Solving the Inventory Dilemma: 
Cut Costs NOW and Improve Service

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About Smart Software

- Leading provider of forecasting, demand planning, and inventory optimization software since 1984
- Primary customer need: find the inventory ‘sweet spot’
  - Meet service objectives, minimize stockouts
  - Reduce inventory costs
- Unique advantage – planning for intermittent demand
- Thousands of demand & inventory planners worldwide
- SmartForecasts® integrates with leading ERP & Supply Chain software systems
Who I am

- Reginald Soubry, p.eng.
- Senior Analyst, Material management, Logistics, Montreal Transit Corporation
- Professional experience:
  - 30 years in stock management
  - 25 years in public transit
  - 14 years with the Logistics Service
  - Last 5 years in stock management system development and performance enhancement
What is the STM?

- Société de transport de Montréal
  Provides public transit services on the 480 km² island of Montreal
- 388 million trips handled in 2010
- Bus punctuality 86.3% (scheduled time –1 to +3 minutes)
- Metro reliability: 97.9% on-time (less than 5 minutes late)
- 162 million km travelled by our buses and metro-cars
- 1705 buses and 749 metro-cars
- Annual budget (2010): 1.090 B$
- Replacement value of our assets: 14.5 B$
- 8,680 permanent employees

- 2010’s Outstanding Public Transit System in North America, according to the American Public Transportation Association (APTA)
- 2008’s Most productive manpower (hrs/car-km) of the 27 largest metro systems in the world, according to the London Imperial College.

Where We Were (2008)

- 200,000+ SKUs
- 33.6 M$ of inventory
- Inactive SKUs: estimated value over 10 M$
- Overall part availability: 76%
- No way to properly differentiate between insurance, inactive and obsolete parts.
- No way to properly identify overstocks.
- Reprovisioning parameters: safety stocks, reorder points and reorder lot sizes were, most of the time, determined by a “best guess” from the associates.
- Basic forecasting on specific items only.
Where We Wanted to Go

- We wanted to be the best parts provider in the public transit industry. Find the optimal balance between stock level and service level.
- Meet 100% of service agreement requirements
  Ex.: 99.5% of parts required for maintenance made available within the time allowed:
  - All parts stocked in store: over the counter
  - All parts stocked in network: 72 hours
- Calculated parameter:
  - Stock management parameters based on forecasted demand
  - Safety stocks to cover desired service level
  - Order points dependant on forecasted demand
- Stocks in control:
  - All parts classified according to nature and velocity
  - No overstocks, No inactive stocks and No obsolete parts
- Manage stocks proactively instead or reactively, with the proper tools, processes and people.

Challenges and To-Do List

- Management and managers buy-in on the benefits of proper stock management.
- Convincing the associates that “a machine” can properly calculate parameters.
- Clean up stocking and provisioning parameters for the 200,000+ SKUs.
- Forecasting demand: both regular and intermittent (random)
- Transferring control of the reprovisioning parameters from manual to calculated, without prior major data scrub (cleanup) and without significant financial or operational impact.
- Replenish items where stock levels were insufficient.
- Dispose of excess, inactive and obsolete stocks.
The Results

For the items that were present at the beginning of the project:

➤ Overall part availability: 94% (+18%)
➤ Inventory reduction of 4.1 M$ (-12%) to 29.2 M$
➤ Inactive stocks reduced to 7.8 M$ (-24%)
➤ Item demand estimation for major RFPs prepared with the help of the demand forecasting tool.

Critical Enablers

➤ Knowledge and understanding of the basic classical calculations and the influence of stock parameters on them.
➤ A way to forecast lead-time demand for both regular and intermittent demand items.
➤ A way to recalculate stock parameters.
➤ An improved “in-house” stock management system with re-modeled re-order point (ROP) processes that take better account of economic lot sizes, minimum stocks, maximum stocks.
Lessons Learned and Keys to Success

- Clear objectives and the priorities.
- Plan the work in stages and make sure you have measurable and reasonable targets as well as a way to measure how close you are to the bulls-eye at each step. Have a backup plan.
- Clear definition of everyone's role and buy-in at all levels: Management, managers, personnel and suppliers.
- Make sure you have the bodies to do the work properly on the floor, that they are informed and trained and manage the change.
- Involvement and teamwork at all levels and all stages of the project.
- Plan the work, Work the plan and Have the right tool set.
- Don't over think it!

Demand Forecasting: Where the Supply Chain Starts

Demand forecasts drive the supply chain, but they're nearly impossible to produce when demand is intermittent.
Intermittent Demand Example

Intermittent Demand

- What is “Intermittent Demand”
  - “slow-moving,” seemingly random requirements for parts or finished goods
  - Demand history – large percentage of zero demand values

- Generally considered difficult or nearly impossible to forecast

- Especially common among:
  - Service Parts Operations – 70% of items or more
  - Equipment / Vehicle / Facility Maintenance
  - Industrial Tools and Other Capital Goods Manufacturers
Intermittent Demand Problem

Consider – What comes next:

a) 10 20 30 40 50 60 ___
b) 50 100 50 100 50 100 ___
c) 2 4 8 16 32 64 ___
d) 0 18 0 0 6 27 ???

Finding the Inventory “Sweet Spot”

Reduce Inventory  The Inventory Sweet Spot  Increase Service Levels

The minimum amount of inventory required over a specified lead time to meet a desired service level
Best-in-Class Inventory Forecasting

Use a *service level driven* approach (SLD)

- Define service level requirements by item / product group
- Understand financial implications:
  - Cost to achieve the goal
  - Stock-out pain of missing the goal
- Find the optimal inventory allocation
  - Strategic decision: service level / financial trade-offs
  - Identify inventory excess, opportunities for service improvement
  - CFO, VP of Sales, Director of Operations/Materials
- *Don’t chase the forecast*

Pillars of an effective Service Level Driven (SLD) Process

- Communication across stakeholders – Finance, Sales, Operations
- Inventory classification
- Lead-time measurement
- Calculation of forecast uncertainty
- Automatically process thousands of parts
- Compare *desired vs. achieved* service level
### Inventory Cost Reduction Path

- **Stage 1: Process Improvement**
  - Initial Cash Savings
  - Adjust PO’s / Deliveries
  - Year 1: $80 M
  - Year 2: $60 M
  - Year 3: $40 M
  - Year 4: $20 M

- **Stage 2: Initial Cash Savings**
  - Adjust PO’s / Deliveries

- **Stage 3: Gradual Reduction to New Equilibrium**

### Getting Started - Validate the Opportunity

- You can do this in 2-3 weeks – requires:
  - Historical parts consumption data for 36 months (or periods)
  - Existing inventory levels & parts on order

- Demonstrate Opportunity:
  - Select representative subset of parts & service levels
  - Generate forecast, calculate safety stock requirements
  - Compare recommended inventory stock vs. existing levels

- Demonstrate Vendor Credibility:
  - Provide solution vendor with historical data – hold back last 2 months
  - Ask vendor to forecast at your desired service level
  - Compare: accuracy hitting service level, and cost of inventory required
Discussion

- Questions & Answers

- For more information or a copy of today’s presentation, please contact:
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Thank you for joining us!