

Downer's EAM Journey

EAM Success through Integrated Technologies



Introduction

Uchiraka Yatawara, Websphere Applications Manager

E: Uchiraka.Yatawara@downergroup.com **M:** +61 437 099 677

Abhijeet Rajankar – EAM Technical Manager

E: Abhijeet.Rajankar@downergroup.com **M:** +61 421 716 556

Gideon Olivar – Senior Functional Consultant

E: Gideon.Olivar@downergroup.com **M:** +61 467 732 257



Downer Company Profile

WORK-IN-HAND

\$20B

REVENUE

\$7B

EMPLOYEES

20,000+

LOCATIONS

**AUSTRALIA,
NEW ZEALAND,
ASIA PACIFIC,
SOUTH AMERICA
AND SOUTH
AFRICA**

- **Overview**
 - Leading provider of engineering and infrastructure management services to public and private sectors
 - Located predominantly in Australia, New Zealand and the Asia-Pacific region
- **Market Sectors**
 - Minerals and Metals
 - Oil and Gas
 - Transport
 - Power
 - Communications
 - Property
- **Operating Divisions**
 - Downer Infrastructure
 - Downer NZ
 - Downer Mining
 - Downer Rail



Downer Rail

WORK-IN-HAND

\$5.2B

REVENUE

\$1.1B

EMPLOYEES

2,500



- **Overview**
 - The leading provider and maintainer of freight and passenger rolling stock in Australia.
- **Operates**
 - 3 engineering design centres
 - 4 manufacturing plants
 - 20+ maintenance facilities in Australia.
- **Asset Management Services**
 - Passenger rolling stock
 - Freight rolling stock
 - Simulators
 - Locomotives
 - Operations and maintenance facilities



Success Through Integration

Sydney's Waratah Trains



Waratah Train Project

In 2006 Downer entered in to an agreement as a major contractor to the Waratah Train Project with Public Private Partnership (PPP). WTP is the largest rolling stock procurement project ever undertaken in Australia.



Three Core Elements

Auburn
Maintenance Centre

1. Designing, building and commissioning the Auburn Maintenance Centre



78 eight-car train sets

2. Designing, building and commissioning 78 eight-car train sets for use on the Sydney rail network



30-year Through-Life-
Support contract

3. Maintaining all 78 train sets as part of a 30-year Through-Life-Support contract.



Waratah Trains

- Named after NSW's floral emblem 'Waratah'
- A Waratah (Also known as an A-Set) comprises of 8 Cars. This includes 2 Driver Cars, 4 Motor Cars and 2 Trailer Cars.
- Automatic Climate Control
- Live CCTV Streaming with more than 150 CCTV cameras per train
- Advanced Fire Detection
- Improved lighting using energy efficient LED lighting, which is world first for passenger trains
- Smart Air Conditioning and 3G network connectivity

Waratah Train Project – Current Status



Waratah Train Project - Current Status

- 39 new trains are already in passenger service
- 20 more trains are in production
- Expected completion is end of 2014.

Systems Opportunity

- The project required a 'best of breed' approach to an EAM solution
- Highly available integration platform for real-time transactions
- IBM products were selected as the core platform
- Integration required for existing legacy systems
- Foundation EAM can be leveraged
- Provides a focus to build and align support capability

Why IBM Technologies?

- Successful implementations already exist across the organization
- Internal capabilities to support the implementation and Business As Usual (BAU).
- Ability to leverage from existing EAM (Maximo), Integration (Websphere) and Service Management (Tivoli) practises.

IBM Product Suite

- IBM Maximo Enterprise Asset Manager
- IBM Maximo Asset Configuration Manager
- IBM Maximo for Transportation
- IBM Maximo Service Request Manager
- IBM Maximo Asset Navigator
- IBM Maximo Calibration
- IBM SLA Manager
- IBM Maximo Adaptor for Microsoft Project
- IBM Maximo for Service Providers
- IBM Websphere Message Broker
- IBM Websphere MQ
- IBM Websphere Partner Gateway
- IBM Websphere Application Server
- IBM Tivoli Omnibus and Network Manager
- IBM Tivoli NetCool/Omnibus Gateway
- IBM Smart Cloud Control Desk



System Challenges

Supporting 'state of the art' fleet rollout

- Managing asset configuration and maintenance activities
- Ability to provide feedback to the production line



30-year Through-Life-Support contract

- Ability to effectively manage and report against a detailed contract with multiple stakeholders



High priority real-time B2B Transactions

- Ability to integrate with multiple internal and external systems via highly available integration platform.



Legacy Systems and Business Transformation

- Ability to maintain integration to and from legacy systems
- Downer transformation activities

Fleet Management Facilities System (FMFS)

FMFS:

- Maintenance Management
- Set Planning & Analysis
- Fleet Network Display
- Train Crew Display Emulator
- Data Mart

Click to open selected application in a new browser window

Downer
Welcome: Uchirako Yafawara

CityRider

FMFS Release and Schedule

“A Day in the Life of the Business..”

OPERATIONS

- Train schedules refined to optimise use of fleet
- Trains monitored in operation to minimise Incidents
- Faults identified/analysed -> preventive maintenance

MAINTENANCE

- Work orders issued to maintenance personnel
- Scheduled maintenance performed
- Faults rectified

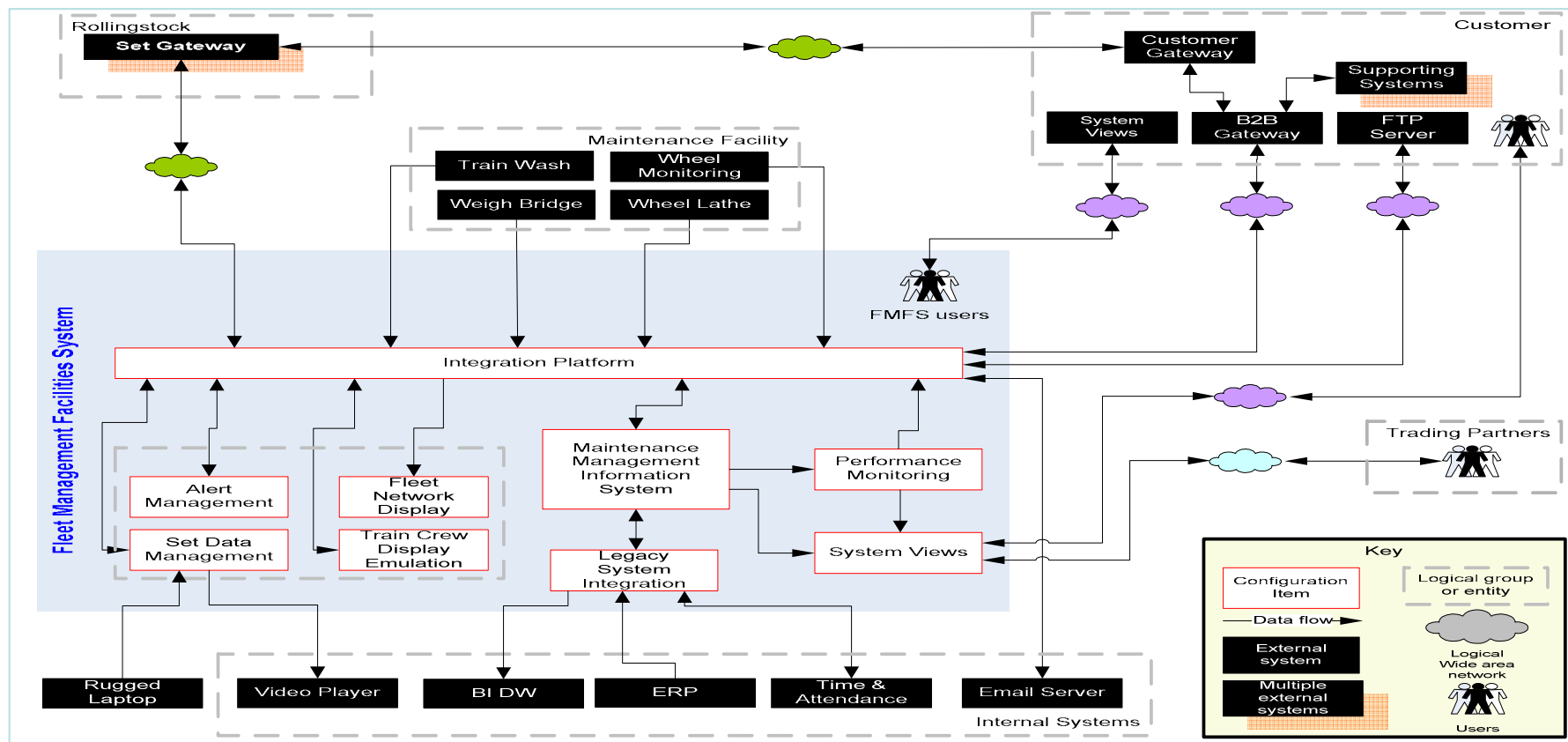
CONTRACTUAL

- Daily negotiation of all invoice affecting items
- Required trains made available to operate
- Daily Performance monitoring & revenue calculation
- Monthly invoice calculated & supporting data provided

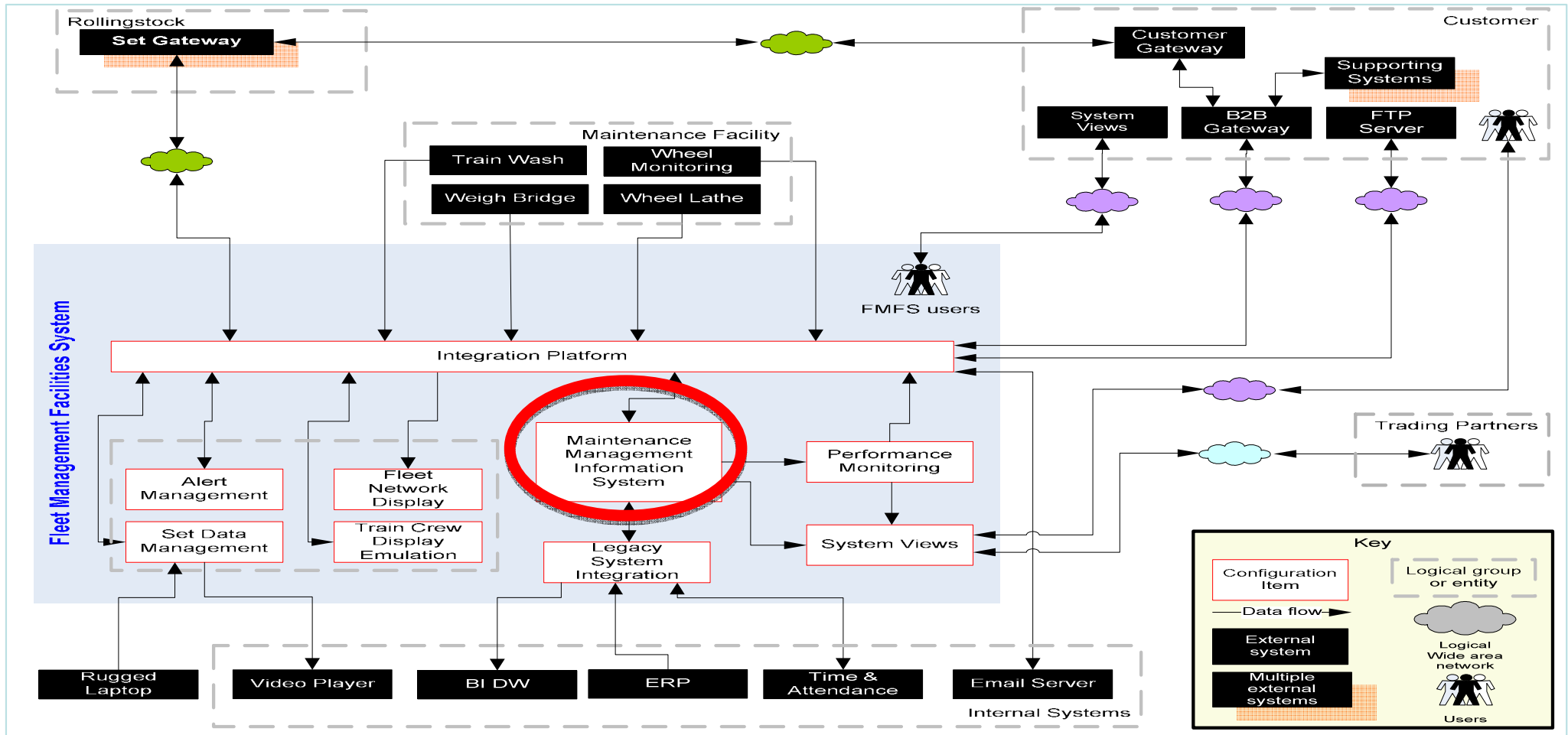


FMFS Solution in Focus

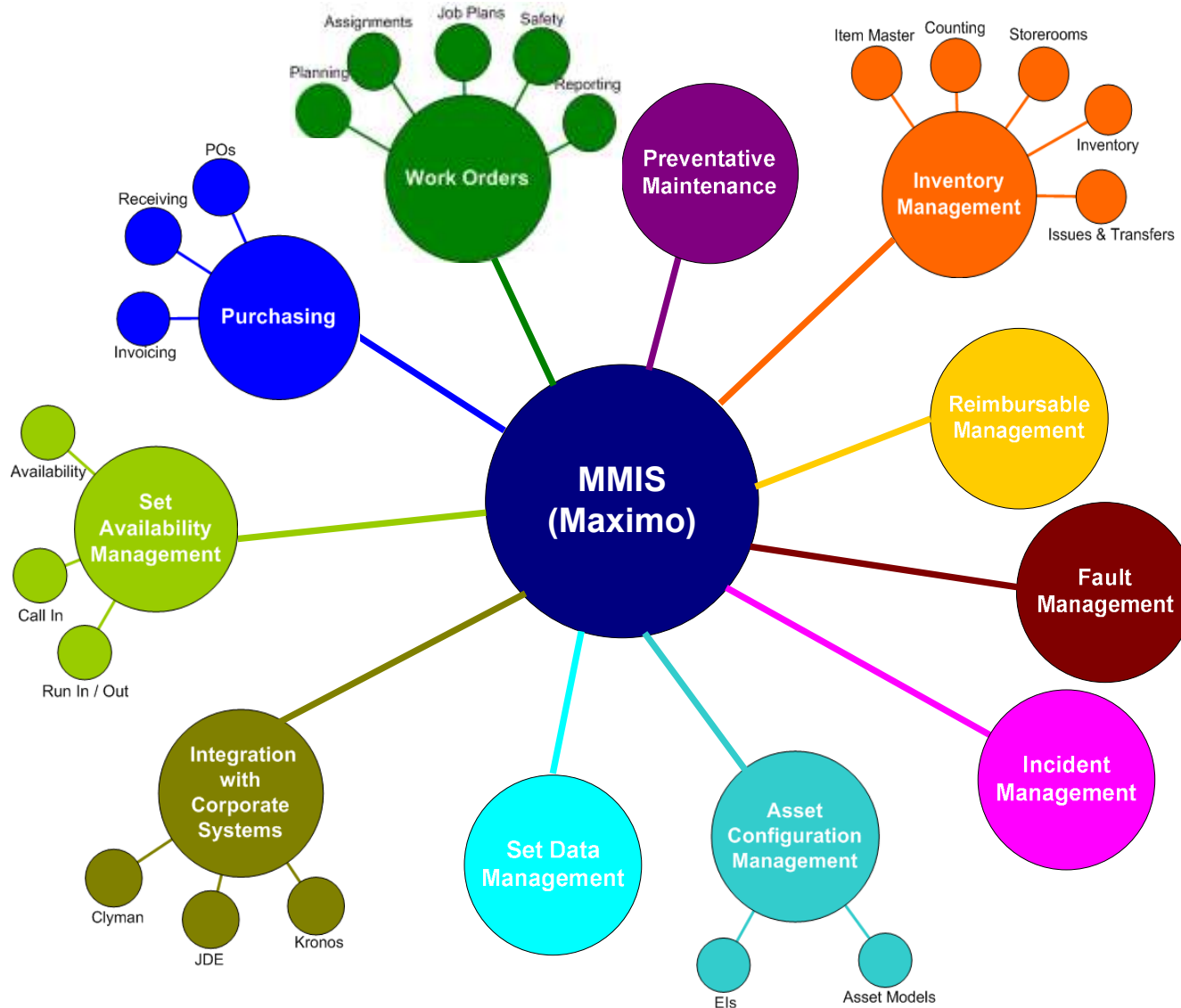
The Fleet Management Facilities System (FMFS) is a customisable, reusable application that integrates all aspects of the value chain and provides interoperability with customer's applications.



Maintenance Management Information System (MMIS)



Maintenance Management Information System (MMIS)



Key Business Outcomes - MMIS

- Day to day processes are stream lined and relevant information is easily accessed and reported on.
- Up skilling users with leading edge Asset Management System knowledge.
- Perform Maintenance – both Proactive and Reactive.
- Manage Inventory.
- Defining and Managing KPIs
- Manage Business Work flow processes
- Increased job satisfaction from improved platform and efficiencies.

Integration Requirements Vs. Challenges

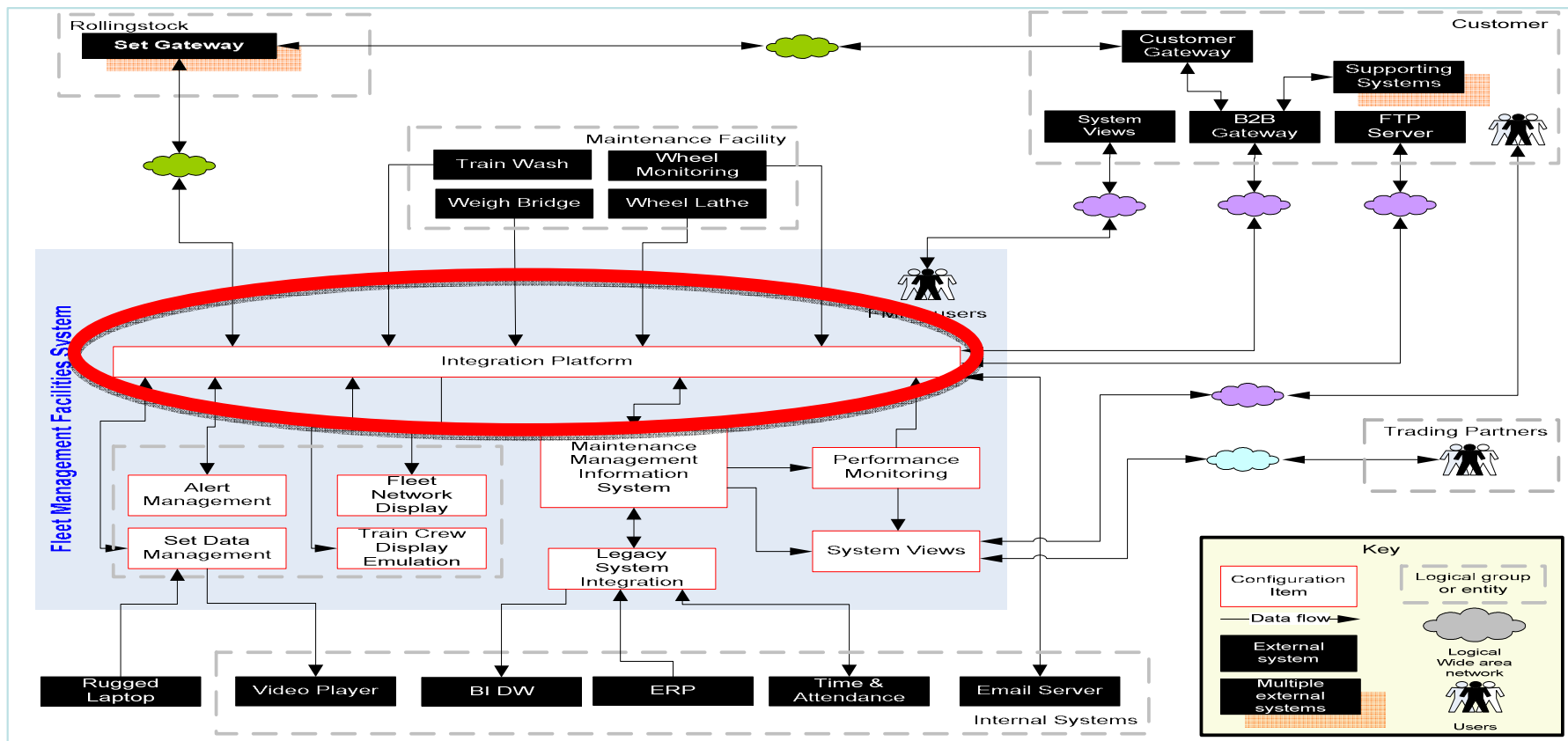
- Traceability of high priority, business critical transactions.
- Ensure secured transactions between Downer and the client for sensitive, commercially confidence data transfers.
- A service integration model that is capable of communicating to trains.
- Ability to translate multiple subscription requests from several sub systems to a unified layer of communication.
- Availability and scalability of the integration platform in an event of failure.

Common Integration Platform?

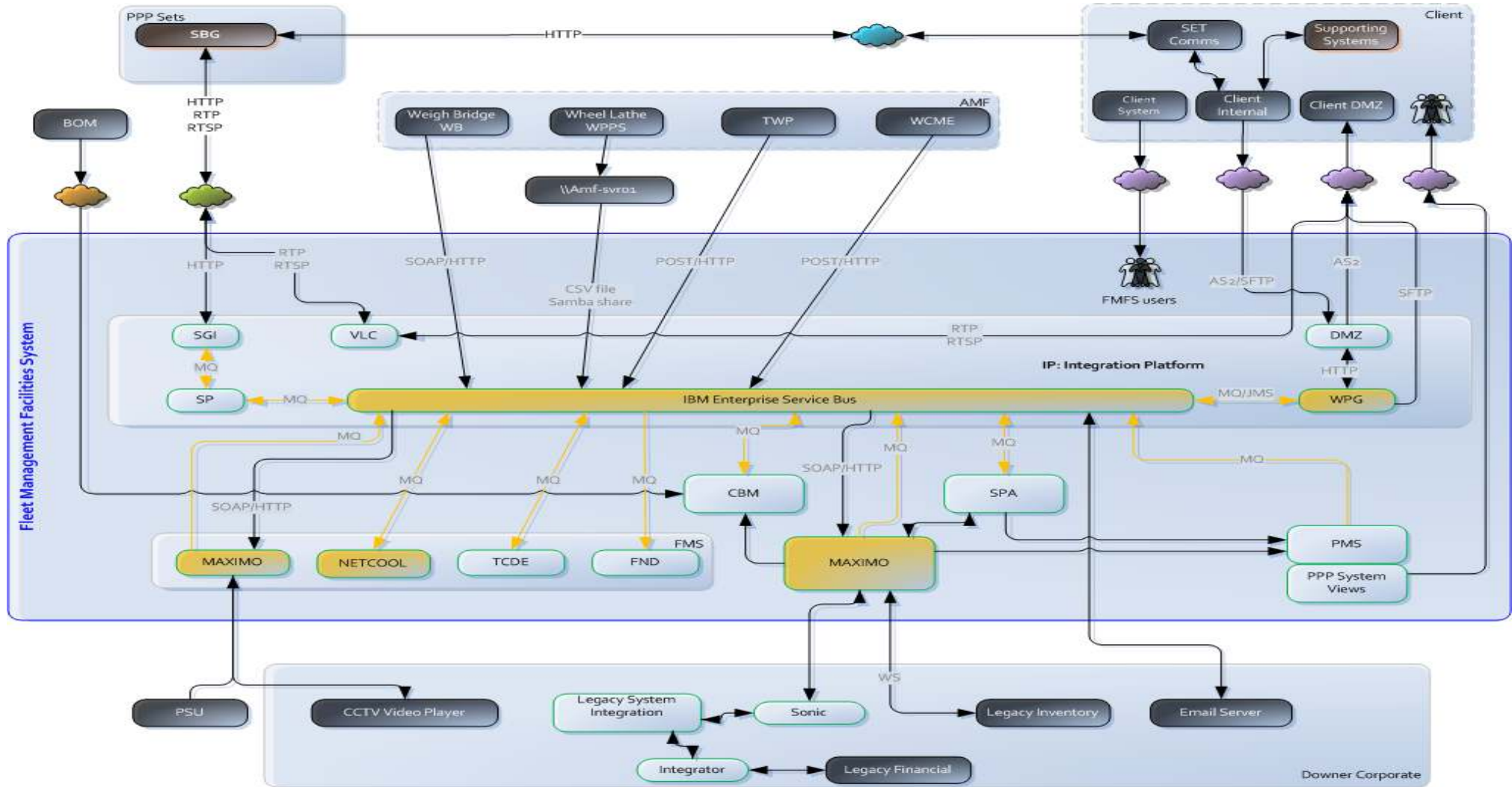
- A common platform for integration was demanded by the highly available down-stream application architecture.
- Contractual agreement between Downer and NSW Government to have the B2B integration platform highly available.
- Traceability of high priority transactions flowing across systems at a centralized integration mechanism.
- Internal legacy systems were not included in to the common integration platform.

Integration Platform

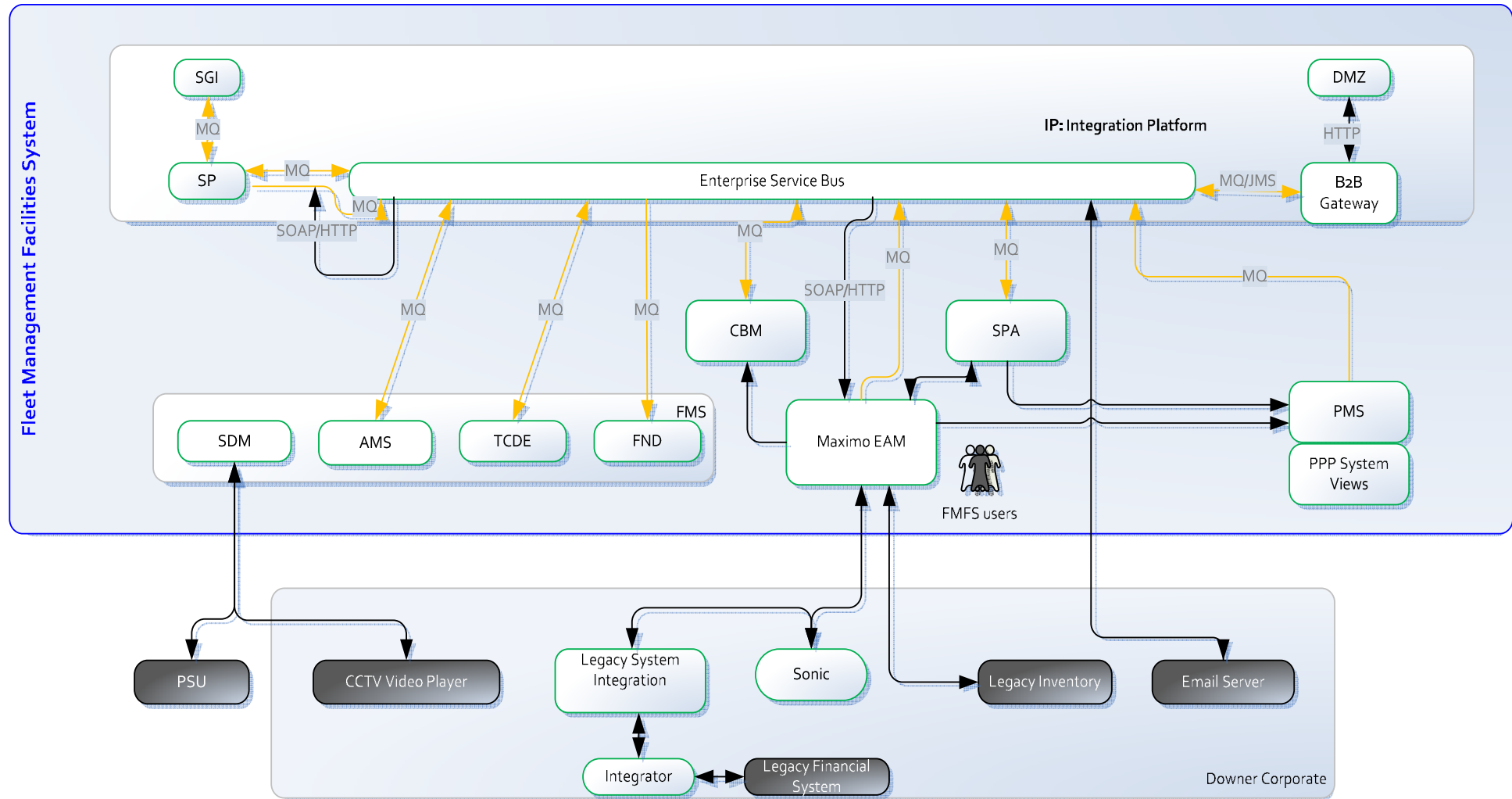
The Integration Platform is a reusable platform that integrates all internal and external sub-systems to effectively communicate real-time end to end transactions.



Integration Platform



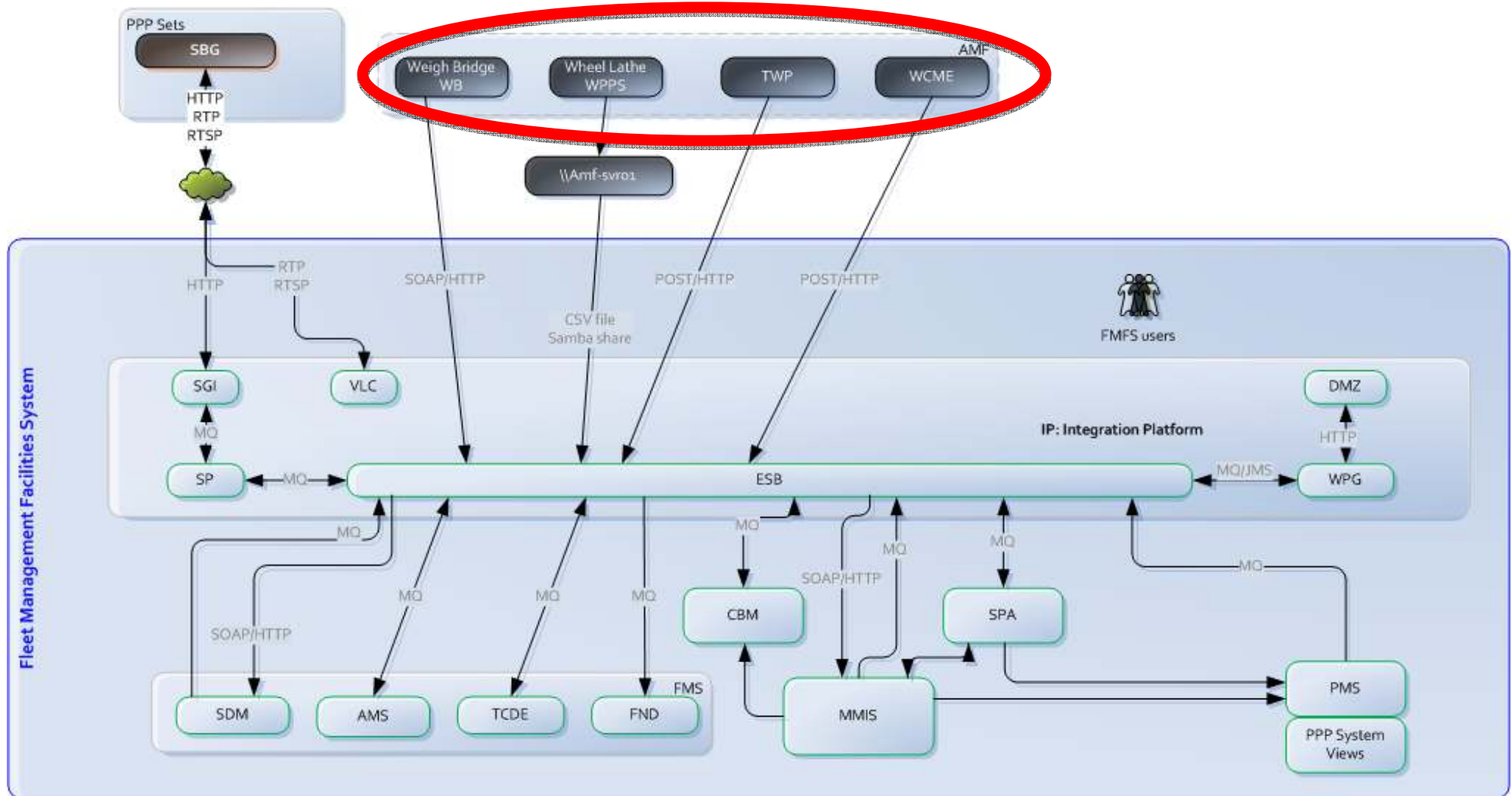
Integration between internal systems



Integration with Specialized Equipment

- Weigh Bridge (WB)
- Wheel Lathe (WPPS)
- Wheel Condition Monitoring Equipment (WCME)
- Train Wash Plant (TWP)

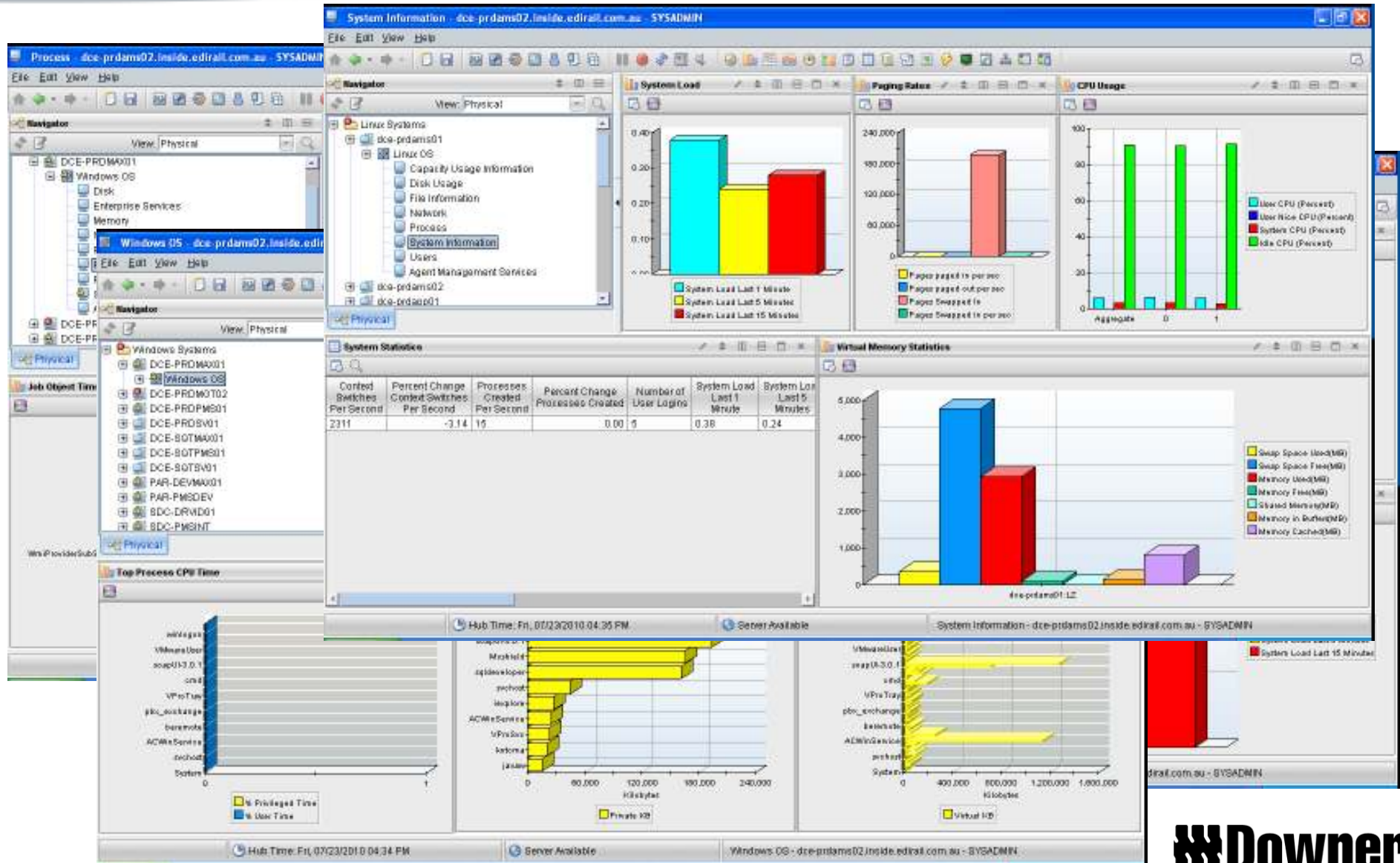
Integration with Specialized Equipment



Integrated Service Management

- IBM Tivoli products were heavily customized to integrate with the trains via unified 'Set Bourne Gateway' to communicate.
- Ensure high availability and scalability of the current systems
- Modern Waratah trains are sending feeds to Maximo via Tivoli Netcool OMNIBUS (Alert Management System) and create automatic Fault records.
- Faults are assigned to fleet operation and support engineers, then workorders are created and the work is carried out.
- Tivoli Netcool OMNIBUS and IBM Tivoli Monitoring products are used.

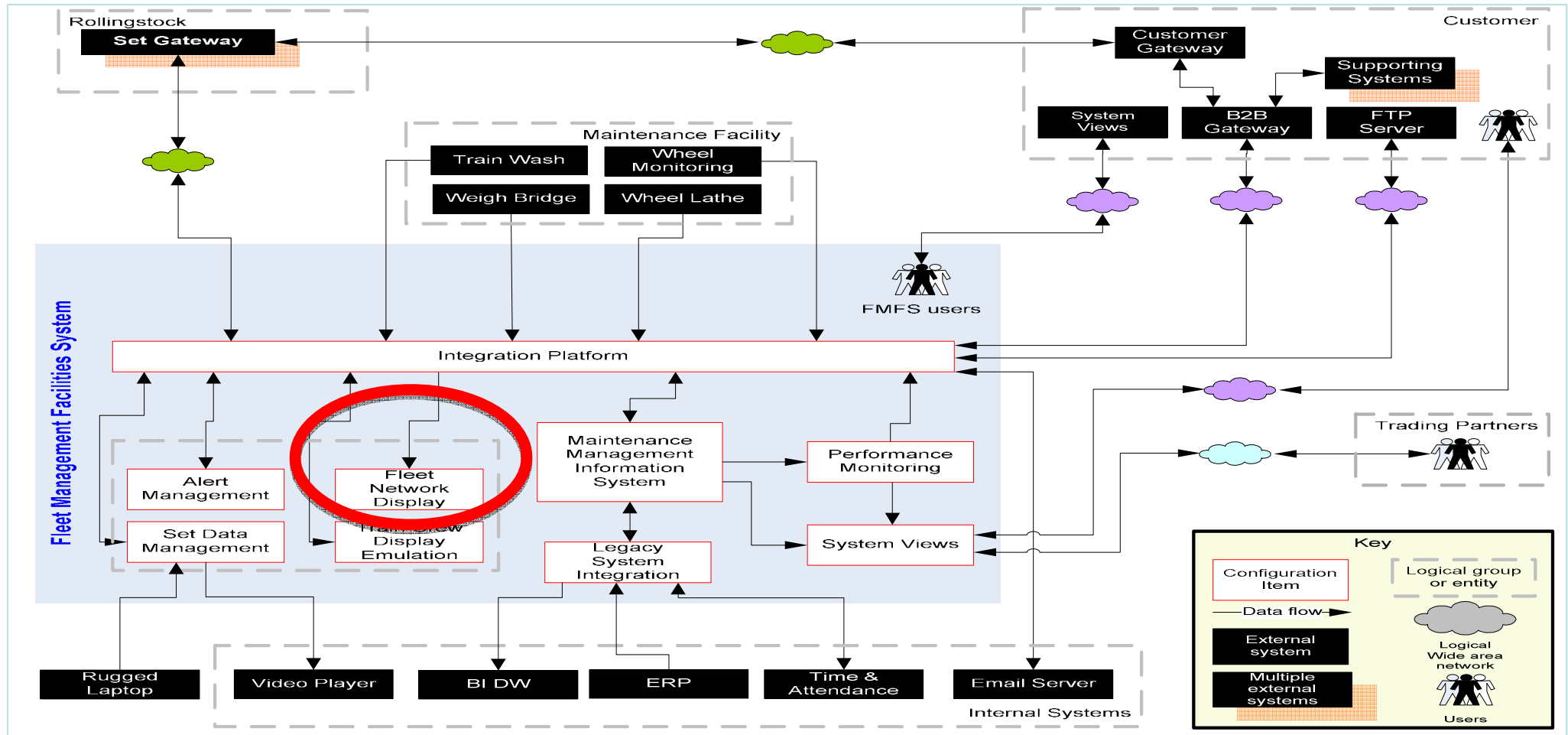
Alert Management System (AMS)



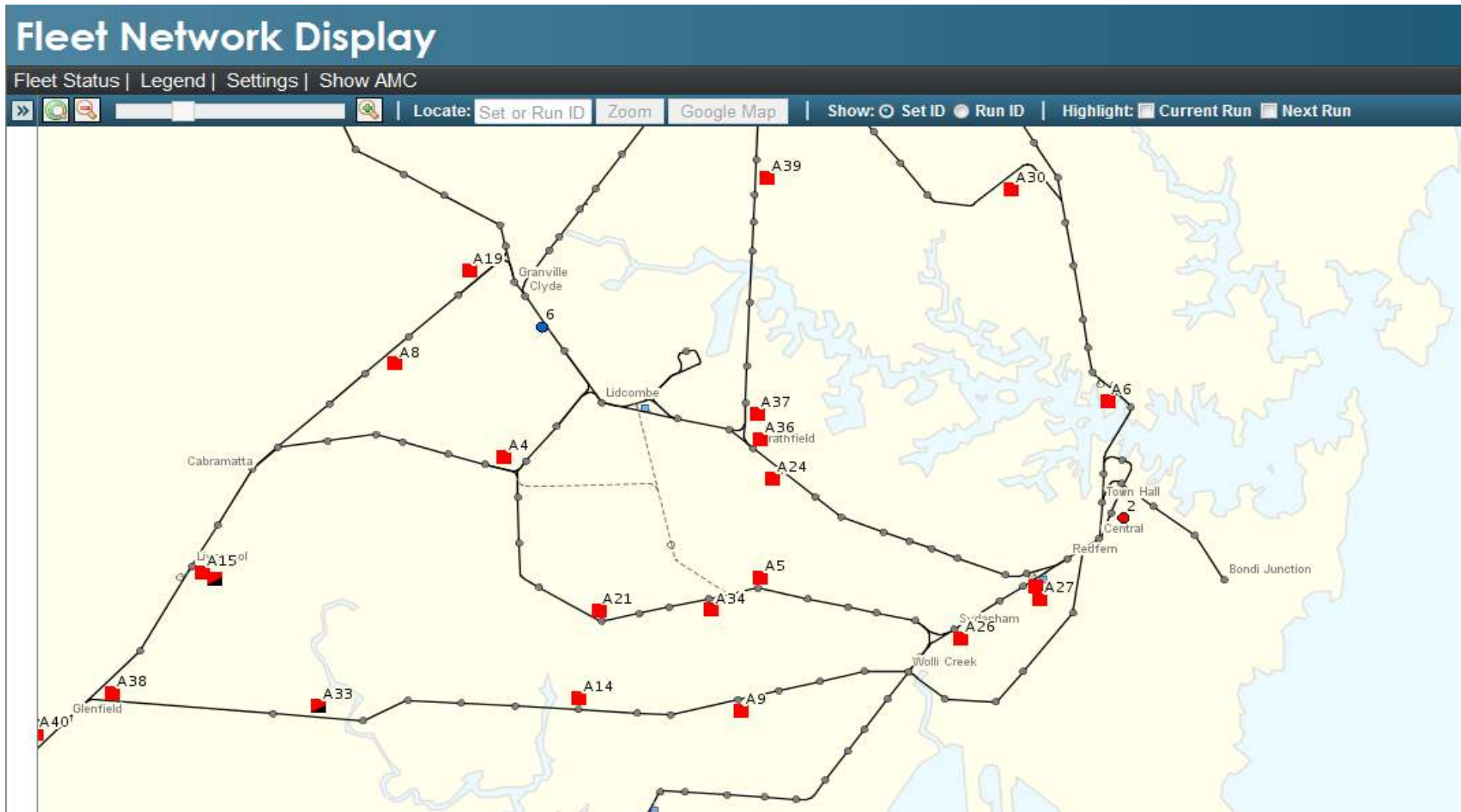
Key Business Outcomes – Integration Platform

- High priority, transactional Business-to-Business Gateway
- Common integration platform translates internal and external communication between the systems
- Automation capability
- Enterprise level integration architecture enables simplified enhancements.
- Effective traceability of every single end-to-end transaction

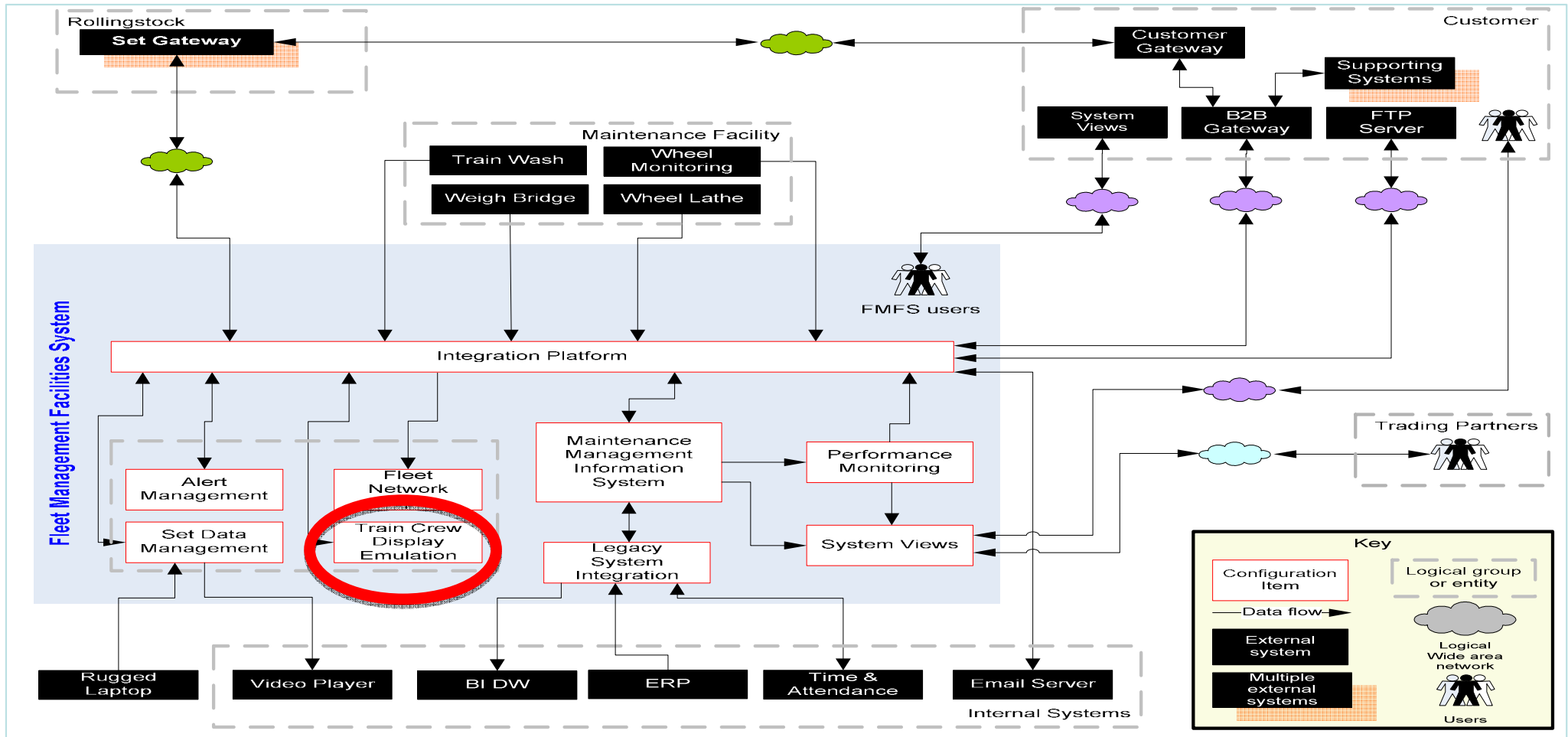
Fleet Network Display (FND)



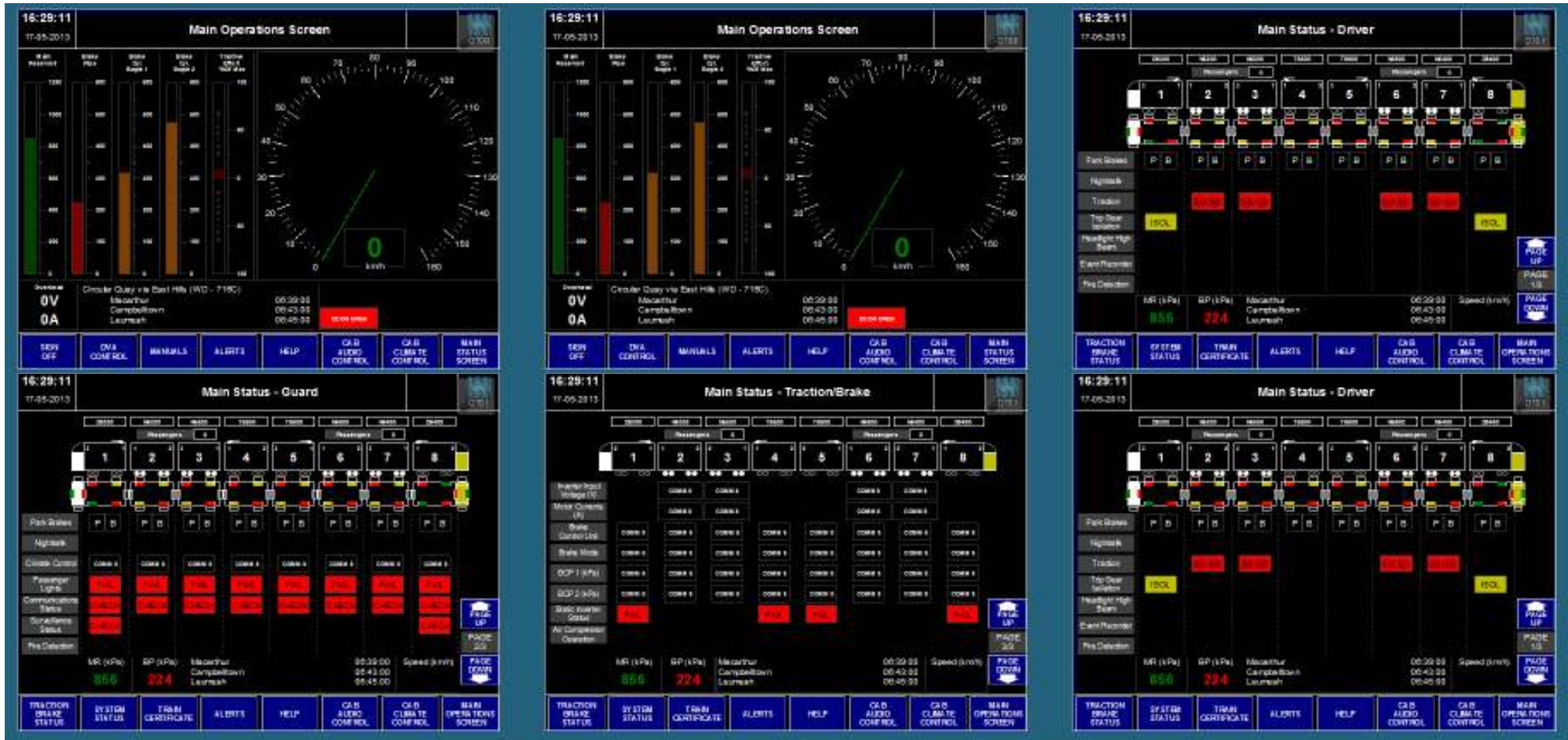
Fleet Network Display (FND)



Train Crew Display Emulator (TCDE)



Train Crew Display Emulator (TCDE)



Learning - Project

1. Ensure operational requirements are not disconnected from contract negotiations
2. Make sure there is a clear plan and focus for Legacy system integration and data management
3. Timing of training is equally as important as the provision



Next Phase of the EAM Journey

- Application Roadmap with planned review phased across the Downer divisions for EAM and ERP
- Focus on current rail contracts to leverage FMFS solutions
- Stay abreast of the new solutions from the IBM product suite and roadmap
- **Business engagement!!!**
- **Business engagement!!!**
- **Business engagement!!!**



Future Projects

- Rolling out integrated condition based maintenance
- Deployment of Maximo Scheduler to streamline the planning and execution of PM activities
- Leveraging the EAM platform for the rest of the rail business (both current and future projects)
- Expanding deployment of Maximo to other core businesses within the Downer group
- Utilising other Maximo modules such as Service Provider to provide enhanced functionality



Continuing the Transformation Journey

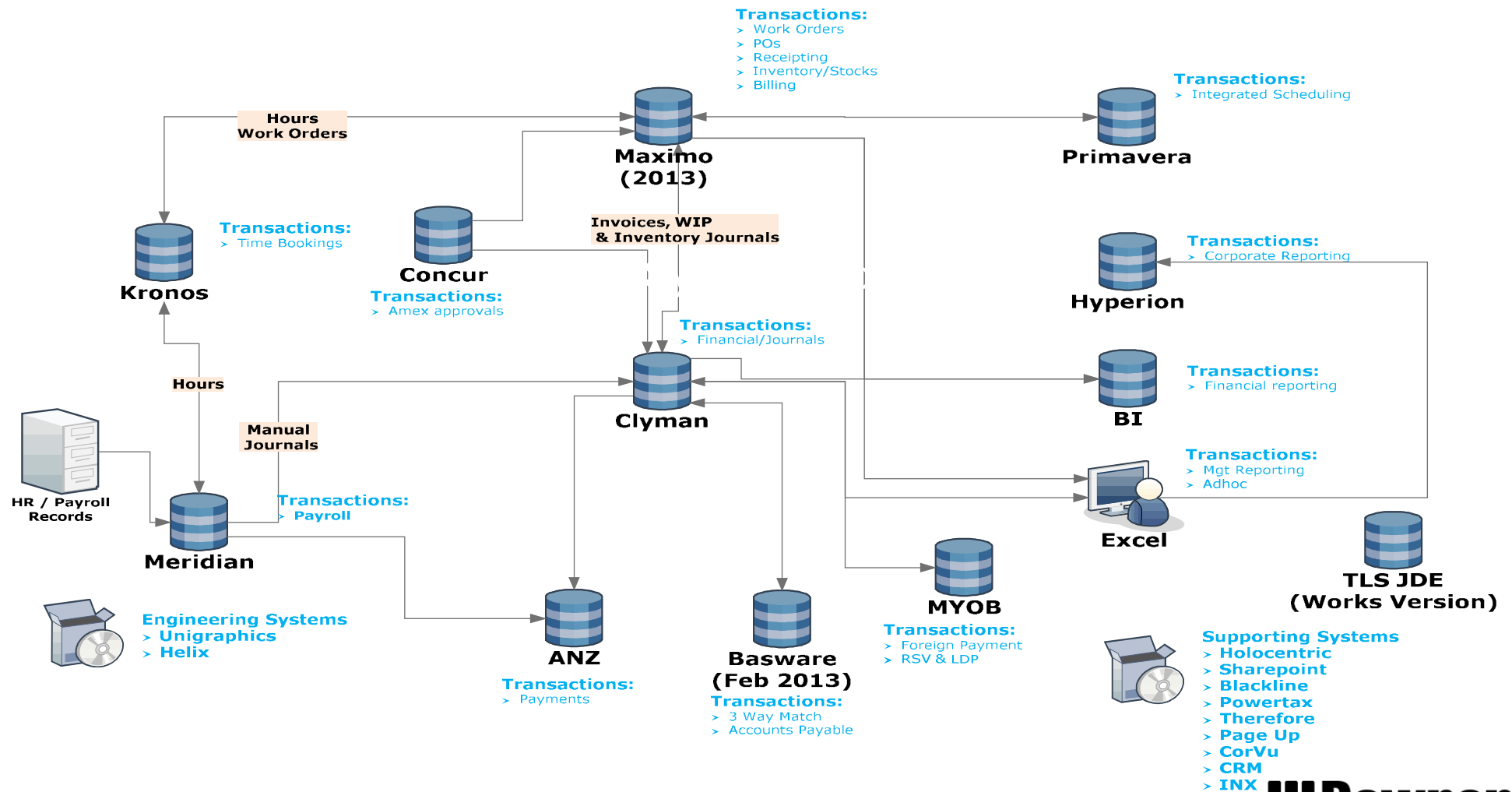
Project Quantum

Abhijeet Rajankar
EAM Technical Manager
Downer Group



System Map

Rail Systems Landscape (Nov 2012)



Improvements for Finance

Current Process	New improved process
Margin is collected by sites.	Margin will be collected and tracked by contract. This will allow a much simpler process to calculate profit.
Sites bill each other for work done.	No internal billing in between the sites. Automatic cost transfer between sites will be introduced resulting in increased efficiency.
Cost of sales transactions are manually generated for Maintenance.	Automated cost of sales transactions reducing current workload for manual processing.
Inventory transactions are manually generated in general ledgers (GL) for inventory and a reconciliation has to be done to verify general ledger balance with inventory reports from system.	All inventory GL transactions will be automated. System reports and inventory GL account will always be in automatic reconciliation improving inventory valuation mechanism.

Improvements for Supply Chain

Current Process	New improved process
All purchase contracts are managed outside the ERP system and are then manually compiled.	All purchase contracts will be managed in Maximo and price list from vendors will automatically populate pricing of items on purchase orders.
All demand is generated by sites through purchase orders.	All demand will be managed by centralised Demand Requisition Planning (DRP) tool ensuring optimisation of inventory.
No visibility of demand by workshops and direct link between supply chain and maintenance operation planning.	Improved visibility of information between Supply Chain and Backshop operations will result in better planning information and improve overall customer experience.
Rotables management processes differ by sites and a number of spread sheets are used to track and maintain Rotables stock.	Rotables will be managed in Maximo and tracking of cost of repair and their lifecycle tracking will be automated.

Improvements for Asset Management

Current Process	New improved process
Locomotives, Passenger & Wagon Configuration displays current only, no historic records.	Ability to review build configuration by date allowing for historical data to be more readily available.
Legacy system only supports a single part number per position and does not limit part configuration.	Maximo will allow to have the ability for multiple part numbers per position and apply fitment rules. Greater flexibility and management of Rotable configuration managed assets.
Asset details/history located in various legacy system screens menus.	Single point access for reviewing asset details in Maximo, simplifying and reducing search time for asset information.

Questions?



Further Information & Contacts

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Downer Website: www.downergroup.com

