Green University of Bangladesh
Department of Computer Science and Engineering (CSE)

Faculty of Sciences and Engineering

Semester: (Spring, Year:2025), B.Sc. in CSE (Day)

Report

Project Title: Engineering on Intelligent Machine Learning Framework for Age-Responsive Internet Access Control

Course Title: IDP-2

Course Code: CSE-406 **Section:** 221-D12

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Submission Date : 16/5/2025

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Report Status

Marks: …… **Signature:.....**

Comments:..... **Date:.....**

1) Introduction:

The Age-Responsive Internet Access Control System is a versatile tool designed for households, educational institutions, and organisations seeking to create a safer and more responsible digital environment. Integrating machine learning technology offers a scalable, efficient, and privacy-respecting approach to internet access management.

2) Motivation:

a)Protecting the young generation from Harmful content.

b)Encouraging Responsible Digital Behavior.

c)Ensuring Privacy and Security.

d)Enabling Personalized and Dynamic Access Management.

3) Problem Domain:

a) The young generation gets addicted to internet services, which are unsuitable for those not old enough to use those services.[1]

b) By browsing some adult sites, they lost their social morality.[2]

c) The government can't take any steps to reduce the addiction because it's very difficult to implement a rule for a certain number of people.[3]

d)Most guardians can't do anything due to their inefficiency with modern devices.[4]

4) Objective:

To develop and implement a machine learning model for age detection to regulate internet access based on user age.

5) Methodology

5.1 Requirement Analysis

- **Problem Identification**:
  Young users are accessing age-inappropriate internet services (e.g., adult content), leading to social and psychological issues. Traditional controls by parents or governments are largely ineffective due to technical limitations or scalability issues.
- **Stakeholder Requirements**:
  - Parents/Guardians: Need tools to restrict or monitor age-inappropriate usage.
  - Government Bodies**:** Require scalable solutions to enforce digital safety policies.
  - Educational Institutions: Want secure online environments for students.
  - End Users (Minors)**:** Need guided, age-appropriate access to digital resources.
- **Functional Requirements**:
  - User age detection via device behavior or account information.
  - Content classification using AI/ML to detect inappropriate websites or applications.
  - Real-time internet access filtering.
  - Parent/guardian control dashboard.
  - Privacy-preserving data handling.
- **Non-Functional Requirements**:
  - High accuracy in age and content detection.
  - Scalability for large user bases.
  - Low latency in access control response.
  - Cross-platform compatibility.

5.2 System Design

- **Architecture Overview**:
  The system will use a modular architecture consisting of:
  - User Interface (UI) for parents/admins
  - Age Detection Module
  - Content Categorization Module
  - Policy Enforcement Engine
  - Cloud/Edge-based Logging & Reporting
- **Components**:
  - Age Detection Engine
    Uses behavioral biometrics, usage patterns, or account data to classify users by age group.
  - Content Filter Engine**:** Uses NLP and image recognition to classify websites/apps.
  - Control Layer**:** Applies rules (block/allow/limit) based on age and content.

- Parental Dashboard**:** Allows guardians to review reports and set manual overrides.

5.3 Performance Evaluation

Evaluation Metrics:

a)Accuracy of age prediction (target > 90%)

b)Precision/Recall of content classification

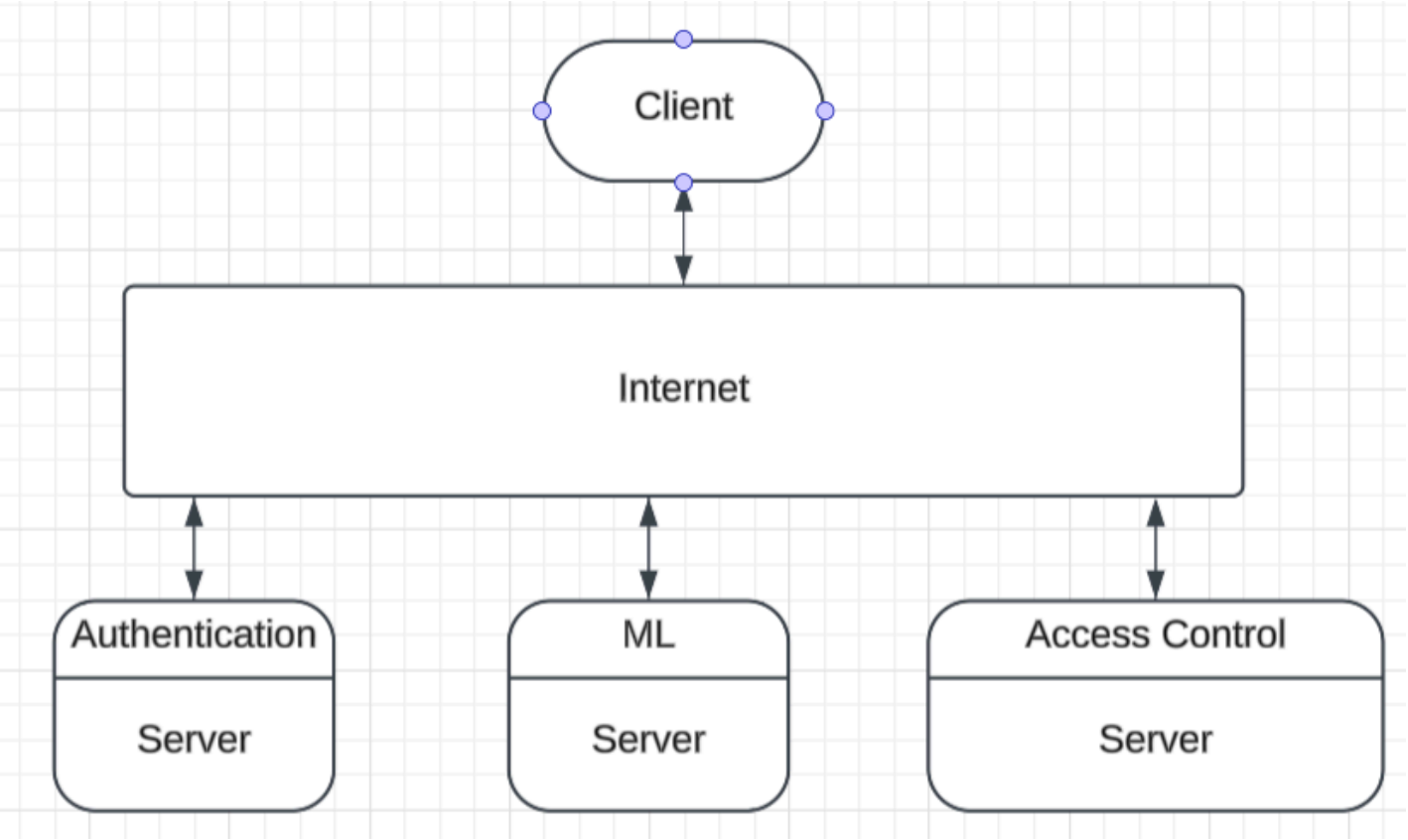
c)Latency of filtering system (target < 1s response)

d)User Satisfaction (parental feedback surveys)

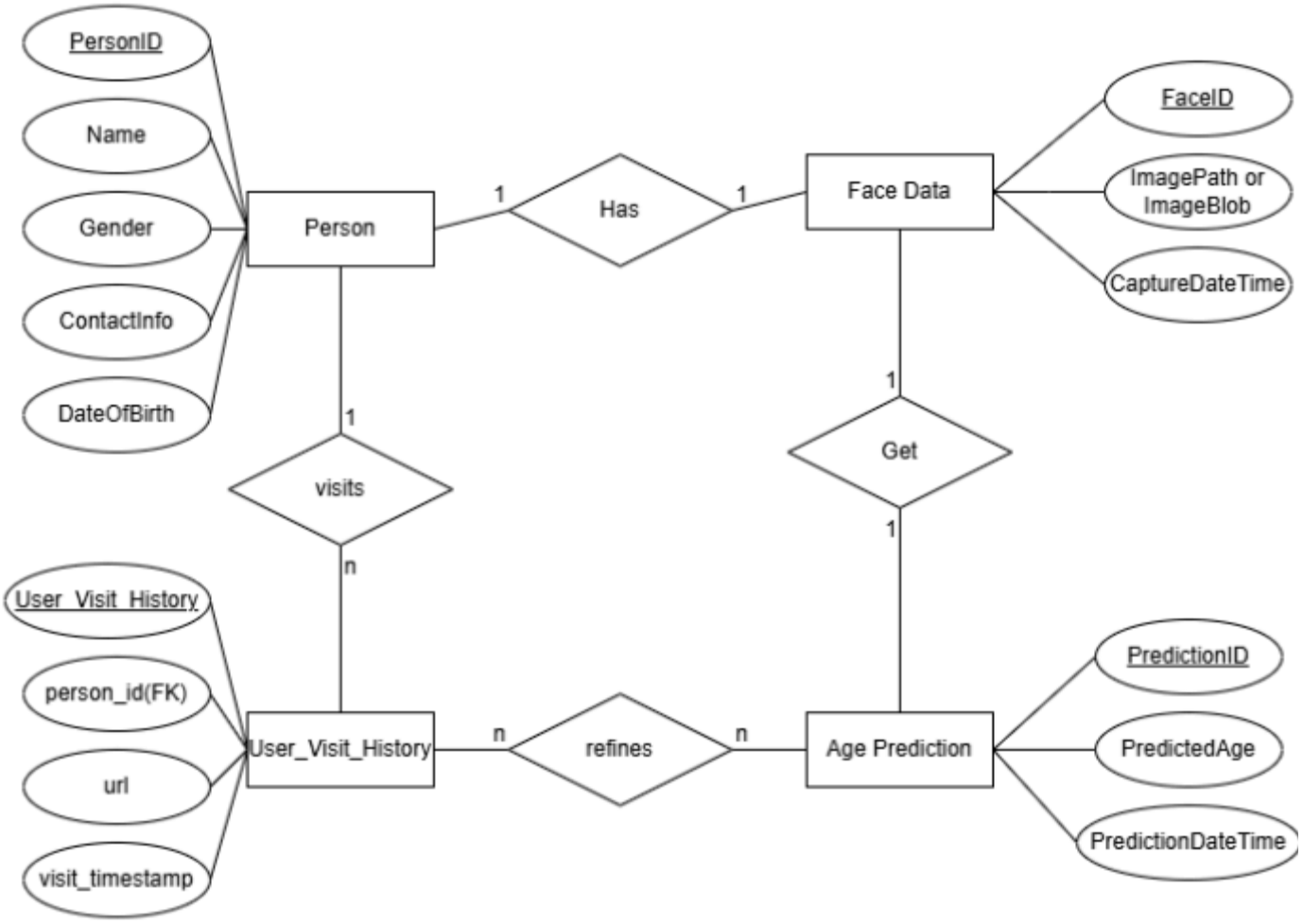
e)System Uptime & Scalability

6) Design and Implementation :

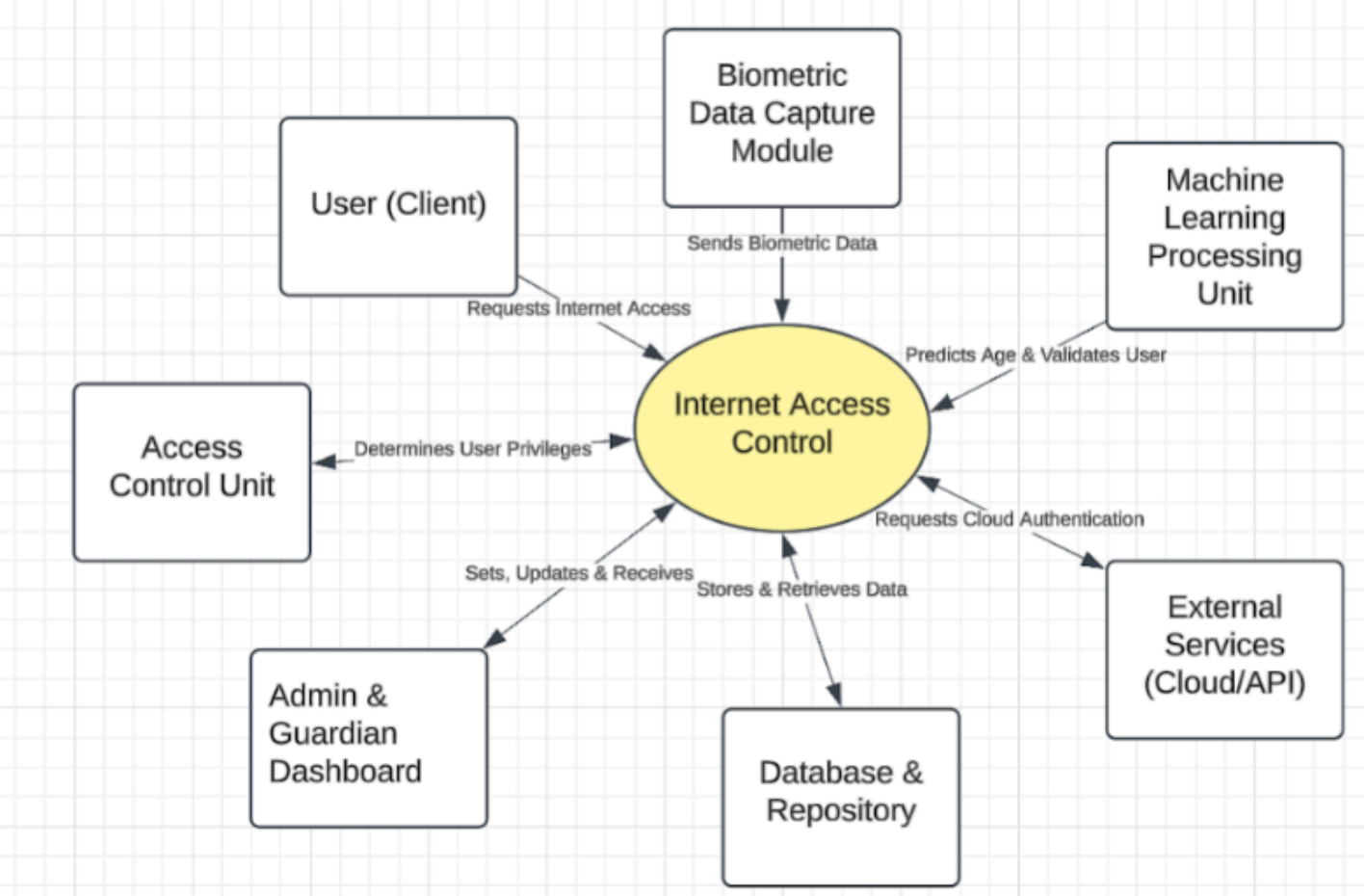
6.1 Client-Server Architecture Pattern



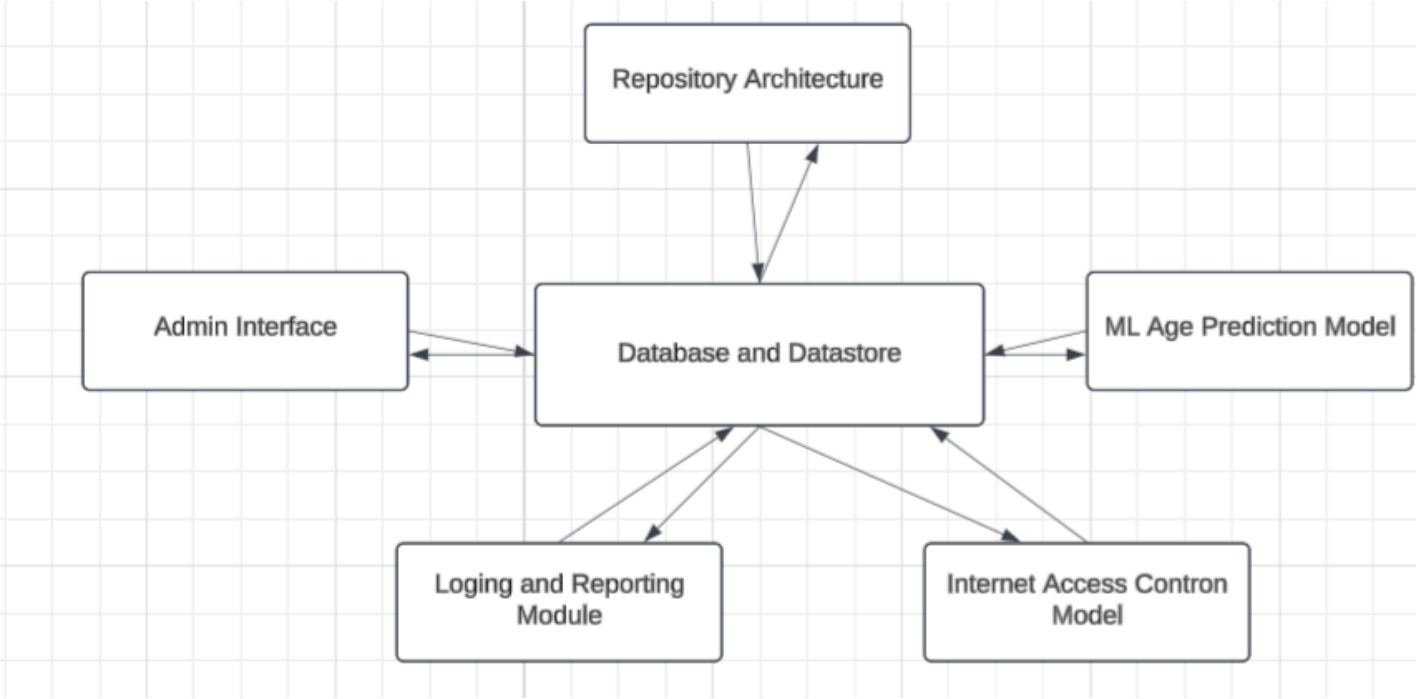
6.2 ER Diagram:



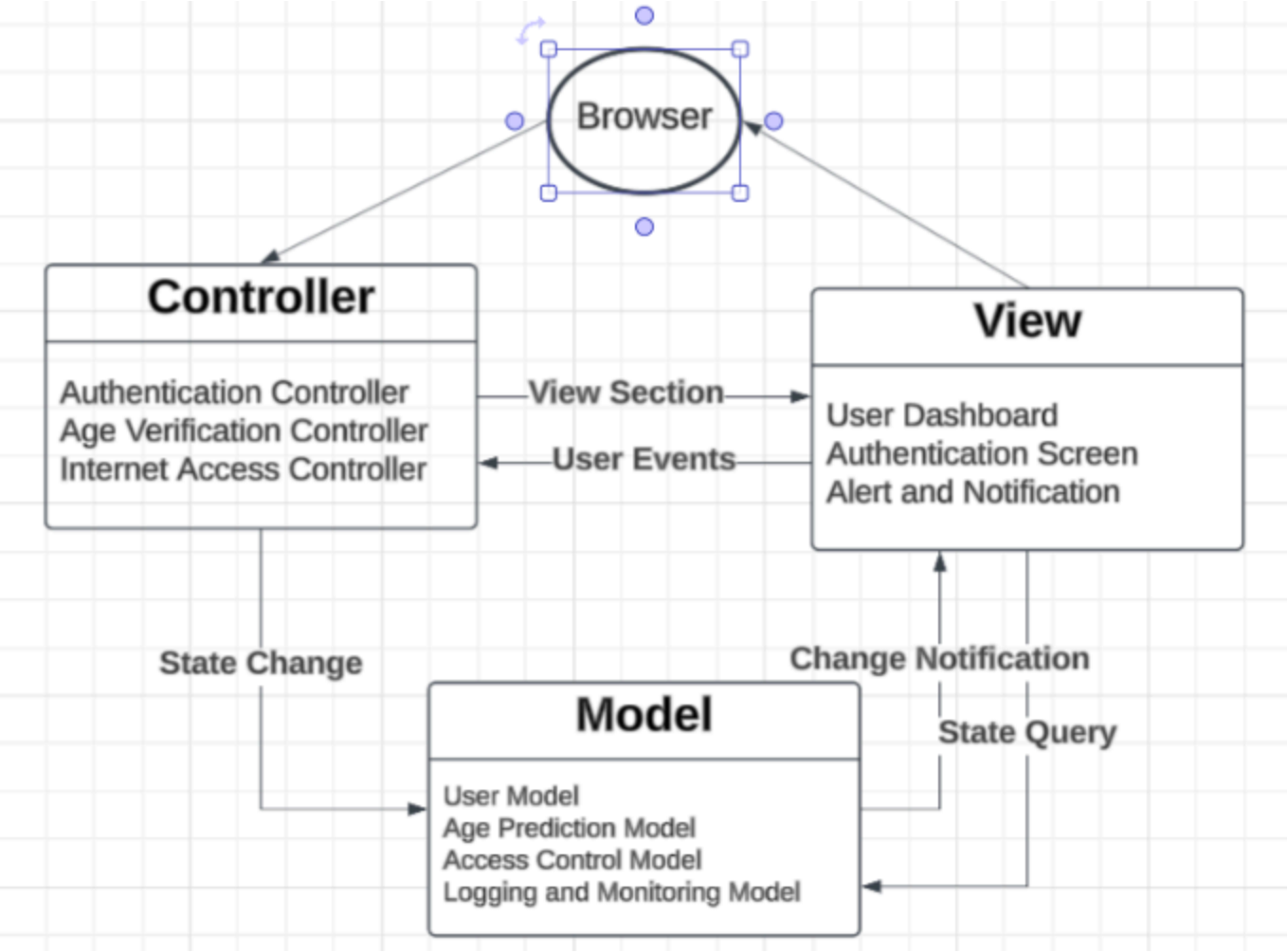
6.3 High-Level Architecture



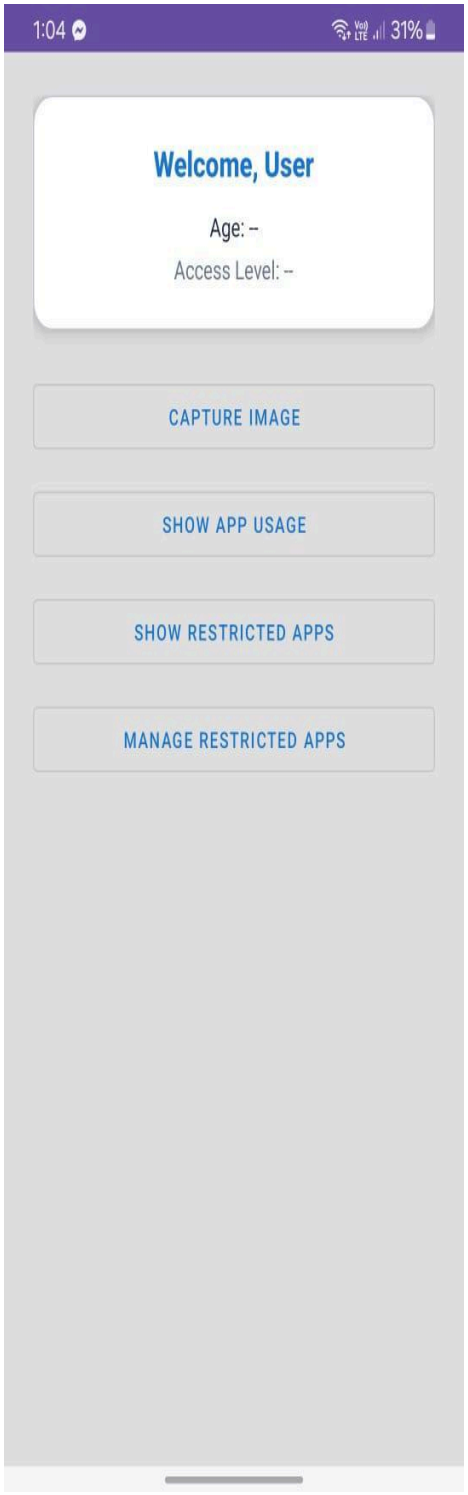
6.4 Repository Architecture



6.5 Web-based Model-View-Controller pattern



6.6 Implementation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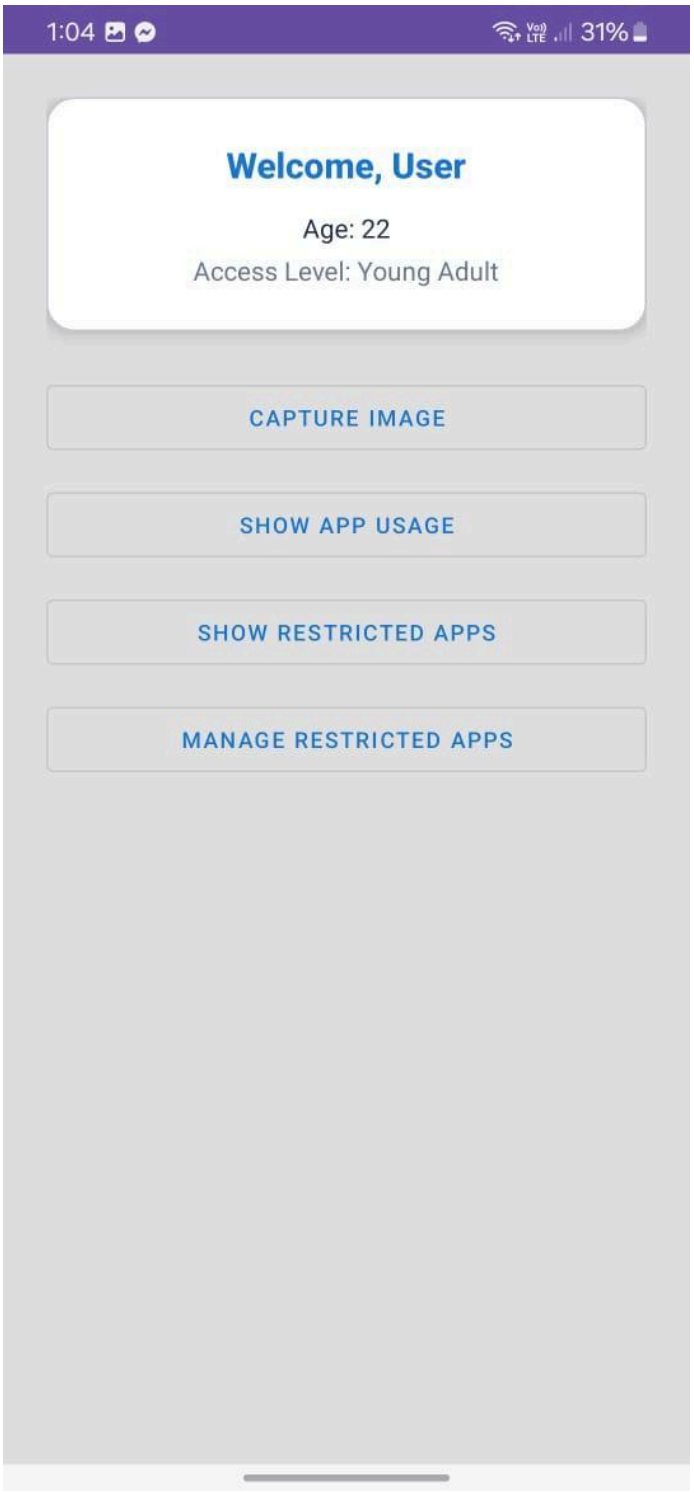
Age: --
Access Level: --
CAPTURE IMAGE
SHOW APP USAGE
SHOW RESTRICTED APPS
MANAGE RESTRICTED APPS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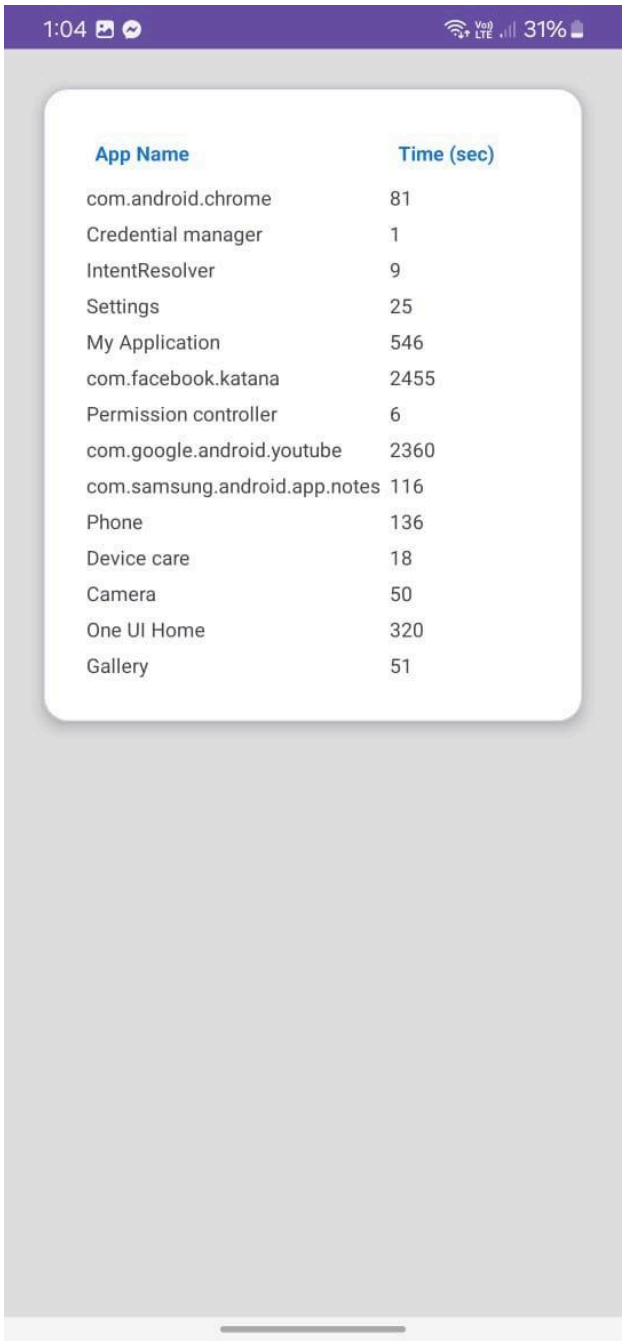
Age: 22
Access Level: Young Adult
CAPTURE IMAGE
SHOW APP USAGE
SHOW RESTRICTED APPS
MANAGE RESTRICTED APPS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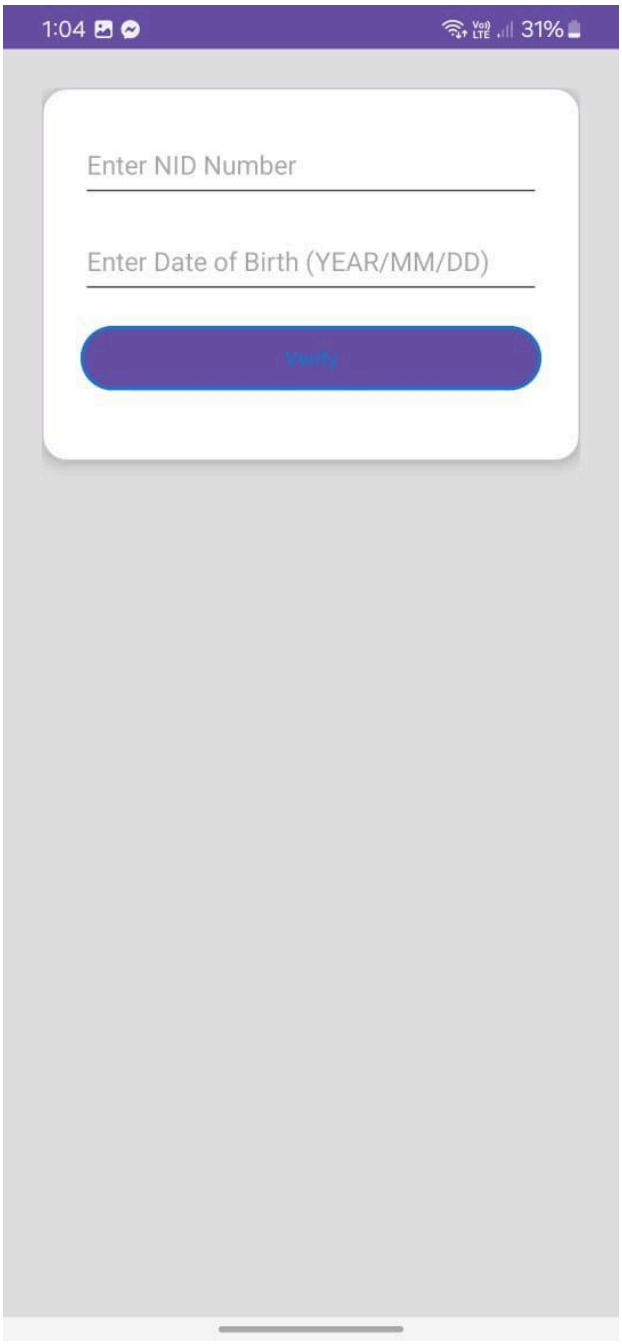
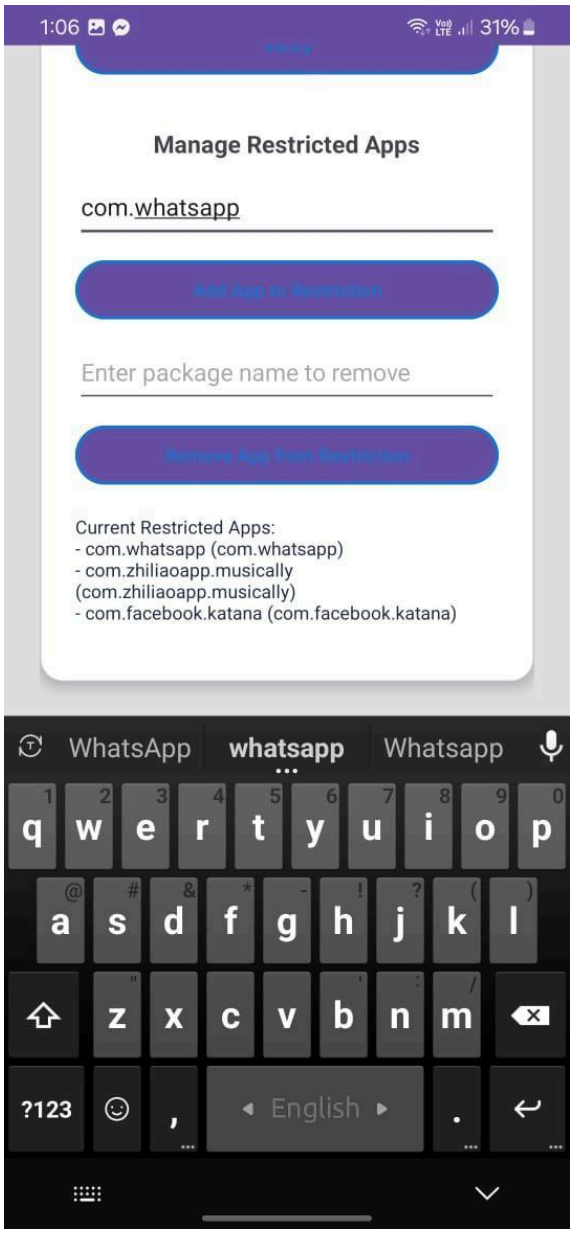
App Name
Time (sec)
com.android.chrome 81
Credential manager 1
IntentResolver 9
Settings 25
My Application 546
com.facebook.katana 2455
Permission controller 6
com.google.android.youtube 2360
com.samsung.android.app.notes 116
Phone 136
Device care 18
Camera 50
One UI Home 320
Gallery 51


1:04
31%
Enter NID Number
Enter Date of Birth (YEAR/MM/DD)
Verify



7) Conclusion

The proposed intelligent machine learning framework for age-responsive internet access control addresses the need to protect the younger generation from age-inappropriate online content. By combining AI-driven age detection with real-time content filtering, the system provides an effective solution to monitor and restrict internet usage based on user maturity levels. This approach overcomes the limitations governments and guardians face in enforcing digital safety, especially in environments lacking technical expertise. The framework balances privacy, security, and accessibility by integrating user-friendly parental controls and robust backend architecture. The system can adapt to evolving content types and user behaviors through performance evaluation and continuous learning, making it a scalable and future-ready solution for digital age control.

In conclusion, this intelligent framework helps safeguard moral and psychological well-being and supports responsible digital citizenship among the young. Further development and deployment can significantly contribute to national-level internet safety policies and family-level digital well-being practices.