LG Electronics

AACS Requirements

Team 3

Document Information

Issuing authority	Team 3

Revision History

Version	Date	Comment	Author	Approver
0.1	2021-06-11	Initial Version	Team 3	

1. Overview

1.1. Objectives

The requirements specification of AACS developed in this project has the following purposes.

- Requirements are developed based on the analysis results of customer requirements.
- System development scope identification and system context definition
- Creating functional/non-functional requirements of the system

1.2. Scope

In this document, the details of the analysis of the requirements necessary for the development of the AI Attendance Check System are detailed.

1.3. Related Documents

Documents related to this document are as follows.

Table 1 Related Documents

	Filename	Version	Remark
1	AACS_ThreatAnalysis_RiskAssessment_Result.xlsx	1.0	
2	AACS_Architecture_Specificaiton.docx	1.0	
3			

1.4. Terms & Acronyms

Table 2 Terms & Acronyms

	Terms & Acronyms	Description	Remark
1	AACS	AI Attendance Check System	
2	FRS	Face Recognition System	
3	ACS	Attendance Check System	

2. Introduction

This system was developed at the request of the tartan company that received the order from CMU. CMU believes that checking student attendance is a waste of time and wants automatic attendance checks.

2.1. System Purpose

2.1.1. System Objective

Table 3 System Objective

System name	AACS(AI Attendance Check System)
Purpose of the system	When installed in the classroom, this system can automatically check the attendance, late, and absence of students.

2.1.2. Target Information

Table 4 Target Information

Customer	Tartan Company
End Customer	CMU

2.2. System Scope

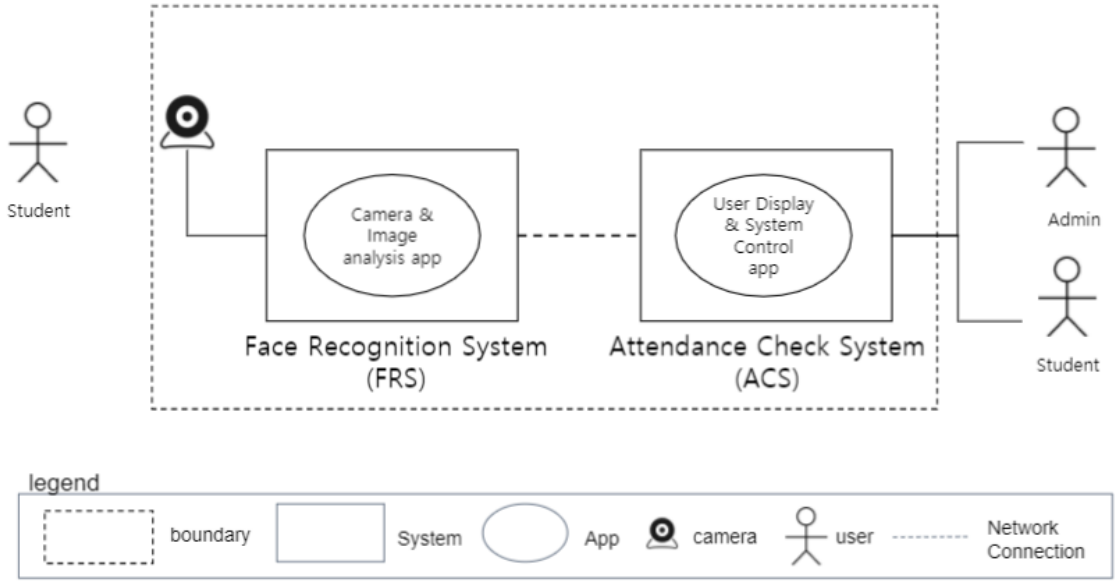

Figure 1 System Scope

3. General System Description

3.1. System Overview

- The system registers the students' faces through the camera.
- Check the attendance status of registered students according to the set class time. Attendance status is indicated as attendance, tardy, or absence.
- Administrators can check the attendance status of students.
- When a student requests an administrator to check past attendance, it can be viewed as a saved video.

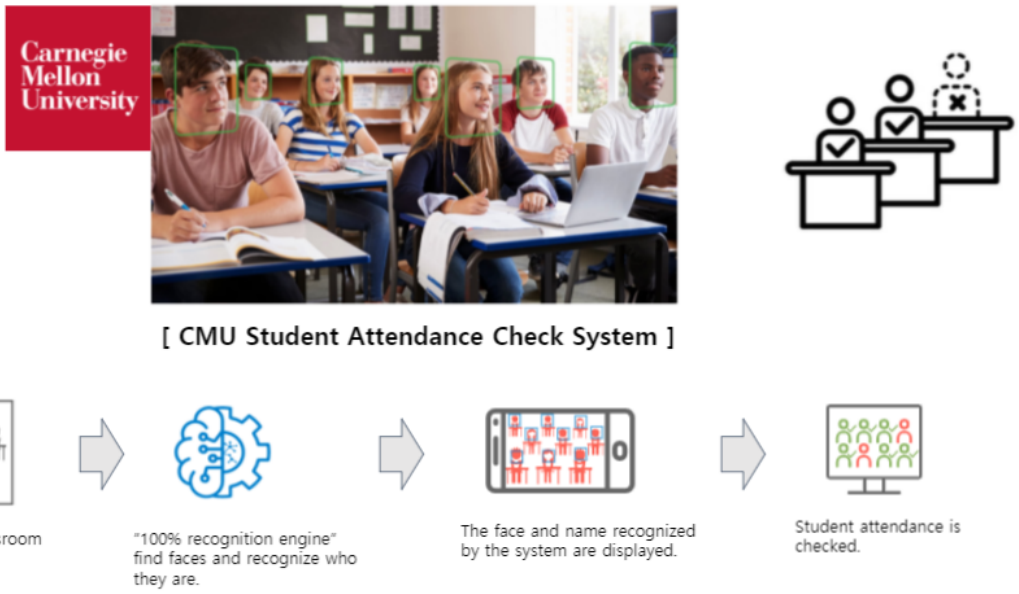

Figure 2 System Overview

4. Functionality Requirements

Describes system requirements that satisfy customer requirements.

Functional requirements were derived by analyzing customer requirements.

In addition, some requirements were derived through threat analysis.

- ID: Requirement_ID with AACS-REQ-xxx
- category : Categorize and organize requirements. If it is divided into categories, it is thought that it will be helpful to check them by category during future development.
- Contents : Detailed description of requirements
- Priority: Define and describe development priorities. Since our development period is set to 3 weeks, it is necessary to prioritize and apply it across the entire requirements.
- implementation : It is an indication of an implementation application item. Among the total requirements, the requirements reflected in the implementation are indicated.

4.1. Functional Requirements

ID	category - 1	category - 2	contents	priority	type	implementation
AACS-REQ-001	login	create user	This system should be able to create users through membership registration.	Low	common	X
AACS-REQ-002		user password	The system applies a hash function to the user password. SHA256	High	common	O
AACS-REQ-003		user password	To set a strong password we should provide the notice (message) to select Password with combination of chars, numbers and special chars etc	High	common	O
AACS-REQ-004		captcha authentication	This system makes a captcha appear when the password is wrong 3 times or more.	Low	common	X
AACS-REQ-005		user authentication	This system requires 2-factor authentication for user authentication.	High	common	O
AACS-		set permissions	This system should be able to set	High	com	O

REQ-006			student/administrator privileges when creating users.		mon	
AACS-REQ-007		set mode	This system should be able to set secure mode and real-time mode when logging in.	High	common	O
AACS-REQ-008		login	This system must be able to connect the ACS and FRS systems during the login function.	High	common	O
AACS-REQ-009		pre-defined user	This system creates users with the privileges of students and administrators in advance.	Mid	common	O
AACS-REQ-010	register of student (Learn mode)	add photo	The system should be able to add photos of students.	High	common	O
AACS-REQ-011		delete photo	The system should be able to delete student photos.	High	derived	O
AACS-REQ-012		end register	The system must be able to finish the student registration function.	High	derived	O
AACS-REQ-013		tune photo	This system should provide the ability to adjust the brightness and illuminance of the photo.	Low	common	X
AACS-REQ-014		select class	This system should allow students to set up their own classes.	Low	derived	X
AACS-REQ-015	attendance check (Run mode, Test run mode)	live attendance	The system should be able to check student attendance in real time.	High	common	O
AACS-REQ-016		past attendance	This system should be able to check the attendance of students through past saved images.	High	common	O
AACS-REQ-017		student list	The system should be able to see a list of students assigned to a class.	High	derived	O
AACS-REQ-018		save student attendance time	The system should be able to store the attendance time of students.	High	derived	O
AACS-REQ-019		check student status	The system should be able to know the attendance, late, and absence status of students.	High	derived	O
AACS-REQ-020		Attendance time setting	The system should be able to set attendance times for students.	High	derived	O

AACS-REQ-021		add class	This system should be able to add a class for attendance check.	Low	derived	X
AACS-REQ-022		Add class manager	This system should be able to set the person responsible for the class.	Low	derived	X
AACS-REQ-023	security	log	The system must support logging for non-repudiation.	High	common	X
AACS-REQ-024		defense	The system should be prepared for keyboard and mouse hooking.	High	common	X
AACS-REQ-025		storing personal information	In this system, the user's personal information and data related to facial recognition must be encrypted and stored.	High	common	O
AACS-REQ-026		secure mode	This system requires encryption of data transmission.	High	common	O
AACS-REQ-027		secure code	Secure coding & static analysis -> Fix RATS results	High	common	O (partially)
AACS-REQ-028		snooping	The system should not allow intermediaries to snoop or spy on the ongoing video feed.	High	common	O
		The security requirements are derived through threat analysis as follows.				
AACS-REQ-029		limited photos	Each student must be able to save up to 5 photos.	High	derived	O
AACS-REQ-030		check capacity	When saving student photos, this system should be able to check the remaining capacity.	High	derived	X
AACS-REQ-031		check capacity	When saving a video about attendance, this system should be able to check the remaining capacity.	Midium	derived	X
AACS-REQ-032		separate partition	This system should be able to save the video of the attendance in a separate partition.	Midium	common	X
AACS-REQ-033		operation	This system should be able to operate the attendance function even if it is not possible to save the video of the attendance.	High	common	X
AACS-REQ-034		encryption	Videos of attendance in this system must be encrypted.	High	common	X
AACS-		hash	User accounts accessing this system must be	High	com	O

REQ-035			hashed.		mon	
AACS-REQ-036		hash	Config setting file that manages device information stored in the system should be signed	High	derived	O
AACS-REQ-037		encryption	Face DB in the system must be encrypted.	High	common	X
AACS-REQ-038		input validation	When logging into the system, the input data should be verified.	High	common	X
AACS-REQ-039		sign	Face DB data stored in the system must be signed by admin.	High	common	X
AACS-REQ-040		encryption	Video DB data stored in the system must be encrypted.	High	common	X
AACS-REQ-041		sign	Video DB data stored in the system must be signed by admin.	High	common	X
AACS-REQ-042		encryption	User DB data stored in the system must be encrypted.	High	common	O
AACS-REQ-043		sign	User DB data stored in the system must be signed by admin.	High	common	O
AACS-REQ-044		heart beat	The system's Comm Manager (ACS) must apply a heart beat.	High	common	X
AACS-REQ-045		input validation	Input verification for the Config setting in the system should be done.	High	common	O
AACS-REQ-046		hash	AI Engine data shall be hashed.	High	common	O
AACS-REQ-047		input validation	Input verification for engine data in the system should be done.	High	common	O
AACS-REQ-048		data loading	It is necessary to check the loading completion of the engine data of the system.	High	derived	O
AACS-REQ-049		input validation	The Comm Manager (FRS) in the system should verify the input.	High	common	O

AACS-REQ-050		IP filtering	The FRS system must receive only a set IP through IP filtering.	High	common	X
AACS-REQ-051		TLS	TLS version 1.2 and above is needed must be applied for communication between FRS and ACS in the system.	High	common	O

legend

type : common-initial requirements, derived-AACS requirements

implementation : X-won't do, O-will do

5. Quality Attribute

Quality attribute refers to the characteristic attributes of a product. Satisfying quality attributes can satisfy customers' requirements for quality.

Quality attributes were derived through customer requirements.

In addition, some Quality attributes were derived through threat analysis.

1. ID: Quality Attribute ID with AACS-QA-xxx
2. Properties : Types of quality attributes
3. Contents : Detailed description of quality attribute

5.1. Quality Attribute

ID	Properties	Contents
AACS-QA-001	Performance	The system must deliver video as close to real time as possible, especially in real-time mode.
AACS-QA-002	Authentication	The system must use two factor authentication for sign on and user credentials must be protected. Lost or compromised credentials must be handled in a reasonable way.
AACS-QA-003	Communication privacy	When in the desired mode the system must ensure that data sent to a user remains private while in transit. No intermediary should be able to snoop or spy on an ongoing video feed.
AACS-QA-004	Proof of identity (nonrepudiati	Users should be confident that the camera they are using is the one that they believe it is.

	on)	
AACS-QA-005	Multi-user privacy:	The system must ensure that multiple video feeds remain private between the intended users.
AACS-QA-006	reliability	The system must ensure that video is reliably delivered. The system should recover from networking errors as soon as possible. The goal is to maintain a secure, performant connection at all costs.
AACS-QA-007	Testing	Ensure the developed software is adequately tested.
AACS-QA-008	Availability	Conduct proper fault/error detection, recovery and reporting.
AACS-QA-009	Security	Ensure the developed software adheres to the company coding standard and quality standards.
AACS-QA-010	Security	Key management for system must be secure.