

COS30045 Data Visualisation

Project Standup 4 - Final Submission

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

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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 `knife_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:** Lead visualisation design, creative chart implementations, and accessibility features (42 hours)
- **Shamil Haqem 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

6 Conclusion

The Australian Police Drug Testing Dashboard represents a comprehensive analysis of 16 years of national enforcement data, successfully transforming complex datasets into actionable insights for transport safety policymakers. The project demonstrates advanced data visualisation techniques, robust technical implementation, and evidence-based design principles.

All deliverables are substantially complete and ready for final submission. The team has maintained effective collaboration throughout the project lifecycle, delivering a high-quality solution that meets all rubric requirements and provides genuine value to the target audience.