

Best Practices for Today's Times



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COST SAVINGS THROUGH TECHNOLOGY: ADVANCED INVENTORY MANAGEMENT AND WAREHOUSE OPERATIONS

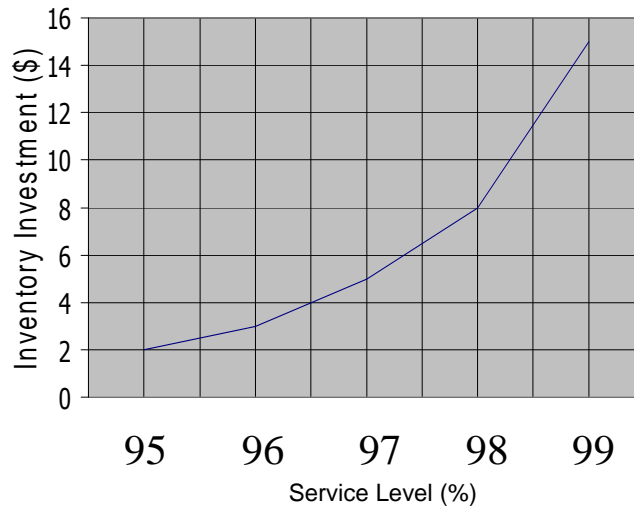
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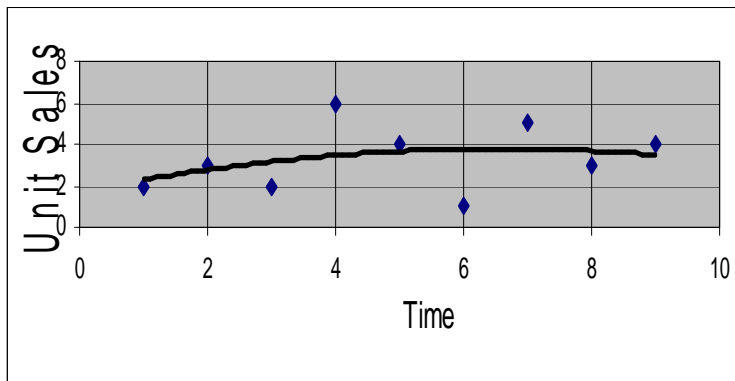
INVENTORY MANAGEMENT

Inventory Investment vs. Service Level



Forecasting is a Guess

Spikes & Dips Distort a Forecast – Adjust for Them Before Forecasting



Smoothing the Forecast: Triple Exponential Smoothing

1st – Exponential Smoothing. Forecasted demand for next period =

$$(1-r) \times (X_n + rX_{n-1} + r^2X_{n-2} + r^3X_{n-3} \dots + r^{n-1}X)$$

X is the value in time period "n", "n-1", etc., and "r" is the smoothing and reaction factor. "n" is the most recent time period

2nd - Double Exponential Smoothing. Forecasted demand for next period =

$$2 \times [(1-r) \times (X_n + rX_{n-1} + r^2X_{n-2} + r^3X_{n-3} \dots + r^{n-1}X)], \text{ minus a correction factor}$$

3rd – Triple Exponential Smoothing. Forecasted demand for next period =

same as for Double Exponential Smoothing,

PLUS $r \times [(1-r) \times (\text{double exponential forecast for period } n-1)] + r \times [(1-r) \times (\text{double expo forecast for period } n-2)] + r \times [(1-r) \times (\text{double expo forecast for period } n-3)] \dots + r (\text{double expo forecast for first period})$

Adjusting the Forecast for Other Uncertainty:

- unexpected, larger than forecasted demand, D
- lead time deviation, L
- vendor fill rate deviation, V

$$D = \text{square root of } \left[\frac{\sum_{i=1}^n (\text{actual}_i - \text{forecast}_i)^2}{n} \right] \text{ times } X$$

where X varies with the target service level

L comes from a user-built table of lead time deviation vs user-defined deviation multiplier (e.g., 10% deviation corresponds to 1.05)

V comes from a user-built table of fill rate deviation vs user-defined deviation multiplier (e.g., 99% fill rate corresponds to 1.01)

$$\text{Adjustment quantity} = \text{forecast value} \times D \times L \times V$$

WAREHOUSE MANAGEMENT -- Alternatives to Bar Codes

Voice-Directed Processing:
Update. Pros and Cons



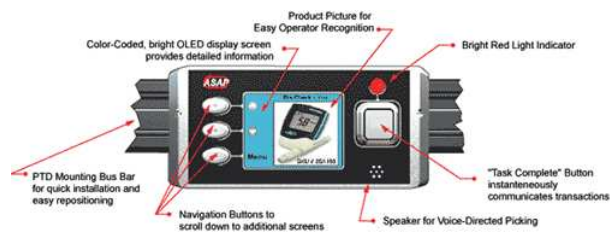
Pick to Light



PTL – Single-SKU display



PTL- Sophisticated Display Device



RFID = Radio Frequency
IDentification.



Chip circuit embedded in a bar
code label



Non-product Uses of RFID



If money were not a
consideration



For more information about keeping inventory low **without hurting customer service**, and about **preventing warehouse mistakes** while increasing productivity, contact

Dick Friedman, Certified Management Consultant, and President of General Business Consultants

Inventory Management & Warehouse Operations Specialists

Call for a FREE 30-minute phone consultation

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