



Cutting-Edge Concepts in Inventory Management

Just-In-Time (JIT) and Accurate Response have quickly become popular approaches due to the dramatic improvements on profitability. Due to the reduction in holding costs, profitability and the amount of cash on hand is boosted. This freed capital has become vital for funding investment in new technologies, reducing debt and aggressively expanding into foreign markets. The two inventory management approaches are defined below:

Just-In-Time (JIT) - underscores the importance of effective lead-time management. Incremental reductions in lead-time present vast opportunities for production/manufacturing improvement. In a manufacturing environment, JIT is optimised when an operator receives materials only when the materials are required. This concept saves money in holding/inventory costs and increases production responsiveness and flexibility.

Accurate Response - focuses on forecasting, planning, and production. Accurate Response helps to increase the speed in the supply chain so managers can delay raw material requirement decisions, obtain more market information, and better determine production requirements. Accurate Response relies on flexible manufacturing and shorter cycle times to better match supply with demand.

By properly incorporating these approaches, a firm can significantly increase their production efficiency. This increased performance is primarily attributed to the reduction in working capital, an accounting principle that includes raw materials plus work-in-process inventory plus finished goods plus short-term receivable minus short-term payables. By lowering inventory levels, the working capital required to operate a given business decreases, providing the firm with a competitive advantage. Warehouses begin to disappear which eliminates a substantial expense/investment for a firm. In addition, many workers, equipment (e.g. forklifts) and supplies are removed which strengthens the balance sheet, income and cash flow statement. Firms such as General Electric, Whirlpool, Quaker Oats and Campbell Soup are optimising their inventory



management in order to gain a competitive advantage and better position themselves for future growth.

General Electric's CEO, Dennis Dammerman recently commented on their vast reduction in working capital, "The concept not only generates cash, it also speeds up production, which helps you run your business far better."

Recent Examples of Success

Company	Outcome/Benefit
Campbell Soup	Reduced working capital by \$80 million to develop new products and buy foreign companies.
Quaker	Quaker has reduced working capital from 13% of sales to 7.3%, freeing \$200 million in cash.
American Standard	Decreased working capital by \$525 million, which reduced the debt and allowed capital investment in lucrative opportunities.



JUST-IN-TIME

Just-In-Time is a philosophy that concentrates on minimizing the unproductive time in a production process. Embedded in this concept are other management practices such as continuous improvement (kaizen), employee involvement and total quality control. Other organizations have referred to JIT as “stockless production”, “materials as needed”, “continuous flow manufacturing”, and “zero inventory”.

Below is a description of several components of JIT that are critical to a JIT inventory management system:

- *Small lot sizes* - Smaller lots provide the company with two major advantages: 1.) More flexibility to meet changes in market demand and 2.) Decreased inventory holding costs. By producing in smaller lots, firms can lower cycle time inventory, reduce lead times and pipeline inventory, and achieve a uniform workload on the production system (Smaller lots are easier to schedule as opposed to large lots which take up large amounts of processing time).

- *Short set-up times* - This concept goes hand in hand with small lot sizes. By reducing set-up times, firms can afford to produce smaller lot sizes since the costs for set-up is minimal. For example, if a company is inefficient in set-ups, the company will have fewer tendencies to change products, which will drive the firm’s inventory system further from the JIT approach.

- *Consistent, high quality* - JIT systems are designed to control quality at the source as opposed to later in the process. The workers of the production process are responsible for inspecting their own work. If a defective unit is discovered, it is returned to the area where the defect took place. This philosophy gives more autonomy and accountability to the workers, which empowers them to produce high quality products.

- *Rigorous preventative maintenance program* - Due to the inherently high degree of automation, preventative maintenance is critical in JIT systems. Unplanned downtime of a machine can be extremely disruptive and costly. This proactive approach is mandatory for this philosophy to be implemented properly.



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- *Close, supplier ties* - Suppliers must provide the producer with frequent, on-time deliveries of high-quality materials. Close supplier participation is vital to the system. Sole sourcing has become the cornerstone since this long-term relationship promotes the development of loyalty, more efficient designs and improved overall quality.

 - *Flexible work force* - A flexible work force can be a tremendous asset to a firm. During bottlenecks or unplanned shocks in demand, the production process will be able to react efficiently by re-assigning tasks to workers.



ACCURATE RESPONSE

Due to the uncertainty in markets, managers are finding the task of predicting demand and planning production more difficult. Many industries are rapidly becoming more competitive due to advancing technologies and proactive management techniques. Therefore, accurate forecasting is becoming a necessity for success. Forecasts are becoming less accurate and firms are suffering the consequences on their financial statements and in their overall efficiency. These side effects are extremely apparent in volatile and seasonal industries, which require an unjustifiably large capacity to manufacture in response to actual demand. Accurate Response is a concept designed to minimize the impact of forecasts and simultaneously redesign the planning/production process.

Accurate Response is a new approach to forecasting, planning, and production. One of the fundamental components is determining what forecasters can and cannot predict. From this information, the appropriate portions of the supply chain are analysed to make the system faster and more flexible. This will allow managers to postpone decisions, obtain more market information/signals, and make more informed decisions in order to match supply with demand. The underlying premises of Accurate Response focus on flexible manufacturing and shorter cycle times.

Accurate Response incorporates two elements, which allow firms to better predict/manage their production processes. First, this concept factors in the impact of missed sales opportunities. Accurate Response measures the cost per unit of stock outs and markdowns and factors them into the overall evaluation of the firm's performance. For example, if the company were not able to meet demand, the lost sales would be factored into the overall costs, which could help justify increasing production to obtain/maintain those customers. Second, Accurate Response breaks down the various products and classifies them as relatively predictable or relatively unpredictable. This is determined from historical data and expert opinions. These two elements help companies better understand their business and overhaul their supply chain from the supplier networks to the number and location of warehouses.

Benefits from Accurate Response

- By differentiating between predictable and unpredictable products, the approach to manufacturing these classes of products can be changed. The predictable products should be made further in advance in order to “reserve” capacity during the selling season for the unpredictable products. This minimizes the potential risk of accumulating vast inventories of products.



- By reducing mismatch costs (the additional costs associated with excess supply), companies possess a greater ability to lower prices. Throughout the supply chain, retailers, distributors, and suppliers build the cost of inaccurate forecasts into their prices. This lower price will allow firms to gain a competitive advantage.

- Due to point-of-sale scanners, companies can readily obtain data on consumer buying patterns. Utilizing Accurate Response will allow firms to expand their product line in order to supply what the consumers demand.

Recent Examples of Success

Company	Outcome/Benefit
L.L. Bean	Analysing uncertain products and obtaining Stock out data which helps drive production decisions.
Timberland Company	Developed a production-planning system Linked to a sales-tracking system that Updates demand forecasts. This has reduced stock out and markdown costs significantly.
Sport Obermeyer, Ltd.	Cut mismatch costs (additional costs associated with excess supply) in half by using Accurate Response.

Accurate Response is quickly becoming a popular approach to inventory management. Manufacturing companies can reap tremendous benefits from the increased production flexibility, which will allow them to better match the dynamic market demands. In addition, there is less emphasis on forecasting which will dramatically lower the company's risk and the potential of escalating inventory holding costs.



DIAGNOSTIC TOOLS

Listed below are an Inventory Management Checklist and a list of questions that will assist in the diagnosis of inventory management problems. This information should provide helpful insight when analysing a firm's current inventory management situation.

INVENTORY MANAGEMENT CHECKLIST

- Measure overall turns
- Measure turns for each inventory category
- Benchmark to internal and external sources
- Implement cycle counting
- Evaluate forecasting accuracy monthly
- Analyse WIP against monthly sales
- Track actual service performance to budgeted safety stock levels
- Measure out-of-stock, backorder and lost order trends against inventory levels



HOW DO MANAGERS KNOW THEY HAVE TOO MUCH INVENTORY? DO YOU:

- See WIP sitting idle on the shop floor?
- Store inventory outside?
- Pay employees overtime to reorganize the stock area?
- Buy in volume solely to receive quantity discounts?
- Have trucks lined up at receiving?
- Have no trucks at the shipping dock?
- Have excess inventory at distribution centres?
- Have elaborate warehousing systems for WIP?
- Have a stable weekly production level?
- Evaluate/Track products that are slow moving?
- Have the plant, but not the shipping dock, working overtime or on the weekends?
- Require four or more days to take physical inventory?



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**WORLDWIDE
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SOLUTIONS**

For More Information Please Contact: Joseph Turnbull

Worldwide Business Solutions: www.wwbgroup.com

The London Office

31, Candover Close

Harmondsworth

Middlesex, UB7 0BD

Tel: +44 (0) 208 7599631

Fax: +44 (0) 208 7599632

turnbull.j@wwbgroup.com