Master of Applied Artificial Intelligence

Individual Retrospective

Self-Assessment

- **Active Data Acquisition**

  I located and assessed several relevant Australian datasets on respiratory disease and air pollution, including important sources from AIHW, EPA Air Watch, and many state-based open data portals. Robust correlation analysis needs data coverage across several states and time periods, which I made deep research on.
  Alignment with HD persona: Demonstrates initiative in sourcing high-value, context-specific data with a critical focus on completeness and quality.

- **Data Quality and Ethics Assurance**

  We, as a group reviewed licensing, privacy implications, and ethical constraints for all datasets, particularly around health data sensitivity. This ensured that our analysis complies with legal and institutional standards before processing began.
  Alignment with HD persona: Reflects a professional and ethical approach to data handling, ensuring work is defensible and compliant to the regulation and laws.

- **Preprocessing Strategy Formulation**

  I handled the preprocessing and cleaning procedures, which included standardizing pollutant measurement units across datasets, matching time-series intervals, and addressing missing values. For modelling, this offers an organized way to generate reliable, comparable data.
  Alignment with HD persona: Shows vision in creating scalable, repeatable processes that account for the demands of downstream modelling.

- **Collaboration and Technical Support**

  I coordinated closely with team members integrating API data and prototyping visualisations to ensure dataset structures would be compatible with future real-time inputs.
  Alignment with HD persona: Demonstrates collaborative skills and technical foresight to prevent rework and maximise team efficiency.

- **Contribution to Agile Workflow**

  I regularly updated our shared project planner, ensuring tasks and milestones were aligned to our sprint objectives, which kept the dataset workstream transparent and on track.
  Alignment with HD persona: Actively engages in team process improvement and progress visibility, key to delivering consistent high-quality outputs.

Course Learning Outcomes

In this section, describe how you are progressing in demonstrating each of your course learning outcomes. Please note any outcomes you are focusing on. List the course (degree) learning outcomes for each GLO and briefly explain how your activities and contributions demonstrate these outcomes.

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GLO1 – Discipline-specific knowledge and capabilities

- *Develop an advanced and integrated knowledge of the technologies of artificial intelligence, including deep learning and reinforcement learning, with detailed knowledge of the application of AI algorithms across a range of domains and applications including computer vision and speech processing.*
- *Design, develop and implement software solutions that incorporate novel applications of artificial intelligence.*
- *Apply advanced knowledge of artificial intelligence to the research and evaluation of AI solutions and provision of specialist advice.*
- *Design artificial intelligence solutions that incorporate safe ethical decision making.*

Investigating, locating, and collecting information needed for creating an AI-driven correlation study between air quality and respiratory disease rates has allowed me to use my knowledge to this project. My efforts to locate and choose excellent Australian datasets, such EPA Air Watch and AIHW medical records, directly contribute to the development of machine learning models and geospatial analytics. I am providing that the dataset will be prepared for complex statistical and artificial intelligence methods like regression modelling by organizing preprocessing operations, which include time-series alignment, resolving missing values, and standardizing pollutant metrics.

I have also demonstrated an understanding of the ethical dimensions of AI applications by reviewing the legality, licensing, and privacy implications of sensitive health data. This aligns with the safe and responsible use of AI, ensuring compliance with institutional guidelines and protecting individual privacy. These activities reflect both the technical and ethical aspects of AI solution design, positioning our project for accurate, transparent, and socially responsible outcomes.

GLO2 – Communication

- *Prepare a range of technical and user-oriented documentation using adequate structure, terminology and context to address technical and non-technical audiences.*
- *Convey information and instructions in a clear, concise and coherent manner using appropriate oral communication techniques and skills for a broad range of audiences.*
- *Imagine, conceive, and represent ideas using IT conventions, modelling languages, and standards to reflect on complex artificial intelligence ideas and processes in an effective manner.*
- *Apply interpersonal skills to lead, proactively assist, contribute to ideas, respect opinions and value contribution made by others when working collaboratively with a wide range of stakeholders.*

I have effectively communicated with the technical and non-technical team members throughout the project to guarantee that we are all on the same page regarding objectives, scope, and procedures. As part of this, brief dataset documentation outlining the format, source, licensing, and any possible preprocessing requirements was prepared. In order to maintain openness on progress and challenges, I used precise language and organized updates when I participated in sprint planning talks. I listened intently to others' opinions at team meetings, took criticism into consideration while working on my assignments, and talked professionally and cooperatively with everyone, particularly when integrating the contributions of new team members. Our agile process has been able to preserve clarity and mutual understanding thanks to these efforts.

GLO3 - Digital literacy

- *Identify, select and use a range of digital technologies and tools to generate, manage and share digital resources associated with advanced artificial intelligence concepts and solutions.*
- *Independently and systematically locate information, evaluate its reliability, and use the information for design, problem solving and research purposes.*
- *Recommend and use appropriate practices and processes to ensure the security, integrity, safety and availability of digital resources.*

To find, assess, and save high-quality data resources, I have used a variety of digital tools, including Teams Planner for sprint planning and GitHub for collaborative code and dataset management. I used data completeness, update frequency, and source reliability to evaluate dependability while choosing datasets. To protect data security and integrity, I also made sure that ethical and licensing standards were met. All project resources are kept organized, accessible, and safe for all participants thanks to my use of central repository and organized version control.

GLO4 - Critical thinking

- *In assessing complex artificial intelligence scenarios, critically evaluate arguments, hypothesis, systems and proposals to identify basic statements.*
- *In assessing complex artificial intelligence scenarios, locate ambiguity and vagueness in arguments, requirements, and proposals to determine if ideas are reasonable, and identify information that may be contradictory, omitted, or not collected.*
- *In assessing complex artificial intelligence scenarios, apply judgement in evaluating ideas, associated reasoning, and available evidence to arrive at conclusions that are valid.*

I evaluated the applicability of several sources when doing dataset research, considering granularity, completeness, and possible measurement bias. I found certain dataset constraints that can impact correlation analysis, such irregular time periods or a lack of geographic coverage. Early detection of these gaps allowed me to offer preprocessing procedures and alternate sources to address data discrepancies. Our models will be based on solid, contextually relevant facts thanks to this analytical technique.

GLO5 - Problem solving

- *Apply expert, specialised technical skills, knowledge and techniques to identify and define complex problems utilising advanced artificial intelligence in a variety of contexts.*
- *Apply expert, specialised technical skills and knowledge in modelling methods and processes to understand problems, handle abstraction and design novel artificial intelligence solutions.*
- *Apply expert, specialised technical skills and knowledge to develop innovative and creative approaches and/or solutions in planning, designing, managing, evaluating and executing complex artificial intelligence projects.*
- *Integrate knowledge of social, safety, legal and cultural aspects to solve problems in complex and contradictory situations.*

My main contributions to problem-solving have been to recognize and resolve difficulties in the preparation and acquisition of datasets. To manage missing values, standardize data formats, and match periods between air quality indicators and medical records, I have used my skills in preprocessing design. I addressed these problems creatively, finding a balance between the importance of thorough data coverage and practical, ethical,

and legal limitations. Through the integration of factors like privacy compliance and domain-specific knowledge in respiratory health, I have contributed to the development of a solution direction that allows accurate, moral, and significant AI analysis.

GLO6 - Self-management

- *Evaluate own knowledge and skills with relation to wider artificial intelligence community and use frameworks of reflection to define and progress professional goals.*
- *Recognise the need, and engage in, independent learning for continual development pf specialist knowledge and skills in artificial intelligence as a computing professional.*
- *Demonstrate the ability to accept responsibility for objectives, and work under broad direction, engaging in the feedback process independently to ensure outcomes are achieved.*

I've evaluated my current skills in data collection, preprocessing, and AI integration, identifying areas in which my talents fit project requirements and those in which I still need to improve. For instance, I found a weakness in my geospatial analytic abilities, which I want to fix after the datasets are prepared and cleansed. I have independently dealt with my tasks, adjusting priorities in response to changing project goals and achieving deadlines. To improve my search and selection tactics, I have also asked the team leader for opinion on the quality and relevancy of the dataset. This procedure shows that I can find a balance between accountability and autonomy, making sure that my work directly affects project results.

GLO7 - Teamwork

- *Contribute specialist knowledge and skills of artificial intelligence when working within a team, demonstrating high levels of responsibility and accountability.*
- *Engage consistently and professionally in groupware to contribute expert knowledge and skills of artificial intelligence to achieve shared team objectives and outcomes.*
- *Apply strategies to lead and support positive group dynamics, manage conflict and to function effectively as a team member.*

To help the team build a strong foundation for upcoming modelling work, I have offered my technical experience in dataset evaluation and source. To ensure that two new team members could successfully integrate into our Agile process, I actively participated in their onboarding by outlining our project scope, objective, and early choices. By leading brainstorming sessions and implementing their recommendations, such as looking into APIs for real-time AQI data, I contributed to idea sharing. I established productive group dynamics and lessened the onboarding process for new contributors by encouraging open discussion and upholding a friendly, welcoming atmosphere.

GLO8 - Global citizenship

- *Apply professional ethics, responsibilities, and norms of professional computing practice.*
- *Demonstrate awareness of regulation and ethical implications of acquisition, use, disclosure and eventual disposal of information.*
- *Engage with global trends and research with concern for societal, health, safety, legal, and cultural issues to effectively manage responsibilities relevant to artificial intelligence in practice.*

I have given ethical and legal issues priority while working with sensitive environmental and health data, making sure that all applicable Australian data rules are followed. Before

suggesting the usage of datasets, I evaluated them for licensing limitations and kept in mind the privacy risks associated with hospital admission data. My investigation of local Australian sources and global air quality statistics demonstrates an understanding of both local public health effects and global environmental trends. Our project deliverables are guaranteed to stay socially relevant, morally sound, and influenced by best practices in responsible AI application thanks to this global-local viewpoint.

SFIA Skills associated with the course

Data Science (DATS)

Through the identification, collection, and evaluation of several datasets from reliable sources, including EPA Air Watch and AIHW, I have shown my abilities in data science. This required assessing the temporal granularity, possible biases, and completeness of the dataset. To prepare for statistical and artificial intelligence-based correlation modelling, I have started organizing data integration techniques to match environmental indicators with respiratory sickness records. The fundamental DATS skill set, converting unstructured, unorganized data into a useful, structured resource for analysis is reflected in these exercises.

Machine Learning (MLNG)

I have made sure we have clean, high-quality datasets for upcoming training and testing, which is crucial preparation for the machine learning implementation step, which has not yet started. Regression modelling and predictive analytics for air quality–health correlations are the ultimate goals that drive my dataset selection. I am also helping my teammates with looking at real-world API-driven apps and related Kaggle projects to find possible model architectures and feature engineering strategies that fit our goals.

Research (RCSH)

I have conducted targeted research with my teammates as well to locate reliable data sources, examine related case studies, and identify technical approaches used in similar projects worldwide. This includes reviewing academic literature on air quality modelling, exploring government-published environmental reports, and extracting applicable methods for data integration. I have ensured my research process is systematic and evidence-driven, with clear documentation for the team to reference.

Numerical analysis (NUAN)

I have conducted initial numerical evaluations of datasets, including determining missing data rates, verifying measurement scales, and determining temporal alignment between datasets. Preventing statistical biases in subsequent correlation modelling requires this quantitative examination. My next plans involve creating statistical preprocessing procedures to combine and normalize data for more reliable geographical and regression analysis.

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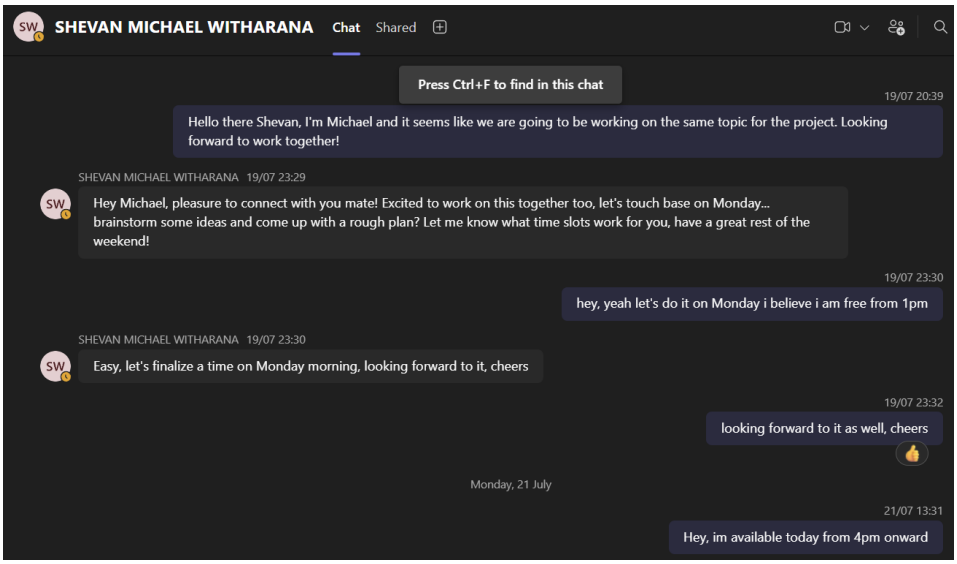
Evidence

1. **Defined Workflow and Scope:**

Have a meeting with the team leader to establish the technical scope of the project and to clarify roles, with focus on the correlation between respiratory hospital admissions and air pollution.

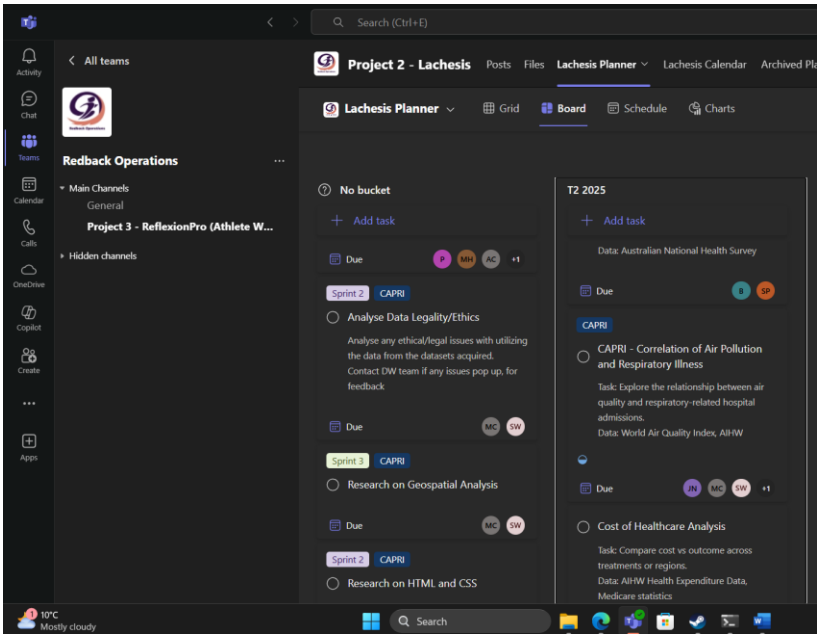
So what? To make sures the is a team alignment and allows targeted research and development efforts, preventing scope creep early in the project lifecycle.



2. **Use Agile Methodology:**

Decided to use an Agile process with weekly sprints and progress management task boards (like Trello).

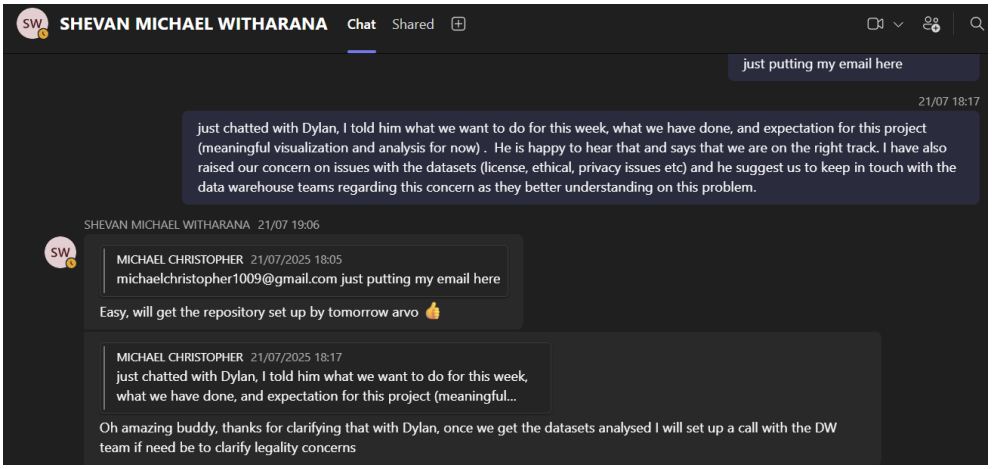
So what? This allows constant feedback integration and iterative development by increasing transparency and flexibility.



3. **Started the Ethical and Legal Review:**

Review the conditions of use for AIHW and WAQI data and evaluating the sensitivity of the data, particularly regarding health records.

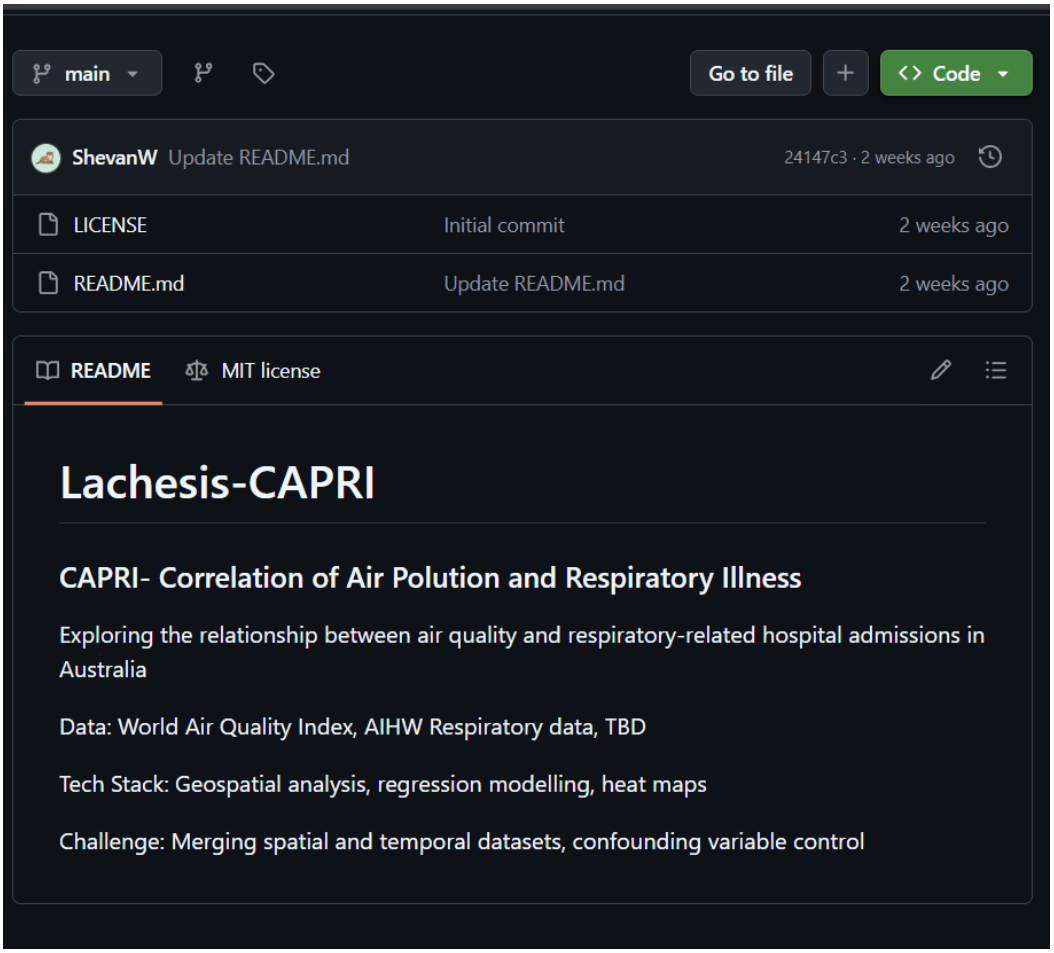
So what? Guarantees adherence to ethical computing guidelines and gets us ready for any necessary institutional approval requirements.



4. **GitHub Repository Setup:**

Create a well-organized GitHub repository to store raw data, cleaned, data, analytical script and notebooks, as well as documentation folders.

So what? This creates a centralized, version-controlled platform for efficient code and research collaboration and progress tracking.

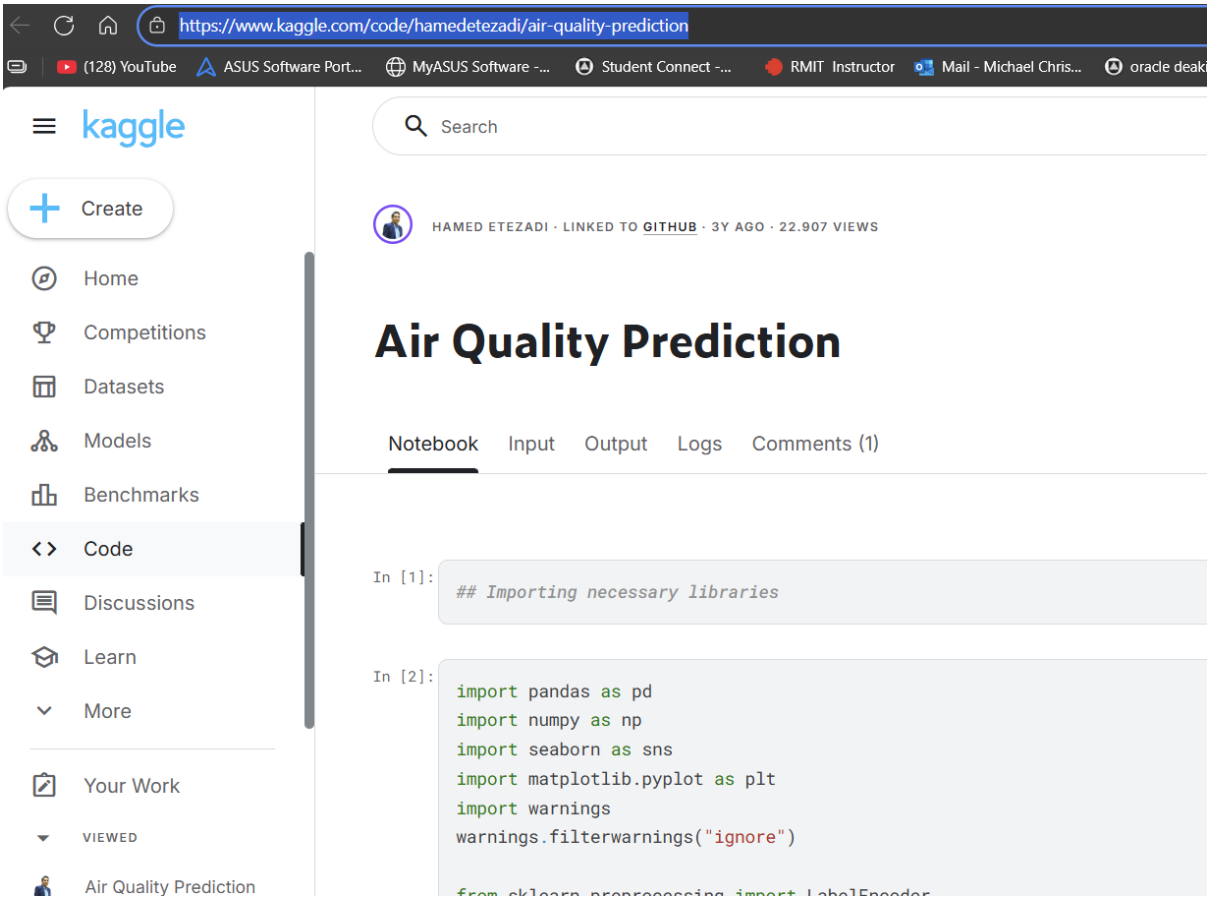


5. **Initial Exploratory Research Assignment:**

Assigned roles and responsibilities for exploring the relationship between air quality trends and hospital admissions as well as respiratory illnesses, including identifying time-lag patterns.

So what? This research can inform the selection of regression models and guide data transformation steps for temporal alignment.

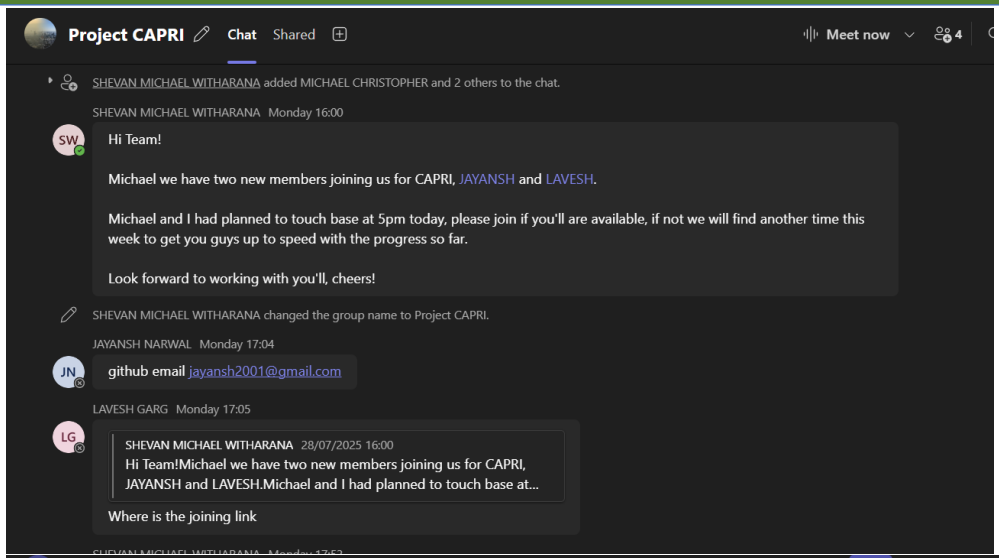
Air Quality Prediction for inspiration

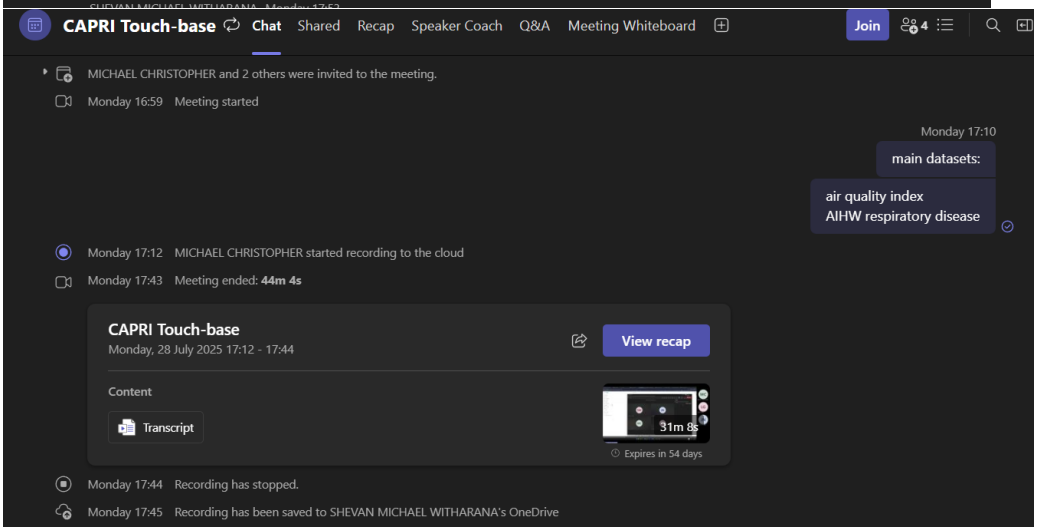


6. **Held a Brainstorming Session with Full Team:**

Conducted a second brainstorming session, incorporating fresh perspectives from the new members. One proposed integrating an API to collect real-time AQI, and another initiated prototyping a browser-based interface using HTML/CSS.

So what? These contributions enhance the technical feasibility and interactivity of our project, potentially increasing its real-world applicability.





7. **Weekly recurring meeting:**

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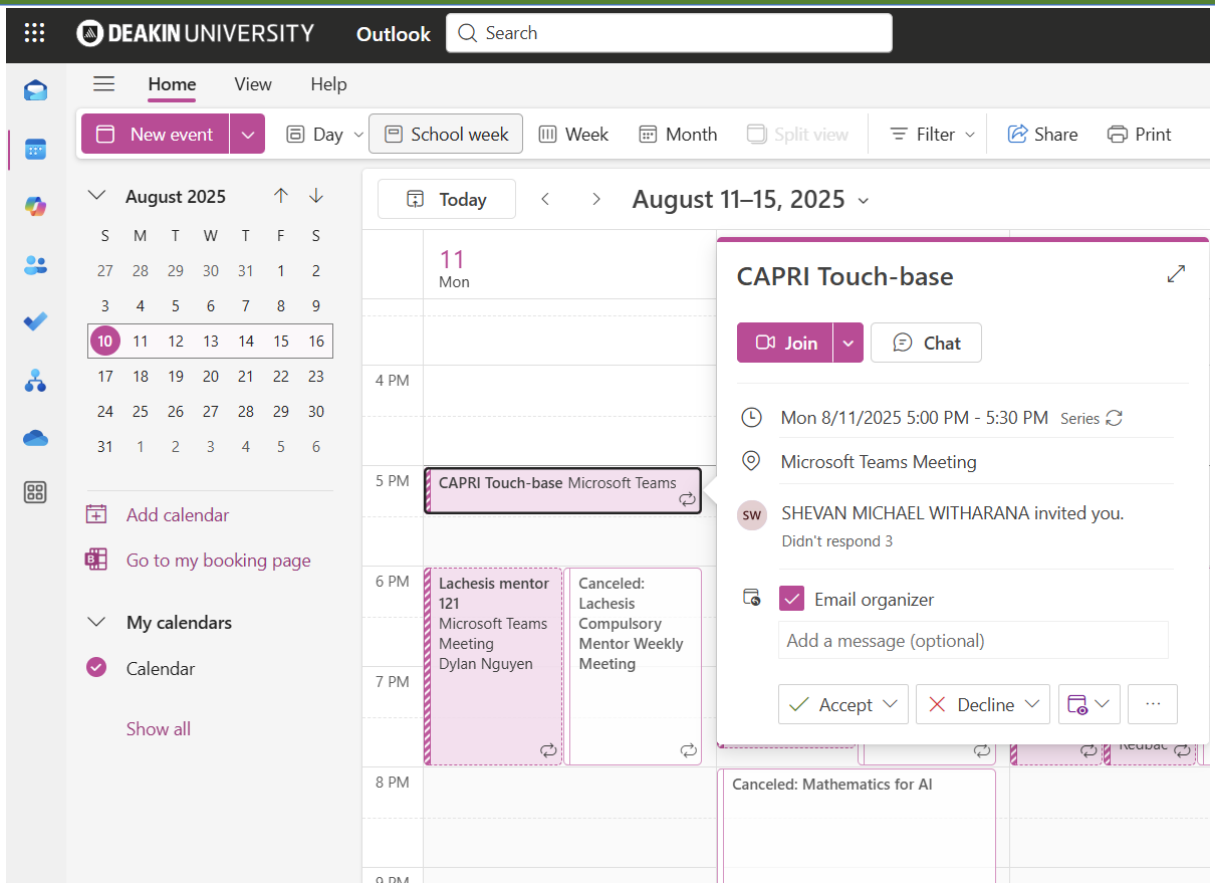
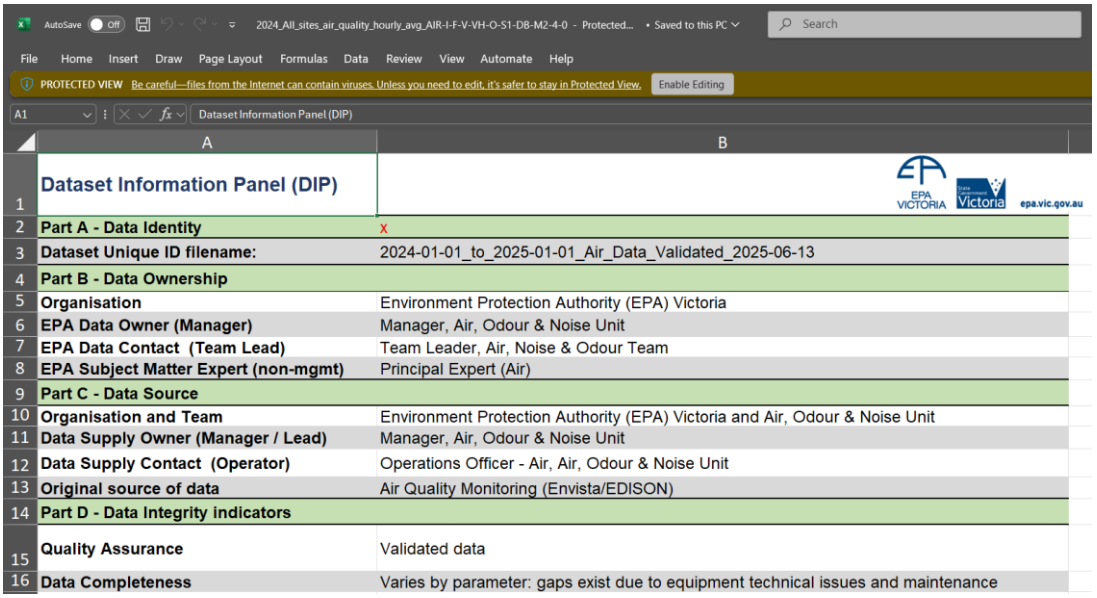


8. Dataset Gathering



Dataset Information Panel (DIP)

Part A - Data Identity	x
Dataset Unique ID filename:	2024-01-01_to_2025-01-01_Air_Data_Validated_2025-06-13
Part B - Data Ownership	
Organisation	Environment Protection Authority (EPA) Victoria
EPA Data Owner (Manager)	Manager, Air, Odour & Noise Unit
EPA Data Contact (Team Lead)	Team Leader, Air, Noise & Odour Team
EPA Subject Matter Expert (non-mgmt)	Principal Expert (Air)
Part C - Data Source	
Organisation and Team	Environment Protection Authority (EPA) Victoria and Air, Odour & Noise Unit
Data Supply Owner (Manager / Lead)	Manager, Air, Odour & Noise Unit
Data Supply Contact (Operator)	Operations Officer - Air, Air, Odour & Noise Unit
Original source of data	Air Quality Monitoring (Envista/EDISON)
Part D - Data Integrity indicators	
Quality Assurance	Validated data
Data Completeness	Varies by parameter: gaps exist due to equipment technical issues and maintenance

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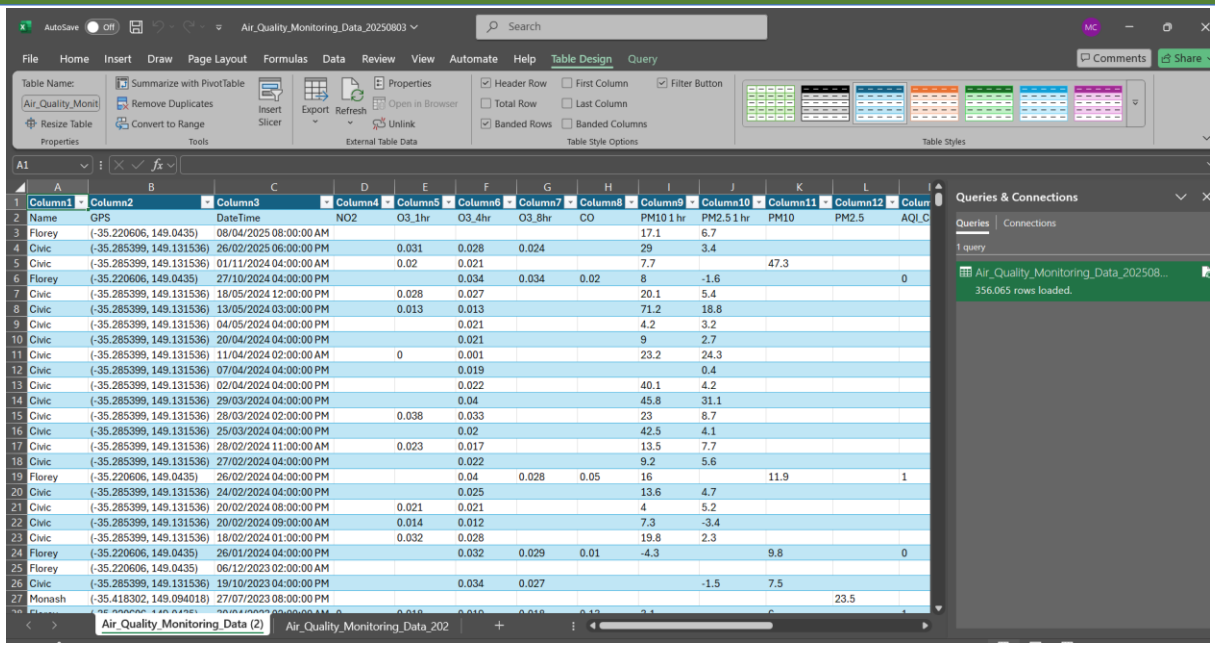

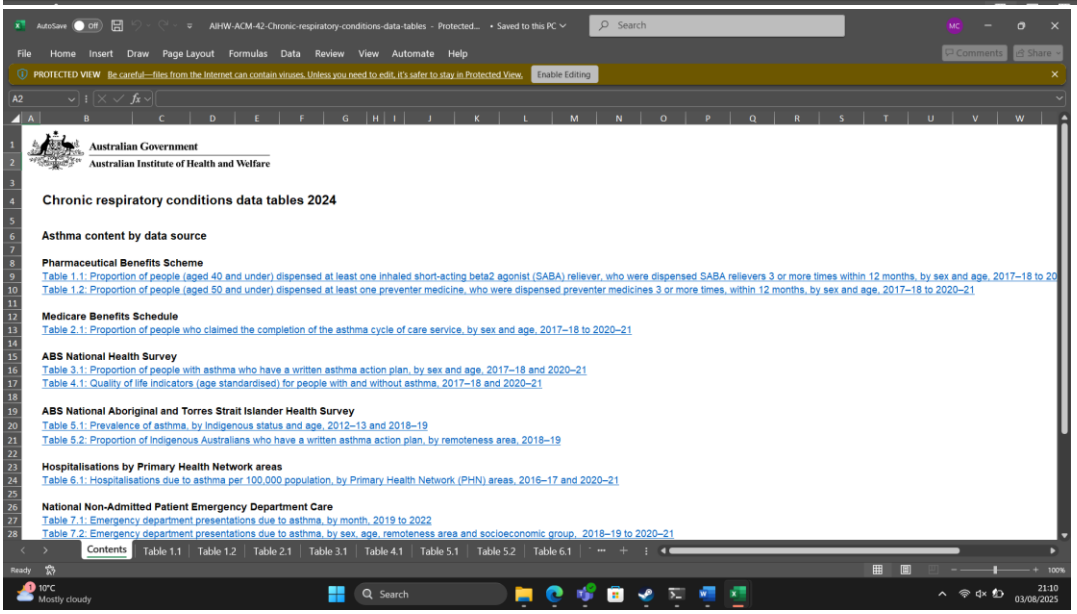

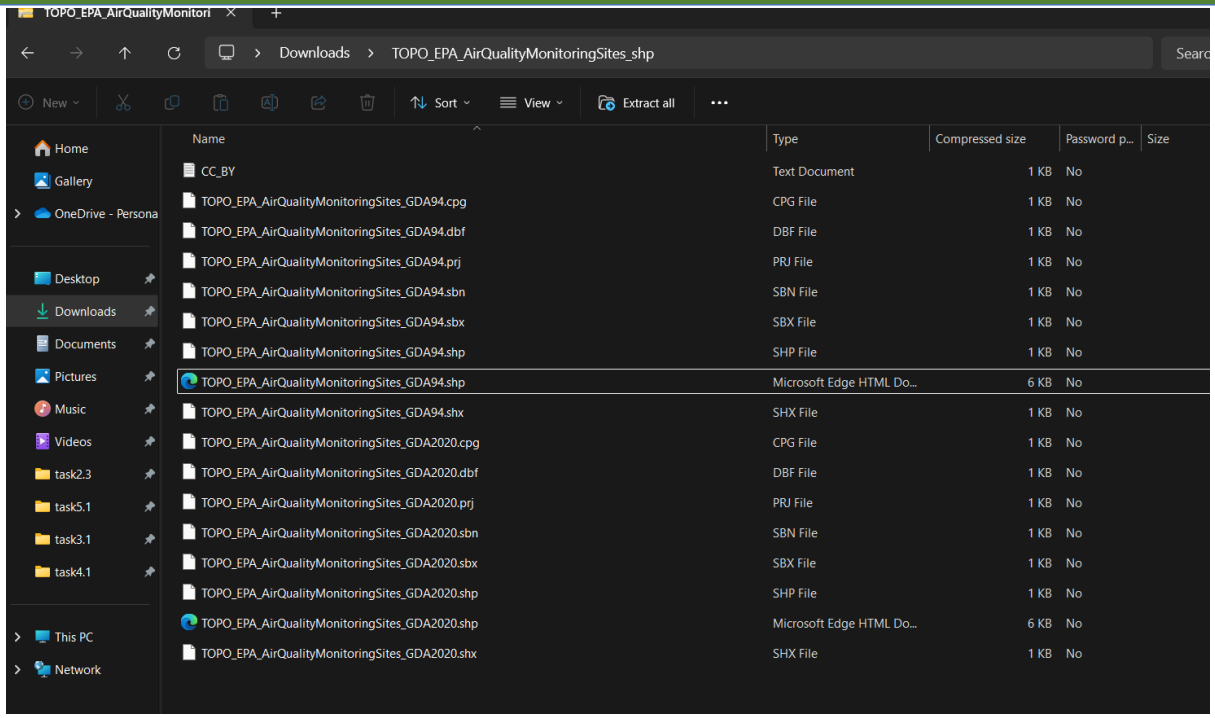

9. Update Agile Project Planner:

Revised the shared team planner to reflect new team roles, current priorities, and iterative milestones.

So what? This ensures transparency, accountability, and efficient sprint execution as our project's scales.