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ORACLE Platinum Partner Cloud Premier EMEA

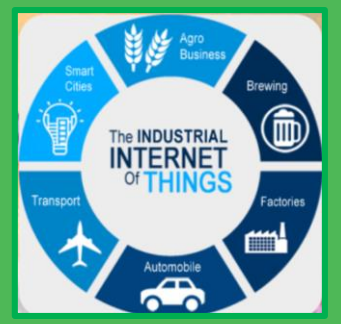
HOW INTERNET OF THINGS TRANSFORMS THE INDUSTRY

Denis SENPERE
VP, Inspirage Europe

Lausanne, April 19th 2018

Courtesy Alstom/Amtrak

THE IMPACT OF IOT



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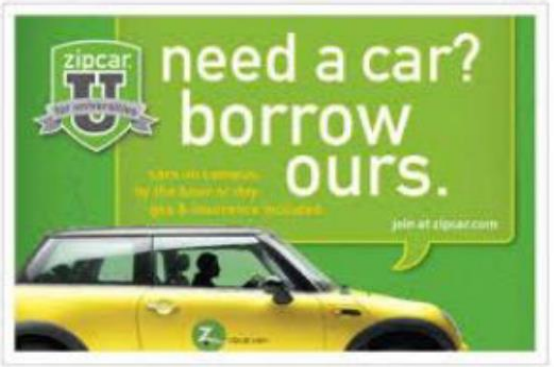
THE RISE OF NEW CUSTOMER-CENTRIC BUSINESS MODELS

IoT as a means to ***improve asset utilization*** is the beginning

Consumables as a service

Usage based service models



Temporary Power as a Service

IoT as a disruptive technology to create ***new, customer-centric business models*** will create the ***next generation market leaders***

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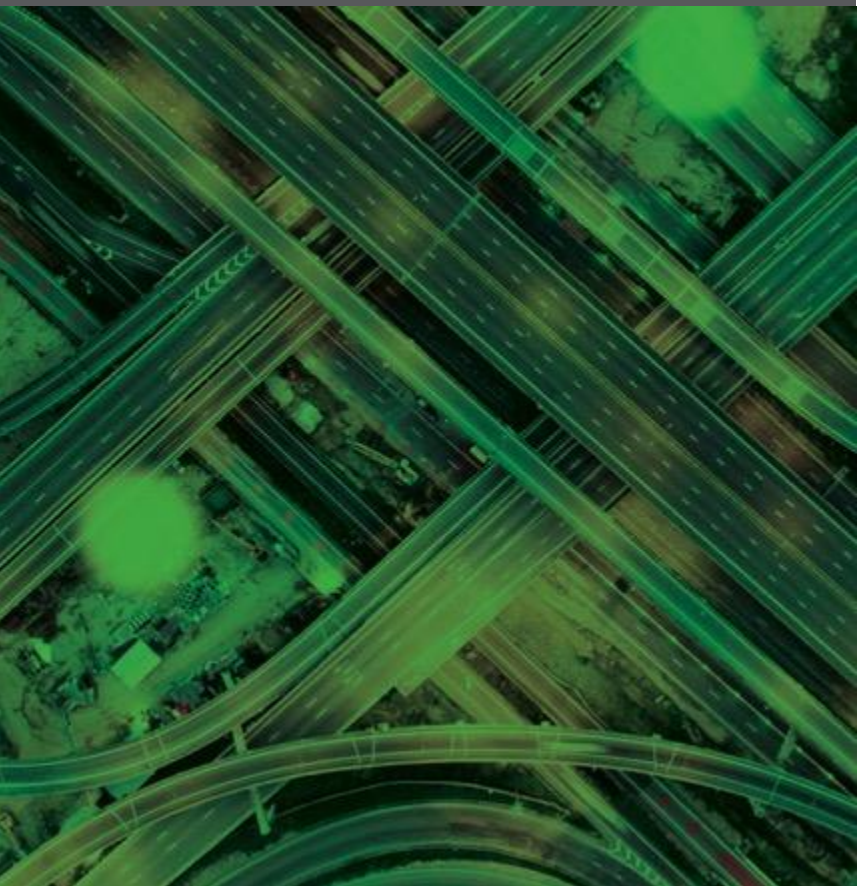
INCREASE SHAREHOLDER VALUE



The ROI for IoT investments in a digital supply chain come from both both top-line and bottom-line growth.

INCREASED MARKET SHARE

Companies with digital supply chains incl. IoT outperform their competitors in the marketplace through

- Increased engagement
- Enhanced services
- Improved quality leads to customer loyalty
- Faster time-to-market

REDUCED COSTS

Companies that digitize their supply chain and include IoT will see improved margins through

- Improved safety and security
- Optimized Increased sustainability
- Reduced returns, repairs
- Increased visibility

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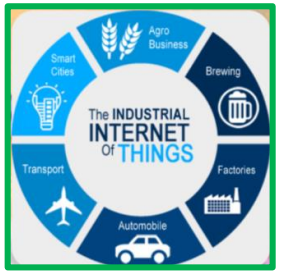
WHAT IS THE IMPACT FOR YOUR PRODUCTS AND PROCESSES ? (1/2)

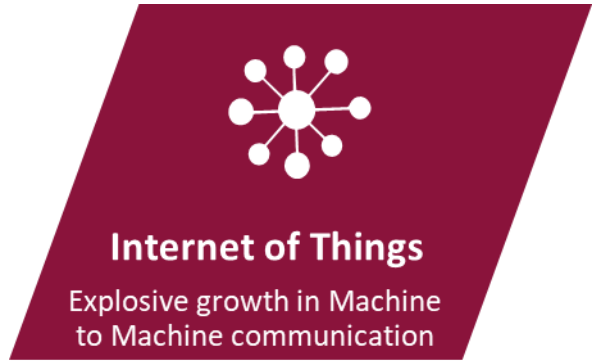


- You were supporting **« configured products »** with limited connectivity

- You now need to support **« evolving products »** with continuous upgrades, transmitting a lot of data to analyze, with totally new business requirements

- Your organizations will evolve to cross-functional Engineering with a tight link with IT, requiring a higher degree of collaboration and data integration

- Cloud is the only efficient way to go with IoT



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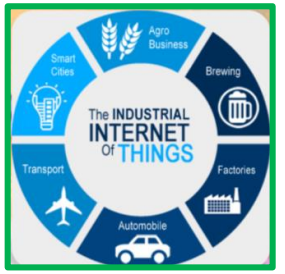
WHAT IS THE IMPACT FOR YOUR PRODUCTS AND PROCESSES ? (2/2)



- **Product Designs need to evolve**
  - Include data collection and monitoring mechanisms
  - Support remote service to a fine granularity level
  - Support new business models such as Product-as-a-Service *(eg: electric cars on demand in big cities)*
  - Support very late design changes, including after delivery
  - Support security levels from hackers

40% of manufacturers will provide Product-as-a-Service by 2018

-IDC 2015

25% say IoT has “sparked a new wave of innovation thanks to data that give us better insights”

-The Economist intelligence

- **Product Development methods need to evolve**
  - Design connected products, entirely or subsytems
  - Manage the lifecycle of such products *(configuration, upgrades, variability, security)*
  - Use big data to manage Quality, Support and Maintenance
  - Use big data to optimize Performance and Autonomy
  - Simulate all new bunch of operational cases during design phase
  - Support many remote processes *(early adopters, selective upgrades…)*

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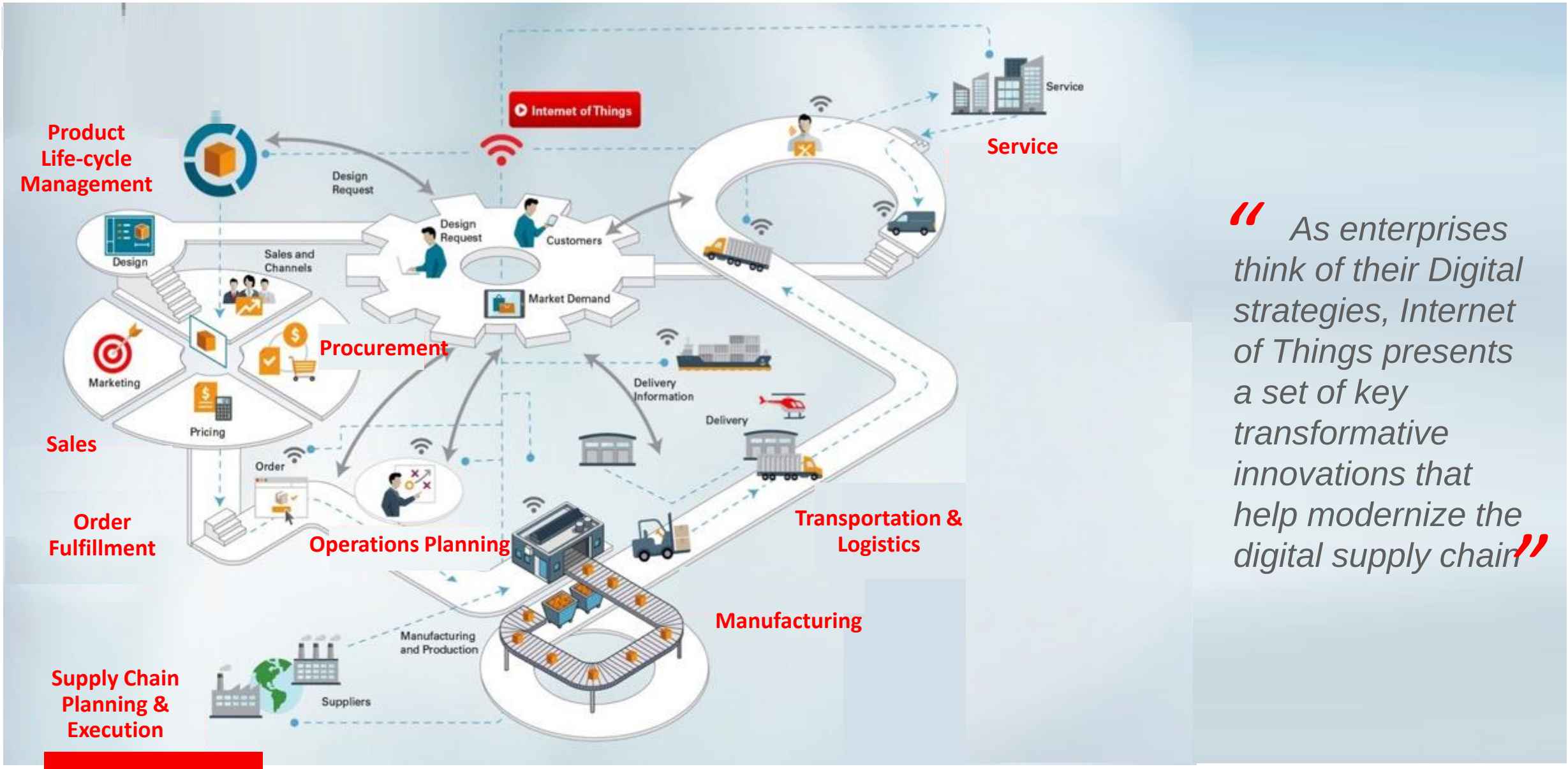
IOT-ENABLED MODERN SUPPLY CHAIN FOR THE DIGITAL AGE



" As enterprises think of their Digital strategies, Internet of Things presents a set of key transformative innovations that help modernize the digital supply chain "

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IIOT SOLUTIONS – COMPLEX CONNECTIVITY STACK

LEVELS

6 **VALUE** – collaboration of customers, integrators, service providers with business processes

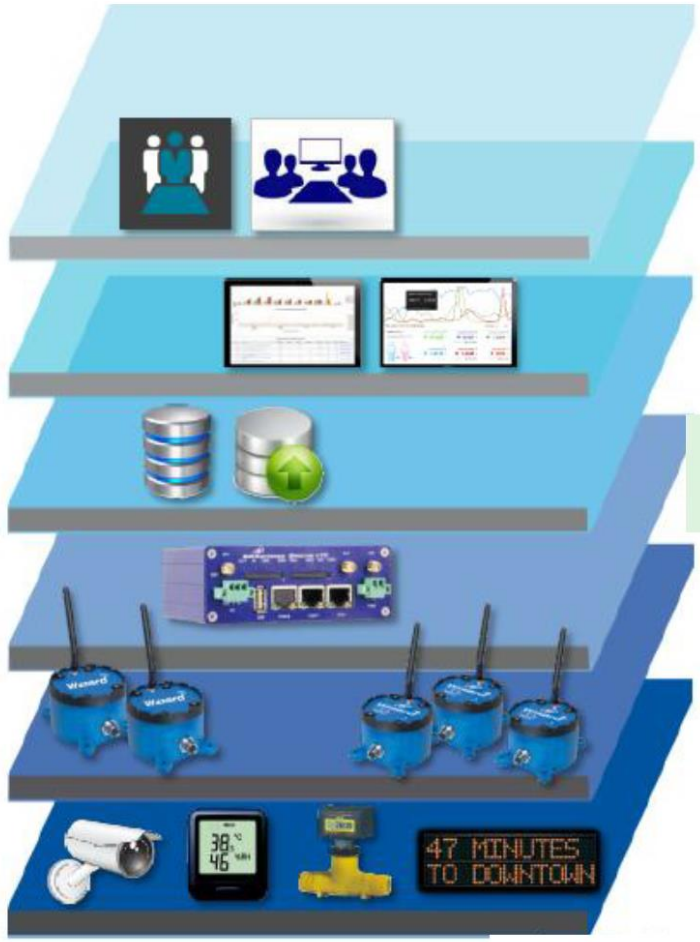
5 **APPLICATIONS** – reporting and analytics

4 **DATA STORAGE & ACCESS** –

3 **DATA AGGREGATION, PROCESSING, TRANSFORMATION** – gateway layer

2 **INTELLIGENT CONNECTIVITY** – communication and processing units

1 **PHYSICAL DEVICES** – "things" in the "Internet of Things"



IT
- Query based
- Data at rest
- Not real time

Disparate Requirements

OT
- Event based
- Data in motion
- (Near) real time

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ORACLE IOT APPLICATIONS
MAKE IOT SIGNALS ACTIONABLE

Detect

Track movement
Read temperature
Gauge humidity
Sense vibration

Device Signals

Analyze

Visualize status
Contextualize events
Predict failures
Trigger alerts
Update device parameters

Business Events

Act

Dispatch service
Reroute shipments
Substitute materials
Replan supply

IoT Devices

- Building Sensors
- Equipment
- Logistics
- Mobile Devices

IoT Cloud Applications

- Asset Monitoring
- Production Monitoring
- Fleet Monitoring
- Connected Worker

SCM Cloud

- Inventory & Cost Mgmt
- Manufacturing
- Transportation Mgmt
- Warehouse Mgmt

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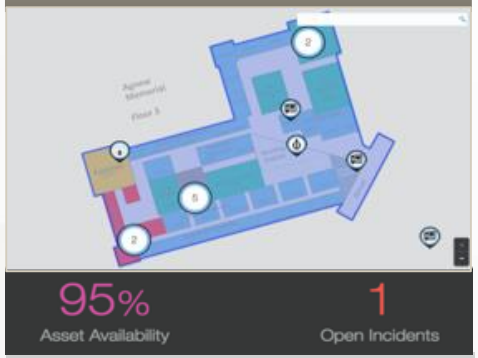
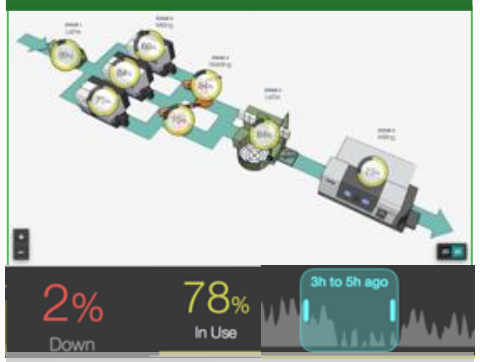
ORACLE IOT APPLICATIONS

Asset Monitoring



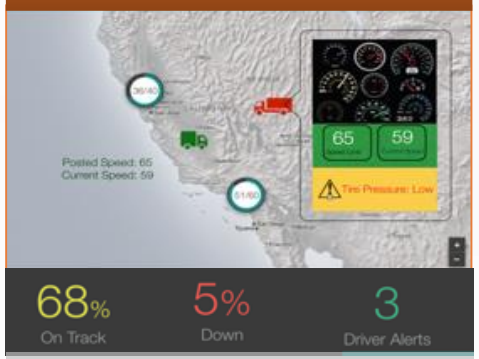
Monitor assets, their health, utilization & availability

Production Monitoring



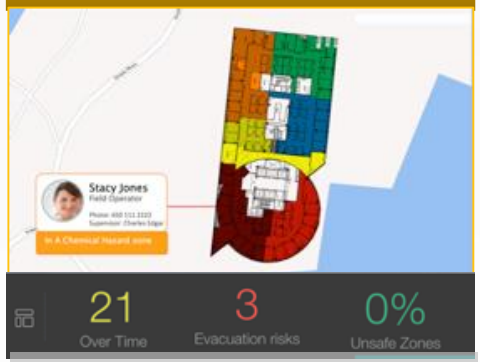
Manufacturing equipment & production line monitoring & prognostics

Fleet Monitoring



Monitor shipments, fleet vehicles, driver behavior and costs

Connected Worker



Enhance worker safety through monitoring of workers and environment

Service Monitoring for Connected Assets

Automate asset monitoring and customer service to enhance customer experience

Internet of Things Cloud Enterprise (Platform)

Connect | Analyze | Integrate | Learn

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IoT DEPLOYMENT PHASES

Devices	Connected Assets	Predictive Analytics	Service Excellence	Apps
	Phase 1	Phase 2	Phase 3	ERP SCM MES
	Connected Assets	**Predictive Analytics**	**Service Excellence**	**Customer Support** **CRM** **HCM**
	• Remote Monitoring • Asset Tracking • Business Alerts	• Proactive Decisions • Predictive Algorithms • Improved Products	• Business Transformations • IoT Blended Into Enterprise Applications	**Custom Enterprise Applications**

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USE CASE:
FLEET MONITORING

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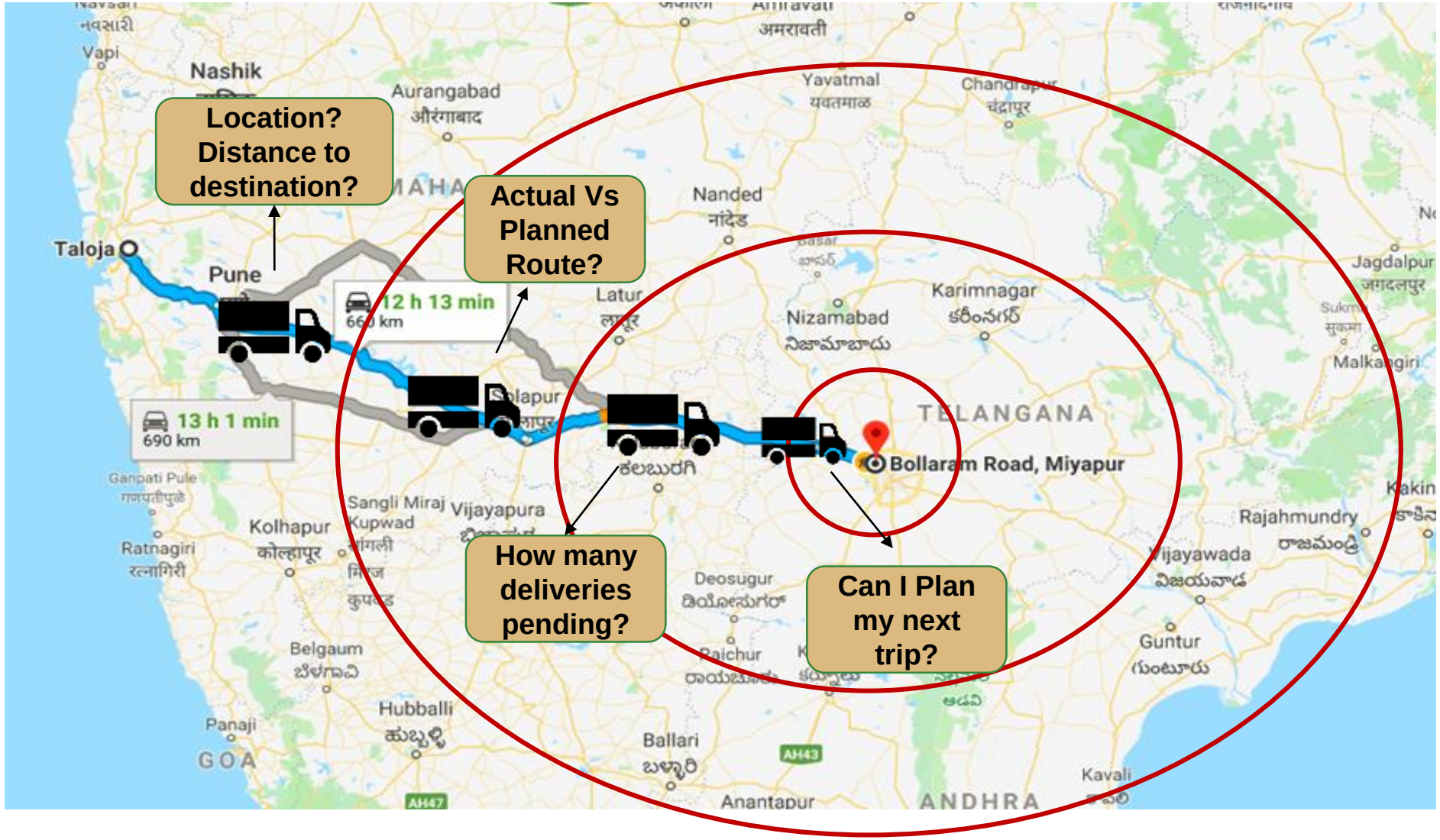
VISIBILITY – CIRCLES OF INFLUENCE



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BUSINESS NEEDS

Track	Alert	Predict	Act

• Truck location
• Truck utilization
• Truck availability
• Truck Actual route
• Shipment Delivery status
	• Trip delays
	• Route deviations
	• Accidents
		• Time to deliver considering
		  • Traffic
		  • Route(s)
		  • Distance
		  • Speed
		  • Regulation
			• Create automatic events / alerts
			• Change Service provider
			• Assign next trip
			• Change stop sequence
			• Communicate

Track using Mobile App or GPS or OBD device	**Create alerts for any deviations**	**Predict accurate ETA**	**Trigger workflow in downstream applications**

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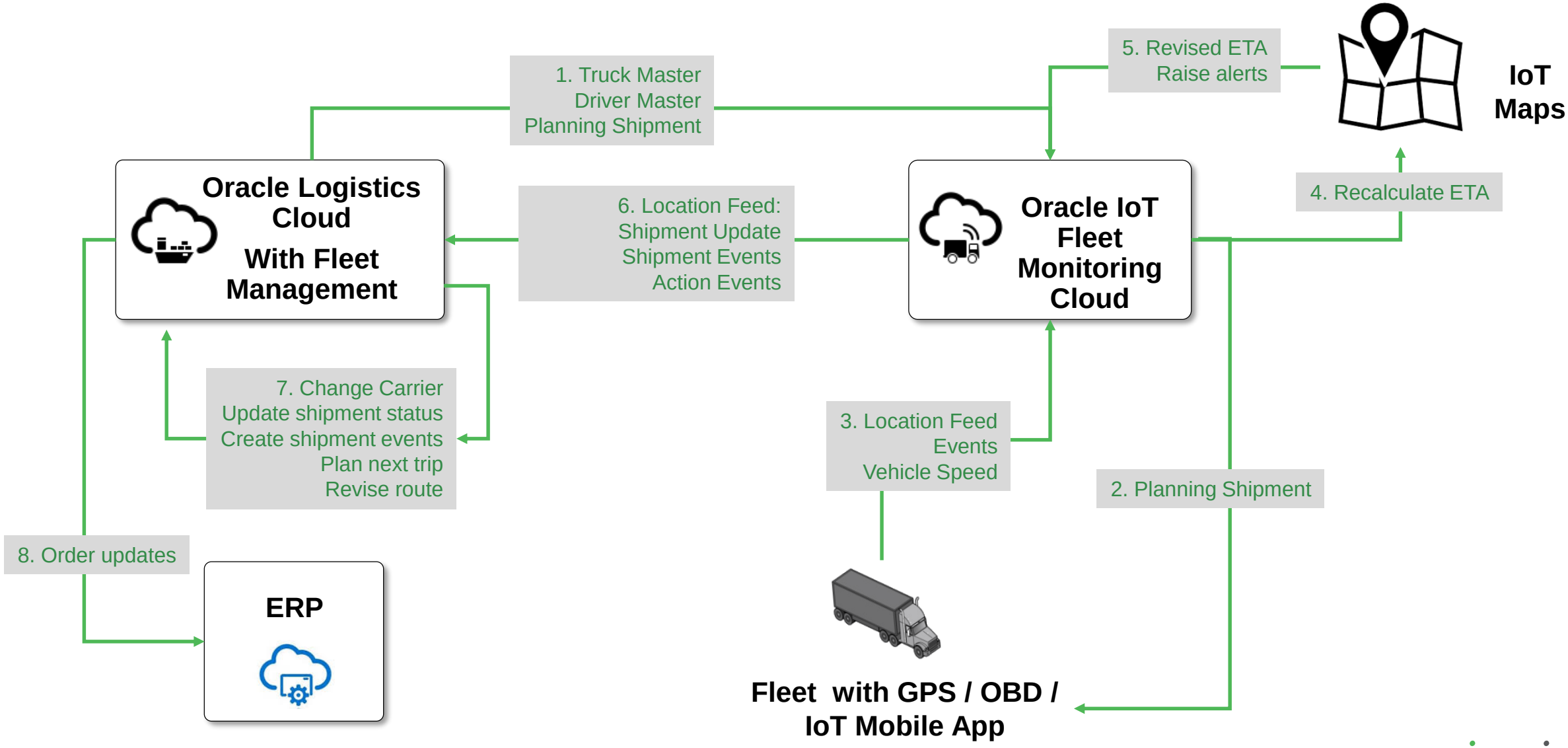
INFORMATION FLOW -UPDATED



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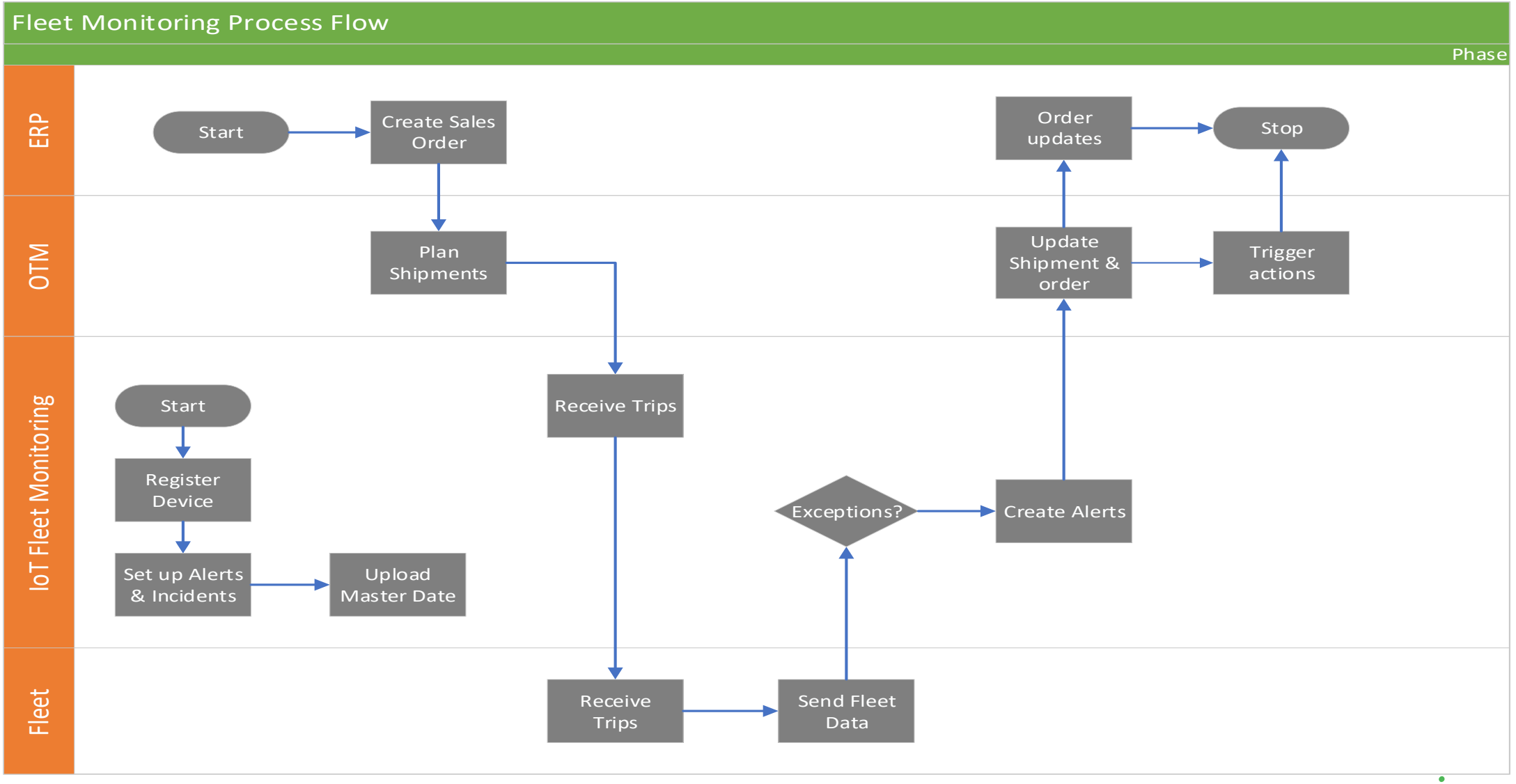
PROCESS FLOW



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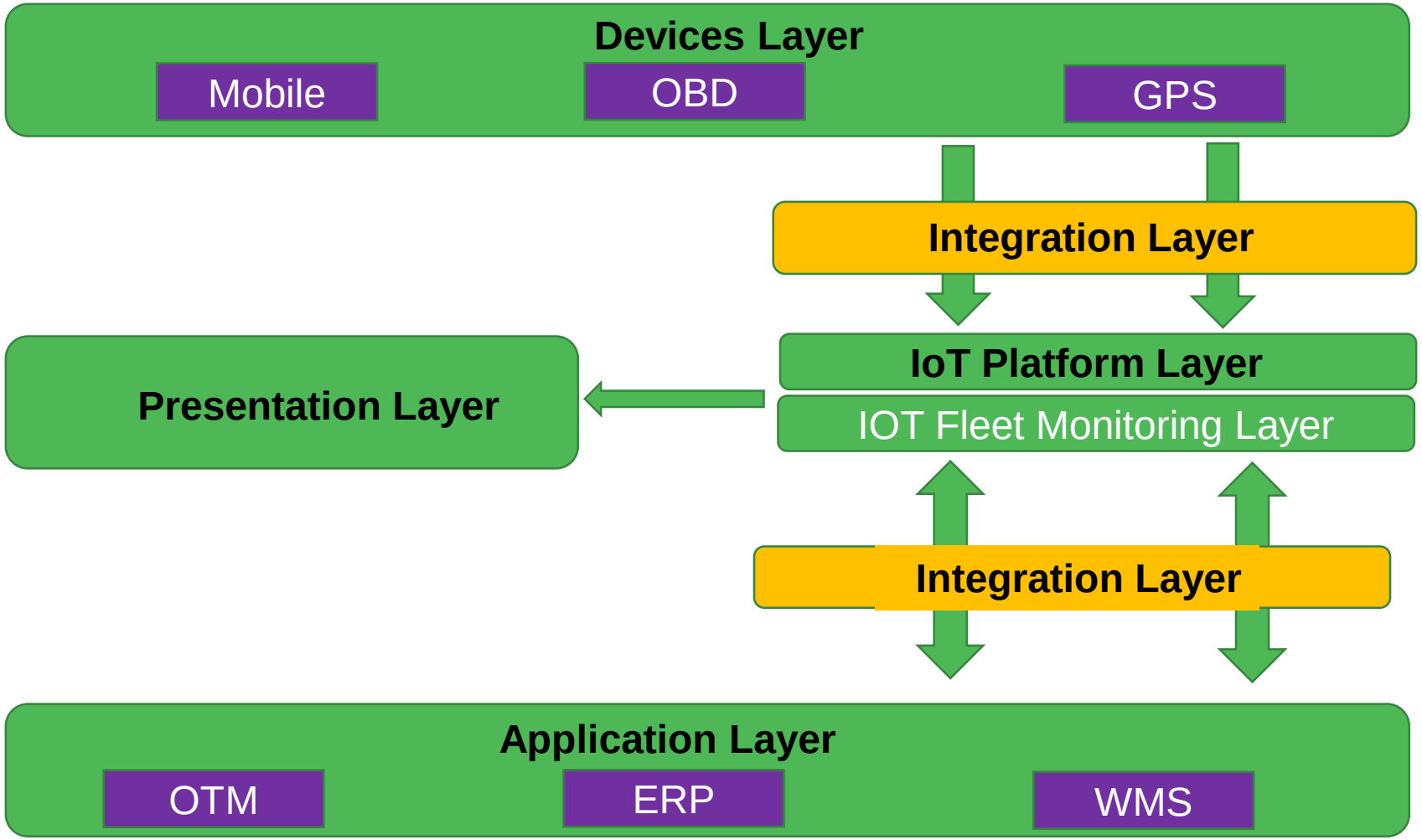
ARCHITECTURE



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FLEET MONITORING

- Improved shipment visibility
- Improved throughput
  Plan downstream activities better in advance
- Optimized fleet planning
  Re-use fleet for subsequent trips
- Better customer service
  Extend shipment visibility to customers
- Better control
  Manage exceptions

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USE CASE:
CARGO MONITORING

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USE CASE – CARGO MONITORING

Pilferage?

Door
- No of times Opened
- No of Stops

Cargo Damaged?

Temperature:
- Ideal Range – 0- 5 c
- Current – 8 c

Pilferage

Route:
- Planned vs Actual
- Stop Sequence

Pilferage?

Weight:
- Loaded weight – 9 T
- Current Weight – 8.5 T

Damaged / Wrong Dly?

Contents:
- Cargo status

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BUSINESS NEEDS

Track	Alert	Analyse	Act

• Temperature
• Speed
• Weight
• Cargo status
• Route
• Door opening
	• Temperature exception
	• Route deviations
	• Weight discrepancy
	• Door opening
	• Over speeding
		• Shipment condition considering
		  • Weight
		  • Temp..
		  • Door opening
		  • Shipment condition
			• Create automatic events / alerts

Track using OBD device & external sensors	**Create alerts for any deviations**	**Predict Theft / Wrong shipment**	**Trigger workflow in downstream applications**

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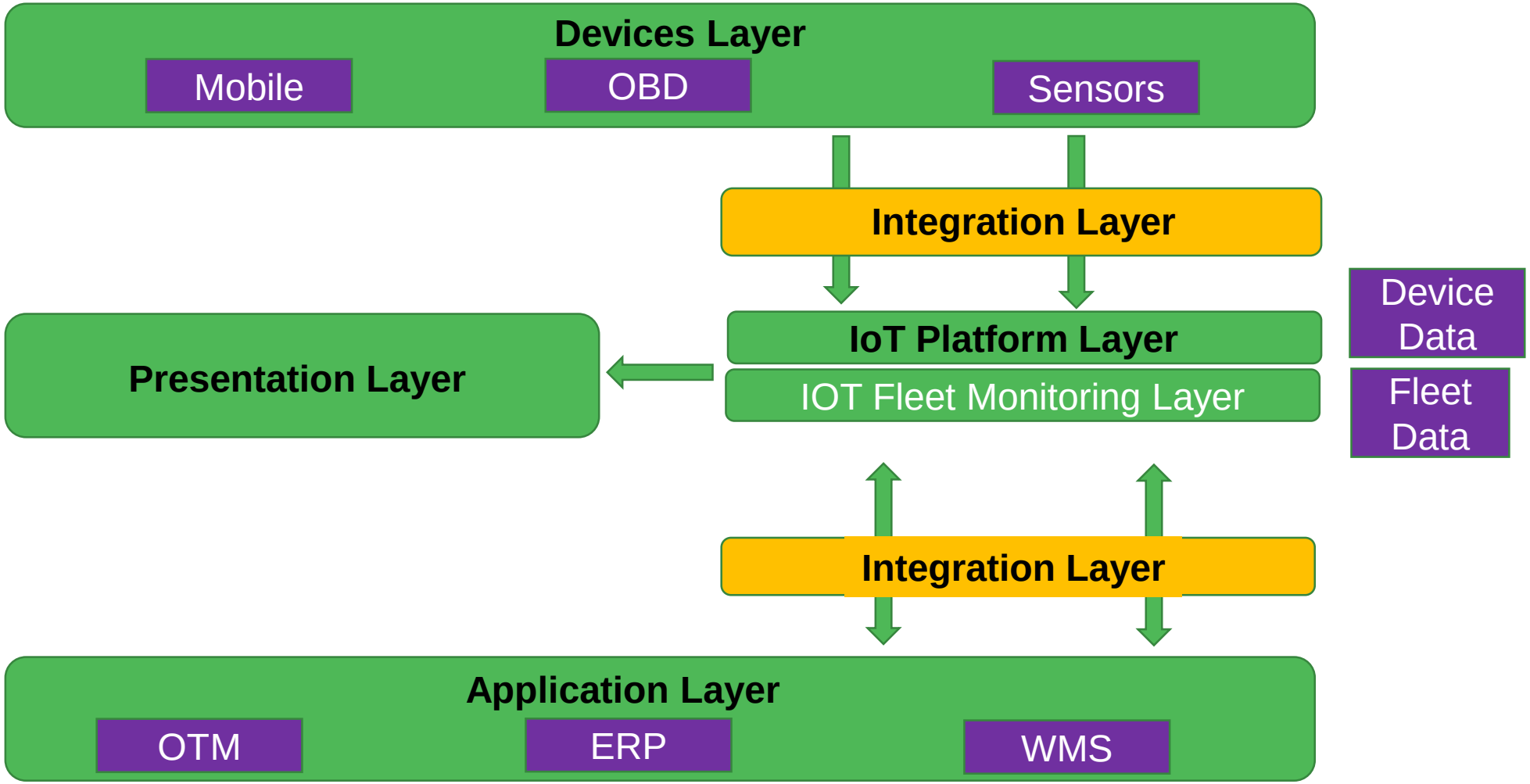
ARCHITECTURE



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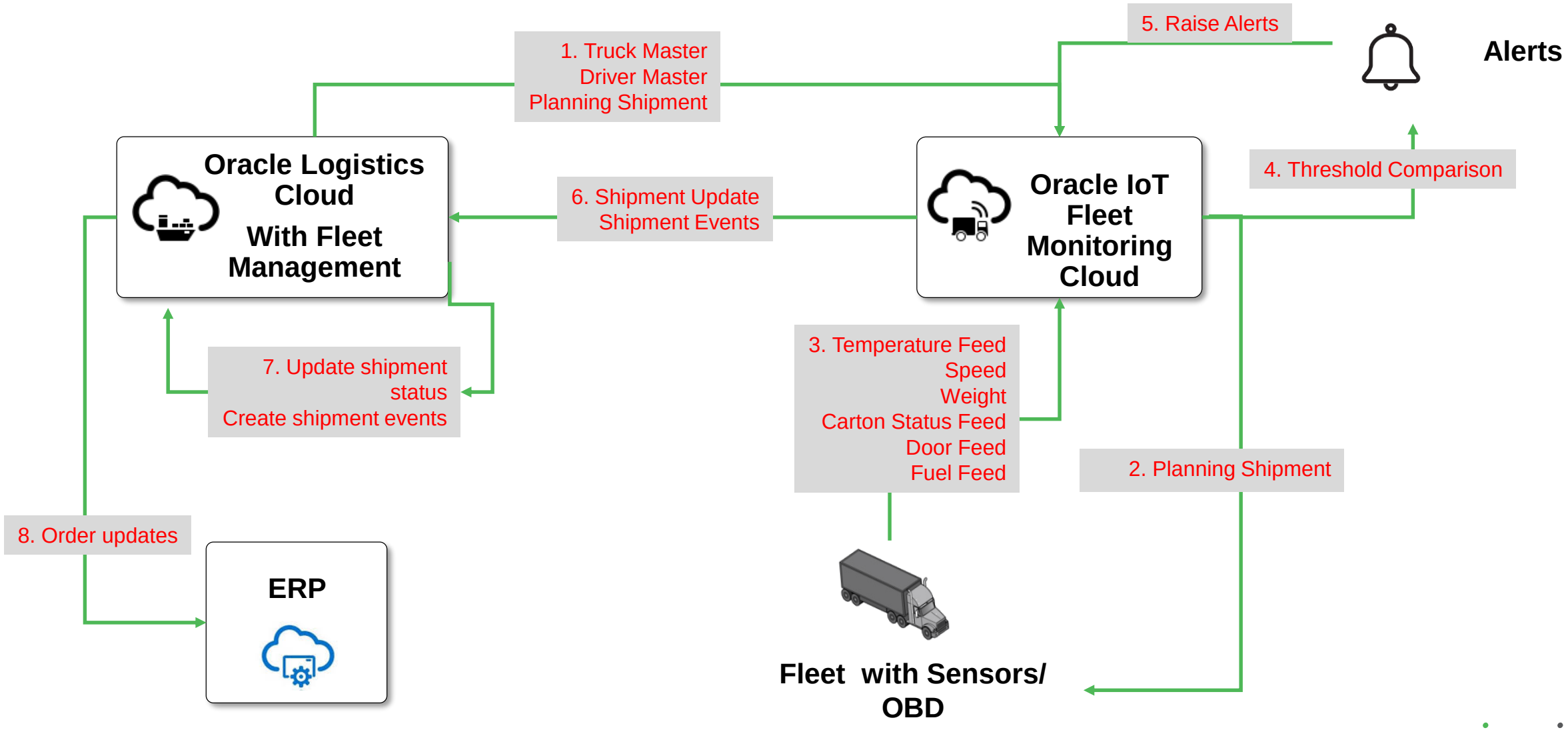

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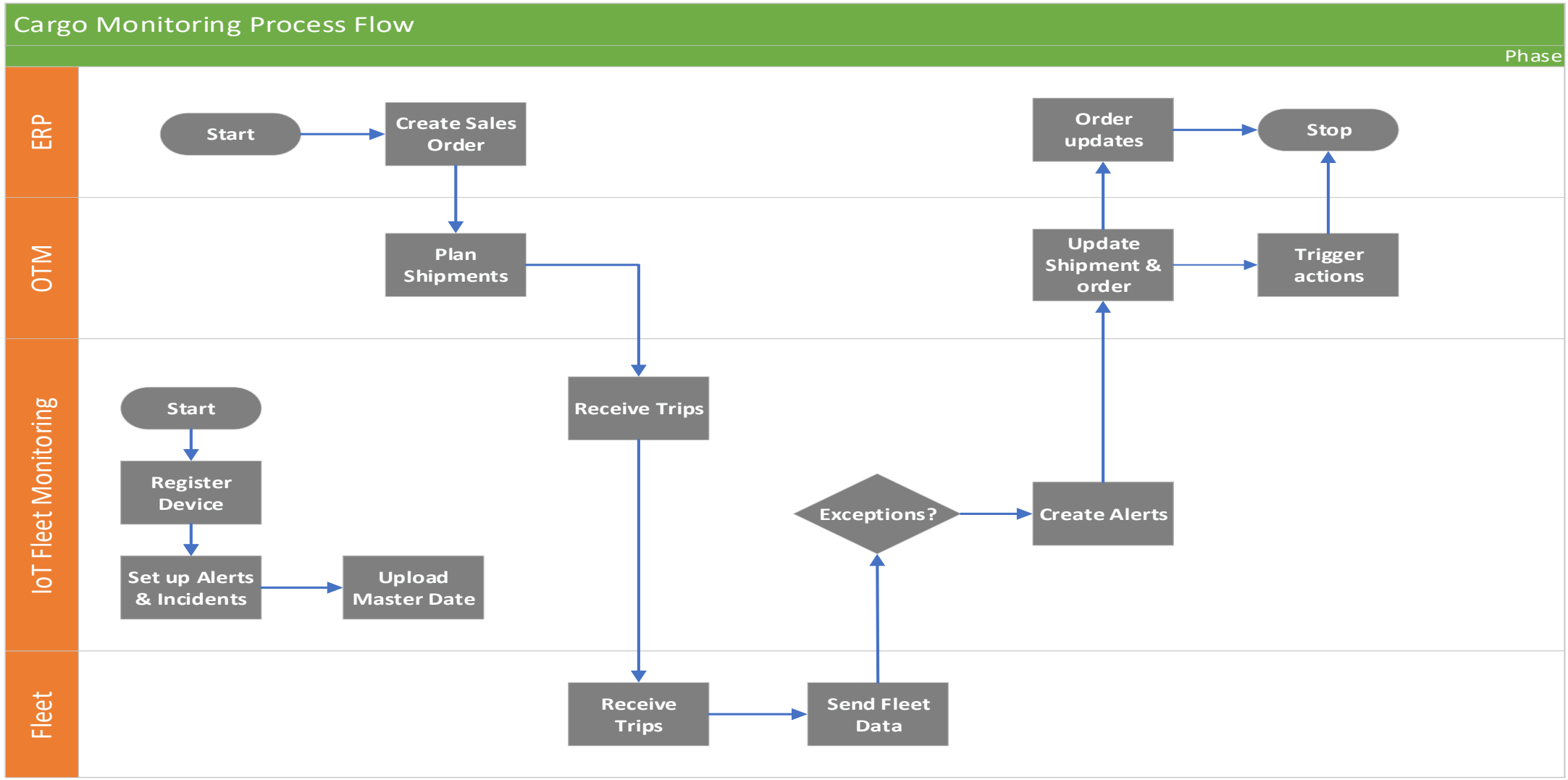
PROCESS FLOW



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BUSINESS BENEFITS

Business Benefits

- Minimize Shipment damages
- Improve fill rate
- Minimize theft and pilferage

Best Use cases

- High value goods transportation
- Perishable (Temp Controlled) Cargo transportation

Customers:

- Shipper with own or dedicated or contracted fleet
  - Pharma
  - Food & Beverages
  - 3PL

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USE CASE: WEIGHT-BASED AUTOMATED MATERIAL MOVEMENT

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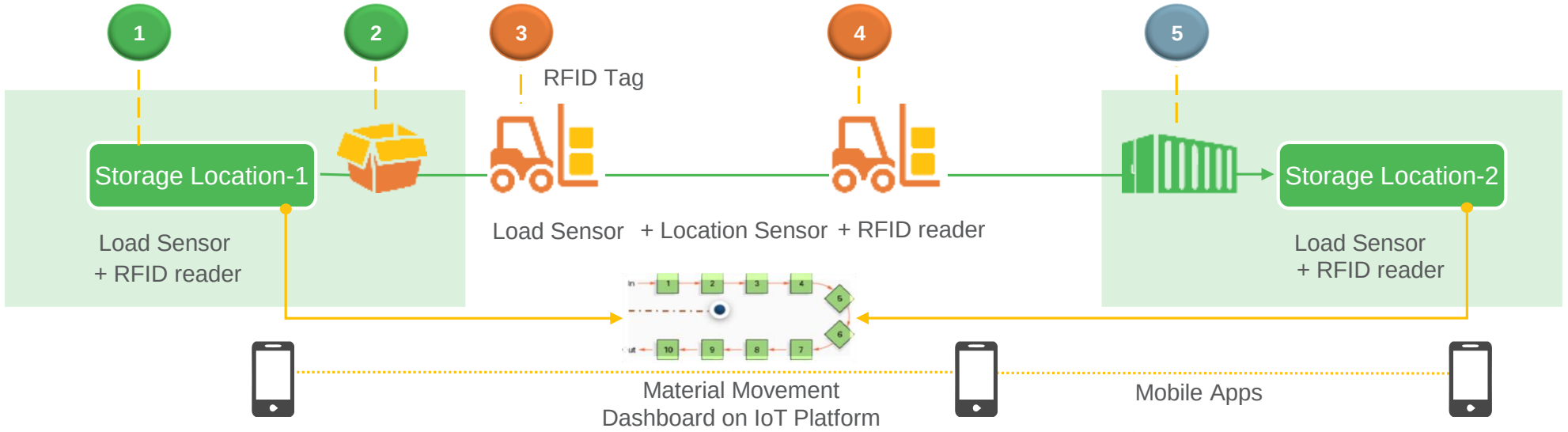
AUTOMATED MATERIAL MOVEMENT WITH IN-PLANT TRACEABILITY



	1 2 Picking	3 4 Transfer	5 Put Away
WHAT	• **Auto-identify Material Picking and Picker** • **Auto-calculate Units Picked** • **Notify Stakeholders**	• **Auto-validate Material & Quantity** • **Automated System Record** • **Exception Management** • **In-Transit Material display on the Dashboard**	• **Auto-identify Put away** • **Auto-validate Material & Quantity** • **Automated System Record** • **Exception Management & Notify Stakeholders**
HOW	• Parameter Monitored : Weight and SKU • Sensor Type : Load Sensor and RFID • Technology : IoT, SCM Cloud, Mobility, RFID	• Parameter Monitored : Weight, SKU and Position • Sensor Type : Load Sensor, Location Sensor and RFID • Technology : IoT, SCM Cloud, Mobility, RFID	• Parameter Monitored : Weight and SKU • Sensor Type : Load Sensor and RFID • Technology : IoT, SCM Cloud, Mobility, RFID

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SOLUTION VALUE PROPOSITION

Smart Production with Automated Material Transfer and Improved In-Plant Traceability

60%-70% ↓ **Reduction in Data Entry Time** [1]

20%-30% ↓ **Reduction in Labor Cost** [2]

Real-Time System of Records	Proactive Exception Handling	Real-Time in-Plant Tracking of Critical Items	Intelligent System Guided Controls	Control Towers To Manage Operations
1. Real-Time Information of Critical High Value Items 2. Minimal Manual entry of data from Job Card – Effort Reduction	1. Picking Wrong Item: Auto Alert 2. Picking Wrong Quantity: Auto Alert 3. Material moved out of Handler Bin : Auto Alert with Location identification in the Process Exception Dashboard	1. Material Movement Dashboard 2. No “Misplaced” items leading to “Lost Inventory” 3. Higher Inventory accuracy leading to improved Fulfillment rates	1. Material delivered to Incorrect Work Center: Auto Alert 2. Minimizes multiple Picker trips for the same Material against a Job (Incorrect Item, Qty.)	1. Minimizes Picker Route Deviation 2. Picker Efficiency Data which can be linked to Compensation Benefits

[1] http://www.assemblymag.com/articles/92976-ensuring-traceability-in-electronics-assembly [2] The 2015 MHI Annual Industry Report by Deloitte and MHI

For a large logistics organizations

150,000 pallets for In-Plant movement → **6 minutes of staff time per pallet** → **2 Man-Years of labor savings**

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DIGITAL IMPERATIVE

A company’s ability to leverage data from many sources, including IoT, to make decisions is a key factor in the journey to become an integrated supply chain.

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THANK YOU !

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