SE 4485: Software Engineering Projects

Fall 2025

Project Management Plan

|  |  |
| --- | --- |
| Group Number | Team 1 |
| Project Title | City Level Air Quality Prediction Application |
| Sponsoring Company | Raytheon (Team A) |
| Sponsor(s) | Ryan Havens <Ryan.Havens@rtx.com>,  Marc Perna <marc.perna@rtx.com>,  Trey Williams <trey.williams@rtx.com>,  Trevor Lang <trevor.a.lang@rtx.com> |
| Students | 1. Jay Chung <cwc130330@utdallas.edu>  2. Amelia Quinn <qcb220000>  3. Kevin Melo <ksm220005>  4. AJ Kimbrough <ank210005>  5. David Santos <des210001>  6. Andrew Einright <ame210008> |

**ABSTRACT**

This document defines team organization, lifecycle model, risks, required resources, scheduled deliverables, professional guidelines, and configuration management for the City Level Air Quality Prediction (CLAP) Application.

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**INTRODUCTION**

The purpose of this document is to describe how Group 1 will plan, design, execute, and monitor the development lifecycle of the City Level Air Quality Prediction (CLAP) system. This application predicts future AQI category for a single U.S. city using historical AQI and weather data. Details regarding the structure, methodology, tools, and risk-mitigation strategies are provided.

# **PROJECT ORGANIZATION**

Team Members and Roles:

1. Jay Chung (cwc130330) - Group 1 Team leader, Software & AI Engineer
2. Amelia Quinn (qcb220000) - Software & AI Engineer
3. AJ Kimbrough (ank210005) - Group 1 Lead Architect, Software & AI Engineer
4. Kevin Melo (ksm220005) - Software & AI Engineer
5. David Santos (des210001) - Software & AI Engineer
6. Andrew Einright (ame210008) - Software & AI Engineer

Sponsors:

1. Ryan Havens - Software Engineer
2. Marc Perna - Technical Director, Software & Senior Technical Fellow
3. Trey Williams - Associate Director, Systems Engineering
4. Trevor Lang - Senior Front-End Engineer

# **LIFECYCLE MODEL USED**

Incremental, iterative lifecycle model:

* Iterative delivery of components
* Continuous integration
* Incremental changes based on sponsor feedback

# **RISK ANALYSIS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk:** | **Likelihood:** | **Impact:** | **Mitigation:** | **Rationale:** |
| Scope Creep | Medium | High | Restrict to one city. | Simplifies requirements |
| AQI Data inconsistency | Medium | High | TBD | TBD |
| Forecast variability | Medium | Medium | TBD | TBD |
| API unavailability | Low | High | TBD | TBD |
| Team Coordination | Medium | Medium | Weekly Meetings, clear task ownership | Meetings will mitigate the likelihood of errors due to miscommunication. |

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# **SOFTWARE AND HARDWARE RESOURCE REQUIREMENTS**

Software:

1. Python
2. SQLite database
3. GitHub for CI/CD
4. Docker

Hardware:

1. Student laptop
2. Internet access

# **DELIVERABLES AND SCHEDULE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Deliverable:** | **Due Date:** | **Responsibility:** | **Dependencies:** |
| Weekly Report | Every Friday | Team leader | N/A |
| Project Management Plan | 09/12/2025 | Team leader | Must be approved by sponsors. |
| Requirements Documentation | 09/26/2025 | Team leader | Must be completed before Architectural Design. |
| Architecture Documentation | 10/24/2025 | Team leader | Must be completed before Detailed Design. |
| Detailed Design Documentation | 11/07/2025 | Team leader | Must be completed before Testing. |
| Test Plan | 11/21/2025 | Team leader | Must be considered during Requirements Specification and Architectural Design. |
| Final Project Presentation Slides | 12/02/2025 | Team leader | N/A |
| Final Project Report | 12/05/2025 | Team leader | N/A |

# **MONITORING, REPORTING, AND CONTROLLING MECHANISMS**

* Weekly Attendance Reports must be produced based on Weekly Progress Meetings with the sponsors, to be submitted every Friday of that week.
* Weekly Sponsor Reports are recommended at least once every week.
* GitHub is recommended for version control and configuration management.
* Milestone reviews are recommended for scheduling and meeting important deadlines.

# **PROFESSIONAL STANDARDS**

* Academic integrity
* Respect for all team members
* Equal distribution of workload
* Timely delivery of assigned tasks
* Good behavior (e.g. not missing deadlines and not submitting poor quality work)

# **EVIDENCE THE DOCUMENT HAS BEEN PLACED UNDER CONFIGURATION MANAGEMENT**

* Please download the template from this [[link](https://course.techconf.org/se4485/Template/CM-Tool.pdf)]

**ENGINEERING STANDARDS AND MULTIPLE CONSTRAINTS**

* IEEE Std 1058-1998: Software Project Management Plans [[pdf](https://course.techconf.org/se4485/IEEE/IEEE-Std-1058-1998-Software-Project-Management-Plans.pdf)]
* PMBOK® Guide: Project Management Body of Knowledge [[pdf](https://course.techconf.org/se4485/IEEE/PMBOKR.pdf)]
* IEEE Std 12207: Software Life Cycle Processes [[pdf](https://course.techconf.org/se4485/IEEE/IEEE%2012207%20(2017)%20-%20Software%20Life%20Cycle%20Processes.pdf)]
* IEEE Std 15939: Measurement Process [[pdf](https://course.techconf.org/se4485/IEEE/IEEE%2015939%20(2017)%20-%20Measurement%20Process.pdf)]
* ISO/IEC/IEEE Std 29148-2018: Systems and Software Engineering

§ Life Cycle Processes

§ Requirements Engineering [[pdf](https://course.techconf.org/se4485/IEEE/ISO-IEC-IEEE-29148-2018.pdf)]

Students should work with their project sponsor(s) to identify all the standards and constraints that should be applied for preparing this document. Additional materials that are not listed above can be included.

**ADDITIONAL REFERENCES**

* Larson, E. and Gray, C., 2014. Project Management: The Managerial Process. McGraw Hill
* Humphrey, W.S. and Thomas, W.R., 2010. Reflections on Management: How to Manage Your Software Projects, Your Teams, Your Boss, and Yourself. Pearson Education

Each group may include other related references that are not listed above.

**Appendix A.**

The following provides a professional standards guideline for the teams. This guideline may be tailored. The professional standards must be agreed upon by each member in the team.

Guideline:

On the first occurrence of unacceptable behavior, determine the circumstances involved, resolve the problem, and document the event in the meeting minutes.

On a second occurrence, notify the instructor of the problem. A meeting will be set up to evaluate the situation and resolve the problem.

On a third occurrence, again notify the instructor of the problem. A meeting will be set up to evaluate the situation and resolve the problem. At this point, the team will have the *option* of removing the team member. If removed, then the team member receives a pro-rated grade based on the number of weeks they have participated in the group.

Examples of unacceptable behavior may include not delivering on time, delivering poor quality work, missing team meetings, being unprepared for team meetings, disrespectful or rude behavior, etc. Reasons such as “too busy” or “I forgot”, or “my dog ate my design model” are unacceptable.

Valid reasons that must be considered include those listed for obtaining an incomplete standing in a course (illness, death in the family, travel for business or academic reasons, etc.)