

By using Jumar Solutions and the Project Phoenix automation software, these phases were completed in a fraction of the time it would have taken to manually undertake a project of this nature for a system the size and complexity of TRAILS.

The work completed to date identifies the current state and the architecture vision for the future.

The next phase in the process is component provisioning.

Paul McRae comments, "The combination of Jumar's experienced consultancy team and their unique Project Phoenix software, coupled with the business knowledge and experience brought by the staff here at Queensland Transport, has resulted in excellent progress to date. Our next challenge is to cut the first component from TRAILS and we are hoping that Jumar's automation expertise will continue to reduce the manual effort during this pilot project phase and beyond."

## The Benefits

Some of the benefits to Queensland Transport of componentising TRAILS in this way include:

### Clear Vision of Direction

The well structured, pragmatic architecture definition helps communication between the development and management teams, allows the definition of a reliable roll-out plan and ensures that everyone is working towards the same goal.

### Reduced Complexity

By understanding which components are to be realised and how they relate to each other, it becomes possible to apply component-based development elements only where necessary, thus saving time and resources. Risk is reduced by analysing models in detail, in advance, to help clarify and quantify the significance of key transitioning issues.

### Increased Opportunity for Re-use

Well-defined component interfaces with clear specifications help promote re-use and allow existing TRAILS functionality to be more easily exposed to consumers.

### Parallel Development

By identifying components and a migration strategy it is possible to run parallel development. Scoping elements of work and releases is easier because the dependencies between components and their services are better understood through the elaboration of the component architecture.

### Solid Basis for Future Transition Planning

The project provides a clear understanding of which components are going to be created and how these relate to each other.

Queensland Transport plans to follow the CBD roadmap as closely as possible. Specification types are already being used in the TRAILS Gen web user interface. The department has recently developed a reference data component and purchased a message handling component.

Queensland Transport will take an opportunistic implementation approach and will take any opportunities that arise to introduce componentisation. This reflects the total commitment to the componentisation of TRAILS.

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# Queensland Transport The Future Vision for TRAILS



## Background

Queensland Transport is the state government department responsible for regulating transport over land, sea and air in Queensland, Australia. It serves 4.1 million people in an area of 1.06 million square miles.

Queensland Transport's Transport Registration and Integrated Licensing System (TRAILS) handles all driver licensing and vehicle/trailer/ship registrations within the state. With 120 million transactions per year, it is Queensland Government's largest application. TRAILS is a strategic application for Queensland Transport and is expected to have a

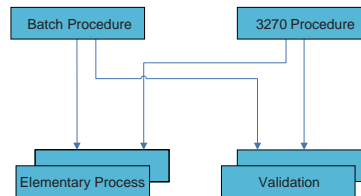
long and useful life. Consequently, there has been significant investment in the application and re-use is a priority.

TRAILS currently runs on an IBM mainframe with a zOS/CICS/DB2 operating system using CA Gen 6.5 and 7.5. Queensland Transport has been using Gen since the early days of the product when it was known as IEF.

Gen's model-driven development capabilities align to the strategic direction for development within Queensland Transport.

## The Challenge

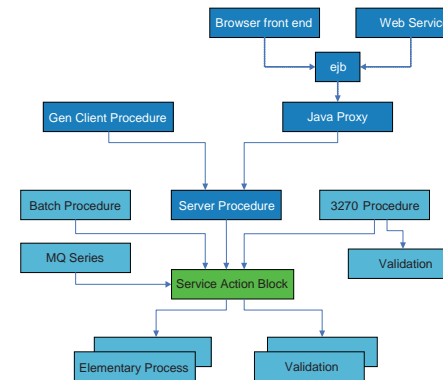
TRAILS is accessed by departmental staff via 3270 terminal emulation and by selected external users via web services. The current TRAILS system evolved from a traditional mainframe development



pictured below. With the increasing demand for services and web access to elements of the TRAILS application, Queensland Transport needed to provide external parties (including the general public) with easier access to information and the ability to complete certain transactions online.

In 1997 Queensland Transport adopted a service-oriented architecture (SOA) approach. The service action block was introduced to support business

services. The services could then be consumed and exposed through different channels. The architecture has now evolved to offer the services via web services to external partners, via a Java browser front-end to the general public, via a Gen browser front-end for internal staff and via WebSphere MQ (formerly MQSeries) for business-to-business communications.



The SOA within TRAILS is very mature and a significant amount of TRAILS functionality is exposed as business services. However, TRAILS is still very tightly coupled from an entity and code perspective. Queensland Transport made a strategic decision to componentise TRAILS using a component-based development approach.

In November 2005, Queensland Transport began the journey to componentise TRAILS. The aim was to identify and extract components that align to key functional areas within TRAILS. This would provide the flexibility and agility for TRAILS to be more

responsive to business demands, and provide a software layer that better supports the SOA approach.

Paul McRae, Enterprise Architect at Queensland Transport, says "Despite our mature SOA, we have a philosophy of continuous improvement and recognised the opportunities that componentisation offered. We made a strategic decision to introduce a component-based development approach to TRAILS."

Queensland Transport consulted Jumar Solutions to help define the target component architecture.

## The Solution

Queensland Transport developed a 'CBD roadmap' to detail the future vision for TRAILS. The roadmap presents a clear view of what the department plans to achieve and the impact on the existing TRAILS structure. It also helps with planning and prioritisation and provides volumetrics to help quantify the associated transitioning costs. Senior management fully support the roadmap, which will smooth the progress of the required activities.

Jumar worked closely with Queensland Transport staff during the architecture definition phase of the componentisation project and used its Project Phoenix analysis software to help identify the logical series of steps to complete the future architecture vision.

Jumar's Project Phoenix is a collection of configurable software tools and services that allow traditional Gen applications to be modernised with automation support. The configurable automation allows advanced analysis, editing and restructuring of Gen models to meet customer modernisation requirements.

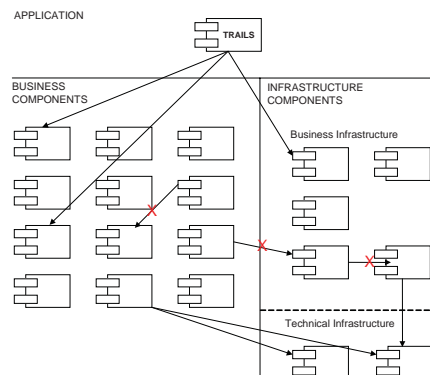
The componentisation of TRAILS was detailed in four project phases: initial component architecture; detailed component architecture; detailed component specification and component provisioning (re-engineering).

### Initial Component Architecture

This phase identified the candidate business and technical components required to support the TRAILS application and created a catalogue detailing their name, description, rationale, priority, candidate interfaces and main entity types supported.

### Detailed Component Architecture

This phase refined the component architecture and further expanded the component definitions and classified components as either business, business infrastructure or technical infrastructure (see diagram below for component consumption rules).



Key design decisions were made around component layering, referential integrity, use of return/reason codes, performance, CBD standards and the development of a component provisioning team.

### Detailed Component Specification

Based on outputs from the detailed component architecture phase, Jumar delivered the specification types and translator action blocks for 24 components to support the future CBD transitioning of TRAILS. Project Phoenix automation software was used to create almost 500 specification types and 1000 translator action blocks from specification type to entity type mapping information (a primary deliverable from the detailed component architecture phase).

Detailed component specifications for the public operations are still to be created.

### Component Provisioning (Re-Engineering)

This future phase involves a combination of procuring and tailoring selected infrastructure components from the marketplace and re-using TRAILS functionality, where possible, to create components by transitioning the existing implementation code. Queensland Transport and Jumar will prove the concept by 'cutting' a small compact component out of the main TRAILS system via an initial pilot project. This involves selecting the component to be cut, isolating and modularising the component to break the direct connections that currently exist in TRAILS and substituting calls to the new component operations where appropriate.

A successful pilot will provide the building blocks for the remaining componentisation of TRAILS.

## The Results So Far

Queensland Transport, with support from Jumar, has now completed both the initial component architecture and detailed component architecture phases and has started the detailed component specification phase.

A repeatable process will be defined so that the same techniques, metrics and procedures can be used on subsequent component provisioning activities.

Andy Scott, Operations Director at Jumar, explains, "Our Project Phoenix analysis software helped Queensland Transport architects to focus on the areas within TRAILS that are problematic from a componentisation perspective. Over 50 per cent of the action blocks within TRAILS were automatically allocated to the correct component with no manual intervention required. Project Phoenix reporting helped to distil the information and focus attention on the difficult areas. This helped to maximise the involvement of the architects and make the overall process more manageable."

Once the required mapping between the component specification and implementation layers was defined, then the creation of supporting specification types and translator action blocks for the 24 components was completed by Jumar from the United Kingdom as an outsource assignment. Jumar was able to deliver the results to Queensland Transport in 10 days using Project Phoenix automation. This represents significant time and cost savings when compared with traditional approaches.

Jumar is looking forward to working closely with Queensland Transport during the pilot project phase to help define a repeatable process for provisioning components from TRAILS and demonstrate how further savings can be made in areas that typically involve huge amounts of manual transitioning effort."

The first two phases required analysis of a considerable number of objects to establish component ownership: almost 700 existing entity types, 700 procedures and more than 7500 action diagrams.