What Is Just In Time Inventory Management?

As digital transformation expands and the marketplace becomes increasingly connected through, and powered by, technologies like automation, analytics, and artificial intelligence, making process improvements to cut costs and boost efficiency is the name of the game for many businesses.

For companies of all sizes, implementing *just-in-time inventory management* (JIT inventory management), also known as *lean manufacturing* or the *Toyota Production System* (TPS), is an essential part of reducing expense and waste while maximizing efficiency and profits.

JIT inventory systems let these companies walk a fine line to meet customer demand while keeping inventory costs low.

Your business can also achieve lasting and significant improvements when

implementing just-in-time inventory management.

But to do so, it's crucial to understand both how JIT works and the process changes and resources necessary to support it.

Defining Just-in-Time Inventory Management

JIT goes by many names. In addition to lean manufacturing and TPS, the terms *short cycle manufacturing* (preferred by technology giant Motorola), as well as *continuous-flow manufacturing* (CFM) and *demand-flow manufacturing* (DFM)—the terms of choice at IBM—can also be used to describe JIT.

Whatever name you prefer, JIT was born in 1960s Japan. In the years following WWII, industry in the Land of the Rising Sun was struggling under major pressure from three very large pain points:

1. Japan's relatively small size and corresponding lack of available natural resources.
2. Insufficient available land for sprawling factories and warehouse spaces full of inventory.
3. A lack of available cash in Japan's struggling post-war economy.

To address these pain points within the Toyota Motor Corporation, a man named Taiichi Ohno—an industrial engineer—began developing and implementing the inventory management method he called *kanban* at the dawn of the 1960s.

Ohno's system identified seven types of waste that cripple production efficiency (known in Japan as *muda*), and ten precepts designed to guide the aspiring lean manufacturer toward high productivity, minimal expense, and maximum profits.

The "Seven Wastes" method targeted:

- Unnecessary transportation.
- Excessive inventory levels.
- Unnecessary motion in people, equipment, or machinery.
- Delay, whether humans waiting to act or equipment standing idle.
- Excess production.
- Investment in unnecessary features or devoting more time to product development than is absolutely necessary to meeting customer needs.
- Defects in the production process, which generate additional labor, material, and correction costs.

By the late 1970s, Ohno's system had transformed Toyota's entire production process and was so synonymous with that company's successful streamlining that Western audiences introduced to the process referred to it primarily as the Toyota Production System. It was hailed as an overnight sensation by Western manufacturers, but in fact took more than 15 years of careful work to polish and perfect—a tradition that lives on in today's just-in-time inventory management, where Ohno's core concepts of minimal waste and maximum productivity are blended with concepts such as *kaizen* (continuous improvement).

The burgeoning presence and power of digital transformation has made JIT an essential part of supply chain management strategies for companies that can build a system focused on four essentials:

- Steady, predictable production
- Error-free production workflows and equipment
- Top-notch quality of workmanship and products
- Reliable, proven vendors throughout the supply chain

> *Under a JIT inventory system, inventory costs drop because there's no need to pay storage costs for excess inventory—there is no excess inventory.*

The Purpose of JIT Inventory Management Systems

The primary goal of JIT inventory is to implement:

- Strategic supply chain management, building a streamlined but complete supply chain full of vendors with high reliability and proven performance in meeting Key Performance Indicators (KPIs) crucial to your company's production process.
- Changes to the production system and inventory strategy that maximize efficiency and accuracy to decrease waste and eliminate the need for excess inventory levels, expense, and warehouse space.
- Process optimization through real-time analysis and continuous improvement to target problem areas and increase performance and reliability.

Benefits of Just-in-Time Inventory Management

To understand how valuable JIT inventory can be, it must be compared to, and contrasted with, the more traditional model known as *just in case* (JIC) inventory management.

Using JIC, manufacturers carried significantly larger amounts of both raw materials and finished goods in their inventories to provide a cushion against increased consumer demand.

Under a JIT inventory system, inventory costs drop because there's no need to pay storage costs for excess inventory—there *is* no excess inventory.

In addition, JIT further reduces costs and improves competitive advantage through:

- Short production runs that give manufacturers greater agility to meet shifting consumer demand.
- Minimal warehouse and raw material expenditure. Orders are produced to meet demand. For example, Toyota issues production orders only after a customer order is received.
- Additional savings from not having to carry inventory produced to meet canceled or otherwise invalid orders.
- Improved cash flow. Reduced capital expenditures free your working capital to be invested in other projects and product development. This is particularly useful to small businesses with minimal budgets and a definite need for both efficiency and liquidity.

Potential Challenges When Using Just-in-Time Inventory Management

While it's tough to contest the benefits on offer when using JIT, it's important to remember that the system only works when your company has the "four essentials." The riskiest part of JIT inventory are a lack of reliable suppliers and disruptions that have no contingencies attached.

For example, without standing inventory, the loss of a single-source provider of raw materials can delay or even disable production on your end. A natural disaster or political conflict can shut down trade routes and leave you, and your customers, stranded without recourse.

Unexpectedly large or unusual orders can throw a spanner into the works, shifting production resources away from other orders and creating a potential chain reaction of expense, delays, and lost goodwill from customers.

Ironically, few companies know the true potential cost of a JIT inventory failure like Toyota. In 1997, a fire at one of Toyota's suppliers—another Japanese company called Aisin—crippled its production of P-valves for Toyota vehicles. The damage was so severe it shut down production for weeks.

Aisin was a single supplier for Toyota, and without P-valves, Toyota was forced to shutter its own production for several days while it searched for a replacement vendor.

With Toyota shut down, other suppliers that relied upon the automotive giant for regular orders also had to halt production, creating a devastating chain reaction with a jaw-dropping price tag. Experts originally estimated the fire would cost Toyota as much as ¥30 billion, but the actual cost in lost revenue was closer to ¥160 billion.

JIT Inventory Management in Action

While the JIT process has been used around the world since the late 1970s, it has been further refined through the use of emerging technologies.

In addition to Toyota, manufacturers as varied as Dell, Harley-Davison, and Apple all use JIT to ensure their companies maximize savings, productivity, and customer satisfaction.

These companies have the resources, and cultural commitment, necessary to tackle the potential pitfalls head-on and keep production and delivery rolling with contingencies developed to handle both foreseeable delays and unexpected disasters.

Using a comprehensive, cloud-based procurement solution that includes support for JIT inventory implementation can help immensely in this regard.

With built-in process automation designed for continuous improvement, centralized data management for optimal transparency and accuracy, and powerful analytics powered by artificial intelligence, it's much easier to source strategically, develop responsive, context-sensitive internal workflows and process controls, and connect inventory management to your existing software environment.

With these technological tools, you can develop a smart inventory management strategy that's responsive and agile enough to ensure you never run out of raw materials, pay needless fees, or waste your company's precious capital, labor, or time.

Beyond production, applying lean manufacturing principles across business units has allowed companies to adapt JIT for a variety of uses, including:

- **On-demand publishing.** JIT makes it possible to print and ship only as many books as are ordered, either in-house or through partnerships with other companies (e.g., Amazon, Smashwords, etc.). Independent publishing houses and self-published authors both rely on this approach to minimize returns, lower production expenses, and reduce or even eliminate the need to remainder or pulp unsold copies of books.
- **Retail distribution (drop shipping).** Companies that sell finished goods but do not manufacture them can use JIT to eliminate the need to store inventory. Customer orders are routed from the retailer to the manufacturer, who ships the goods directly to the end user.
- **Fast food, made fresh.** Fast food giants such as Burger King, Taco Bell, and McDonald's keep the materials necessary to create their famous foodstuffs on hand in sufficient quantities, but leverage JIT inventory management to produce fresh, hot food only when it's been ordered. This allows them to provide both customization options and a consistent consumer experience to meet customer demand.

As with manufacturing, businesses using JIT for these purposes can benefit substantially from using a smart and comprehensive software solution designed for lean inventory management.

Is JIT Inventory Management Right for Your Business?

Walking the fine line known as just-in-time requires planning, dedication to excellence, and the right set of tech tools and techniques.

By investing your time and resources in building a reliable supply chain, setting top-quality standards for production and goods, and best-in-class software tools, you can meet your customers' expectations and needs—without needless expense or waste.

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