

# Emerging Supply Chain Technologies

November 2010



# Agenda

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**Overview of Food Industry in India**

**Technology Requirement**

**Emerging Technologies**

## Overview of Food Industry in India

### Technology Requirement

### Emerging Technologies

## Food Industry in India - Overview

- US\$ 175 billion today likely to grow to US\$ 400 billion by 2025
- Growing at the rate of 30%
- Food and food products account for about 50% of the value of final private consumption. Its about 20% in developed nations.
- There are 10 million street vendors in India, of which 6 million only sell food
- In India about 90% of food purchases are made within a distance of 1.5 km from the customer's home.
- Food retail has surpassed the dominating apparel and accessories sector
- 4 formats - Neighborhood, Supermarket, Hypermarket and Cash-n-Carry



# Key Supply Chain Challenges

Respond effectively to real-time customer demand

Monitor supply signals 24x7

Maximize customer satisfaction through rapid fulfillment

Manage short and unpredictable product life cycles

Improve collaboration with vendors and partners

Reduce inventory and safety stock levels

Forecast, model, and optimize resource usage

Support demand-driven manufacturing and logistics

Plan product introductions and promotions intelligently

Make sourcing decisions based on a single consistent model

Measure sales plans against supply and against performance

Integrate applications in one view

Eliminate redundant data and multiple data repositories

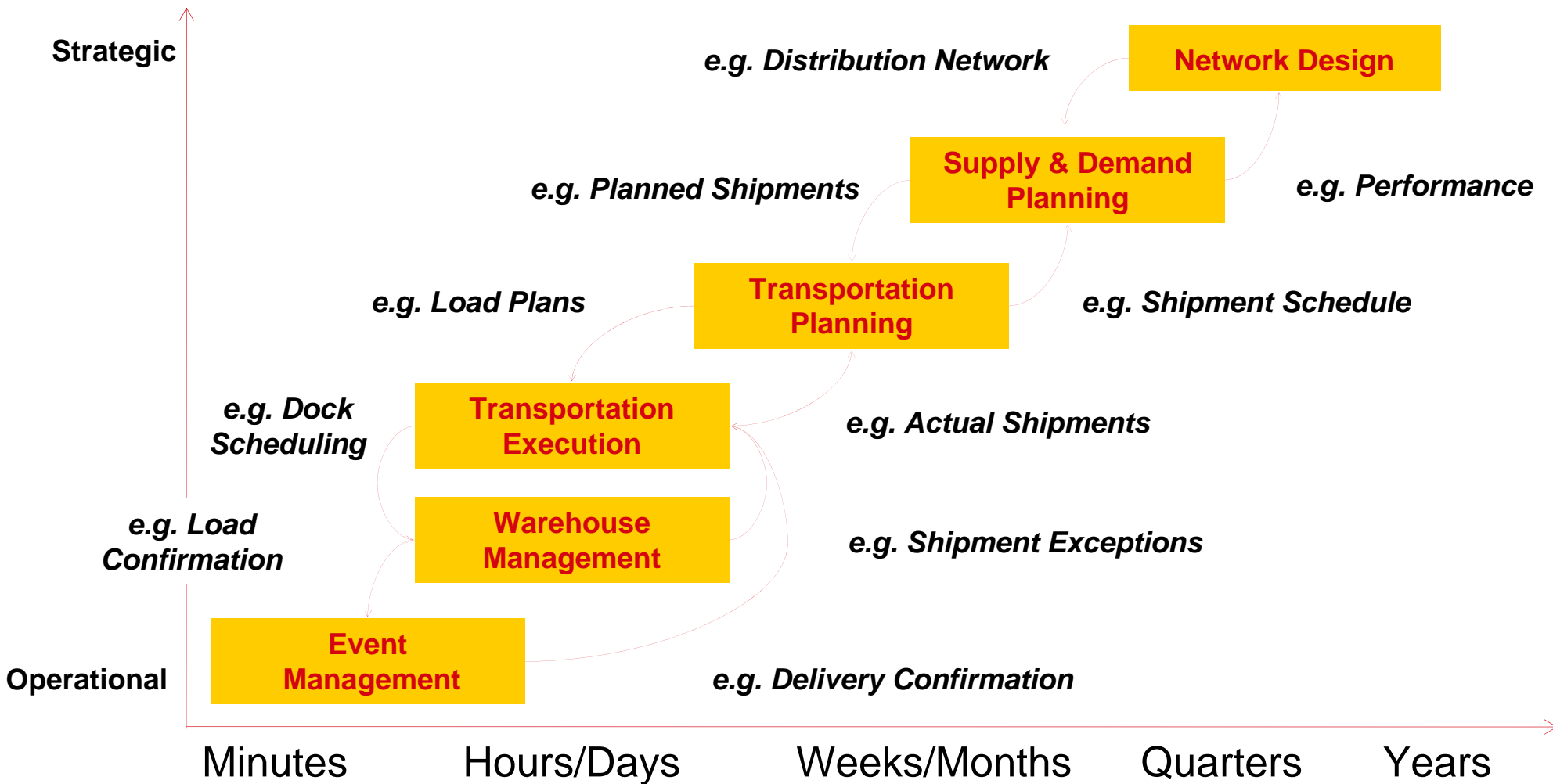
Give users familiar functions for updates to planning data

## Overview of Food Industry in India

## Technology Requirement

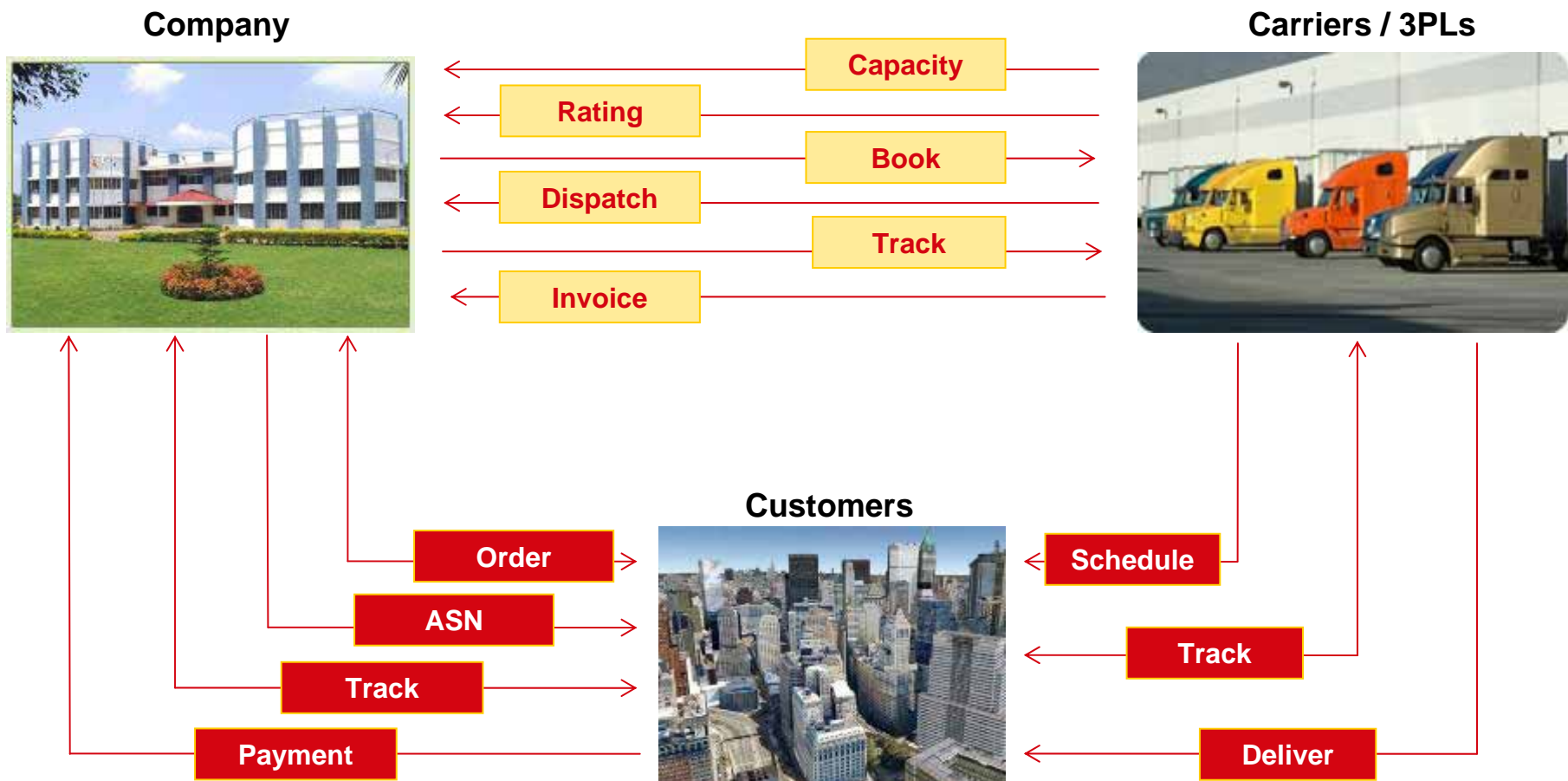
## Emerging Technologies

# Technology is needed for Integrated Planning and Execution



# Leading to Collaboration

## Logistics Collaboration *Share Information Real - Time with Trading Partners*



# Enabling Seamless Flow of Information

## *Multiple Information Collaboration Methods*



### **Web**

- Online portal access for all trading partners
- Secure remote access from any location

### **XML**

- Support for OAGI XML standards
- Secure, guaranteed, one-time only delivery
- Trading partner specific data mapping



### **EDI**

- Support for industry standards (X12, EDIFACT, etc)
- Partnerships with major EDI translators

### **Email**

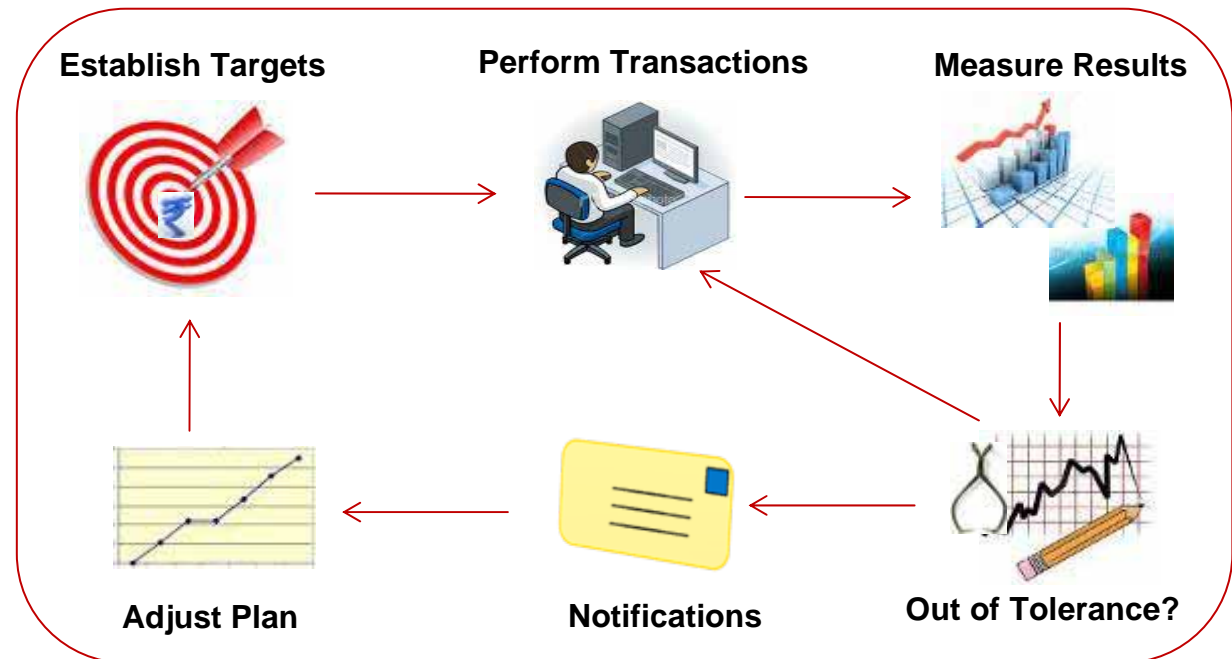
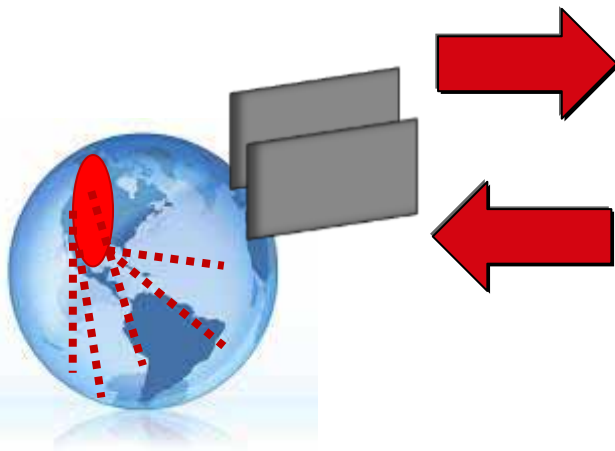
- Interactive, easy access, no integration
- Notification of activity on business documents



# Facilitating Performance Improvement

## *Drive Continuous Improvement Through Integrated Intelligence*

### Logistics Plan



Overview of Food Industry in India

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**Emerging Technologies**

## Emerging Technologies

### Supply Chain Event Management

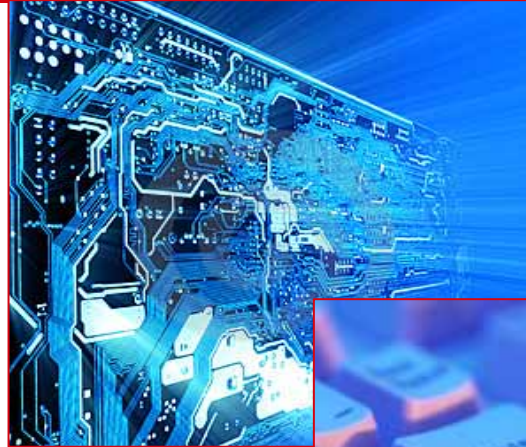
- Visibility
- Fulfilment
- Integration

### Agent Technologies

### Optimization Technologies

### Order Management

### Integrated Messaging Platform



## Emerging Technologies

### Supply Chain Event Management

- Visibility
- Fulfilment
- Integration

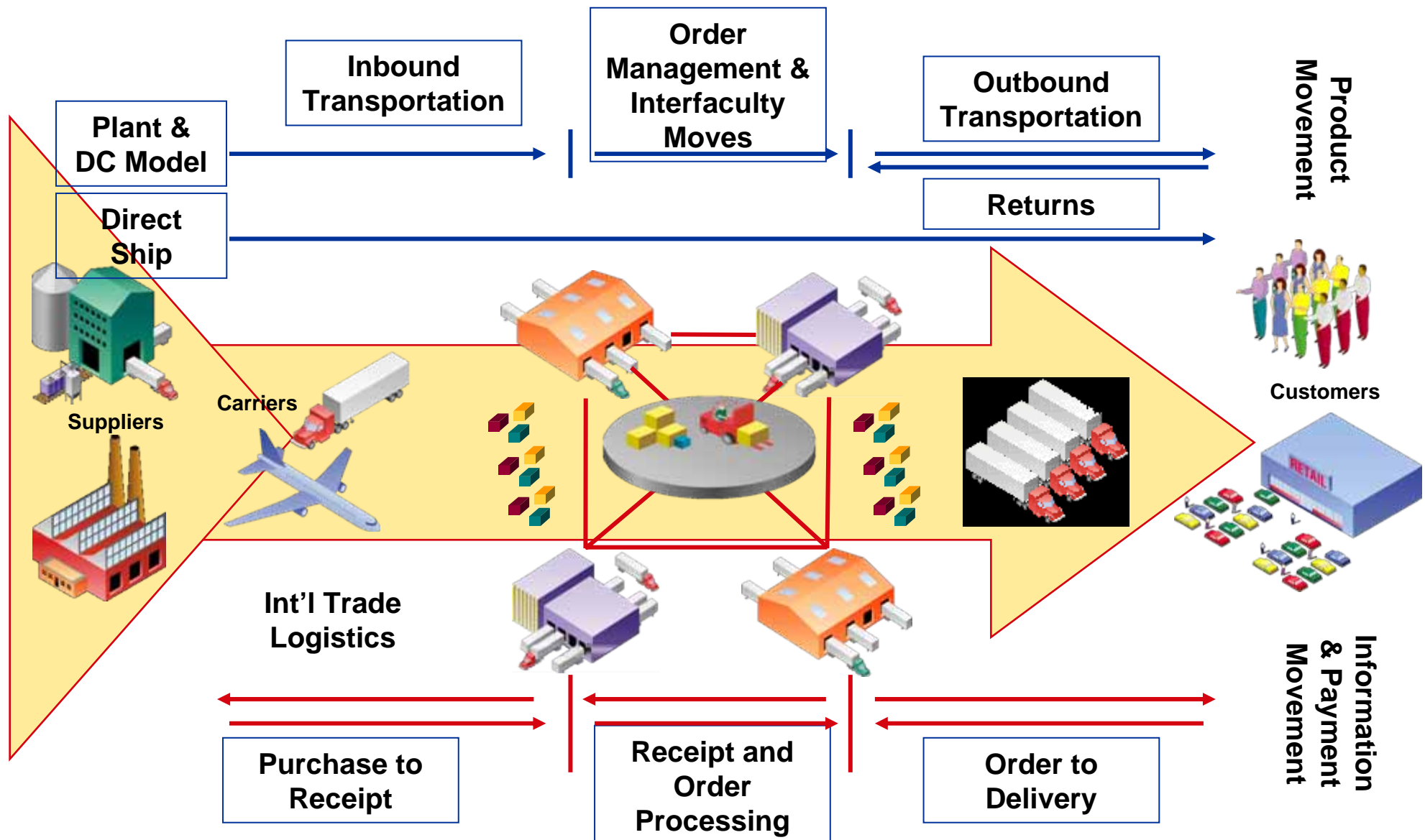
Agent Technologies

Optimization Technologies

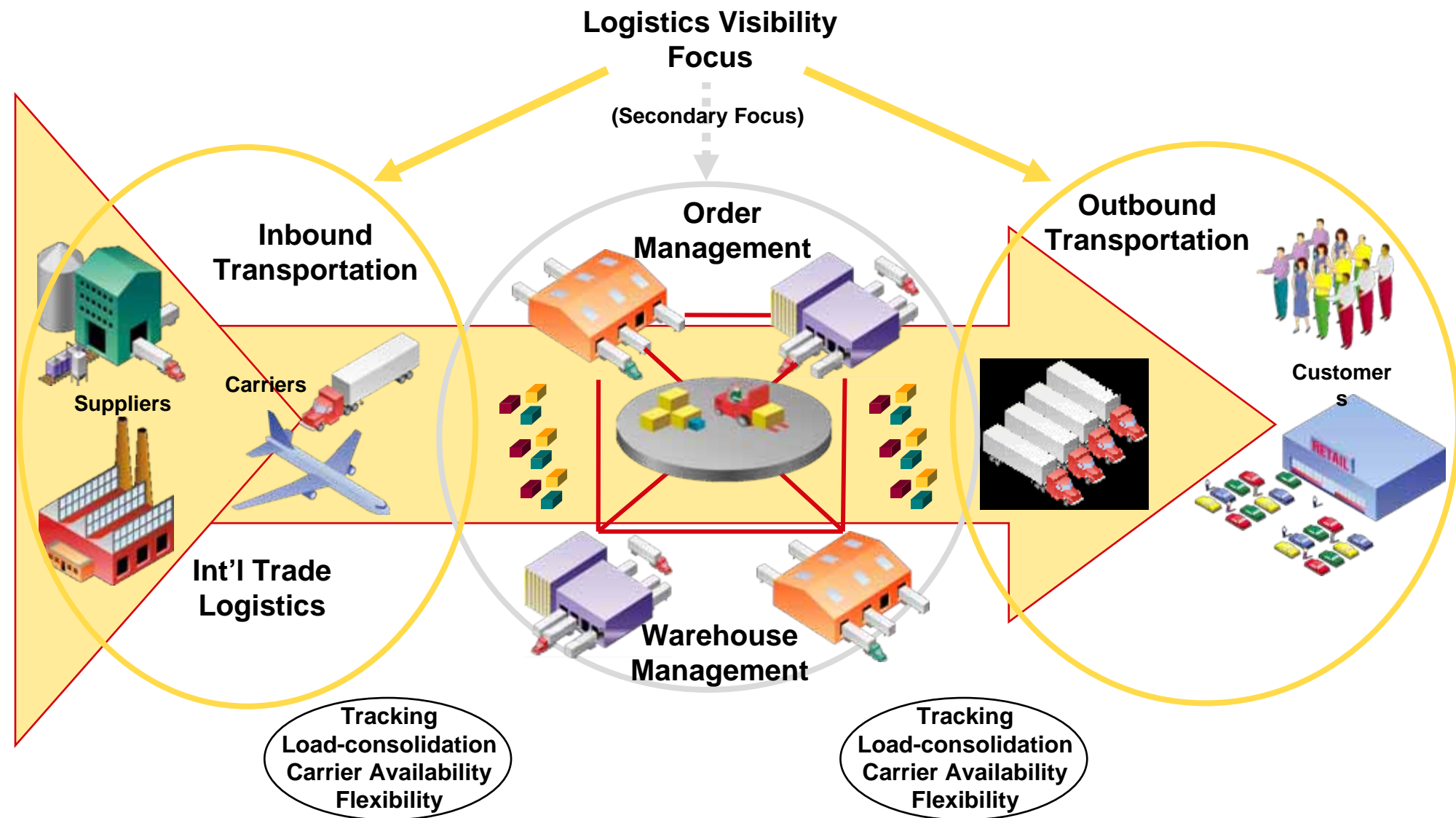
Order Management

Integrated Messaging Platform

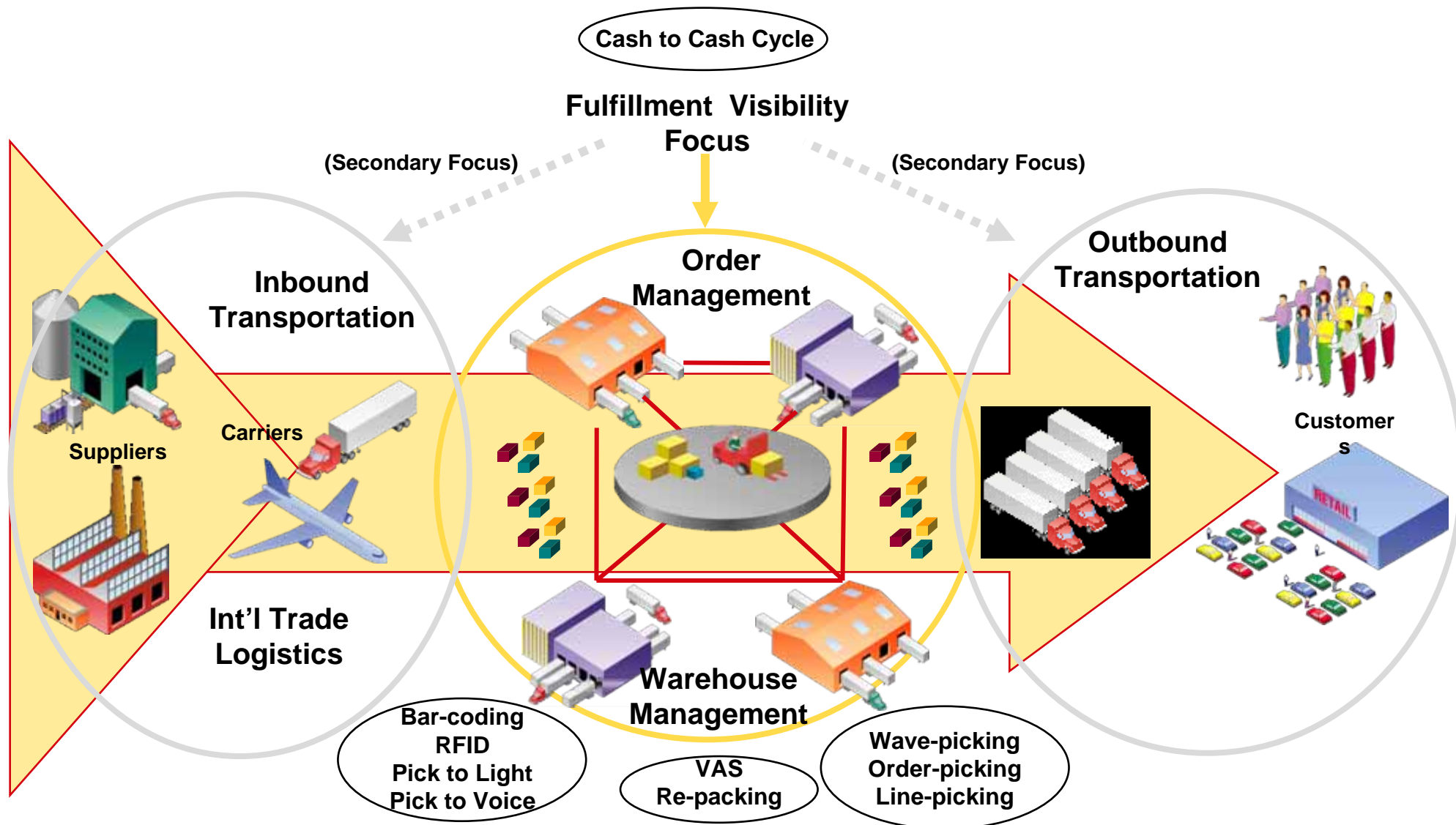
# Event Management



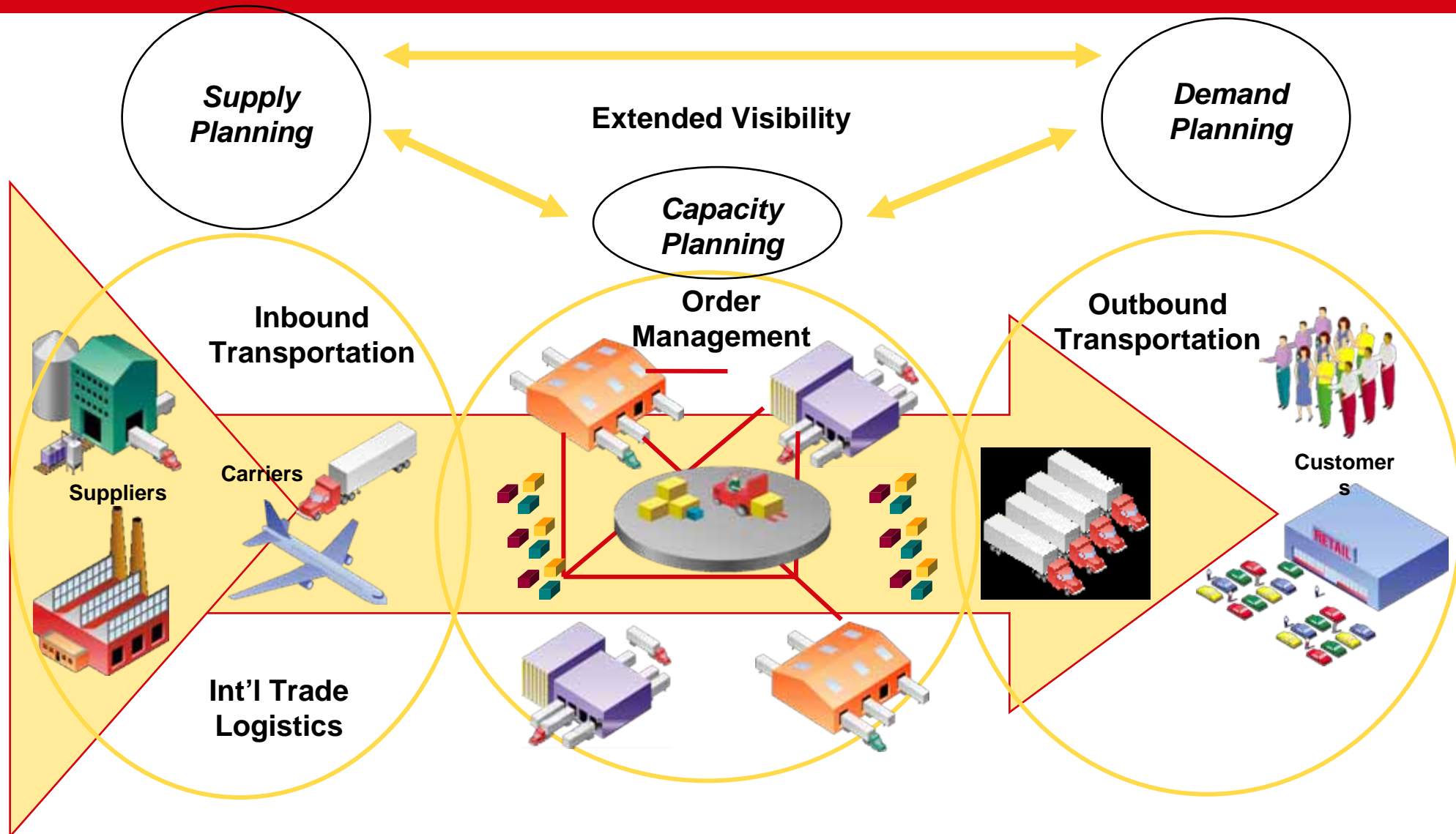
# Visibility Across Logistic Chain



# Order Management Visibility



# Integrated Holistic Approach



## Emerging Technologies

### Supply Chain Event Management

- Visibility
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### Integrated Messaging Platform

## Agent Technology

Agent Technology is a new generation of software that allows managing in real time the complexities of modern business.

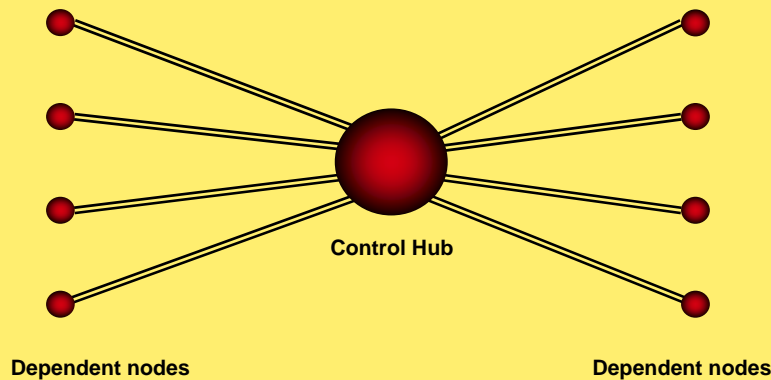
The agent has the senses to gather information, reasoning to evaluate it and the authority and autonomy to act independently.

Thus it can watch systems, consider new information, monitor changes, learn from previous results and trigger actions that will bring it closer to achieving its objectives.

➤ **With the introduction of technologies like RFID, bar-coding, RF, point-of-sale scanning technologies and board computers a lot of real-time data input becomes available. The next step for many companies will be to use these vast amounts of (near) real-time data to optimise their supply chain.**

# Agent Technology vs. Traditional Technology

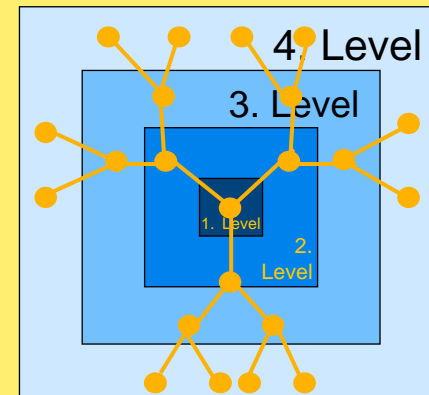
## Traditional



### Characteristics:

- Reactive analysis of historical data
- 'Not real-time'
- The optimization model is a high level aggregation
- Unstable Optimum
- Central planner needs complete information: Central system needs all relevant information
- Top-down linear optimization does not provide a list of actions at execution level

## Adaptive Agent



### Characteristics:

- Adaptive Execution recognizes exceptions/changes of environment
  - Real-time
  - In a robust fashion across heterogeneous systems
  - Beyond organizational boundaries
- Adaptive Execution optimizes and automates execution
  - Identifies/coordinates options on a local base (collaboration)
  - Finds the best localized deviation from the plan, considering multiple constraints (optimization)
  - Identifies and implements the best solution to deviation from plan in near real-time (execution)

## Emerging Technologies

### Supply Chain Event Management

- Visibility
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### Agent Technologies

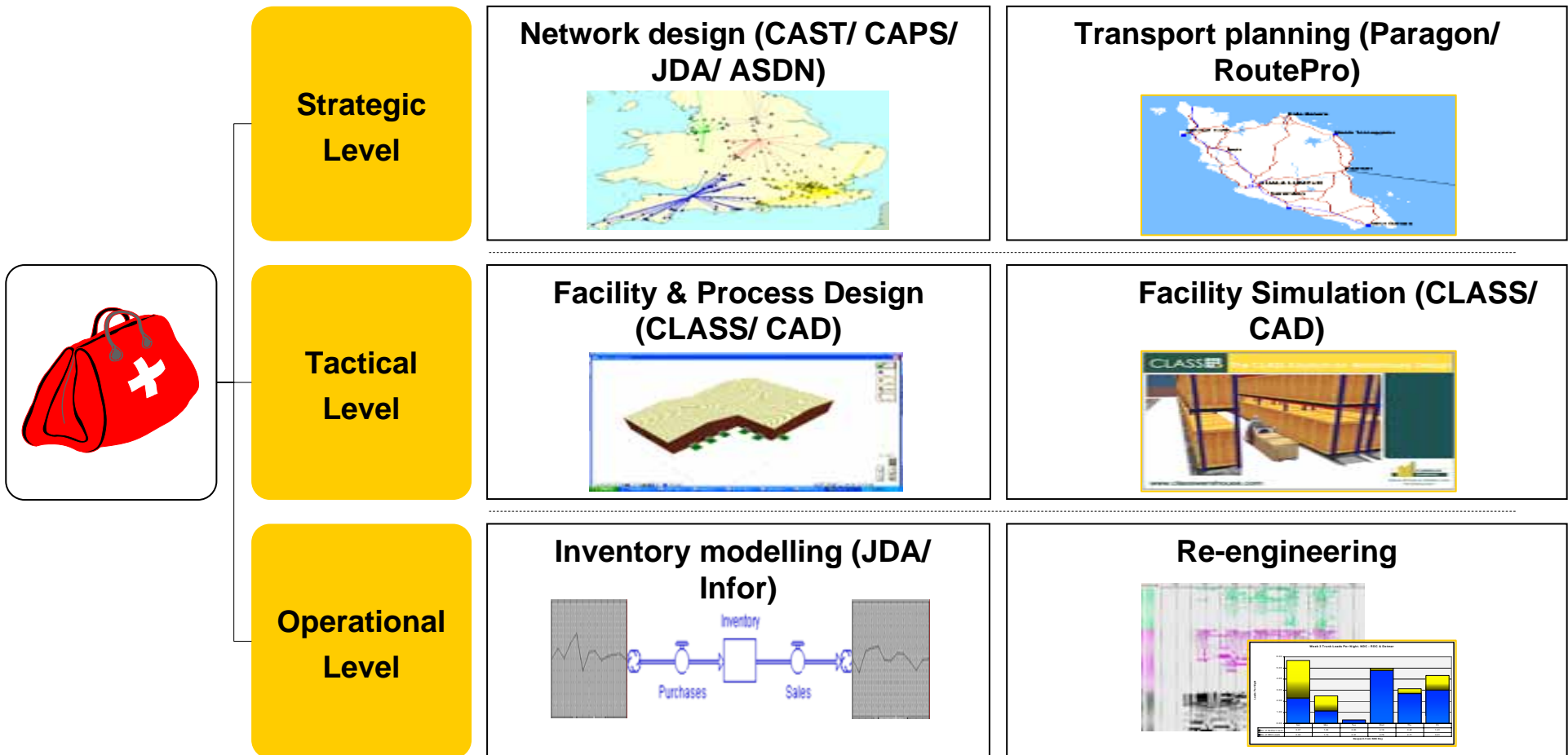
### Optimization Technologies

### Order Management

### Integrated Messaging Platform

# Optimization Technologies

## Three-pronged Optimization Strategy



## Emerging Technologies

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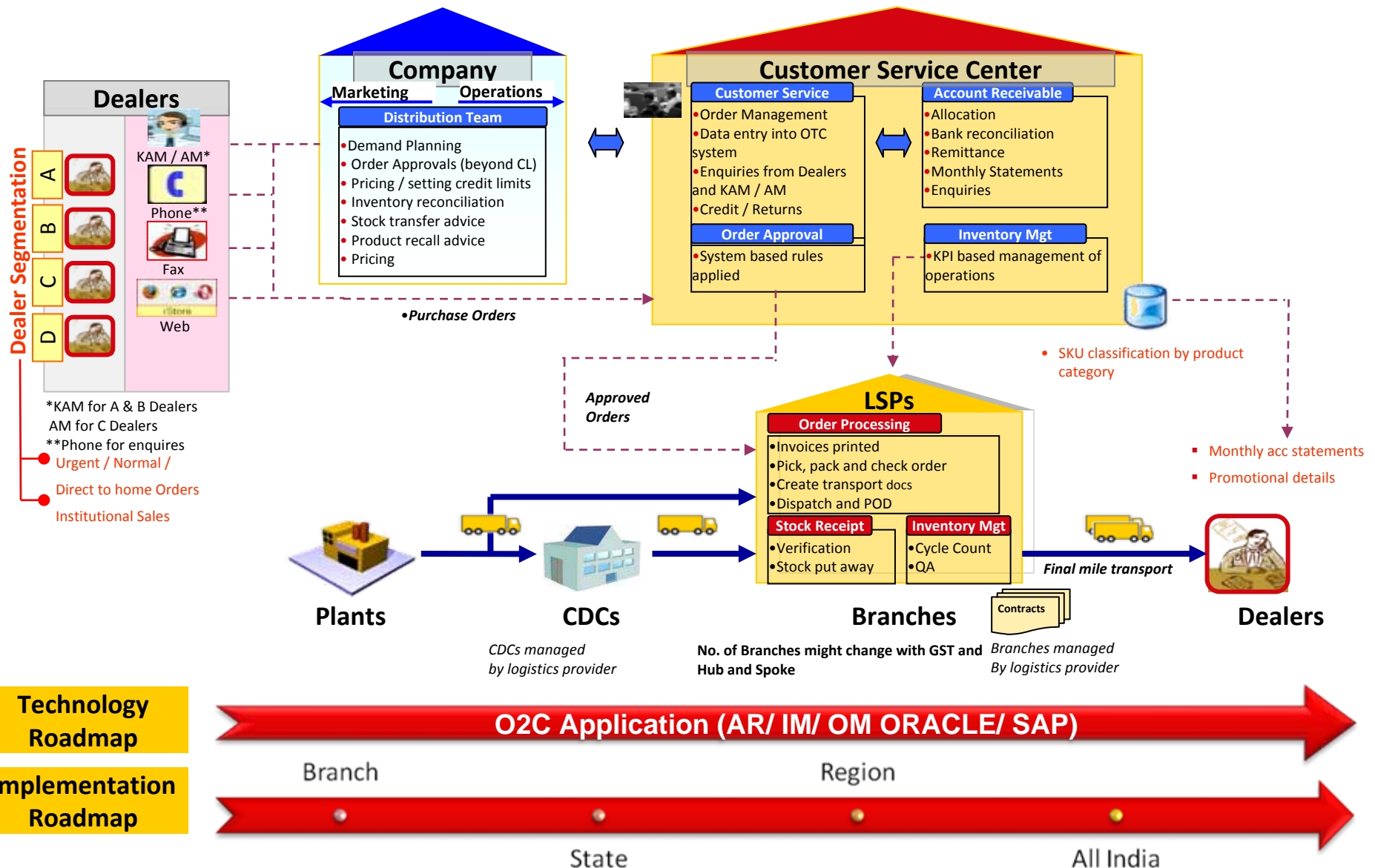
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# Order Management



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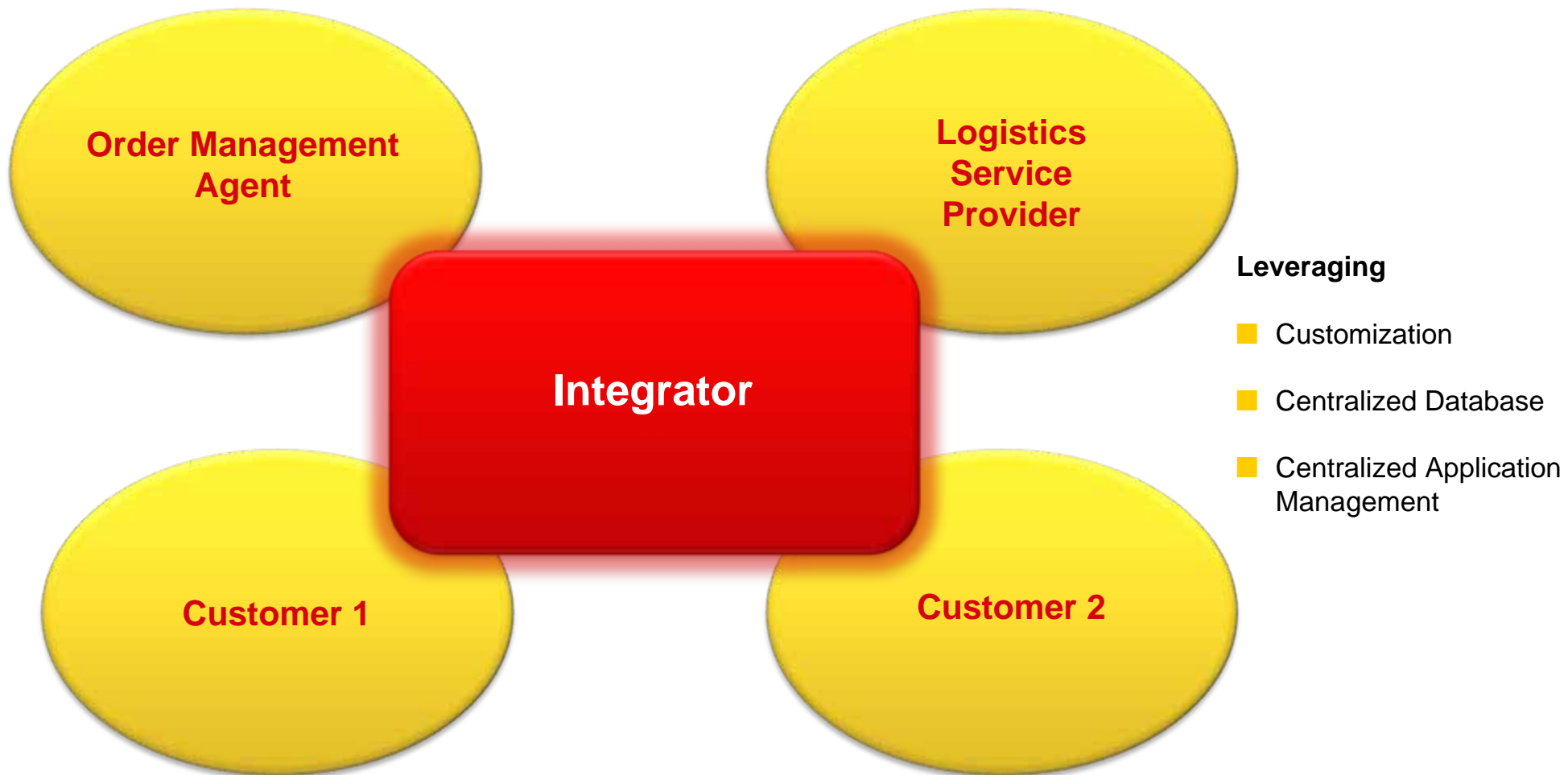
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## Data Collaboration

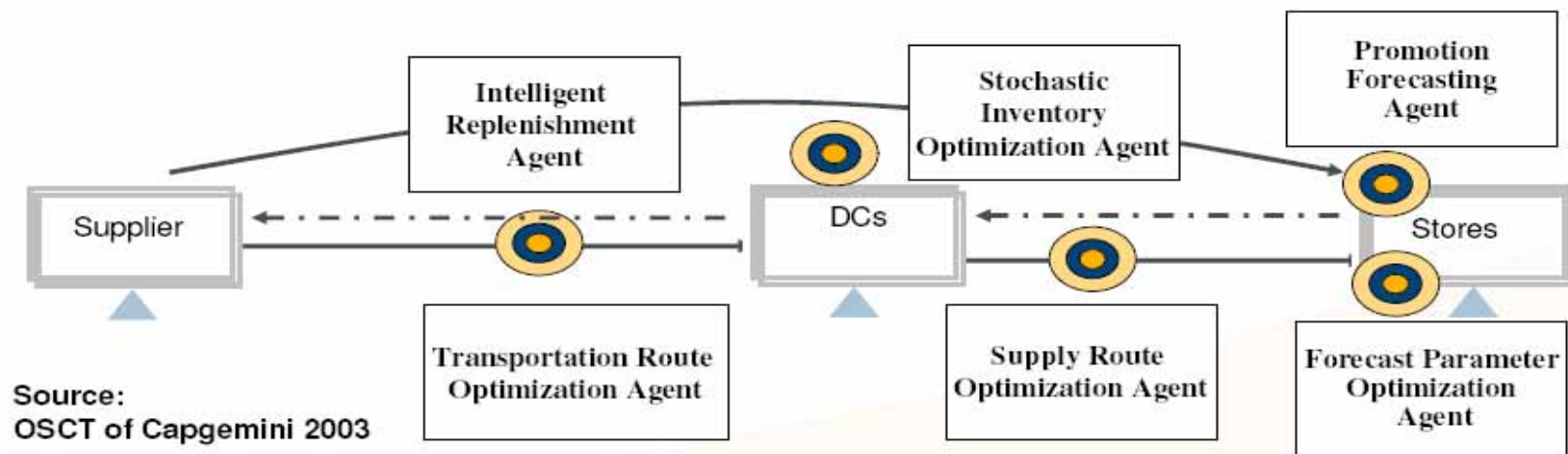


For e.g. Employwise

**THANK YOU**

# Backup Slides

## Adaptive Supply Network (ASN) Solution



### Agents collaborating

- Daily Demand Forecasting on SKU and store-level enabled by agent-based model readjustment (**Forecast Parameter Optimization Agent**)
- Special promotional forecast using agent pattern recognition (**Promotion Forecasting Agent**)
- Creates ONE Forecast through Demand Propagation (**Intelligent Replenishment Agent plus Supply Route Optimization Agent**)
- Continuous optimization of inventory levels (**Stochastic Inventory Optimization Agent**)
- Optimized replenishment using routes with best cost and service level trade-off (**Intelligent Replenishment Agent plus Supply Route Optimization Agent**)
- **Transportation Route Optimization Agent** minimizing transportation cost at best service-level

# Supply chain trends according to Gartner

