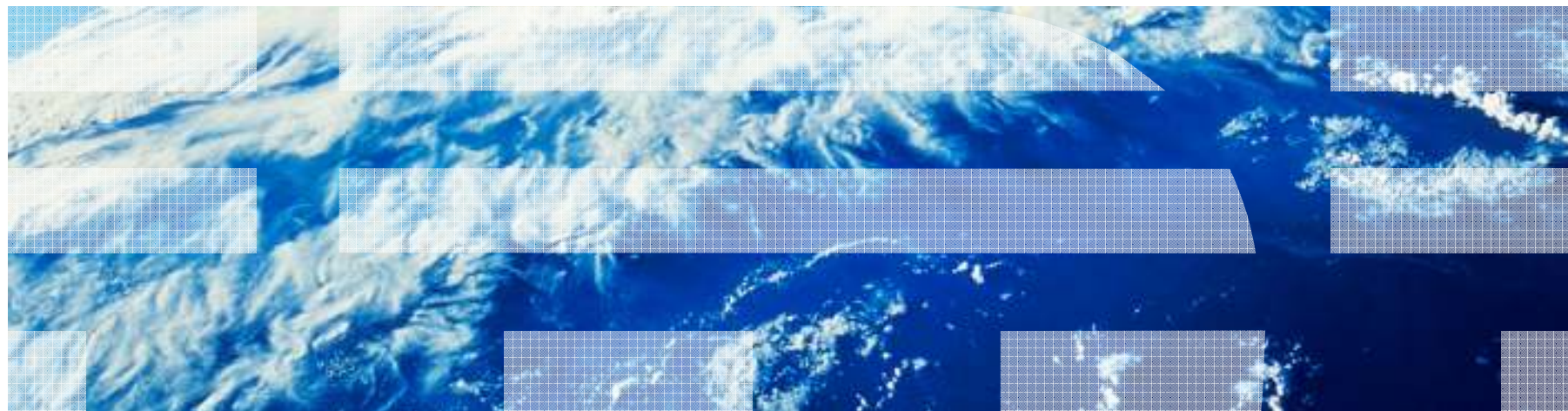# Optimize Supply Chain Planning & Execution

Rahul Jadhav

Business Manager – Commerce Solutions

23rd Nov, 2011

Agenda

Supply Chain: Key objectives and Business Challenges

Approach to Maximize Supply Chain Opportunities

Leveraging IBM Solutions

Why Now – Greater ROI !

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Supply Chain: Key objectives and Business Challenges

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Supply Chain: Key Objectives and Challenges

IBM

Key objectives

Growth (Revenue/Volume)

- **Improve customer Orientation** (service levels, deliver to promise, customer retention etc)
- Leadership through **new products & promotions**

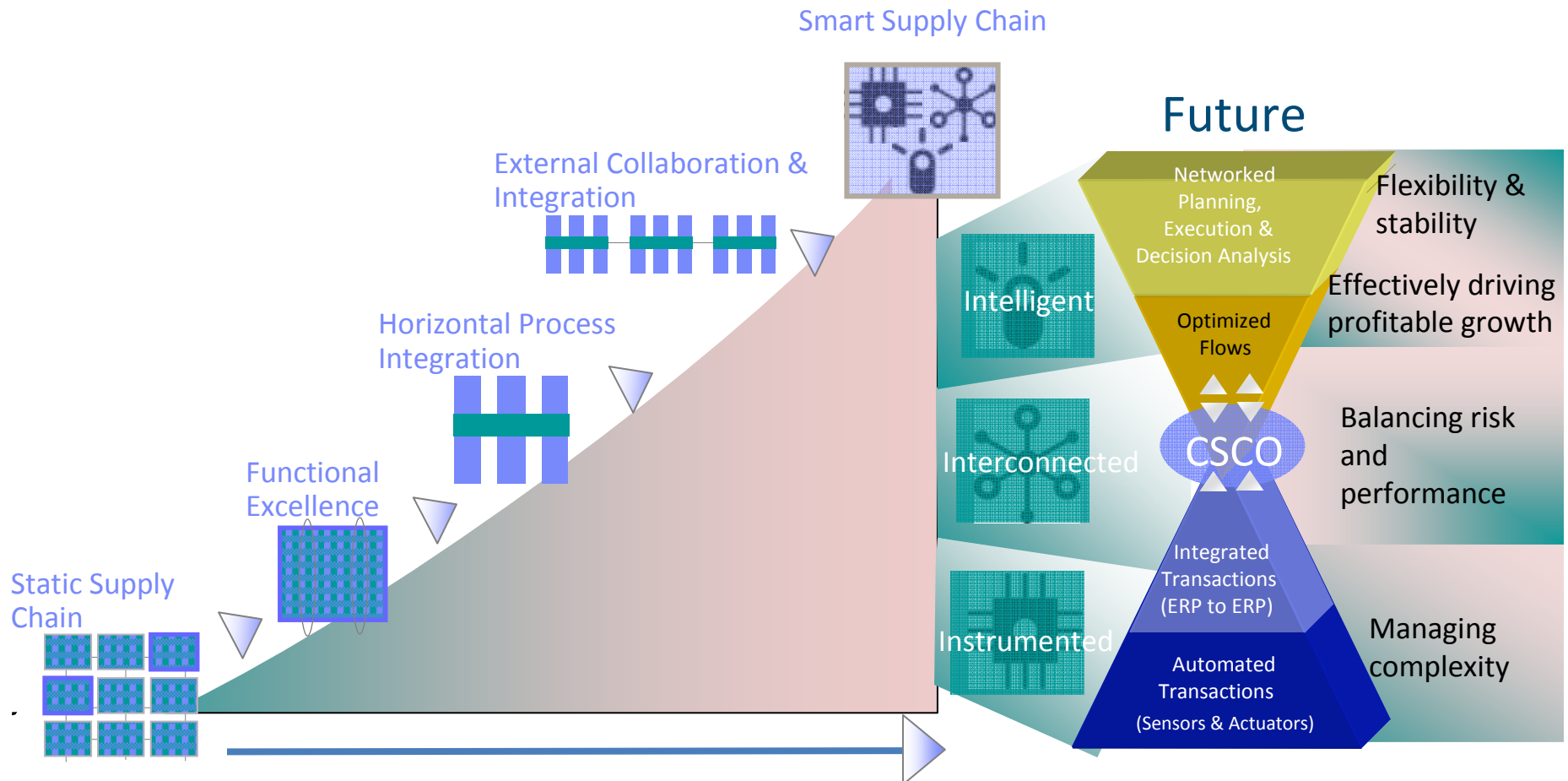| Improve Net Realization (EBIDTA) |
|---|

- **Optimize Total Landed Cost**
- **Reduction in Inventory**
- Optimization of freight costs

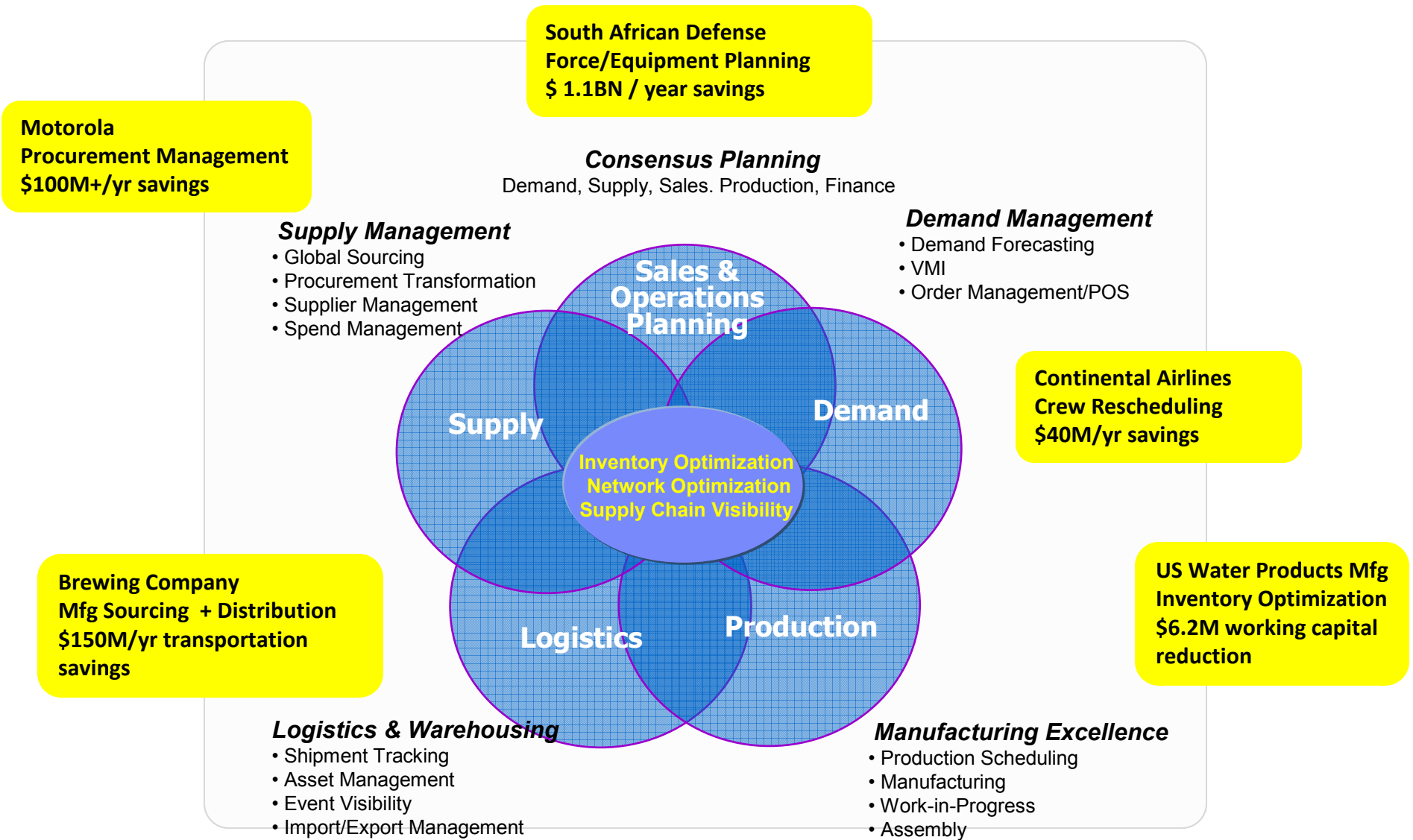| Improve Asset utilization |
|---|

- Improved asset utilization **for plants and logistics**
- Reduced order fulfillment **cycle time**
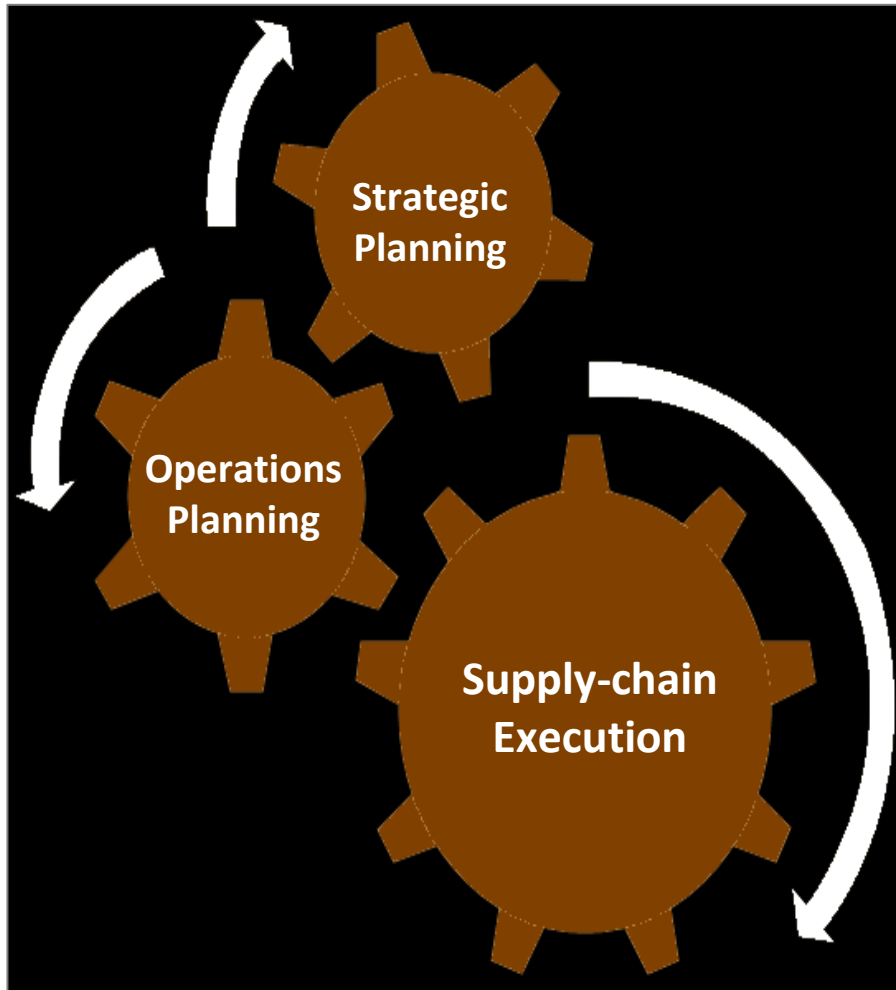- Integrate supply chain to **increase velocity**

Our point of view on the progression of supply chain management of the future

Smart Supply Chain

External Collaboration & Integration

Horizontal Process Integration

Functional Excellence

Static Supply Chain

Future

	Flexibility & stability
Networked Planning, Execution & Decision Analysis	
	Effectively driving profitable growth
Optimized Flows	
Intelligent	
CSCO	Balancing risk and performance
Interconnected	
Integrated Transactions (ERP to ERP)	
Instrumented	Managing complexity
Automated Transactions (Sensors & Actuators)	

Clients typically find themselves at various points on this journey based on division/business unit, product and/or customer

Supply Chain Optimization drives dramatic results

South African Defense Force/Equipment Planning $ 1.1BN / year savings

Motorola Procurement Management $100M+/yr savings

Consensus Planning
Demand, Supply, Sales. Production, Finance

Supply Management
• Global Sourcing
• Procurement Transformation
• Supplier Management
• Spend Management

Demand Management
• Demand Forecasting
• VMI
• Order Management/POS

Sales & Operations Planning

Supply

Demand

Inventory Optimization
Network Optimization
Supply Chain Visibility

Continental Airlines Crew Rescheduling $40M/yr savings

Logistics

Production

US Water Products Mfg Inventory Optimization $6.2M working capital reduction

Brewing Company Mfg Sourcing + Distribution $150M/yr transportation savings

Logistics & Warehousing
• Shipment Tracking
• Asset Management
• Event Visibility
• Import/Export Management

Manufacturing Excellence
• Production Scheduling
• Manufacturing
• Work-in-Progress
• Assembly

Planning and Execution Synergy

Strategic Planning

Operations Planning

Supply-chain Execution

- **Strategic (Long-term) planning** focused on customer, revenue and profits

- **Operations planning** to drive operational efficiencies, reduce waste and improve KPIs

- **Supply Chain Execution** aligned with overall strategy & operations

Agenda

Supply Chain: Key objectives and Business Challenges

Approach to Maximize Supply Chain Opportunities

Leveraging IBM Solutions

Why Now – Greater ROI!

Maximize SCM Opportunities: **Strategic Planning**

Three pronged approach:

1. Redesign Supply Chain Network

2. Redefine Inventory Strategy

3. Redefine Transportation Strategy

Maximize SCM Opportunities: **Strategic Planning**

IBM

Network + Inventory + Transportation Optimization = Significant ROI

3. Transportation Optimization
Goal - Optimize Cost & Route Planning
- Evaluate Transportation Strategies
- Multi-modal fleet, Tariff Simulations
- Inbound & Outbound planning

1. Network Optimization
Goal - Optimize Cost & Service Delivery
- Optimum # of facilities
- Optimum Demand-Supply Linkages
- Sourcing, Capacity mix & Product Mix

Continuous Improvement

Faster Scenario Analysis & Comparison

Smarter Decisions

2. Inventory Optimization
Goal: Optimize service levels & cost
- Optimize Inventory positioning
- Inventory Norms
- Service levels – cost trade-off

Maximize SCM Opportunities: **Strategic Planning**
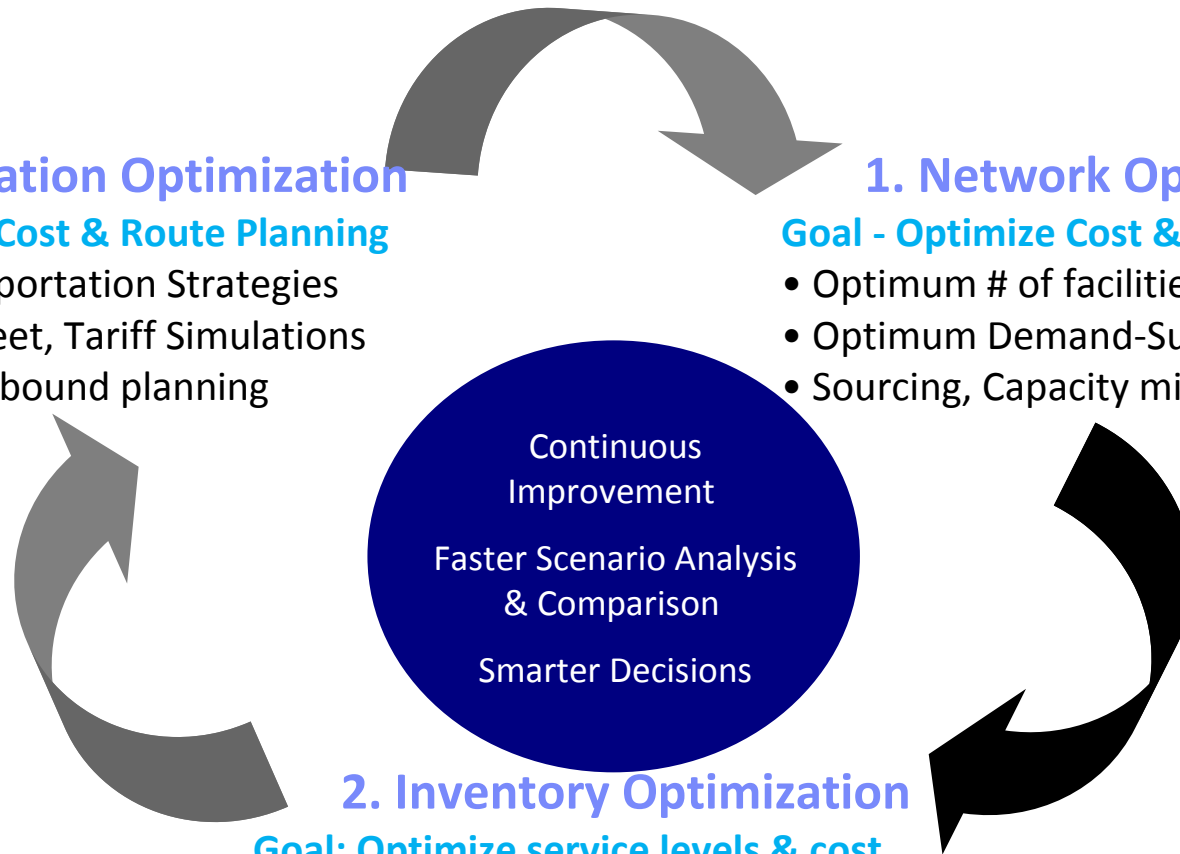
1. Network Optimization

Strategic Network Design Decisions

- Optimize locations, capacities of suppliers, plants, DCs, etc.

- The best way to assign customers and products to DCs

- Optimum demand-supply linkages

- What-if scenario analysis for
  - Costs and service levels
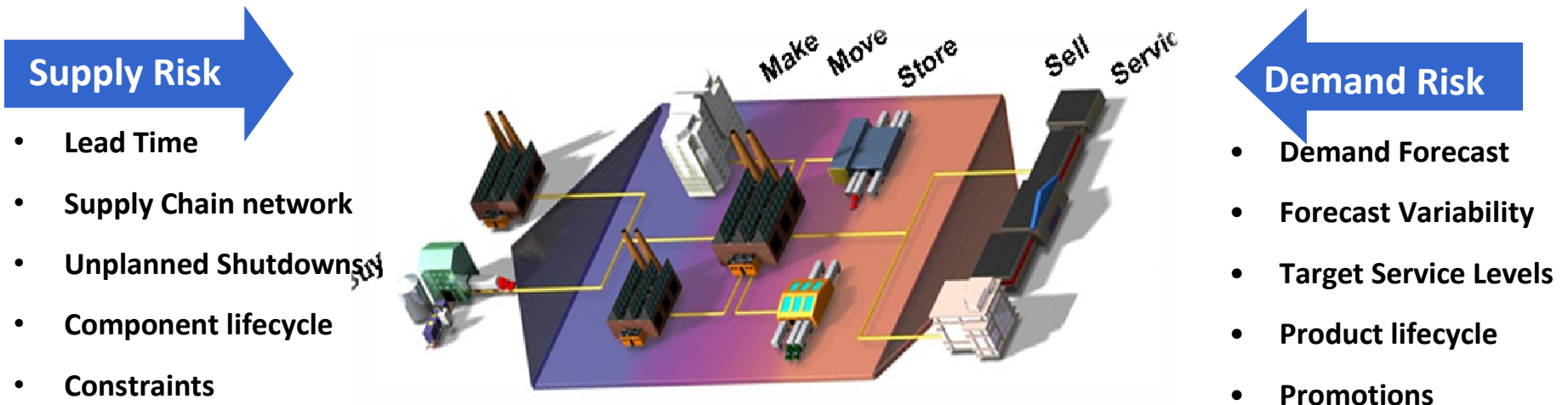 - Inbound, outbound freight, duties
  - Transportation & warehousing costs

Manufacturing / Sourcing Decisions

- Product Mix and Capacity Mix

- Single sourcing vs. dual sourcing

- Inventory pre-build decisions to address demand seasonality

- Impact of changes to production location / capability on overall supply chain costs

- Timing of changes in supply chain

Maximize SCM Opportunities: **Strategic Planning**

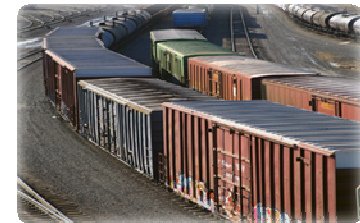## 2. Inventory Optimization

Business Challenges

- **Complex network, proliferation of SKUs, shorter product lifecycles**

- **Service expectations despite volatile demand, promotions & seasonality**

- **Frequent stock-outs despite excess inventory**

- **Long supply lead times while customer expecting frequent/shorter delivery times**

Supply Risk

- Lead Time
- Supply Chain network
- Unplanned Shutdowns
- Component lifecycle
- Constraints

Make Move Store   Sell Service

Demand Risk

- Demand Forecast
- Forecast Variability
- Target Service Levels
- Product lifecycle
- Promotions
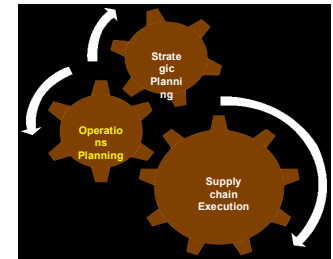
3. Transportation Optimization and Route Planning

Transportation Decisions

- Logistics Budget Planning and Strategy decisions
- Targeted **fleet size** and composition
- Dedicated fleet v/s Market Carriers
- Impact of **backhauls – Inbound:Outbound synergy**
- **Hub Strategies** – Consolidation / Deconsolidation
- Fixed Routes v/s Dynamic Routes
- Opportunities for **continuous moves** with multi-pick / drop
- Load consolidation: LTL to FTL
- Optimize for pickup/delivery windows, service times
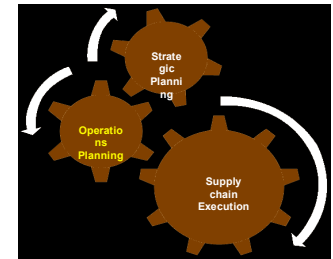- Analyze **carbon footprint** of the transportation operations

Maximize SCM Opportunities: **Operations Planning**
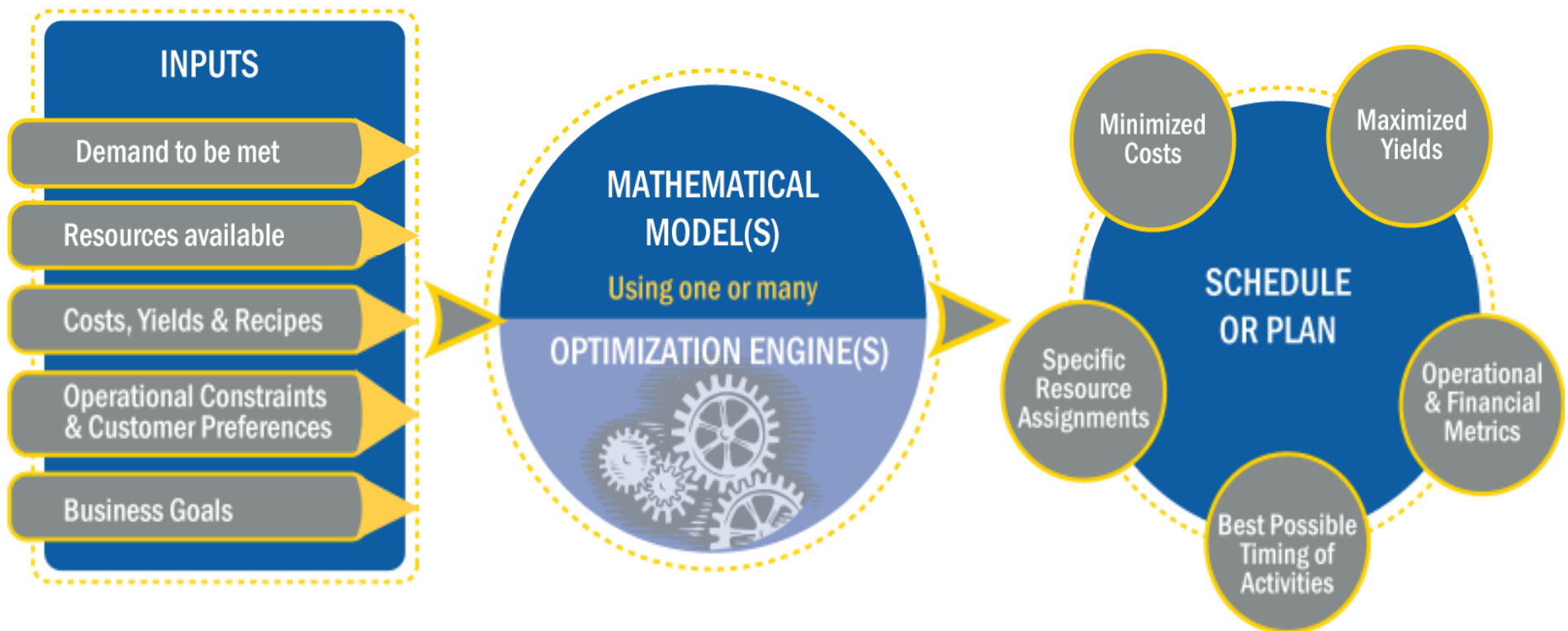## Sales & Operations Planning

Demand Planners
Sales
Marketing
Product Management

Forecast Demand

Demand

Source Systems

Supply

Fulfilment & Distribution Planning

Consensus

EXECUTIVE REVIEW

Resolve Issues

Set Direction

Determine Strategic Impact

Supply Plan

Supply Chain
Operations
Engineering
Logistics

Scorecards

Reports & Analysis

Dashboards

Event Notification

Strategic Planning

Operations Planning

Supply chain Execution

Production Planning & Scheduling

The Structure of Optimization Models

INPUTS

- Demand to be met
- Resources available
- Costs, Yields & Recipes
- Operational Constraints & Customer Preferences
- Business Goals

MATHEMATICAL MODEL(S)
Using one or many
OPTIMIZATION ENGINE(S)

SCHEDULE OR PLAN

- Minimized Costs
- Maximized Yields
- Specific Resource Assignments
- Operational & Financial Metrics
- Best Possible Timing of Activities

Maximize SCM Opportunities: **Execution**

Multi-channel Selling & Fulfillment

Customer Channels

Call Center | Kiosk | eCommerce | Mobile | Store

Global Visibility

Enterprise Applications

Cross Channel Inventory and Order Hub

Promising (ATP) | Order Orchestration | Supply Chain Visibility

External Services

Performance Management

Distribution Centers | Drop Shippers | 3PL's | Store Network
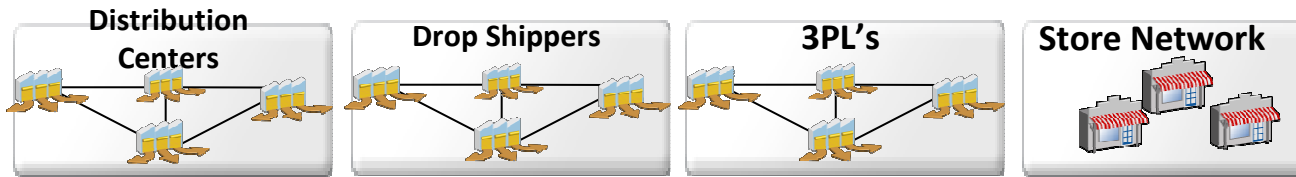
Fulfillment Network

Maximize SCM Opportunities: **Execution**

Order Capture - Promising - Allocation

Analytics

Order Capture
(Multi-Channel)

Supply Chain Visibility

Order Promising
(Intelligent ATP)

Order Fulfillment
(& Value added Services)

Order Allocation and Scheduling
(Business Rules)
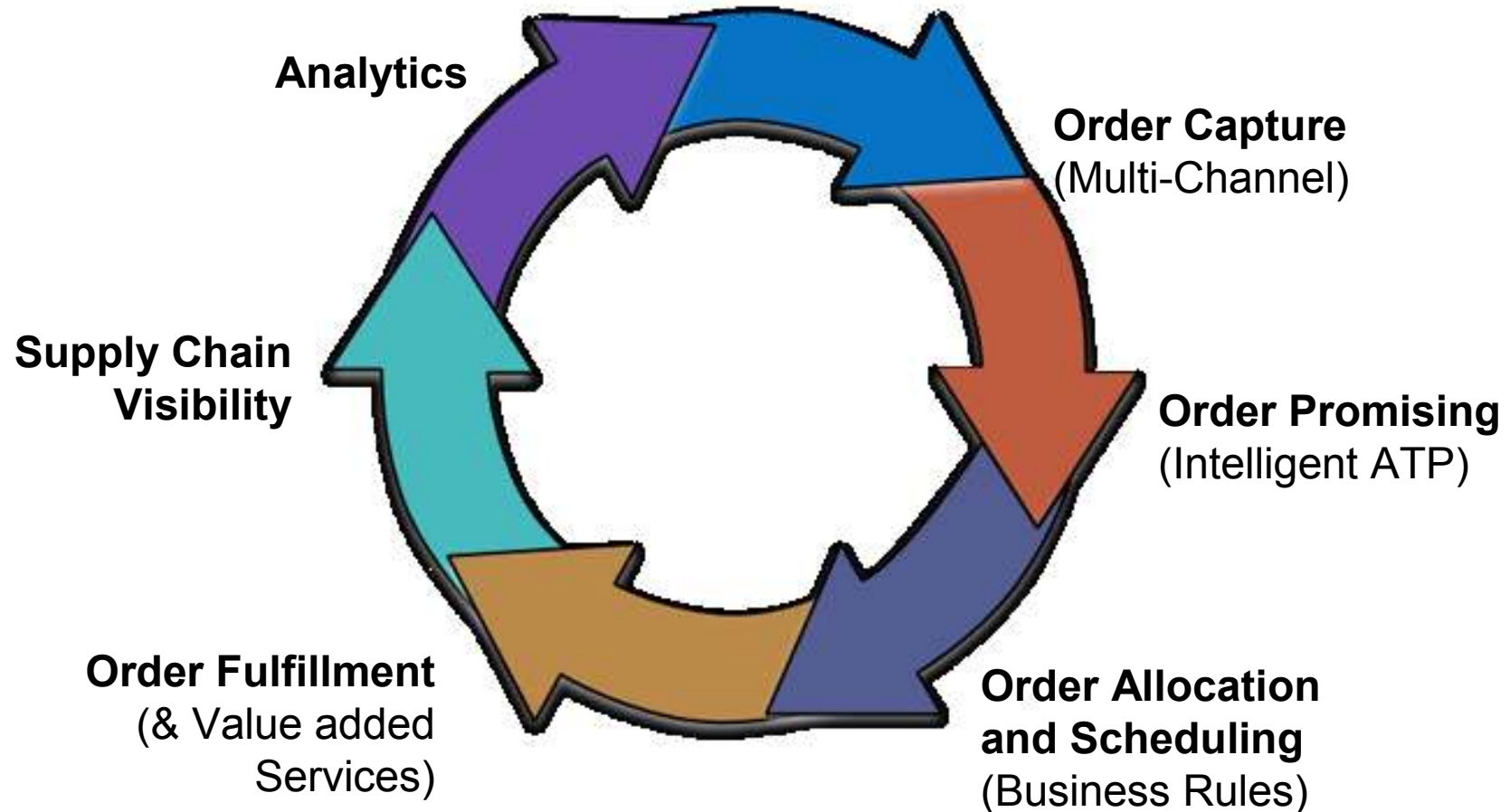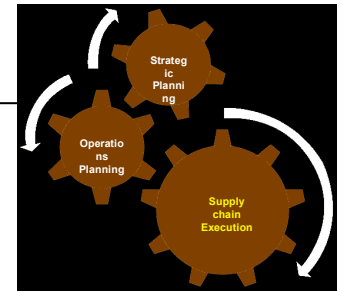
Maximize SCM Opportunities: **Execution**

Order Fulfillment

Inbound Processing
- **Receipts, QA**
- **Returns**
- **Put away**

Inventory Control
- **Locator/Slot/Bin Level**
- **Serial & Lot Control**
- **Cycle Counting**

Other Capabilities
- **Yard Management**
- **MHE Integration**
- **FSL Replenishment**

- ✓ **Global**
- ✓ **Multi-Tennant**
- ✓ **Networked Design**
- ✓ **Process Centric**

Outbound Processing
- **Wave Planning**
- **Pick/Pack/Stage**
- **Shipment Planning**

Operational Visibility
- **Labor & Task Management**
- **Productivity Manager**
- **Event Monitoring**

Value Added Services (VAS)
- **Work Order Management**
- **Assembly, Testing, Kitting, Packaging, Special Processing**

Maximize SCM Opportunities: **Execution**

Supply Chain Visibility and Analytics: Strategic Control Tower

The Solution

- Integrated Business Analytics
- Predict, identify and manage supply chain constraints and performance issues

Key Benefits

- Smarter value chains for on-time-ship performance
- Prevent issues, solve constraints & disruptions faster

Linked executive through operational reporting

CHANGE MANAGEMENT
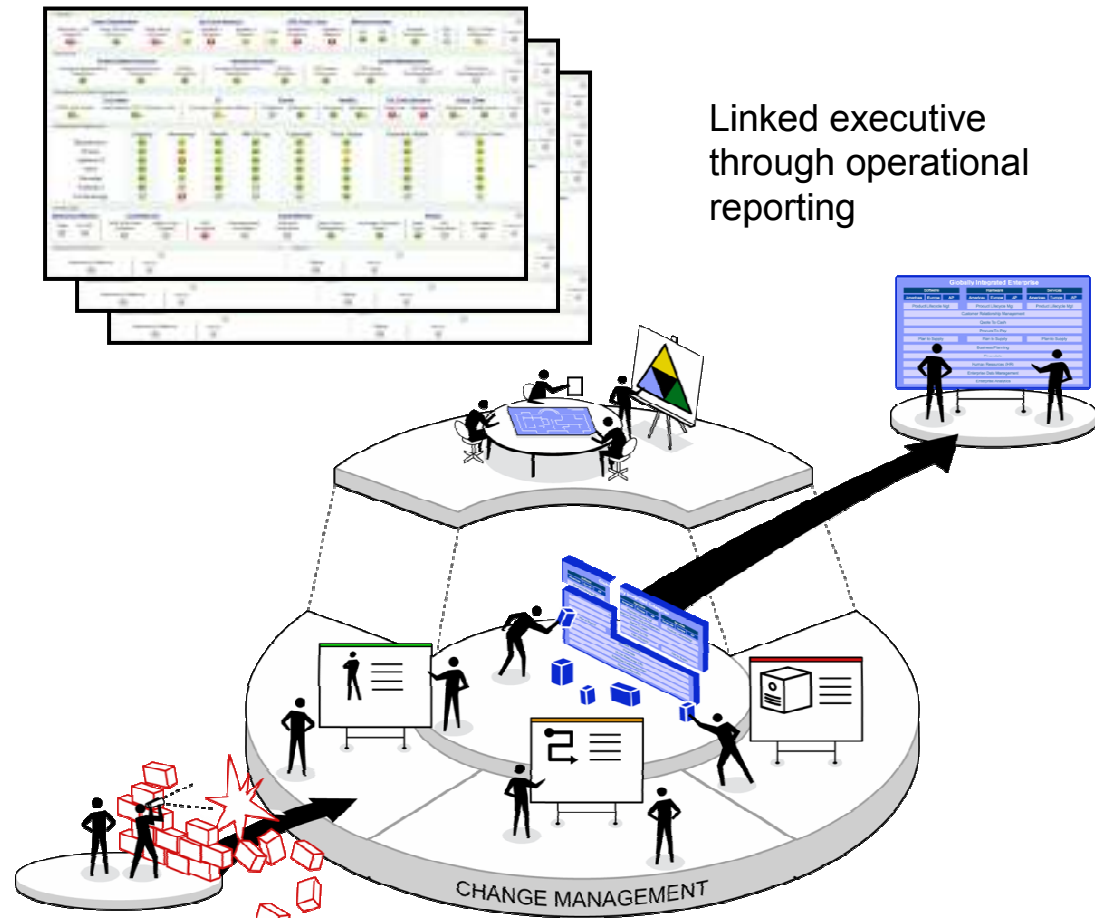
Global performance optimization cockpit

Agenda

Supply Chain: Key objectives and Business Challenges

Approach to Maximize Supply Chain Opportunities

Leveraging IBM Solutions

Why Now – Greater ROI!

Leveraging IBM Solutions to Optimize Supply Chain

ILOG Supply Chain Solutions

- **Strategic Network Optimization**
- **Inventory Optimization**
- **Transportation Optimization**
- **Sales & Operations Planning**
- **Production Planning & Scheduling**
- **ILOG CPLEX solver**

Sterling Commerce Solutions

- **Sterling Multi-channel Selling & Fulfillment solutions**
- **Warehouse Management Solution**
- **Global Supply Chain Visibility**
- **B2B solutions**

IBM Consulting Experience and Expertise

- IBM solutions being used by thousands of leading companies worldwide
- IBM consultants have unmatched expertise in supply chain planning & optimization

Customers leveraging ILOG and Sterling Solutions

Agenda

Supply Chain: Key objectives and Business Challenges

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ROI from Supply Chain Optimization

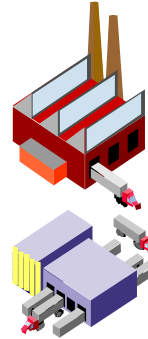# Supply Chain Optimization: Great Opportunity, Greater ROI
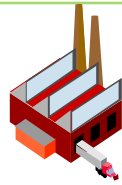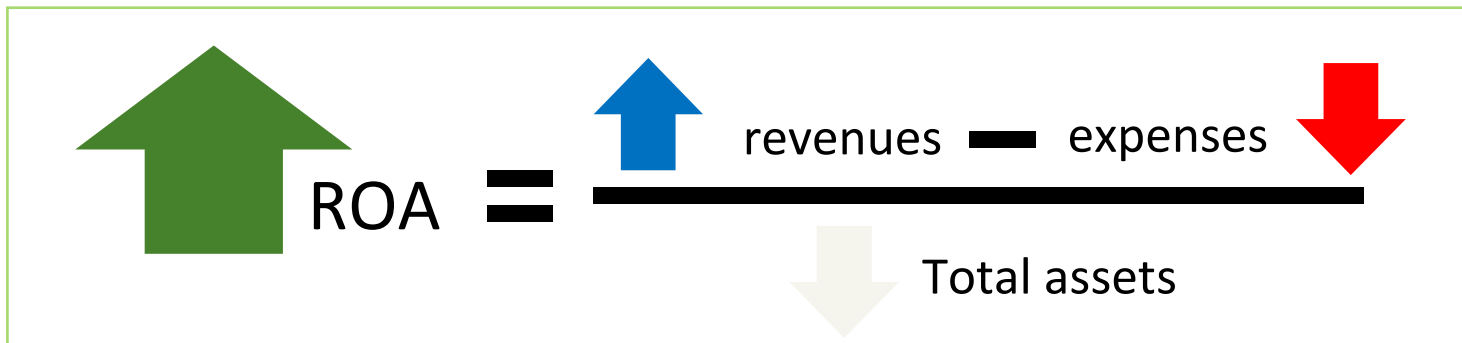
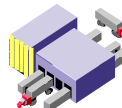## Typical Potential Quantifiable Benefits

- Increase Sales/Revenue
- Increase customer service levels 1% to 5%

- Reduce operating costs (Freight Cost, Handling, Storage Manufacturing, procurement) 5% to 10%

$$\text{ROA} = \frac{\text{revenues} - \text{expenses}}{\text{Total assets}}$$

- Reduce fixed assets (consolidate production lines, plants, warehouses) by 5% to 10%
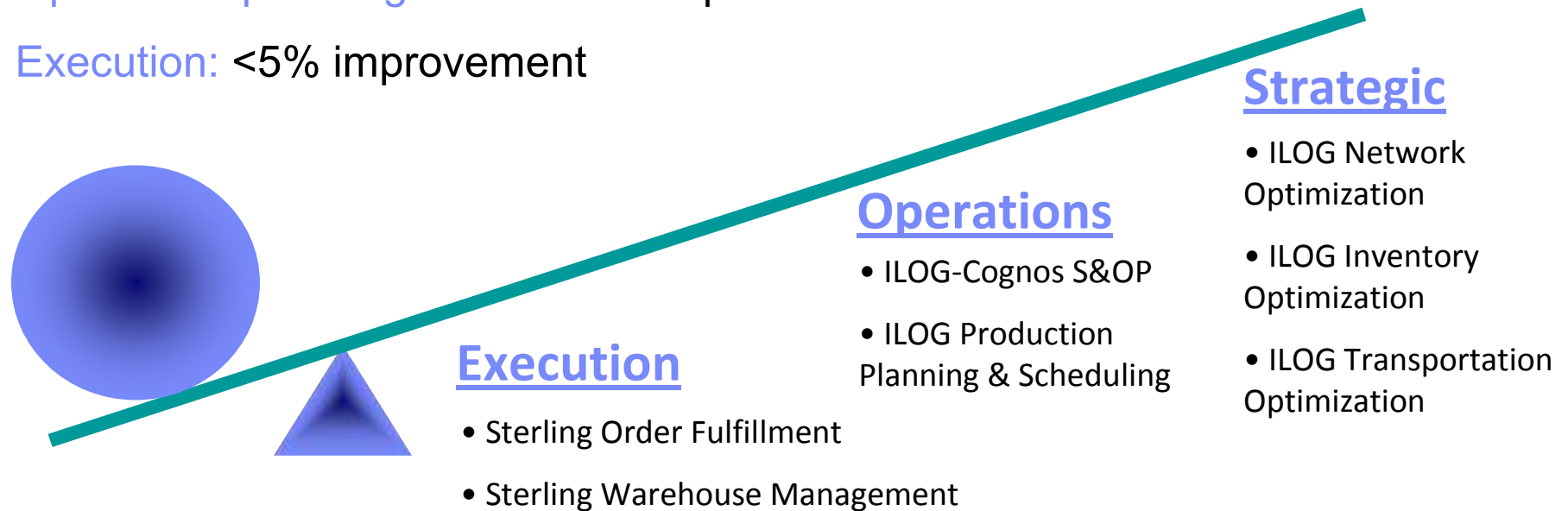- Reduce total inventory (RM, WIP, FG) by 10% to 15%

24

Drive significant impact with IBM Supply Chain Optimization Solutions:

Typical potential impact through IBM solutions:

- Strategic planning: 10% to 15% improvement

- Operations planning: 5% to 10% improvement

- Execution: <5% improvement

Strategic

- ILOG Network Optimization

- ILOG Inventory Optimization

- ILOG Transportation Optimization

Operations

- ILOG-Cognos S&OP

- ILOG Production Planning & Scheduling

Execution

- Sterling Order Fulfillment

- Sterling Warehouse Management

Appendix

Success Stories in India

Case Study – Network Redesign

IBM

Areas:
- Supply Chain Network Design
- Inventory Optimization
- Plant Location Analysis

Objectives:
- Identify network to support GST Implementation
- Recommend Distribution and Inventory Strategy

Total Savings Summary & Implementation Roadmap

	2010 Implementation Time			
	3 mos	12 mos	2011	2012
DC Consolidation	1.0	0.0	1.8	2.0
Inv. Charges	0.2	0.0	0.4	0.4
Rail	0.6	0.0	1.1	1.2
On-Going Total Log. Savings	1.9	0.0	3.2	3.6
	6.6%	0.0%	11.4%	11.3%
One-Time WC Impact	2.3	0.0	0.0	0.0
TOTAL SAVINGS	4.2	0.0	3.2	3.6
Rupee/SSU Log. Savings	0.4	0.0	0.5	0.5

Candidate Facilities and Final Network
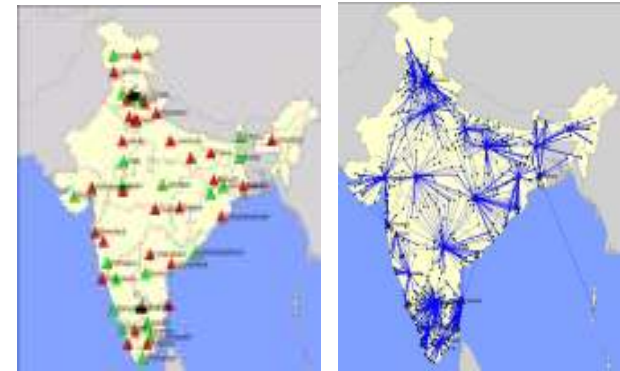
Solution Summary

- Consulting & Implementation of IBM ILOG tools for strategic network design
- Analysis on working capital impact of network configuration changes

Business Results

- Possible reduction in number of DCs from 32 to 21 with GST implementation
- Possible reduction in logistics cost by 10%
- Possible Working capital reduction by 14%

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- **Objective** - Improve forecast accuracy and optimize inventory level across after-market spare parts supply chain, while meeting targeted service levels

- **Inventory issues**
  - Use of sub-optimal inventory buffers leading to excess inventory / poor service levels
  - Absence of "what-if "analysis & limited visibility in inventory performance measures

- **Forecasting issues**
  - Basic extrapolation technique of moving average causing forecast to lag actual demand
  - High deviation between tentative and firm plan given to suppliers & measurement process

Benefit Area	Description
Improved Forecast Accuracy	Significant improvement in forecast accuracy across different category of parts
Optimized Inventory Levels	Reduction in inventory levels for Spare Parts SKUs for targeted service level. through optimal setting of inventory parameters
Consistent Service Levels	Solution has helped in achieving consistent service levels
Supply Chain Flexibility	Solution provides flexibility in evaluating various "what-if" scenarios and comprehensive results analysis

Case Study – Transportation Route Planning

- **Objective:** To perform tactical level planning to estimate fleet requirements and operation planning to derive optimal route planning

- **Challenges:**
  - Around 650 dealers spread across 500 towns across India. Planning to expand the dealer network to various towns. Hence route planning need was highlighted
  - Tactical planning to estimate transportation needs and optimal route planning
  - Evaluation of various scenarios (direct delivery, DC to DC deliveries, multi-stop routing etc)

Benefit Area	Description
Improved Tactical planning / estimation	**Evaluate and design optimum routes** **Estimate fleet requirement (number & type of vehicles) by time**
Optimal Route Planning	**Daily planning & dispatches to derive optimal multi-stop routing**
Reduced Transportation cost	**Helps in optimizing fleet as well as reduction in transportation variable cost due to route optimization**
Supply Chain Flexibility	**Solution provides flexibility in regularly evaluating various "what-if" scenarios and selecting the better parameters**

Thank you! Next steps:

IBM

Visit the IBM Smarter Commerce Booth or contact us to learn more about how IBM can optimize your supply chain rahuljad@in.ibm.com | +91 9880001431

Learn how other IBM clients are benefiting from IBM Supply Chain Solutions
http://www.sterlingcommerce.com/customers/by-product/
http://www-01.ibm.com/software/websphere/products/optimization/case_studies/

Learn more about IBM ILOG and Sterling Commerce Solutions for Supply Chain Management
http://www-01.ibm.com/software/websphere/products/sca/
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http://www.sterlingcommerce.com/products/multi-channel-fulfillment/transportation-management/
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