



कृषि एवं किसान  
कल्याण मंत्रालय  
MINISTRY OF  
AGRICULTURE AND  
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# AGRISURE GREENATHON

## Team Details

- Team Name: AnnaVARS
- Team Leader Name: Raghuvaran D
- Problem Statement: Track 1: Smart Agriculture on a Budget

## Brief about the idea

The proposed solution is a thermally controlled storage system designed to prevent postharvest damages in tomato processing. The system prioritizes cost-effectiveness, feasibility, scalability, and environmental friendliness, aiming to extend shelf life and minimize degradation.

# Opportunities

## **How different is it from any of the other existing ideas?**

- Current methods often compromise on flavor, nutritional quality, and energy efficiency. The proposed system integrates advanced thermal regulation technologies and focuses on sustainability and economic viability.

## **How will it be able to solve the problem?**

- By precisely controlling temperature, humidity, and ethylene levels, the system prevents chilling injuries, manages ethylene-induced ripening, and extends the shelf life of tomatoes.

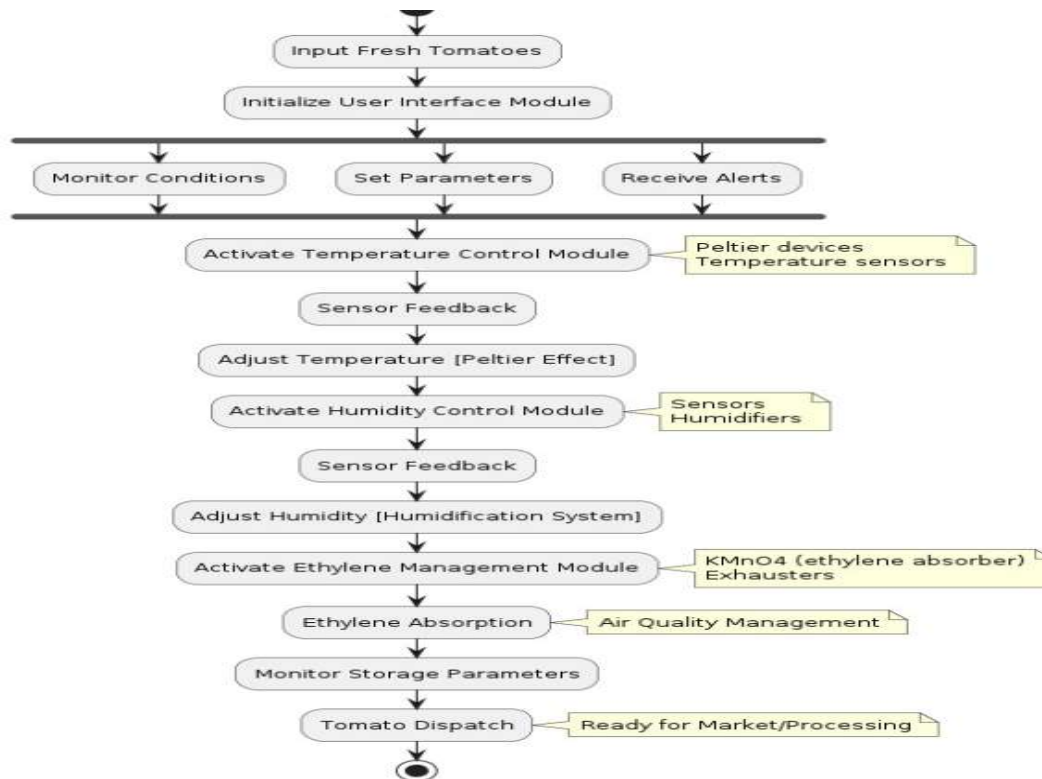
## **USP of the proposed solution**

- Cost-effective, scalable, and environmentally friendly with a focus on maintaining tomato quality and reducing post-harvest losses.

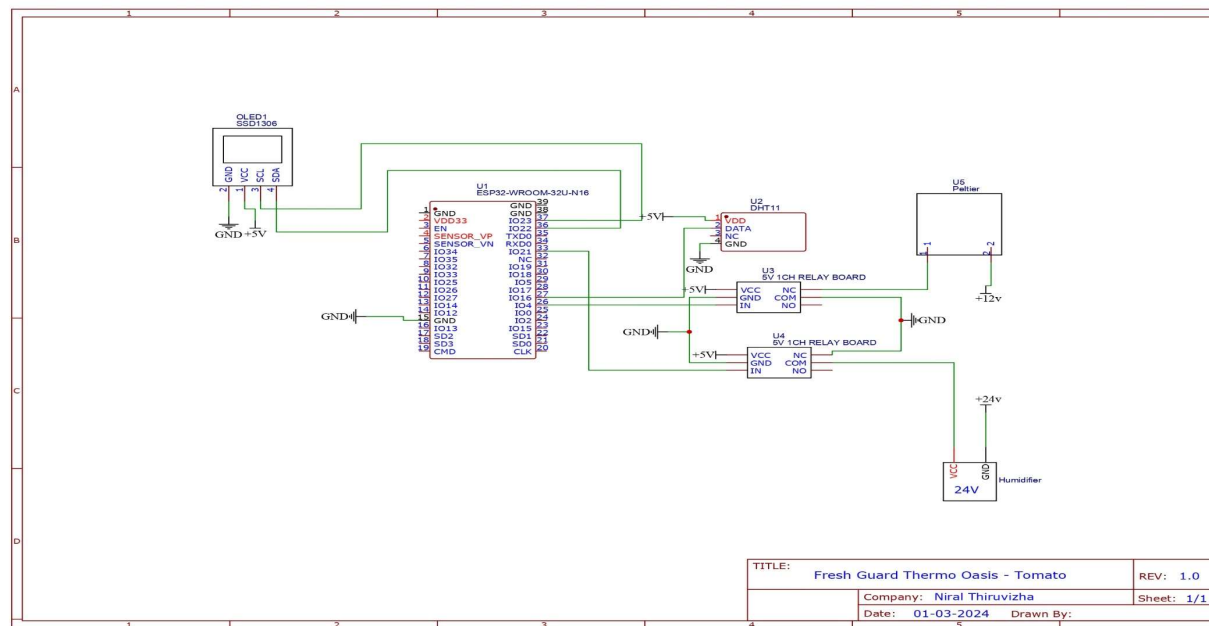
## List of features offered by the solution

- Temperature Control Module (using Peltier devices)
- Humidity Control Module
- Ethylene Management Module (using Potassium Permanganate absorbers)
- User Interface Module
- Modular Storage Units

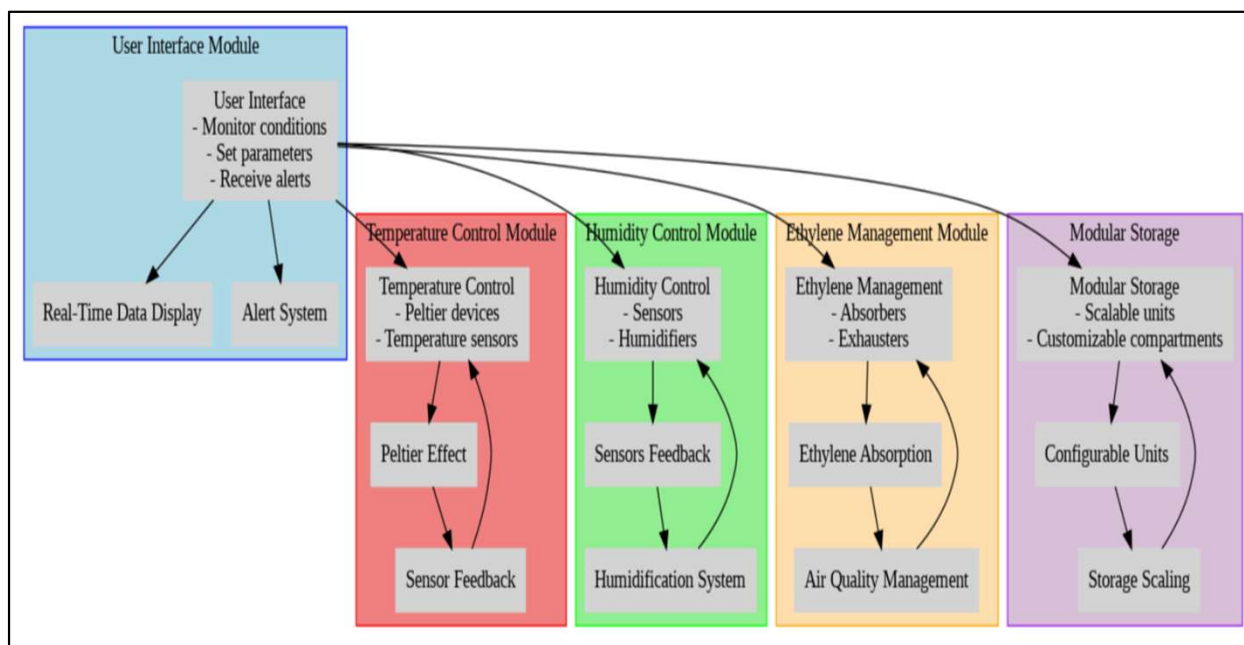
# Process flow diagram or Use-case diagram



# Wireframes/Mock diagrams of the proposed solution (optional)



# Architecture diagram of the proposed solution



# Technologies to be used in the solution

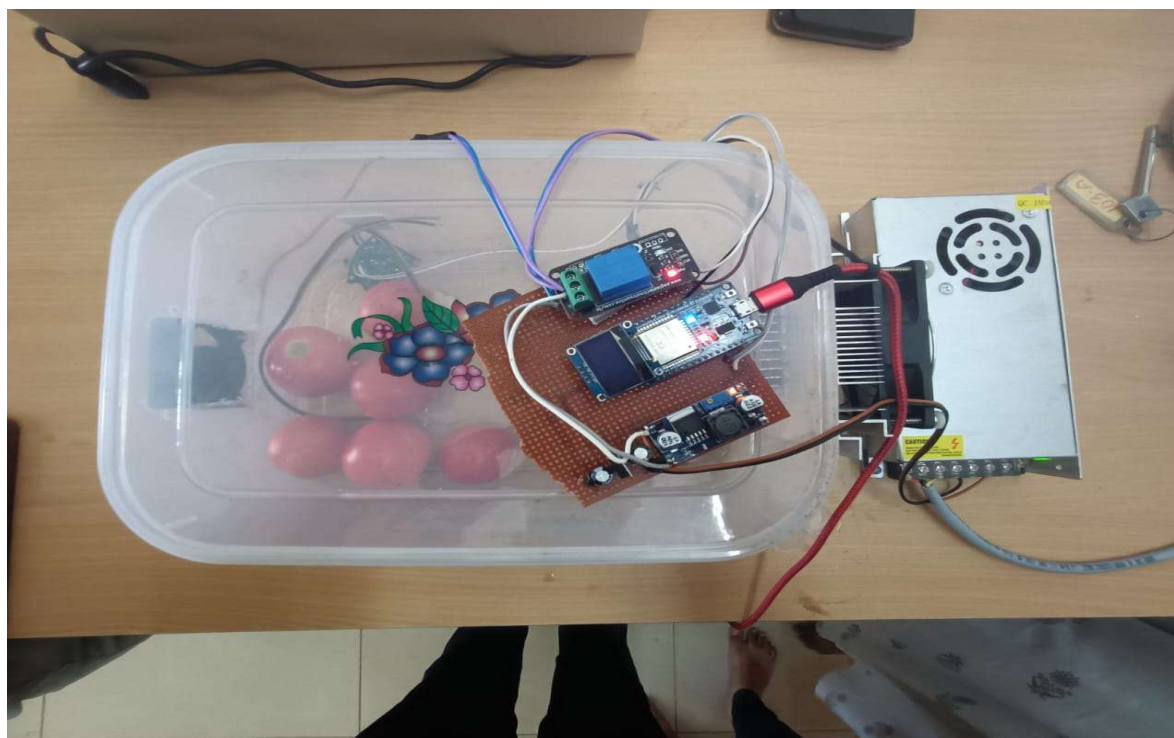
1. Peltier devices for temperature control
2. Humidity sensors and regulators
3. Ethylene absorbers (Potassium Permanganate)
4. User Interface technologies for monitoring and control
5. Modular construction for scalability



## Estimated implementation cost (optional)

Item	Estimated Cost Range
Insulation Materials	Rs 1000-Rs 3000
<del>Coolings</del> and Heating Systems	Rs 500-Rs 2000
Humidity and Control Systems	Rs 400-Rs 1000
Ethylene Management System	Rs 500-Rs 2000
IoT Components	Rs 500-Rs 3000
IoT Connectivity Modules	Rs 1000 -Rs 2000
Microcontrollers	Rs 2000- Rs 6000
Miscellaneous Cost	Rs 1000- Rs 5000
<b>Total Estimated Cost</b>	<b>Rs 7000-Rs 24000</b>

## Snapshots of the prototype



# Prototype Performance report/benchmarking

It is still is development process.

## Additional Details/Future Developments

- 1.Advanced Analytics:** Machine learning for predictive analysis
- 2.Renewable Energy Integration:** Solar power
- 3.Expanded Monitoring:** Additional sensors for deeper insights
- 4.Smart Packaging:** Packaging solutions to extend shelf life
- 5.Broader Crop Application:** Adaptation for other perishable crops
- 6.Material Science Innovations:** New materials for improved efficiency

# GitHub Public Repository Link & Demo Video Link

<https://github.com/RaghuvaranDBECse32/FGTO>

## Conclusion

The innovative thermally controlled storage system for tomatoes addresses critical postharvest challenges, providing a comprehensive solution that ensures quality, reduces waste, and enhances market competitiveness. By leveraging advanced thermal regulation technologies, the system effectively manages temperature, humidity, and ethylene levels to extend the shelf life of tomatoes while maintaining their flavor and nutritional value.



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