Software Requirements Specification (SRS) Document

Mosquito Corridor Identification and Visualization.

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Brief problem statement

Software system to establish and visualize paths frequented by mosquitos in IIIT-H campus and thus avoid potential environmental hazards and wastage of resources due to their rampant usage all over the area. The system, using an established map, would help in determining effective eradication methods and alert users whenever they approach a populated area.

System requirements

Users require a browser capable of running JavaScript, handling HTML5 and CSS animations, and an internet connection.

Developers require:

1. MERN Technology Stack(MongoDB, Express js, React ,Node js)

2. React Native

3. Open Layers library

Users profile

Our system primarily has three types of users.

1. **Admin:** They mainly constitute the development team who have access to the data from the micro sensors, store records of mosquito paths. Hence, their access is protected via authentication.
2. **Monitors:** These users (whose access is protected via authentication) are allowed to view the corridor paths on the map. In addition to this, they are also provided with location, proper eradication technique to facilitate them in eliminating such corridor paths.
3. **Public:** These users utilize a mobile app which allows them to send a distress message indicating a mosquito outbreak in their area. Furthermore, users receive a notification
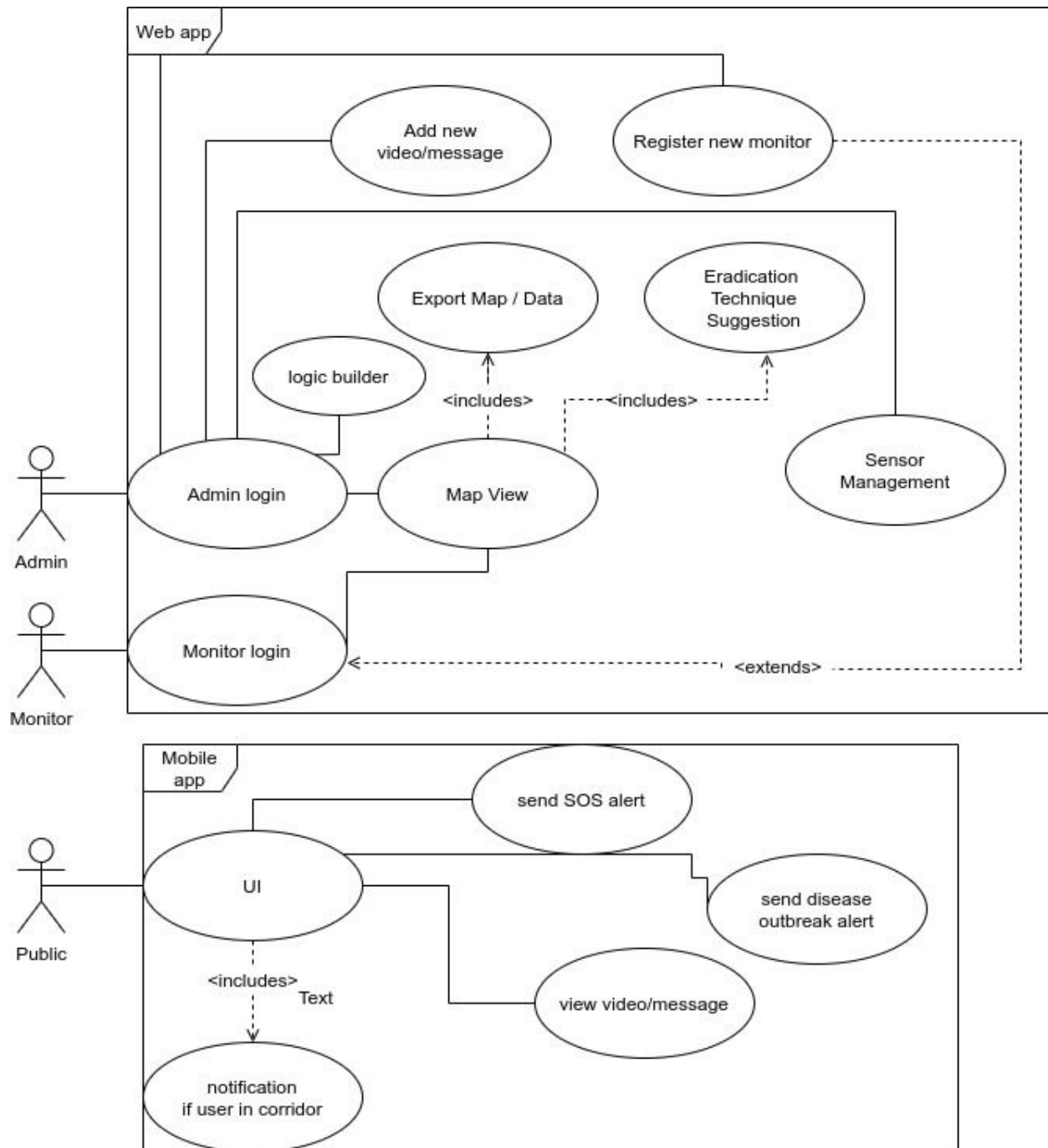
whenever they arrive in the vicinity of a mosquito corridor path. Users' location access is required at all times by the app. This location access of various users is utilized by the system as a parameter in identifying possible mosquito corridor paths. The users are also provided with a targeted video and tip to educate them on eradication techniques without using chemicals.

Feature requirements (described using use cases)

No.	User Case Name	Description	Release
1	Login/Logout	Users can login and logout of their own accounts.	R1
2	Map View	Users can view the mosquito corridors on the map.	R1
3	Sensor management	User can or deactivate the sensors add/remove based on the requirements.	R2
4	Export data	User can export the data collected from micro sensors.	R2
5	Export Map	User can obtain a map of the mosquito corridor of anytime.	R2
6	Eradication technique	User is suggested an eradication technique and given a location for each corridor	R2
7	Distress message	Users can ping the server in case of mosquito outbreak.	R1
8	Sending notification	User receives a notification when they are in the vicinity of a mosquito corridor.	R2
9	Register new monitor	User should be able to new monitor to the database.	R2
10	Display targeted Video	User is shown a targeted video, picked from a database, on the mobile app. The videos are about mosquito eradication techniques and education of users.	R2

11	Display targeted message	User of the mobile app is sent a targeted message.	R2
12	Add new video	User is allowed to add a new video via URL to the database from which one is picked and sent to a mobile app.	R2
13	Add new message	User is allowed to add a new text message to a pre-existing set of messages out of which one is picked and sent to the mobile app user.	R2
14	Logic Builder	User can change the bounds of the parameters to incorporate in the logic	R2
15	Disease prone area specification	User can report if the area is a specific disease prone area.	R1

Use case diagram

Web app

- Add new video/message
- Register new monitor
- Export Map / Data
- Eradication Technique Suggestion
- logic builder
- Admin login
- Map View
- Sensor Management
- Monitor login

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Admin

Monitor

Mobile app

- send SOS alert
- UI
- send disease outbreak alert
- view video/message
- notification if user in corridor

<includes>
Text

Public

Use case description

Use Case Number:	UC-1
Use Case Name:	Login/Logout
Overview:	Users can login and logout of their own accounts.
Actors:	1. Admin 2. Monitor
Pre condition:	None
Flow:	Main (success) Flow: 1. Create database holding users. 2. Store user details securely. 3. Front end support for accepting details and beginning session.
	Alternate Flows: Display appropriate error messages.
Post Condition:	User's session is now active and can be used to make changes in the user's stead.

Use Case Number:	UC-2
Use Case Name:	Map view.
Overview:	Admin and Monitor can view the mosquito corridors on the map.
Actors:	1. Admin 2. Monitor
Pre condition:	Have to be logged in as either Admin or Monitor.
Flow:	Main (success) Flow: 1. Contains the most probable path of possible mosquito corridors. 2. When clicked on the path, a message pops up giving the best eradication method for that particular path.
Post Condition:	User can either review other paths or redirect himself to any accessible pages.

Use Case Number:	UC-3
Use Case Name:	Distress message
Overview:	Users can ping the server in case of mosquito outbreak.
Actors:	1. Monitor

	2. Public
Pre condition:	User must have an active session. In case of mosquito outbreak, user can ping the server.
Flow:	Main (success) Flow: 1. Server gets the location of pinged user. 2. Location of users is used as a parameter in mosquito corridor path drawing.
	Alternate Flows: Displays appropriate error messages, if the server gets continuously pinged from same user
Post Condition:	User is not allowed to ping the server for the next hour to control traffic.

Use Case Number:	UC-4
Use Case Name:	Sending Notification.
Overview:	Users get notified through the app if they are close to the mosquito corridors or in the path connecting the corridors
Actors:	Users
Pre condition:	User must be sharing his location continuously.
Flow:	Main (success) Flow: 1. The mosquito corridors and the paths will be stored in suitable data structures.

	2.When the path of corridors are crossed with the users , the server alerts him being at a mosquito prone area.
	Alternate Flows: Each user gets notified only once in an hour as there might be multiple reasons for the user to stay in that particular region.
Post Condition:	*User's session is not accessible for the next hour to control traffic.*

Use Case Number:	*UC-5*
Use Case Name:	*Eradication Technique.*
Overview:	*Whenever any path connecting the corridors are selected then, the pop up shows an eradication technique suitable to that environment.*
Actors:	*Monitor, Admin.*
Pre condition:	*Have to be logged in as either Admin or Monitor.*
Flow:	*Main (success) Flow:* *1.Considering CO_2 levels, temperature, humidity and population density as parameters, an algorithm is used to choose an appropriate eradication technique.*
	Alternate Flows: If the values from the sensors are deviating from the expected values then an extreme method of eradication is suggested.

Post Condition:	*Users can give feedback after seeing the eradication method for quality purposes.*

Use Case Number:	*UC-6*
Use Case Name:	*Sensor management.*
Overview:	*Drastic deviations from the expected values*
Actors:	*Admin.*
Pre condition:	*Have to be logged in as Admin.*
Flow:	*Main (success) Flow:* *1.Considering CO2 levels, temperature, humidity and population density as parameters, an algorithm is used to choose an appropriate eradication technique.*
	Alternate Flows: If the values from the sensors are deviating from the expected values then a general method of eradication is suggested.
Post Condition:	*Users can give feedback after seeing the eradication method for quality purposes.*

Use Case Number:	*UC-7*
Use Case Name:	*Export Data*
Overview:	*User can export the data of sensors, mosquito paths in csv file format which can be useful for analysing the conditions of mosquito corridors.*
Actors:	*Admin, Monitors.*
Pre condition:	*Have to be logged in as Admin or Monitor.*
Flow:	*Main (success) Flow:* *1.Data from sensors are stored in database, which can be used to determine mosquito paths.* *2.Data is retrieved in order of oldest to newest*
	Alternate Flows:Display appropriate error messages.
Post Condition:	*Users can analyse the data exported or redirect himself to any accessible pages.*

Use Case Number:	*UC-8*
Use Case Name:	*Export Map*
Overview:	*User can export the map of mosquito corridor anytime*
Actors:	*Admin, Monitor.*
Pre condition:	*Have to be logged in as Admin or Monitor.*
Flow:	*Main (success) Flow:* *1.Data from sensors are stored in database, which can be used to determine mosquito paths.* *2.Determined mosquito paths are visualized on map, which can be exported.*
	Alternate Flows:Display appropriate error messages.
Post Condition:	*Users can analyse the Map exported to understand the path of mosquito corridors or redirect himself to any accessible pages.*

Use Case Number:	*UC-9*
Use Case Name:	*Register new Monitor.*
Overview:	*Admin will have a separate page to register a new trusted monitor.*
Actors:	*Admin.*
Pre condition:	*Have to be logged in as Admin.And the admin have to verify whether the monitor can be trusted or not.*
Flow:	*Main (success) Flow:* *1.The email which is used for verification is used as the username.*
	Alternate Flows:If existing email is given for registration alert is popped up for the admin.
Post Condition:	*The added Monitor should be active on all times to be able to deploy the drone for eradication of the corridors.*

Use Case Number:	*UC-10*
Use Case Name:	*Display targeted video*
Overview:	User is shown a targeted video, picked from a database, on the mobile app. The videos are about mosquito eradication techniques and education of users.
Actors:	*Public*
Pre condition:	*User must request for a video by clicking the respective button*
Flow:	*Main (success) Flow:* 1. *User is redirected to the link of the video.*
Post Condition:	*Users are educated with knowledge of how to control/reduce the population of mosquitoes.*

Use Case Number:	*UC-11*
Use Case Name:	*Display targeted message*
Overview:	User of the mobile app is sent a targeted message.
Actors:	*Public*
Pre condition:	*User must request for a tip by clicking the respective button.(**Tip of the day**)*

Flow:	*Main (success) Flow:* 1. *User is shown a targeted message*
Post Condition:	*Users are educated with knowledge of how to control/reduce the population of mosquitoes.*

Use Case Number:	*UC-12*
Use Case Name:	*Add new video*
Overview:	User is allowed to add a new video via URL to the database from which one is picked and sent to a mobile app.
Actors:	*Admin*
Pre condition:	*Have to be logged in as Admin*
Flow:	*Main (success) Flow:* 1. *Admin enters the link in the box provided.*
	Alternate Flows: *Display appropriate error messages if the link already exists in the database or if the link is broken.*
Post Condition:	*The link is stored in the database from which a random a link is sent to the public for educational purposes.*

Use Case Number:	*UC-13*
Use Case Name:	*Add new message*
Overview:	User is allowed to add a new text message to a pre-existing set of messages out of which one is picked and sent to the mobile app user..
Actors:	*Admin*
Pre condition:	*Have to be logged in as Admin*
Flow:	*Main (success) Flow:* 1. *Admin enters a tip in the box provided.*
	Alternate Flows: *Display appropriate error messages if the tip is beyond a certain limit.*
Post Condition:	*The tip is stored in the database from which a random a tip is sent to the public for educational purposes.*

Use Case Number:	UC-14
Use Case Name:	Logic Builder
Overview:	User is given the privilege to change the logic of the algorithm for corridor detection.
Actors:	Admin
Pre condition:	Have to be logged in as Admin
Flow:	Main (success) Flow: A separate page is allocated for the logic builder from which they can change ranges of the parameters(Temperature, Humidity,Wind speeds.)
	Alternate Flows: Trash values will be detected and an alert is popped up.
Post Condition:	The values are taken to incorporate into the logic.

Use Case Number:	*UC-15*
Use Case Name:	Disease prone area specification
Overview:	User can report if the area is a specific disease prone area.
Actors:	*Public*
Pre condition:	*NA*
Flow:	*Main (success) Flow:* *The app has buttons for the Public_User to report the type of disease in the area.*
Post Condition	*An entry is added in the Admin's view stating the disease and location.*