



BOOST PRODUCTION VOLUMES & OPERATIONAL EFFICIENCY

with Cloud-Based Inventory Management

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1. Modern Manufacturing Challenges and Capabilities

The manufacturing sector is critical to our global economy, with an output of nearly \$14 trillion in 2019 alone. As robust as that sounds, new and unprecedented challenges face the industry as the global economy and supply chains rebound from the aftermath of the Covid-19 pandemic. Shortages, rising costs and delays in supplies are putting pressure on businesses across all sectors from retail to industrial manufacturing, to the automotive industry. Because of these new challenges, manufacturers are being forced to innovate to weather these changes.

An example from recent news is General Motors (GM) having to shutter multiple assembly plants including one in Kansas City due to a severe shortage of semiconductor chips used in various vehicle parts which directly affected vehicle production. The Detroit Free Press reports GM expects losses from the chip shortage to cost the company \$1.5 to 2 billion. Overall, the present chip shortages are expected to cost the global auto industry \$14.3 billion or more in revenues in the first quarter alone, and \$60.6 billion for the year. The semiconductor shortage highlights the fragile nature of the supply chain and how easily things can change on a moment's notice. By ensuring enough inventory or raw materials are on hand at all times, companies can be better prepared for unexpected surprises.

By introducing cloud-based technology, manufacturers are better equipped to achieve optimal production levels and maintain efficient supply chains. In this whitepaper, we will explore the capabilities of cloud-based inventory management applications, as well as the short and long term benefits they provide.



2. The Value of an Efficient Workflow

Manufacturing workflows are an essential element of the supply chain. An efficient workflow eliminates inventory shrinkage and waste by establishing an optimal series of processes designed to respond to meet customer demand quickly and adapt as needed.

However, manufacturing operations often suffer from bottlenecks in their workflow processes which could be avoided by capturing higher resolution information into the state, location, and authenticity of their inventory.

Stalled Production Caused by Bottlenecks

Workflow processes operate in an interconnected chain, so if one machine or process slows down due to a lack of necessary inventory or personnel or ineffective technology, this delay will extend to other steps in the workflow process. The bottleneck causes a ripple effect, slowing down the entire process. Until the specific bottleneck is resolved, you continue to pay for time, people and machines that are unable to operate efficiently and fulfill orders.

Overstocked Supply

In order to maximize revenue, a manufacturer needs to avoid paying for unnecessary supply and tying up much-needed cash. When workflow processes experience long-term bottlenecks, manufacturers are forced to store and transport the accumulated inventory which remains in the queue. This adds costs to a manufacturing operation and cuts into the bottom line.

The takeaway? Businesses who opt to share critical inventory information across all parts of their organization in real-time maximize productivity and revenue while simultaneously avoiding common bottlenecks.

3. Mobile Data Capture for Real-Time Control, Visibility, and Integration

Manufacturers who know the exact location, status, and authenticity of their inventory as needs arise are better equipped to facilitate communication across the supply chain. A smart cloud strategy sets companies up for success as they implement mobile data collection methods and applications to gain real-time inventory visibility and control. Cloud computing accelerates inventory operational efficiency and ensures the manufacturing shop floor is properly fed.

Control

Paper-based processes and outdated legacy software are oftentimes not equipped with the agility to direct inventory, assets, and personnel as needed to avoid bottlenecks. In fact, inefficient processes can cost companies as much as 20-30% of their annual revenue.ⁱⁱ

For most manufacturers, improving their overall efficiency starts with better production planning and control. Some beneficial features include:

- Proper tracking of material consumption
- Labor optimization and idle time reduction
- Improved inventory management
- Maximized equipment utilization
- Improved product quality and outcomes
- Enhanced customer service

Put simply, mobile-first applications keep your production lines highly productive and accurate, allowing manufacturers to easily locate and deliver the precise quantity of materials needed on time and in full.



Visibility

Mobile data capture helps manufacturers understand the requirements and status of a work order in real-time, which means you can achieve faster build cycles and an optimal response to customer demand.

Manufacturers can also use mobile applications to quickly access accurate performance metrics based on real-time assessments of raw material consumption, stock availability, and machine and asset performance. This valuable data allows you to identify and address any potential bottlenecks before they become especially problematic.

Cloud-based approaches to inventory management enable manufacturers to gain real-time visibility into several key areas related to efficient workflows, including:

- Safety
- Yield (first pass and overall)
- Capacity utilization
- Throughput
- Manufacturing cycle time
- Customer returns
- Customer fill rates
- Supply availability
- Schedule attainment
- Equipment effectiveness

An efficient manufacturing operation requires a high-level of collaboration, from leadership teams to operators, and because cloud-based approaches to inventory management offer real-time visibility and communication with easy-to-use applications, manufacturing operations utilizing this technology are streamlined and avoid human error.

Because cloud-based technology enables the automation of key processes, manufacturers can save costs not only in added efficiency from reduced human error, but also from hiring a cost-efficient workforce. According to a McKinsey report, 45% of current paid activities can be automated by today's technology, and this amounts to an equivalent of \$2 trillion in total annual wages.ⁱⁱⁱ

In switching to a cloud-based approach, manufacturers can identify cost-saving processes that can be effectively automated, freeing up available personnel to focus on necessary tasks.

Integration

Today, there are a variety of cloud-based integration tools on the market to help you connect your production equipment and tools to your business processes. These tools help capture signals off specific equipment, providing valuable business data. This enables enhanced collaboration and coordination throughout the entire process from raw materials to finished goods.

Smart manufacturers are taking integration a step further, using a low-code platform to transform and leverage this information immediately. Using a low-code platform grants the ability to harmonize the applications with existing business processes as opposed to forcing unnatural processes in the work flow. Additionally, manufacturers who choose to integrate with automation tools and warehouse control systems optimize their productivity and can better track finished goods produced.

A key factor in this decision will be integration with existing backend systems and enterprise resource planning systems and flexible configurability. In order to maximize revenue generation, a business should choose a solution that does not require costly overhauls of existing systems, but that still maintains the flexibility needed to adapt to industry specific challenges.

Today's cloud-based solutions offer the ability to track critical information on all physical activity related to inventory management – from the inbound receipt of goods to picking to packing and shipping. This data is then communicated across the organization so everyone has the most updated information for decision-making and planning. Even those located remotely or in disconnected environments can contribute to operations and collaborate on projects with cloud-based manufacturing software.

4. Example Applications: Discrete Manufacturing, Kanban, and Kitting

The combination of a mobile-first manufacturing material handling system and cloud-based inventory management increases your visibility and accuracy of material utilization, as well as your accountability for the end user who is completing the tasks throughout the product life cycle to completing the finished good. To better understand the potential impact of this approach, we'd like to walk you through the following application use-cases: **Discrete Manufacturing, Kanban and Kitting**.

Discrete Manufacturing

Discrete Manufacturing is the production of distinct parts, materials, or items. These include finished goods that end up as parts of larger systems, such as nuts and bolts, brackets, wires, and assemblies, as well as complete individual products.

Representative discrete manufacturing industries include automotive, consumer electronics, machinery and many, many others. Each industry will have different production goals. For example, in terms of throughput efficiency and automation, each discrete manufacturing approach stands to benefit from implementing cloud-based inventory management technology.

A cloud-based approach to discrete manufacturing can optimize order fulfillment processes and enable manufacturers to use mobile applications to track the state, location, and authenticity of each component for either made to order or build to stock. Furthermore, these applications can track work orders being filled and parts being issued, providing visibility into what's needed and the status of job completion. Tracking this information at the point of activity results in increased accuracy and productivity. This level of inventory control and visibility empowers discrete manufacturers to meet customer demand quickly and efficiently at any scale.



Kanban

The Kanban manufacturing system is a self-regulating pull system that aims to provide shorter lead times and reduced inventory levels. Inventory is pulled from the warehouse, sourced from manufacturing or a third-party supplier, and delivered in a just-in-time manner based on replenishment need as signaled by the work center. This means that manufacturers utilizing a lean Kanban process can achieve cost reductions both by avoiding spending on unneeded new inventory and reducing the cost of warehousing and maintaining their existing inventory^{iv}. The principle behind a Kanban system is that customer demand should drive inventory replenishment decisions in an optimally cost-effective manufacturing operation.

Mobile-first technology helps Kanban manufacturers deliver on this principle by eliminating non-value add steps and providing automation where needed in the inventory scheduling process. Manufacturers can set up electronic Kanban cards that indicate what is being replenished. These cards are delivered to work centers as needed. The picking, delivery and replenishment requests are all completely automated and paperless processes, delivering increased efficiencies over manual Kanban.

Kitting

Kitting is a manufacturing process in which the parts required to produce a product are bundled and directly delivered to the point-of-use, which is usually a specific portion of the assembly line or packing process. Manufacturers use mobile-first kitting applications to reduce their material handling costs, streamline packing and shipping, and better perform inventory tracking and control.

Cloud-based inventory management technology facilitates the kitting process by enabling manufacturers to use mobile applications for quick, build-to-order kitting of items. Users can also make necessary adjustments on the fly. These mobile applications can accurately track the assembly and delivery of parts to precise locations in real-time and enable communication across all points of the process of delivered bundled inventory. As with Kanban, the goal of kitting is to utilize a lean manufacturing approach, and cloud-based technology is helpful in this approach because of its ability to reduce human error, both by providing accurate data in real-time and by automating key processes.





5. Productivity, Compliance, Inventory Optimization, and Revenue Generation

In summary, we have seen that cloud-based approaches to inventory management have the potential to help manufacturers meet the challenges of modern manufacturing and achieve increases in inventory optimization, revenue generation, productivity, and compliance.

Inventory Optimization



Optimizing workflow processes involves knowing the exact status and location of inventory, tools, and personnel to prevent bottlenecks and distribute resources for maximum efficiency. By providing real-time inventory visibility and control, cloud-based inventory management approaches empower manufacturers to identify potential inefficiencies and direct resources as needed using mobile technology, resulting in an agile response to customer demand.

Revenue Generation



Using cloud-based technology, you can leverage accurate inventory visibility and precise inventory control to reduce inventory shrinkage and improve production yield with accurate stock availability. This technology drives streamlined, cost-saving processes such as mobile-first build-to-order, build-to-stock, and inspections, all while enabling a level of control of shop floor inventory usage that increases efficiency and leads to revenue gains.

Productivity



Cloud-based technology provides access to valuable data that can be utilized to increase productivity. This includes real-time accurate performance metrics for raw material consumption, machine/asset performance, and supply availability. Manufacturers can utilize this data to optimize throughput and production yield and identify and minimize waste.

Compliance



The real-time visibility that cloud-based technology provides includes visibility into safety data and industry-specific manufacturing standards. Visibility across every work order process means that you can be confident in a complete, accurate picture of how your manufacturing operations meet compliance standards.

The Future of Manufacturing

While the manufacturing industry faces challenges to sustained growth, implementing cloud-based inventory management solutions can provide the agility and control needed to meet these challenges. Manufacturers operate at a variety of different scales and across diverse industries, but they share a need to maximize efficiency. The future of manufacturing will rely on technology that streamlines workflow processes and minimizes costs, and cloud-based technology is designed to meet these needs, offering the capability to boost production and revenues by providing real-time visibility and communication across the supply chain.



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