mca SOLUTIONS

The New Standard

in Service Supply Chain Optimization.



Optimized After-Sales Service Supply Chain Planning & Control

Morris A. Cohen

Chairman

May 22, 2003

XYZ Corporation

- Global manufacturer of factory equipment and automation
- Sales, revenue growth has stagnated
- Profit, cash flow crisis

→ "Customer Asset Management Strategy"

- Provide comprehensive service products to existing customer base
- Use service to grow revenue and meet profit goals

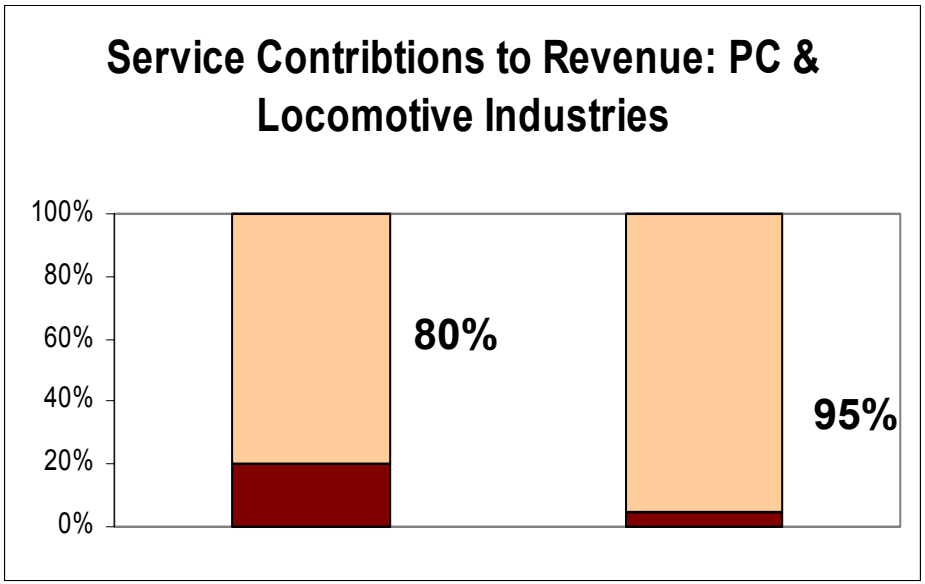
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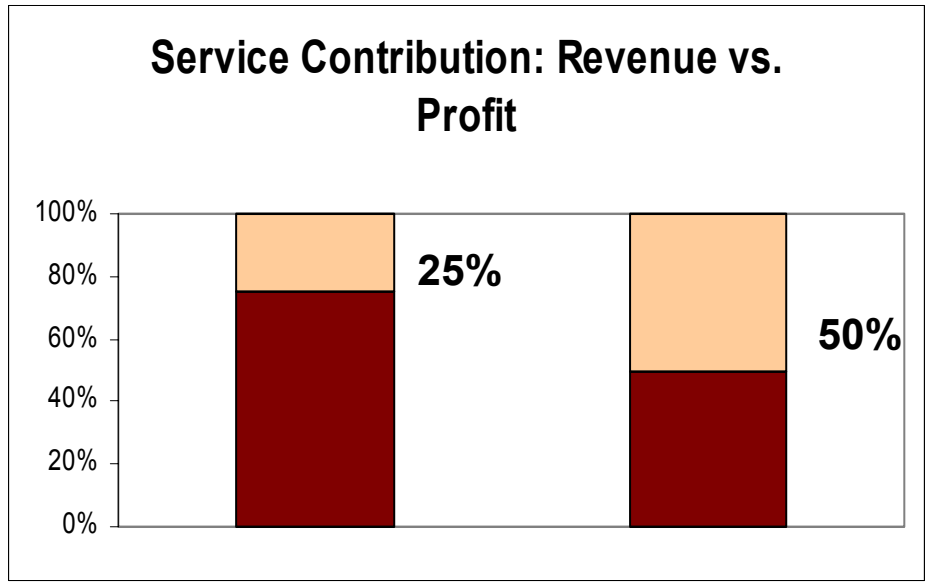
Service Centric Strategy - Drivers

- Difficult and expensive to find new customers and to increase revenues based on product sales
- After-sales service to installed base of products provides a low risk, high margin revenue stream over a long period of ownership
- Owner/operators seek to prolong useable equipment life and increase availability → decrease cost of ownership.
- Expectations for “perfect” service have escalated → increased willingness to pay for differentiated service products
- ERP and CRM systems enhance visibility of customer service transactions throughout the extended value network

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Service Revenue Contribution
Product and Equipment Manufacturers





Services

Products

Sources: Harvard Business Review, Sept. 1999, Supply Chain Management Review, Jan. 2003

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Service Centric Strategy - Enablers

- Increase sales of parts and service (repair, upgrade, support, etc.) to existing customers
- Provide customized service performance contracts and optimize pricing
- Outsource infrastructure through 3rd party providers
- Use integrated decision support tools to increase efficiency and maintain service quality

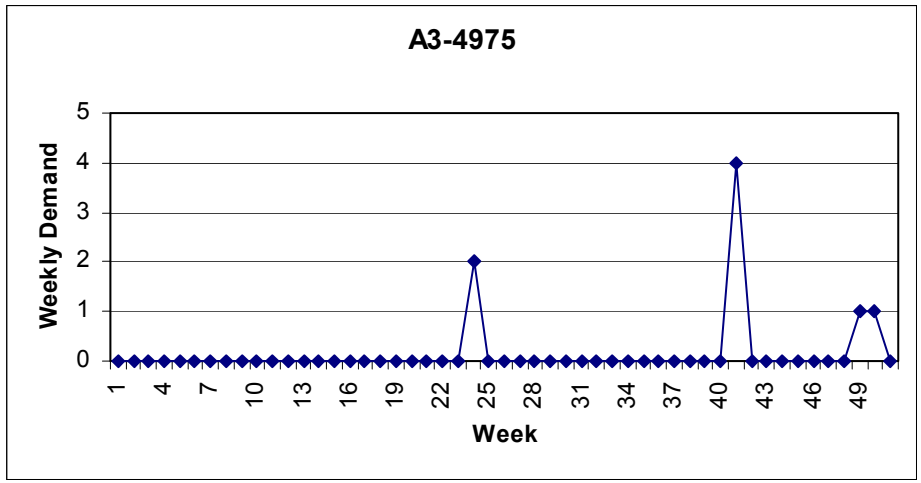
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Service Supply Chain Management Mistakes

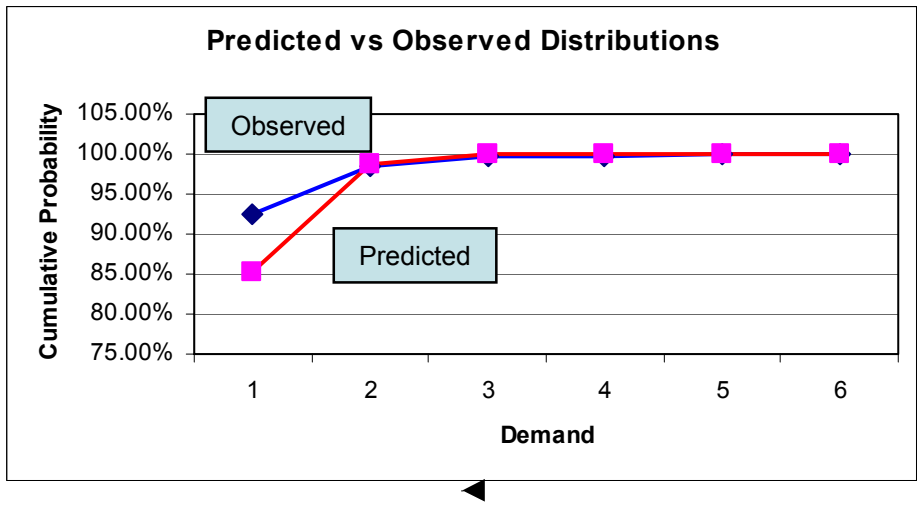
- You can forecast demand
- Maximize customer satisfaction through maximum material (part) availability
- Manufacturing thinking and systems can be adapted to service support

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A Typical Part History



Forecast:
Poisson (0.161)



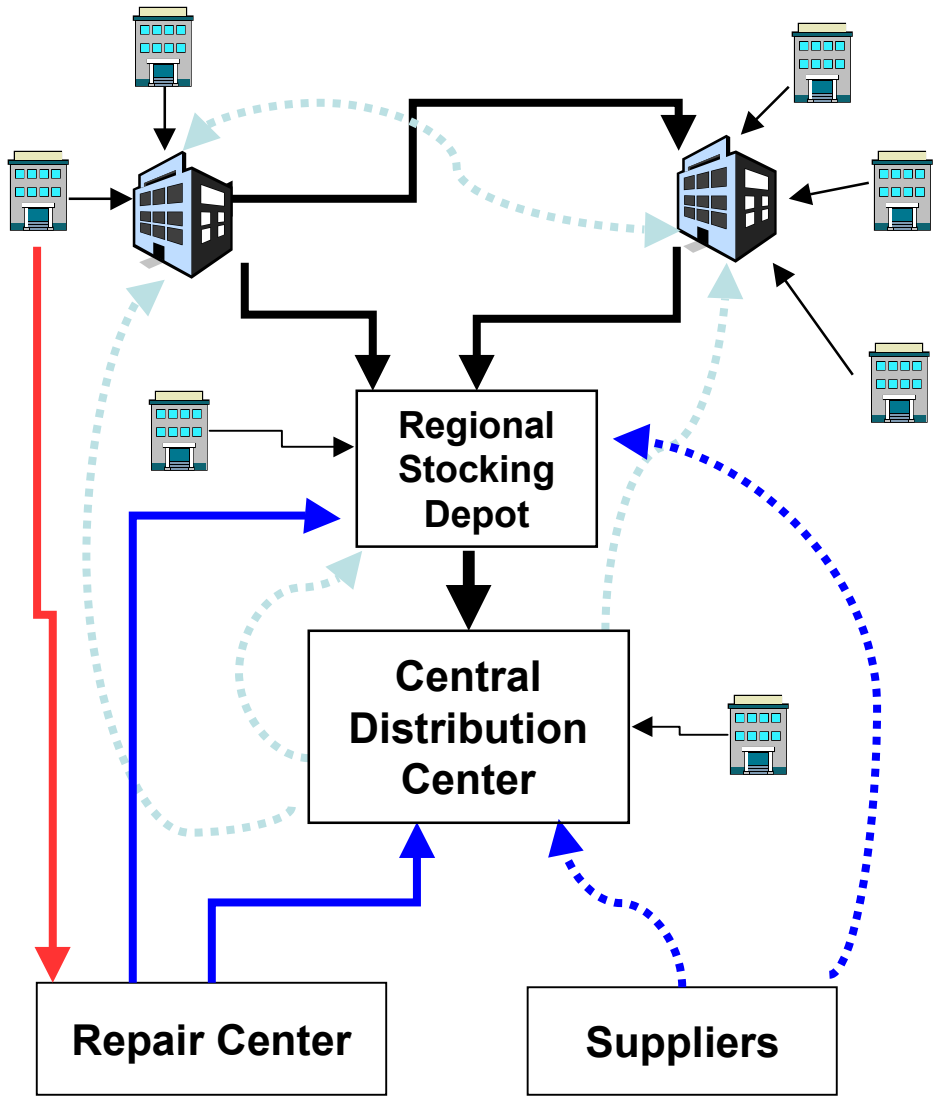
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Service Supply Chain Complexity

- Customer service contract response times measured in hours
- Significant investment (inventory, facilities) with very low turnover
  - (1.0 – 2.0)
- High obsolescence rate
- Complex facility resource networks
- High levels of demand and supply risk
- Complex material flows
  - forward and reverse paths
  - multiple sources of supply
  - lateral and vertical resource pooling.

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Service Supply Chain Network



Customer Demand

"Pass-Up Demand

Replenishment

Defective Returns

Repaired

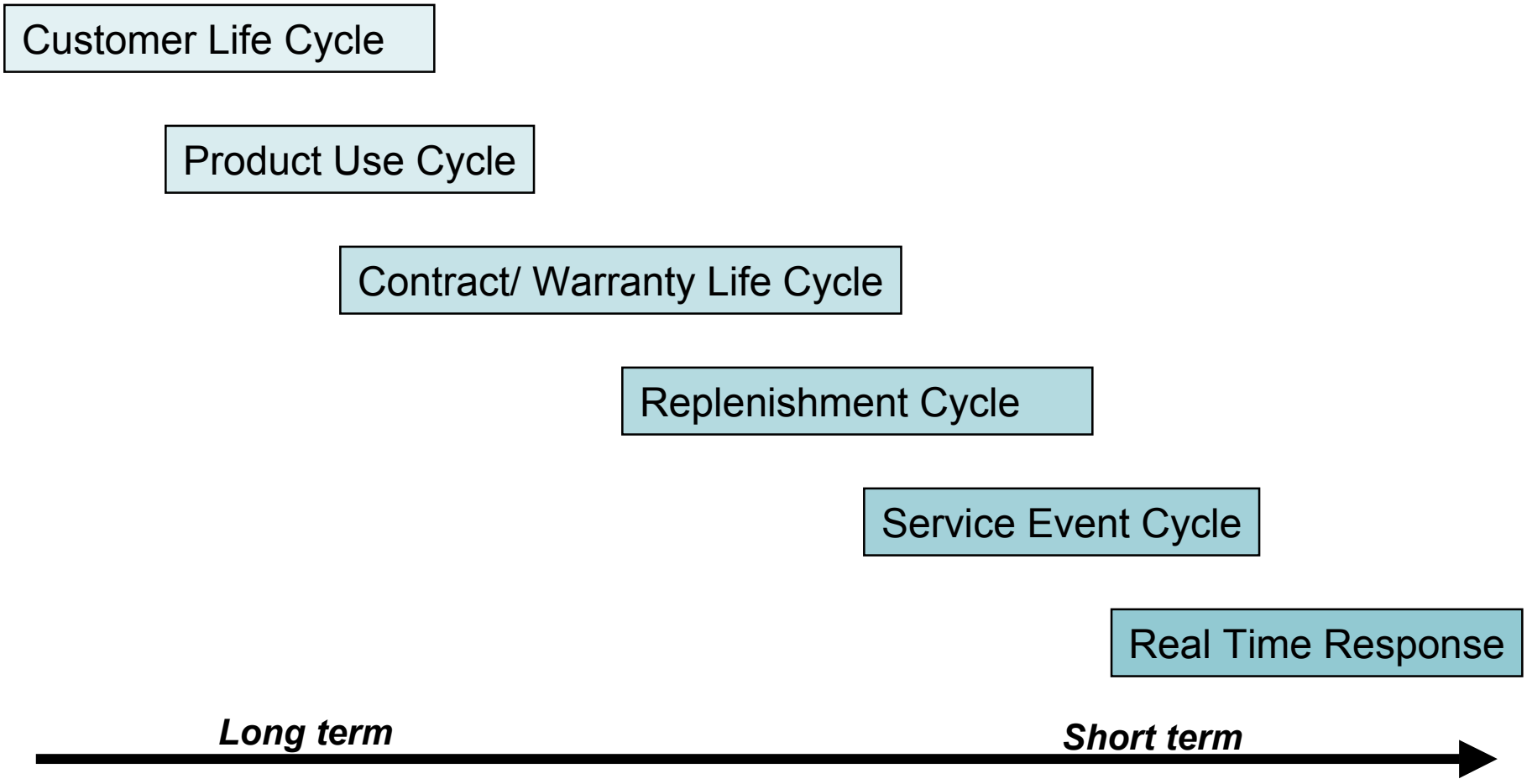
Transfer/Allocate

Customer Site

Local Stocking Location/ Consignment (Customer Kit Inventory)

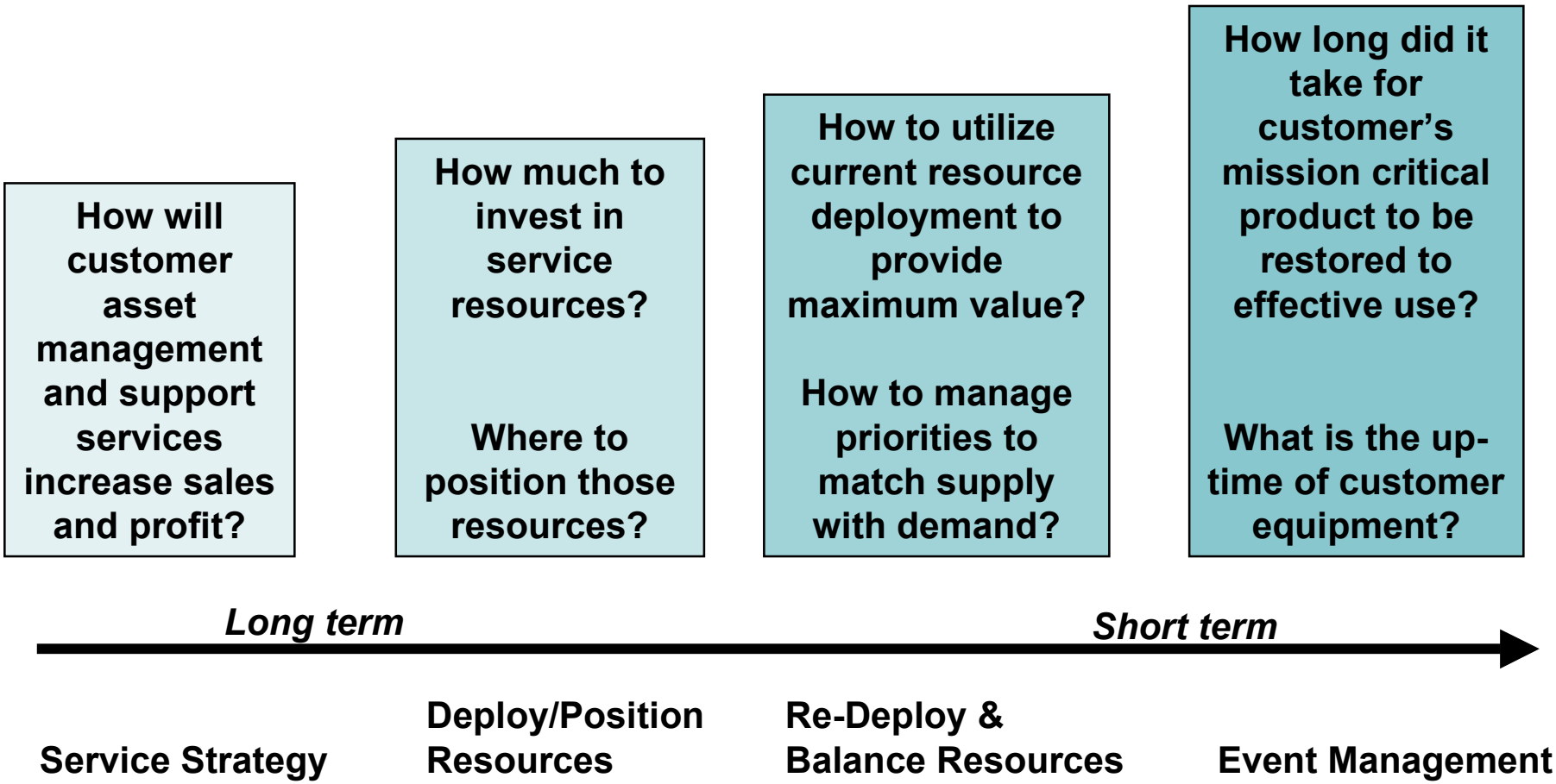
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Service Supply Chain Planning Horizons



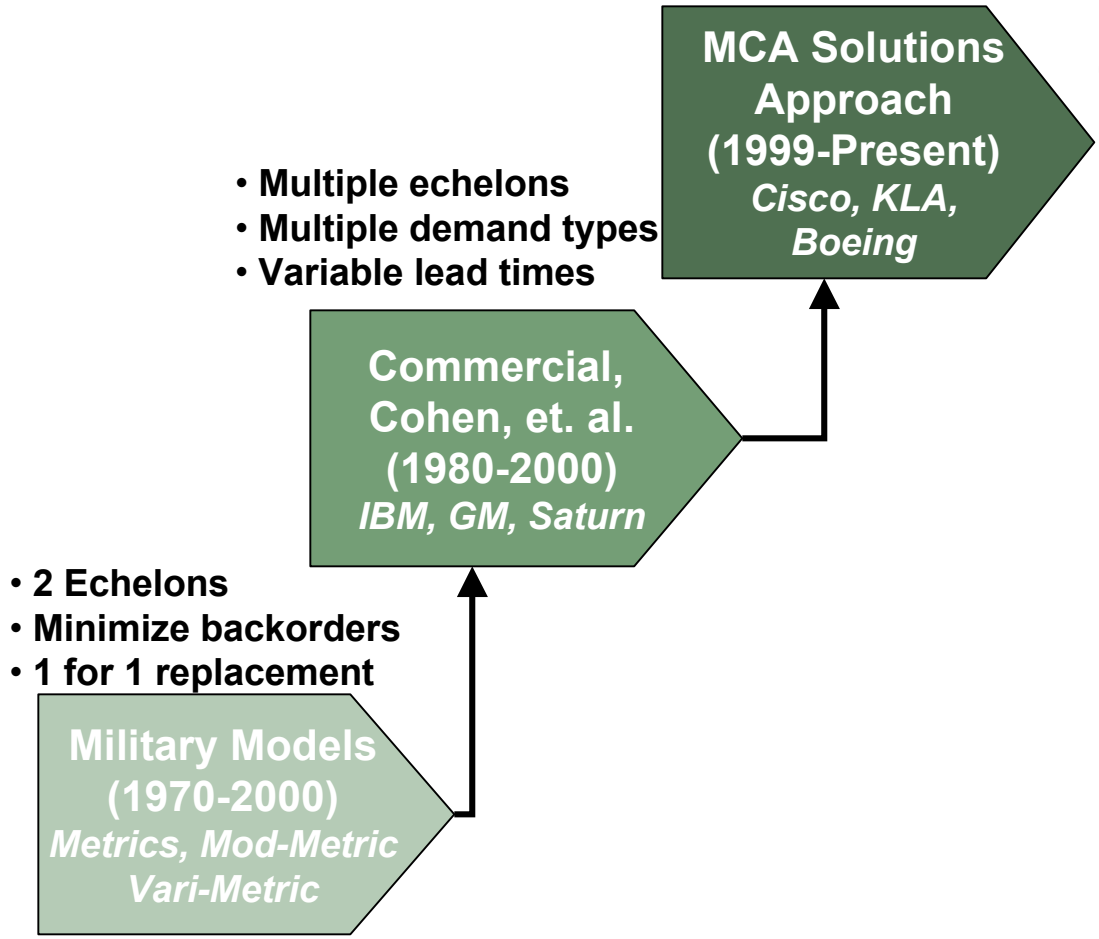
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Planning Questions



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MCA Solutions Builds Upon a Long History of Service Supply Chain Optimization

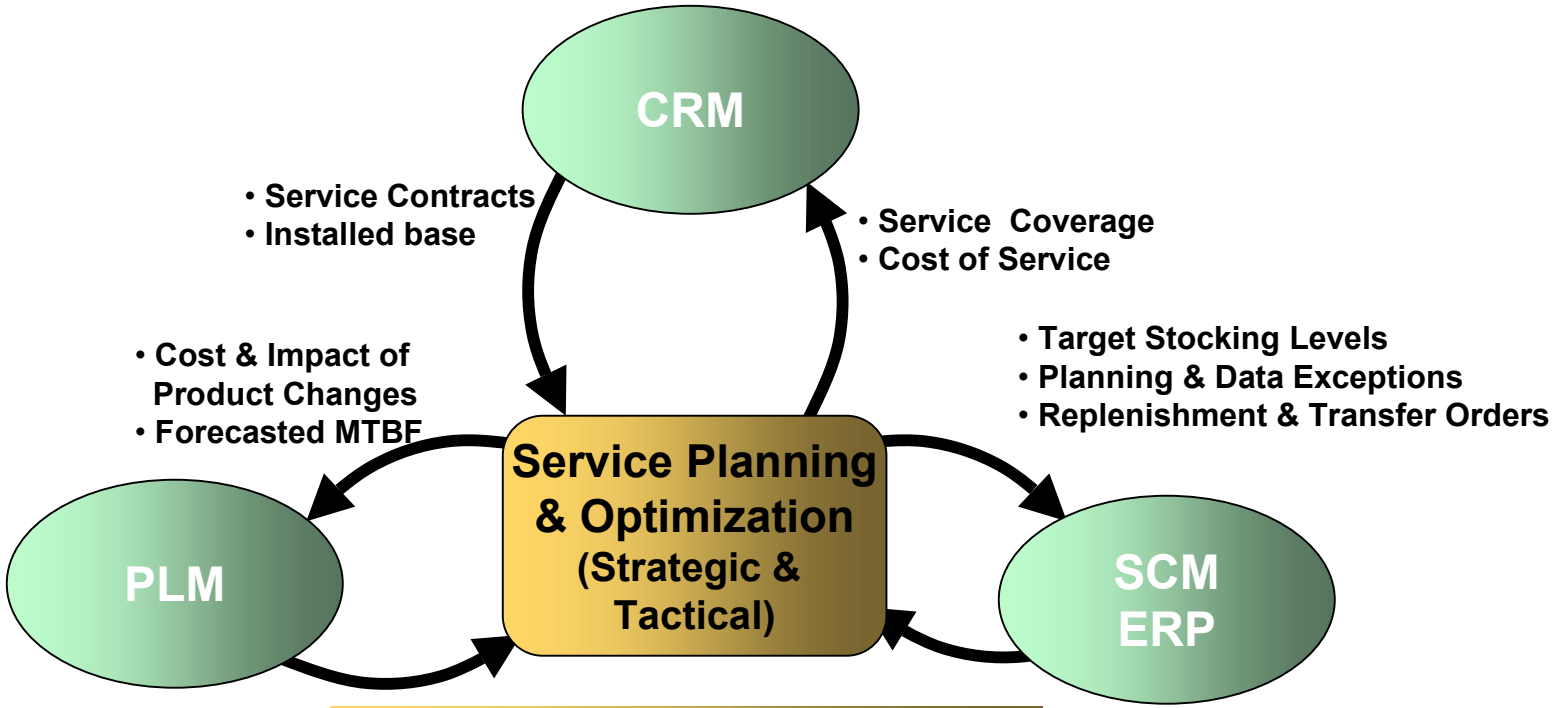


MCA SPO: Merge best of Military and Cohen et al approaches

- 1- for -1 and/or EOQ/ROP
- Multiple part hierarchies
- BOM sparing
- Causal + Time Series Forecasting = "MCA Blended"
- Multiple demand sources
- Multiple supply modes
- Nested service requirements and resource constraints
- Fill Rate &/or Availability based optimization
- Coordinated strategy/tactics optimization
- Rationing and differentiated service planning
- Multi-echelon optimization →Horizontal and vertical pooling

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Service Planning and Optimization Suite: Integration with Enterprise Systems



- Product & Supersession Changes
- MTBF Initial Estimates

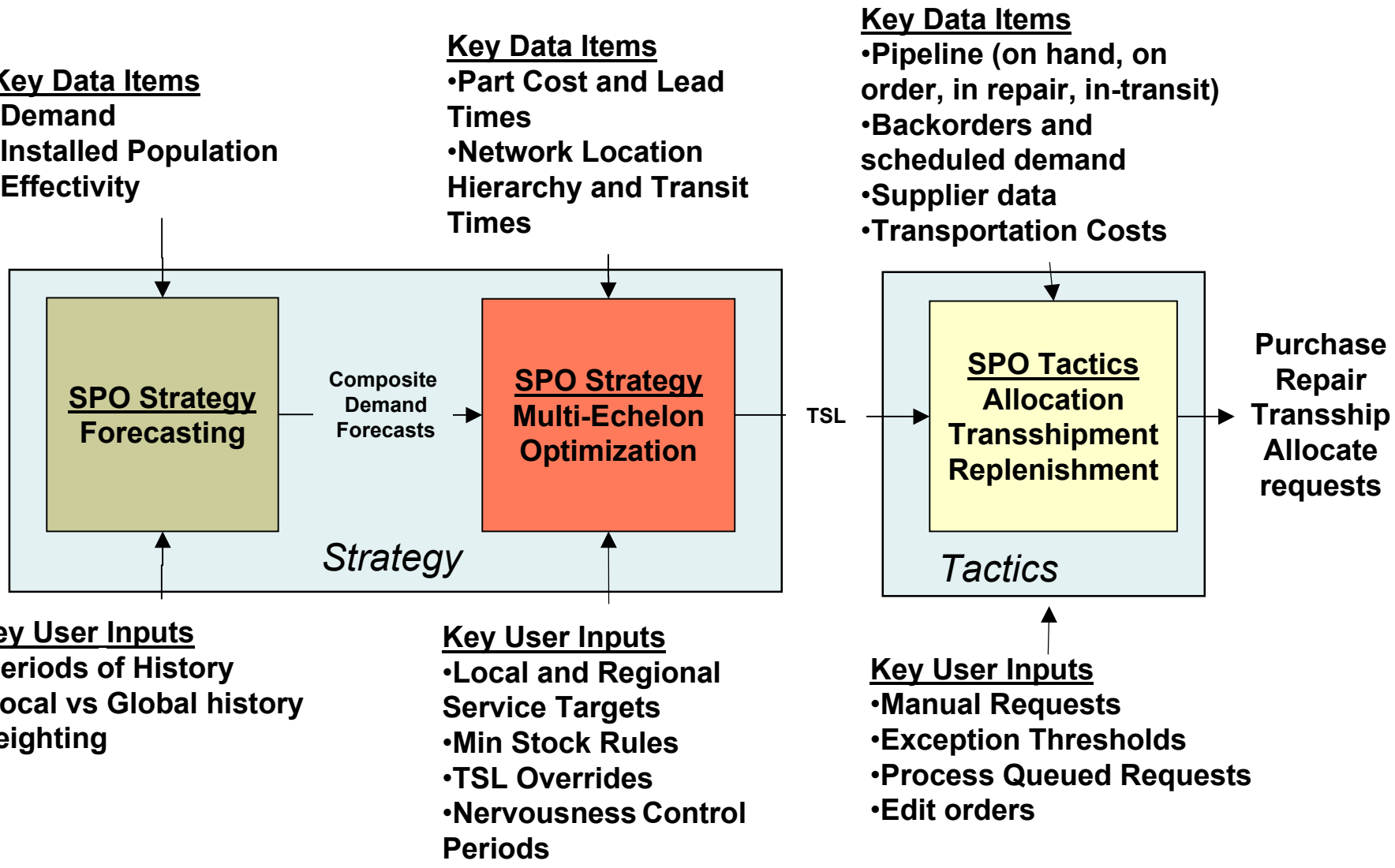
SPO Functions

- Forecast demand, MTBF & installed base
- Position inventory across all echelons
- Analyze service inventory tradeoffs
- Manage service contracts
- Assess performance
- Analyze design changes (product network, contract)
- Allocate, replenish and transship parts throughout supply chain

- Product on-hand & on-order
- Historical usage
- Supply Chain Network
- Product Master

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SPO Decision Flow



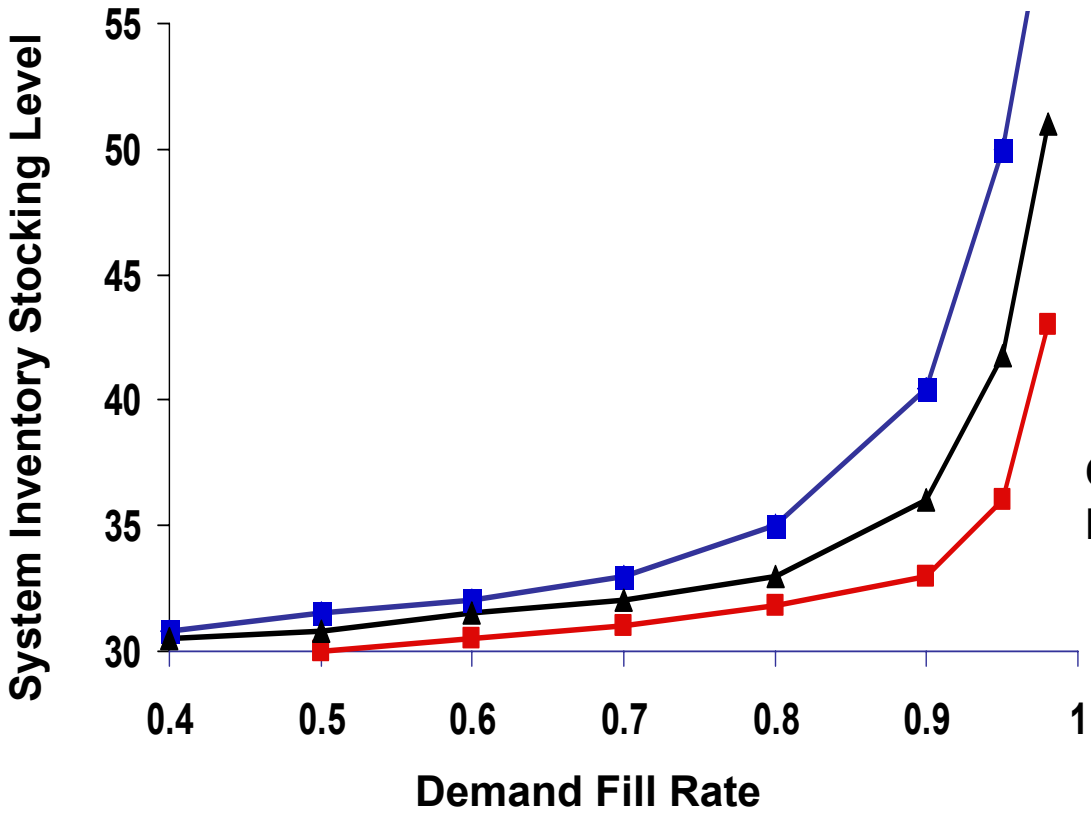
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Guiding Philosophy-Strategy

- Coordinate Strategic and Tactical Level Planning
- Resource deployment decisions are made at a strategic level to provide maximum shortage protection at the lowest cost and investment
- These decisions must be made before demands are known at the customer-part-location level
- Service contracts specify response times measured in hours, lead times are measured in days or weeks
- Demand is inherently non-predictable
- A variety of “hierarchy” based strategies can be used to maximize efficiency of resource use
- This is an exercise of portfolio risk management

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SPO: Benefit of Network Optimization
Shifting the *Cost/Service* Frontier



Optimal Frontier: Part Optimization

Optimal Frontier: Location Optimization

Optimal Frontier: Network Optimization

Rather than planning each part in isolation, a part's stocking level is decided based on its service contribution to the location and network and its inventory investment

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Guiding Philosophy - Tactics

- Re-deployment of resources throughout the service supply network takes place on an ongoing basis
- Material movements within the service supply chain can improve service and lower cost
- Basic decisions include:
  - ***Replenishment*** to bring parts into the system
  - ***Allocation*** to distribute arriving material for maximum effectiveness
  - ***Transshipment*** to re-distribute from locations with “excess” to locations with “shortage”
- The risk management approach must be maintained
- Forecasts cannot be treated as numbers; but rather as probability distributions
- User decision support - based on near real time system status is feasible with MCA’s state-of-the-art software platform
- Work queue support, rule-based triggers and rapid integration with execution systems to support intelligent supply chain event management

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Cisco Success Story

- Extensive evaluation process
- SPO Interfaces daily with ERP, CRM & SCM systems
- 5-month worldwide implementation
  - 110,000 part numbers
  - 700 stocking locations
  - 7 million contract line items
  - 2,000 active users
  - Average 250 users per day
- Global results 6 months after go-live
  - Availability increase of 3% (from 94% to 97%)
  - Net inventory / revenue decrease of 21% (from 4.3% to 3.4%)
- Continuing functional extensions

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	01 Q4	02 Q2	02 Q4	Improvement
Customer Sat (Q35L)	4.25	4.35	4.38	+3.1%
Material Availability	94.25%	96.50%	97.10%	+3.03%
Net Inventory:Revenue	4.29%	3.95%	3.38%	-21.2%

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Boeing Success Story



Boeing IDS is $23 Billion business, leader in Performance Based Logistics (PBL) contracts with their military customers

- **Extensive evaluation across all sites including all major service supply chain vendors**
- **MCA selected based on:**
  - Ability to model complex use case
  - Understanding of aerospace supply chain
  - Forecasting, strategic, and tactical planning product
  - Vision for future
  - Company management team and employee strength
- **Aggressive rollout plans**
  - Live for F-18 FIRST program September ‘03
  - Rollout across all existing programs by end of ‘04
- **Continuing functional extensions**
  - Availability, multi-indenture, multi-causals, performance measurement

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Challenges Going Forward

- Event Management Intelligence
  - Sense/predict requirements for service before failure → pre-emptive resource deployment
- Collaboration with Suppliers and Customers
  - Maximize risk pooling and scale economies
  - Information sharing
  - Yield management pricing
  - Exchanges and auctions to promote market efficiency
- Multi-Resource Coordination
  - Human resources (Field Engineer, Call Center)
- End of Life and NPD Considerations
  - Proactively replace installed equipment
- Organizational Challenges
  - Theater vs central planning
  - Global factors (exchange rates, duties, quotas)

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