# 📝 NLP Project – Technical Lead Report (Week 7-8)

**Name**: Erin David Cullen

**Start Date**: 01 September

**End Date**: 14 September

## ✅ 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

* Industry partnership establishment (~1 hr)
* Mentor consultations and guidance (~1 hr)
* Hardware solution research and evaluation (~3 hr)
* Project adaptation planning (~2 hr)
* Feature/Module: Industry Partnership Development
  + Established contact with NTSU Aviation (<https://ntsuaviation.com/>) through mentor coordination
  + Facilitated initial discussions between Belgium Campus (Simba Zengeni) and NTSU Aviation
  + Secured preliminary agreement for collaboration and potential drone sponsorship
  + Initiated discussions for enterprise-grade DJI drone access
* Feature/Module: Hardware Solution Research
  + Researched NTSU Aviation's available drone fleet and capabilities
  + Analyzed enterprise-grade DJI drone specifications and onboard processing
  + Evaluated potential solutions for video quality, depth detection, and spatial awareness issues
  + Assessed ROS2 compatibility and SLAM capabilities of advanced DJI platforms
* Feature/Module: Project Adaptation Planning
  + Analyzed implications of transitioning to enterprise-grade hardware
  + Evaluated overlap between current software implementation and onboard drone capabilities
  + Identified areas where project scope may need adjustment based on drone specifications
  + Planned integration strategy for advanced drone features with existing codebase
* Tools/Libs Used:
  + NTSU Aviation website and documentation for research
  + DJI enterprise drone specifications and technical documentation
  + Communication platforms for mentor and industry partner coordination
* Outcome/Results:
  + Successfully established industry partnership with NTSU Aviation
  + Secured potential access to enterprise-grade DJI drone hardware
  + Identified viable solution for current video quality and spatial awareness limitations
  + Created pathway for implementing SLAM functionality through advanced drone capabilities
* Contributions (if applicable):
  + Developed strategic approach to hardware upgrade integration
  + opportunities for enhanced project capabilities through partnership

# 📌 2. Current Tasks in Progress

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

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Description | ETA | Blockers |
| NTSU Aviation meeting coordination | Scheduling and preparing for company collaboration meeting | 1 week | Company availability and scheduling |
| Drone requirements specification | Defining technical requirements for enterprise drone selection | 1-2 hours | Unknown drone specifications until meeting |
| Hardware integration planning | Planning software adaptation for enterprise drone capabilities | On hold | Pending drone model confirmation |
| Partnership agreement finalization | Establishing formal collaboration terms with NTSU Aviation | 1 week | Legal and administrative processes |

## 📅 3. Upcoming Tasks

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

* **Task: NTSU Aviation Collaboration Meeting**
  + **Purpose/Goal:**
    - **Meet with NTSU Aviation to discuss drone specifications and requirements**
    - **Evaluate available enterprise-grade DJI drone models**
    - **Establish formal partnership terms and collaboration framework**
    - **Determine project timeline and hardware access schedule**
  + **Dependencies:**
    - **Company availability and meeting scheduling**
    - **Technical requirements documentation**
    - **Team member availability**
* **Task: Enterprise Drone Integration Assessment**
  + **Purpose/Goal:**
    - **Analyze selected drone's onboard capabilities and ROS2 compatibility**
    - **Identify overlapping functionality between current software and drone features**
    - **Plan software architecture adaptation for enterprise hardware**
    - **Evaluate SLAM implementation opportunities with advanced drone**
  + **Dependencies:**
    - **Drone model confirmation from NTSU Aviation**
    - **Access to drone technical specifications**
    - **Understanding of onboard processing capabilities**
* **Task: Project Scope Restructuring**
  + **Purpose/Goal:**
    - **Restructure project scope based on enterprise drone capabilities**
    - **Identify software components to maintain, modify, or eliminate**
    - **Update project timeline and milestone definitions**
    - **Realign team responsibilities based on new hardware requirements**
  + **Dependencies:**
    - **Complete drone capability assessment**
    - **Team consensus on new project direction**
    - **Updated requirements from partnership agreement**
* **Task: Hardware-Software Integration Planning**
  + **Purpose/Goal:**
    - **Design integration strategy between existing codebase and drone systems**
    - **Plan data flow and communication protocols with enterprise drone**
    - **Establish testing and development procedures with new hardware**
    - **Create backup plans for software-only implementation if needed**
  + **Dependencies:**
    - **Drone access and specifications**
    - **Understanding of drone SDK and development tools**
    - **Partnership agreement finalization**

## 🚨 4. Issues & Risks

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

|  |  |  |  |
| --- | --- | --- | --- |
| Issue | Impact | Suggested Action | Owner |
| Partnership dependency | Project success now heavily dependent on NTSU Aviation collaboration | Maintain software-only backup plan and diversify hardware options | Team |
| Unknown drone specifications | Cannot plan integration without knowing exact drone model and capabilities | Prioritize meeting scheduling and technical specification gathering | Ed |
| Project scope uncertainty | Unclear how much current codebase will remain relevant with enterprise drone | Document all current implementations and plan modular adaptation | Team |
| Timeline disruption | Hardware transition may delay project milestones and deliverables | Adjust project timeline and communicate changes to stakeholders | Ed |
| Over-reliance on external hardware | Losing access to drone could halt project progress entirely | Maintain parallel development paths for software-only and hardware-integrated versions | Team |

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## 📈 5. Key Insights / Recommendations

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

* Industry partnerships can provide transformative hardware solutions that address fundamental technical limitations
* Enterprise-grade drones may eliminate many custom software development challenges by providing built-in capabilities
* Partnership establishment requires careful coordination between academic mentors and industry stakeholders
* Hardware transitions introduce significant project scope uncertainty that must be managed proactively
* Maintaining software-only backup implementations is critical when depending on external hardware partnerships
* SLAM and advanced localization become viable options with enterprise drone platforms that have onboard ROS2 environments
* Project timeline flexibility is essential when integrating external partnerships and hardware dependencies
* Early engagement with industry partners provides valuable insights into practical implementation challenges and solutions