



# FINAL REPORT

ES115-DESIGN, INNOVATION  
AND PROTOTYPING Group-23, TECHSPARKS

# NEED STATEMENT

To design a tool/device to navigate through manholes and tunnels for efficient mosquito repellent spraying, providing a safer and more effective alternative to manual fogging.

# DESIGN OPPORTUNITIES

## FOGGING MECHANISM ENHANCEMENT

Explore improvements in the fogging system for more efficient mosquito control in varied environmental conditions, benefiting residential neighborhoods and housing societies..

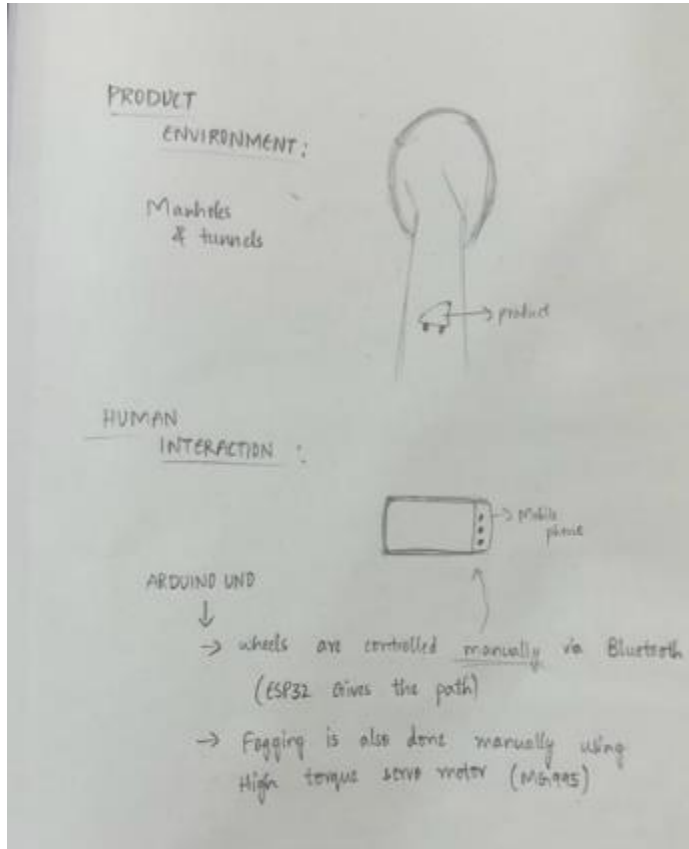
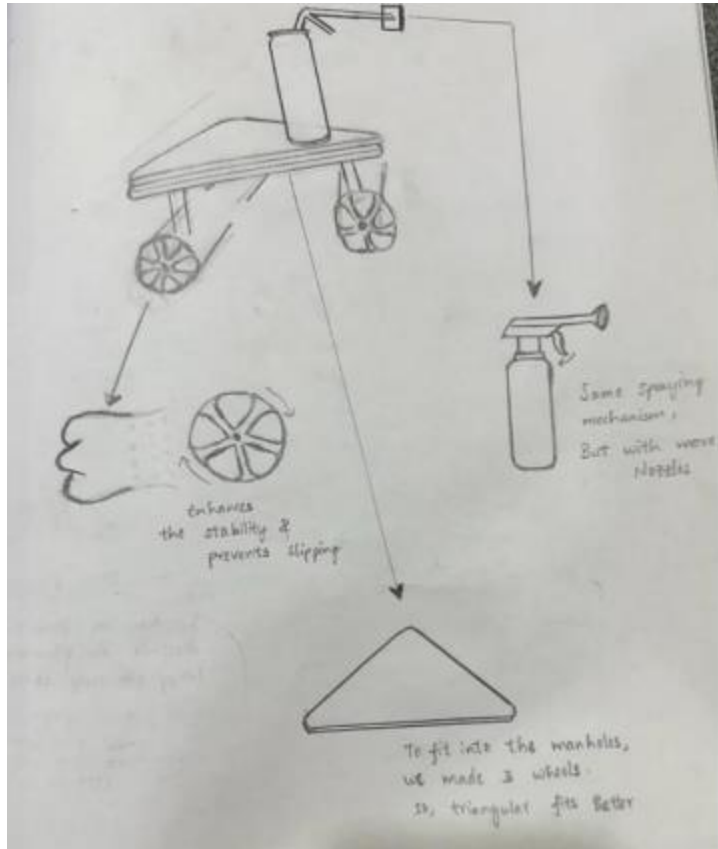
## ADAPTABILITY TO MANHOLE DIMENSIONS

Modify design for adaptability to various manhole sizes, ensuring versatility across different environments.

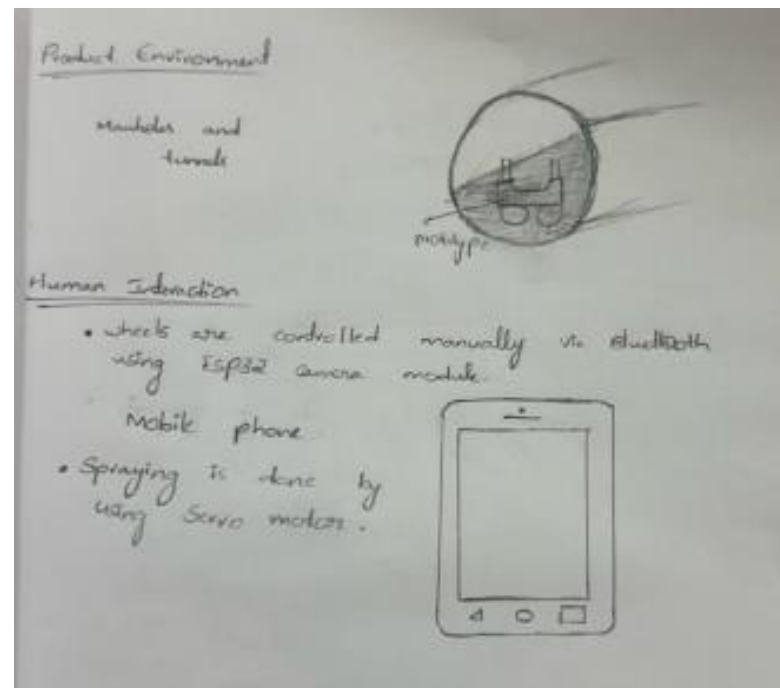
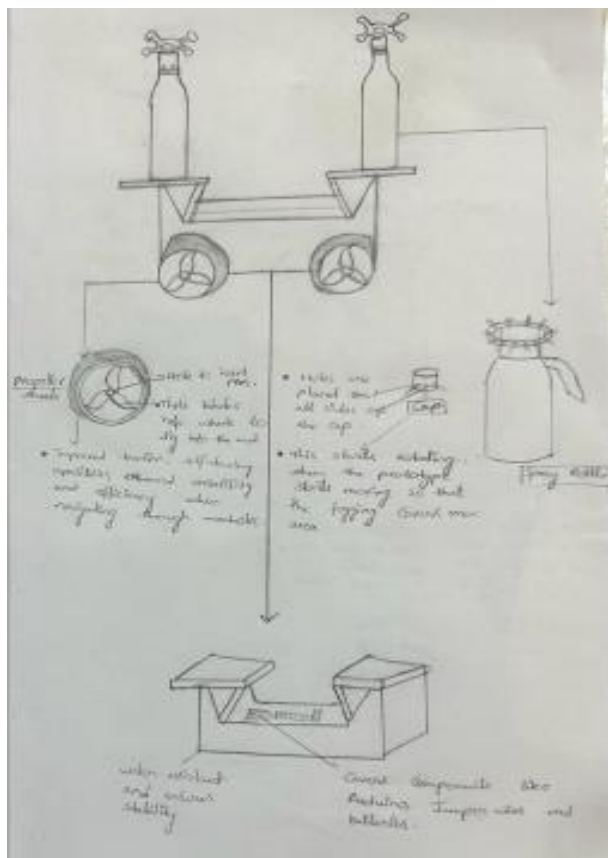
## IMPROVED WHEEL MOVEMENT

Explore advanced wheel designs for enhanced maneuverability in sluggish areas and water without prescribing specific solutions.

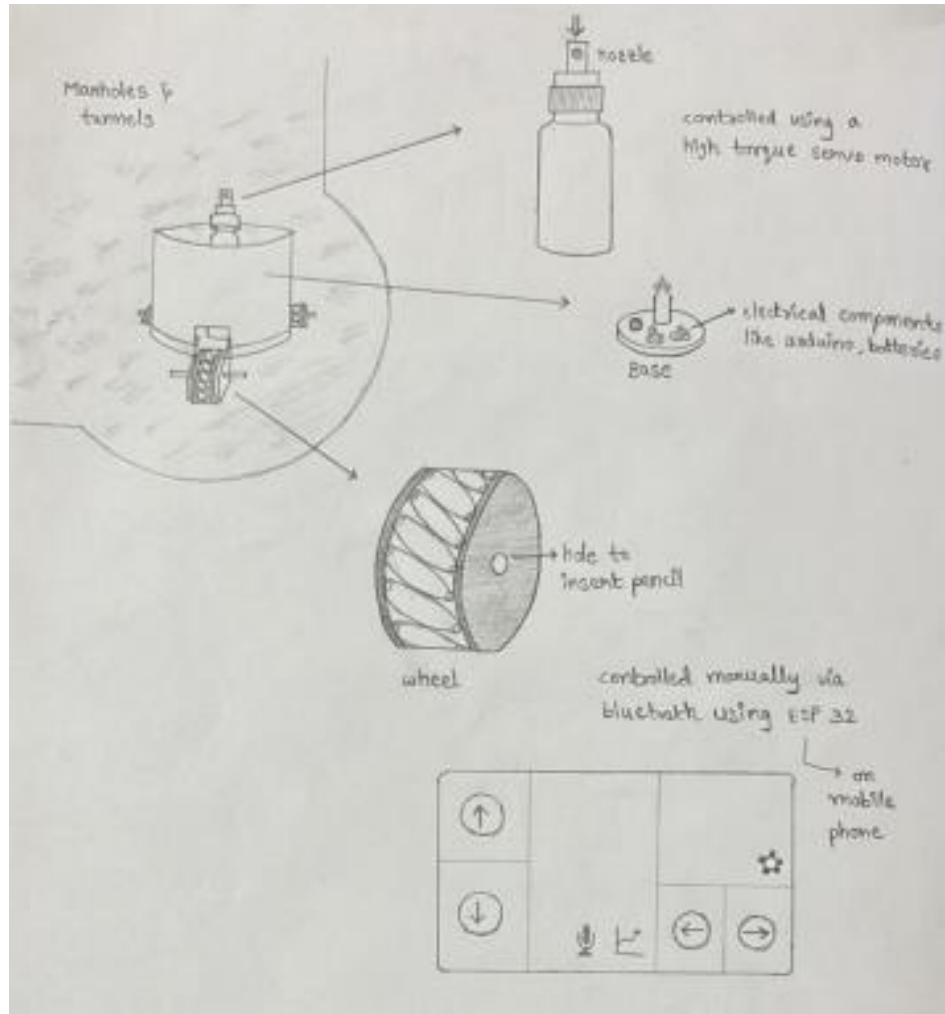
# SKETCHES AND MOCK-UP 1

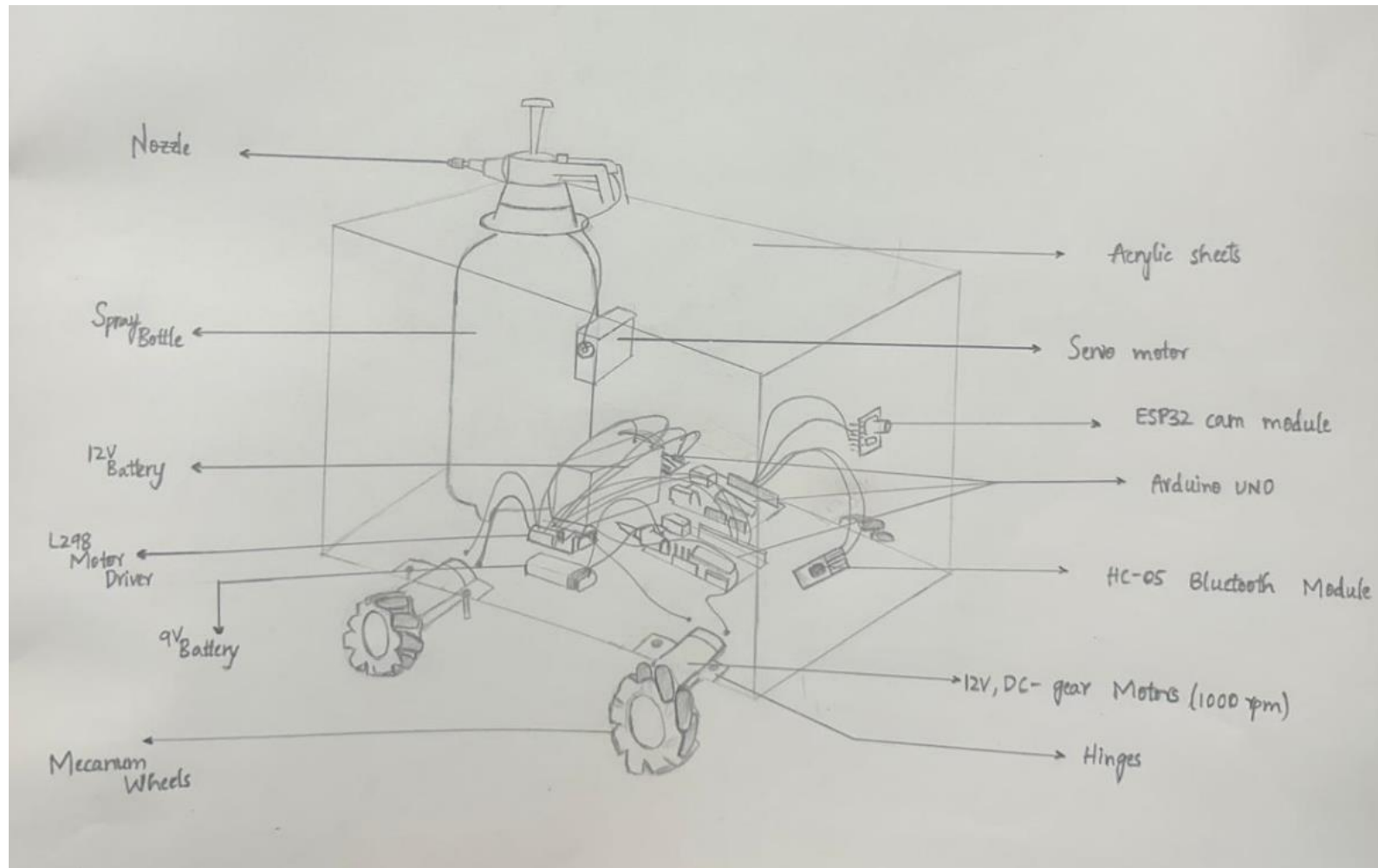


## SKETCHES AND MOCK-UP 2



# SKETCHES AND MOCK-UP 3





# SKETCH OF THE FINAL PROTOTYPE

# How are design opportunities addressed ??

## FOGGING MECHANISM ENHANCEMENT

To enhance the fogging mechanism, to maximize spraying and to ensure that the spray disperses in all directions effectively, we used a hollow cone nozzle.

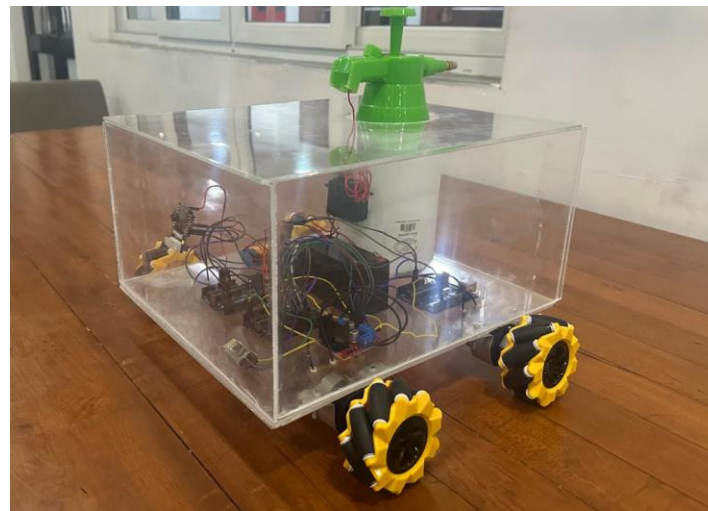
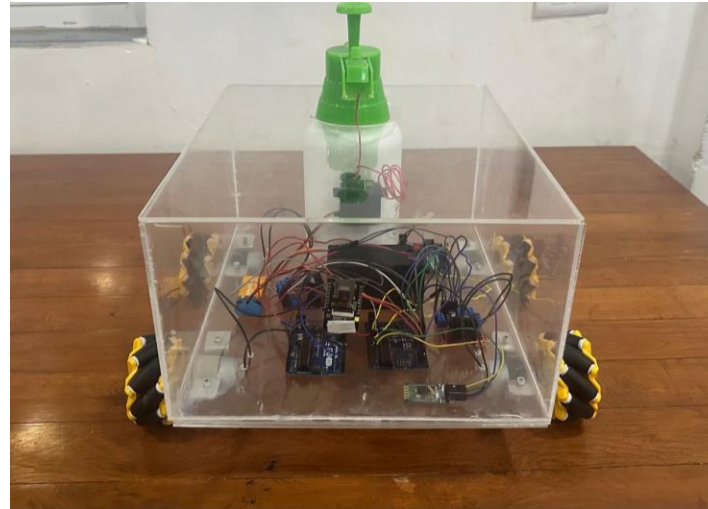
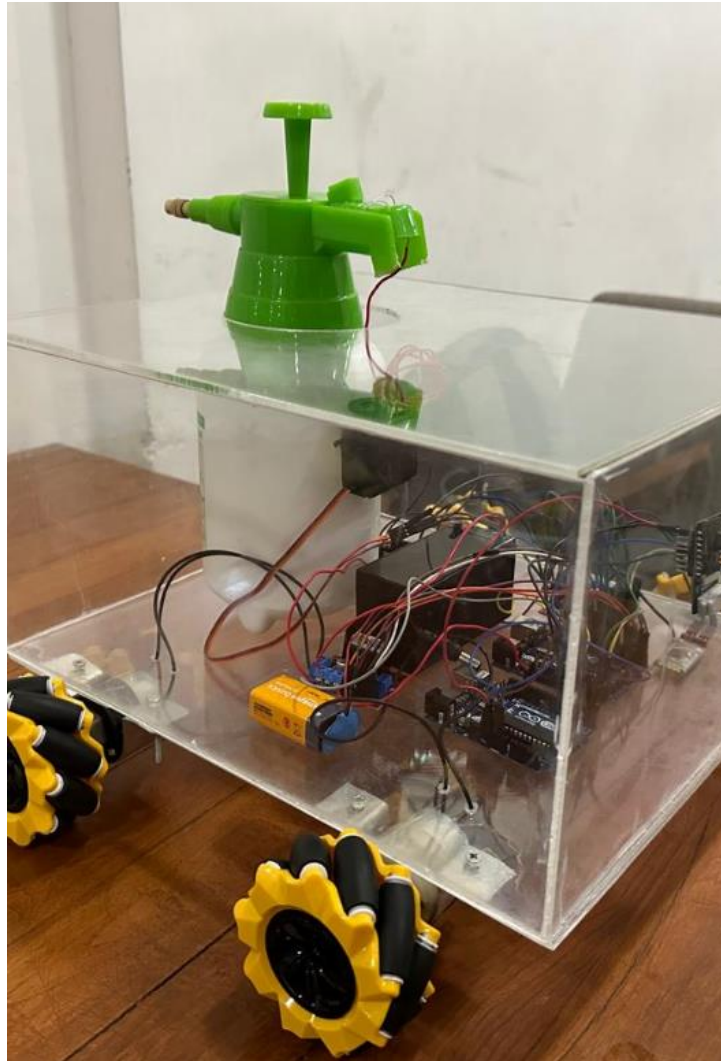
## ADAPTABILITY TO MANHOLE DIMENSIONS

30cm is the dimension of our prototype to fit in all the components and move easily inside manhole, as the average dimension of a manhole is 60cm approximately. Closed prototype to make sure the electrical components stay water resistant.

## IMPROVED WHEEL MOVEMENT

We preferred using mecanum wheels so that the prototype can easily move in all directions, although the manholes are sluggish areas.





**Final  
prototype**

# LEARNINGS

## Learnings from the course

- ❖ Understanding the iterative nature of design process including ideation, prototyping, testing and refining.
- ❖ Developing practical experience using various techniques such as 3d printing, laser cutting, woodworking and metal working. Improving skills in CAD(Computer- Aided- Design) software for creating digital prototype.
- ❖ Realising the value of user feedback, feasibility analysis and market research in turning concepts into successful products.

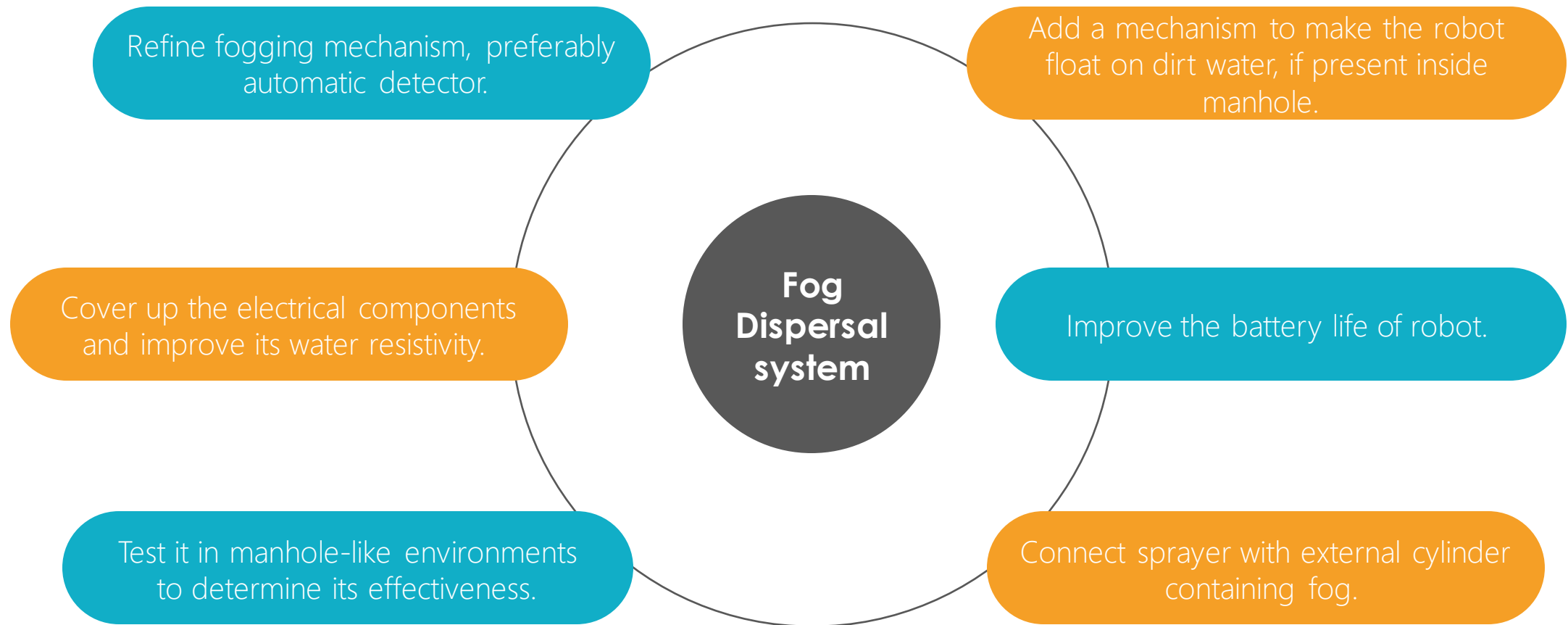
## Learnings from the Project

- ❖ Learning to integrate different components and module such as CAM module and HC05 Bluetooth module.
- ❖ Overcoming challenges during the design and construction such as electrical connectivity, mechanical integration and software functionality enhances the problem-solving skills.
- ❖ Ensuring unique fogging mechanism developed as part of the project and how it differs from traditional mosquito control methods. Also, ensuring that the prototype meets the safety standards.
- ❖ Learned the importance of teamwork and time management.

# CONCLUSION

In conclusion, this project represents an innovative and promising approach to mosquito control, influencing a fogging mechanism for the mosquito population reduction. This product may grab user interest to purchase, for effective mosquito control and replaces manual fogging to reduce human exposure to pesticides, public health impact, efficiency sewage system near neighborhoods.

# FUTURE SCOPE





**Thank You**