

Rail Executive Presentation

Global Rail Freight Conference GRFC

St. Petersburg, Russia

July 7th, 2010



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SAINT PETERSBURG

6-7 JULY 2010



ОРГАНИЗАТОРЫ КОНФЕРЕНЦИИ:



THE BEST-RUN BUSINESSES RUN SAP



Agenda



- **SAP & Rail Industry**
- SAP Rail Solutions & Value Propositions
- SAP for Intelligent Container Management
- Strategic Industry Innovation – SAP closer to Rail

THE BEST-RUN BUSINESSES RUN SAP



Facts Dec 31st 2009 and Business Outlook 2010



SAP starting 1972 arrived Dec 31st 2009 at:

- SAP headquartered in Walldorf, Germany, listed on the Stock exchanges at Frankfurt + New York is today Europe's largest software company (no3 worldwide)
- SAP has 47.598 employees worldwide
- SAP 's Annual Revenues exceed €10.7 BN
- Over 97.000 companies in over 120 countries run SAP software

SAP is providing the following outlook for the full-year 2010

- SAP expects full-year 2010 Non-IFRS software + software related service re-venue to increase in a range of 4% to 8% at constant currencies (2009: €8.2 bn)
- SAP expects its full-year 2010 Non-IFRS operating margin to be in a range of 30% to 31% at constant currencies (2009: 27.4%)
- SAP projects an effective tax rate of 27.5% to 28.5% (based on IFRS) for 2010 (2009: 28.1%)



SAP Rail Industry customer examples (after acquiring Business Objects)



Asia / Pacific

- JR East + JR West, J
- QR, AUS
- TranzRail, NZ
- India Railway, INDIA
- Kowloon Kanton Rail, CHINA
- Korail, KOREA



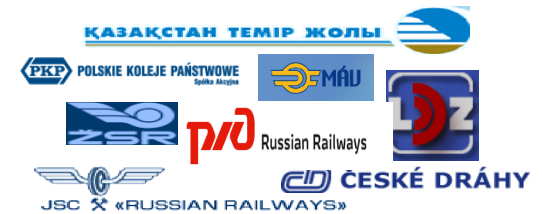
North America: 6 of the top 7 run SAP

- Norfolk Southern, US
- Ferromex, MEX
- Canadian Pacific Railway, CA
- Canadian National Railway, CA
- Union Pacific, US
- Kansas City Southern
- AMTRAK, US
- Centro Atlantica, BR
- BNSF, US
- Watco Rail, US



CIS/Eastern Europe 8 of the top 10 run SAP

- Slovak Railway, SL
- MAV, HU
- Belarus Railway, BL
- Croatian Railway, HR
- Ceske Drahy, a.s., CZ
- Kazakhstan Railway, KZ
- Lithuanian Railway, LT
- RZD Russian Railways, RU
- PKP, PL
- Latvian Railway, LV



7 of 7 X-Rails

- Deutsche Bahn, D
- SBB/CFF, CH
- ÖBB, A
- Coras Iompair Eireann, IRL
- Ferrovie dello Stato., IT
- DSB, DK
- SJ Swedish Rail, S
- VR, Finnish Rail
- Nederlandse Spoorwegen, NL
- SNCF, F
- Veolia Transport, F
- Green Cargo, SE
- NMBS/SNCB, BE
- CFL, LU
- First Group, U.K.
- NSB, NO.
- Eurotunnel, U.K., F
- REFER, P
- Turkiye CDD, TR
- BLS, CH
- Prorail B.V., NL
- Refer, P



Western Europe 10 of the top 10 Run SAP

Africa / Middle East

- Transnet, ZA
- ENR Egyptian Natl Railway, EG
- PRASA, ZA
- Israel Railway, IL



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- **SAP Rail Solutions & Value Propositions**
- **SAP for Intelligent Container Management**
- **Strategic Industry Innovation – SAP closer to Rail**

THE BEST-RUN BUSINESSES RUN SAP





Typical CEO questions

- How do I provide seamless passenger services?
- How do I customize freight services?
- How do I provide integrated mass transit services?
- How do I reduce risk to compliance?
- How do I reduce cost and increase customer satisfaction?
- How do I reduce impact and heighten sustainability?
- How do I ensure value from IT?

Railway Industry's challenges

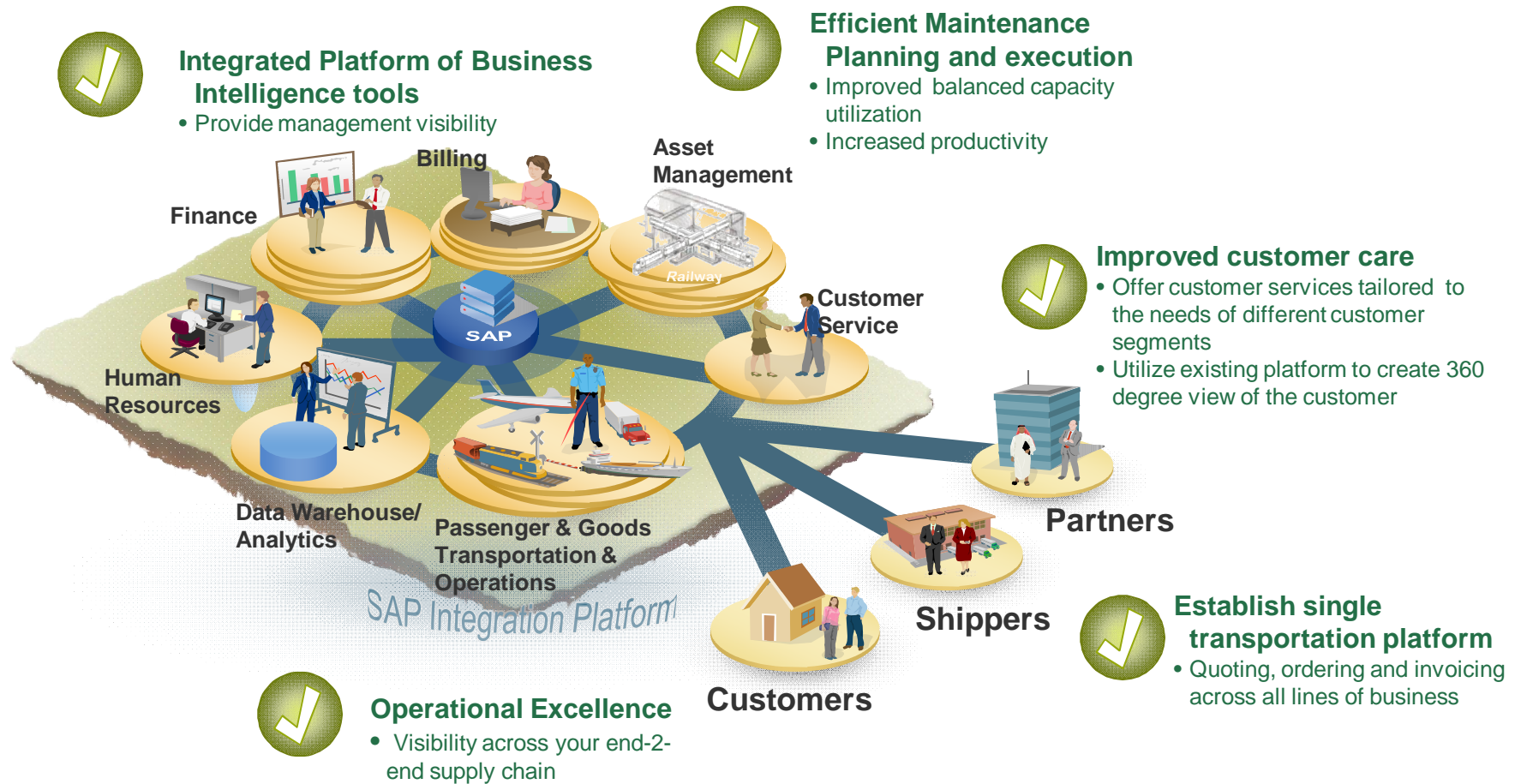


IT Landscape

Homegrown and Best of Breed, Many Custom Interfaces

The IT Landscape is the Challenge

Railway Industry's objectives uniquely enabled by SAP



SAP Integration Platform

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THE BEST-RUN BUSINESSES RUN SAP



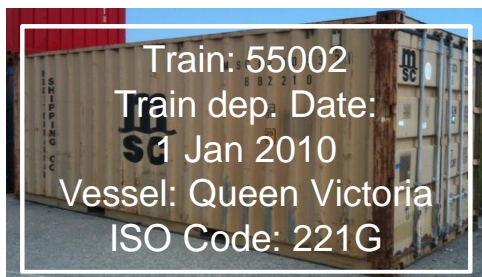
Concepts for managing the Container Terminal



Containers are represented as Handling Unit with “dummy”, serialized Material

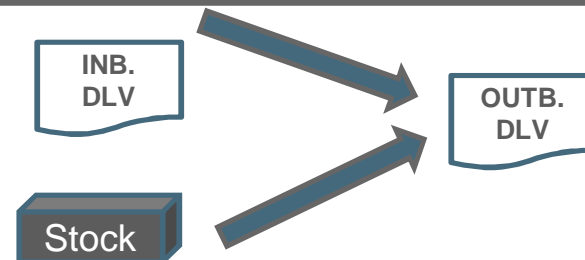


Extra Characteristics for Containers are appended to the Handling Unit Header Table

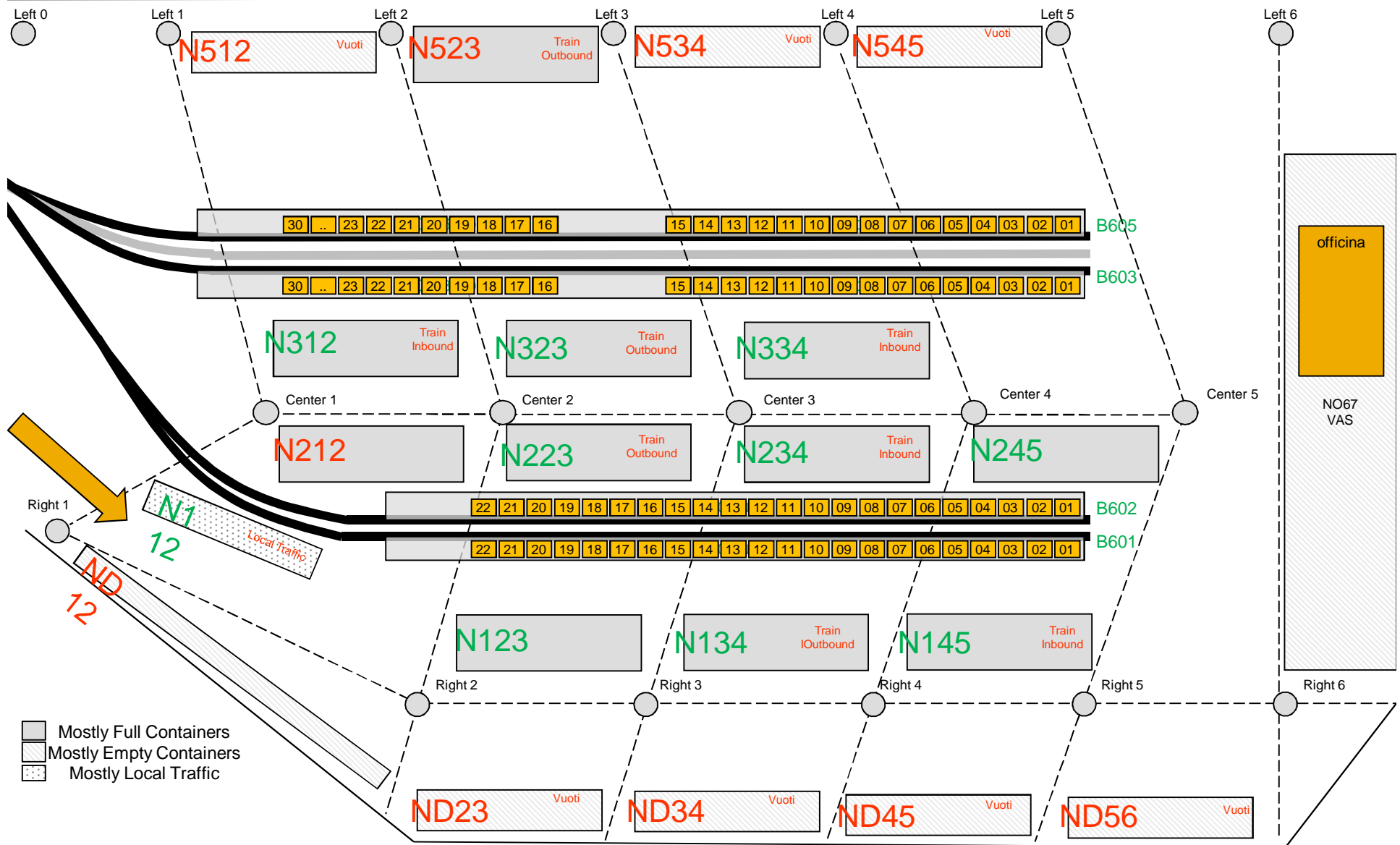


Create Outbound Deliveries with reference to:

- Inbound delivery or
- Container in Stock



SAP Extended Warehouse Management - Warehouse Structure - Phase 1



SAP (SupplyChain) Event Mgmt at Green Cargo – Why SAP Event Manager ?



SAP EM -Why & How

- Customer demand for an track and trace solution within all business lines of Green Cargo
- Green Cargo Logistics implemented a "control tower" solution for their business – not taking the transport chain in consideration
- The former solution was not suitable for the rail business – functionally or technically
- Internal and external demand as well as system landscape complexity required a powerful solution to handle various demands



SAP (SupplyChain) Event Mgmt at Green Cargo - Tracking objects (hierarchy) + events in SAP



J/VG order	82914950	Nettovarde			
Uppdragsvarare	588	Nordisk Transport Rail AB / Box 44 / 231 21			
Godemottagare	588	Nordisk Transport Rail AB / Box 44 / 231 21			
Beställnr		Best datum			
Försäljning / Positionsöversikt / Positionsdetalj / Beställare					
Avtal	342791				
Alla positioner					
Pos	Material	MtM	MSE	Bestnr	Q
10	JVGE001			1 VGNvagn-2B-Alla stationer-Alla	02025
20	JVGP001			1 VGNbestnr: 58732701	102036
30	JVGP001			1 VGNbestnr: 58732702	102036
40	JVGE001			1 C20 Bestnr: 58732701	302056
50	JVGE001			1 C20 Bestnr: 58732701	302056
60	JVGE001			1 C20 Bestnr: 58732702	302056
70	JVGE001			1 C20 Bestnr: 58732702	302056

Tracking Hierarchy in SAP EM



Customer Order / Train



Railcar



Container / Unit Load

Online

- Application System
- Internet (WCL)
- Phone (Voice Recognition)
- SMS
- Web enabled mobile devices (WAP/GPRS)
- Barcode Scanning via AS
- Manual input in EM
- Tracking Service Provider
- RFID

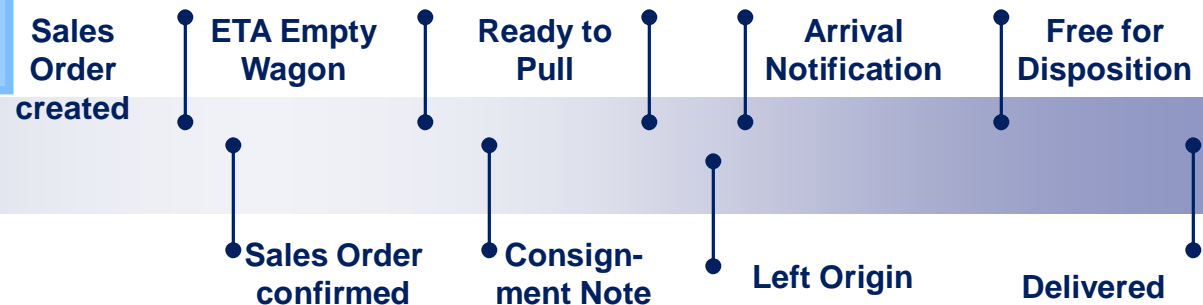
IDoc
XML
BAPI
EDI

Event Manager

Offline

- Mobile Devices (PDA etc.)
- Application System (i.e.: Batchmode)
- Tracking Service Provider
- RF

Tracking Events (example)





Customer satisfaction and added value

- Interaction with the customer reduces work/time/costs...
- Customer can report status/actions like Free for Disposition or other
- Customer interaction can change objects in source system
- Effort reduction due to direct communication with customer instead of Mail, Fax or Phone
- SAP EM enables to survey SEQUENCING, TEMPORAL + QUANTITATIVE + QUALITATIVE CORRECTNESS of the overall Business Process Execution by controlling the expected process step and comparing it with the predefined process step
- SAP EM reacts automatically according to predefined "what-ifs" in case of non-occurrence and overdue



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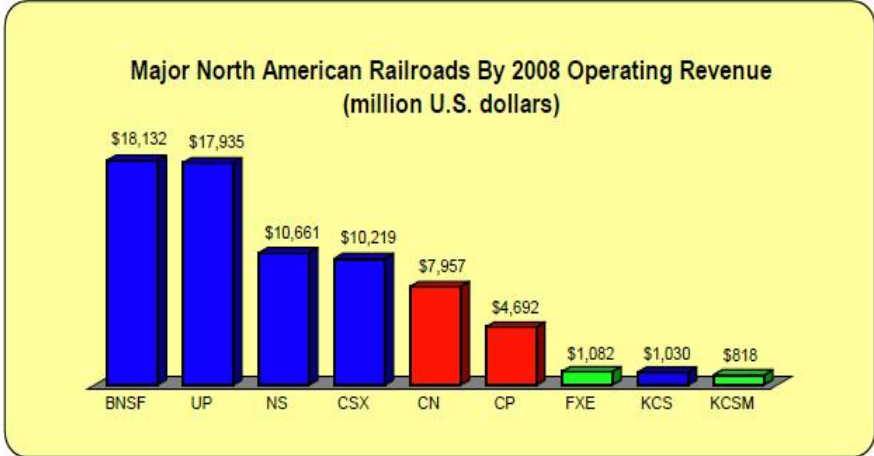
SAP Rail User Group - "SUGRail"



North America Freight Stats

- Operate approximately 170,000/273,600 miles/KM of track
- Cars/wagons – 700,000 / 1,600,000 (railway/all)
- Carloads – 40,000,000 (~waybills)
- Revenue - \$75b

- Formed December 2008 under ASUG
- Bi-annual in-person meetings
- Working Groups
 - Car repair billing
 - Linear Asset Management
 - Lead to Cash (L2C)
- Future – Expand Globally



Why SAP?



Enable business strategy

- SAP is platform of choice of most commercial users of rail - share an IT strategy with your customers and partners

Best in Class

- Most widely adopted railways solution, with largest rail customer base **SAP sets the industry standard**



Lowest risk

- SAP's financial applications and core ERP offering are **proven** to work well, matching the industry **specific needs of railways**
- Continuous solution enhancements with largest R&D, you will never outgrow SAP

Lower TCO

- Strength of integration across the broadest of product offerings SAP provides a true **business process platform** for railways
- Open platform leverages use of legacy systems while providing **IT strategy for the future**

SAP's Railway Industry Events 2010 Preview



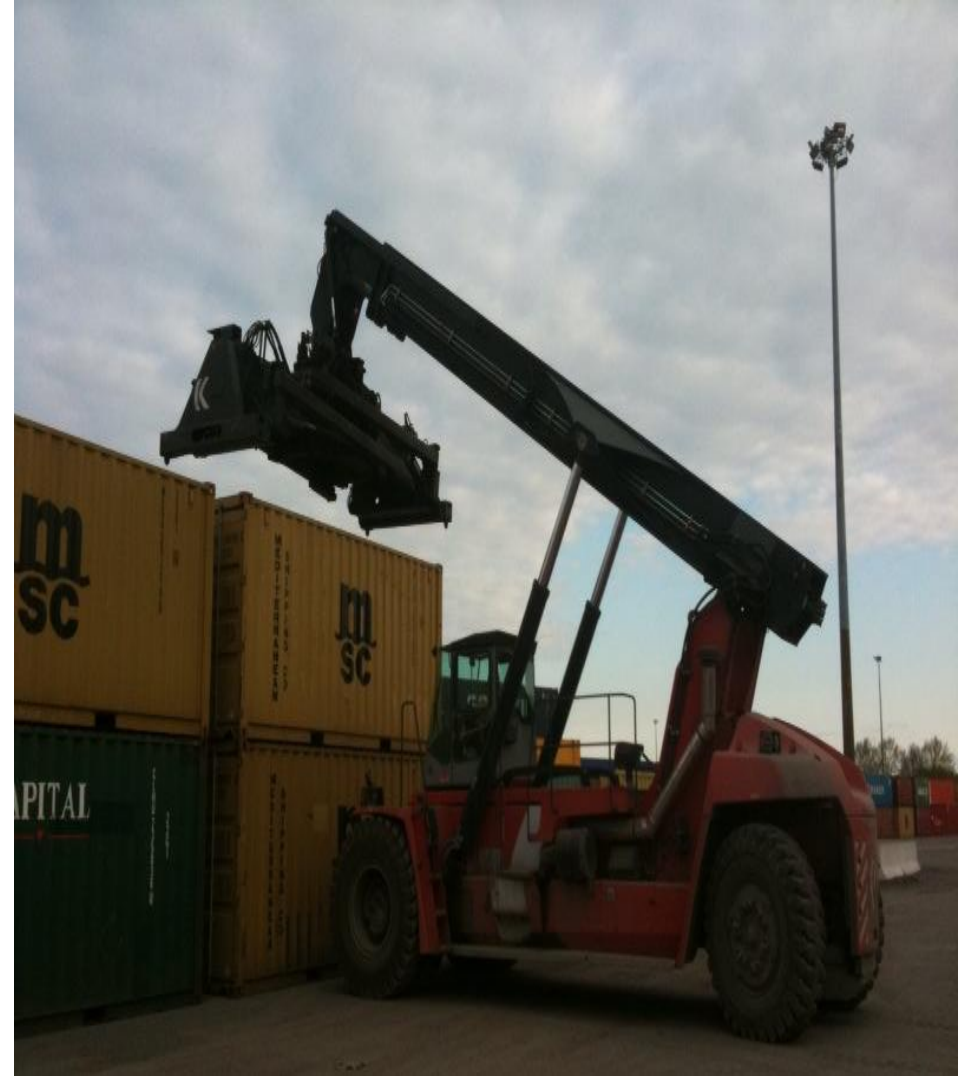
- Sep 19+20,
SAP EMEA+India Railway Industry conference in Berlin

- Sep 21 - 24,
Innotrans Railway Fair, Berlin

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Thank You !



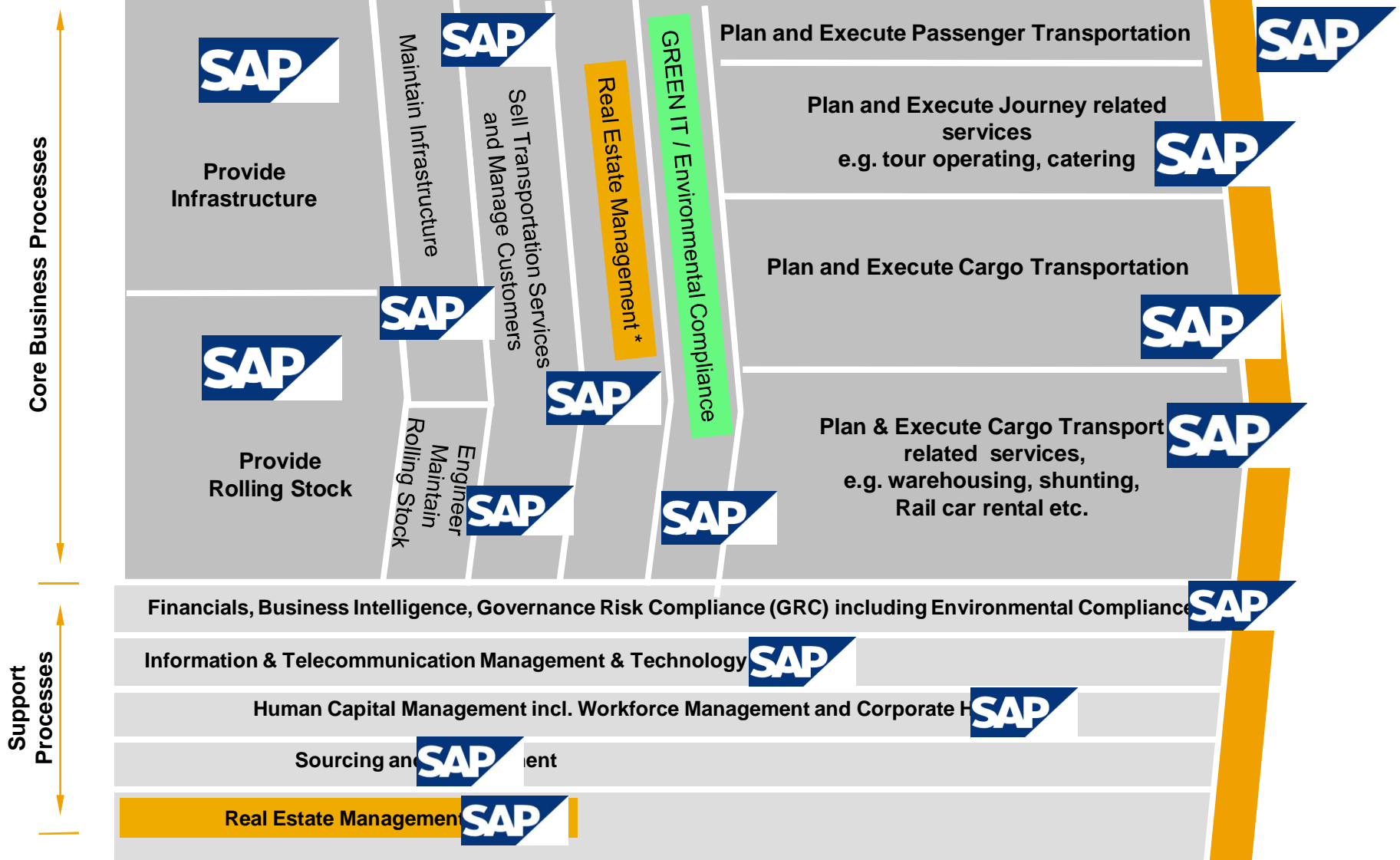
APPENDIX !



Impact - Railway Industry - Core and support processes



Depending on the client Real Estate Management could be either considered as core or support process



Railway Industry Business Solutions – Key focus areas



RollingStock mgmt (Maintenance + Refurbishment)

Logistic Operations

Infrastructure Services

Real Estate Management

Passenger Management

Work force Management

- Maintenance Event planning
- Refurbishment
- Vendor managmt.
 - Spare parts management
- Reliability Centered Maintenance

- Cargo Transport
- Customer Service
- Billing & Invoicing
 - Global Service offering
- Warehousing and distribution serv.
- ShuntingYard mgmt
- Supplychain visibility

- Diagnostic integr
- Master schedule plan
 - Construction & project managmt.
 - Vendor managmt.
 - Maintenance & Warehousing

- Land Use mgmt
- Management and operation of national stations
- Sales and service activities in stations
- Partner Management

- CRM
 - Loyalty Program
 - Redirection Service
 - Call Center mgmt
 - Seat reservation
 - Fare collection (Convergent Charge)



SAP – A partner of choice for Railways in their transformation process



What is SAP's Specific Commitment to Railway & Metropolitan Transportation Industry ?

SAP - Industry Value Network to increase the value SAP and partners bring to Railways through specific solution development e.g. CDP- Customer Development Project.



SAP participation at annual, Railway industry gatherings like Innotrans - Fair.

Innovation with Railways to develop pilots and test use of new technologies

Initiating and Driving SAP User Group Railways - SUGRAIL



DB – Deutsche Bahn

Rolling Stock Asset Maintenance with SAP



Company:

- Name: Deutsche Bahn AG
- Headquarter: Berlin, Germany
- Project Location: Frankfurt, Germany
- Industry: Transportation & Logistics
- Formed in 1994 from the merger of the two German railways, DB is Europe's largest railway company
- Products & Services: Mobility, Logistics, Network
- Turnover: 33.5 Billion EUR (2010)
- Employees: 240,200 (2010)
- Web Site www.db.de



Challenges and Opportunities

- Maintain 450,000 rail cars, busses and vehicles for 230 plants and 2.2 million maintenance orders each year
- Compliance to a variety of ever changing technical and legal requirements
- Coordinating the complex train, plant, part and personnel maintenance requirements in one system

Implementation Highlights

- Set up of a universal data gateway to receive measurement data from trains
- Normal maintenance requirements are integrated with damage notifications, so advanced scheduled maintenance can be preformed during damage repairs
- Complex maintenance is able to be performed in several smaller steps, reducing holding times

“We are quite satisfied with SAP in daily operations. Availability is very high”

Christian Markowitz
Dir of IT Request Management
Deutsche Bahn Fernverkehr AG

Why SAP

- Lays the foundation for decommissioning legacy systems built in-house
- Standardizing with central SAP systems across DB

Benefits

- Lower operating costs
- High-availability system that works with time critical tasks further reducing maintenance costs
- 6,600 daily users on one system coordinating their activities
- Exceeds legal requirements which call for 10 years of maintenance documentation
- All plants know what maintenance work lies ahead and how much time is available.



SAP Customer Relationship Management for Rail Cargo Operators - Transnet Freight Rail



QUICK FACTS

Transnet Freight Rail Limited

- Location: Johannesburg, South Africa
- Industry: Cargo Railways
Turnover: € 1,3 bn
- Employees 24.577
- Web Site www.transnet.net
- Implementation Partners SAP Consulting

Transnet Ltd.

Location: Johannesburg, South Africa
Industry: Railways, service providers
Turnover € 2,589 bn
Web Site www.transnet.net
Implementation Partners
SAP, Accenture, HCL-Axon

Transnet is responsible for

- Rail Cargo Operations
- Rail Infrastructure
- Pipelines
- Port Management
- Terminal Management
- Port Authority
- Rail Engineering

•Challenges and Opportunities

- Create a standardized system across all work streams related to Customer Relationship Management (CRM)
- Improve sales and opportunity-related analytics for sales & financial management,
- Implement standardized business processes same time with implementing IT-solution

•Implementation Highlights

- Developed a change management and communication strategy detailing the approach to the work stream
- Functional gaps were identified and resolved with a future state business 'blueprint' created.
- Smart system configuration
- Employees from various locations involved in the project
- Senior management sponsorship
- Building up strategic Roadmap e.g. To integrate Call Centers
- Frequent CRM refresh trainings

Why SAP

- Comprehensive functionality
- SAP focus on process excellence and innovation
- Several options could be configured, possibility to adapt to future requirements easily
- Future functional innovation for rail
- Robust platform

Benefits

- Reduced total cost of ownership of the system landscape and infrastructure
- Improved accuracy of information for regulatory requirements
- Seamless integration of sales & opportunity information within the organization and with external partners
- Improved management of sales, and financials, across all areas of operation
- Single view on customer across the Group



SAP Customer Relationship Management for Rail Cargo Operators - Transnet Freight Rail



Transnet Freight Rail Ltd. - operational details

Moves **17%** of South Africa's freight annually

100% of **export Coal**

100% of **export Iron Ore**

Annual revenues of over **R14 billion**

R35 billion capital investment over the next 5 years

Other Statistics

Employees - 24 577

Rail Network - 22 241 km

Fleet – 77 849

Locomotives - 2106



COALink

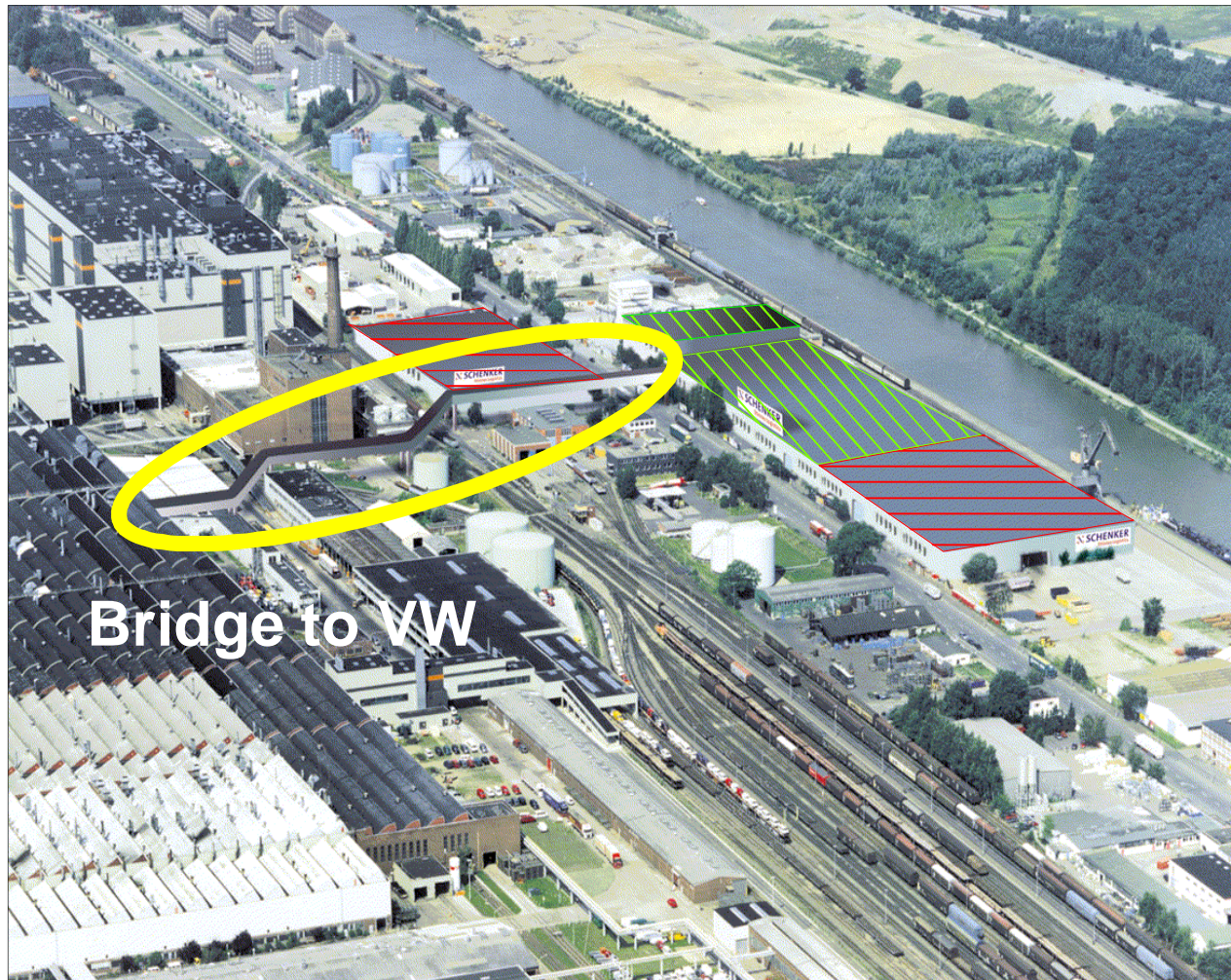
Specialist business unit that provides world-class transport for South Africa's export coal from the Mpumalanga coalfields to the Richards Bay coal terminal. It is one of the world's most efficient bulk export logistic supply chains. 2010/2010 Budget – 72 million tons

Orex

Orex is a specialist business unit dealing with the transport of iron ore over a 861km railway line. In Oct 2010 they railed 844.388 tons of coal in a single week. Train length 4 km, 342 100-ton wagons, 10 locos



DB Schenker Contract Logistics using SAP at VW's Supplier Park in Hannover



■ The logistics center is divided into two areas:

- **A. VW warehouse for assembly parts**

■ ca. 19.000 m²

- **B. Supplier park**

■ ca. 17.000 m²

Goods receipt processes

- Material requirements planning
- Shipping notification
- Incoming inspection
- HU labelling
- Goods receipt posting
- Goods receipt confirmation

Goods issue processes

- JIT calls
- Sequencing
- Withdrawal
- Subassembly
- Printing and labelling
- JIS rack check
- Goods issue posting
- JIS delivery
- Convoy management
- Daily collective delivery note

Internal warehouse processes

- Storage bins, strategies
- Stock transfer
- Automatic replenishment
- Automatic storage bin assignment
- Inventory management
- Physical inventory
- Daily stock information
- Empties management



Functions

- RF functions for the complete process
- Forklift truck - monitoring system

DB Schenker Contract Logistics using SAP at VW's Supplier Park – Picking and sequencing



(1) Anlagensort		(2) Montagelinie		(3) Lieferantennummer (V)		(4) Modellbezeichnung	
VWAG21		Linie 01		18749/2		Frontend	
(5) Lieferantenwechsel-Nummer (WZ) (Z) (Z) (Z)				(6) Materialbestenheft-Id. Packfolge-Nr. (Z)			
Beispiel: GmbH12345678901234567890123456712345				A9002001231234567890			
Werk: 312345678901234567890123445678901234567				2000000718			
12345 Diestadt1234567890123456789012345678901							
(170) Sequenz- Nr. (170)	(120) Fahrzeug-Kenn-Nr. mit Soil - prod. jahr (2059)	(110) Fabr.-Nr. im Gespell (105)	(110) Sequenz- Nr. (170)	(120) Fahrzeug-Kenn-Nr. mit Soil - prod. jahr (2059)	(110) Fabr.-Nr. im Gespell (105)		
4711	01282299031234	01	4711	01282299031234	23		
4712	01282299111234	02	4712	01282299111234	24		
4713	01284499031234	03	4713	01284499031234	25		

Scan bar code on contents list of JIS rack (here: SAP simulation)

F3 ENDE

KOMMISSIONIEREN

JIS-GESTELL

2000000718

>JIS SCANNEN !



Sequencing display of hand-held scanner

F4 Next F3 Zrk

M 7H5863711C 6Y3

HU : 3085

Pla : 47-13-01

Verf: 12

Soll: 12 / Kommi: 0

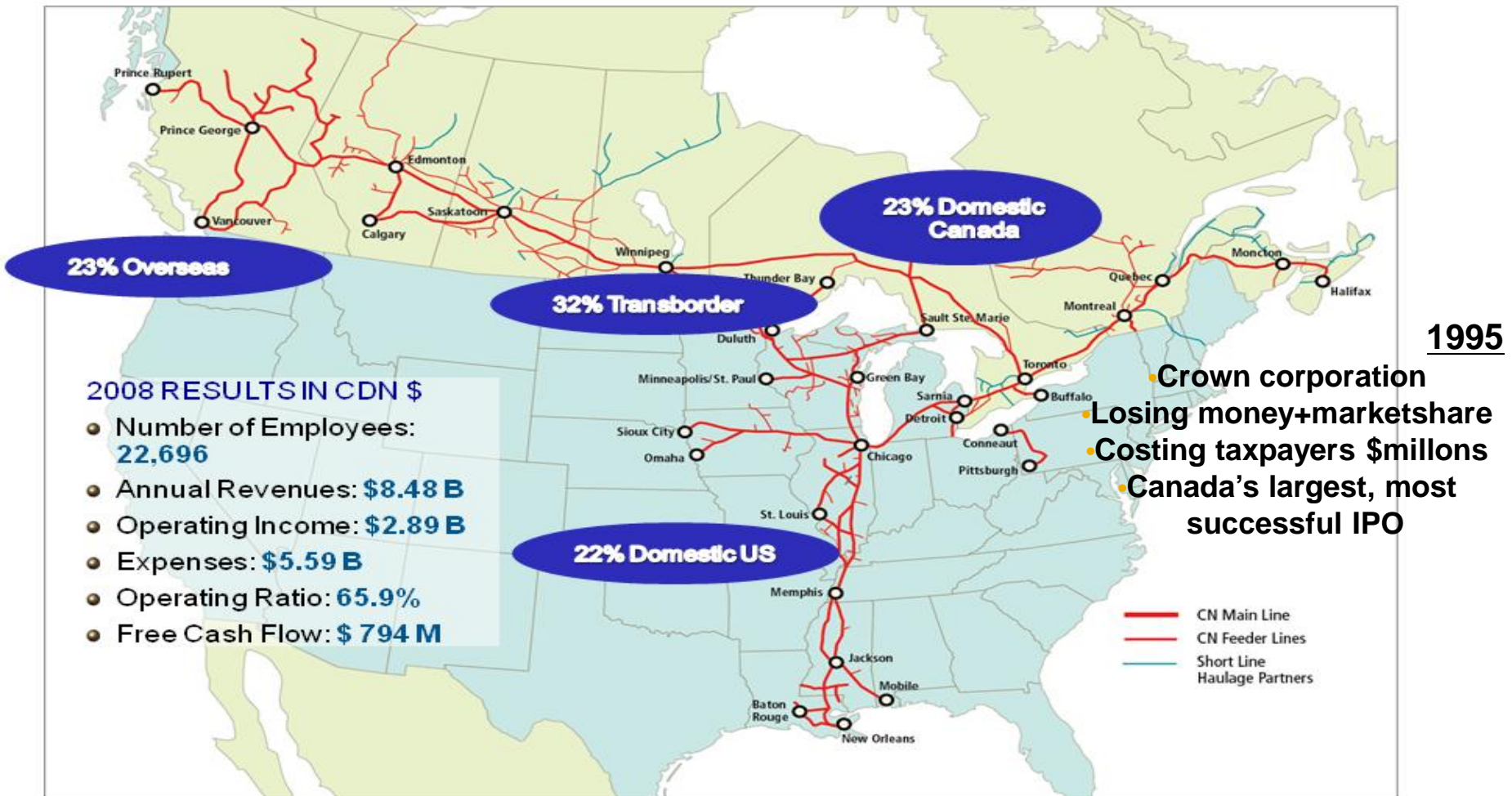
HU : |

>LAGER-HU SCANNEN !

SAP Customer Case - Canadian National Rail CN's turn around between 1995 and 2010



A GREAT NORTH AMERICAN FRANCHISE



SAP Customer Case - Canadian National Rail

CN eliminated 150 legacy systems



EVOLUTION OF SAP AT CN



October 1999	January 2001	April 2002	2003 - 2006	2007 - 2009	
	Illinois Central		Wisconsin Central Great Lakes, BC Rail, Mackenzie Northern & Lakeland	Savage Alberta Athabasca Northern Chemin de Fer de Quebec EJ&E	Railway Integrations
CN/GT Inventory Requisitioning Bar Coding Purchasing	Intranet Requisitioning IC Field Inventory	Procurement Cards Expense & Travel Field /Rail Shop Inventory	Fuel Management MyCN Vouchers SRM	Ore Dock Warehouses Aggregate Warehouses Vendor Portal	Supply Management
General Ledger Financial Reporting Accounts Payable	Projects System Asset Accounting Recoverable Billing	Business Warehouse (FI) Budget Planning	Budget Planning Functional Location Int. Payroll Consolidations	Mobile Asset Accounting Real Estate Treasury	BPS/BW Finance
Mgmt. Employee Info Compensation & Succession Time / Gross Payroll	US Rollout All Unionized Employees Time Reporting	Qualifications Employee Self-Service Net Payroll CDN. & US Benefits	Voice/NLU (time) Compensation Mgmt. Pension/Benefit Int. Employee Performance	Employee Performance ePortal	Human Resources
SAP 4.0	SAP 4.5	Employee Health & Safety Incident/Accident Log Medical Solution	Law Pack Replacement Police Optimization U.S. Medical Solution	Freight Claims Safety BW Cost of Drailment	Safety/ Risk Mgmt.
<ul style="list-style-type: none"> • Elimination of 150 legacy systems • 12,000 current SAP users 		Network Assets S&C Config. Mgmt.	Bridge Condition Bridge Management	Track Inspection System	Engineering
		Mobile Assets (Loco/Car) Work Equipment Main Shops (Transcona)	Facility Maintenance Locomotive Optimization	Wheel Wear Mgmt. Archiving	Mechanical
		SAP 4.6	SAP 4.7	Locomotive Mgmt. Crew IVR iCrew	Transportation
				SAP ECC 6.0	

SAP Visual Solutions and EWM for Rail Cargo Shunting Yard Managers



- Prototype for a Rail subsidiary managing a shunting yard at a large european industry site
- Project started end of 2009
- Project is managed by SAP Consulting



SAP's Locomotive Management System Workflow



Select Display Options

- Drilldown capability to see Regional Corridors
- Pick lists within views for:
 - Corridor Views and Stations
 - Filtering capability by locomotive and train type

Planning

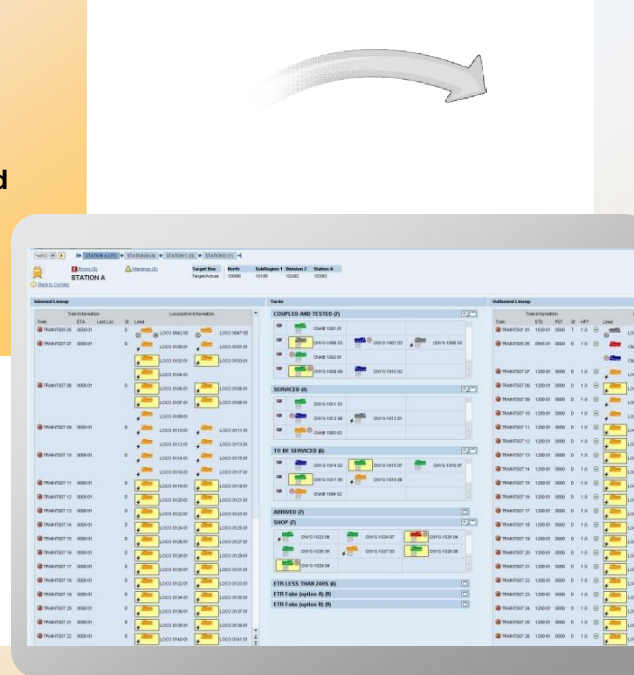
- Characteristics and Condition of locomotives (including inspection dates)
- Direction of locomotives
- Offline and Foreign locomotive information
- Assign a repositioning (deadhead) order to a specific train
- Plan lifts and setouts of locomotives on-line
- Ability to assign locomotives to yard trains
- Mark locomotives as usable/not usable
- Locomotive availability ex-shops
- Track, Audit, Report all actions

Assign Locomotives

- 2-click assign / un-assign locomotives
- Color coding for trains early, on time, late
- Status box for assignment of repositioning (deadhead) order
- Coupling / Locomotives ready at shop
- Assigned locomotives easily identified

Calculate Supply/Demand (Line-up)

- From Service Scheduling
 - Outbound train ID and plan including HPT
 - Real-time ETD and ETA with adjustments
 - Inbound train ID / locomotives assigned
 - Tonnage forecast or plan
 - Real-time updates



LMS User Experience

At a glance – Workcenter & Corridor



- Workcenter is a consistent shell among all views (corridor and station)
- Corridor enables visualization of line-up / train flow in real time



Workcenter

Search
Search Highlight On
Reports
Target Box...

CORRIDOR - ASTON TO MONTREAL
▶
ASTJCT (11) → DAVELU (0) → LEMIEU (1) → MANSEA (0) → PARISV (0) → FORTPQ (0)

CORRIDOR - ASTON TO MONTREAL ⚠ [Warnings \(1096\)](#)

2009-03-20 2157

North/Westbound

Station or Train	Train Infor...	Corridor Destination	Locomotives
Station or Train	Last Locati... PCP	Dest Station	ETA
▼ MONTREAL TASCH YARD (0)			
▼ RIVIERE PRAIRIES (0)			
▼ L'ASSOMPTION (0)			
▼ SHAWINIGAN (0)			
▼ GARNEAU (0)			
▼ HERVEY (0)			
▼ ST CASIMIR (0)			
▼ ST MARC (0)			
▼ DESCHAMBAULT (0)			
▼ PORTNEUF (0)			
▼ DONNACONA (0)			
▼ STE FOY (0)			
▼ JOFFRE (36)			
A21231 24	JOFFRE TA 0641 28	NO WJCT	1028 1622
A21241 24	JOFFRE TA 1424 28	NO WJCT	1028 1622
A39881 31	WJCT TA 1757 21	NO STRACO	1631 1124

Toolbar for system-wide functions

Navigation control

Header with alerts & filters

Traffic with 1-click navigation to stations

LMS User Experience

At a glance – Station Overview



- Station line-ups displays train and assigned locomotive
Icons used to visualize train and locomotive status
2-click assignment procedure

Workcenter

Header

Station Line-Ups & Yards

Search Search Highlight On Reports Target Box

CARRIDOR-CHAMPAIGN TO MEMPHIS montasyar Go

ASTJCT (11) → DAVELU (0) → LEMEU (1) → MANSEA (0) → PARISY (0) → FORTPQ (0) → VILLER (0) → VALALA (1) → FORTIE (0) → LAURIE (0) → STAPOL (4) → TRUDEL (0) → STNICO (8) → CHAUDI (18) → WJCT (8) → JOFFRE (51) → CHARNY (0) → STROY (0)

Log off Settings

TASCHE, PQ Warnings (3)

2009-03-20 16:46 EST

[To Corridor](#)

Target Box

Target or Actual: 250/456 125/418 0/82 0/46

EASTERN REGION CHAMPLAIN MONTREAL MONTREAL TASCHE YARD

Filters

View Targeted locomotive counts versus actual

Time Horizon (hours): 720 System trains and system locomotives Throughput

Time-bound filtering for planning visualization

Numeric Train IDs Yard trains and regional locomotives Short Cuts

Apply Filters Save as Defaults Reset to Defaults

Inbound Lineup

Train	ETA	Last Loc	St	#	Lead	Locomotive Information
Q08091 11	1210 13	TASCHE 0000		1		CN 80209 00
Q24031 11	1210 13	TASCHE TD 0540 24	M			
Q24021 11	1210 13	TASCHE 0000	M			
A91011 25	0000 25	SYMING 0000				
A99991 25	1110 25	JOFFRE 0000	T			
A22221 25	1745 25	SYMING 0000				
A33331 25	1745 25	CHAUDITA 1458 25	M			
B04001 25	1745 25	SYMING TD 1654 25	M			
A22211 25	1745 25	SYMING		1		MARC 3 00

Yards

- Coupled and Tested (2)
- Serviced (9)
- To be serviced (4)
- Arrived (1)
- Shop (3)
- ETR Less than 24hs (2)

Outbound Lineup

Train	ETD	PST	St	HPT	#	Lead	Coupled and Tested
Q23020 18	1100 06			0.0	1		
V00000 30	1100 06			0.0	2		
Q20961 11	1100 06			0.0	2		
V00000 12	1100 06			0.0	1		
A00000 01	1100 06			0.0	2		
L00000 18	1100 06	P		0.0	4		AWPX 1007 00
							CSXT 86603 00
							AWPX 3004 00
L00000 17	1100 06	P	0.3	5			CN 8016 00
							AWPX 09 00
							MAD1

Inbound Line-Up with train events

Yards for locomotive maintenance

Outbound Line-Up with planned/current assignments

LMS User Experience

At a glance – Station Outbound Line-up



- Train scheduling status icon / last station on schedule flag / distributed-power flag
- Locomotive status and condition / assignments

Station Line-Up

Outbound Lineup							Coupled and Tested				
Train Information				Locomotive Information			Trk	Set	St		
Train	ETD	PST	St	HPT	#	Lead					
L00000 18	1100 06		P	0.0	+	4	CSXT 66603 00	AWPX 3004 00	MA01	0910	CT
				0.0	+	2	FUEL: N/A Actual Available HP: 4400 100% TASCHE -> CHAUDI, L00000 18, Setout to Yard In serviced yard No Previous train				
Q81041 00	1530 11		P	0.0	+	3					
Q24021 11	1100 11			0.0	+	1					
Q08091 11	1100 11								MA01		
A17001 09	1110 11			0.0	+	2					
A17001 23	1110 11		P	0.1	+	3					

Annotations:

- Train horse-power tonnage (points to HPT column)
- 2-click assignment (points to assignment icon)
- Locomotive information (points to popup menu)
- Coupling management (points to coupling management area)

Rail Industry Linear Assets Working Group



BNSF Railway Company



Enterprise Asset Management
Linear Asset Management

Thursday, May 20, 2010

Asim Ghanchi



Sub-Group Charter

- Develop and maintain a Linear Reference Model to determine gaps within SAP's current linear capability and influence SAP to address these gaps through future enhancements
- Define best practices for railroads to get started with SAP to manage linear assets
 - Modeling railroad Linear Assets leveraging SAP's LAM capability



Developments since the Fall SUGRAIL meeting LAM Testing Group

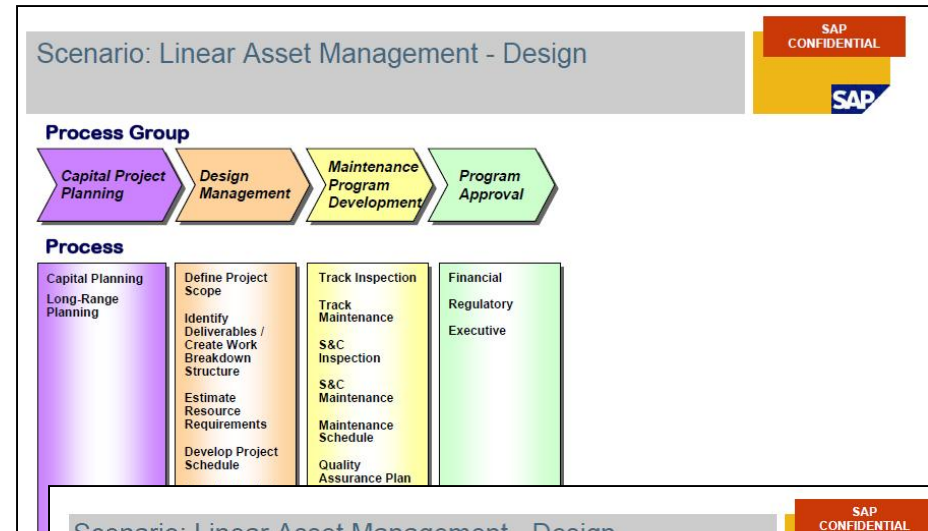
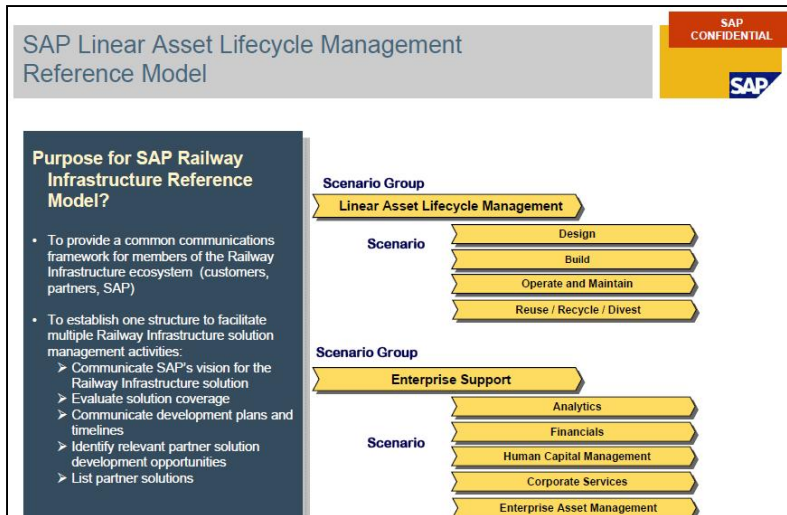


Developments since the Fall SUGRAIL meeting March 2010 Meeting

- Common scenarios in managing linear assets
 - Creation of new mainline & renaming assets
 - Dynamic segmentation
 - Defining relationships (intersects, under/over passes, etc)
- Linear Reference Model (LRM)
- Next Step was to develop a draft of the LRM for Railroads



Linear Reference Model



Scenario: Linear Asset Management - Design

Process Group	Description
Design Management	
Process	
Define Project Scope	Clearly defined the scope of the project. This would include the physical beginning and ending points of the project, a general description of the roadway including any supporting structures, signal and communications requirements and other important features of the project.
Identify Deliverables / Create Work Breakdown Structure	Deliverables would include right-of-way acquisition, roadway preparation, tunnels, bridges, culverts, grade crossings, signals and communications. The identification of deliverables enables the development of a work breakdown structure (WBS) for project cost and schedule management.
Develop Project Schedule	The project schedule lists the lowest level elements that cannot be further sub-divided. These elements provide the basis for both budget and resource planning. Each element is defined by a start-complete date, a duration and is linked to other elements based on dependencies.
Estimate Resource Requirements	The resource requirements plan matches the skills necessary to complete the deliverables identified. Resources planned include materials, worker skills and hours and required equipment or other assets. Adheres to standards and specifications.
Develop Project Budget	The costs of each element in the project schedule is estimated and forms the project budget. All required financial resources (manpower, materials and equipment/assets) are extended by time or quantity and cost to establish a budget for each element in the schedule.
Authorization for Expenditure	Throughout all phases of the project, budget authorization for each phase required. These authorizations would be incorporated as milestones in the project schedule.
Develop Risk Plan	Develop a plan for risk mitigation. The plan outlines the mitigation steps to be taken and potential risks to project completion.

Scenario: Linear Asset Management - Design

Process Group	Description		
Design Management			
Process	SAP/Partner Product (Q110)	SAP/Partner Roadmap	Comments
Define Project Scope			
Identify Deliverables / Create Work Breakdown Structure			
Develop Project Schedule			
Estimate Resource Requirements			
Develop Project Budget			
Develop Risk Plan			

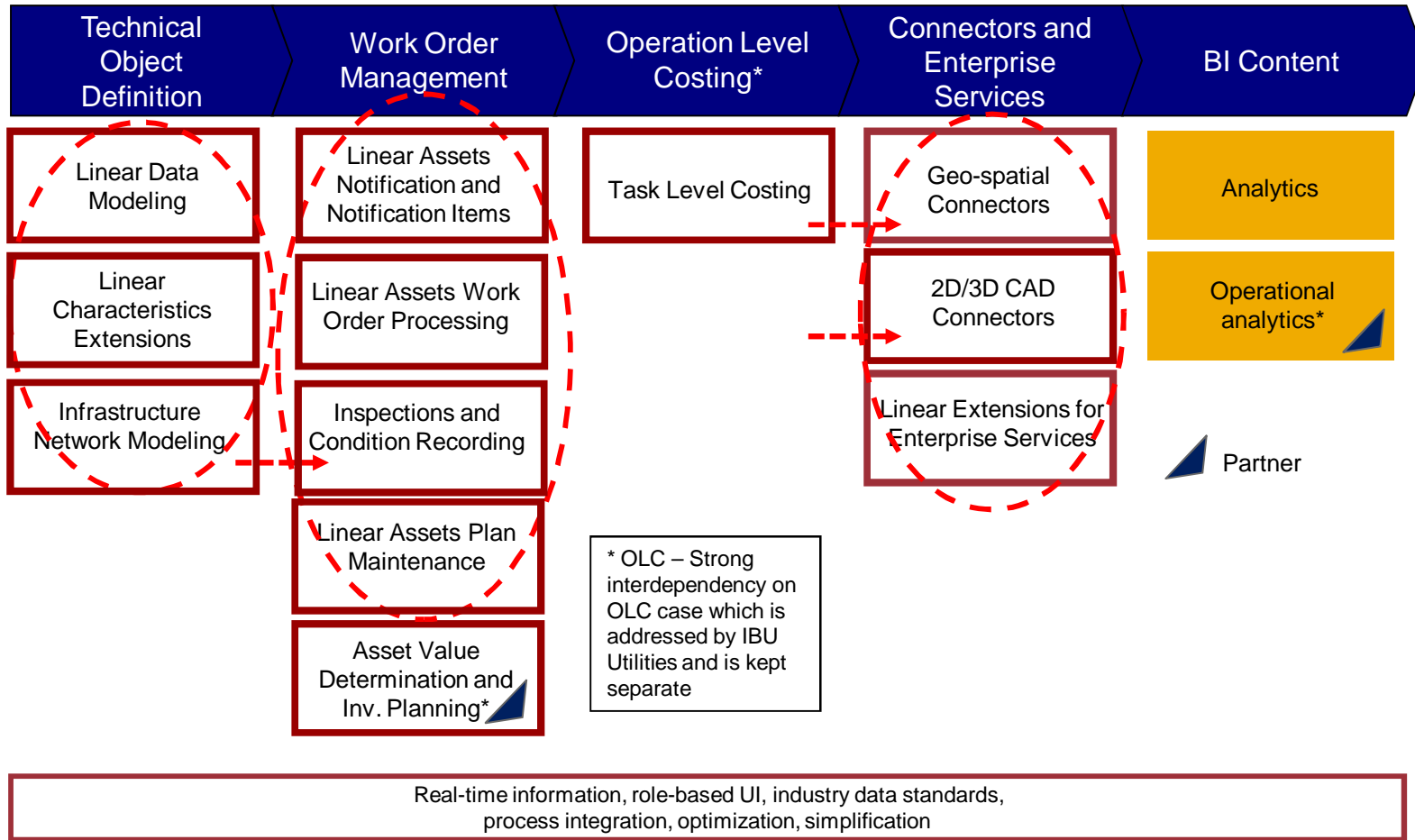
Solution Fit: ● < 50% ● 50-80% ● 80-90%

Linear Assets Management (LAM)

Initial Areas of Investments



Solution overview



Critical functional gap/Investment proposed

Critical integration gap/Investment proposed

Linear Asset Management – One Page Summary



Linear Asset Management

- **Linear Asset Management is functionality within the Plant Maintenance (PM) module which is especially designed to meet the requirements of linear asset maintenance.**
- **In Asset Intensive Industries like Oil & Gas, Railways, Utilities and Public Sector the utilization of traditional hierarchical structure of assets to represent their production or infrastructure networks is a complex and difficult process.**
- **The need to represent and model assets which extend for several kilometers (or miles) with changing characteristics and conditions requires modeling and management tools to provide the specific capabilities to support and manage these complex assets.**

Solution Enhancements

- Linear referencing functions e.g. schema for markers.
- Linear data modeling - Enhancement of technical objects functions (functional location and equipment) and classification system to support the definition of a linear asset.
- Linear asset work management - Enhancement of work order processing to support linear work definition including work orders, confirmations and maintenance plans.
- Inspection and condition monitoring - Enhancement of notifications, measurement points/Counters and measurement documents to support linear information.
- Reports for all of the above.

Key Benefits

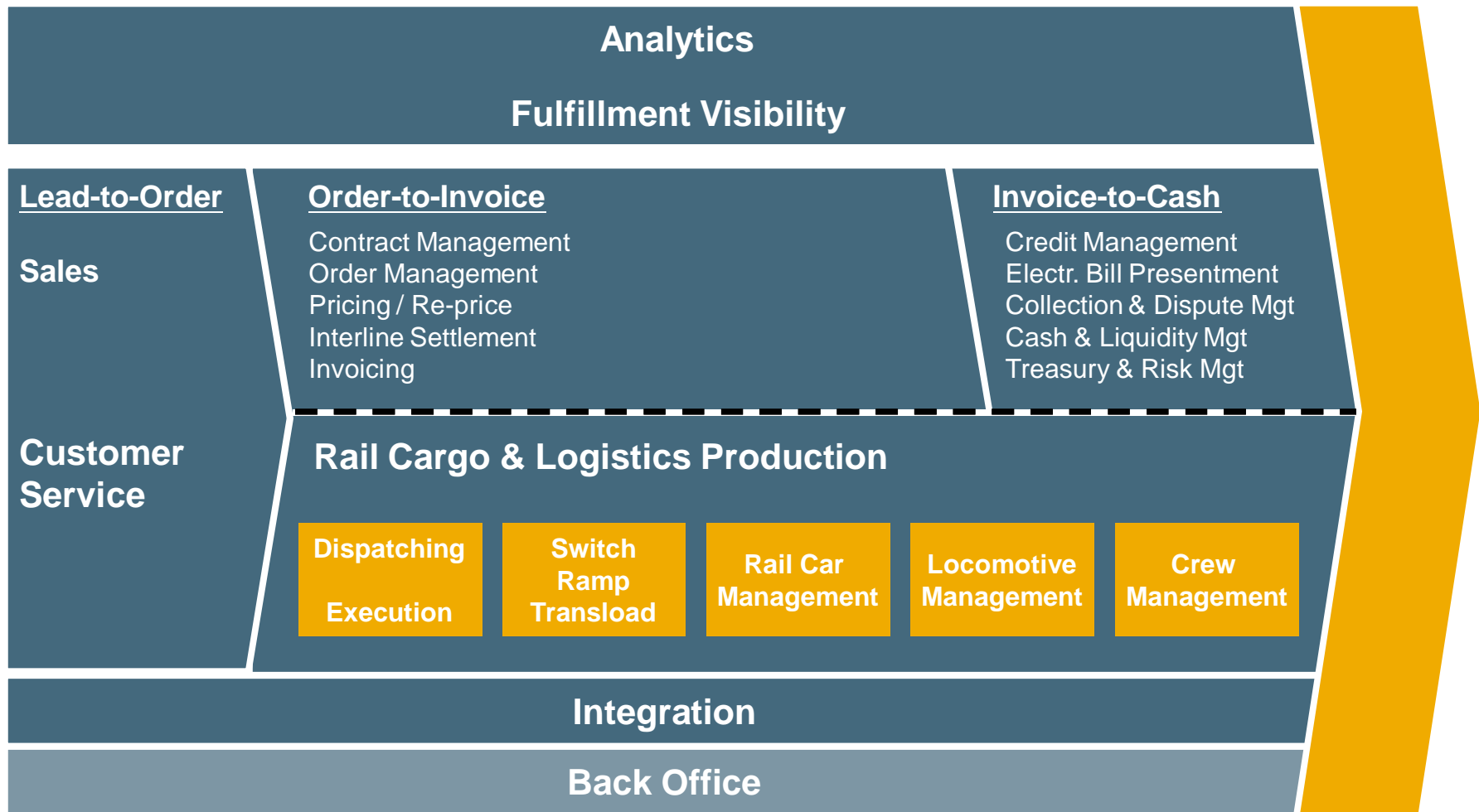
- Manage continuous assets with dynamic segmentation.
- Identify maintenance locations (where to work), by linear attributes like start/end point, length and offsets.
- Increase assets capability and availability as low performance in any linear section can have big impact on overall throughput.
- Ability to report on order costs at operation level



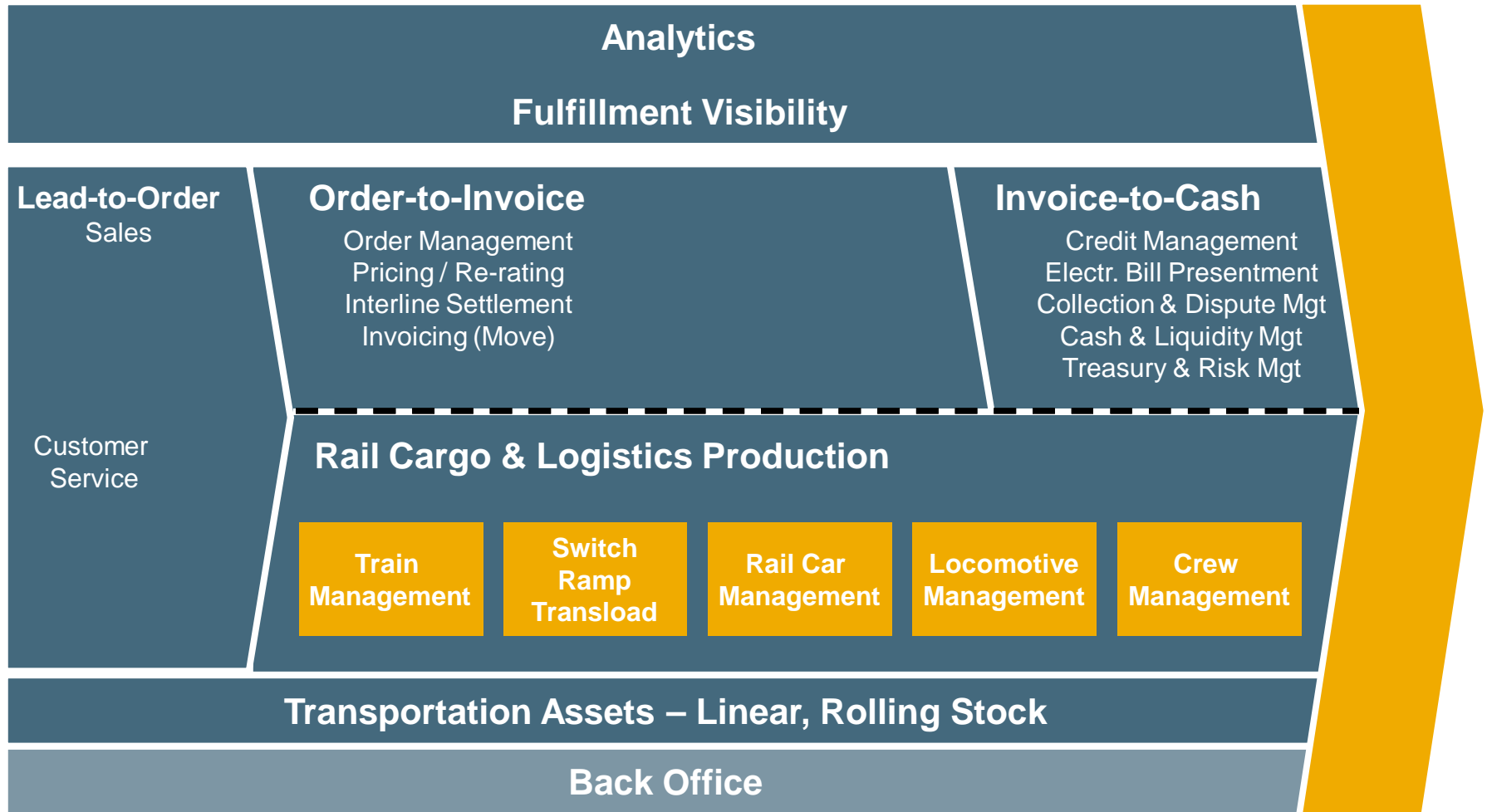
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The Railway Value Realization Chain Lead To Cash

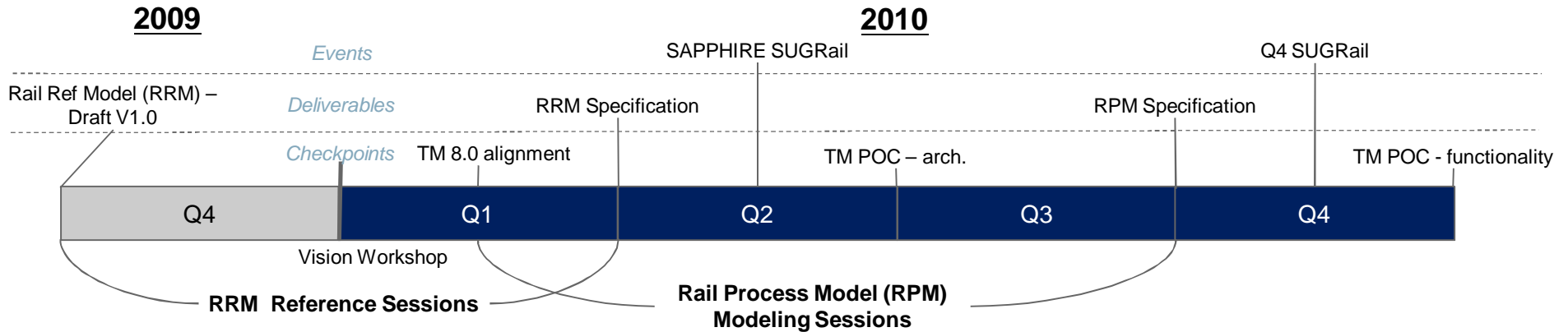


The Railway Value Realization Chain



Railway operations is a dynamic environment with complex sets of process interdependencies

Project Outcome



- Reference Model for Rail Cargo business
- Definition of L2C scenarios
- Fit/Gap Analysis
- RoadMap for Sol4Rail
- High level specification for Prio 1 items
- Business Case creation

SAP Innovative Solutions

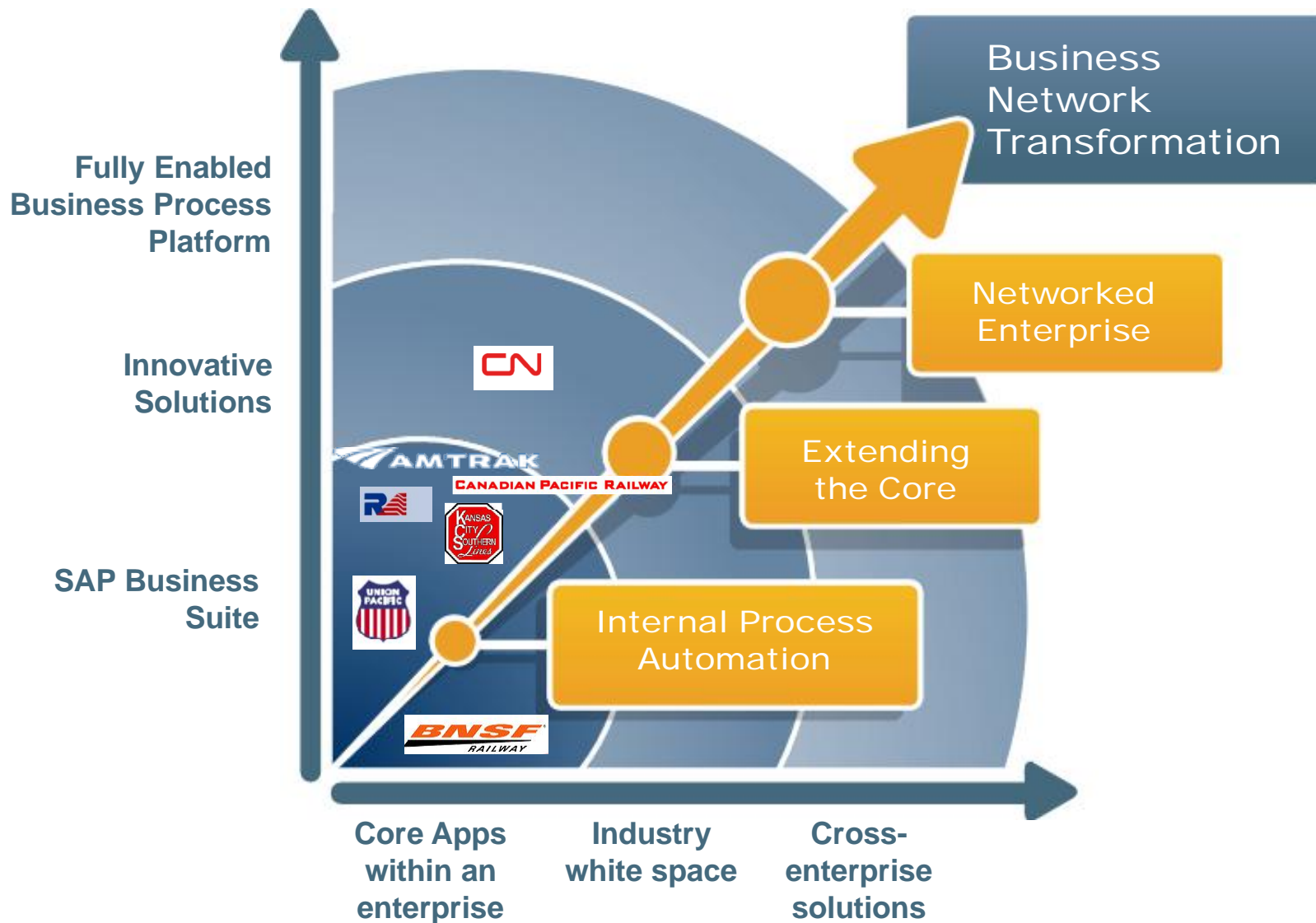
Railcar Management



- Railcar Extension (RCX)
 - Track railcars in transit via railroad-provided sightings (Car Location Messages) or GPS
- “On-Site” Event Management (OSEM)
 - Track the locations and status of railcars and other equipment on-site at a plant, railyard, or other facility
- Freight Cost Extension (FCX)
 - Enhanced route/carrier selection and freight costing enhancements
- Distance Determination Services (DDS)
 - Road distances on shipment stages via interface to third-party distance providers



Leveraging Innovation for a Dynamic Business Environment



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