Project Title : ANALYTICS TOOL FOR PLACEMENTS

Project Submitted to : IBM

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Department : ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

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Team ID : NM2023TMID00881

Team Size : 4

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1.INTRODUCTION

1.1 Project Overview

The Analytics Tool for Placements" project is a comprehensive system designed to optimize the placement process in educational institutions. The primary goal of this project is to leverage data analytics and visualization techniques to enhance the efficiency, transparency, and success rates of student placements. By collecting and analyzing relevant data, the tool provides valuable insights to students, placement officers, and recruiters, facilitating data-driven decision-making.

1.2 Purpose

The purpose of the "Analytics Tool for Placements" project is to revolutionize the placement process in educational institutions by leveraging data analytics and technology. The tool serves several key purposes:

Enhanced Decision-Making: The primary purpose of the analytics tool is to enable data-driven decision-making. By collecting and analyzing relevant data, educational institutions, placement officers, and students can make informed decisions about career choices, skill development, and recruitment strategies. This leads to more effective placement outcomes.

Optimizing Student-Recruiter Match: The tool helps match student profiles, skills, and preferences with the requirements of recruiters. By analyzing both historical placement data and real-time market demands, the tool ensures that students are connected with job opportunities that align with their abilities and aspirations. This optimization enhances the chances of successful placements

2. Ideation and Proposed Solution

2.1 Problem statement definition

In many educational institutions, the process of student placements is often inefficient, lacks transparency, and struggles to effectively match students with appropriate job opportunities. Placement officers face challenges in understanding the diverse skill sets of students, identifying suitable job openings, and ensuring students are adequately prepared for interviews. Recruiters, on the other hand, find it difficult to evaluate the quality of

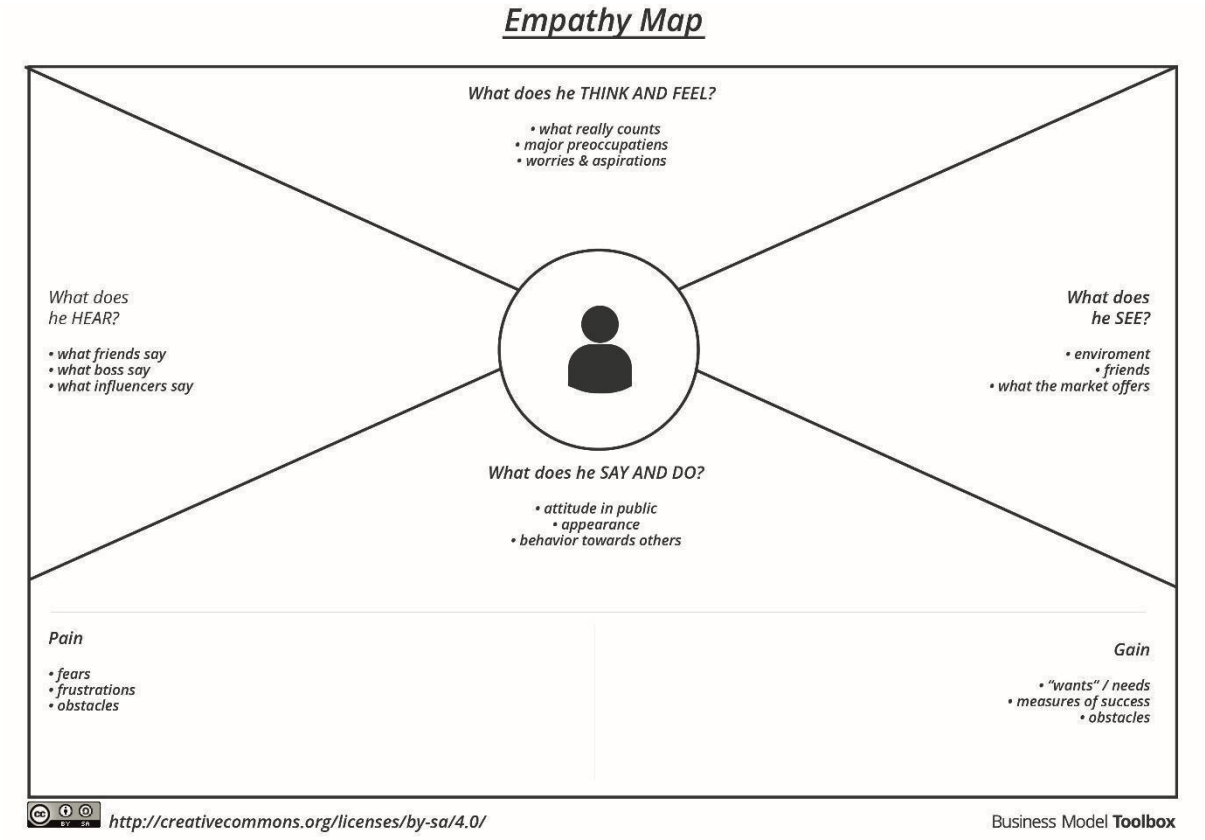
candidates based solely on traditional resumes and academic transcripts. Additionally, students often lack insights into market demands, leading to mismatched career choices and unpreparedness for the job market.

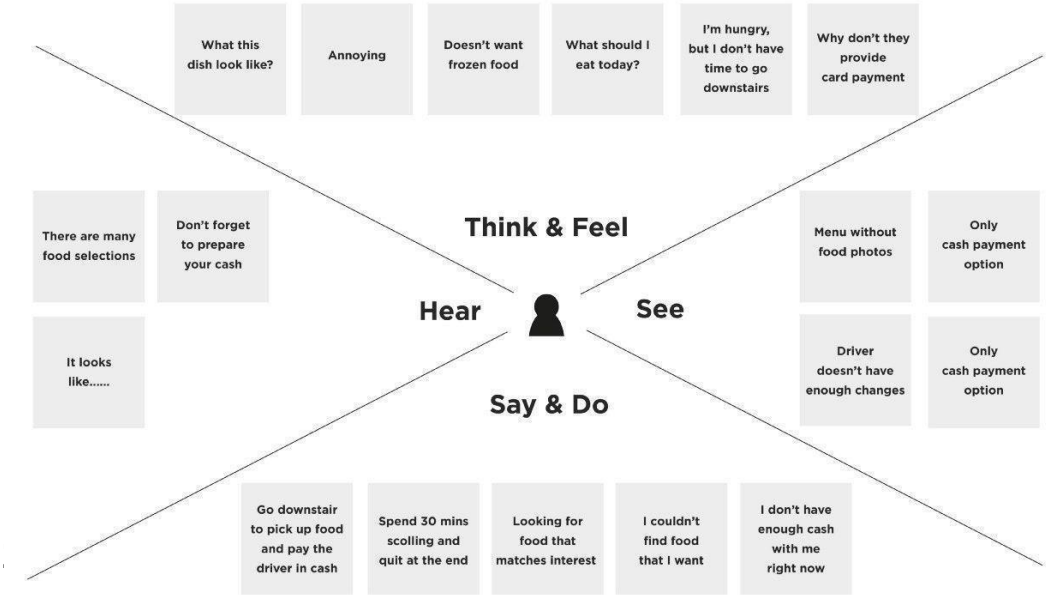
These challenges highlight the need for a comprehensive "Analytics Tool for Placements" to address the following issues:

Lack of Data-Driven Decision Making: The absence of a centralized system for collecting, analyzing, and visualizing data hampers the ability of educational institutions, placement officers, and students to make informed decisions about career paths, skill development, and job opportunities.

Inefficient Matching of Students and Job Opportunities: The absence of a sophisticated system to match students' skills, interests, and qualifications with job requirements often results in mismatched

2.2 Empathy map canvas





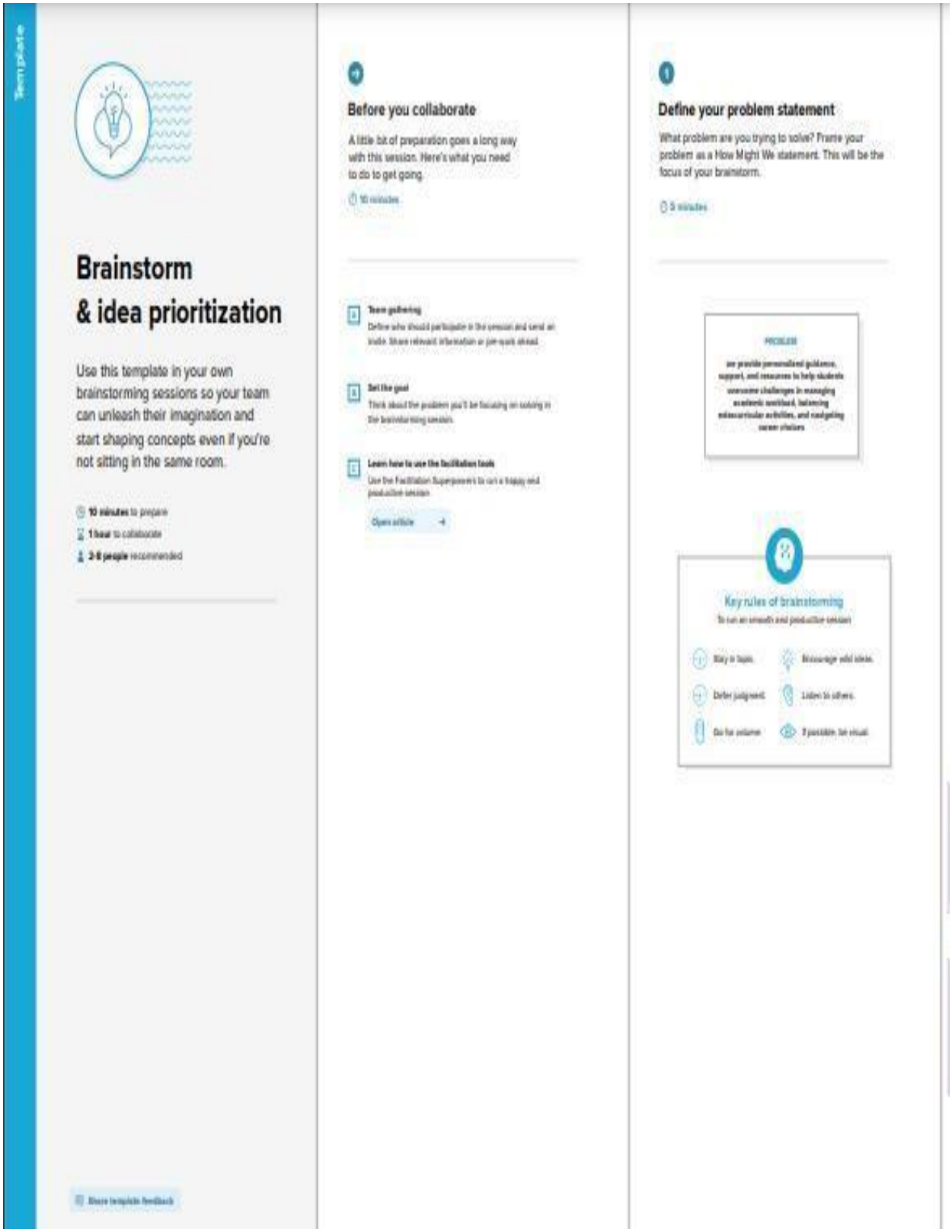
Pain

- Hard to find their food interests
- Uncomfortable paying cash
- Looking for food that matches interest

Gain

- Comfortable
- Accuracy

Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping

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!

THOWHEETHA FERTHOUSE.A

Object Detection: Use OpenCV's object detection algorithms to identify cars in the parking lot and determine which parking spots are currently occupied or vacant.

Image Processing: Use OpenCV's image processing capabilities to enhance the image quality and reduce the noise in the parking lot images captured by the cameras, improving the accuracy of the parking spot detection.

ANBARASAN.G

Machine Learning: Develop machine learning algorithms using OpenCV and other frameworks to train the system to recognize parking spots and differentiate between occupied and vacant spots.

Automated Parking Guidance: Use the information gathered by the AI-enabled parking system to guide drivers to the nearest available parking spot through an app or a digital display, reducing the time taken to park and improving the overall parking experience.

AMARNATH.V.S

Real-time Monitoring: Monitor the occupancy status of parking spots in real-time and send alerts to the parking lot management team when a spot remains occupied for an extended period, indicating a potential issue.

Integration with Payment System: Integrate the parking system with a payment system to enable drivers to pay for parking using a mobile app or a payment kiosk, reducing the need for physical payment and making the parking process more convenient.

PRATHAP.R.J

Efficient Resource Management: Use the data gathered by the parking system to optimize resource management, such as adjusting the lighting and ventilation systems based on the occupancy status of the parking lot.

Multi-level Parking Lot Support: Extend the parking system to support multi-level parking lots by leveraging OpenCV's 3D image processing capabilities to recognize parking spots on different levels and guide drivers to the nearest available spot on any level.

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.

Placement Prediction Algorithm

Placement Dashbord

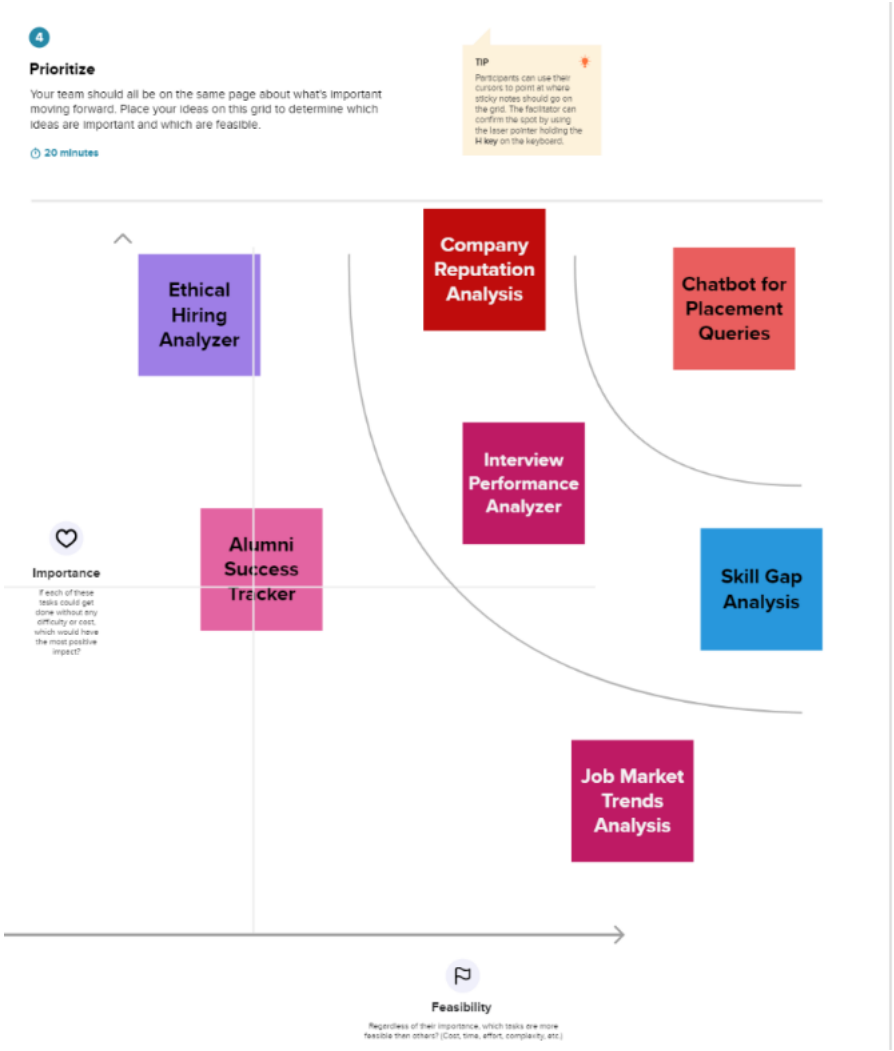
Skill Gap Analysis

Resume Analyzer

Interview Performance Analyzer

Ethical Hiring Analyzer

Step-3: Idea Prioritization



2.4 Proposed solution

S.No.	Parameter	Description

1.	Problem Statement (Problem to be solved)	The problem is the complexity and competitiveness of the job market, leading to challenges for students in finding suitable placements. Additionally, there's a lack of personalized guidance, making it difficult for students to align their skills with industry demands. Recruiters face inefficiencies in finding candidates who match their job requirements. The Analytics tool for placements aims to address these challenges by providing personalized career guidance, efficient job matching, and actionable insights for students, while streamlining the recruitment process for recruiters
2.	Idea / Solution description	The Analytics tool for placements is an intelligent platform that utilizes data analytics and machine learning algorithms to match students with relevant job opportunities based on their skills, interests, and academic background. It offers personalized career recommendations, skill development resources, and interactive dashboards displaying industry trends. For recruiters, it provides targeted candidate

		matching, streamlining the recruitment process and ensuring the right fit for job openings.
3.	Novelty / Uniqueness	The uniqueness lies in the tool's ability to offer highly personalized recommendations to both students and recruiters. It integrates advanced data analytics, machine learning, and userfriendly interfaces to create a seamless experience. Additionally, the tool fosters meaningful alumni connections, promoting
		mentorship and networking opportunities, which is a novel approach in the realm of placement solutions.
4.	Social Impact / Customer Satisfaction	The tool's social impact is substantial, empowering students to make informed career decisions, enhancing their employability, and reducing the stress associated with job searches. It promotes diversity and inclusion by

		connecting candidates with employers who prioritize these values. Customer satisfaction is ensured through personalized recommendations, efficient recruitment processes, and alumni engagement, leading to positive experiences for both students and recruiters.
5.	Business Model (Revenue Model)	The business model revolves around subscription plans for educational institutions and recruitment agencies. Institutions pay for access to the tool's analytics, student engagement features, and support services. Recruiters pay for premium job posting services and access to advanced candidate matching algorithms. Additionally, there can be revenue streams from offering premium career development resources and certification programs to students.

6.	Scalability of the Solution	The solution is designed with scalability in mind. It can handle a growing user base, both in terms of students and recruiters, by leveraging cloud-based infrastructure. The algorithms and databases are optimized for scalability, ensuring that the system can efficiently process a large volume of data and user interactions. Moreover, continuous updates and improvements are made to adapt to evolving market demands, ensuring longterm scalability and relevance.

3.REQUIREMENT ANALYSIS

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The user interface should be easy to navigate, with intuitive design and clear instructions, ensuring users can effectively use the tool without confusion.
NFR-2	**Security**	The tool must safeguard user data and personal information, ensuring that it remains confidential and protected from unauthorized access.
NFR-3	**Reliability**	The system must operate consistently without frequent outages, ensuring that users can rely on it for critical tasks.
NFR-4	**Performance**	The system should respond quickly to user interactions, ensuring that users can access data and features without significant delays.
NFR-5	**Availability**	The system should regularly backup user data, and in the event of data loss or system failure, it must have mechanisms in place to recover the data.
NFR-6	**Scalability**	The system must handle a growing number of users and data without a decrease in performance, making it adaptable to an expanding user base.

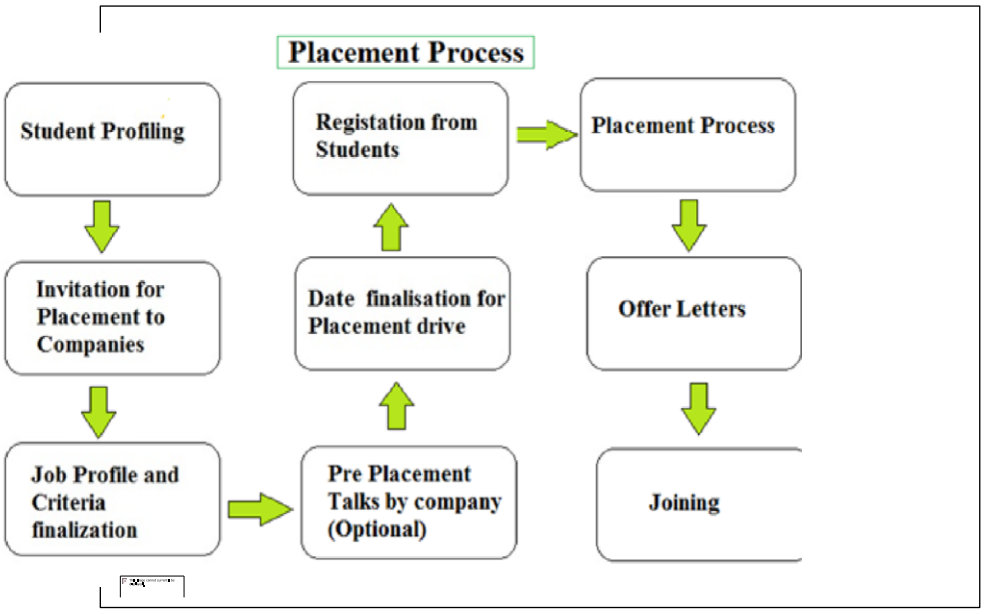
3.2 Non-functional Requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Profile completion	Adding Education Details , Skills Adding Career Preferences
FR-4	Alumini profile Integration	Connect student's existing professional profile (LinkedIn, etc.) to my account
FR-5	Job Search Filters	Filter job opportunities by location, industry, and job type
FR-6	Recruitment Performance Reports	Access to reports on the performance of my job postings

4. PROJECT DESIGN

4.1 DATA FLOW DIAGRAMS

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. 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 the information, and where data is stored



4.2 Solution and Technical Architecture

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

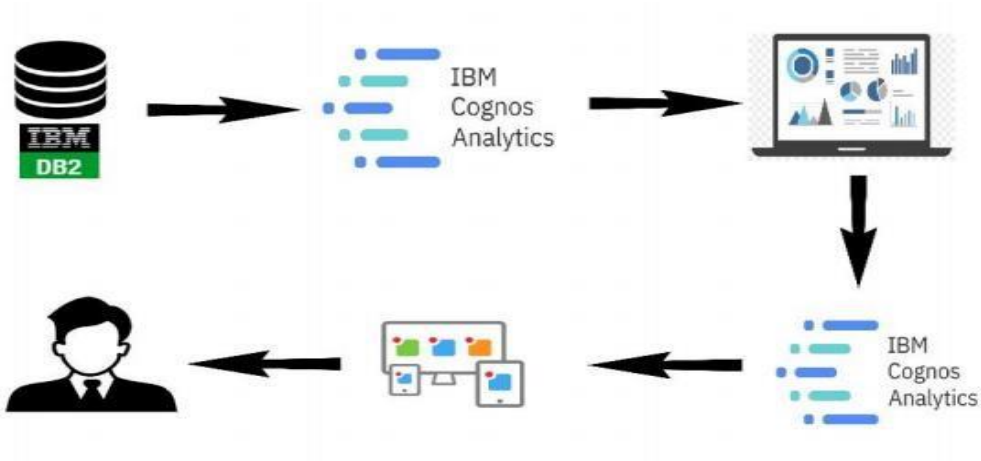


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Technology used

4.2 User Stories

Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Thowheetha Ferthouse.A
User Authentication and Authorization	USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Amarnath.V.S
Data Collection and Integration	USN-3	As a user, I can register for the application through Facebook	2	Low	Anbarasan.G
Security &Data Privacy	USN-4	As a user, I can register for the application	2	Medium	Pradhap.R.J

		through Gmail			
Login	USN-5	As a user, I can log into the application by entering email & password	1	High	
Dashboard					

5. CODING AND SOLUTIONING

5.1 Feature 1

The features of the existing system are including a user login creator to provide user interface, student performance analyser, student development card, achieved credit, passing criteria card and wise student performance attribute card. Providing the online interface for students, faculty etc. Increasing the efficiency of school record management. Decrease time required to access and deliver student records. To make the system more secure. Decrease time spent on non-value-added tasks.

The proposed system that we are going to develop will be used as the chief performance system for helping the organization in managing the whole database of the student studying in the organization. Therefore, it is expected that the database would perform functionally all the requirements that are specified.

5.2 Feature 2

The proposed system provides the student an easy and accurate data about projects and academic percentages. Students can view all the information in just one click which saves a lot of time and effort. The proposed system maintains a database to store all the information. In this system, there is no chance of losing data. Adding and searching the information is very easy which does not take much time and physical effort.

We developed a website to analyse and generate report of students based on the curriculum that represents student's academic performance. We have developed the system such that, it will automatically parse data onto the database from excel file, which will in return reduce time consumption of analysis of data.

For these we used HTML, CSS, PHP, my SQL and java script. After teacher logins into system, data is been fetched dynamically through the database. For here, parsing is done using PHP Excel. It is an inbuilt library for PHP to fetch data from excel files over or within network. We hope to accelerate the analysis by developing the analysis system. It provides assistance to teachers and administrator to track record of each student, subject and department by using various techniques such sort.

6. RESULTS

6.1 Performance Metrices

Performance metrics for the "Analytics Tool for Placements" project are essential to evaluate the effectiveness, efficiency, and impact of the system. These metrics provide valuable insights into the success of the tool and help in making data-driven decisions. Here are some key performance matrices for the project:

Placement Success Rate: This metric measures the percentage of students who secure jobs through the tool compared to the total number of students seeking placements. A higher placement success rate indicates the effectiveness of the tool in matching students with appropriate job opportunities.

Time-to-Placement: This metric measures the average time taken for a student to secure a job from the moment they start using the tool. A shorter time-to-placement indicates the efficiency of the system in connecting students with suitable job opportunities quickly.

Matching Accuracy: Matching accuracy assesses how well the tool matches students with job opportunities based on their skills and qualifications. It measures the percentage of successful matches between students and recruiters. High matching accuracy indicates that the tool effectively understands student profiles and recruiter requirements.

7. ADVANTAGES AND DISADVANTAGES

Advantages

- Data-Driven Decision Making
- Improved Placement Success
- Personalized Guidance
- Efficiency and Automation

- Enhanced Transparency

Disadvantages

- Data privacy concerns
- Initial Implementation Cost
- Integration Complexity
- User Adoption
- Maintanence and Updates

8. CONCLUSION

The "Analytics Tool for Placements" project represents a significant leap forward in optimizing the placement processes within educational institutions. By leveraging data analytics, automation, and personalized guidance, the tool addresses the challenges faced by students, placement officers, and recruiters. It promotes data-driven decision-making, enhances transparency, and significantly improves the matching accuracy between students and job opportunities. Through the successful implementation of this project, educational institutions can expect higher placement rates, increased student satisfaction, and improved relationships with recruiters, ultimately bolstering their reputation in the academic and professional communities.

9.FUTURE SCOPE

Continuous Enhancement: The tool should continue to evolve by incorporating the latest advancements in data analytics, machine learning, and artificial intelligence. Regular updates will ensure that the system remains competitive and effective in an ever-changing job market.

Integration of Emerging Technologies: Explore the integration of emerging technologies such as blockchain for secure data management, natural language processing for enhanced user interactions, and predictive analytics for more accurate student-job matching.

Global Expansion: Consider expanding the tool's reach to educational institutions worldwide. International collaboration and insights could enrich the system's capabilities and provide a more comprehensive understanding of global job markets.

Enhanced User Experience: Focus on refining the user interface and experience based on user feedback. Intuitive design and user-friendly interfaces will encourage higher adoption rates among students, placement officers, and recruiters.

10. APPENDIX

Data Dictionary

- school - student’s school (binary: ‘GP’ - Gabriel Pereira or ‘MS’ - Mousinho da Silveira)
- sex - student’s sex (binary: ‘F’ - female or ‘M’ - male)
- age - student’s age (numeric: from 15 to 22)
- address - student’s home address type (binary: ‘U’ - urban or ‘R’ - rural)
- Medu - mother’s education (numeric: 0 - none, 1 - primary education (4th grade), 2 â€“ 5th to 9th grade, 3 â€“ secondary education or 4 â€“ higher education)
- Fedu - father’s education (numeric: 0 - none, 1 - primary education (4th grade), 2 â€“ 5th to 9th grade, 3 â€“ secondary education or 4 â€“ higher education)
- traveltime - home to school travel time (numeric: 1 - <15 min., 2 - 15 to 30 min., 3 - 30 min. to 1 hour, or 4 - >1 hour)
- studytime - weekly study time (numeric: 1 - <2 hours, 2 - 2 to 5 hours, 3 - 5 to 10 hours, or 4 - >10 hours)
- failures - number of past class failures (numeric: n if 1<=n<3, else 4)
- schoolsup - extra educational support (binary: yes or no)
- famsup - family educational support (binary: yes or no)
- paid - extra paid classes within the course subject (Math or Portuguese) (binary: yes or no)
- activities - extra-curricular activities (binary: yes or no)
- nursery - attended nursery school (binary: yes or no)
- higher - wants to take higher education (binary: yes or no)
- internet - Internet access at home (binary: yes or no)
- romantic - with a romantic relationship (binary: yes or no)
- famrel - quality of family relationships (numeric: from 1 - very bad to 5 - excellent)
- freetime - free time after school (numeric: from 1 - very low to 5 - very high)
- goout - going out with friends (numeric: from 1 - very low to 5 - very high)
- Dalc - workday alcohol consumption (numeric: from 1 - very low to 5 - very high)
- Walc - weekend alcohol consumption (numeric: from 1 - very low to 5 - very high)
- health - current health status (numeric: from 1 - very bad to 5 - very good)
- absences - number of school absences (numeric: from 0 to 93)

- G1 - first period grade (numeric: from 0 to 20)
- G2 - second period grade (numeric: from 0 to 20)
- G3 - final grade (numeric: from 0 to 20, output target)

Github and Project Video Demo Link

GITHUB LINK : https://github.com/thowhee/Alanytics-tools-for-placements
PROJECT VIDEO LINK: https://drive.google.com/file/d/1-jydcprs5BTNT23yKki_t0BsghzJYLcn/view?usp=sharing