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Assuring Digital Success

CASE STUDY

TRANSPORT INDUSTRY

KJR delivering a quality data pipeline to enable smarter decisions & greater public value

Austroads

Project: Austroads Data Management Platform Automated Acceptance Testing

KEY OUTCOME 1

Enhanced dashboard trust and accuracy

KEY OUTCOME 2

Confidence in production deployments

KEY OUTCOME 3

End to end functionality tested with over 300 automated tests

BACKGROUND

Austroads is the association of Australian and New Zealand transport agencies, leading national efforts to improve the safety, productivity, and sustainability of the road network. With strong in-house expertise in data, technology, and research, Austroads partners with industry to deliver complex, future-focused solutions.

To support these outcomes, Austroads engaged KJR to assist with the delivery of a large-scale telematics data platform using Databricks. The platform ingests data from heavy vehicles through the National Telematics Framework—capturing position, mass, alarms, and configuration—before applying multi-stage transformations including ingestion, cleanse, enrichment, and aggregation.

The enriched data is visualised through the Telematics Analytics Platform (TAP) to support transport analysis, regulation, and planning. Due to the volume and complexity of the data pipeline, automated testing was essential. KJR designed and implemented a robust framework to validate each transformation stage and ensure data quality and consistency throughout the platform.

CHALLENGE

Austroads required end-to-end testing for a complex, high volume data pipeline that processed millions of telematics records collected from vehicles operating across Australasia. Each record underwent multiple transformation stages, including cleaning, enrichment, and aggregation.

Cleaning involved removing duplicates and filtering out implausible mass readings. Enrichment added geospatial mapping, derived calculations, and jurisdiction tagging before aggregation for reporting and analysis.

The challenge was ensuring data integrity and accuracy at every stage without manual testing. The solution had to support continuous deployments and provide fast, reliable feedback to agile development teams, enabling early detection of data quality issues in a dynamic environment.

SOLUTION

KJR developed over 300 automated test cases using a behaviour-driven development test framework, aligned with a version-controlled CI/CD pipeline. Message templates stored in a test automation database simulated realistic telematics scenarios. Tests validated ingestion, data cleaning, enrichment—including geospatial joins, jurisdiction tagging, speed and distance calculations—and aggregation.

Integration with Databricks and a cloud storage solution enabled in-platform validation. Test execution was automatically triggered on deployment to the test environment, with results reported directly into a test management and reporting tool, enabling timely, traceable feedback to the development team and supporting rapid iterations.

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DELIVERABLES

KJR delivered a comprehensive test automation framework that integrated directly with Austroads' deployment pipeline and data environment. Key deliverables included:

- 300+ behaviour-driven development test framework test cases across ingestion, cleaning, enrichment, and aggregation
- Test message templates for realistic telematics data simulation
- Integration with a version-controlled CI/CD pipeline for continuous test execution
- Real-time test reporting into a test management and reporting tool for traceability and reporting

KEY OUTCOMES

KJR's test automation framework transformed Austroads' data validation process from manual and reactive to automated, proactive, and continuous. Over 300 test cases ensured comprehensive coverage of key transformation stages—validating that ingestion logic correctly handled message formats, cleaning logic removed duplicates and detected implausible values, and enrichment processes accurately calculated speed/distance metrics and mapped records to enrolments, jurisdictions, and road segments. Aggregated output was validated to ensure consistency and correctness across grouped data.

The framework was integrated into a version-controlled CI/CD pipeline, triggering tests on deployment to the test environment. This provided real-time validation feedback via a test management and reporting tool, helping the development team catch and resolve issues early.

This full-stack, automated testing approach led to faster defect identification, higher development velocity, and improved overall data quality. By embedding testing into the delivery pipeline, KJR enabled continuous assurance and reduced the risk of flawed data reaching production. The outcome was a more stable, trusted data platform that supports evidence-based decision-making and regulatory oversight in the transport sector.

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VALUE TO CLIENT

KJR's test automation solution provided long-term value by embedding high-confidence, continuous data validation into Austroads' delivery processes. By automating over 300 tests and integrating them into the CI/CD pipeline, Austroads was able to identify issues early in the development lifecycle—reducing costly rework and improving data integrity from the source. The solution covered all stages, from ingestion to dashboard presentation, enabling full visibility into transformation accuracy.

The integration with the test management and reporting tool enabled clear traceability of test outcomes to user stories and requirements, allowing faster triage of issues and tighter alignment between testing and development.

Furthermore, KJR delivered maintainable, documented test assets and upskilled the Austroads team to execute and extend tests independently. This future-proofed the solution and empowered Austroads to maintain rigorous quality assurance as the platform evolves. The automation has reduced regression risks, supported agile delivery, and enabled rapid response to data issues, enhancing the platform's overall reliability and credibility. The outcome was a robust, high-quality data pipeline that empowers Austroads to make better, data-driven decisions and deliver greater public value.

"***KJR made a significant impact on our Data Management Platform project by delivering a high-quality, fully automated regression suite. Their team demonstrated strong technical capability, designing scalable and maintainable test automation solutions and integrating them seamlessly into our CI/CD workflows.***

Equally commendable was their collaborative working style—they communicated clearly, responded quickly to changing priorities, and worked closely with all the developers and other project team members, consistently adding value across sprints, aligning on the goals and deliverables.

Thanks to Renard and the wider team for their dedicated efforts on this project. KJR is a highly reliable partner we would gladly recommend."

— Mithra Sujith Test Manager Austroads

TOOLS & TECHNOLOGIES

Databricks

databricks