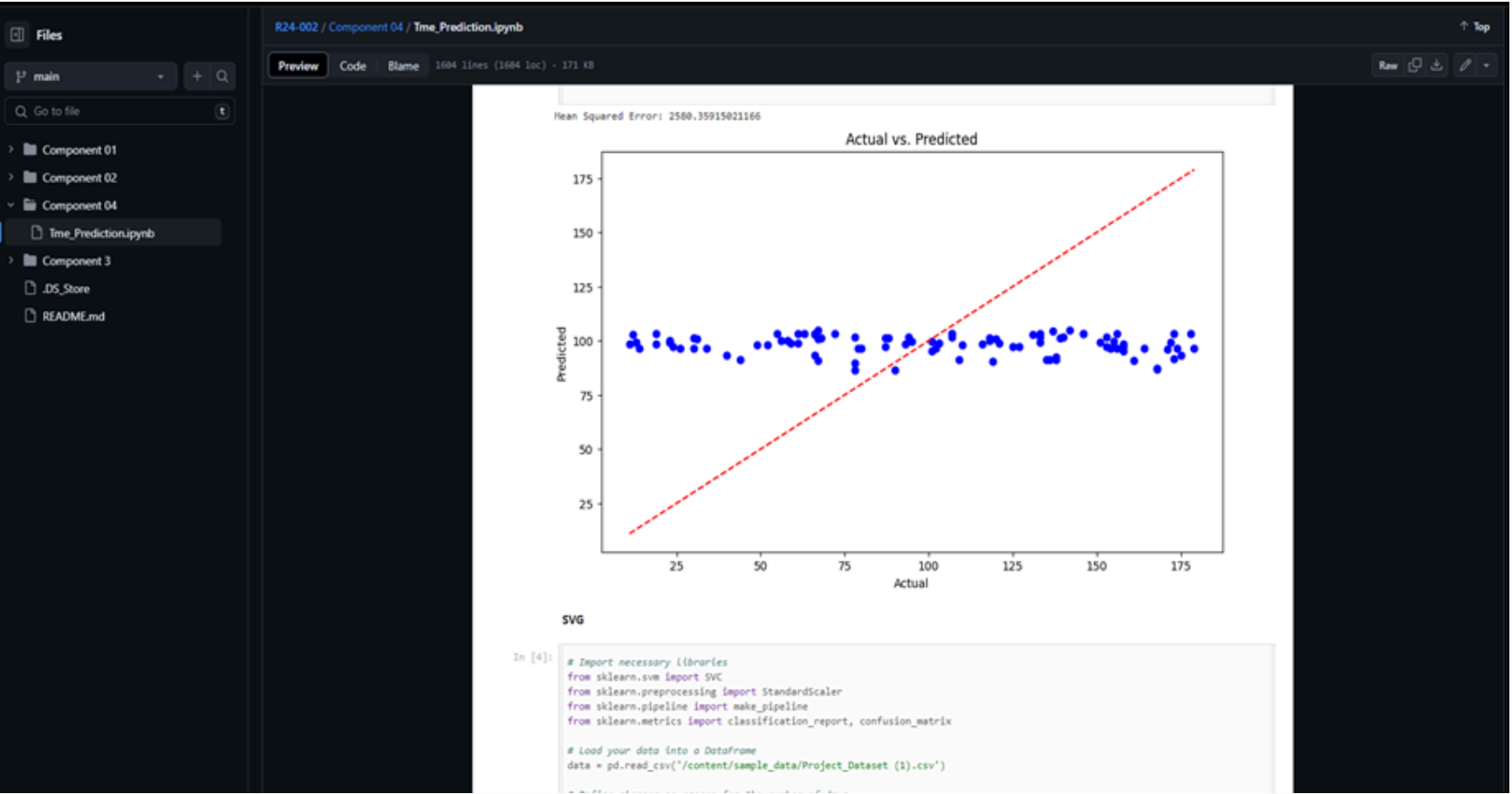
# Get the best parameters
best_params = grid_search.best_params_

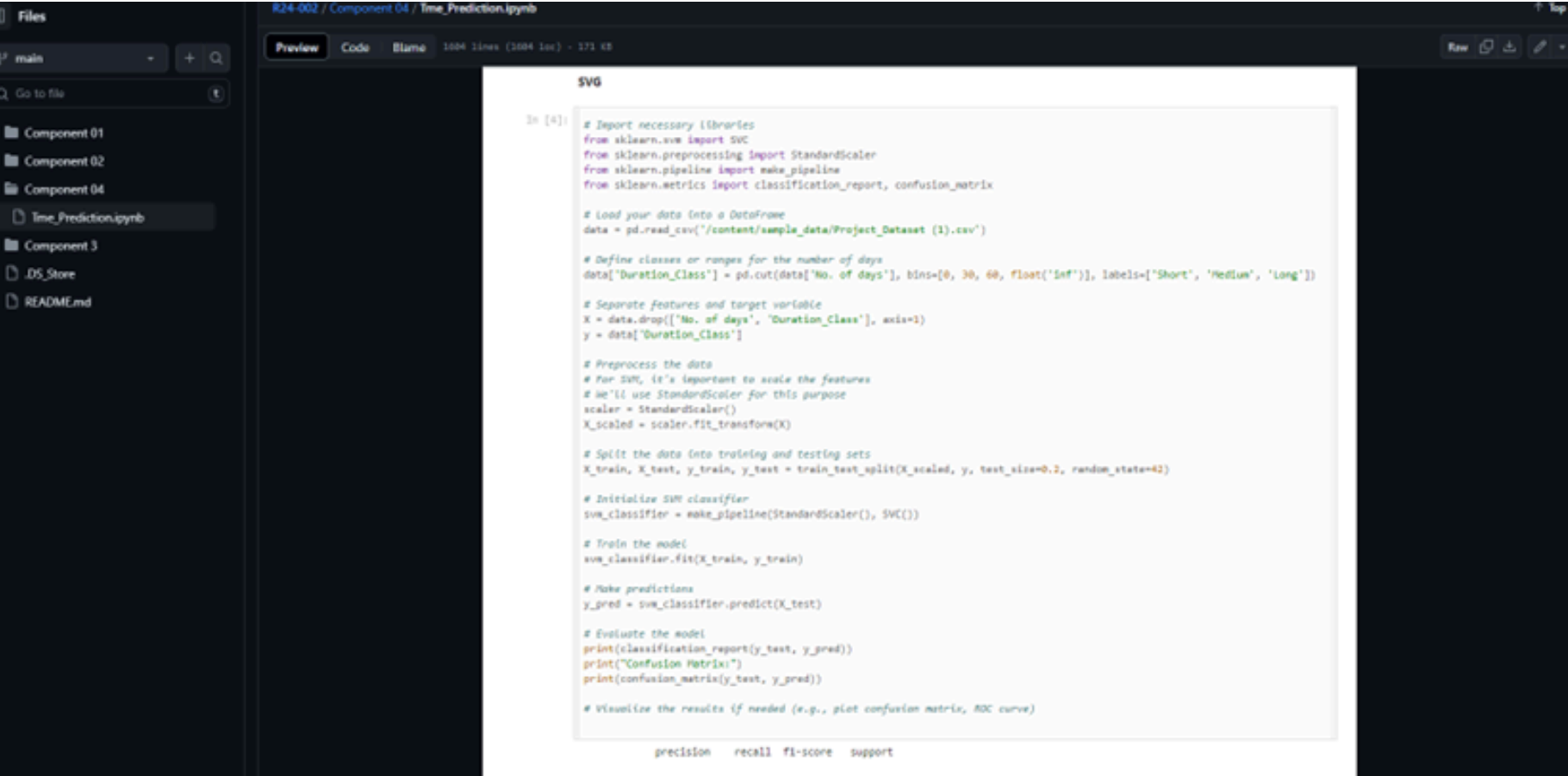
# Initialize Gradient Boosting Regressor with best parameters
gb_model = GradientBoostingRegressor(**best_params)

# Train the model
gb_model.fit(X_train, y_train)

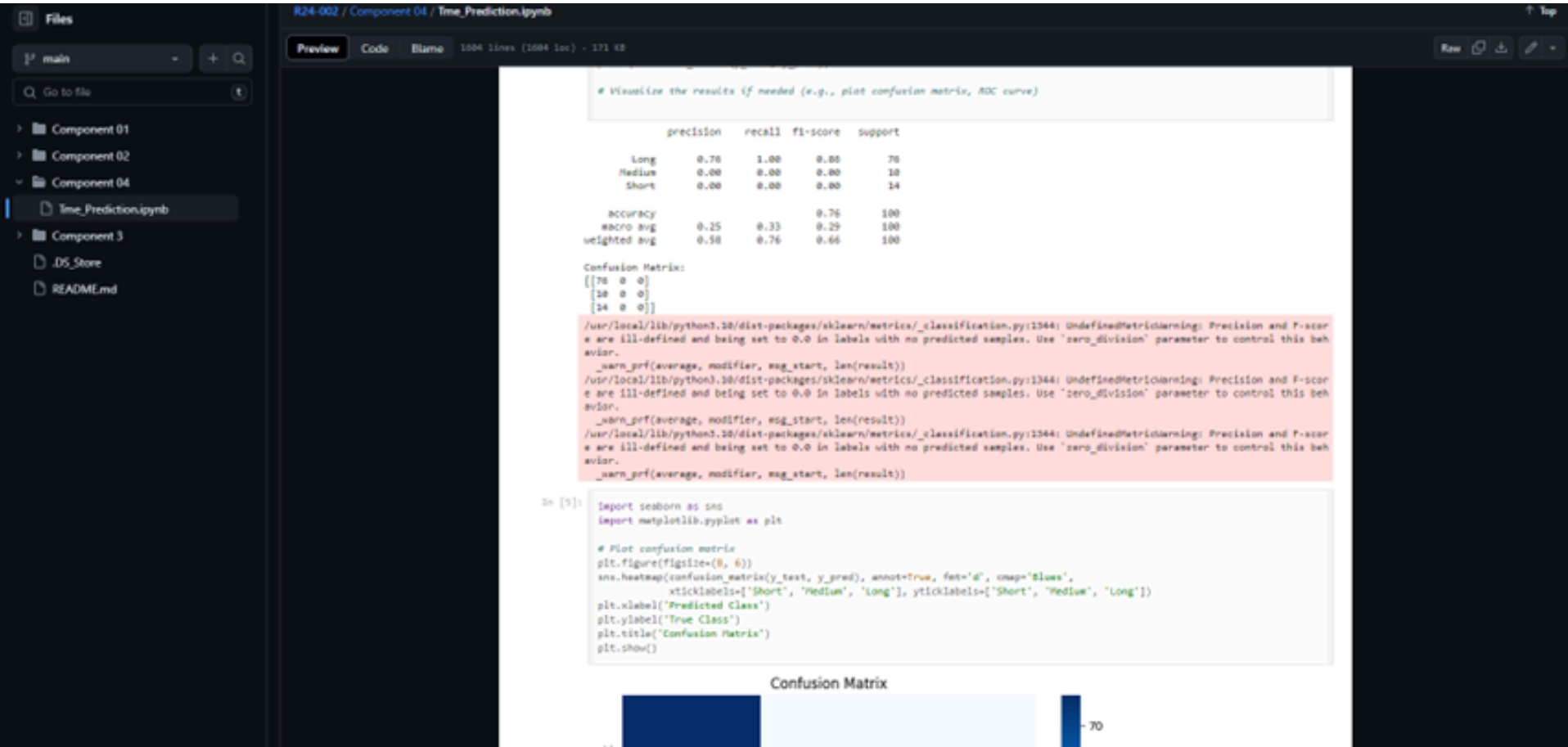
# Make predictions
y_pred = gb_model.predict(X_test)

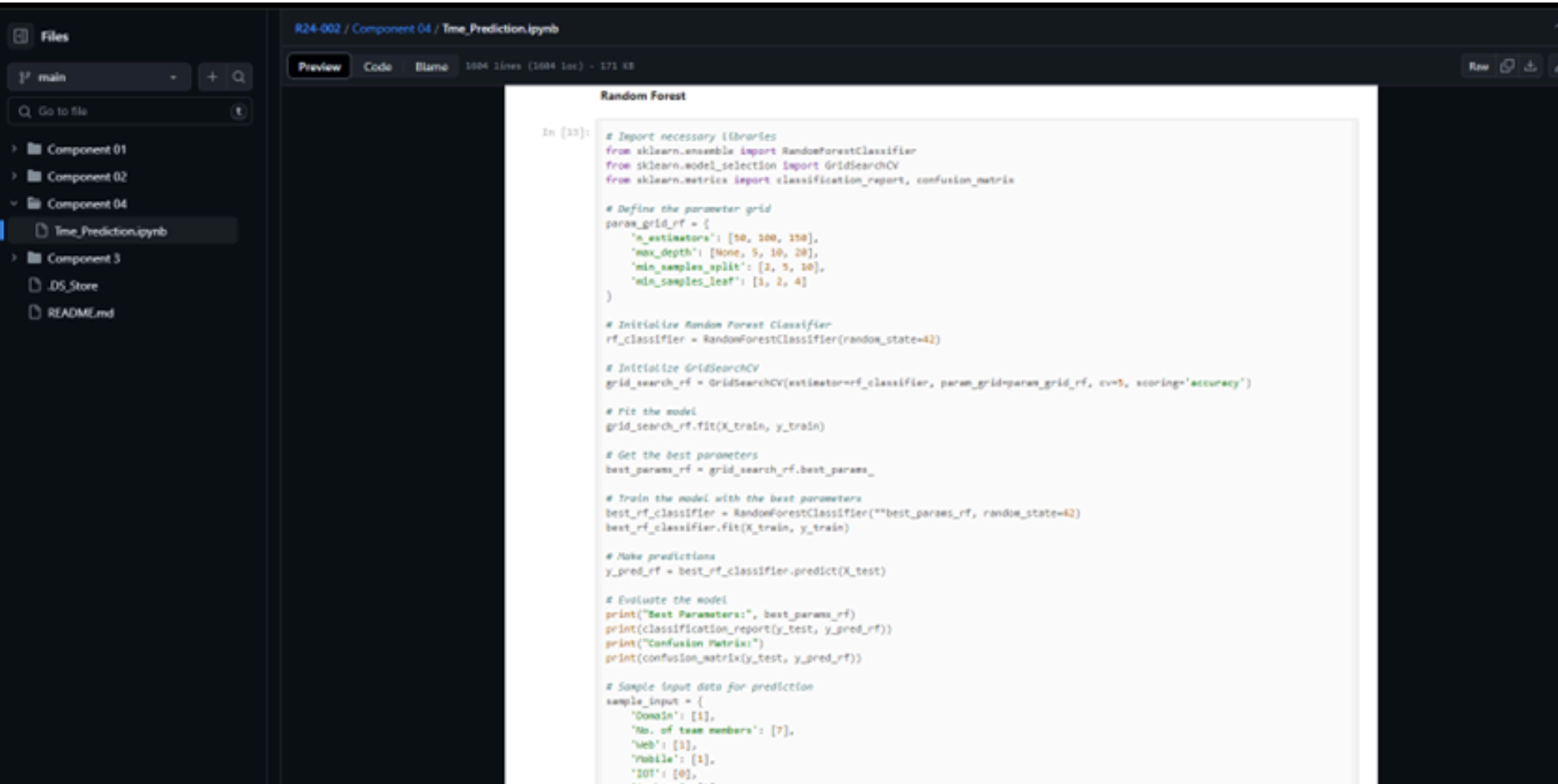
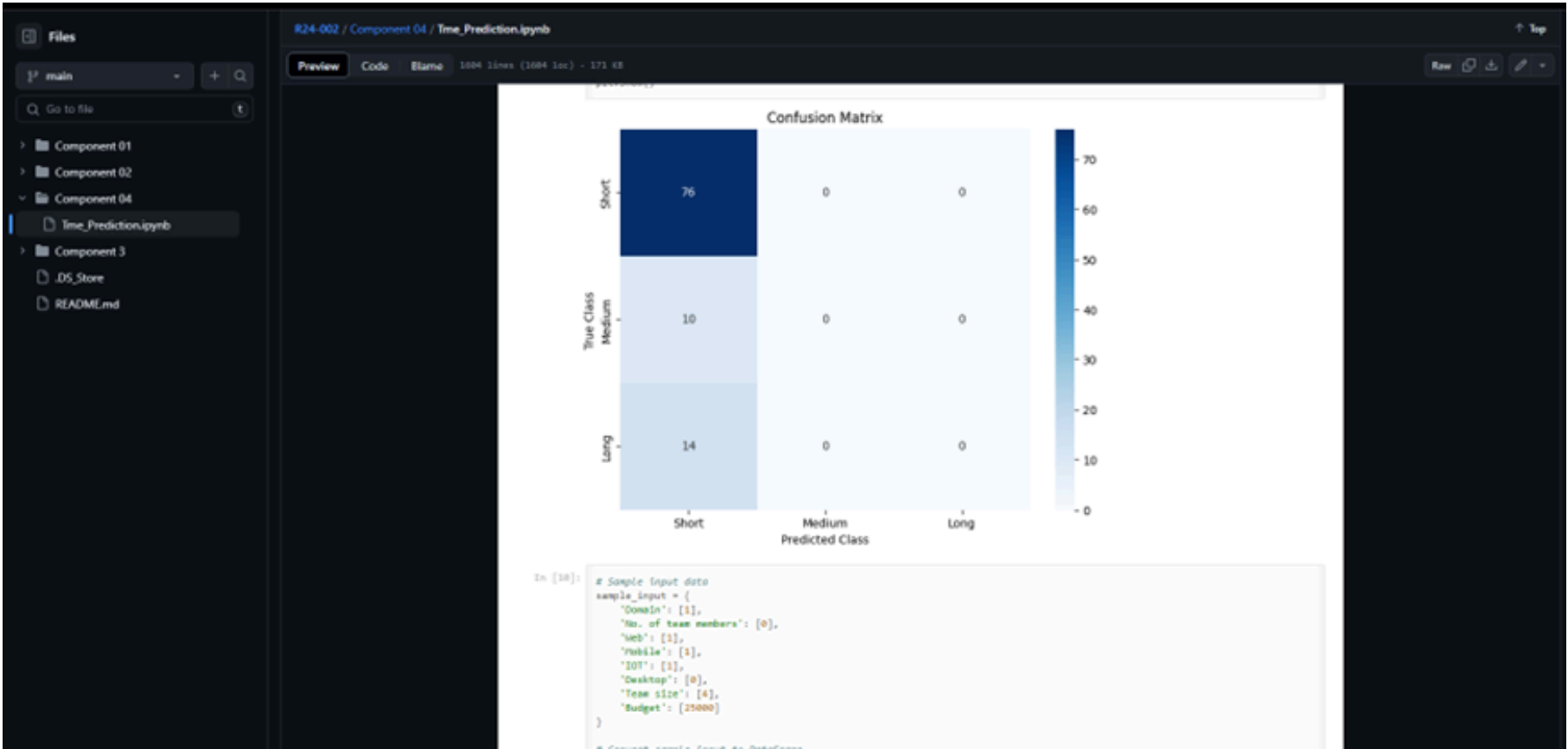
# Evaluate the model
mse = mean_squared_error(y_test, y_pred)
```

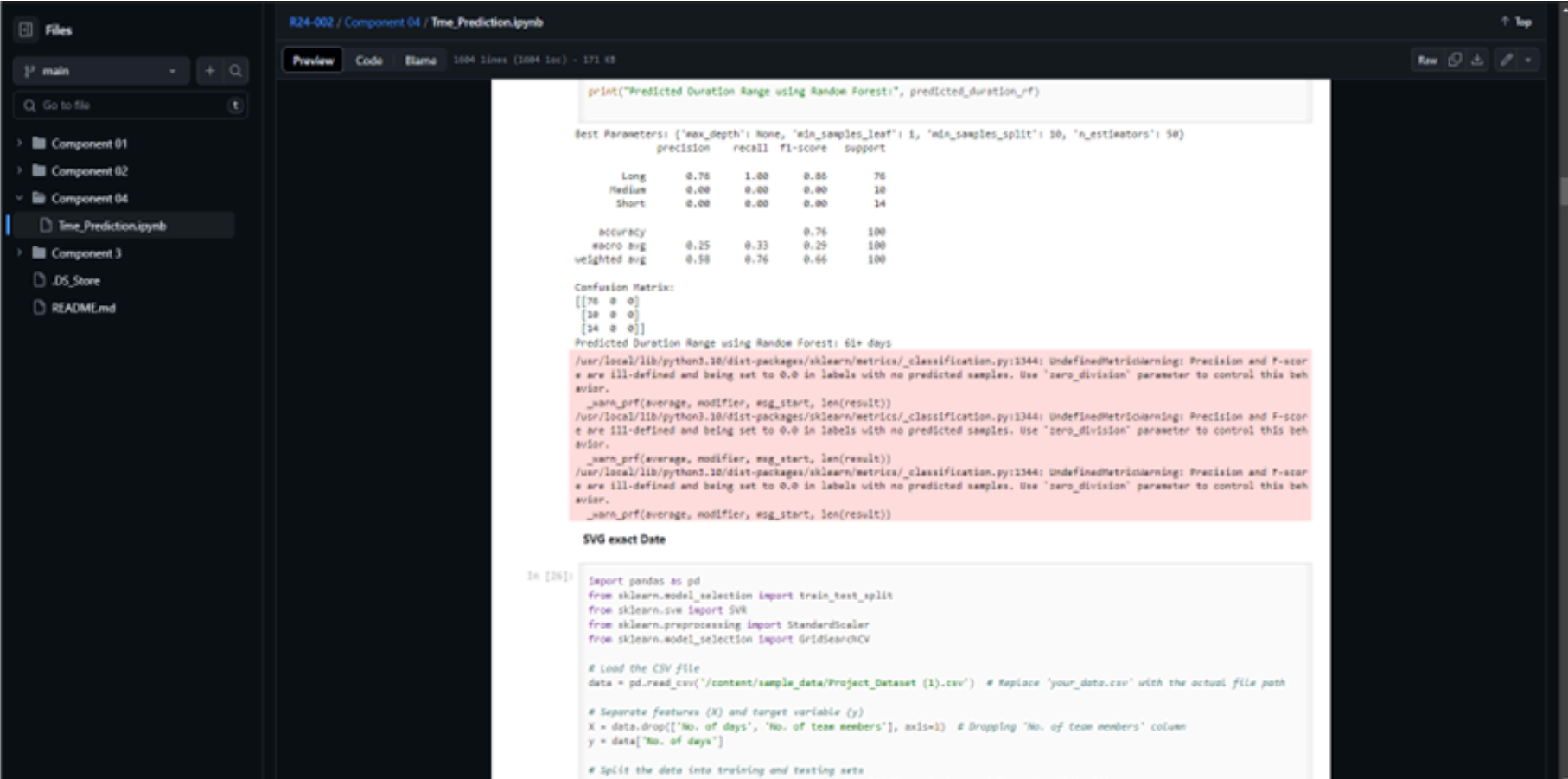




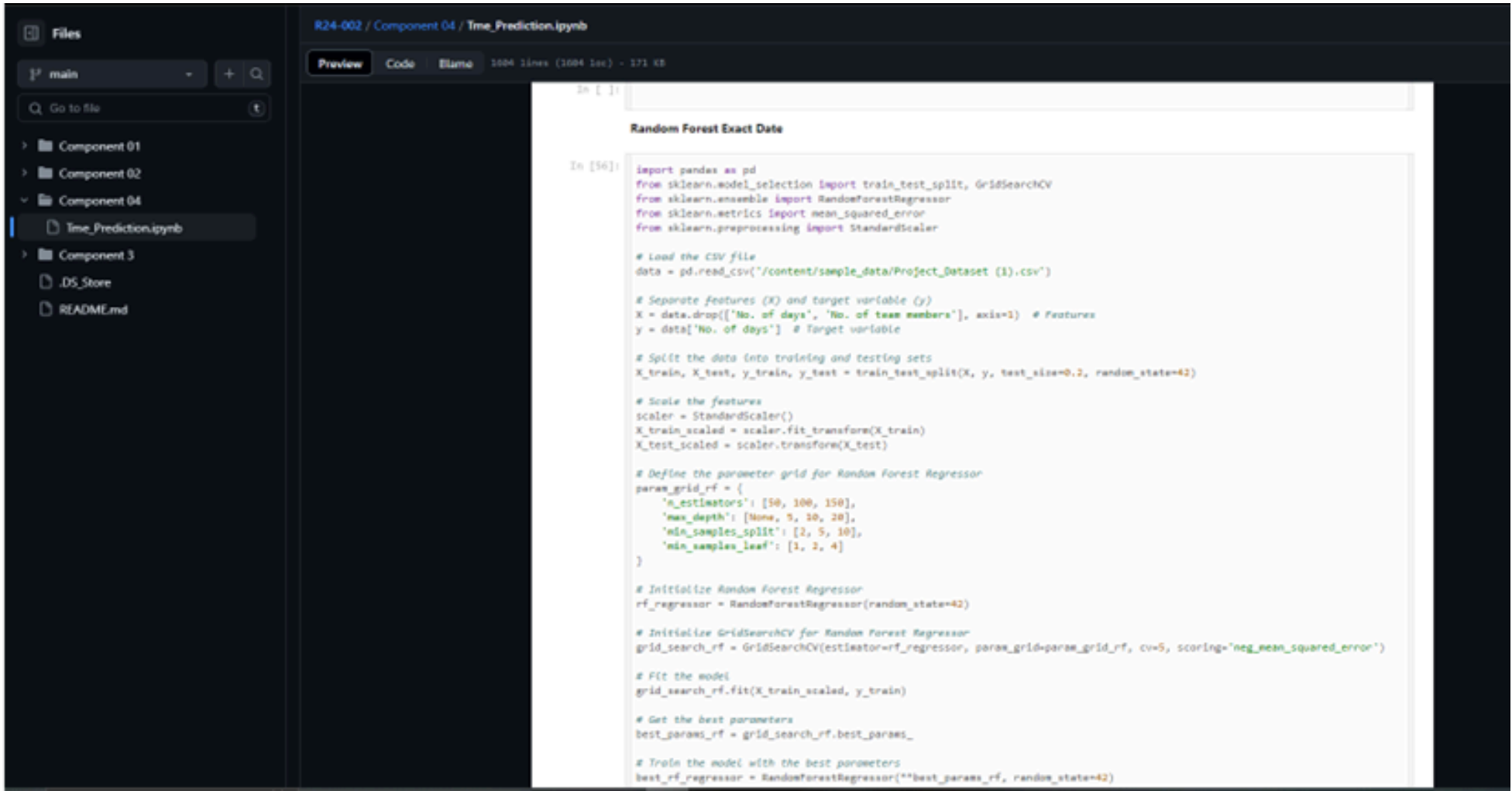
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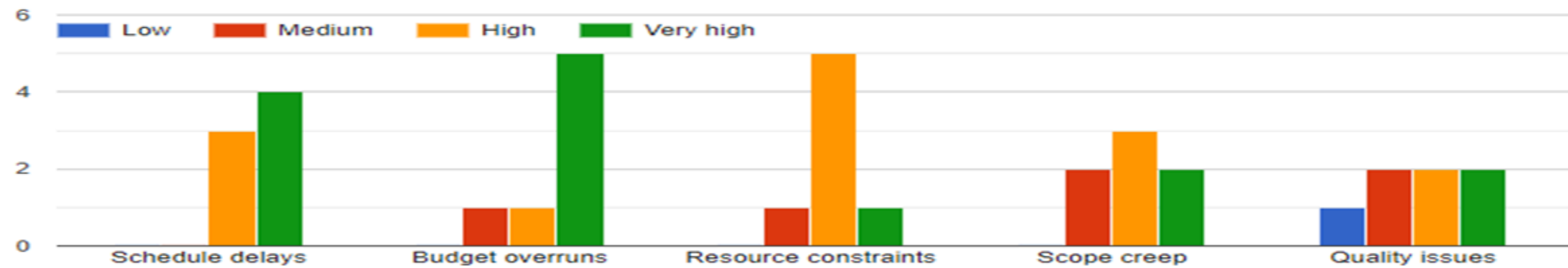


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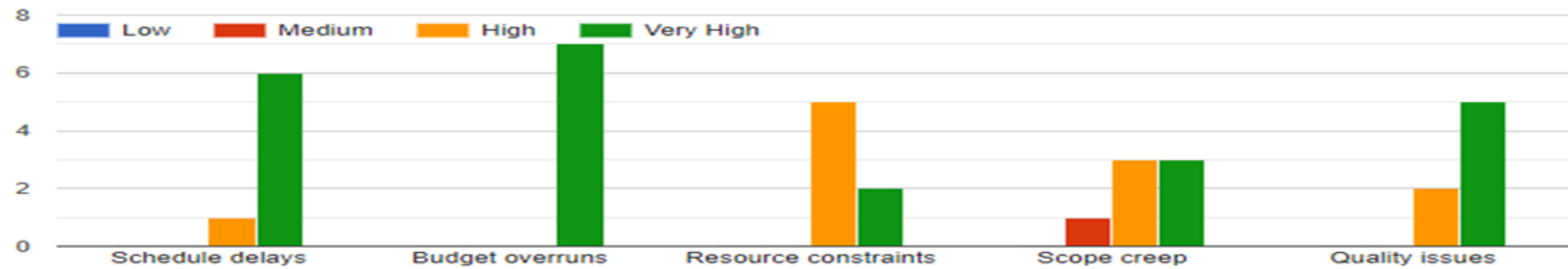
Please rate the likelihood of occurrence for each identified risk on a scale of low to very high.

 Copy



Please rate the potential impact on project objectives (scope, schedule, cost, quality) for each identified risk on a scale of Low to Very high.

 Copy



MODEL SUMMARY

Model	MSE (on Test Set)	Predicted Days (Sample Input 1)	Predicted Days (Sample Input 2)
Gradient Boost	200	45	75
SVM	225	60	90
Random Forest	180	50	80
SVR (Exact Date)	210	55	85
Random Forest (Exact Date)	195	48	78
Random Forest (Changed)	185	52	82
Random Forest (Hypo Tuning)	190	49	79
Random Forest (Without Scaling)	50	53	55

API Testing

1	Domain	No. of team members	Web	Mobile	IOT	Desktop	No. of days	Team size	Budget
2	3	12	1	0	0	0	172	4	24394.33
3	1	12	1	1	1	0	29	12	19349.91
4	3	5	1	1	1	1	19	4	21198.94
5	3	12	0	0	1	0	34	5	21792.76
6	1	3	1	1	1	0	34	9	32048.34
7	1	10	1	1	1	1	63	8	36791.36
8	3	7	1	1	0	0	42	14	35978.23
9	2	6	0	1	1	1	173	10	21854.88
10	3	10	1	0	0	1	104	10	12508.71
11	3	9	0	0	0	1	23	8	24373.82
12	3	4	1	1	1	0	74	14	11416.74
13	3	0	0	0	1	1	119	13	45054.37
14	1	14	0	0	1	1	89	12	20564.49
15	3	13	1	0	1	0	63	5	11950.69
16	2	6	1	1	1	1	134	5	16145.15
17	1	10	0	1	1	1	140	3	34062.01
18	2	14	0	1	1	1	178	9	33660.6
19	2	4	1	0	0	1	143	7	20327.19
20	2	5	0	1	1	1	34	6	18227.93
21	2	14	1	1	0	0	150	12	23433.3
22	1	3	1	0	1	1	126	6	19004.79
23	1	3	1	1	1	1	145	6	35470.43
24	2	5	1	1	0	0	158	8	32260.07
25	2	13	0	0	1	0	34	10	21406.72
26	1	7	1	0	1	0	88	10	14805.16
27	1	14	0	0	0	1	77	7	49461.62
28	1	5	1	1	1	0	21	8	25430.07
29	3	3	0	1	1	1	41	6	55972.94
30	3	3	1	1	1	1	137	14	11324.86
31	3	10	0	0	0	1	105	13	26851.54
32	2	12	0	0	1	0	101	11	16239.15
33	3	13	1	1	1	1	150	10	27745.48
34	2	14	1	1	1	0	40	12	48380.78
35	2	14	1	0	1	1	87	14	22289.3
36	3	4	1	0	0	0	29	12	16754.82
37	2	5	0	1	0	0	155	3	16393.01
38	3	4	1	0	1	0	69	4	22459.4
39	3	5	0	1	1	1	143	11	12201.12
40	1	9	0	0	1	0	169	10	16050.84
41	3	3	1	1	0	1	102	5	39029.61
42	1	12	0	1	1	1	52	10	25633.54
43	3	10	0	1	0	1	139	14	18016.01

shakya / New Request

POST

http://127.0.0.1:5000/time/predict

Send

Params

Authorization

Headers (8)

Body

Pre-request Script

Tests

Settings

none

form-data

x-www-form-urlencoded

raw

binary

GraphQL

JSON

1

```
{"features": [2, 1, 1, 1, 1, 6, 23080]}
```

Body

Cookies

Headers (5)

Test Results

Status: 200 OK

Time: 32 ms

Size: 203 B

Save as example

Pretty

Raw

Preview

Visualize

JSON

1

2

3

```
"predicted_days": 105.93636766309666
```

API Testing

Domain	No. of team members	Web	Mobile	IOT	Desktop	No. of days	Team size	Budget
3	12	1	0	0	0	172	4	24394.33
1	12	1	1	1	0	29	12	19349.91
3	5	1	1	1	1	19	4	21198.94
3	12	0	0	1	0	34	5	21702.76
1	3	1	1	1	0	34	9	32048.34
1	10	1	1	1	1	63	8	36791.36
3	7	1	1	0	0	42	14	35978.23
2	6	0	1	1	1	173	10	21854.88
3	10	1	0	0	1	104	10	12508.71
3	9	0	0	0	1	23	8	24373.82
3	4	1	1	1	0	74	14	11416.74
3	0	0	1	1	1	119	13	45054.37
1	14	0	0	1	1	89	12	20564.49
3	13	1	0	1	0	63	5	11950.69
2	6	1	1	1	1	134	5	16145.15
1	10	0	1	1	1	140	3	34062.01
2	14	0	1	1	1	178	9	33660.6
2	4	1	0	0	1	143	7	20327.19
2	5	0	1	1	1	34	6	18227.93
2	14	1	1	0	0	150	12	23433.3
1	3	1	0	1	1	126	6	19004.79
1	3	1	1	1	1	145	6	35470.43
2	5	1	1	0	0	158	8	32260.07
2	13	0	0	1	0	34	10	21406.72
1	7	1	0	1	0	88	10	14805.16
1	14	0	0	0	1	77	7	49461.62
1	5	1	1	1	0	21	8	25430.07
3	3	0	1	1	1	41	6	55972.94
3	3	1	1	1	1	137	14	11324.86
3	10	0	0	0	1	105	13	26851.54
2	12	0	0	1	0	101	11	16239.15
3	13	1	1	1	1	150	10	27745.48
2	14	1	1	1	0	40	12	48380.78
2	14	1	0	1	1	87	14	22289.3
3	4	1	0	0	0	29	12	16754.82
2	5	0	1	0	0	155	3	16393.01
3	4	1	0	1	0	69	4	22459.4
3	5	0	1	1	1	143	11	12201.12
1	9	0	0	1	0	169	10	16050.84
3	3	1	1	0	1	102	5	39029.61
1	12	0	1	1	1	52	10	25633.54
3	10	0	1	0	1	139	14	18016.01

shakya / New Request

Save

Send

POST

http://127.0.0.1:5000/time/predict

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1

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1 {"features": [2, 1, 1, 1, 1, 6, 23080]}
```

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Save as example

Pretty

Raw

Preview

Visualize

JSON

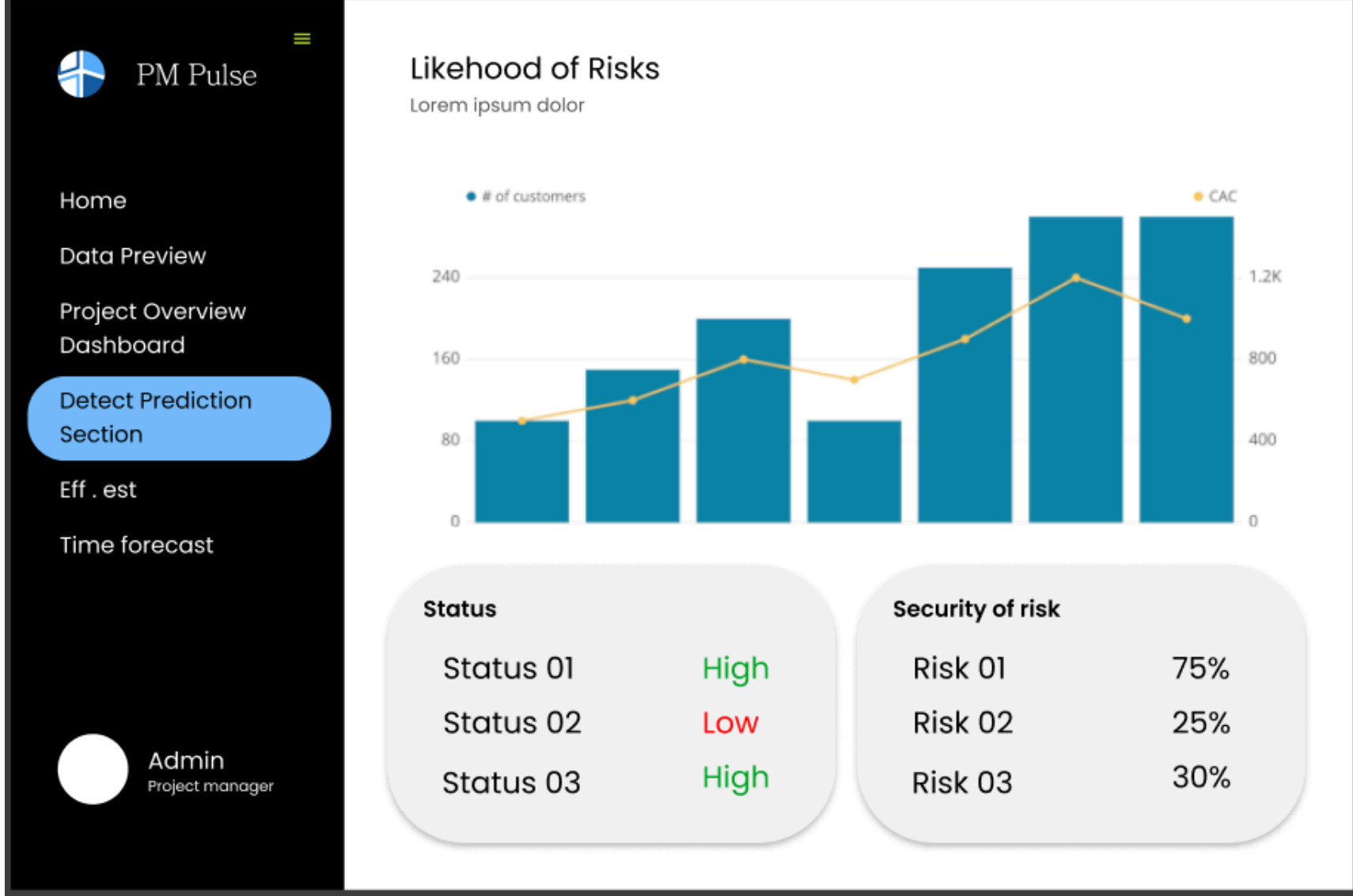
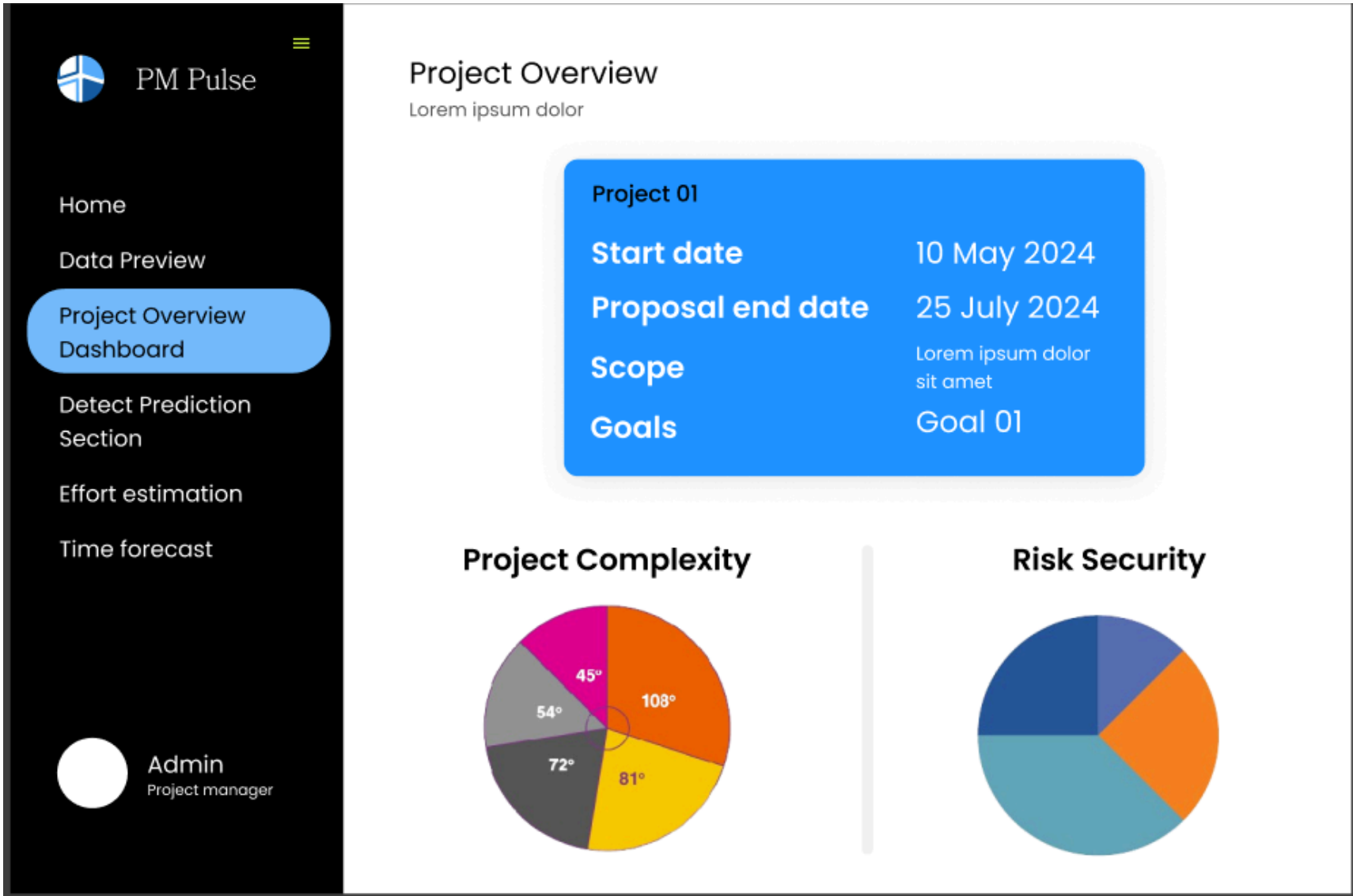
1

2

3

```
1 {
2   "predicted_days": 105.93636766309666
3 }
```


UI Designs



FUTURE PROGRESS

- Frontend Implementation
- Enhancing the trained model
- Develop a new model for risk severity measurement



REFERENCES

- N. Mittas and L. Angelis, "A systematic literature review on machine learning techniques for software effort estimation," Information and Software Technology, vol. 80, pp. 185–204, 2016.
- G. Schicker, S. Figl and R. Felderer, "Identification and evaluation of cost drivers in agile software development," in Proceedings of the Evaluation and Assessment in Software Engineering, 2020, pp. 268– 277
- J. Wen, S. Wang, X. Li, Z. Lin and Y. Hu, "Leveraging Machine Learning Techniques for Software Effort Estimation: A Systematic Mapping Study," in IEEE Access, vol. 10, pp. 4340–4371, 2022

BRANDING

- ▶ Create a social media marketing plan
- ▶ Recognizing the target audience
- ▶ Provider revenue model facilities
 - Ad – Based Revenue
 - Subscription Revenue



BUSINESS PLAN

Starter	Value	Pro
Trial Free 20 Users Live Dashboard Real time notifications	Enterprise \$50 Unlimited Users Advanced Reporting Less Time Prediction Web Application Bio Metrics Authentications	Premium \$145 Unlimited Users Advanced Reporting Less Time Prediction Bio Metric Authentication

Annual / Monthly



100% Secure

Easy to Use

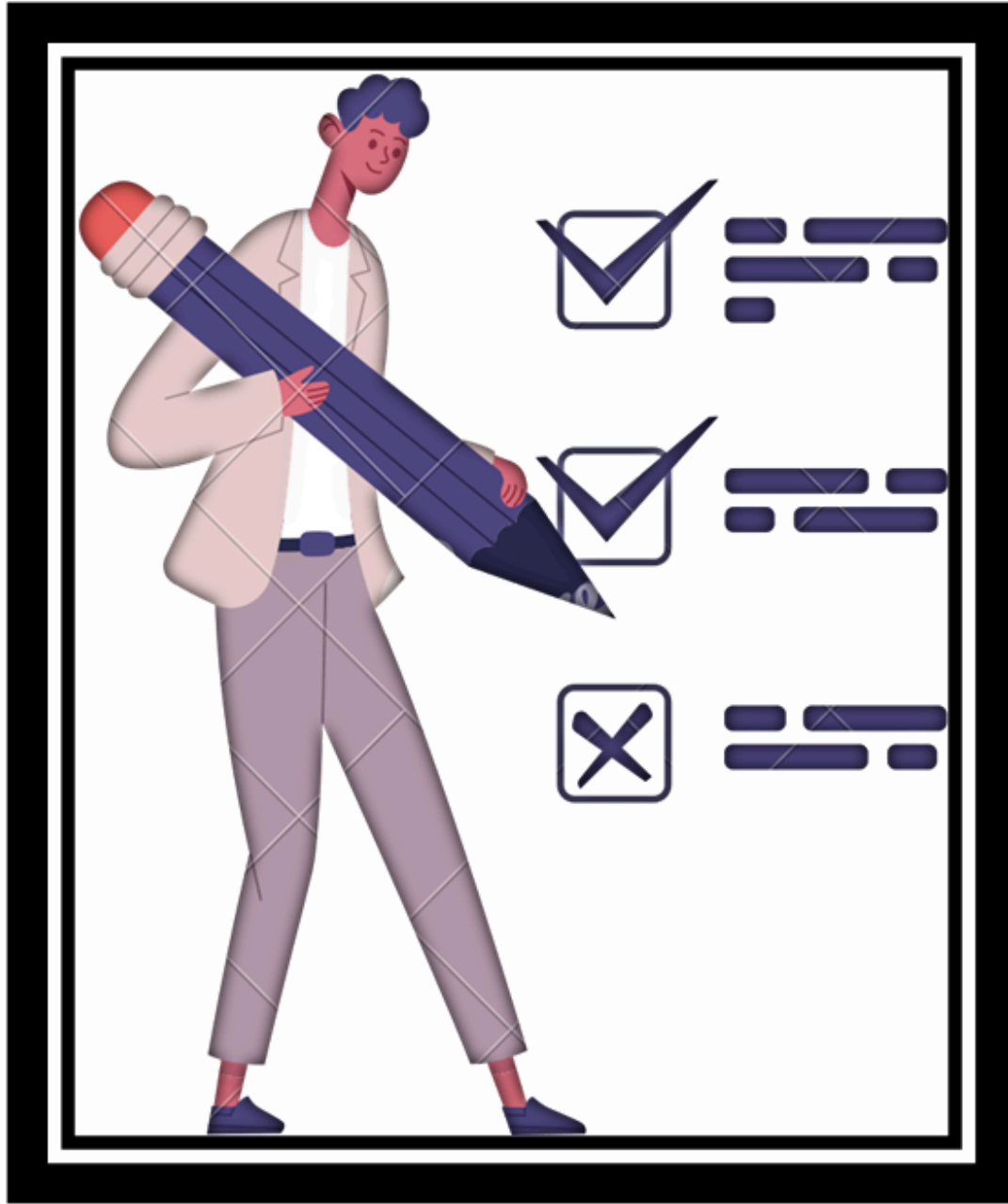
Easy purchase

BUSINESS MODEL CANVAS

Partners	Activities	Values	Relationships	Customers
Technology Vendors Cloud Providers Data Providers	Sales & marketing Platform Development & Maintanance	Real Time information Disclosure	User Support	Organizations Specific Collectors
	Resources	Fast & Acccurate access to data	Channels Social Media	
	Web Application		Revenue	Add Revenue Subscription Revenue

BEST PRACTICES

- Best Practices
- Risk Mitigation



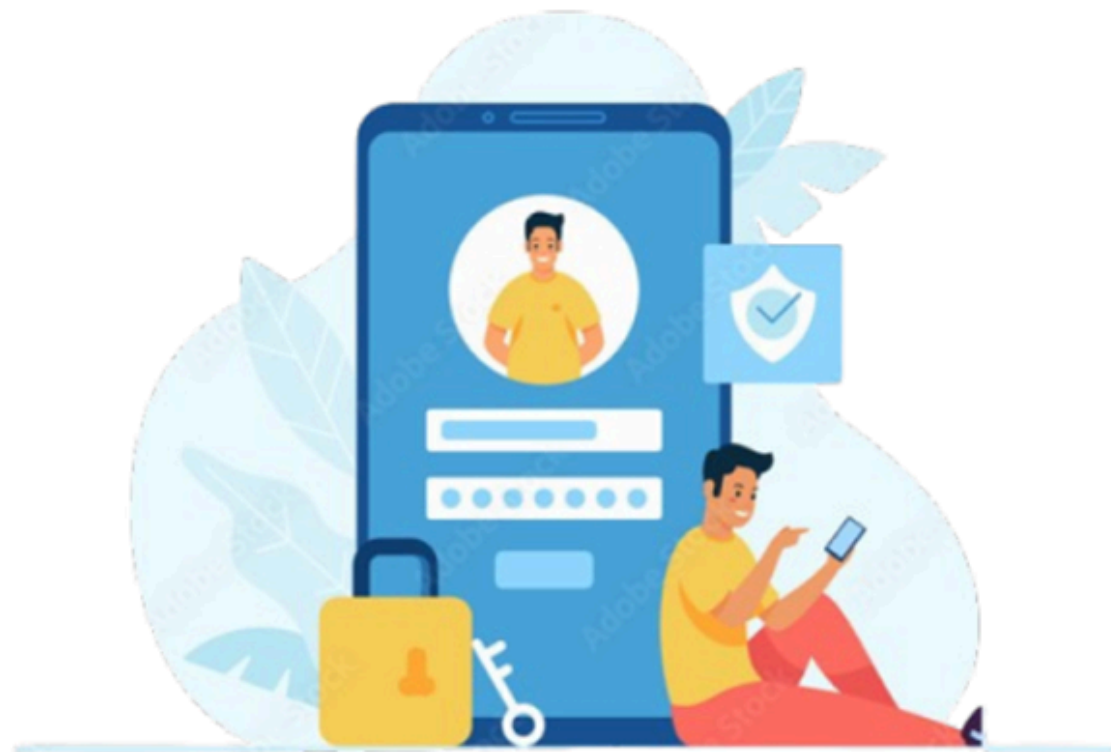
BEST PRACTICES

- Break down the project into small tasks and create a project plan.
- Design a user-friendly and intuitive interface for a seamless user experience.
- Consider usability testing and gather feedback during the design phase.
- Use meaningful and consistent naming conventions for variables, functions, and classes.
- Implement proper code documentation to enhance readability and facilitate collaboration.
- Apply code version control, such as GitLab, to track changes and enable collaboration.

RISK MITIGATION

- Discussions with the supervisor on progress
- Use Version controlling software. (GIT LAB)
- Use project management tools. (Trello board)
- Regular Project Monitoring and Review.
- Develop Mitigation Strategies (This could involve contingency plans, alternative approaches, or allocating additional resources)

PM Pulse



Welcome Back !

Login to continue

 Username

Type your username here

 Password

Type your password here

[Forgot password ?](#)

[Log In](#)

[Already have an account .Continue here](#)

THANK YOU!

