Supply Chain Innovation & Digital Transformation

IHS Markit
COAL CONFERENCE CAPE TOWN
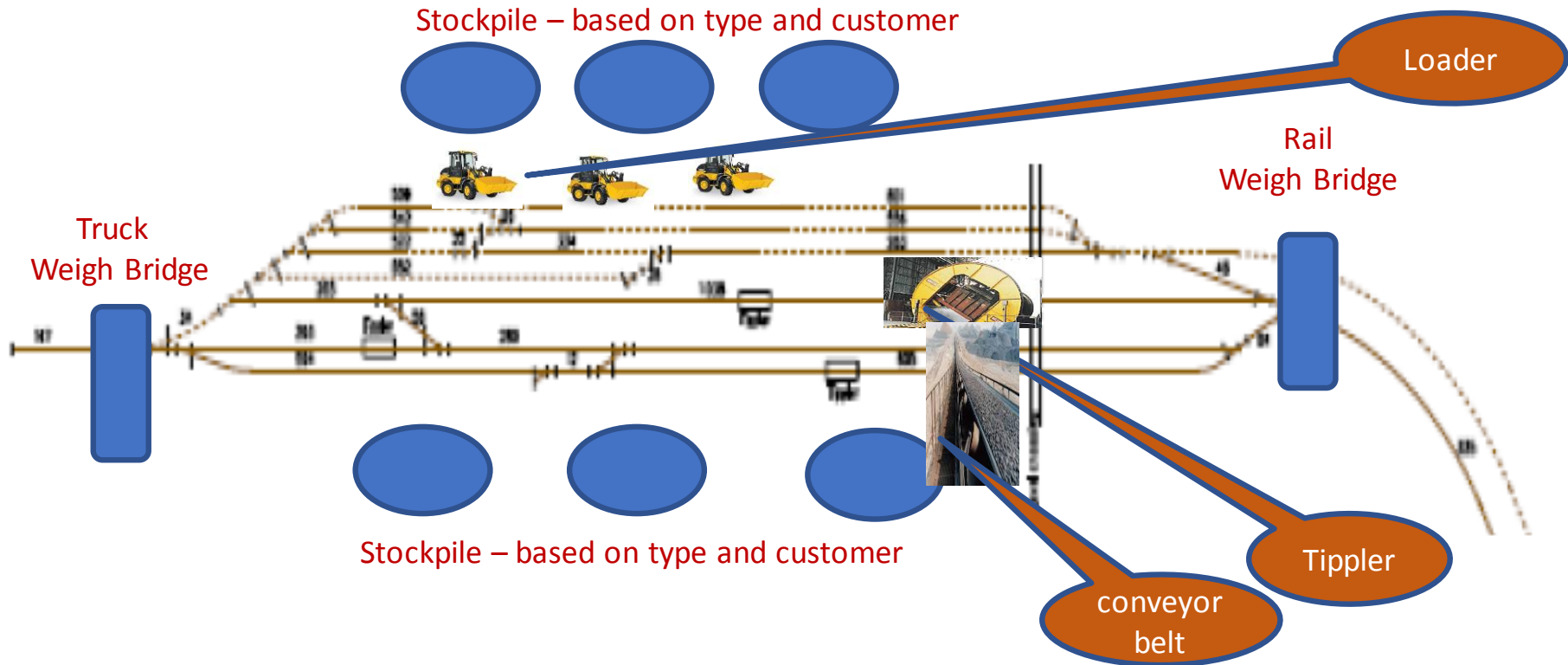1 FEB 2019

SUPPLY CHAIN MANAGEMENT

Inland terminal receives coal from supplier (Mining) thru truck / rail , stockpile based on the (coal product type and customer) within yard and export to customer thru rail / road. Manage Road-> Rail , Rail -> Rail, Rail -> Truck

Mine	Plant	Siding	Port/Industry /Power

PRODUCT FLOW

INFORMATION FLOW

CASH FLOW

+ Effeciency
+Reduced Loss
+ improved
Cash Collection

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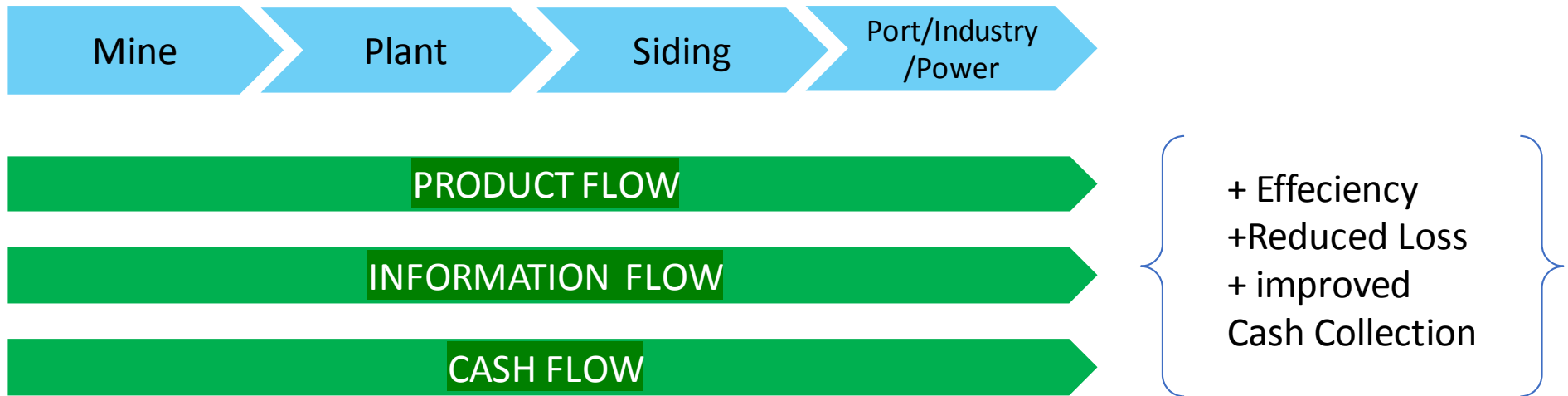
UNDERSTANDING OF CONTEXT

Inland terminal receives coal from supplier (Mining) thru truck / rail , stockpile based on the (coal product type and customer) within yard and export to customer thru rail / road. Manage Road-> Rail , Rail -> Rail, Rail -> Truck

Stockpile – based on type and customer

Loader

Rail Weigh Bridge

Truck Weigh Bridge

Stockpile – based on type and customer

Tippler

conveyor belt

CHALLENGES

Key Challenges

- Load data integrity
- Visibility of supply chain
- Coal grades integrity
- Stockpile integrity
- Operational efficiency
- Lack of collaboration

The solutions should offer significant system and process improvements such as
- **single source of truth**;
- **automate functions** where possible to reduce resource needs;
- **manage by exceptions** for bare minimum manual intervention;
- **automate data transfer** using standard mechanism which will significantly reduce manual errors and lastly provide
- **management reporting and dashboard** to the business for accurate monitoring of the terminal operation in a near real time basis.
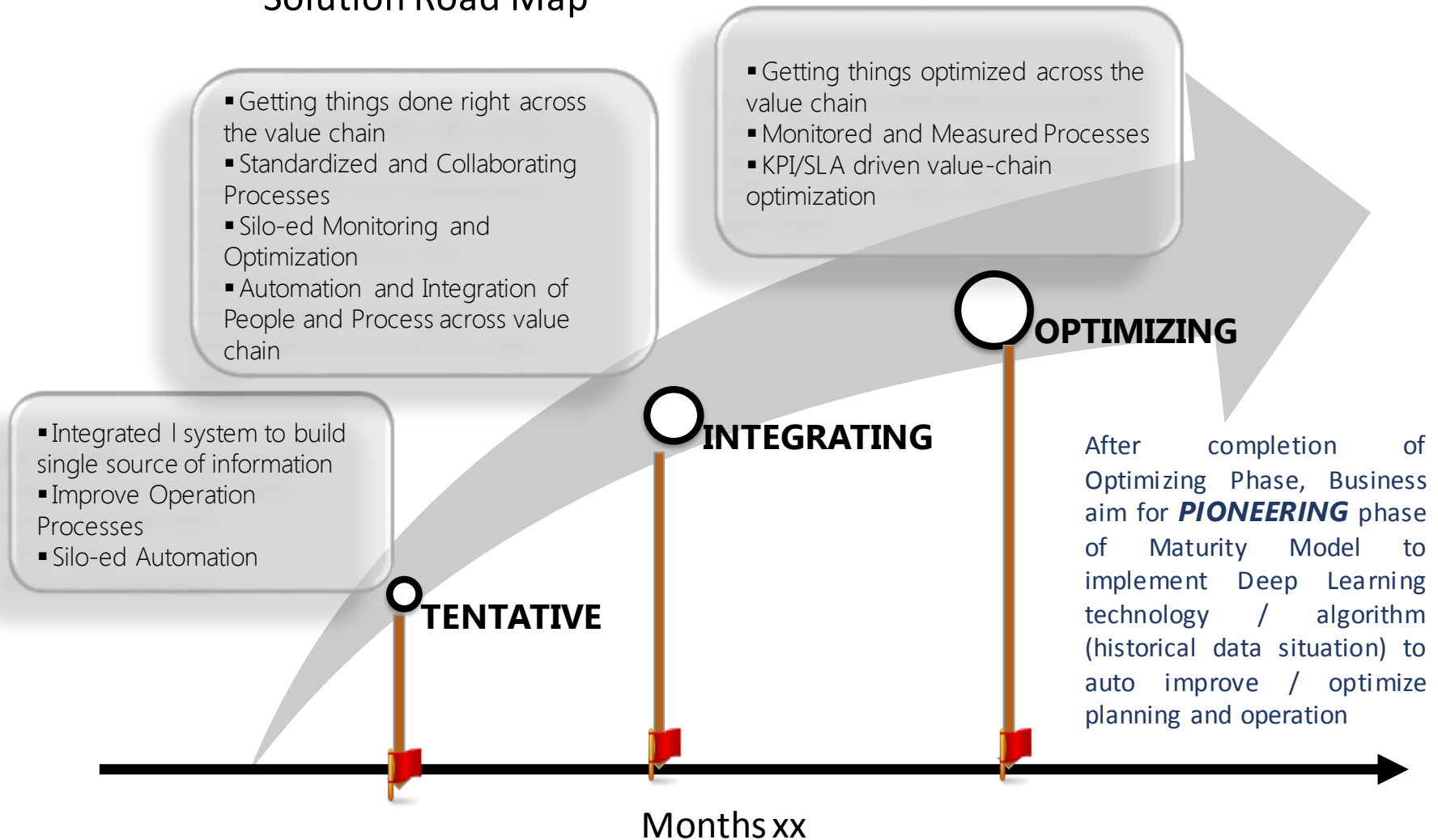
Development of Platform proposed the three phases keeping business priority in consideration
- **TENTATIVE -** Integrated l system to build single source of information , Improve Operation Processes, Silo-ed Automation
- **INTEGRATING -** Getting things done right across the value chain, Standardized and Collaborating Processes, Silo-ed Monitoring and Optimization , Automation and Integration of People and Process across value chain
- **OPTIMIZING -** Getting things optimized across the value chain, Monitored and Measured Processes, KPI/SLA driven value-chain optimization

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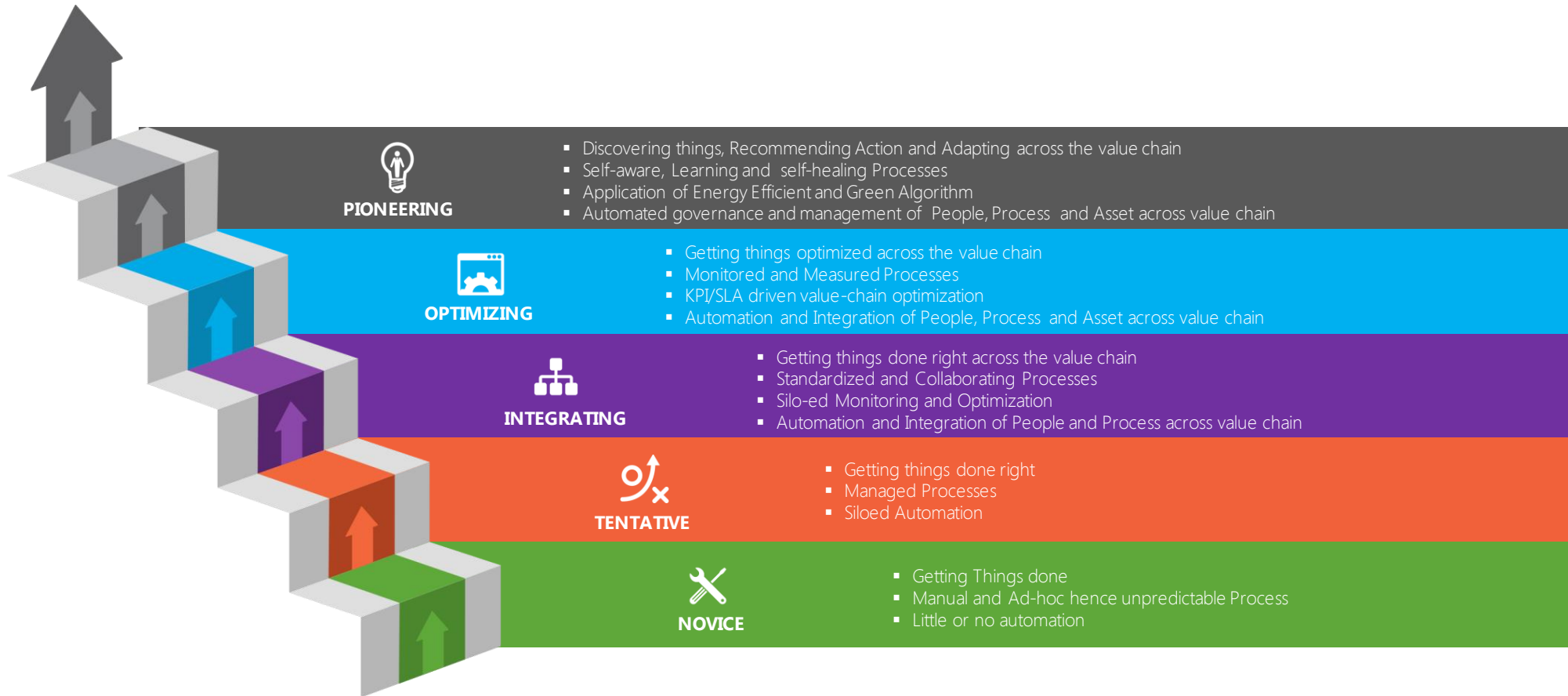
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Solution Objective

- Single Source of Truth
  - Single source of Information for operation and all inland terminal locations
  - Capability to multiple cargo and grade
  - Multi tenancy Capabilities
  - Introduced integration capabilities in all IT system
- Improve Operational Control and Supervision
  - Near Real time central monitoring view of loading and off-loading operation on Rail and Truck
  - Capture Gate Weighbridge / Loader / Motion Bridge activities and monitor
  - Automation of multiple workflows with support of Mobile devices
- Advance Planning and Automation
  - Introduce Auto Gate features
  - Advance Planning to Truck / wagon movement,   Loading / off-loading of wagon and trucks, customer stock piles
- Introduce Digital Platform for Stakeholder integration
  - Single window to manage information with all stakeholders
  - Avoid Manual management of customer and operational data
- Self Service Platform for Data Analysis and Reporting
  - Introduce self service platform to improve reporting and data analysis

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Solution Road Map

- Getting things done right across the value chain
- Standardized and Collaborating Processes
- Silo-ed Monitoring and Optimization
- Automation and Integration of People and Process across value chain

- Getting things optimized across the value chain
- Monitored and Measured Processes
- KPI/SLA driven value-chain optimization

- Integrated I system to build single source of information
- Improve Operation Processes
- Silo-ed Automation

OPTIMIZING

INTEGRATING

TENTATIVE

After completion of Optimizing Phase, Business aim for *PIONEERING* phase of Maturity Model to implement Deep Learning technology / algorithm (historical data situation) to auto improve / optimize planning and operation

Months xx

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Smart Terminal Maturity Model

PIONEERING
- Discovering things, Recommending Action and Adapting across the value chain
- Self-aware, Learning and self-healing Processes
- Application of Energy Efficient and Green Algorithm
- Automated governance and management of People, Process and Asset across value chain

OPTIMIZING
- Getting things optimized across the value chain
- Monitored and Measured Processes
- KPI/SLA driven value-chain optimization
- Automation and Integration of People, Process and Asset across value chain

INTEGRATING
- Getting things done right across the value chain
- Standardized and Collaborating Processes
- Silo-ed Monitoring and Optimization
- Automation and Integration of People and Process across value chain

TENTATIVE
- Getting things done right
- Managed Processes
- Siloed Automation

NOVICE
- Getting Things done
- Manual and Ad-hoc hence unpredictable Process
- Little or no automation

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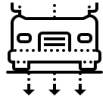
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Solution Realization : Stock Reconciliation Event – Example
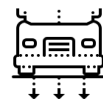
Event - Receives Cargo By Truck

| Truck Arrival | Weigh Truck Full | Truck Off-load | Weigh Truck Empty | Truck Departure | Stock Available |

Event – Delivery Cargo by Train

| Train Arrival | Weigh Wagon Empty | Inspection Check | Load Wagon | Weigh Wagon Full | Train Departure | Stock Available |

Monitoring
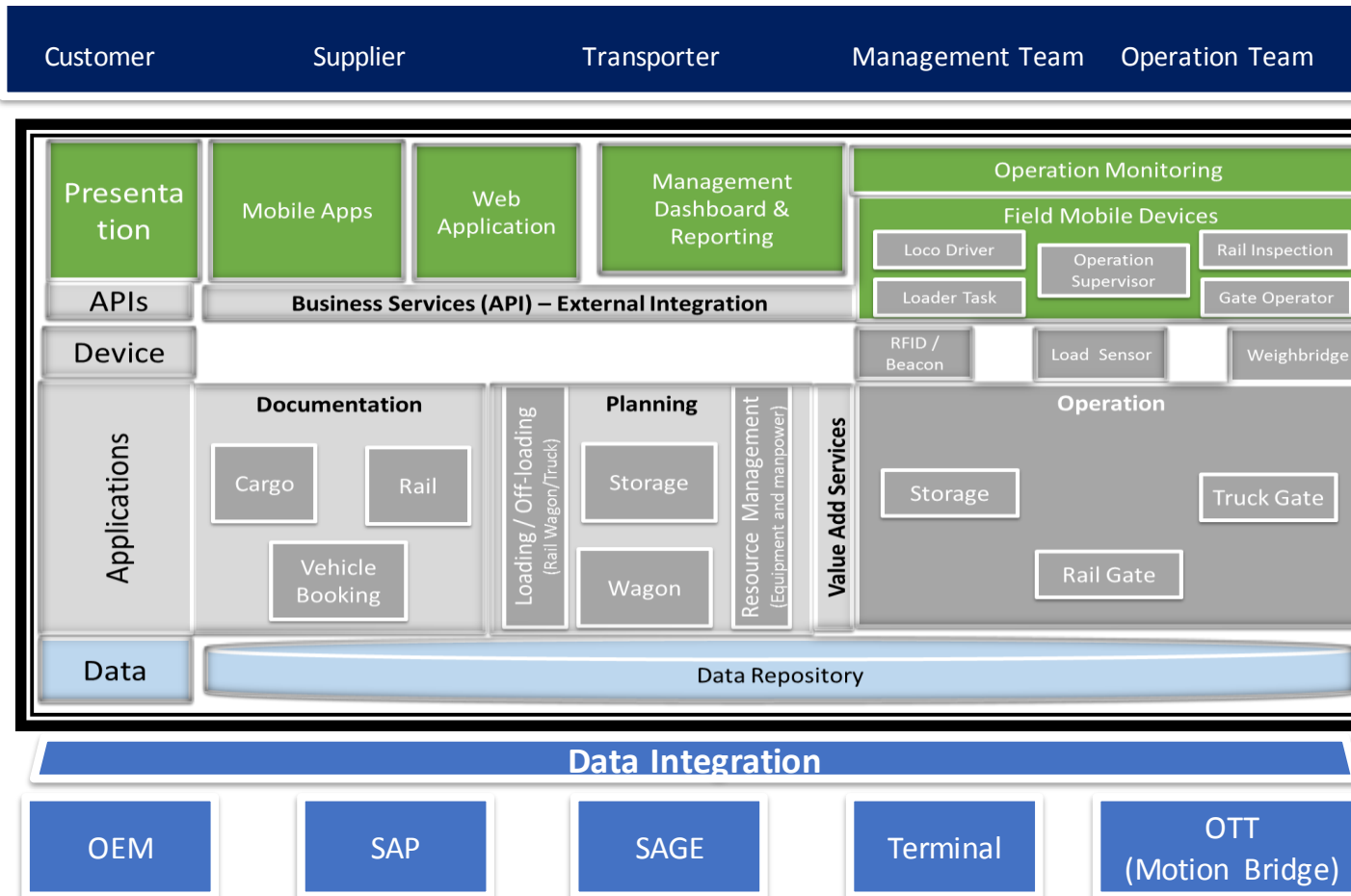
| Truck Turn Around Time | Wagon Loading Status | Wagon Loading Status | Stock in hand | Train Turn Around Time | Exception -Overload / Under loaded wagon -Missing Wagon detail |

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Target Proposed Solution

- Integrated solution for all stakeholders (internal / external)

- Enable Data integration with the other applications

- Deployed on Cloud

- Provide API, Web Application and Mobile Apps for external stockholders for information exchange

- Integrate with devices to provide automation at gate and near real time operation monitoring

Solution Component

Documentation	Planning	Operation	Value Add Services

Documentation

- **Create Order** for cargo by Rail / Truck
- **Delivery Order** for Rail / Trucks
- Truck Pre announcement: Advance information by haulers on Truck arrivals for receipt/delivery of the cargo
- **Rail Registration**: Registers the rail for its each visit to the terminal with wagons details attached to rail
- **Record details** wagons attached to rail and associated cargo mapping

Planning

- **Storage Planning**
  - Profile Definition -Yard definition with Rows and Columns
  - Stock Pile Management
  - Area allocation for incoming cargo on the storage locations
- **Resource Planning** - Planning of equipment and manpower
- **Operation Planning** – For Cargo Loading / Unloading of Rail / Truck for number moves equipment to be performed

Operation

- **Gate Operations**: Truck gate in / Gate Out operations recording for cargo, Assign stock pile location
- **Gate pass** to loader mapping
- Print gate pass with assigned stock pile
- **Truck Loading / Unloading** Operations Recording
- **Rail Operations** Recording
  - Rail Arrival / Departure Recording
  - Exchange Yard Operations (In /Out) - For handing over Rail from Railways to Terminal or vice versa
  - Drawn Out - Draw wagons to exchange yard
- **Mobile Applications for Truck/ Rail Operations and auto gate**
- **Hold and Release** of cargo recording
- Operation Monitoring – Gate/ Cargo/Storage
- **Order Closure** For reconciliation of received quantity against requested quantity
- **Interface**s with various devices for receiving data, EAM and Invoice system

Value Add Services

- Rail wagon cleaning services, General Cargo services and miscellaneous services
- Cargo shifting services
- Wagon Cleaning Service - Invoked by Weight Validation

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THANK YOU

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