# CBA Back Room Study: Recommendations to Save Time & Money

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Systems View

# Outline

- History
- Objectives
- Methodology
  - Store interviews
  - Online survey
  - Process flow models (with simulation demo)
  - Industry comparisons
  - Cost/benefit analysis
- Results and recommendations

# History

- Requested by CBA Supply Chain Committee in 2005.
- Initiated 7/5/05 by Systems View
- Store Visits 7/27/2005 – 9/19/2005
- Online Survey conducted 10/03/2005 - 11/08/2005
- Final Report completed 12/21/2005
- Christian Retail Solutions Committee is currently examining ways to implement recommendations

# Objectives

- Identify and analyze the business processes typically used by CBA retailers to fulfill business-to-business transactions with their suppliers.
- Determine the potential for improving current processes through the introduction of specific technologies in the areas of:
  - technology *standards* for ordering, receiving, invoicing, payments, etc.
  - recommended *best practices* in receiving, invoicing, payments, and returns.
  - standardized information systems such as EDI and web-based transactions
- Develop metrics and benchmarks for future innovation and improvements

# Methodology

- Retailer Interviews
- Broad store survey
- Process (simulation) modeling
- Industry Research
- Cost/Benefit Analysis

# Store Interviews

- 9 stores categorized by annual sales: 3 each of Small (< $750K), Medium, and Large (> $2M).
- Interview key operations personnel to determine typical process flows for ordering, receiving, and returns
- Characterize activities with estimated durations, volumes, likelihood of occurrence, technologies, and procedures

# Online survey

- Purpose was to validate store survey data and obtain estimates for some data not collected during the interviews.
- Web-based survey posted on the CBA website
- The response was relatively small (64), but when combined with the interview data was sufficient to characterize store processes to the required degree of accuracy (order of magnitude)

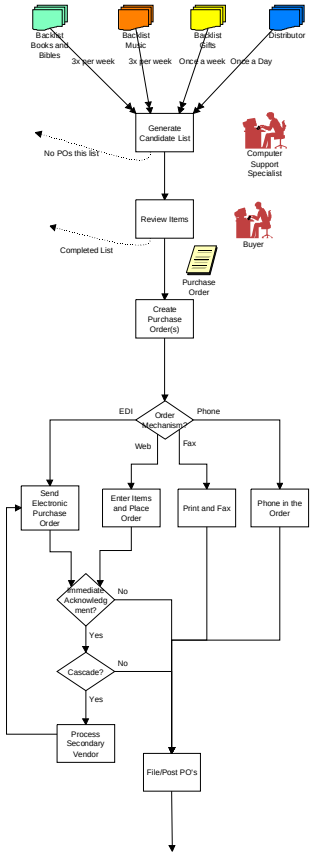
# Process Flow (simulation) Models

- Major processes (cost drivers) identified: Frontlist Ordering, Backlist Ordering, Receiving, Returns
- Composite of process flows captured during store interviews
- Populated with data from store interviews and online survey
- Used to develop and compare costs/times associated with “as-is” and “to-be” processes

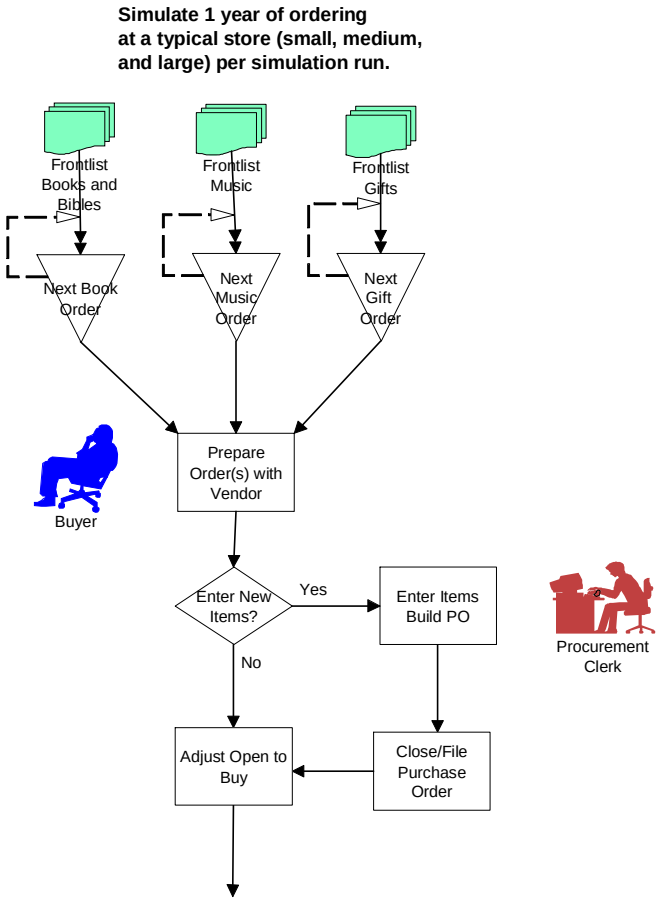
# Simulation Demo

- Rationale for Simulation Approach
  - Successful track record
  - Automates computations
  - Explicitly incorporates statistical uncertainty (each result is the average over 500 simulation runs)
  - Intuitive user interface aids understanding
- Over to Demo….

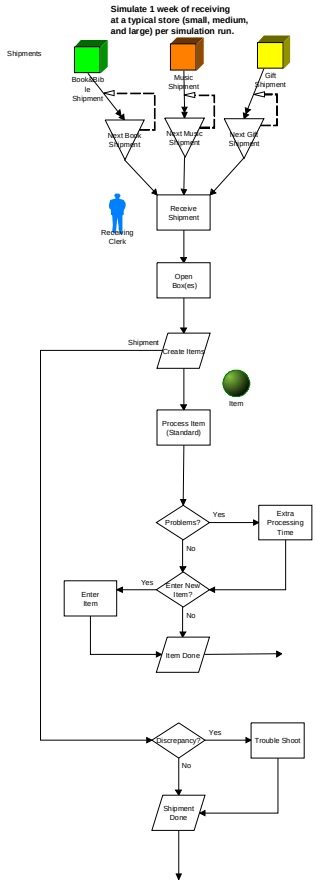
# Backlist Ordering (Backup Slide)



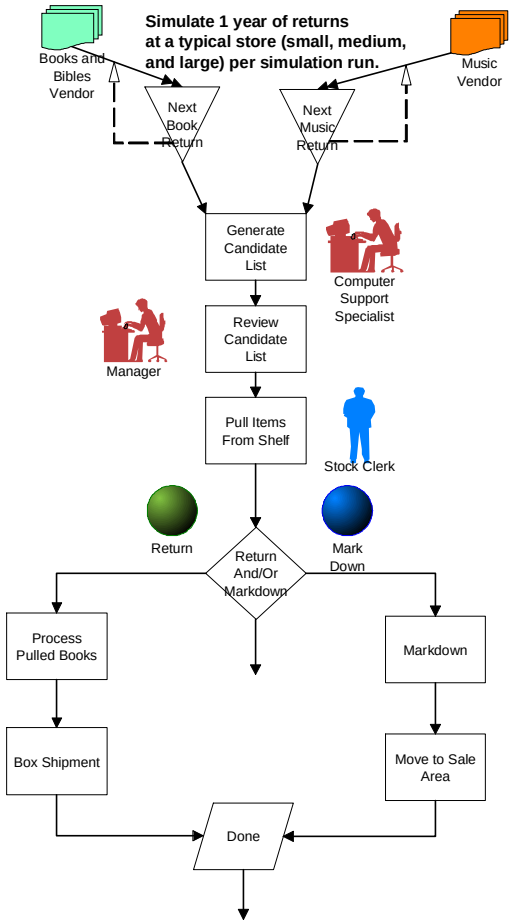
# Frontlist Ordering (Backup Slide)



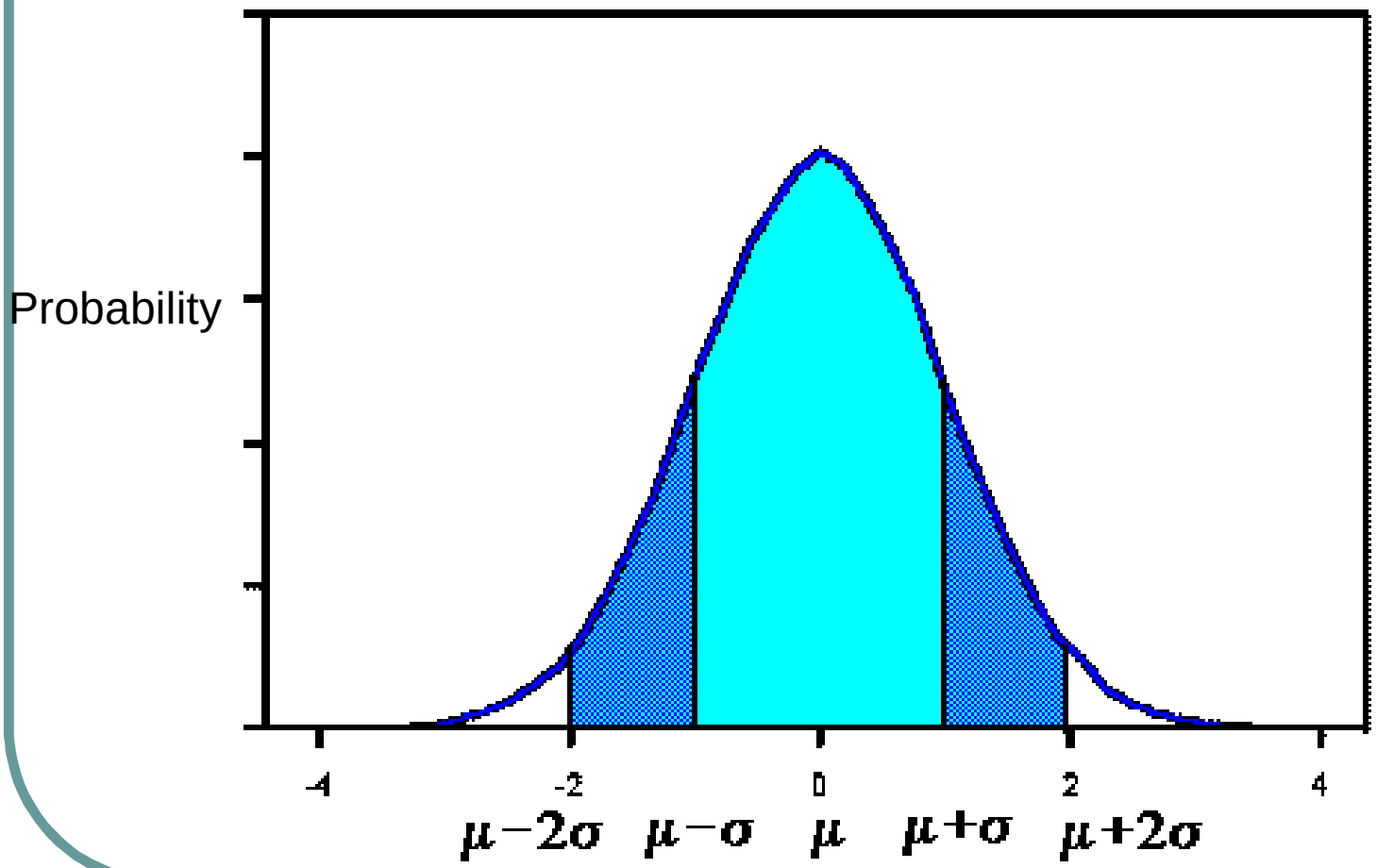
# Receiving (Backup Slide)



# Returns (Backup Slide)



# Example: Uncertainty (expressed as a "Normal Probability Distribution")

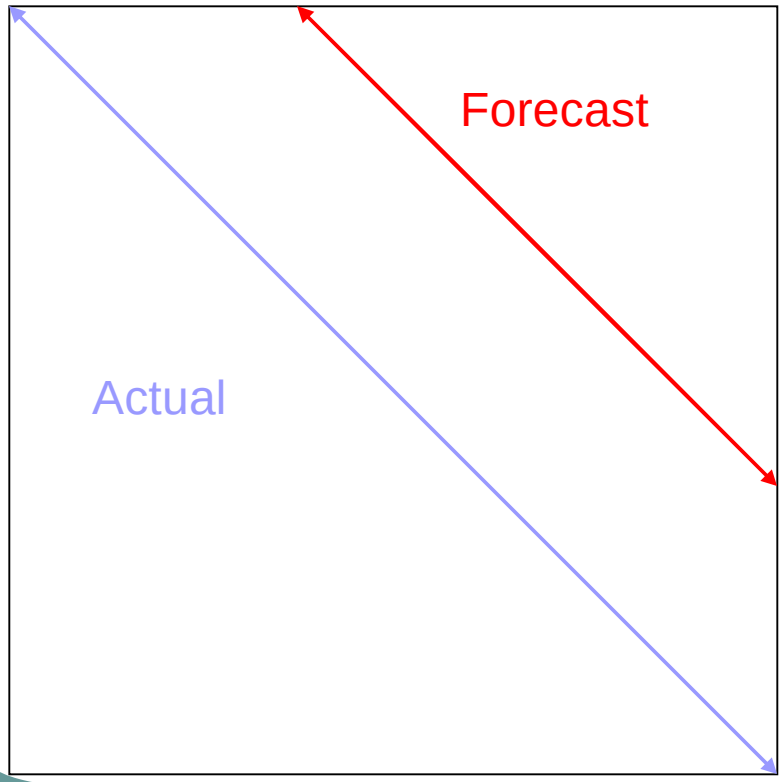


# Industry Comparisons: Inventory Control and Planning

- **CBA** stores combine output of POS system inventory modules with expert judgment (largely the latter) to determine which orders to place and when
- Most POS systems used by CBA stores provide only *very* basic forecasting approaches as a basis for inventory planning (see examples)
- **Borders** now uses an inventory control software called “Store Replenishment™” developed by JDA
- **Barnes and Noble** uses a new inventory control system developed by i2 technologies
- The systems used by **Borders** and **B&N** use very sophisticated forecasting and planning algorithms

# Forecasting Example 1

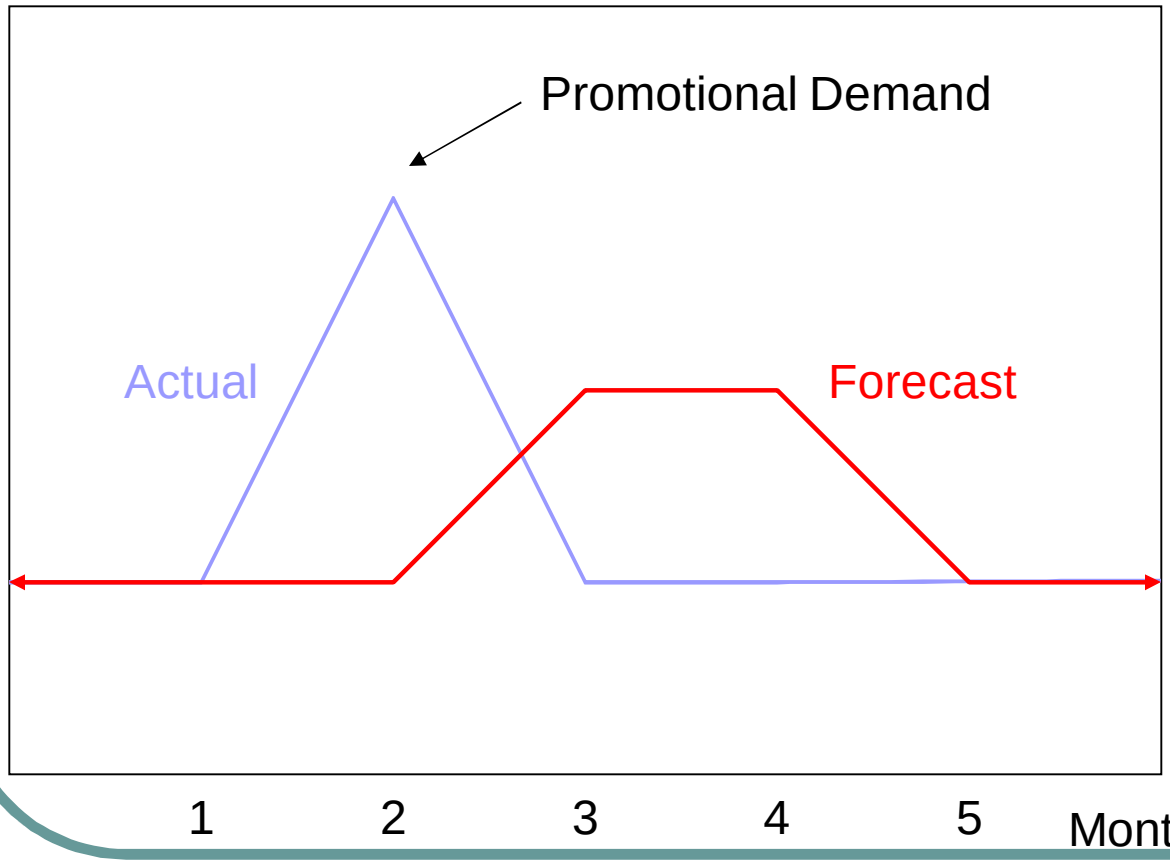
Assume a forecast that assumes next months demand is the average of the last two months historical demand (typical of current POS systems)




→Systematic Over-forecasting

# Forecasting Example 2

Assume a forecast that assumes next months demand is the average of the last two months historical demand (typical of current POS systems)




→Under/over forecasting

# Industry Comparisons: Quality Control

- Inventory inaccuracies are pervasive in the book selling industry – leading to either excess inventory or lost sales
- “Continuous Improvement” techniques provide simple means of improving processes:  reduction or errors - identifying and eliminating “waste”.

# Industry Comparisons: Benchmarks

| Metrics | ABACUS | | CBA - Operating Statement Survey | |
|---|---|---|---|---|
| | Low Profit Stores | High Profit Stores | Average Store | High Profit Stores |
| **Inventory Turns** | 2.68 | 3.37 | 2.7 | 2.7 |
| **Sales Per Selling Sq. Ft.** | $251 | $405 | $145 | $167 |
| **COGS %** | 60.8% | 59.6% | 61.2% | 60.8% |

**Selected Metrics from ABA and CBA Store Surveys**

# Cost/Benefit Analysis

- Options analyzed:
  - Automated Entry of New (Frontlist) Items
  - Decrease Discrepancy Rate by 50%
  - Decrease Gift Problem Rate by 50%
  - Improved/Automated Inventory Control (CPFR approach)
- Consider changes in marginal labor, training, inventory, and software costs

# Cost/Benefit: Automated Entry of New Items

- Depending on their size, stores place dozens or even hundreds of frontlist orders every year.
- Each order requires entering new item specific data into the POS/inventory systems. (This may occur immediately after ordering or during receiving.)
- Entering the information manually requires anywhere from 15 minutes to 4 hours per order.
- While some vendors reportedly provide electronic files of new item information these are not widely utilized or do not provide a complete solution.
- Reasons for nonuse may include cost, lack of comprehensiveness, incomplete/incompatible/out-of-date item data, or lack of knowledge on its existence.
- Stores wondered why this information could not be uniformly provided electronically at the time of ordering in a format that could be easily uploaded into their POS system.

# Cost/Benefit: Decrease Discrepancy Rate

- “Discrepancy” occurs when received quantity of one or more line items in the shipment does not match  expectation.
- Most of the time, this means a shortfall, but could also be an overage or damaged items.
- Survey Average: About 6% of book and music shipments and 10.5% of gift shipments
- Typically requires 5-10 minutes on the phone with the vendor plus paperwork adjustments

# Cost/Benefit: Decrease Gift Problem Rate

- Gifts appear to suffer the most from incomplete labeling and/or paperwork during receiving.
- Problems include:
  - Individual units of a single item within a box are not labeled separately.
  - Items may have a stock number but no standard UPC code
  - Items may have no identifying label at all.
  - Packing slip is at the bottom of a shipping case.
  - Packing slip may not reference original purchase order number or invoice number
  - Invoice is not included with the shipment (sent later).
  - Packing list may not have individual prices (retail and/or purchase) needed for labeling
  - Packing list may only have garbled/ambiguous item names
- Survey Average: About 24.5% of gift shipments
- Requires time consuming extra research during receiving (avg of 2.5 minutes/line item)

# Cost/Benefit: Improved/Automated Inventory Control

- CPFR (Collaborative Planning, Forecasting, and Replenishment) approach would partner stores with vendors via collaborative software to determine what to order, when, and how much
- Proposed system would combine individual store inventory data with vendor's market data to create more accurate demand forecasts by item considering trend, seasonality, product life cycle, and promotional demand.
- Jointly developed forecast would provide solid basis for order plans that balance the costs of excess inventory versus lost sales.

# Results

| Option | Individual Store Values | | | | | Industry Net Annual Benefit ($/yr) |
|---|---|---|---|---|---|---|
| | Transition Cost | Net Annual Benefits | | | | |
| | | Small Store ($/yr) | Med. Store ($/yr) | Large Store ($/yr) | Average Store ($/yr) | |
| Improve/Automate Inventory Control | $500 (one time) | 3,703 | 15,274 | 41,156 | 7,564 | $14,537,239 |
| Automate Entry of New Items | $100/yr | 284 to 824 | 647 to 2,111 | 2294 to 7,075 | 436 to 1,332 | $838,722 to $2,560,950 |
| Decrease Gift Problem Rate by 50% | Store mgmt refocus | 132 | 539 | 1,894 | 284 | $546,444 |
| Decrease Discrepancy Rate by 50% | Store mgmt refocus | 27 | 102 | 325 | 54 | $104,653 |

# Recommendations

| Improvement | Estimated Industry Net Annual Benefit ($/yr) | Recommendation To CBA |
|---|---|---|
| Improve/Automate Inventory Control | **$14,537,239** | Encourage development of industry-wide CPFR system |
| Automate Entry of New Items | **$838,722 to $2,560,950** | Encourage POS vendors to incorporate needed functionality |
| Decrease Gift Problem Rate by 50% | **$546,444** | CBA Supplier Certification program; Advocate store-level continuous improvement |
| Decrease Discrepancy Rate by 50% | **$104,653** | CBA Supplier Certification program; Advocate store-level continuous improvement |