American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

Campus Surveillance System

A Software Engineering Project Submitted
By

Semester: Spring 2023-2024		Section: C	Group Number: 3	
SN	Student Name	Student ID	Contribution (CO3+CO4)	Individual Marks
01	MD TAFHIMUL HAQUE SADI	22-47071-1		
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03	RAIAN TASNIM SAODA	22-46331-1		
04	SUMAIYA AFRIN	22-46304-1		

The project will be Evaluated for the following Course Outcomes

CO3: *Select* appropriate software engineering models, project management roles and their associated skills for the complex software engineering project and evaluate the sustainability of developed software, taking into consideration the societal and environmental aspects	Total Marks	
Appropriate Process Model Selection and Argumentation with Evidence	[5 Marks]	
Evidence of Argumentation regarding process model selection	[5Marks]	
Evaluate the sustainability of the developed software in terms of both society and the environment (Impact identification)	[5Marks]	
Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report	[5Marks]	
CO4: *Develop* project management plan to manage software engineering projects following the principles of engineering management and economic decision process	Total Marks	
Develop the project plan, its components of the proposed software products	[5Marks]	
Identify all the activities/tasks related to project management and categorize them within the WBS structure. Perform detailed effort estimation correspond with the WBS and schedule the activities with resources	[5Marks]	
Identify all the potential risks in the specific project and prioritizing/categorizing those to overcome the risk factors.	[5Marks]	

Description of Student's Contribution in the Project work

Student Name: MD TAFHIMUL HAQUE SADI
Student ID: 22-47071-1
Contribution in Percentage (%): 25%
Contribution in the Project:

_____
Signature of the Student

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Contribution in the Project:

_____   _____
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Student Name: RAIAN TASNIM SAODA
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Contribution in the Project:

_____   _____
Signature of the Student

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Contribution in Percentage (%): 25%
Contribution in the Project:

_____   _____
Signature of the Student

PROJECT PROPOSAL

1. Project Description:

Our project topic is "Campus Surveillance System". The "Campus Surveillance System" project represents a pioneering approach to security infrastructure, integrating advanced technologies like artificial intelligence (AI), machine learning, and IoT devices. At its core lies a sophisticated network of high-resolution cameras strategically positioned across the campus to provide real-time monitoring and recording capabilities. These cameras, equipped with features like motion detection and facial recognition, feed data to AI and ML algorithms for continuous learning and adaptation. Through seamless integration with IoT devices such as sensors and access control systems, the system ensures comprehensive security coverage while enabling automated responses to potential threats. Moreover, a centralized management console empowers administrators to efficiently monitor, configure, and generate reports, while robust data storage solutions guarantee secure archiving and retrieval of footage. With its emphasis on scalability, privacy compliance, and remote management capabilities, this innovative surveillance system sets a new standard for campus security, offering heightened protection and peace of mind to stakeholders.

2. Problem Statement:

This project is mainly based on the security system for any kind of educational institute. Sometime because of the huge area of a campus, it will become tough to maintain and check everything manually. To ensure students as well as other people connected with the institution, this system is really important and helpful. This system can prevent any kind of campus violence and the administrator can easily monitor what is happening at the institution. As the Traditional surveillance systems often suffer from inefficiencies and limitations that hinder their effectiveness in ensuring comprehensive security and surveillance. These limitations include:

Manual Monitoring and Analysis: Traditional surveillance systems rely heavily on manual monitoring and analysis by human operators, which can be prone to errors, fatigue, and oversight. This manual approach limits the scalability and real-time responsiveness of the surveillance system.

Limited Intelligence and Insights: Conventional surveillance systems lack the ability to extract meaningful insights from the vast amounts of video data they capture. They are often unable to distinguish between normal and abnormal activities or identify specific objects or individuals of interest.

Reactive Response to Security Threats: Traditional surveillance systems typically provide a reactive response to security threats, relying on human intervention after an incident has occurred. This delayed response can result in increased risk exposure and compromised safety.

Ineffective Resource Allocation: Without intelligent analytics and automated decision-making capabilities, traditional surveillance systems may allocate resources inefficiently, leading to unnecessary costs and manpower requirements.

Privacy Concerns and Compliance Issues: Many traditional surveillance systems raise privacy concerns due to indiscriminate data collection and retention practices.

Scalability and Adaptability Challenges: Legacy surveillance systems often lack scalability and flexibility, making it difficult to adapt to changing security requirements or expand surveillance coverage in large or dynamic environments.

Nowadays, ragging is a common term for the educational institutions specially on university level. It can be really painful for the victim student and they suffer with both psychical and mental problem and this can lead them to suicide which is really concerning and an alarming problem for our educational system. So if the campus is surrounded with cameras, which can notify any kind of violence as well as if there is a checking system which can identify any kind of inappropriate object then everyone will become concern to do or bring any kind of inappropriate thing, which can reduce and ultimately erase ragging and other inappropriate activity from the campus. This system can also help to give security to the children on school level so parents can be tension free. So as a whole, this system is really helpful for giving a healthy, tension free, student friendly educational environment.

3. Proposed Solution

A smart campus surveillance system aims to leverage cutting-edge technologies such as artificial intelligence, machine learning, computer vision, and IoT to:

Automate Surveillance Processes: Implement automated monitoring, analysis, and alerting functionalities to reduce reliance on manual intervention and improve operational efficiency.

Enhance Intelligence and Insights: Incorporate advanced video analytics algorithms to extract actionable intelligence from video feeds, enabling proactive threat detection, behavior analysis, and anomaly detection.

Enable Real-time Response: Integrate AI-powered decision-making capabilities to enable real-time response to security threats, including automated alerts, notifications, and incident escalation procedures.

Optimize Resource Allocation: Utilize predictive analytics and resource optimization algorithms to allocate surveillance resources more effectively, minimizing costs and maximizing coverage

Ensure Privacy and Compliance: Implement privacy-preserving technologies such as encryption, anonymization, and access controls to protect sensitive data and ensure compliance with relevant regulations.

Facilitate Scalability and Adaptability: Design the surveillance system with scalability and flexibility in mind, allowing for seamless expansion, integration with new technologies, and adaptation to changing security needs over time.

By addressing these key challenges and adopting a holistic approach to surveillance system design and implementation, a smart surveillance system can provide enhanced security, improved operational efficiency, and better compliance with privacy regulations in diverse environments.

Target Users:

There going to be 3 types of users will be using this system:
- **Administrators:** These individuals would utilize the system to manage accounts, navigation system and configure surveillance.
- **Security Personnel:** Security teams would rely on the system to monitor for any suspicious activities, potential security breaches, or unauthorized access to campus facilities.
- **Maintenance Staff:** They could use the system to monitor and manage campus infrastructure. Also monitoring system status, system equipment check, detecting maintenance issues, network configuration and managing storage resources.
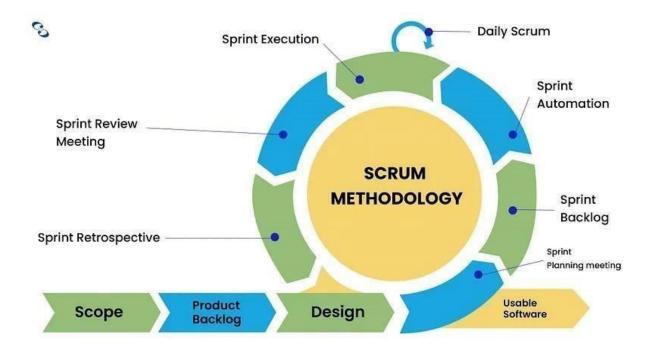
User Benefits:

By using this system users will be greatly benefited. Some important user benefits are given bellow:
1. **Crime Prevention:** The presence of advanced surveillance technology can deter criminal activity on campus. Additionally, AI algorithms can analyze patterns and abnormality to predict and prevent crimes before they occur.
2. **Enhanced Security:** AI-powered surveillance systems can detect and respond to potential security threats in real-time, ensuring a safer environment for everyone on campus. This can include identifying unauthorized individuals, monitoring for suspicious behavior, and alerting security personnel promptly.
3. **Faster Response Times:** With AI capabilities, surveillance systems can automatically prioritize alerts based on the level of threat, allowing security personnel to respond more quickly to emergencies and incidents.
4. **Emergency Management:** In the event of emergencies such as fires, natural disasters, or medical incidents, AI-powered surveillance systems can provide crucial information to emergency responders, enabling faster and more effective response efforts.
5. **Improved Incident Investigation:** AI-enabled surveillance systems can provide valuable evidence in the event of incidents or crimes, aiding law enforcement in their investigations and potentially leading to faster resolutions.
6. **Efficient Resource Allocation:** By analyzing data collected from surveillance cameras, it can provide insights into campus usage patterns, allowing administrators to allocate resources more efficiently based on actual demand.

4. Process Model

Scrum is a framework that enables agile team communication and value delivery. Scrum is a method for getting work done as a team in tiny chunks at a time, with constant experimentation and feedback loops to learn and improve as you go. Scrum enables individuals and teams to generate value gradually in a collaborative manner. Scrum, as an agile framework, provides just enough structure for people and teams to adopt into their work processes while still incorporating the best practices to optimize for their specific needs.

Let's discuss about the process model of our project "Campus Surveillance System" based on scrum process model:

- **Product Owner (PO):**

  - The Product Owner represents the stakeholders and is responsible for maximizing the value of the product.

  - In this project, the Product Owner collaborates with stakeholders to gather requirements, prioritize features, and maintain the Product Backlog.

- **ScrumMaster:**

  - The ScrumMaster facilitates the Scrum process and ensures adherence to Scrum principles and practices.

  - They may also serve as a coach for the team, removing impediments, and fostering a productive working environment.

- **Team:**

  - The development team is cross-functional and responsible for delivering increments of functionality during each sprint.

  - They collaborate closely to plan, develop, test, and deliver product increments related to the Campus Surveillance System.

- **Sprint Planning:**

  - Sprint Planning meetings are held at the beginning of each sprint.

  - During these meetings, the Product Owner presents the highest-priority items from the Product Backlog, and the Team selects the items they will work on during the sprint.

- **Daily Scrum Meeting:**

  - Daily Scrum meetings are conducted to provide brief updates on progress, ongoing work, and any impediments.

  - The ScrumMaster facilitates these meetings, ensuring that team members are aligned and focused on achieving the sprint goal.

- **Sprint Review:**

  - Sprint Review meetings are held at the end of each sprint.

  - The Team presents the completed work to stakeholders, and feedback is gathered to inform future iterations of the product.

- **Sprint Retrospective:**

  - Sprint Retrospective meetings are conducted after the Sprint Review and before the next Sprint Planning meeting.

  - The Team reflects on the sprint process, identifies areas for improvement, and defines action items to address these improvements in future sprints.

Utilization of Product Backlog and Sprint Backlog:

- The Product Backlog is used to maintain a prioritized list of all desired features, enhancements, and fixes for the Campus Surveillance System.

- The Sprint Backlog is a subset of the Product Backlog items selected for implementation during each sprint, guiding the team's work throughout the sprint.
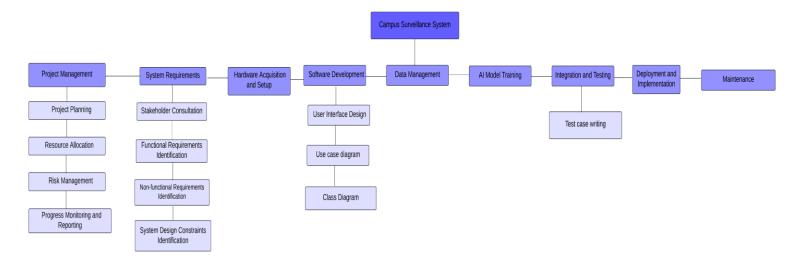
Burndown Charts:

- Burndown charts are utilized to visualize the remaining work in the sprint backlog over time, providing insights into the team's progress and velocity.

By following the Scrum process model and incorporating these key elements, the "Campus Surveillance System" project can effectively deliver value to stakeholders in an iterative,

transparent, and collaborative manner while ensuring the development team remains focused and adaptable to changing requirements.

5. WBS:

WBS link:

https://lucid.app/lucidchart/2fd23a72-615c-45c7-acd3-30cf128a8477/edit?viewport_loc=-2978%2C-297%2C3412%2C1583%2C0_0&invitationId=inv_1169db00-42c6-4857-8775-64250fd523a7
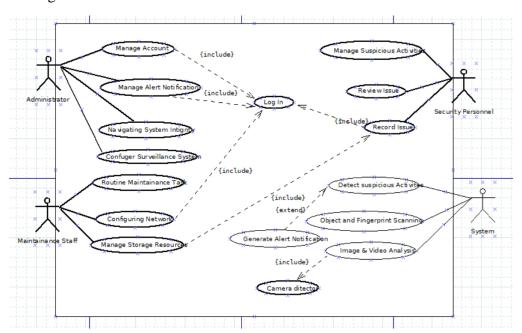
6. Project Requirements

Functional Requirements:

- **Login:** Administrator, Maintenance staff and security personnel need to login with their name, role and password.
- **Camera Management:** Administrators should be able to configure surveillance cameras such as camera angle, camera setup within the system.
- **Alert System:** Administrators and Maintenance staff should receive alerts via SMS, or push notifications when predefined events such as motion detection, camera tampering, or unauthorized access occur.
- **Access Control Integration:** Integrate with existing campus access control systems to enable selective camera access based on user roles and permissions.
- **Analytics and Reporting:** Provide analytical tools for generating reports on surveillance data, including trends, patterns, and incident statistics.
- **Live Monitoring:** The system should provide live video monitoring of various campus locations in real-time.
- **Record and review:** Maintenance staff should able to record and review issues within system.

Non-Functional Requirements:

- **Privacy Compliance:** Ensure compliance with relevant privacy regulations by implementing measures such as anonymization and access controls for sensitive data.
- **Data Security:** Implement strong encryption for data transmission and storage to ensure the security and integrity of surveillance footage.
- **Data Retention:** Define data retention policies for storing surveillance footage and ensure compliance with legal requirements.
- **Maintenance and Support:** Provide ongoing maintenance and technical support services to address any issues or updates required for the system.
- **Scalability:** The system is scalable to accommodate an increasing number of cameras and users as the campus grows.
- **Usability:** Design the user interface to be intuitive and user-friendly, with clear navigation and informative feedback for administrators.
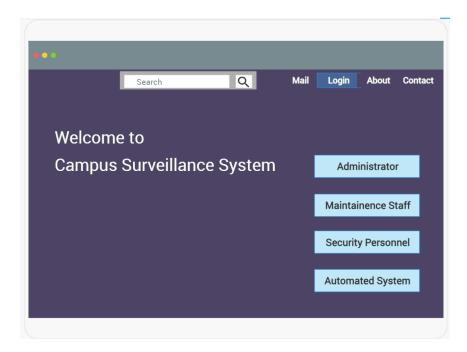
Use Case Diagram:

7. Prototype Design:

Here the sample prototype is given:

https://www.fluidui.com/editor/live/project/p_g4dM8RIpfln8cMKFyrrFZ5hWcWzpF3RZ
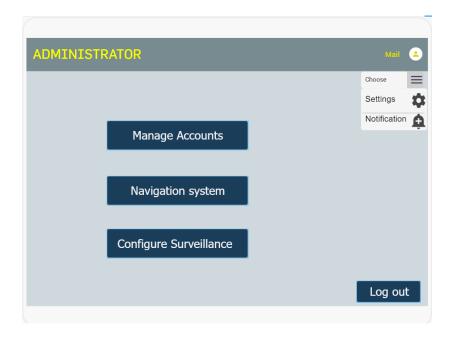
This is the main page of our project. First, press the login button. The login UI will be opened
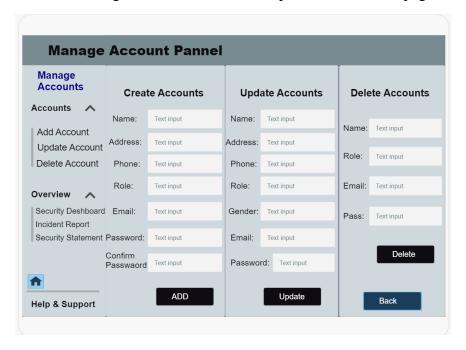
Then Input the mail, role such as administrator, maintenance staff, security personnel and press the login button. The main page will be opened.
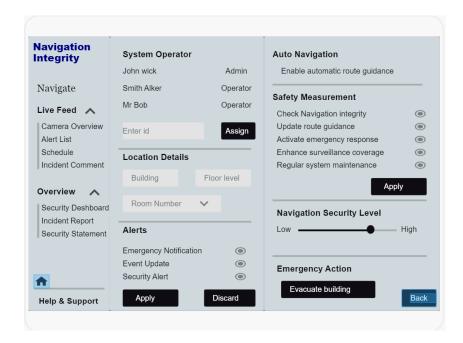
If we press the administrator button, The main page of administrator will open.
If we press the Maintenance staff button, The main page of the Maintenance staff will open.
If we press the Security personnel button, The main page of the Security personnel will open.
If we press the Automated system button, The main page of the Automated system will open.
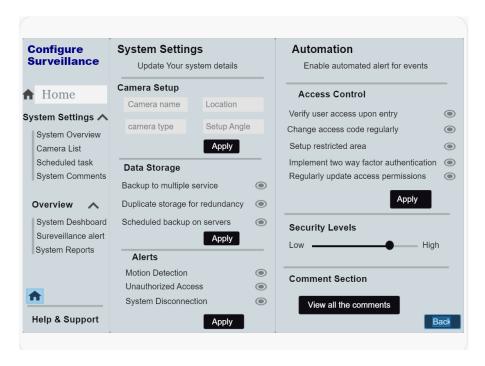
The Administrator has three use cases. If the Manage accounts button will press, the manage account UI will be opened. If the Navigation system button will press, the Navigation system UI will be opened. If the Configure surveillance button will press, the Configure surveillance UI will be opened. Press the log out button And it will Open the UI of main page of our project.
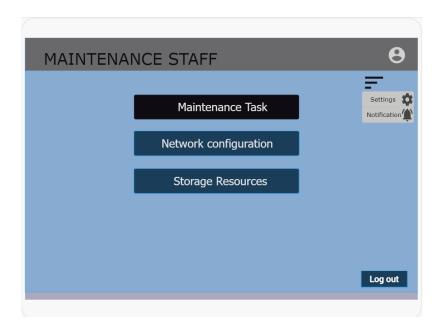
Manage account panel can add, update and delete accounts.
We can go the administrator main page if we press back button.
If we click home icon, the main page of our system will be opened.

We can go the administrator main page if we press back button.
If we click home icon, the main page of our system will be opened.

We can go the administrator main page if we press back button.
If we click home icon, the main page of our system will be opened.
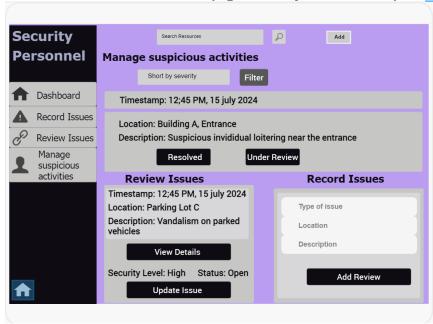
This is the Maintenance staff main page. The Maintenance staff has three use cases. If the Maintenance task button will press, the Maintenance task UI will be opened. If the Network configuring button will press, the Network configuring UI will be opened. If the Storage resources button will press, the Storage resources UI will be opened. Press the log out button And it will Open the UI of main page of our project.

We can go the administrator main page if we press back icon button.
If we click home icon, the main page of our system will be opened.
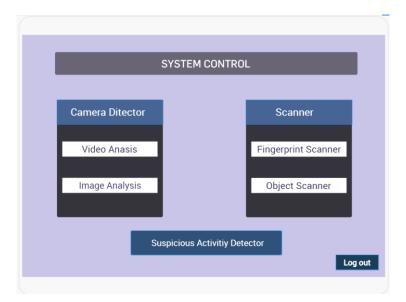
We can go the administrator main page if we press back icon button.
If we click home icon, the main page of our system will be opened.
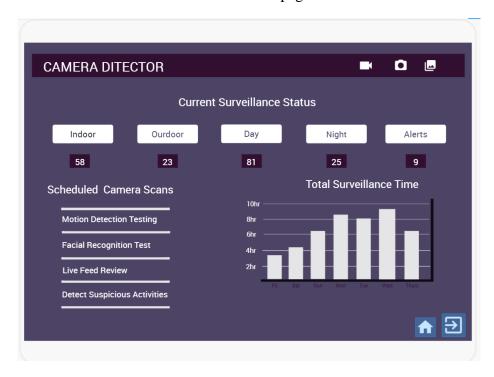
This is the security personnel main Page UI.
Press the home icon button, The main page of our system will be opened.
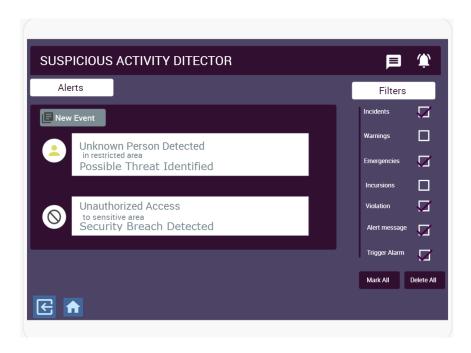
This is the Automated system control main page. The Automated system has three use cases. If the Camera detector button will press, the Camera detector UI will be opened. If the Scanner button will press, the Scanner UI will be opened. If the Suspicious activity detector button will press, the Suspicious activity detector UI will be opened. Press the log out button, it will Open the UI of main page.

We can go the administrator main page if we press back icon button.
If we click home icon, the main page of our system will be opened.
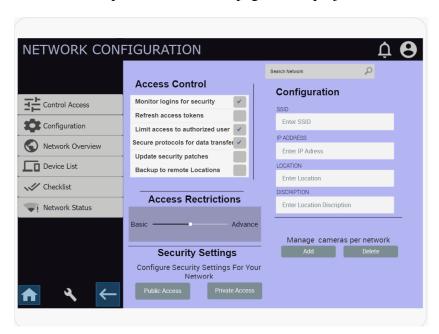
We can go the administrator main page if we press back icon button. If we click home icon, the main page of our system will be opened.
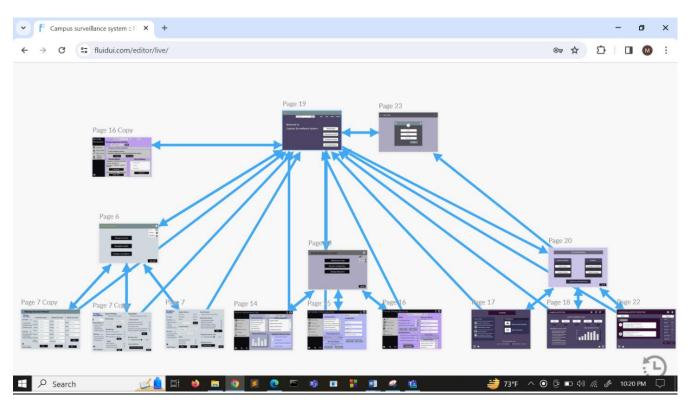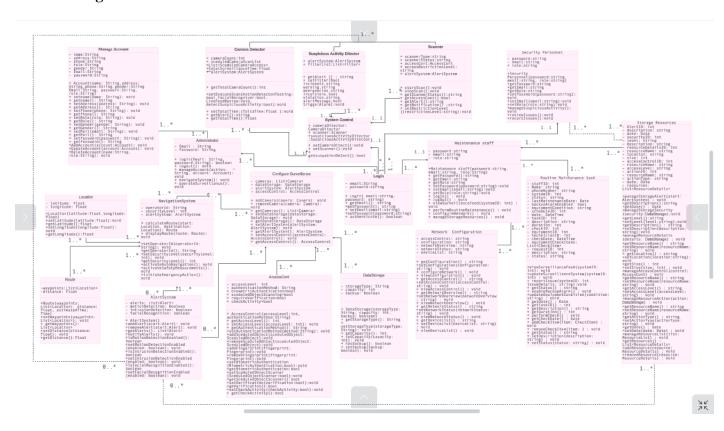
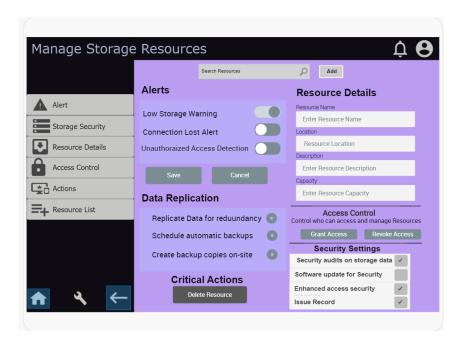We can go the administrator main page if we press back icon button. If we click home icon, the main page of our system will be opened.

The full project UI link:
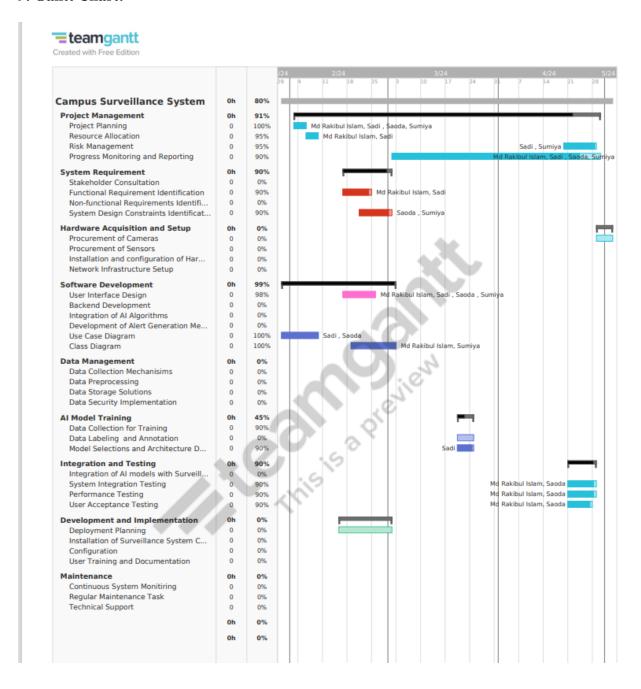
8. Class Diagram
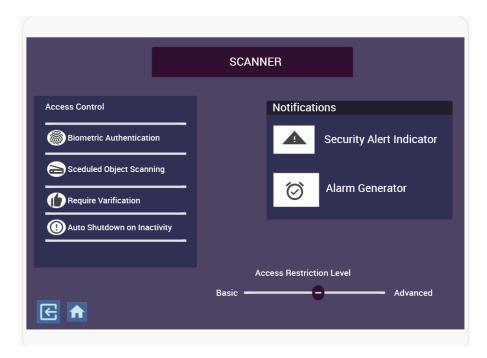
Class diagram Link:

https://lucid.app/lucidchart/4c2152eb-2802-4312-b7db-c75747ce3539/edit?viewport_loc=-9992%2C-5509%2C19615%2C7631%2C0_0&invitationId=inv_9bf7ff01-40d0-4bde-80c8-f63529cdd85f

9. Gantt Chart:

11. Test Case:

Test Case ID	CSS_1_1	Test Case Description	Test the Login Functionality in the Campus Surveillance System			
Created By	Md Rakibul Islam	Reviewed By	Saoda	Version		1.1
QA Tester's Log	Review comments from Saoda incorporated in version 1.0					
Tester's Name	Md Rakibul Islam	Date Tested	21-04-2024	Test Case (Pass/Fail/Not Executed)	Pass	

S #	Prerequisites:			S #	Test Data	
1	User should have an account.			1	userid = rakibul78	
2	User must have valid username and password			2	Pass = 12345	
3				3		
4				4		

Test Scenario	Verify login with valid username and password					

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Go to app	Site should open	As Expected,	Pass
2	Enter username	Credential can be entered	As Expected,	Pass
3	Enter password	Credential can be entered	As Expected,	Pass
4	Click login	Customer is logged in	As Expected,	Pass

Test Case ID	CSS_1_2	Test Case Description	Test the SIGN-UP Functionality			
Created By	Md Rakibul Islam	Reviewed By	Saoda	Version		1.1
QA Tester's Log	Review comments from Bill incorporated in version 2.1					
Tester's Name	Md Rakibul Islam	Date Tested	21-04-2024	Test Case (Pass/Fail/Not Executed)	Pass	

S #	Prerequisites:			S #	Test Data	
1	Website should be loaded.			1	Full name: Md Rakibul Islam Phone:01878659495 NID:987654321 Registration Number: abc-10 Address: Bashundhara R/A Email: rakibulislam77799@gmail.com Username: Rakibul_01 Password: 1234	
2	User must have valid username and password			2	Full name: Raian Tasnim Saoda Phone:0187865949 NID:987654100 Registration Number: abc-10 Address: Bashundhara R/A Email:raiantasnim2411@gmail.com Username: Raian_02 Password: 0111	

Test Scenario	Verify login with valid username and password					

Step #	Step Details	Expected Results	Actual Results			

				Pass / Fail / Not executed / Suspended
1	Go to the website	Site should open	As Expected,	Pass
2	Enter a valid username	Credential can be entered	As Expected,	Pass
3	Enter phone number	Credential can be entered	As Expected,	Pass
4	Enter NID	Credential can be entered	As Expected,	Pass
5	Enter address	Credential can be entered	As Expected,	Pass
6	Enter Registration number	Credential can be entered	As Expected,	Pass
7	Enter E-mail	Credential can be entered	As Expected,	Pass
8	Enter username	Credential can be entered	As Expected,	Pass
9	Enter password	Credential can be entered	As Expected,	Pass

Test Case ID		CSS_1_3	Test Case Description		Verify Live video feed			
Created By		Md Rakibul Islam	Reviewed By		Saoda		Version	1.1
QA Tester's Log		Review comments from Saoda incorporated in version 1.0						
Tester's Name		Md Rakibul Islam	Date Tested		22-04-2024		Test Case (Pass/Fail/Not Executed)	Pass
S #	Prerequisites:				S #	Test Data		
1	User must be logged in				1	Authorized usernames and passwords for login testing		
2	1.Surveillance cameras are properly positioned to cover key areas of the campus.				2	Test scenarios for motion detection and intrusion testing		
3	Ensure that feed is clear				3			
					4			
Test Scenario	Verify live video feed							
Step #	Step Details		Expected Results		Actual Results		Pass / Fail / Not executed / Suspended	
1	Check if the live video feed from surveillance cameras is displayed on the dashboard		Live video feed should be displayed without any glitches		As Expected,		Pass	

2	Ensure that the feed is clear and the cameras are functioning properly	Live video feed should be displayed without any glitches	As Expected,	Pass

Test Case ID		CSS_1_4	Test Case Description		Test motion detection in Campus Surveillance System			
Created By		Md Rakibul Islam	Reviewed By		Saoda	Version		1.1
QA Tester's Log		Review comments from Saoda incorporated in version 1.0						
Tester's Name		Md Rakibul Islam	Date Tested		22-04-2024	Test Case (Pass/Fail/Not Executed)		Pass
S #	Prerequisites:				S #	Test Data		
1	The Campus Surveillance System is installed and configured				1	Test scenarios for motion detection and intrusion testing		
2	Motion detection and facial recognition features are enabled and configured				2			
					3			
					4			
Test Scenario	Test motion detection.							
Step #	Step Details		Expected Results		Actual Results		Pass / Fail / Not executed / Suspended	

1	Walk into the field of view of a surveillance camera	Motion detection should trigger alerts when movement is detected	As Expected,	Pass
2	Observe if the system detects the motion and triggers an alert.	Motion detection should trigger alerts when movement is detected	As Expected,	Pass
3	Repeat the test with different cameras	Motion detection should trigger alerts when movement is detected	As Expected,	Pass

Test Case ID		CSS_1_5	Test Case Description		Test facial recognition			
Created By		Md Rakibul Islam	Reviewed By		Saoda	Version		1.1
QA Tester's Log		Review comments from Saoda incorporated in version 1.0						
Tester's Name		Md Rakibul Islam	Date Tested		22-04-2024	Test Case (Pass/Fail/Not Executed)		Pass
S #	Prerequisites:				S #	Test Data		
1	The Campus Surveillance System is installed and configured				1	Enrolled faces for facial recognition testing.		
2	Surveillance cameras are properly positioned to cover key areas of the campus				2			
3	Motion detection and facial recognition features are enabled and configured.				3			
4					4			

Test Scenario	Test facial recognition.								
Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Enroll a person's face into the system as a known individual.	Facial recognition should accurately identify enrolled individuals.	As Expected,	Pass
2	Walk in front of a surveillance camera with facial recognition capability.	Facial recognition should accurately identify enrolled individuals.	As Expected,	Pass
3	Verify if the system correctly identifies the enrolled individual and triggers an alert.	Facial recognition should accurately identify enrolled individuals.	As Expected,	Pass
4	Repeat the test with multiple enrolled individuals.	Facial recognition should accurately identify enrolled individuals.	As Expected,	Pass

Test Case ID	CSS_1_6	Test Case Description	Test intrusion detection.

Created By	Md Rakibul Islam	Reviewed By	Saoda			Version		1.1	
QA Tester's Log	Review comments from Saoda incorporated in version 1.0								
Tester's Name	Md Rakibul Islam	Date Tested	23-04-2024			Test Case (Pass/Fail/Not Executed)		Pass	

S #	Prerequisites:			S #	Test Data				
1	The Campus Surveillance System is installed and configured.			1	Test scenarios for motion detection and intrusion testing				
2	Surveillance cameras are properly positioned to cover key areas of the campus			2					
3	Motion detection and facial recognition features are enabled and configured.			3					
4				4					
Test Scenario	Test intrusion detection.								

Step #	Step Details	Expected Results	Actual Results		Pass / Fail / Not executed / Suspended	
1	Simulate an unauthorized entry into a restricted area.	Intrusions into restricted areas should trigger alerts.	As Expected,		Pass	
2	Verify if the system detects the intrusion and triggers an alert.	Intrusions into restricted areas should trigger alerts.	As Expected,		Pass	

3	Repeat the test with different restricted areas.	Intrusions into restricted areas should trigger alerts.	As Expected,	Pass

Test Case ID	CSS_1_7	Test Case Description	Test alarm system integration		
Created By	Md Rakibul Islam	Reviewed By	Saoda	Version	1.1
QA Tester's Log	Review comments from Saoda incorporated in version 1.0				
Tester's Name	Md Rakibul Islam	Date Tested	24-04-2024	Test Case (Pass/Fail/Not Executed)	Pass
S #	Prerequisites:		S #	Test Data	
1	The Campus Surveillance System is installed and configured.		1	Test alarm system working or not	
2	Surveillance cameras are properly positioned to cover key areas of the campus		2		
3	Motion detection and facial recognition features are enabled and configured.		3		
4			4		
Test Scenario	Test alarm system integration				

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Activate the campus alarm system manually or simulate an emergency situation.	Integration with the alarm system should work seamlessly.	As Expected,	Pass
2	Verify if the Campus Surveillance System receives the alarm signal and displays corresponding alerts.	Integration with the alarm system should work seamlessly.	As Expected,	Pass
3	Ensure that relevant cameras are automatically focused on the affected area.	Integration with the alarm system should work seamlessly.	As Expected,	Pass

Test Case ID	CSS_1_8	Test Case Description	Test data logging and reporting.		
Created By	Md Rakibul Islam	Reviewed By	Saoda	Version	1.1
QA Tester's Log	Review comments from Saoda incorporated in version 1.0				
Tester's Name	Md Rakibul Islam	Date Tested	26-04-2024	Test Case (Pass/Fail/Not Executed)	Pass
S #	Prerequisites:		S #	Test Data	

1	The Campus Surveillance System is installed and configured.			1	Test data logging and reporting successfully or not
2	Surveillance cameras are properly positioned to cover key areas of the campus			2	
3	Motion detection and facial recognition features are enabled and configured.			3	
4				4	

Test Scenario	Test data logging and reporting.				

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Perform various activities within the campus premises while being recorded by the surveillance system.	Data logging and reporting should provide accurate records of events.	As Expected,	Pass
2	Access the system logs and reports.	Data logging and reporting should provide accurate records of events.	As Expected,	Pass
3	Verify if the system accurately records events, timestamps, and associated footage.	Data logging and reporting should provide accurate records of events.	As Expected,	Pass

Test Case ID	CSS_1_9	Test Case Description	Test Intrusion Detection in Various Restricted Areas

Created By	Md Rakibul Islam	Reviewed By		Saoda	Version		1.1
QA Tester's Log	Review comments from Saoda incorporated in version 1.0						
Tester's Name	Md Rakibul Islam	Date Tested		26-04-2024	Test Case (Pass/Fail/Not Executed)	Pass	

S #	Prerequisites:			S #	Test Data		
1	The Campus Surveillance System is installed and configured.			1	Test Intrusion Detection in Various Restricted Areas		
2	Surveillance cameras are properly positioned to cover key areas of the campus			2			
3	Motion detection and facial recognition features are enabled and configured.			3			
4				4			

Test Scenario	Test Intrusion Detection in Various Restricted Areas				

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Attempt to access different restricted areas without authorization.	The system should promptly detect intrusions into restricted areas and trigger appropriate alerts.	As Expected,	Pass

2	Verify if the system detects the intrusion and triggers an alert.	The system should promptly detect intrusions into restricted areas and trigger appropriate alerts.	As Expected,	Pass

Test Case ID	CSS_1_10	Test Case Description		Test Alarm System Integration with Emergency Protocols			
Created By	Md Rakibul Islam	Reviewed By		Saoda	Version		1.1
QA Tester's Log	Review comments from Saoda incorporated in version 1.0						
Tester's Name	Md Rakibul Islam	Date Tested		27-04-2024	Test Case (Pass/Fail/Not Executed)	Pass	

S #	Prerequisites:			S #	Test Data
1	The Campus Surveillance System is installed and configured.			1	Test Alarm System Integration with Emergency Protocols are working or not
2	Surveillance cameras are properly positioned to cover key areas of the campus			2	
3	Motion detection and facial recognition features are enabled and configured.			3	
4				4	
Test Scenario	Test Alarm System Integration with Emergency Protocols				

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Activate the campus alarm system manually or simulate an emergency situation.	The Campus Surveillance System should receive the alarm signal, trigger alerts, and focus cameras on the affected area, demonstrating seamless integration with emergency protocols.	As Expected,	Pass
2	Verify if the Campus Surveillance System receives the alarm signal and displays corresponding alerts.	The Campus Surveillance System should receive the alarm signal, trigger alerts, and focus cameras on the affected area, demonstrating seamless integration with emergency protocols.	As Expected,	Pass
3	Ensure that relevant cameras are automatically focused on the affected area.	The Campus Surveillance System should receive the alarm signal, trigger alerts, and focus cameras on the affected area, demonstrating seamless integration with emergency protocols.	As Expected,	Pass

Test Case ID	CSS_1_11	Test Case Description	Test Data Backup and Recovery Mechanisms		Test Data Backup and Recovery Mechanisms
Created By	Md Rakibul Islam	Reviewed By	Saoda	Version	1.1

QA Tester's Log	Review comments from Saoda incorporated in version 1.0							
Tester's Name	Md Rakibul Islam	Date Tested		27-04-2024		Test Case (Pass/Fail/Not Executed)		Pass
S #	Prerequisites:			S #	Test Data			
1	The Campus Surveillance System is installed and configured			1	Ensure Data Backup and Recovery Mechanisms properly or not			
2	The Campus Surveillance System is installed and configured			2				
3	Motion detection and facial recognition features are enabled and configured			3				
4				4				
Test Scenario	Test Data Backup and Recovery Mechanisms							
Step #	Step Details	Expected Results		Actual Results		Pass / Fail / Not executed / Suspended		
1	Simulate data loss scenarios and initiate data backup and recovery processes.	The system should demonstrate robust data backup and recovery mechanisms, ensuring data integrity and continuity of surveillance operations.		As Expected,		Pass		

2	Verify if the system successfully backs up and restores surveillance data.	The system should demonstrate robust data backup and recovery mechanisms, ensuring data integrity and continuity of surveillance operations.	As Expected,	Pass

Test Case ID	CSS_1_12	Test Case Description		Privacy Compliance Testing			
Created By	Md Rakibul Islam	Reviewed By		Saoda	Version		1.1
QA Tester's Log	Review comments from Saoda incorporated in version 1.0						
Tester's Name	Md Rakibul Islam	Date Tested		28-04-2024	Test Case (Pass/Fail/Not Executed)		Pass
S #	Prerequisites:			S #	Test Data		
1	The Campus Surveillance System is installed and configured			1	Verify privacy masking in sensitive areas		
2	The Campus Surveillance System is installed and configured			2			
3	Motion detection and facial recognition features are enabled and configured			3			
4				4			

Test Scenario	Privacy Compliance Testing			
Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Identify sensitive areas (e.g., restrooms, medical facilities).	Privacy masking should effectively obscure sensitive areas from surveillance footage, ensuring compliance with privacy regulations.	As Expected,	Pass
2	Activate privacy masking for these areas.	Privacy masking should effectively obscure sensitive areas from surveillance footage, ensuring compliance with privacy regulations.	As Expected,	Pass
3	Verify that no identifiable information is captured in these areas.	Privacy masking should effectively obscure sensitive areas from surveillance footage, ensuring compliance with privacy regulations.	As Expected,	Pass

Test Case ID	CSS_1_13	Test Case Description	Network Security Testing		
Created By	Md Rakibul Islam	Reviewed By	Saoda	Version	1.1
QA Tester's Log	Review comments from Saoda incorporated in version 1.0				

Tester's Name	Md Rakibul Islam	Date Tested	28-04-2024	Test Case (Pass/Fail/Not Executed)	Pass
S #	Prerequisites:		S #	Test Data	
1	The Campus Surveillance System is installed and configured		1	Conduct penetration testing	
2	The Campus Surveillance System is installed and configured		2		
3	Motion detection and facial recognition features are enabled and configured		3		
4			4		

Test Scenario	Network Security Testing			
Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Attempt unauthorized access to the surveillance system's network.	The system should resist unauthorized access attempts, and vulnerabilities should be identified and addressed promptly.	As Expected,	Pass
2	Probe for vulnerabilities and attempt to exploit them.	The system should resist unauthorized access attempts, and vulnerabilities should be	As Expected,	Pass

		identified and addressed promptly.		

Test Case ID	CSS_1_14	Test Case Description	Performance Testing			
Created By	Md Rakibul Islam	Reviewed By	Saoda	Version		1.1
QA Tester's Log	Review comments from Saoda incorporated in version 1.0					
Tester's Name	Md Rakibul Islam	Date Tested	29-04-2024	Test Case (Pass/Fail/Not Executed)		Pass

S #	Prerequisites:			S #	Test Data		
1	The Campus Surveillance System is installed and configured			1	Evaluate system performance during peak hours		
2	The Campus Surveillance System is installed and configured			2			
3	Motion detection and facial recognition features are enabled and configured			3			
4				4			
Test Scenario	Performance Testing						
Step #	Step Details		Expected Results		Actual Results		

				Pass / Fail / Not executed / Suspended
1	Increase the load on the surveillance system by monitoring high-traffic areas.	The system should maintain optimal performance, with minimal latency and no degradation in image quality during peak usage.	As Expected,	Pass
2	Monitor system response time and camera latency.	The system should maintain optimal performance, with minimal latency and no degradation in image quality during peak usage.	As Expected,	Pass

Test Case ID	CSS_1_15	Test Case Description	User Acceptance Testing			
Created By	Md Rakibul Islam	Reviewed By	Saoda	Version		1.1
QA Tester's Log	Review comments from Saoda incorporated in version 1.0					
Tester's Name	Md Rakibul Islam	Date Tested	29-04-2024	Test Case (Pass/Fail/Not Executed)		Pass
S #	Prerequisites:			S #	Test Data		
1	The Campus Surveillance System is installed and configured			1	Test usability for security personnel		
2	The Campus Surveillance System is installed and configured			2			

3	Motion detection and facial recognition features are enabled and configured			3					
4				4					

Test Scenario	User Acceptance Testing.					

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Provide training on system usage to security personnel.	Security personnel should find the system intuitive and easy to use, with minimal training required to perform essential tasks effectively.	As Expected,	Pass
2	Ask security personnel to perform common tasks such as camera control, footage review, and alarm response.	Security personnel should find the system intuitive and easy to use, with minimal training required to perform essential tasks effectively.	As Expected,	Pass

Test Case ID	CSS_1_16	Test Case Description		Documentation Review			
Created By	Md Rakibul Islam	Reviewed By		Saoda	Version		1.1

QA Tester's Log	Review comments from Saoda incorporate in version 1.0							
Tester's Name	Md Rakibul Islam	**Date Tested**		30-04-2024		**Test Case (Pass/Fail/Not Executed)**	Pass	
S #	**Prerequisites:**			**S #**	**Test Data**			
1	The Campus Surveillance System is installed and configured			1	Review system documentation completeness			
2	The Campus Surveillance System is installed and configured			2				
3	Motion detection and facial recognition features are enabled and configured			3				
4				4				
Test Scenario	Documentation Review							
Step #	**Step Details**	**Expected Results**		**Actual Results**		**Pass / Fail / Not executed / Suspended**		
1	Review user manuals, maintenance guides, and emergency protocols provided by the system vendor.	System documentation should be comprehensive, accurate, and up-to-date, providing clear guidance for users and administrators.		As Expected,		Pass		
2	Verify that documentation covers all aspects of system setup, operation,	System documentation should be comprehensive, accurate, and up-to-date, providing		As Expected,		Pass		

	maintenance, and troubleshooting.	clear guidance for users and administrators.		

12. Risk Management:

Project Risk, Impact, Risk level

Date of last review: **5/2/2024**

ID	Description of Risk	Impact	Risk Response	Risk Level	Risk owner	Notes
1	Incompatibility of existing IT infrastructure	Delay project implementation,increase costs	pre-implementation review,upgrades	High	Tafhimul	Coordination with IT department before procurment
2	Failure of critical software components	compromise system functionality,data integrity	Implement robust testing phases,utilize frameworks	High	Rakibul	Regular updates and maintenance to be established
3	Security vulnerabilities in the surveillance system	Potential data breaches, unauthorized access	Integrate advanced cybersecurity, regular security au	High	Sumaiya	Monitoring and updates on cybersecurity threats
4	Delays in hardware delivery, installation of IoT devices	Project timeline extension and budget overruns	Develop contingency plans	Medium	Saoda	Regular follow-ups with vendors to check delivery
5	Proper training of personnel for using surveillance system	Reduced system effectiveness, potential misuse	Plan proper training programs and provide support	Medium	Tafhimul	Include real-time support in training module
6	Data privacy issues for improper handling of data	Legal penalties and damage reputation	Implement strict compliance, secure data storage	High	Saoda	Regular audits and updates to privacy policies
7	Scope creep due to unclear project requirements	Could lead to resource strain and project delays	Define clear project boundaries and requirements	High	Rakibul	Use change management processes
8	Insufficient stakeholder or communication breakdowns	Stakeholder expectations and dissatisfaction	Establish communication and stakeholder meetings	Medium	Sumaiya	Periodic reviews and updates to stakeholders
9	Budget overruns or poor financial management	Necessitate scope, additional funding reduction	Monitor budget closely and regular financial reviews	High	Rakibul	Update financial forecast, stakeholders budget status
10	Legal and regulatory changes affects surveillance policies	Compliance risks,potential project modifications	Informed on legislative change, adapt project scope	Medium	Tafhimul	Engagement with legal experts for ongoing advice
11	Resistance or backlash from students or faculty privacy	Negative public relations, potential disruption	Outreach and education programs for safegaurds	Medium	Saoda, sumaiya	Transparency and proactive communication are key

10. Conclusion:

The "Campus Surveillance System" project marks a significant advancement in our commitment to enhancing campus safety through technology. Successfully integrating cutting-edge AI and IoT capabilities, this system provides comprehensive real-time surveillance and intelligent threat detection across the campus. Throughout the project, emphasis was placed on scalability, robust data privacy measures, and extensive user training, ensuring the system is not only effective today but also well-prepared for future expansions and challenges. The project's success can largely be attributed to the dedicated collaboration among project teams, stakeholders, and the campus community, demonstrating that innovative solutions can significantly improve security in educational settings. As we move forward, continuous monitoring and feedback-driven updates will ensure the system remains at the forefront of technological advancements, continuing to provide a secure and conducive learning environment.