Software Requirements Specification

for

WatchDog

Prepared by Group 02

Software Requirement Engineering, section - C

American International University of Bangladesh

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1. Introduction

CCTV (Closed-Circuit Television) is a TV system in which signals are not publicly distributed but are monitored primarily for surveillance and security purposes. Closed-Circuit Television utilizes video cameras in surveillance of a particular area using a limited number of surveillance monitors. Almost all video cameras fit in the usage as the CCTV cameras, although the ones used must have high definition for accuracy in monitoring. But it is not enough to fight against crime because of failure to deter people from committing crimes in the first place. This proposal includes how we can use this CCTV more efficiently and solve this major problem to deter people from committing crimes in the first place.

1.1 Purpose

The purpose of this document is to build an CCTV system to detect crimes in real time to make it easy to prevent crimes. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external systems.

Document Conventions

Title	**Font Name**	**Font Size**
Heading1	Times New Roman	18
Heading2	Times New Roman	14
Content	Times New Roman	12

1.2 Intended Audience and Reading Suggestions

This project is a prototype for the CCTV system. This has been implemented under the guidance of MOHAMMAD SAMAWAT ULLAH, faculty, Cs department, AIUB to fulfil the requirements for the Software Requirement Engineering course, Fall 2018-19 semester. This project is useful for the CCTV system development team and as well as to the users.

1.3 Product Scope

This project will consist of how we can use this CCTV more efficiently and solve this major problem to deter people from committing crimes in the first place. The system will detect the crimes first and then the system will send automatically notification to the users. It will always collect the history of the crimes and new crimes will be always added in the database.

1.4 References

- IEEE. *IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications.* IEEE Computer Society, 1998.
- https://krazytech.com/projects
- ***Karl E. Wiegers***

2. Overall Description

2.1 Product Perspective

The CCTV system do the following things-

- **CCTV system can detect suspicious behaviors by itself:** The CCTV system can recognize any suspicious behaviors.
- **Send notification for any crime in real time:** Whenever any suspicious thing or any crimes committed, it will automatically send the message to the person who is monitoring the CCTV.
- **CCTV system can learn new crimes:** Users can set flag to an event as crime and cctv system can learn from that. It will send notification for this type of crime in future.
- **Track a person automatically:** The user can select a person and system will track the person automatically.
- **Categorized history:** The system will save the event in their respective categories.

2.2 Product Features

The major features of CCTV system as shown in below-

1. **Notification about crime in real time:** The CCTV system will detect crime and send notifications in real time.
2. **Track a person:** The user can select a person and the system will track that person automatically.
3. **Categorized history:** The system save the event in details in their respective categories.
4. **Video player:** There is a custom video player which has many useful tools. Like zooming in, zooming out, slow frame change, fast frame change.
5. **360° view :** The system can construct 360° view of an event, so users can see in depth.
6. **Learn new crime:** The system can learn new crimes as new crimes happens. After learning about a new crime the system will give notification if this type of crime happen.
7. **Protective area:** The user can make an area protected and the system will give notification whenever a person enters that area.
8. **Notification via sms:** The system can send notification via sms.

2.3 User Classes and Characteristics

- The admin officers.
- The guards.
- The owner of the organization.
- Behavior analyst.
- IT officer .

2.4 Operating Environment

Operating environment for the CCTV system is as listed below.

- Distributed database
- Operating system: Windows.
- Database: sql+ database
- Platform: c#.net/Java

2.5 Design and Implementation Constraints

- The detection of an event should be fast enough.
- SQL commands for above queries/applications.
- Implement the database at least using a centralized database management system.

2.6 User Documentation

- User manual.
- Online help center. ● Help forum.

2.7 Assumptions and Dependencies

- The system is dependent on the quality of CCTV cameras, because we assumed that their quality will be at least standard.
- The system needs data from the user for working decently and we assumed that users will give it to the system.

3. External Interface Requirements

3.1 User Interfaces

- Front-end software: C#.net version
- *Back-end software: SQL+*

3.2 Proposed UI

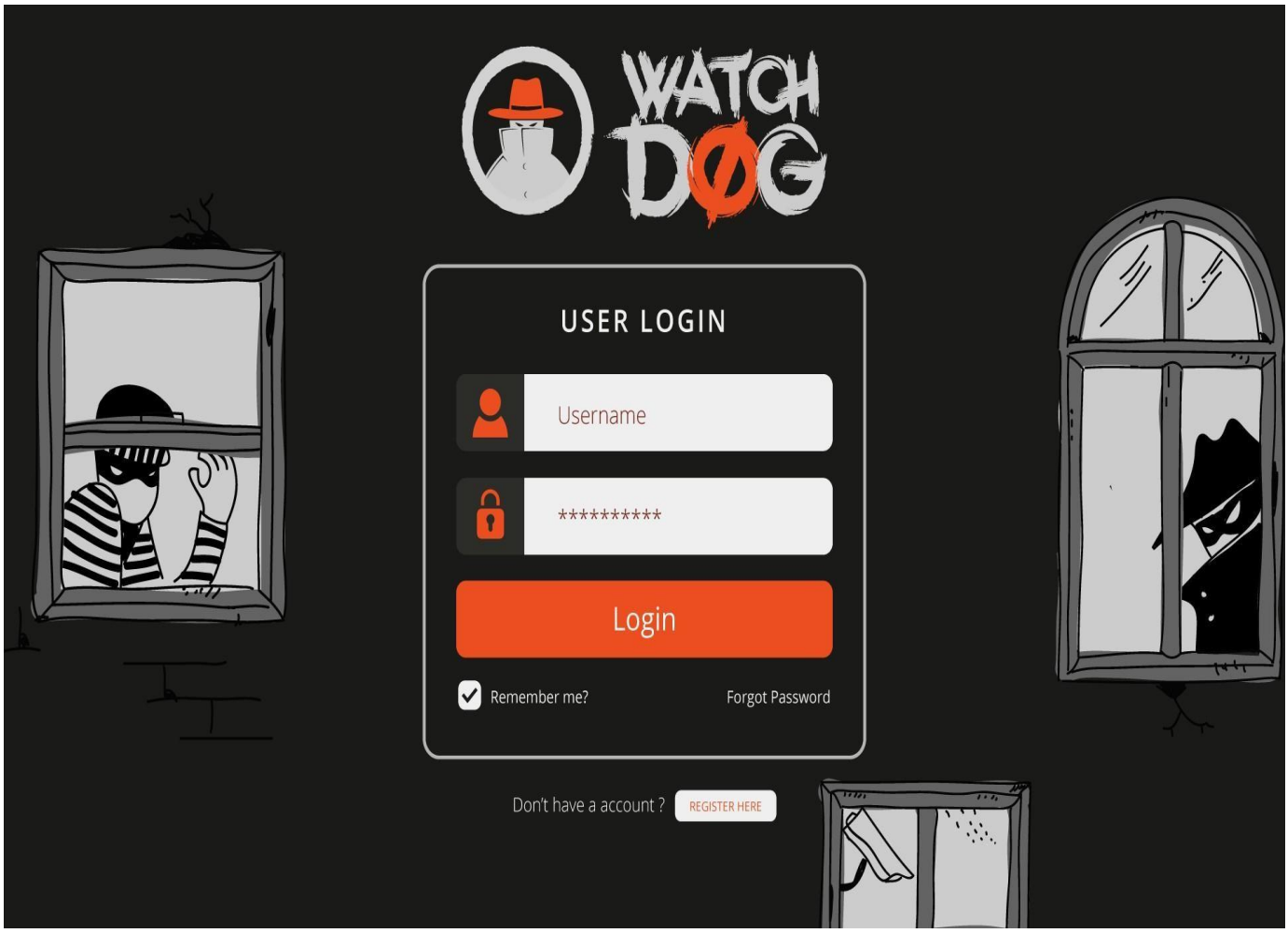


Fig: Login Page

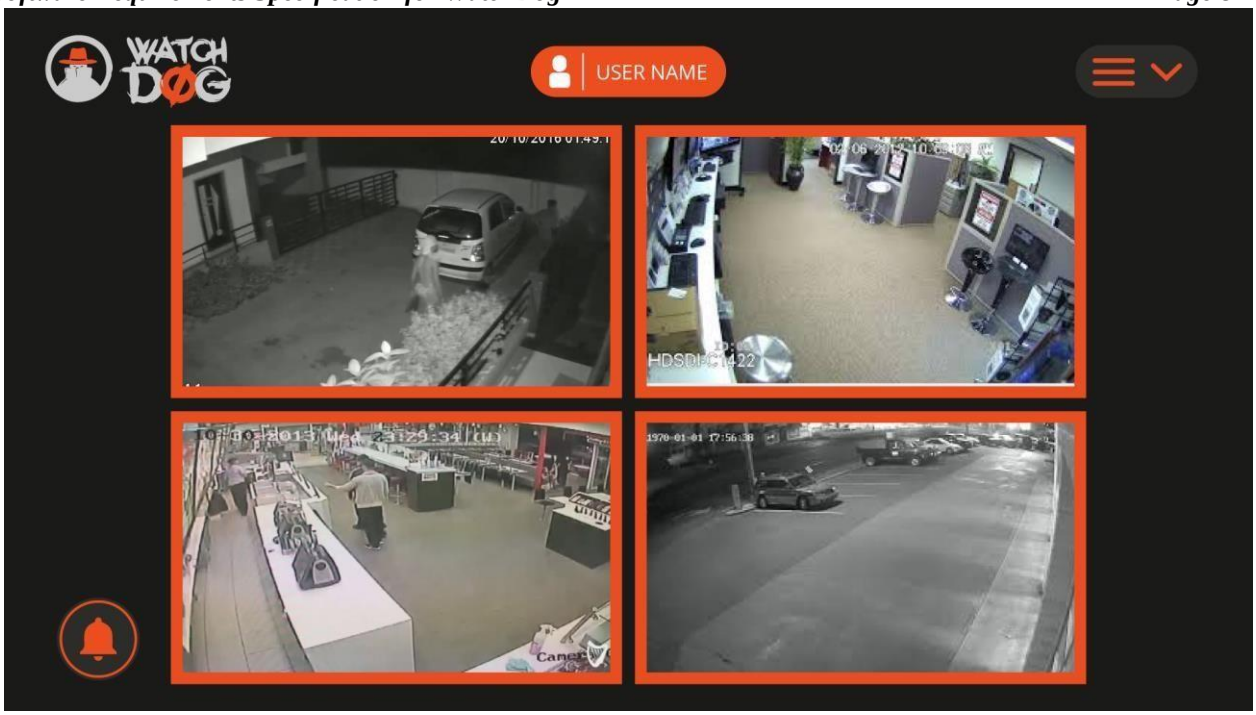


Fig: Dashboard 1

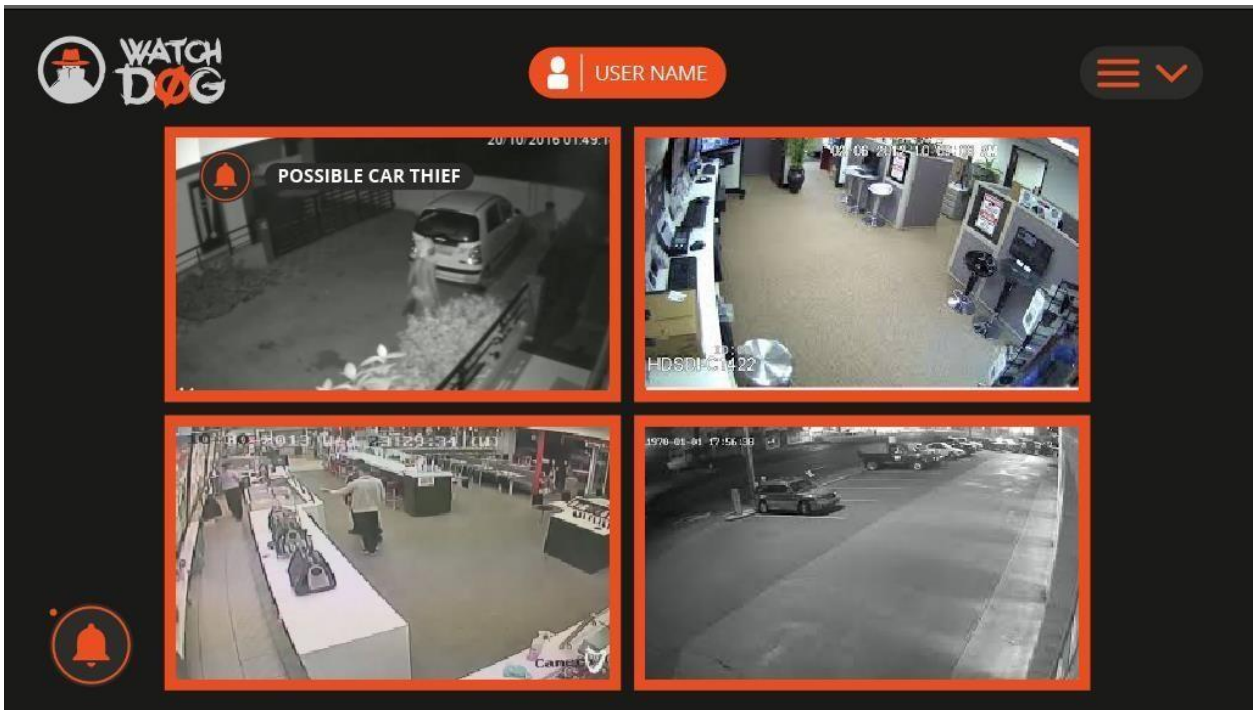


Fig: Dashboard 2

3.3 Hardware Interfaces

- Network switch and cables.
- Switch for alarm in every zone.

3.4 Software Interfaces

Following are the software used for the CCTV system.

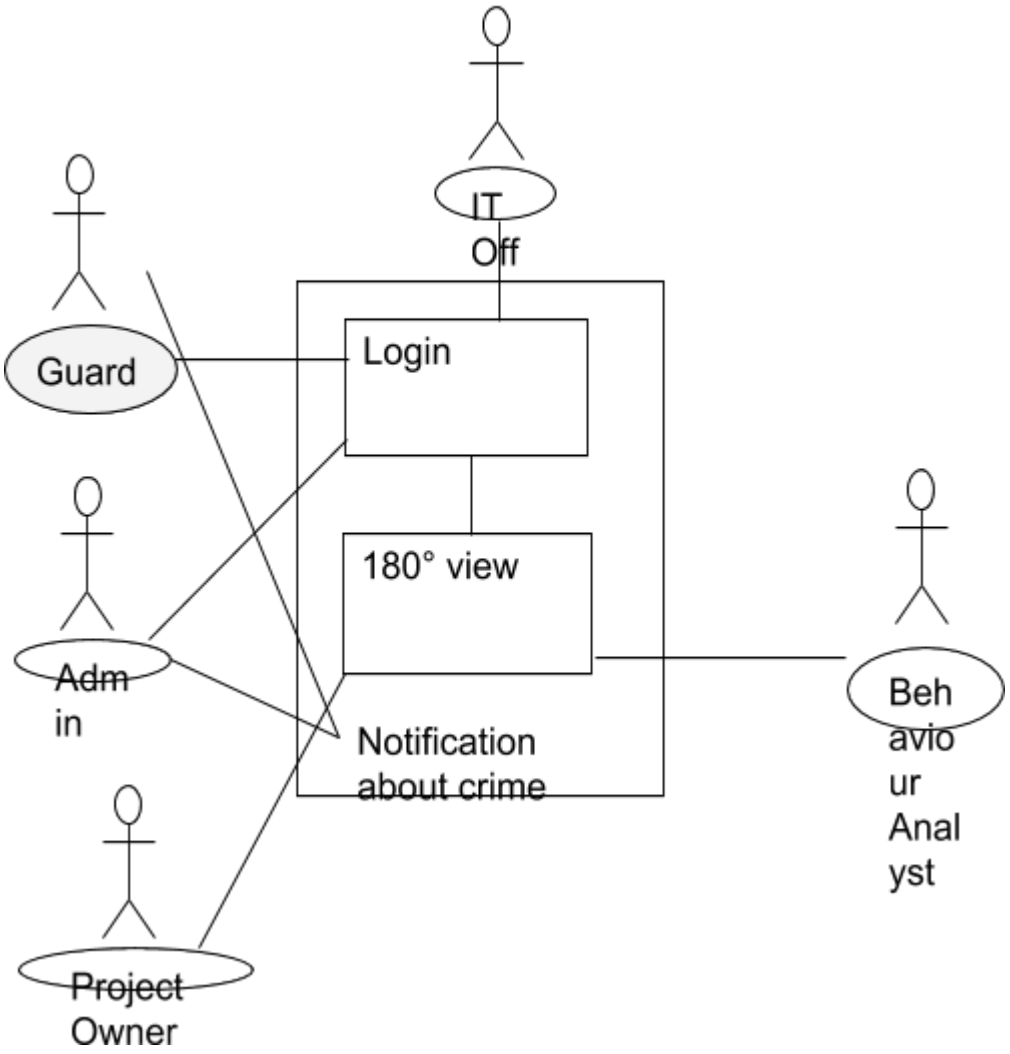
Software used	Description
Operating system	We have chosen Windows operating system for its best
Database	To save the event records. we have chosen SQL+ support and user-friendliness.
C#.Net language	database . To implement the project we have chosen C#.Net for its more support and user friendliness.

4. System Features

The major features are already written in section 2.2. Here are some use cases of the system.

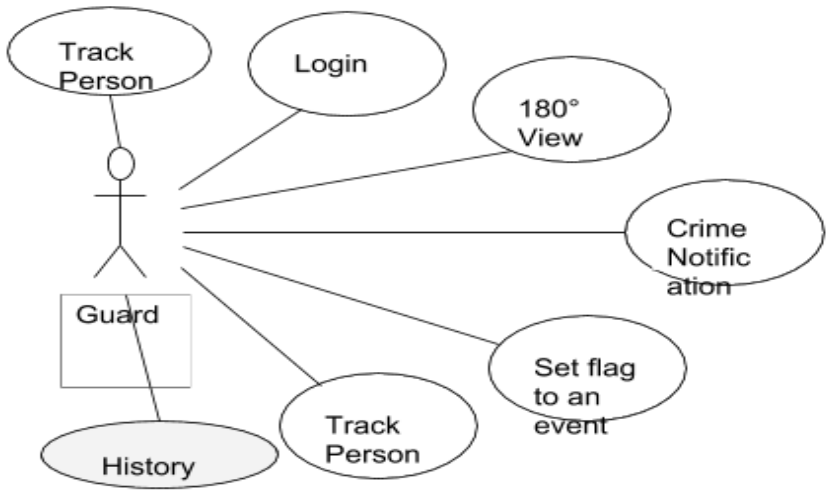
4.0 Overall Description

4.1 System Environment



4.2 Functional requirements Specifications

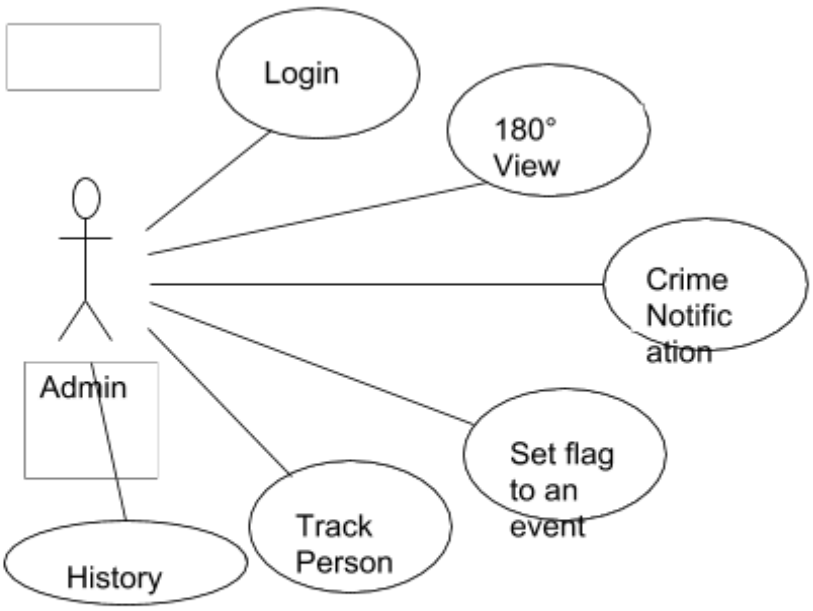
4.2.1 Guard Use Case:



Initial Step-By-Step Description:

1. The guard can login into the system.
2. The guard can see the 180° view of the footage.
3. The guard will get the notifications about the crimes.
4. The guard can set flag to an event.
5. The guard can track the person.
6. The guard can see the previous crime histories.

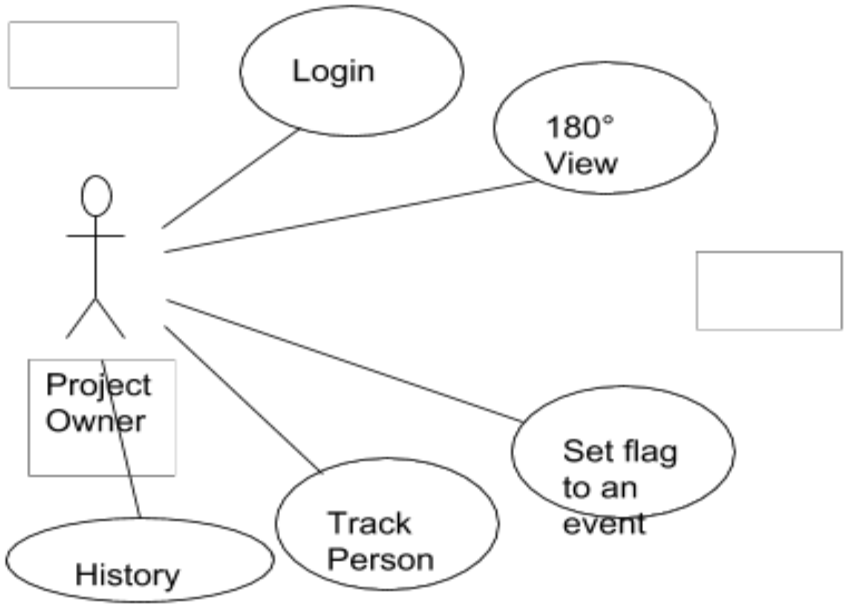
4.2.2 Admin Use Case:



Initial Step-By-Step Description:

1. The admin can login into the system.
2. The admin can see the 180° view of the footage.
3. The admin will get the notifications about the crimes.
4. The admin can set flag to an event.
5. The admin can track the person.
6. The admin can see the previous crime histories.

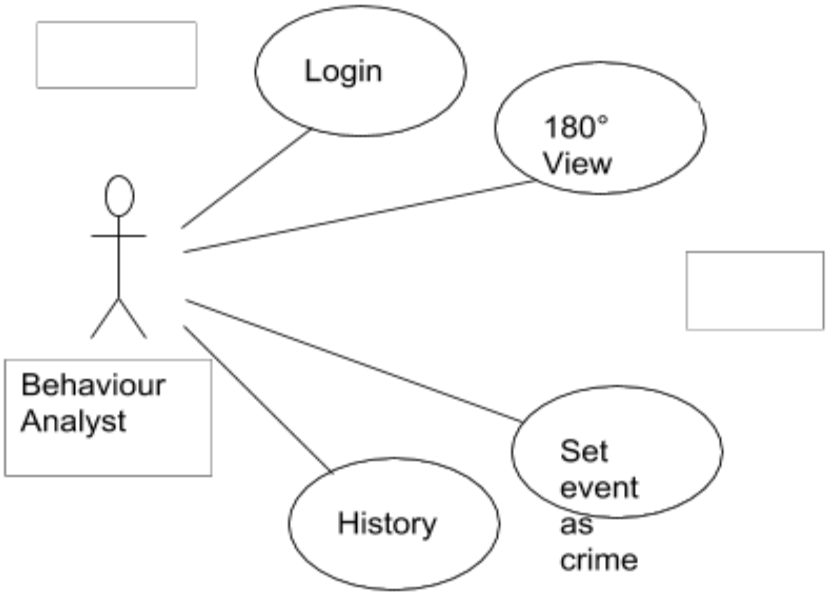
4.2.3 Project Owner Use Case:



Initial Step-By-Step Description:

1. The project owner can login into the system.
2. The project owner can see the 180° view of the footage.
3. The project owner can set flag to an event.
4. The project owner can track the person.
5. The project owner can see the previous crime histories.

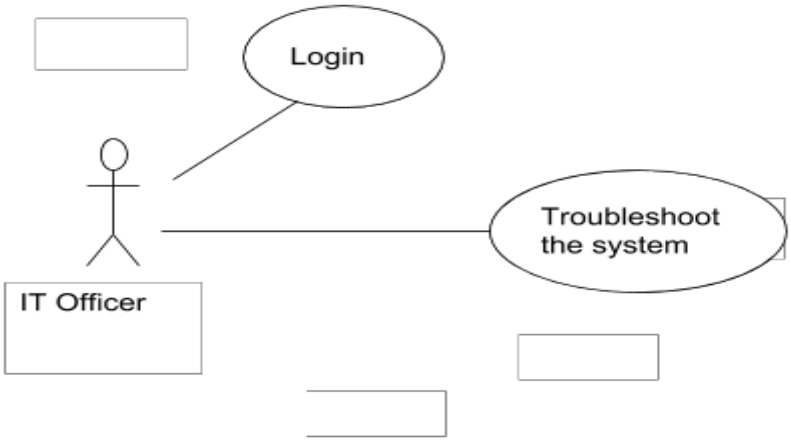
4.2.4 Behavior Analyst Use Case:



Initial Step-By-Step Description:

1. The behavior analyst can login into the system.
2. The behavior analyst can see the 180° view of the footage.
3. The behavior analyst can set event as crime.
4. The behavior analyst can see the previous crime histories.

4.2.5 IT Officer Use Case:



Initial Step-By-Step Description:

1. The IT Officer can login into the system.
2. The IT Officer can troubleshoot the system.

4.3 User Story:

SL	As a/an	I want to	So that	Acceptance criteria
1	Admin officer	Log in	I can use the system	Display admin dashboard
2	Admin officer	Get notified via sms	I can know a crime is happening	Send notification via sms
3	Admin officer	Track employees	I can know what he/she is doing	Set a tag to employee and change camera accordingly
4	Admin officer	Set a flag to any event as crime	The system gives me notification in future	Show interface for set a event as a crime
5	Admin officer	See the history	I can know about all the crimes already happened	Display history dashboard
6	Admin officer	Track suspicious person's movement	I can decide what that person is doing	Set a tag and change camera accordingly
7	Admin officer	Make some area over protected	The system gives me notification when any person is in that area	Set area as over protected
8	Admin officer	Zooming in and out in video player	I can see what happened clearly	Tools for zooming in and out the video player
9	Admin officer	Make a video slow and fast	I can see what happened clearly	Tools for time control in the video player
10	Admin officer	See the 360° view of an area	I can see in details	Construct and display 360° view of an area
11	Guard	Login	I can use the system	Display guard dashboard
12	guard	Report an event	Admin officer can decide whether it's a crime or not	Interface to report a crime
13	Guard	Track suspicious person	I can know what he/she is doing	Set a tag and change camera accordingly

14	Guard	See the history	I can know about all the crimes already happened	Display history dashboard
15	Guard	See the 360° view of an area	I can see in details	Construct and display 360° view of an area
16	Guard	Control the movement of cameras	I can see all around	Interface to control movement
17	Guard	Zoom in and zoom out from the cameras	I can identify suspicious face correctly	Interface for zoom in and out
18	IT officer	Log in	I can use the system	Display Dashboard
19	IT officer	Maintain the system	I can troubleshoot the system	Have full access
20	IT officer	Technical support	The system can be used without any problem	Have access to all the tools
21	Product Owner	Log in	I can use the system	Display admin dashboard
22	Product Owner	Get notified via sms	I can know a crime is happening	Send notification via sms
23	Product Owner	Track employes	I can know what he/she is doing	Set a tag to employee and change camera accordingly
24	Product Owner	Set a flag to any event as crime	The system gives me notification in future	Show interface for set a event as a crime
25	Product Owner	See the history	I can know about all the crimes already happened	Display history dashboard
26	Product Owner	Track suspicious person's movement	I can decide what that person is doing	Set a tag and change camera accordingly
27	Product Owner	Make some area over protected	The system gives me notification when any person is in that area	Set area as over protected
28	Product Owner	System to detect my employees	I can know the identity of a person	Set tag for all the employees
29	Product Owner	Zooming in and out in video player	I can see what happened clearly	Tools for zooming in and out the video player
30	Product Owner	Make a video slow and fast	I can see what happened clearly	Tools for time control in the video player

SL	As a/an	I want to	So that	Acceptance criteria
31	Product Owner	See the 360° view of an area	I can see in details	Construct and display 360° view of an area
32	Behavior Analyst	Log In	I can use the system	Display Analyst dashboard
33	Behavior Analyst	See the flagged events	I can decide what is it	Show all the flagged event
34	Behavior Analyst	See all camera footage related to flagged events	I can decide the nature of a particular event	Display all the footage available for a flagged events
35	Behavior Analyst	Set a flagged event as crime	The system can give notification in the future for that event	Save the flagged events as crime
36	Behavior Analyst	Set a flagged events as a normal event	The system will not give notification in the future for that event	Discard the flagged event
37	Behavior Analyst	Play a camera footage	I can see what happened	Display video player
38	Behavior Analyst	Zoom in and out in video player	I can see what happened	Tools for zooming in the video player
39	Behavior Analyst	Make a video slow and fast	I can see what happened	Tools for time control in the video player
40	Behavior Analyst	See the 360 view of an area	I can see in details	Construct and display 360 view of an area

5. Other Non-functional Requirements

5.1 Performance Requirements

I. The system shall not take more than 5 seconds to the time required to perform an action if the system is detecting a crime. For an example, if it takes 30 seconds to detect a crime or suspicious behavior, it will take no longer than 5 seconds for sending the notifications through the system.
II. The system shall deliver command signals to a CCTV camera within seconds of the signal being generated.

5.2 Safety Requirements

I. **Backup power:** The system will have a backup power supply that will provide power to the system for a minimum of 2 hours in the event of a power failure.
II. **Test and maintain cameras and alarms:** Test and maintain CCTV cameras and various alarms at least once a month, or follow the manufacturer's instructions. Replace any camera or parts of the system if found faulty.
III. **Manual switch:** Alarms will have manual activation controls in each zone.

5.3 Security Requirements

I. Software shall not be accessible from external networks. II. Hardware shall be secure from external tampering.

5.4 Software Quality Attributes

I. **Mean Time Between Failures:** The WD shall not fail on average more than 20% per week.
II. **System Availability:** The system shall be available 99% of the time unless previously announced for scheduled maintenance or backup.

III. **System Reset:** The system shall provide the ability to reset all settings to the default or a saved configuration.

IV. **Developer Access:** The system administrator shall be able to grant developer privileges to users.

V. **Interface is accessible from more than one convenient device:** This includes all of the guard's device, admin officer's device etc. If the system interface is not readily accessible, then it will not be as easy to control and will offer little convenience.

VI. **System restore:** The system shall provide the ability to restore all settings and data from the database in case of system failure.

5.5 Business rules

ID	**Rule definition**	**Type**	**Static or Dynamic**	
Flag-1	Only admin officers can flag an event as crime.	Constraint	Static	Administrative policy
Flag-2	Only behavior analysts can set an event as crime	Constraint	Static	Company policy
Protective area-1	Whenever someone is in any protective area the system shall send a notification	Action Enablers	Dynamic	Administrative policy
				Source

6. Other Requirements

6.1 Legal requirements

I. **Provides Evidence for Court Proceedings:** To enable prosecution to take place, there must be evidence of wrongdoing. CCTV should provide this evidence if necessary. II. **CCTV sign:** A sign should be hanged in every zone of CCTV surveillance system. III. **ICT rules:** All the rules and regulations of ICT ministry should be maintained.

Appendix A: Glossary

Term	**Full Form**
CCTV	Closed-Circuit Television
DB	Database
WD	Watchdog