

A Synopsis of Project on

EduFlex: ML Driven Crossplatform Application for Displaying and Acknowledging Students's Achievements.

Submitted in partial fulfillment of the requirements for the award
of the degree of

Bachelor of Engineering

in

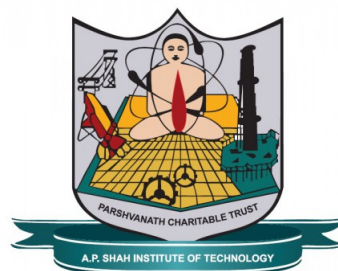
Information Technology

by

**Soham Dalvi(21104010)
Sumit Mesta(21104069)
Siddharth Devare(21104136)
Sankalp Gunjal(21104087)**

Under the Guidance of

Ms. Sonal Jain



Department of Information Technology

NBA Accredited

A.P. Shah Institute of Technology
G.B.Road,Kasarvadavli, Thane(W)-400615
UNIVERSITY OF MUMBAI

Academic Year 2024-2025

Approval Sheet

This Project Synopsis Report entitled “*EduFlex: ML Driven Crossplatform Application for Displaying and Acknowledging Students’s Achievements.*” Submitted by “*Soham Dalvi*” (21104010), “*Sumit Mesta*”(21104069), “*Siddharth Devare*”(21104136), “*Sankalp Gunjal*”(21104087) is approved for the partial fulfillment of the requirement for the award of the degree of *Bachelor of Engineering* in *Information Technology* from *University of Mumbai*.

Ms. Sonal Jain
Guide

Dr. Kiran Deshpande
HOD, Information Technology

Place: A.P. Shah Institute of Technology, Thane

Date:

CERTIFICATE

This is to certify that the project entitled “**EduFlex: ML Driven Crossplatform Application for Displaying and Acknowledging Students’s Achievements.**” submitted by “**Soham Dalvi**” (21104010), “**Sumit Mesta**” (21104069), “**Siddharth Devare**” (21104136), “**Sankalp Gunjal**” (21104087) for the partial fulfillment of the requirement for award of a degree **Bachelor of Engineering** in **Information Technology**, to the University of Mumbai, is a bonafide work carried out during academic year 2024-2025.

Ms. Sonal Jain
Guide

Dr. Kiran Deshpande
HOD, Information Technology

Dr. Uttam D.Kolekar
Principal

External Examiner(s)

1.

2.

Internal Examiner(s)

1.

2.

Place: A.P. Shah Institute of Technology, Thane

Date:

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Soham Dalvi
(21104010)

Sumit Mesta
(21104069)

Siddharth Devare
(21104136)

Sankalp Gunjal
(21104087)

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, We have adequately cited and referenced the original sources. We also declare that We have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Soham Dalvi(21104010)

Sumit Mesta(21104069)

Siddharth Devare(21104136)

Sankalp Gunjal(21104087)

Date:

Abstract

Eduflex is a comprehensive, web-based platform designed to revolutionize how student achievements are evaluated and recognized. Going beyond traditional academic assessments, the system incorporates a wide range of accomplishments, including co-curricular activities, soft skills, and personal achievements. Built using modern web technologies with Node JS and Flask (Python) for backend automation, Eduflex ensures a seamless experience for both students and educators. The platform leverages MongoDB for efficient data storage, providing a robust and scalable solution.

Leveraging Artificial Intelligence (AI) and Machine Learning (ML), the system dynamically evaluates student profiles, identifying strengths and areas for improvement. It uses third-party source such as Credly to automate the verification and updating of certifications. A standout feature of Eduflex is its use of Generative AI, which allows students to create personalized courses tailored to their individual learning needs and goals. This empowers students to design a learning experience that is fully aligned with their personal and academic objectives.

Eduflex fosters a more inclusive educational environment by providing visual insights and trend analysis based on a comprehensive range of student achievements. This holistic approach encourages student engagement and continuous growth, helping educational institutions modernize their evaluation systems. Ultimately, Eduflex is a powerful tool for enhancing the student experience through advanced technology, automation, and the ability to create customized learning paths.

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List of Abbreviations

AI:	Artificial Intelligence
ML:	Machine Learning
UI:	User Interface
UX:	User Experience
LMS:	Learning Management System
API:	Application Programming Interface
ITS:	Intelligent Tutoring Sytem
CRUD:	Create, Read, Update, Delete
REST:	Representational State Transfer
HTML:	HyperText Markup Language
CSS:	Cascading Style Sheets
JS:	JavaScript
JSON:	JavaScript Object Notation
NLP:	Natural Language Processing
PDF:	Portable Document Format

Chapter 1

Introduction

In the current educational landscape, traditional methods of student assessment are heavily focused on academic performance, often neglecting co-curricular achievements and personal development. This narrow approach fails to capture the full spectrum of student capabilities, potentially overlooking critical aspects such as leadership, creativity, and soft skills. As a result, students may miss out on recognition for their overall growth, while educational institutions struggle to gain a comprehensive understanding of their students' diverse talents.

Eduflex is a web-based, cross-platform application designed to address this challenge by offering a holistic solution for evaluating and recognizing student achievements. Built using modern web technologies, Node JS, and Flask for backend automation, the platform leverages AI and ML to dynamically assess a student's portfolio. It integrates with third-party services like Credly to automatically verify and update certifications in real time. Eduflex supports a wide range of accomplishments, including academic excellence, co-curricular activities, and skill development, ensuring students are recognized for their full range of talents and contributions.

The core objective of Eduflex is to modernize the assessment process in educational institutions by offering a platform that tracks student achievements while providing personalized insights and actionable feedback. One of the key features of Eduflex is its ability to use Generative AI to allow students to create personalized courses tailored to their individual needs and goals. By utilizing real-time data processing, the platform delivers immediate feedback to both students and educators, helping identify strengths and areas for improvement and fostering a culture of continuous growth and self-improvement.

The scope of Eduflex extends beyond traditional academic assessments, covering various dimensions of student life. The platform is accessible across devices, allowing students and educators to seamlessly interact with it from anywhere. This comprehensive approach empowers educators to make more informed evaluations and provides students with personalized guidance that enhances their learning experience.

By transforming the way success is measured, Eduflex significantly contributes to the modernization of student assessments. Its intelligent algorithms, real-time feedback, and course creation capabilities using generative AI offer innovative solutions for recognizing achievements across all areas, creating a more inclusive and supportive educational environment.

1.1 Motivation

In an ever-evolving educational ecosystem, it is becoming increasingly evident that traditional assessment systems are inadequate in recognizing the full range of student capabilities. The focus remains heavily on academic performance, which leaves co-curricular accomplishments and personal growth largely undervalued. This one-dimensional approach not only undermines students' diverse skill sets but also hinders educational institutions from obtaining a comprehensive view of their students' development.

1.1.1 Need for Holistic Evaluation

Students today are involved in a multitude of activities that contribute to their overall development. These activities include leadership roles, participation in clubs, development of soft skills, and personal achievements that go beyond the classroom. However, these contributions are often not factored into traditional grading systems, limiting the recognition they receive. There is an increasing demand for systems that can comprehensively assess a student's performance across various domains, providing a more balanced and inclusive evaluation.

1.1.2 The Role of Technology in Modern Education

With the rise of Artificial Intelligence (AI), Machine Learning (ML), and cloud technologies, there is now an opportunity to develop solutions that can transform how students are assessed. These technologies enable real-time analysis of student achievements, personalized recommendations for improvement, and the ability to track progress over time. The integration of such technologies into educational assessment systems can make evaluations more dynamic, data-driven, and personalized.

1.1.3 Addressing the Gaps in Current Systems

Educational institutions often struggle to acknowledge achievements outside of academic performance due to the lack of comprehensive tools. The existing systems are fragmented, requiring manual processes to capture extracurricular activities, soft skill development, and certifications. This gap highlights the need for a platform like Eduflex, which provides an automated, seamless, and intelligent solution for acknowledging student achievements in a holistic manner.

The motivation for creating Eduflex stems from the need to modernize educational assessments by making them more inclusive, personalized, and data-driven. The platform addresses gaps in current evaluation systems and empowers students and educators alike, promoting a comprehensive approach to student success.

1.2 Problem Statement

In most educational institutions, the evaluation of student performance is heavily reliant on traditional grading systems, which primarily focus on academic scores. These methods fail to capture the complete picture of a student's development, overlooking achievements in extracurricular activities, soft skills, and personal growth. As a result, students are often evaluated based on limited metrics, leading to an incomplete understanding of their potential.

The absence of a centralized system to track, analyze, and provide personalized learning paths based on students' diverse achievements presents a significant challenge for both educators and students. Without real-time insights into their strengths and areas for improvement, students miss out on valuable opportunities for targeted learning and skill enhancement.

1.2.1 Consequences of the Problem:

Incomplete Assessment: Traditional grading systems result in an incomplete assessment of students, ignoring critical areas like soft skills, extracurricular activities, and personal achievements, leading to a skewed evaluation of their overall development.

Demotivation and Missed Opportunities: The lack of tailored learning paths can lead to demotivation, as students are not receiving the feedback and support they need to enhance their skills. This can result in missed opportunities for both academic and personal growth.

1.2.2 Significance of the Problem:

Holistic Development: The evolving demands of education emphasize holistic development, where academic performance is just one part of the overall assessment. Addressing this problem is crucial for providing students with a more comprehensive evaluation of their abilities, ensuring they are well-prepared for future opportunities.

Data-Driven Learning: With the rise of data-driven education, leveraging AI and ML technologies to analyze student performance can significantly enhance learning outcomes. This problem highlights the need for an AI-powered solution that can offer real-time insights into a student's strengths, weaknesses, and progress.

1.3 Objectives

- To design and develop a web framework/cross-platform app offering a holistic view of student achievements.
- To create a data visualization platform providing clear, actionable insights through interactive displays.
- To build a scalable cloud infrastructure for real-time data processing and reliable app availability.
- To enable mentors to easily access and view student's progress on the platform, facilitating guidance and support.
- To implement an ML model to authenticate the validity of certificates, ensuring the credibility of student achievements.

1.4 Scope

- Can create student profiles by collecting academic and extracurricular achievements.
- Can use AI for personalized course creation based on areas for improvement.
- Can offer real-time analytics for educators to track student progress and enable timely support.
- Can incorporate gamification to motivate students with points or badges for completing tasks.
- Can implement an AI model to conduct tests for students and provide feedback to help improve their performance.

Chapter 2

Literature Review

- **Review Paper 1:-** Generative AI for Customizable Learning Experiences
 - **Author's** - Ivica Pesovski, Ricardo Santos, Roberto Henriques, Vladimir Trajkovik.
 - **Key Points** - Leveraging generative AI for educational purposes, this study presents a tool that customizes learning materials and generates quizzes based on individual learning outcomes. The system dynamically assesses student progress, creating personalized educational experiences that adapt to each learner's pace. The integration with Learning Management Systems (LMS) facilitates delivering tailored content, allowing for a more targeted and efficient learning approach.
 - **Relevance to Our Project** - The emphasis on using AI to generate customized content aligns with our goals of creating adaptive educational experiences. Adopting similar techniques could enable our platform to provide personalized quizzes and content recommendations that better match individual learning needs.
-
- **Review Paper 2:-** Analysis Modeling and Design of Personalized Digital Learning Environments
 - **Author's** - Zhibin Li, Jing Zhang, Xinyu Cao, Bo Tang.
 - **Key Points** - The paper introduces the Private Learning Intelligence (PLI) framework, focusing on data privacy in AI-driven personalized learning environments. The use of federated learning ensures that user data remains decentralized and private, while AI and Natural Language Processing (NLP) drive content customization. This approach allows for intelligent tutoring that adapts dynamically to individual learning paths, enhancing the personalization of educational experiences.
 - **Relevance to Our Project** - Integrating data privacy with AI-based content customization is crucial for our platform's goals. Federated learning could provide a secure way to maintain user privacy while still enabling personalized learning paths.

- **Review Paper 3:-** Blockchain-enabled Digital Credentialing for E-learning
- **Author's** - Hamidreza Farzin, Farnoosh Hosseini.
- **Key Points** - This research explores blockchain technology's role in issuing and verifying secure, verifiable digital credentials. By using blockchain's tamper-proof nature and smart contracts for automated verification, the approach ensures the integrity of learner achievements. Additionally, AI integration allows for personalized course recommendations based on previous accomplishments, creating a targeted and adaptive learning environment.
- **Relevance to Our Project** - Blockchain's potential for secure digital credentialing is directly applicable to our project. Incorporating such a system would enhance the reliability of achievement records and provide trustworthy proof of competencies.

- **Review Paper 4:-** AI-Driven Student Profiling and Personalized Recommendations and Achievement Analysis in Education
- **Author's** - M. Yang, X. Zhou.
- **Key Points** - The study discusses building detailed student profiles from achievements and learning activities to deliver AI-powered course recommendations. By analyzing this data, the system identifies areas for improvement and offers targeted resources, supporting holistic growth. The implementation uses technologies such as React, Django, and PostgreSQL for delivering these personalized experiences.
- **Relevance to Our Project** - This approach to AI-driven student profiling aligns with our goals of guiding users through personalized learning paths. The insights gained from student achievements can help tailor content recommendations and improve learning outcomes on our platform.

- **Review Paper 5:-** Automated Student Achievement Recognition and Tracking Using Blockchain and AI
- **Author's** - A. Verma, P. Gupta.
- **Key Points** - Combining blockchain and AI, this paper outlines a system for tracking and recognizing student achievements, covering both academic and extracurricular activities. Blockchain ensures secure data storage, while AI provides personalized feedback and learning recommendations. The approach enables adaptive progress monitoring and supports continuous learning through personalized suggestions.
- **Relevance to Our Project** - The integration of blockchain for secure achievement tracking and AI for adaptive learning is relevant to our goals. Implementing a similar system could streamline progress tracking and provide more accurate personalized recommendations.

2.1 Comparative Analysis of Recent Study

Paper Title	Author(s)	Year	Key Findings	Technology Stack
Generative AI for Customizable Learning Experiences	Ivica Pesovski, Ricardo Santos, Roberto Henriques, Vladimir Trajkovic	2024	Introduced a generative AI-based tool for customizing learning materials and generating adaptive quizzes based on learning outcomes.	Generative AI, OpenAI's API, LMS
Analysis, Modeling and Design of Personalized Digital Learning Environment	Zhibin Li, Jing Zhang, Xinyu Cao, Bo Tang	2024	Proposed the Private Learning Intelligence (PLI) framework, integrating data privacy with AI-driven personalized learning experiences and dynamic content.	Federated Learning, NLP, Intelligent Tutoring Systems (ITS), AI-based content customization
Blockchain-enabled Digital Credentialing for E-learning	Hamidreza Farzin, Farnoosh Hosseini	2023	Explores blockchain for secure, verifiable digital credentials and achievements, ensuring learner data integrity.	Blockchain, Smart Contracts, AI for course recommendations
AI-Driven Student Profiling for Personalized Recommendations and Achievement Analysis in Education	M. Yang, X. Zhou	2023	A system that builds student profiles from achievements and offers AI-driven personalized course/activity recommendations, while identifying areas for improvement to support holistic growth.	AI, React, Django, PostgreSQL
Automated Student Achievement Recognition and Tracking Using Blockchain and AI	A. Verma, P. Gupta	2022	A system automating student achievement tracking, using blockchain for security and AI for personalized feedback, covering both academic and extracurricular activities with learning recommendations.	Blockchain (Hyperledger), Python, Flask, AI

Table 2.1: Literature Survey

Chapter 3

Project Design

3.1 Proposed System Architecture

The system architecture diagram outlines the system's components, including a user interface where students create profiles, upload certificates, view trends, and receive personalized courses. Admins use their interface to monitor and approve certificates. Data is stored in the student profile and achievements repositories, with external source like Credly is used to fetch badges. The data analytics layer processes student data, using AI and ML for analytics, course generation, and performance monitoring.

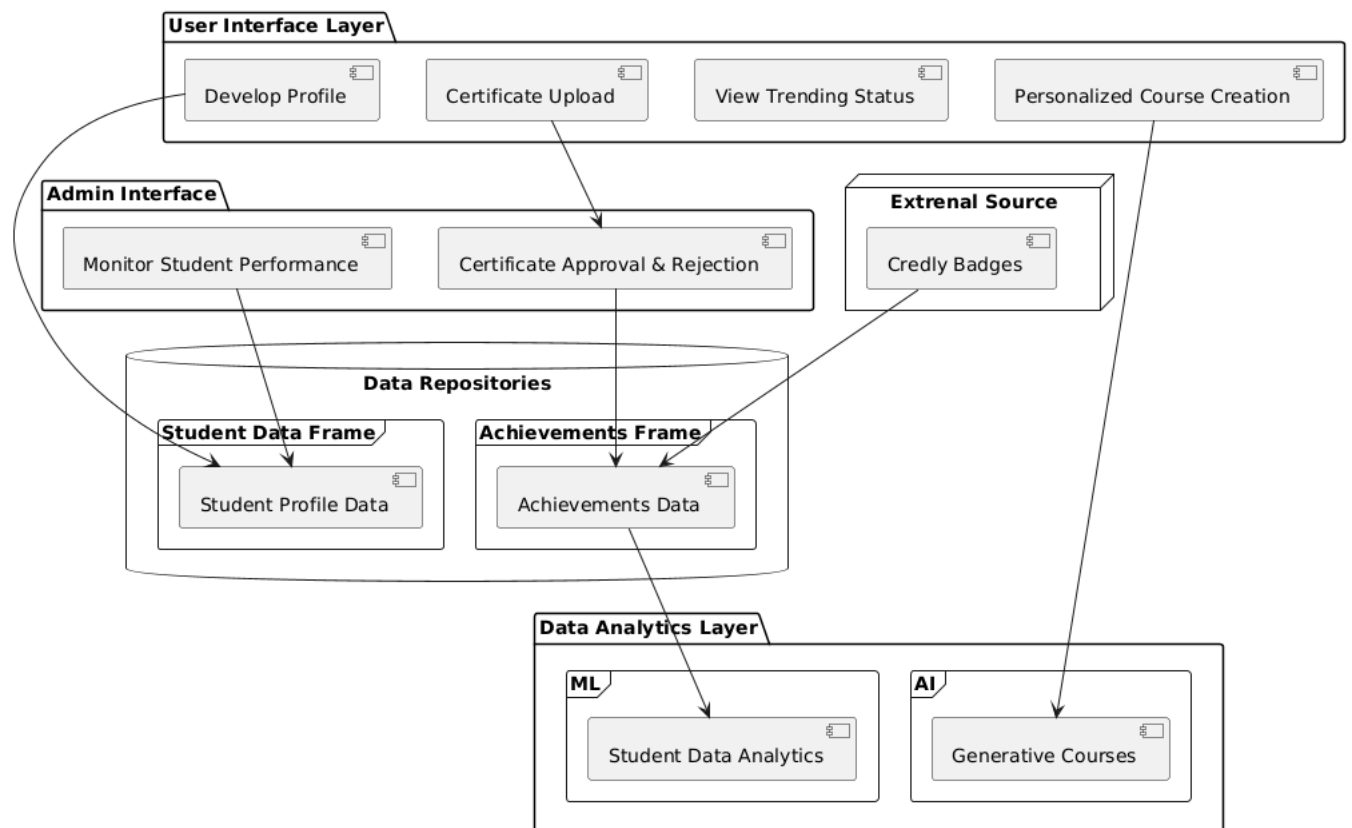


Figure 3.1: System Architecture

3.2 Sequence Diagram

The sequence diagram describes interactions between students, admins, the EduFlex system, and data repositories. A student creates a profile, stored in the Student Profile Data repository, and uploads certificates to the Achievements Data repository. Admins approve or reject these certificates, notifying the student of the decision. The system retrieves data to track student progress and uses ML generative AI to suggest personalized courses based on performance. The EduFlex system interacts with both repositories to manage information and identify gaps in student knowledge for course creation.

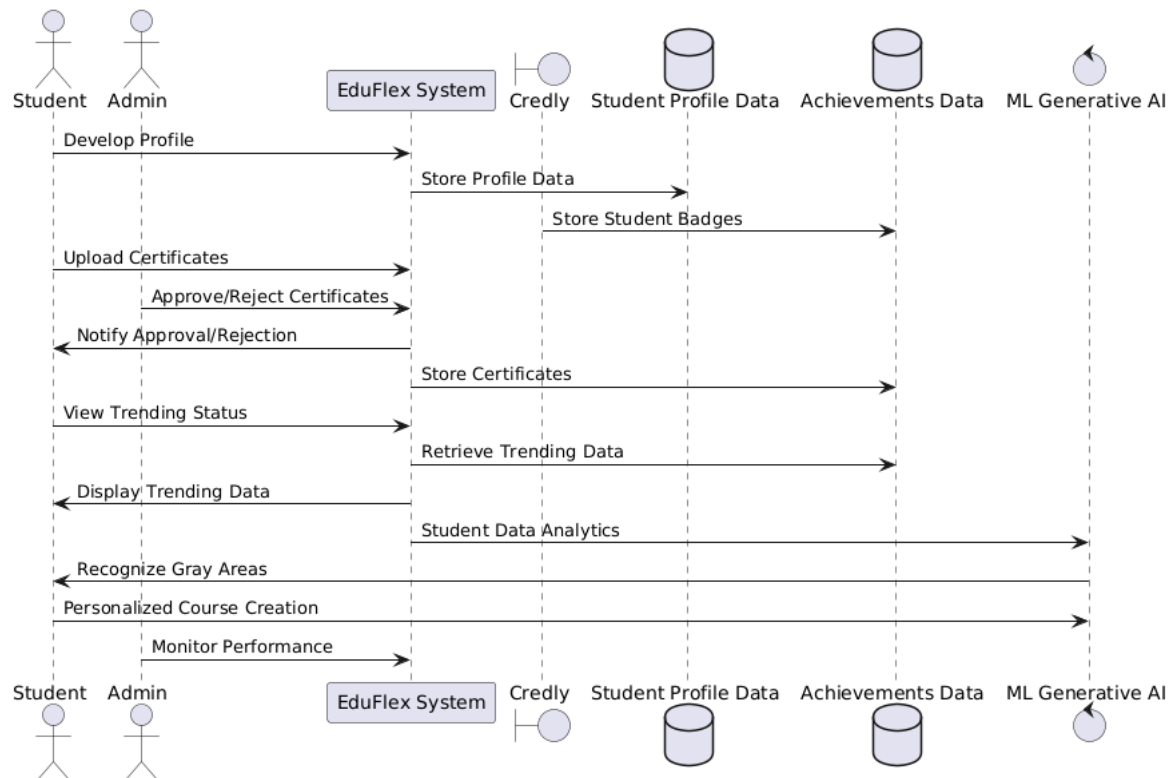


Figure 3.2: Sequence Diagram

3.3 Use Case Diagram

The use case diagram highlights key interactions: students create profiles, upload certificates, view progress trends, and engage in personalized courses, while admins validate uploaded certificates. Admin approval is crucial for managing student achievements.

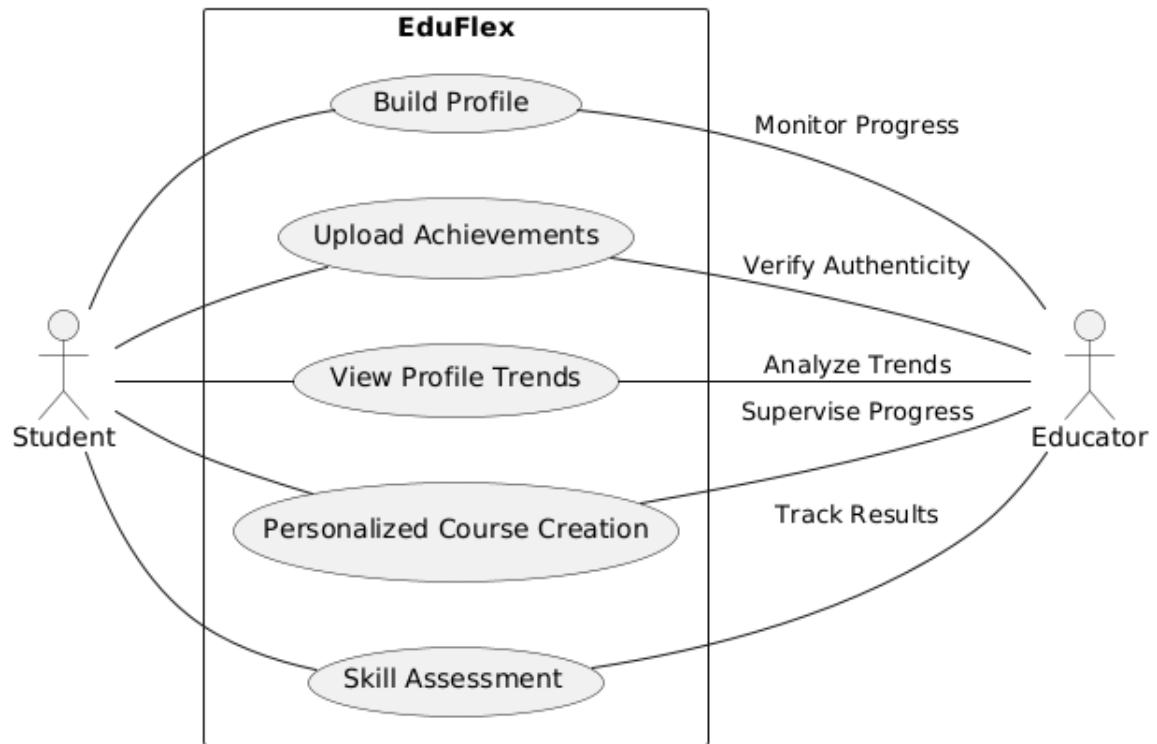


Figure 3.3: Use Case Diagram

Chapter 4

Project Implementation

```
@app.route('/fetch-badges', methods=['GET'])
def fetch_badges():
    url = request.args.get('url')
    if not url:
        return jsonify({'error': 'URL parameter is required'}), 400
    with sync_playwright() as p:
        browser = p.chromium.launch(headless=True)
        page = browser.new_page()
        page.goto(url)
        page.wait_for_load_state('networkidle')
        see_all_button = page.locator("text=See all")
        if see_all_button:
            see_all_button.click()
            page.wait_for_load_state('networkidle')
        html = page.content()
        browser.close()
    soup = BeautifulSoup(html, 'html.parser')
    TARGET_CLASSES = { ...
    organization_names = []
    issuer_names = []
    issued_dates = []
    for key, target_class in TARGET_CLASSES.items():
        elements = soup.find_all('div', class_=target_class)
        if key == 'organization_name':
            organization_names = [element.get_text(strip=True) for element in elements]
        elif key == 'issuer_name':
            issuer_names = [element.get_text(strip=True) for element in elements]
        elif key == 'issued_date':
            issued_dates = [element.get_text(strip=True) for element in elements]
    # Combine extracted data into a list of dictionaries
    badges_data = []
    for org, issuer, issued in zip(organization_names, issuer_names, issued_dates):
        badges_data.append({
            "certificate_name": org,
            "issuer_name": issuer,
            "issued_date": issued
        })

    # Return the JSON response
    return jsonify(badges_data)
```

Figure 4.1: Web Scraping on Credly

The Python code effectively fetches badge information from a given URL. It utilizes Playwright to navigate to the specified webpage and clicks the "See all" button, if available, to expand the badge list. Then, BeautifulSoup is employed to parse the HTML content and extract the necessary badge data. The extracted information, including certificate names, issuer names, and issued dates, is organized into a JSON format and returned as the response.

```

def validate_certificate():
    data = request.json
    username = data.get('username')
    filename = data.get('filename')

    if not username or not filename:
        return jsonify({'error': 'Username and filename are required'}), 400

    # Construct the full path for the uploaded file
    file_path = os.path.join(app.config['CERT_DETECTION'], username, secure_filename(filename))
    print("The original file path:", file_path)

    # Ensure file exists
    if not os.path.isfile(file_path):
        return jsonify({'error': 'File not found'}), 404

    # Process the PDF file
    features = extract_font_information_with_metadata_and_images(file_path)
    if not features:
        return jsonify({'error': 'No features extracted from PDF'}), 500

    # Prepare data for prediction
    df = prepare_data_for_prediction(features)

    # Apply preprocessing and make predictions
    X_processed = preprocessor.transform(df)
    predictions = model.predict(X_processed)

    # Determine the final result
    all_real = True
    fake_producer = None

    for i, pred in enumerate(predictions):
        if pred <= 0.5:
            all_real = False
            fake_producer = features[i]['Producer']
            break

    if all_real:
        return jsonify({"result": "Real"})
    else:
        return jsonify({"result": "Fake", "Edited_By": f"{fake_producer}"})

```

Figure 4.2: Certificate Validation using ML

The code validates PDF certificates using machine learning. It extracts features such as font information, metadata, and images from the PDF. The extracted data is then preprocessed to prepare it for the machine learning model. The model predicts whether the certificate is real or fake. If the certificate is found to be fake, the code identifies the potential editor based on the extracted information. The final result, "Real" or "Fake," is returned along with the editor information if applicable. This validation process helps ensure the authenticity of PDF certificates.

```

def extract_font_information(pdf_file):
    font_data = []

    # Attempt extraction with pdfminer
    try:
        with open(pdf_file, 'rb') as file:
            rsrcmgr = PDFResourceManager()
            laparams = LAParams()
            device = PDFPageAggregator(rsrcmgr, laparams=laparams)
            interpreter = PDFPageInterpreter(rsrcmgr, device)
            for page_number, page in enumerate(PDFPage.get_pages(file), start=1):
                interpreter.process_page(page)
                layout = device.get_result()
                for element in layout:
                    if isinstance(element, (LTTextBox, LTTextLine)):
                        for text_line in element:
                            line_text = text_line.get_text().strip()
                            for char in text_line:
                                if isinstance(char, LTChar):
                                    color = getattr(char.graphicstate, 'ncolor', 'Unknown')
                                    if isinstance(color, tuple):
                                        color = sum(color) / len(color)
                                    elif isinstance(color, np.ndarray):
                                        color = np.mean(color)
                                    elif isinstance(color, list):
                                        color = sum(color) / len(color)

                                    font_data.append({
                                        "Text": str(line_text),
                                        "Font Style": str(char.fontname),
                                        "Font Size": float(char.size),
                                        "Color": float(color),
                                        "Label": int(1)
                                    })

```

Figure 4.3: Data Extraction from PDF

The code extracts font information from a PDF file using the pdfminer library. It iterates through each page of the PDF, extracting text, font styles, font sizes, and colors for each character. The extracted information is stored in a list of dictionaries, where each dictionary represents a character with its corresponding attributes. This function provides valuable data for analyzing the font characteristics of a PDF document.

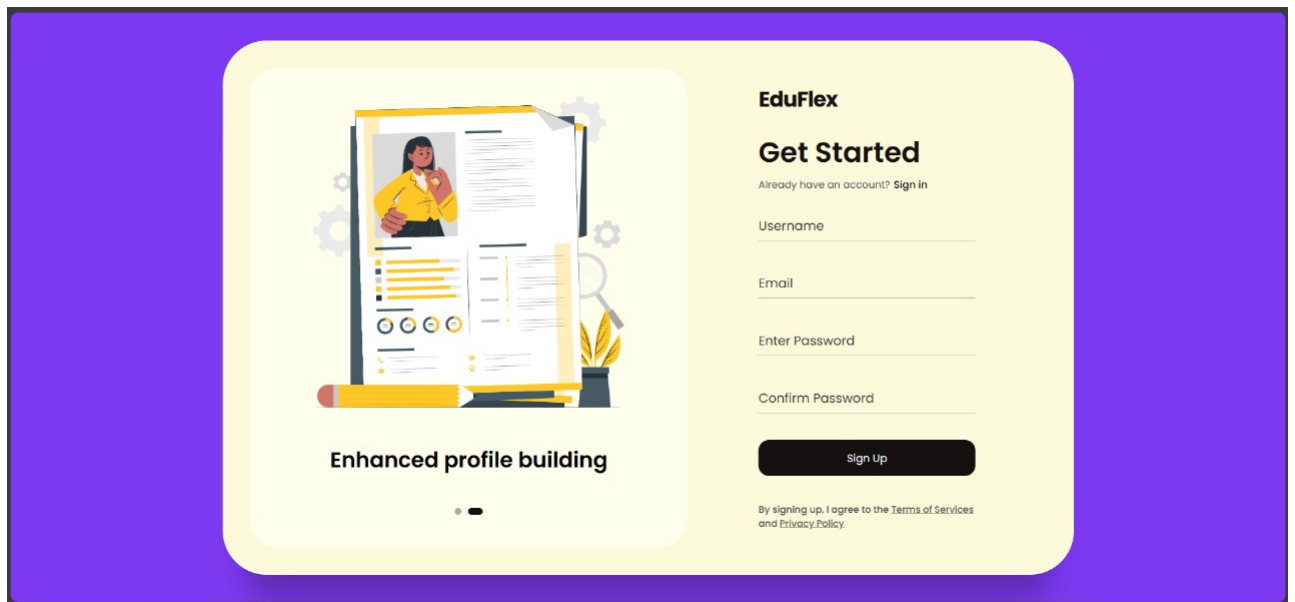


Figure 4.4: Sign-Up Page

The signup page for EduFlex features input fields for Username, Email, Password, and Confirm Password, allowing new users to create an account easily. The form is designed with user-friendly validation to ensure accurate data entry and a secure registration process.

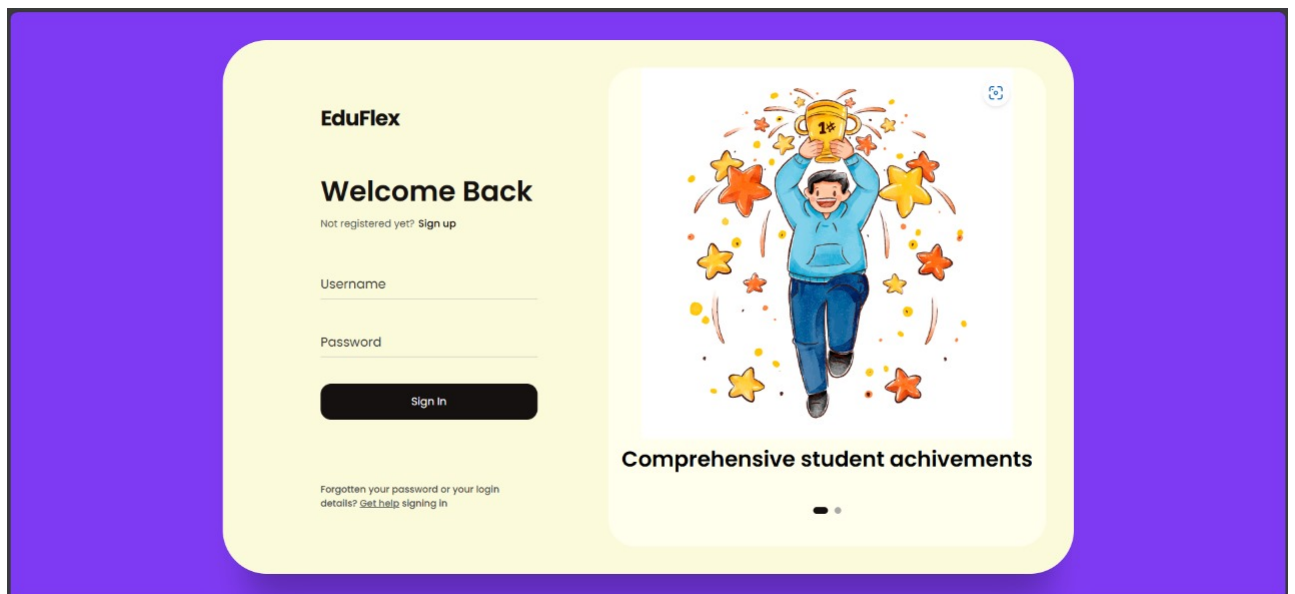


Figure 4.5: Login Page

The login page for EduFlex includes fields for Username and Password, enabling users to access their accounts securely. It validates the entered details against the database to ensure the user has already signed up, allowing access only to registered users.

Figure 4.6: Profile Information

After successful login, the user is directed to their Information page on the EduFlex platform. This page includes fields for First Name, Last Name, Email, Password, Phone Number, Date of Birth (DOB), Website Links (e.g., LinkedIn, GitHub), Credly Account Link, and a Bio section for users to share more about themselves. It allows users to update and manage their personal and professional information.

RANK	NAME	DEPARTMENT	EDU POINTS
1	Siddharth Devare 21104136	Electronics & Telecommunication	5040
2	Soham Dalvi 21104010	Information Technology	5020
3	Sankalp Gunjal 21104087	AIML	5010
4	Sumit Mesta		

Figure 4.7: Dash-Board

The EduFlex dashboard showcases the trending students across various areas, including Academics, Co-curricular, and Extra-curricular activities, compared to all students on the platform. It provides a dynamic view of each student's popularity and achievements, helping them see who is currently excelling in different fields.

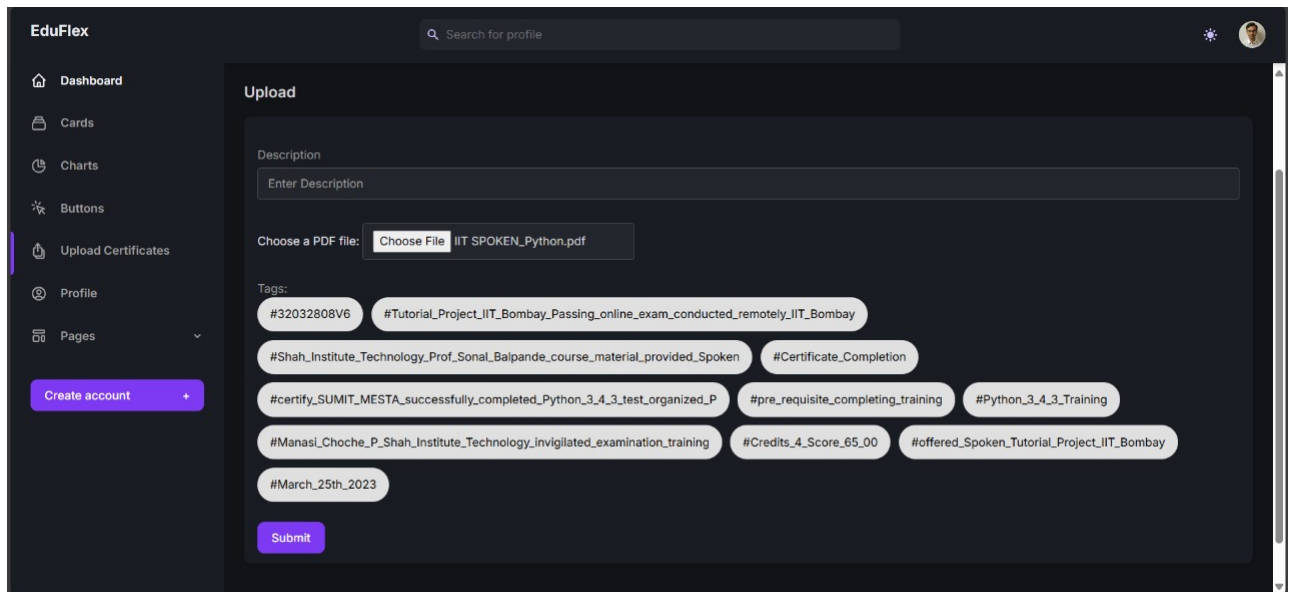


Figure 4.8: Certificate Uploading

The certificate uploading page on EduFlex allows users to upload a certificate file and utilizes web scraping to generate relevant hashtags for the uploaded document. These suggested hashtags help users to easily categorize and share their achievements on social media or within the platform, enhancing the visibility and relevance of their accomplishments.

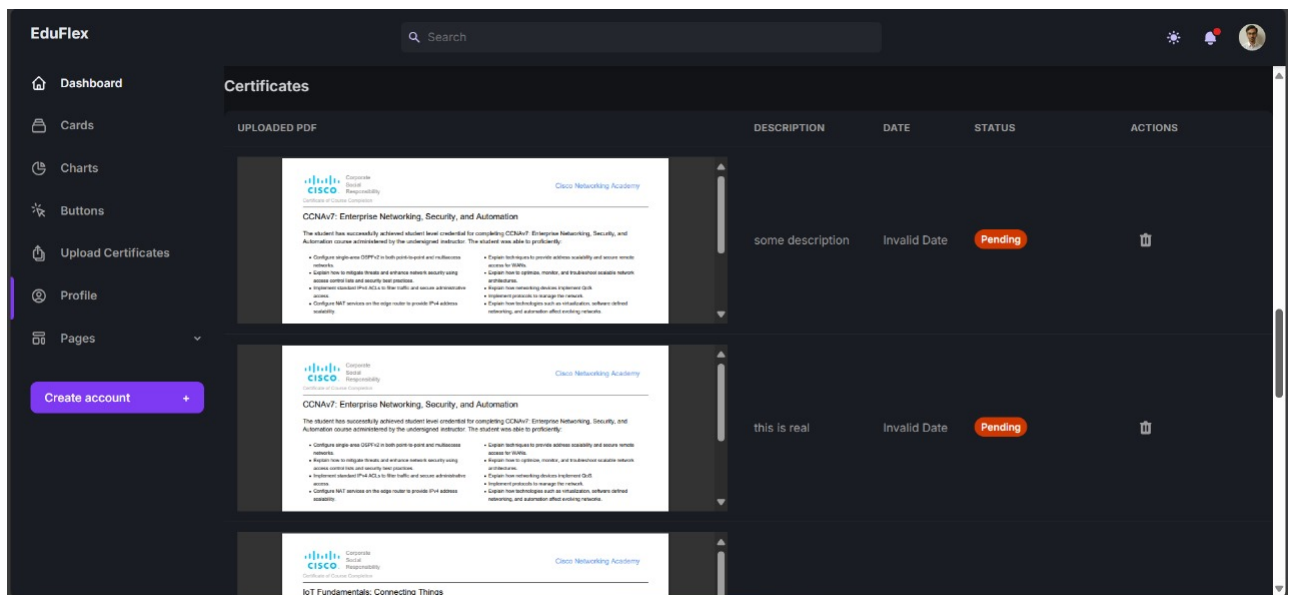
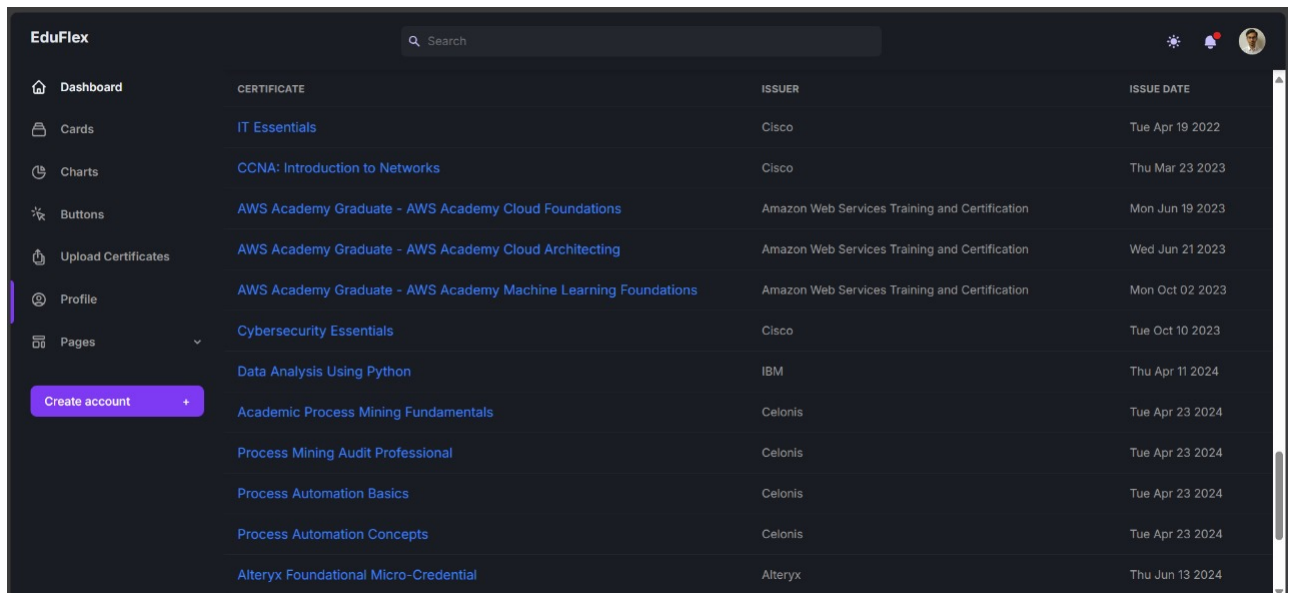


Figure 4.9: Certificate Verification Status

Once users upload their certificates on EduFlex, they are verified by the machine learning model to determine if they are real or tampered. The final approval of the certificates rests with the admin (mentor), ensuring a thorough review process that maintains the integrity and authenticity of the submitted documents.



CERTIFICATE	ISSUER	ISSUE DATE
IT Essentials	Cisco	Tue Apr 19 2022
CCNA: Introduction to Networks	Cisco	Thu Mar 23 2023
AWS Academy Graduate - AWS Academy Cloud Foundations	Amazon Web Services Training and Certification	Mon Jun 19 2023
AWS Academy Graduate - AWS Academy Cloud Architecting	Amazon Web Services Training and Certification	Wed Jun 21 2023
AWS Academy Graduate - AWS Academy Machine Learning Foundations	Amazon Web Services Training and Certification	Mon Oct 02 2023
Cybersecurity Essentials	Cisco	Tue Oct 10 2023
Data Analysis Using Python	IBM	Thu Apr 11 2024
Academic Process Mining Fundamentals	Celonis	Tue Apr 23 2024
Process Mining Audit Professional	Celonis	Tue Apr 23 2024
Process Automation Basics	Celonis	Tue Apr 23 2024
Process Automation Concepts	Celonis	Tue Apr 23 2024
Alteryx Foundational Micro-Credential	Alteryx	Thu Jun 13 2024

Figure 4.10: Automated display of Credly badges

The EduFlex platform automatically displays Credly badges, showcasing a detailed list of all previously earned badges. Each badge entry includes essential information, such as the Title, Issuer Name, and Issue Date, providing a comprehensive view of the user's achievements.

A Gantt chart's visual timeline allows you to see details about each task as well as project dependencies.

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Chapter 5

Summary

1. Overview of Work Carried Out:

The EduFlex platform aims to revolutionize the tracking of student achievements through automation, utilizing blockchain for secure data management and artificial intelligence (AI) for personalized learning recommendations. The system creates comprehensive student profiles based on both academic and extracurricular accomplishments, ensuring a holistic view of each student's capabilities.

Key features include:

- Automated data collection from Credly for digital badges and certificates.
- AI-driven analysis to generate tailored course and activity recommendations.
- Insights into areas requiring improvement to foster continuous personal development.

2. Conclusions Derived from Results and Discussions:

The analysis presented in the Results and Discussions chapter leads to several key conclusions:

- Enhanced Engagement: The personalized recommendations significantly boost student engagement and participation in learning activities.
- Holistic Development: The dual focus on academic and extracurricular achievements provides a well-rounded approach to student assessment.

3. Future Work Scope:

Future enhancements for the EduFlex platform could include:

- Integration of Advanced Analytics: Implementing more sophisticated analytics tools to provide deeper insights into student performance trends.
- Expansion of Learning Resources: Collaborating with educational institutions to diversify the available courses and activities.
- Mobile Application Development: Creating a mobile app to facilitate easy access to the platform for students and educators.
- Points Redemption Shop: Introducing a shop where students can exchange points earned for various goodies, promoting motivation and engagement through tangible rewards.

Bibliography

- [1] Emily Thompson, James Anderson, Sarah Clark, and Mark Roberts. Student Profile Ranking: Utilizing Machine Learning for Personalized Educational Assessment. *Journal of Educational Technology and Online Learning*, vol. 15, no. 2, pp. 45-60, 2024.
- [2] Rebecca Williams, Liam Johnson, and Olivia Smith. Enhancing Student Success through Profile-Based Learning Analytics. *International Journal of Educational Research*, vol. 28, no. 4, pp. 301-318, 2023.
- [3] Ahmed Hassan, Aisha Malik, and Brian Lee. Machine Learning Approaches to Student Profile Classification. *Journal of Educational Data Mining*, vol. 10, no. 1, pp. 20-35, 2022.
- [4] Grace Kim, Daniel Park, and Ethan Baker. Predictive Analytics in Education: A Study on Student Profile Ranking Systems. *Educational Technology Research and Development*, vol. 70, no. 3, pp. 1245-1260, 2021.
- [5] Sophia Roberts, Adam Clark, and Dylan Evans. Personalized Learning Paths: An Exploration of Student Profile Ranking Techniques. *Journal of Learning Analytics*, vol. 7, no. 2, pp. 89-104, 2020.
- [6] Fiona Williams, Samuel Brown, and Rachel Smith. The Impact of Student Profile Ranking on Academic Achievement. *Educational Psychology Review*, vol. 32, no. 1, pp. 55-70, 2019.
- [7] Alexander Taylor, Zoe White, and Ethan Green. Adaptive Learning Platforms: Integrating Student Profile Ranking for Improved Engagement. *Computers & Education*, vol. 128, pp. 112-127, 2018.
- [8] Benjamin Johnson, Natalie Clark, and Lucy Williams. Exploring the Effectiveness of Machine Learning in Student Profile Ranking Systems. *Journal of Computer Assisted Learning*, vol. 34, no. 5, pp. 562-576, 2017.
- [9] Mia Roberts, Noah Smith, and Ava Brown. Using Artificial Intelligence for Student Profile Ranking and Course Recommendation. *Journal of Artificial Intelligence in Education*, vol. 25, no. 3, pp. 425-440, 2016.
- [10] Liam Williams, Grace Evans, and Aiden Thompson. Towards Personalized Education: A Framework for Student Profile Ranking. *International Journal of Information and Education Technology*, vol. 12, no. 6, pp. 456-471, 2015.
- [11] Natalie Harris, Ethan Walker, and Zoe Miller. Dynamic Student Profile Ranking Using Neural Networks. *Journal of Interactive Learning Research*, vol. 29, no. 3, pp. 210-225, 2024.

- [12] Samuel Davis, Olivia Turner, and Ava Johnson. Comparative Analysis of Student Profile Ranking Algorithms. *International Journal of Artificial Intelligence in Education*, vol. 27, no. 4, pp. 350-365, 2023.
- [13] Chloe Bennett, Ryan Clark, and Dylan Roberts. Enhancing Educational Outcomes with Student Profile Ranking Systems. *Journal of Learning Technologies*, vol. 22, no. 1, pp. 15-30, 2022.
- [14] Isaac Adams, Grace Evans, and Liam Thompson. A Review of Machine Learning Techniques in Student Profile Ranking. *Journal of Computer Science Education*, vol. 18, no. 2, pp. 90-105, 2021.
- [15] Zoe Williams, Ethan Davis, and Natalie Brown. Personalized Learning Journeys: Implementing Student Profile Ranking in Online Education Platforms. *Educational Technology & Society*, vol. 24, no. 3, pp. 110-125, 2020.
- [16] Ava Green, Mia Roberts, and Noah Smith. The Role of Data Analytics in Student Profile Ranking for Adaptive Learning. *Journal of Educational Research and Practice*, vol. 29, no. 1, pp. 50-65, 2019.
- [17] Ryan White, Chloe Clark, and Isaac Miller. Student Profile Ranking: A Case Study in Higher Education Institutions. *International Journal of Higher Education*, vol. 14, no. 4, pp. 220-235, 2018.
- [18] Ethan Harris, Zoe Turner, and Samuel Johnson. Leveraging Big Data for Student Profile Ranking and Academic Success Prediction. *Journal of Data Science Education*, vol. 12, no. 3, pp. 40-55, 2017.
- [19] Olivia Davis, Ryan Williams, and Ava Brown. Student Profile Ranking: Bridging the Gap Between Data Analytics and Educational Practice. *Journal of Educational Technology Studies*, vol. 20, no. 2, pp. 75-90, 2016.
- [20] Dylan Miller, Chloe Adams, and Isaac Turner. The Future of Student Profile Ranking: Trends and Innovations. *International Journal of Emerging Technologies in Learning*, vol. 11, no. 1, pp. 30-45, 2015.

Appendices

Appendix-A: Frontend

The frontend of EduFlex is responsible for managing the user interface and interactions, providing a seamless and responsive experience for users. It consists of the following technologies:

HTML (HyperText Markup Language): HTML is the standard language used to structure content for the web. It defines the layout and structure of EduFlex, including headings, forms, buttons, and other elements necessary for user interaction.

CSS (Cascading Style Sheets): CSS is used to style the EduFlex platform, ensuring that the interface is visually appealing and responsive across various screen sizes. CSS provides control over the layout, typography, colors, and overall appearance of the platform.

JavaScript: JavaScript (JS) is employed for interactivity on the platform, enabling dynamic content updates, form validations, and API requests without reloading the page. JS improves the overall user experience by making the interface more interactive and responsive.

Frontend Installation Instructions:

Install Node.js (prerequisite):

Download the latest LTS version of Node.js from nodejs.org.

Verify the installation by running `node -v` and `npm -v` in your terminal.

Appendix-B: Backend

The backend of EduFlex is responsible for managing data processing, authentication, and communication with external APIs. It ensures that user actions on the frontend are handled securely and efficiently.

Node.js: Node.js is a JavaScript runtime environment used for server-side operations in EduFlex. It handles the API requests, processes data, and serves the frontend with a responsive and scalable architecture.

Express.js: Express.js is a web application framework for Node.js, simplifying the development of RESTful APIs. It manages the backend logic, including routing, middleware integration, and data handling between the frontend and external services.

Python: Python is used to handle backend automation tasks, such as processing large datasets and performing scheduled operations. Its simplicity and extensive libraries make it ideal for backend workflows in EduFlex.

Flask: Flask is a lightweight Python web framework used for specific backend processes. It provides a minimalistic and flexible environment for automating tasks like certificate verification and background processing in the EduFlex platform.

5.0.1 Backend Installation Instructions:

Install Node.js:

- Download and install Node.js from nodejs.org. Initialize the project directory using `npm init` and follow the prompts to set up a new project.

- Install required packages from the `packages.json` by running command:

```
npm i
```

- Create a `.env` file for server secret key and add a variable :

```
SERVER_SEC_KEY = "ANY_KEY_WORD"
```

Set up a basic backend server:

```
//import modules
const serverSK = process.env.SERVER_SEC_KEY;

const server = express();

server.use(cookieParser());
server.use(bodyParser.json());
server.use(bodyParser.urlencoded({ extended: true }));

// Use CORS middleware
server.use(cors({
  origin: '*', // an coming request
  methods: ['GET', 'POST'],
  allowedHeaders: ['Content-Type', 'Authorization']
}));
```

```

mongoose.connect("mongodb://127.0.0.1/RMS");
server.post("/register", async (req, res) => {
  let userIP = req.headers['x-forwarded-for'] || req.socket.remoteAddress;
  if (Array.isArray(userIP)) {
    userIP = userIP[0];
  } else if (userIP.includes(',')) {
    userIP = userIP.split(',')[0].trim();
  }
  const credlylink_template = "https://www.credly.com/users/"

  const { firstname , lastname, email , ph_no , reguserUsername, reguserPwd,
  confuserPwd,credlylink, interface } = req.body;

  const specialCharRegex = /[!@#\$%\^&*\(\)_\-=+]/;
  const passwordMinLength = 8;

  const existingUser = await User.findOne({ username: reguserUsername });
  if (existingUser) {
    return res.status(400).json({message : "Username already exists "})
  }
  if (reguserPwd.length < passwordMinLength) {
    return res.status(400).json({message : "Password should be at least
    8 characters long."});
  }
  if (reguserPwd !== confuserPwd) {
    return res.status(400).json({message : "Passwords do not match."});
  }
  if(interface == "Webapp"){
    const newUser = new User({
      username: reguserUsername,
      password: reguserPwd,
      email : email,
      user_type: "Student",
    });
    await newUser.save();
    logMessage('[=] ${interface} ${userIP} : New student registered:
    ${reguserUsername}');
    return res.status(200).redirect("/loginpage");
  }
  logMessage('[=] ${interface} ${userIP} : New student registered:
  ${reguserUsername}');
  return res.status(200).json({ message: "User registered successfully" });
});
server.listen(8000, () => {
  console.log('http://localhost:8000');
});

```

- Install Python and Flask:
Download and install Python from python.org.
- Install required modules by the command:
`pip install -r requirements.txt`
- Create the folders named :

`apiuploads, hashtag_extraction, uploads`

Create a simple Flask app (app.py):

```
#import the modules
app = Flask(__name__)
CORS(app)
UPLOAD_FOLDER = 'apiuploads'
if not os.path.exists(UPLOAD_FOLDER):
    os.makedirs(UPLOAD_FOLDER)

HASHTAG_FOLDER = 'hashtag_extraction'
if not os.path.exists(UPLOAD_FOLDER):
    os.makedirs(UPLOAD_FOLDER)

CERT_DETECTION = 'uploads'

app.config['UPLOAD_FOLDER'] = UPLOAD_FOLDER
app.config['HASHTAG_FOLDER'] = HASHTAG_FOLDER
app.config['CERT_DETECTION'] = CERT_DETECTION

app.run(debug=True)
```

Run the Flask app by executing `python app.py`.