EMERGENCY DRONE DELIVERY FOR MEDICAL SUPPLIES

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INTRODUCTION - OUR PURPOSE

The Emergency Drone Delivery for Medical Supplies Project seeks to transform the speed and reliability of critical medical logistics by deploying autonomous drones capable of transporting lifesaving items—such as blood units, vaccines, and medication—between hospitals, clinics, and emergency zones.
Traditional ground transport is hindered by traffic congestion and distance, especially during disasters.
By introducing unmanned aerial vehicles (UAVs) equipped with intelligent routing, this project enables rapid response, reduced human error, and environmentally sustainable healthcare delivery.
The project aligns with national innovation strategies in smart cities and green mobility.

PROJECT ACHIEVEMENT AND IMPACT

The "Emergency Drone Delivery for Medical Supplies" project, defined a robust framework for transforming critical medical logistics. The project's core purpose was to leverage autonomous Unmanned Aerial Vehicles (UAVs) to ensure the rapid and reliable transport of lifesaving items, such as blood units, vaccines, and medication, bypassing the conventional limitations of ground transport, particularly during emergencies and disasters.

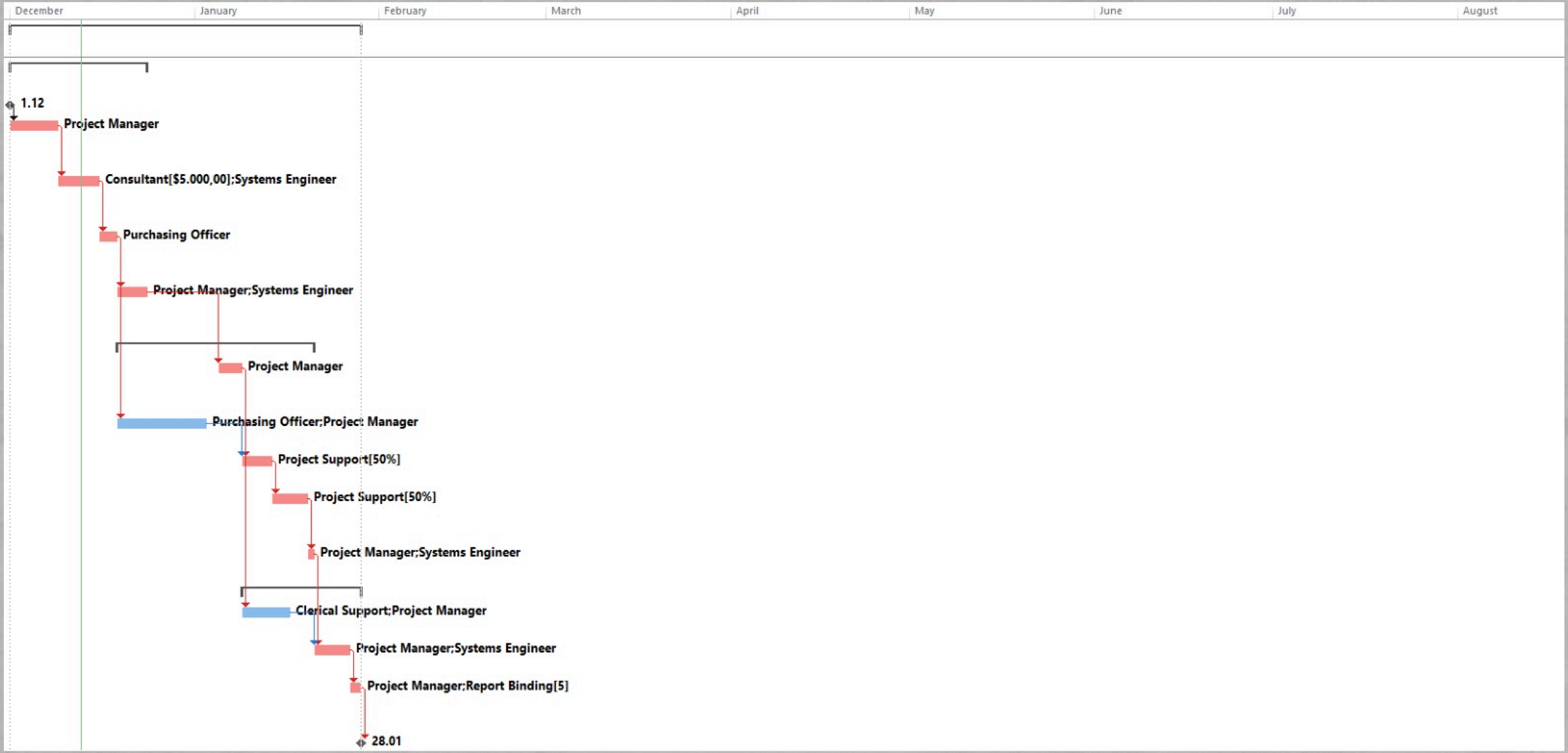
RESOURCES

·Capital Requirements:
Drone components, GPS modules, and sensors – US $ 5 000
·Communication & tracking systems – US $ 2 000
·Software licenses – US $ 1 500
·Testing & maintenance equipment – US $ 1 000
·Training & permits – US $ 500
→ Total Estimated Budget: ≈ US $ 10 000

ID	Task Name	Resources
4	Determine Installation Requirement	Project Manager
5	Ctreate Technical Specification	Systems Engineer, Consultant
6	Identify Supplier Components	Purchasing Officer
7	Validate Technical Specification	Project Manager, Systems Engineer
9	Document Delivery Methodology	Project Manager
10	Obtain Quotes from Suppliers	Project Manager, Purchasing Officer
11	Calculate the Bid Estimate	Project Support
12	Create the Project Schedule	Project Support
13	Review the Delivery Plan	Project Manager, Systems Engineer
15	Create Draft of Bid Document	Project Manager, Clerical Support
16	Review Bid Document	Project Manager, Systems Engineer
17	Finalize and Submit Bid Document	Project Manager, Report Binding

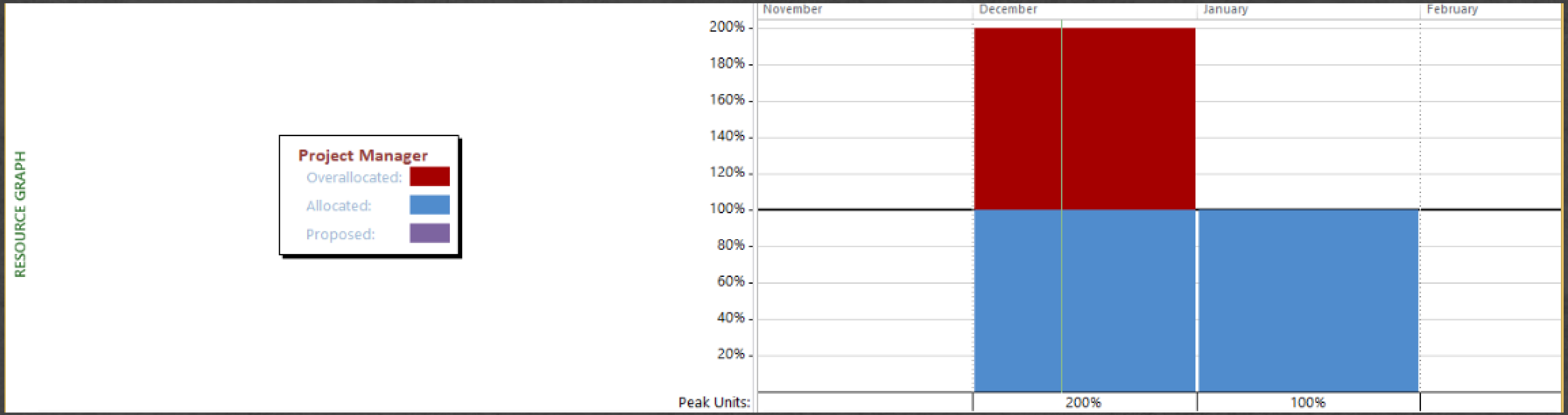
. Human Resources:
·Project Manager: coordination, scheduling, reporting (1 personnel)
·Drone engineers: hardware design, propulsion, assembly (2 personnel)
·Software developer: AI navigation and tracking system (1 personnel)
·Data analyst: risk analysis, performance metrics (1 personnel)
·Tester: flight validation and QA (1 personnel)

RESOURCE USAGE

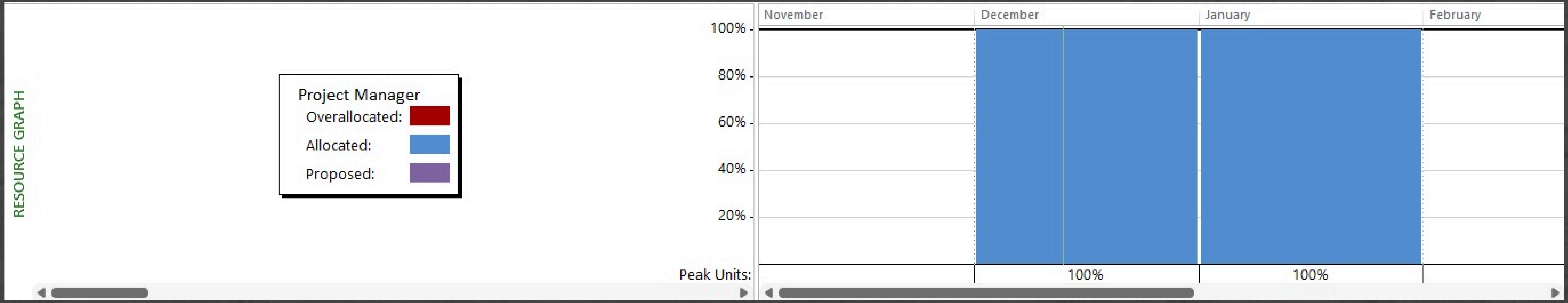


RESOURCE LEVELING

Before



After



Stakeholders

·Project Team (Group 8) – primary executors
·Hospitals & Clinics – operational users
·Emergency Services & Health Ministry – regulatory partners
·Local Authorities – flight-zone permits
·Citizens & Patients – beneficiaries
·Course Instructor – academic supervisor and project sponsor.

Evaluation Methods

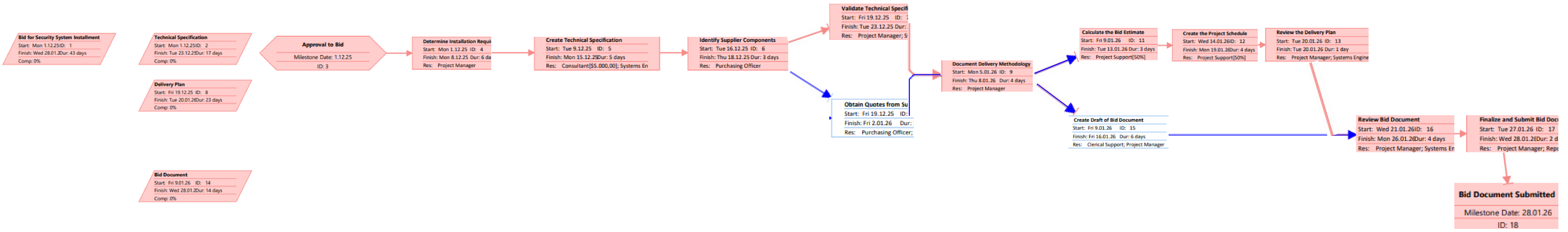
·Performance Tracking: Earned Value (EV) analysis for schedule and cost variance.
·Testing Metrics: Flight success rate, delivery time, and payload accuracy.
·Milestone Reviews: Weekly progress meetings and advisor approval checkpoints.
·Stakeholder Feedback: Survey data from hospitals after pilot runs.
·Post-Project Evaluation: Lessons-learned report and recommendations for future implementation.

RISK MANAGEMENT PLANS

In order to reduce their impact, the project team has identified a number of potential hazards and developed appropriate mitigation procedures.
To guarantee a safe recovery, a fail-safe "return to home" protocol should be put in place.

- A drone crash due to adverse weather conditions poses a high impact risk. To mitigate this, the system will integrate a real-time weather API and restrict flight operations under unsafe conditions.
- A loss of GPS signal is also considered a high-impact risk. The mitigation strategy includes utilizing an Inertial Measurement Unit (IMU) as a backup and implementing a fail-safe “return to home” protocol to ensure safe recovery.
- A battery failure represents a medium-impact risk. To manage this, the system will continuously monitor power status and maintain redundant battery cells for reliability.
- Regulatory delays have been assessed as a medium-impact risk. This will be mitigated by applying for required permits early and maintaining active communication with the relevant aviation authorities.
- A data security breach is another medium-impact concern. To prevent this, all communication channels will be encrypted, and user access rights will be limited according to operational needs.
- Finally, a budget overrun presents a low-impact risk. This will be mitigated by prioritizing essential hardware acquisitions and seeking sponsorships or alternative funding sources where possible.

WBS



Bid for Security System Installment
Start: Mon 1.12.25ID: 1
Finish: Wed 28.01.2Dur: 43 days
Comp: 0%
Technical Specification
Start: Mon 1.12.25ID: 2
Finish: Tue 23.12.25Dur: 17 days
Comp: 0%
Delivery Plan
Start: Fri 19.12.25 ID: 8
Finish: Tue 20.01.26Dur: 23 days
Comp: 0%
Bid Document
Start: Fri 9.01.26 ID: 14
Finish: Wed 28.01.2Dur: 14 days
Comp: 0%
Approval to Bid
Milestone Date: 1.12.25
ID: 3
Determine Installation Requi
Start: Mon 1.12.25 ID: 4
Finish: Mon 8.12.25 Dur: 6 da
Res: Project Manager
Create Technical Specification
Start: Tue 9.12.25 ID: 5
Finish: Mon 15.12.25Dur: 5 days
Res: Consultant[$5.000,00]; Systems En
Identify Supplier Components
Start: Tue 16.12.25 ID: 6
Finish: Thu 18.12.25 Dur: 3 days
Res: Purchasing Officer
Validate Technical Specifi
Start: Fri 19.12.25 ID:
Finish: Tue 23.12.25 Dur:
Res: Project Manager; S
Obtain Quotes from Su
Start: Fri 19.12.25 ID:
Finish: Fri 2.01.26 Dur:
Res: Purchasing Officer;
Document Delivery Methodology
Start: Mon 5.01.26 ID: 9
Finish: Thu 8.01.26 Dur: 4 days
Res: Project Manager
Calculate the Bid Estimate
Start: Fri 9.01.26 ID: 11
Finish: Tue 13.01.26 Dur: 3 days
Res: Project Support[50%]
Create the Project Schedule
Start: Wed 14.01.26ID: 12
Finish: Mon 19.01.26Dur: 4 days
Res: Project Support[50%]
Review the Delivery Plan
Start: Tue 20.01.26 ID: 13
Finish: Tue 20.01.26 Dur: 1 day
Res: Project Manager; Systems Engine
Create Draft of Bid Document
Start: Fri 9.01.26 ID: 15
Finish: Fri 16.01.26 Dur: 6 days
Res: Clerical Support; Project Manager
Review Bid Document
Start: Wed 21.01.26ID: 16
Finish: Mon 26.01.26Dur: 4 days
Res: Project Manager; Systems En
Finalize and Submit Bid Doc
Start: Tue 27.01.26 ID: 17
Finish: Wed 28.01.26Dur: 2 d
Res: Project Manager; Repo
Bid Document Submitted
Milestone Date: 28.01.26
ID: 18

OBJECTIVES MET

The project charter established clear, measurable objectives that guided the design and development phases:
Performance & Speed: The system is designed to achieve drone deliveries within 15 minutes for distances below 10 km.
Safety & Reliability: A high safety standard is upheld by targeting at least 95% successful flights through the integration of real-time monitoring and obstacle-avoidance Artificial Intelligence (AI). Mitigation strategies, including an Inertial Measurement Unit (IMU) for GPS loss and a real-time weather API, ensure operational resilience.
Sustainability: The project aligns with green mobility initiatives by aiming to cut carbon emissions by 40% compared with traditional ground-vehicle delivery.
Compliance: Operations are planned in full accordance with the regulations of the Turkish Civil Aviation Authority.

FINAL OUTLOOK AND FUTURE IMPLEMENTATION

Completed within the scheduled timeframe (November 2025 to June 2026) and operating within the defined US $10,000 budget, the project has established a strong foundation for future implementation.
Crucially, the development of a modular system architecture ensures that the solution is scalable and highly adaptable for broader applications, specifically including disaster-relief and humanitarian missions. The final deployment and evaluation phase, which includes pilot
deliveries and the collection of stakeholder feedback from hospitals, will be critical for achieving continuous improvement in drone routing and system reliability.

CONCLUSION

In summary, this project represents not only a successful academic exercise in project management but also a viable, innovative model for creating a more responsive, efficient, and environmentally sustainable healthcare delivery system. The findings and recommendations documented in the final Lessons-Learned Report will serve as a definitive guide for future research and full-scale deployment.

Thank you