Marwadi University Marwadi Chandarana Group	**Marwadi University** **Faculty of Engineering and Technology** **Department of Information and Communication Technology**
Subject: Capstone Project	**Aim: Project Definition and Scope - Intermediate Review**
Date: 24-9-2025	**Enrolment No: 92310133004**

Introduction

Schools, universities, and organizations often use old ways to track attendance, like paper records, spreadsheets, or basic fingerprint machines. These methods are slow, hard to manage, and can make mistakes. They also don't work well when there are a lot of people or when data needs to be shared or kept safe. To fix these problems, we suggest creating a new attendance system that works over the internet using AWS. This system will automatically mark attendance using face recognition, store all data securely in the cloud, and give real-time reports. By using AWS tools such as S3, Rekognition the system will be able to handle a lot of users, work reliably, and keep data private. This modern approach replaces old methods with a fast, accurate, and easy-to-use digital solution that can be accessed anytime.

Problem Statement

Institutions struggle with managing attendance data because they often use manual methods or on-premise biometric systems. These methods have several issues: They are easy to make mistakes with and take a lot of time. They are hard to use when an organization has a large number of students or employees. They don't offer good data analysis, reporting, or access from a distance. There is a need for a system that is centralized, secure, and automated. This system should handle many users, create real-time reports, and work with cloud technology to grow easily. AWS is the best choice for building such a solution, offering AI-based recognition and cost-effective services.

Objectives

- Use face recognition on AWS Rekognition to automatically mark attendance with accuracy of 90% or higher.
- Keep attendance data safe by storing it on AWS S3 and RDS or DynamoDB, and control access based on user roles.
- Create a web dashboard for admins to check and download attendance reports.
- Offer real-time analysis and charts.
- Design the system to handle up to 500 users at the same time while keeping costs as low as possible.

Relevance to ICT Domain

- Cloud Computing: Implements scalable, serverless AWS architecture.
- Computer Vision: Uses AWS Rekognition for face detection and recognition.
- Data Analytics: Provides insights and visual reports through AWS.
- Cybersecurity: Ensures data privacy with AWS IAM, encryption, and secure access control. This project directly contributes to the ICT fields of cloud computing, and software systems, aligning with modern industry trends.

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Feasibility Analysis

1. Technical Feasibility

- **Frontend:** React.js (dashboard), Tailwind CSS for UI.
- **Backend:** Python 3.13.6, Flask API
- **Database/Storage:** Amazon DynamoDB (Student face key), Amazon S3 (images/excel sheet).
- **AI/ML:** AWS Rekognition (face recognition).
- **Visualization:** Python (Matplotlib, Seaborn, Pandas)
- **Authentication:** IAM (secure login & access management).

2. Economic Feasibility

- Development within AWS Free Tier for prototyping.
- Production cost estimated under ₹400-500/month.
- Affordable and scalable as institutions pay only for usage.

3. Operational Feasibility

- The system can be integrated into daily academic/office workflows with minimal training.
- Interfaces are user-friendly: teachers/admins can access reports with a few clicks.
- Attendance data can be directly exported for compliance or linked with existing HR/academic systems.
- Cloud-based approach reduces dependence on IT staff for system maintenance.

4. Ethical Considerations

- Collecting biometric data (faces) only with **user consent**.
- Admin moderation to prevent unauthorized access or misuse of data.

5. Social Feasibility

- Accepted by students/employees because it reduces manual efforts.
- Reduces bias/errors from manual entry by teachers/admins.
- Supports digital transformation goals of universities and offices.

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Market/User Needs Analysis

1. **Institutional Need**
- Schools and colleges want accurate, fast, and reliable attendance tracking.
- Institutions need real-time reports to monitor student presence.

2. **Student/Employee Need**
- No more manual signatures or waiting in line for biometric scans.

3. **Administrator Need**
- Easy generation of reports for compliance and internal use.
- Reduce human errors in attendance management.

Literature Review

- Existing attendance systems include biometric devices (fingerprint, RFID) and manual registers. While effective at a small scale, they lack cloud integration, real-time access, and analytics.
- Mobile-based attendance apps exist but are vulnerable to proxy marking.
- Cloud-native systems are still limited in educational institutions in India.

Our proposed system is **novel** because it:
- Combines **AWS Rekognition** with a **cloud-native backend** for accuracy and scalability.
- Provides **real-time analytics** through Python (Matplotlib, Seaborn, Pandas)
- Integrates **secure user authentication** with AWS IAM.

Conclusion

The Attendance System Using AWS offers a new, cloud-based approach to solving modern attendance issues. It works well with AWS tools, saves money because you only pay for what you use, and keeps user privacy safe. This project brings faster, smarter, and more dependable attendance tracking for schools, workers, and students. It meets real needs in the market by using advanced tech like cloud computing, AI, and data analysis.