# 📝 NLP Project – Technical Lead Report

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\*\*Date:\*\* 07 July

\*\*Date:\*\* 18 July

## ✅ 1. Work Completed (Since Last Report)

\_What you’ve built, implemented, tested or reviewed and an estimate as to how many hours it took to complete

* Research on available drones and project limitations (~8 hr)
* Team discussions and project planning (~2 hr)
* Containerization architecture research (~6 hr)
* File structure setup and GitHub organization (~2 hr)
* Feature/Module:
  + Conducted comprehensive research on drone hardware capabilities and limitations that will impact project scope. Investigated containerization architecture with ROS2 as the central container coordinating all system components.
* Tools/Libs Used:
  + Docker documentation
  + ROS2 Humble docker container
  + drone manufacturer IDE
* Outcome/Results:
  + Clear understanding of hardware constraints and system architecture requirements. Identified Docker-based workflow with ROS2 container as central hub.
* Contributions (if applicable):
  + Established project file structure
  + Set up GitHub repository and team collaboration workflow

## 📌 2. Current Tasks in Progress

\_What you’re actively working on. Include blockers if any.\_

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Description | ETA | Blockers |
| Team onboarding | Getting all team members familiar with GitHub and project structure | ~ 3 hours | WSL, computer configs |
| Architecture planning | Finalizing containerized system design | ~ 1 hour | None |
|  |  |  |  |

## 📅 3. Upcoming Tasks

\_Planned work for the next sprint or phase.\_

Task: AI Workflow Design, Build and Integration

* Purpose/Goal:
  + Set up Docker containers with ROS2 as central coordination hub
* Dependencies:
  + Finalized requirements from drone testing

Task: Video and Audio Feed Integration

* Purpose/Goal:
  + Get video and audio feeds to run through ROS2 Container
* Dependencies:
  + Docker containerization setup completed

Task: AI Processing Modules Development

* Purpose/Goal:

Build and integrate AI processing modules (object detection, speech-to-text, intent processing, depth analysis, RTAB-Map SLAM)

* Dependencies:
  + ROS2 container setup and video/audio feed integration

## 🚨 4. Issues & Risks

\_Bugs, technical debt, resourcing, or anything threatening progress.\_

|  |  |  |  |
| --- | --- | --- | --- |
| Issue | Impact | Suggested Action | Owner |
| Drone access delay | Blocks hands-on validation of capabilities | Coordinate with equipment procurement | Team |
| System-wide integration complexity | May cause delays and compatibility issues | Design modular architecture with clear interfaces | Ed |
| Low latency video inputs | Video feed unreliability affects real-time processing | Implement buffering and error handling strategies | Team |
| ROS2 container isolation | Difficult integration with Python-based project components | Design ROS2 bridge/API for Python communication | Ed |
| Live video processing challenges | Object detection on continuous feed vs single images | Optimize processing pipeline and implement frame skipping | Team |

## 📈 5. Key Insights / Recommendations

\_Lessons learned, suggestions, architecture notes, or optimizations.\_

* Docker containerization with ROS2 as central hub appears to be the optimal architecture for system coordination
* Early identification of drone limitations will be crucial for realistic project scoping
* Team GitHub workflow established successfully, enabling collaborative development