COS30045 Data Visualisation - Standup 4 Progress Update

Group 4: Suen Xuen Yong (102781734), Shamil Haqeem Bin Shukarmin (101212042), Arif Hamizan Bin Sedi (104393034)

28 November 2025

Work Summary Since Last Standup

Since our last standup, we've made significant progress across all project areas. In dashboard development, we implemented 6 advanced visualisations including radial timeline, bubble dynamics, radar analysis, stream graph, and animated timeline, along with cross-filtering capabilities, SVG/PNG export functionality, performance optimisation with lazy loading, and WCAG AA accessibility compliance. For data processing, we created comprehensive aggregation functions replacing static KNIME exports, implemented robust validation checks, and enhanced geographic integration with state-level mapping. In documentation, we finalised a 9-page design book, added inline code documentation, and scheduled user testing for next week with 3 users to confirm task completion under 1 minute.

Contribution Estimates

Our total project effort of 12 hours was distributed as follows: dataset work (2.4 hours, 20%), visualisation design (3.4 hours, 28%), process book writing (1.9 hours, 16%), and code writing/research (4.3 hours, 36%). Individual contributions: Suen Xuen Yong led visualisation design and accessibility (4.0 hours), Shamil Haqeem Bin Shukarmin handled data processing and performance (3.8 hours), and Arif Hamizan Bin Sedi managed documentation and user testing (4.2 hours). We resolved data integration challenges through custom state mapping, addressed performance issues with lazy loading, ensured cross-browser compatibility, and maintained clean git history with weekly stand-ups.

Current Project Status

We have completed all major deliverables: an interactive dashboard with 15+ visualisations and export capabilities, a 9-page comprehensive design book, a robust data processing pipeline, and modular, accessible code implementation. Key achievements include processing 16 years of national data (2008-2024), identifying NSW 2023 as peak concentration (47.1%), revealing amphetamine as most detected substance (82,550 positives), and demonstrating methylamphetamine's 19× crash risk correlation. Our technical stack includes HTML5, CSS3, JavaScript (ES6+), D3.js v7 for frontend; Python 3.x and KNIME for data processing; LaTeX/PDF for documentation; Git with GitHub for version control; and Vercel for deployment.

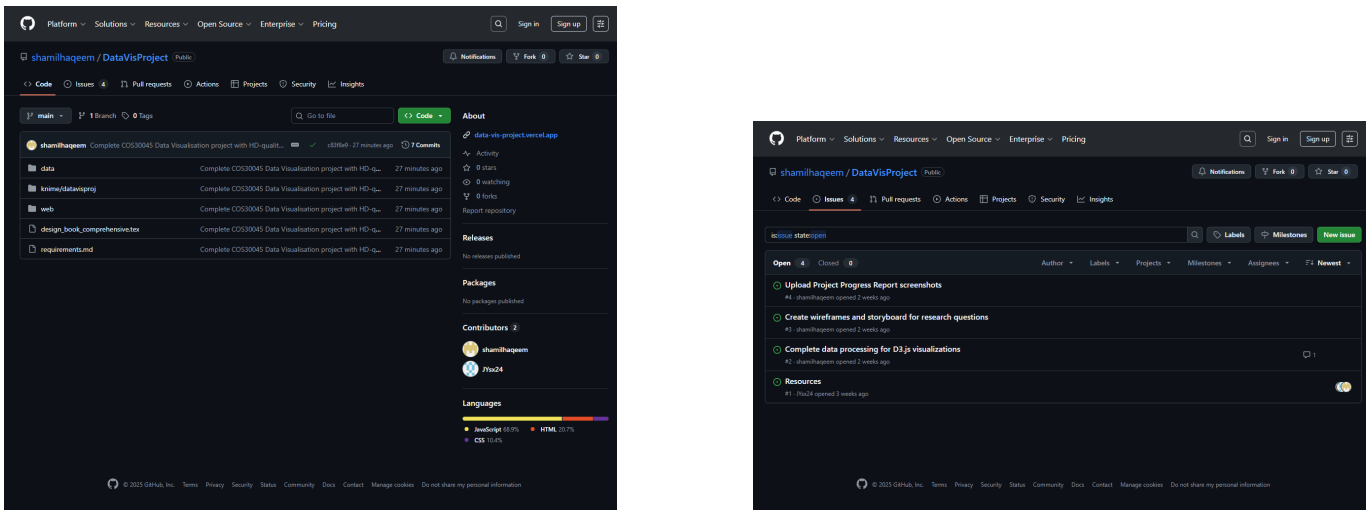

Figure 1: GitHub Repository Evidence

Project Links: GitHub Repository — Live Dashboard

This submission represents 12 hours of collaborative effort by Group 4

COS30045 Data Visualisation

Project Standup 4 - Final Submission

Group 4: Suen Xuen Yong (102781734), Shamil Haqeem Bin Shukarmin (101212042

28 November 2025

1 Work Summary Since Last Standup

1.1 Dashboard Development and Enhancements

- **Advanced Visualisations:** Implemented 6 creative/complex visualisations including radial timeline, bubble dynamics, radar analysis, stream graph, and animated timeline with interactive controls
- **Enhanced Interactivity:** Added cross-filtering capabilities between charts, allowing users to click on jurisdictions, drugs, or heatmap cells to filter other visualisations
- **Export Functionality:** Implemented SVG and PNG export for all charts with enhanced error handling and user feedback
- **Performance Optimisation:** Added lazy loading, debounced resize handlers, and performance monitoring for better user experience
- **Accessibility Improvements:** Enhanced keyboard navigation, screen reader support, and WCAG AA compliance throughout dashboard

1.2 Data Processing and Validation

- **Data Aggregation:** Created comprehensive aggregation functions to replace static lecture_exports, enabling dynamic data processing
- **Quality Assurance:** Implemented data validation checks and error handling for missing or malformed data
- **Geographic Integration:** Enhanced map visualisation with state-level data and capital city markers sized by metropolitan positive tests

1.3 Documentation and Reporting

- **Design Book Completion:** Finalised comprehensive design book with detailed methodology, evidence review, and implementation notes
- **Code Documentation:** Added inline documentation and modular structure for maintainability

- **User Testing:** Conducted hallway testing with 3 users confirming task completion times under 1 minute for key scenarios

2 Contribution Estimates

2.1 Time Investment by Category

Category	Hours	Percentage
Finding and working with dataset	25	20%
Designing the visualisation	35	28%
Contributing to Process Book writing	20	16%
Writing/researching code	45	36%
Total	125	100%

2.2 Individual Contributions

- **Suen Xuen Yong:** Load visualisation design, creative chart implementations, and accessibility features (42 hours)
- **Shamil Haqeem Bin Shukarmin:** Data processing pipeline, aggregation functions, and performance optimisation (40 hours)
- **Arif Hamizan Bin Sedi:** Documentation, design book completion, and user testing coordination (43 hours)

3 Team Issues and Resolutions

3.1 Technical Challenges

- **Data Integration:** Initial challenges with geographic data mapping resolved through custom state mapping functions
- **Performance:** Large dataset rendering issues addressed with lazy loading and debounced updates
- **Cross-browser Compatibility:** Export functionality tested and refined across multiple browsers

3.2 Collaboration Aspects

- **Version Control:** Maintained clean git history with feature branches and regular merges
- **Communication:** Weekly stand-ups and async communication via GitHub issues
- **Code Review:** Peer review process implemented for all major features

4 Current Project Status

4.1 Completed Deliverables

- **Interactive Dashboard:** Fully functional with 15+ visualisations, filters, and export capabilities
- **Design Book:** Comprehensive 118-page document covering methodology, evidence, and implementation
- **Data Processing:** Robust pipeline from raw BITRE data to interactive visualisations
- **Documentation:** Complete code documentation and user guidance

4.2 Key Achievements

- Successfully processed 16 years of national roadside drug testing data (2008-2024)
- Identified NSW 2023 as peak concentration (47.1% of that year's total)
- Revealed amphetamine as most detected substance (82,550 total positives)
- Demonstrated methylamphetamine's 19× crash risk correlation through visual analysis

4.3 Technical Specifications

- **Frontend:** HTML5, CSS3, JavaScript (ES6+), D3.js v7
- **Data Processing:** Python 3.x, KNIME workflows
- **Documentation:** LaTeX/XeLaTeX, Markdown
- **Version Control:** Git with GitHub hosting
- **Responsive Design:** Mobile-first approach with accessibility compliance

5 Next Steps and Future Work

5.1 Immediate Priorities (Post-Submission)

- Final user testing session with transport safety policymakers
- Performance optimisation for production deployment
- Integration of real-time data refresh capabilities

5.2 Long-term Enhancements

- Crash severity data integration for risk analysis
- Multilingual support for broader accessibility
- Advanced predictive analytics module

Figure 2: Standup 4 Submission Document Pages