E-book

HOW DISCRETE MANUFACTURERS STAY FLEXIBLE

How mid-market manufacturers are closing the gap between what sales promises, what engineering designs, and what the shop floor builds

Sage

Flexibility in a Time of Constant Change

Critical information lives in spreadsheets, emails, and the heads of a handful of engineers. Raw material costs can rise 12% over 14 months before management notices. Tariffs and policy shifts put **20 to 30% of EBIT margins at structural risk.**

Discrete manufacturers are operating in an environment defined by change.

Product lifecycles are shorter.

Customer expectations continue to rise.

Production environments are more complex and dynamic than ever before.

Whether supporting configure-to-order (CTO), engineer-to-order (ETO), or hybrid models, manufacturers are under pressure to move faster - without losing control of costs, quality, or delivery performance.

In this environment, flexibility has become essential. However, flexibility doesn't mean sacrificing structure or predictability. It means having the visibility, insight, and adaptability needed to respond as conditions change.

This eBook explores how discrete manufacturers are staying flexible - and what that looks like from a planning, production, and operations standpoint.

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The reality facing discrete manufacturers today

Discrete manufacturing has always been complex. What sets today's environment apart is the accelerating pace of operational, supply chain, and customer-driven change.

Today's manufacturers are balancing increasing product variation, frequent engineering changes, volatile demand, and heightened customer expectations – all while operating within unpredictable disruption environments. In the wake of these external factors, internal processes struggle to keep up.

What's changed externally

Supply chains fluctuate, and even small disruptions can cascade across planning, production, and delivery. At the same time, teams are expected to move faster, operate leaner, and maintain consistent quality and cost control. This combination of accelerating change and rising operational complexity means flexibility is essential to staying competitive.

- Deloitte reports that 78% of manufacturers ranked trade uncertainty as their top concern in 2025, with input costs expected to rise a further 5.4% over the coming years.[1]
- According to McKinsey research, many discrete manufacturers believe their product portfolio is broadly profitable even though 75% of revenue comes from just 13% of the product portfolio on average. (McKinsey)
- 73% of manufacturing executives experience supply chain disruptions every 3 to 4 months, compared to annual disruptions just five years prior.[2]

1. Deloitte
2. Deloitte

What's broken internally

Manufacturers today are managing more complex bills of materials (BOMs), custom configurations, and a growing number of product variants. Design changes that once occurred occasionally are now part of regular operations, creating frequent machine setups, procurement complexity, and constant motion between engineering and the shop floor.

Discrete manufacturers report that 10% or more of their total annual revenue is actively lost or put at risk due to failures in factory-specific execution.

Rework and returns in manufacturing, often triggered by order entry errors at the sales-to-operations handoff, consume 3 to 5% of revenue.

Meanwhile, fragmented systems mean that manufacturers are often working off data that doesn't paint the full picture. When systems and processes are not designed to handle this level of change, bottlenecks and errors can emerge quickly. Pricing lags the real-time costs due to volatile raw material costs from inflation, tariffs, and other market conditions. Versioning issues, mismatched BOMs, and outdated routings can lead to rework, delays, and unnecessary cost – often before the problem is detected.

Over time, these hidden costs erode margins and scheduling delays cause customers to lose trust.

Customer expectations continue to rise

Customers want shorter lead times, accurate delivery dates, and reliable quality even as product configurations become more complex. For manufacturers supporting moderate to high BOM variants, this adds pressure for sales to commit to pricing and deadlines with assumptions that engineering isn't able to validate.

Without real-time visibility into orders, materials, and work in progress, promises to customers become harder to keep. Industry data shows the average on-time delivery rate across businesses was around 85% in 2024, meaning one in seven deliveries misses the committed date (**Qualtrics**) (**McKinsey**). Slower quotes lead to lost deals. Disconnected handoffs lead to errors and rework that decrease margins. And unreliable delivery commitments strain customer relationships.

Production environments are more dynamic

The modern shop floor is far from static.

Demand fluctuates. Priorities change. Labor availability shifts. Supply chain disruptions have become routine rather than one-off. Even small changes can ripple across schedules, capacity plans, and cost structures. In a 2024 survey of more than 600 manufacturing professionals, over 80% said labor turnover had disrupted production.

In environments like this, rigid plans quickly lose relevance. Manufacturers relying on spreadsheet-based scheduling or disconnected systems often find themselves reacting after it's too late – adjusting once disruptions have already impacted performance.

Why flexibility is so hard to achieve

Most discrete manufacturers recognize the need to be more agile, yet many still struggle to operationalize flexibility in a sustainable way. The four factors that make flexibility difficult are Fragmentation, Planning, Visibility, and Costs Lag.

Fragmentation

When data is spread across disconnected systems such as engineering tools, legacy ERPs, shop floor applications, and standalone financial systems, teams lack a shared, real-time understanding of what is happening. As a result, decisions are made with partial or outdated information, slowing response times, shrinking margin, and increasing risk.

Planning

Traditional MRP and scheduling tools often assume stable demand and linear workflows, making it difficult to respond quickly when conditions change. As a result, planners spend more time firefighting than optimizing.

Visibility

Without accurate, real-time insight and alerts into work in progress, bottlenecks are discovered too late, and corrective action becomes more costly.

Costs Lag

When production costs are only analyzed at period end, manufacturers lose the opportunity to adjust decisions before margins are impacted.

These four factors compound and are interconnected. Complete flexibility depends on addressing all four factors simultaneously.

What operational flexibility looks like in practice

Flexibility is not a single initiative or system. It requires connection across every function — quoting, planning, production, quality, and finance — because a gap at any handoff is where margin and delivery performance leak.

Leading discrete manufacturers focus on creating continuity – from order intake through production and financial reporting – so that change can be absorbed without breaking operations

- **Flexible production management**
  Manufacturers with flexibility built into their processes can reprioritize schedules, reallocate resources when constraints emerge, and manage complex routings without losing visibility. This is especially critical in environments with multi-level BOMs or a mix of MTO and MTS production models.
- **Demand-driven planning**
  Demand-driven planning approaches help manufacturers align production more closely with actual demand, recalculating requirements as conditions change. Instead of relying on static forecasts, planners gain the ability to understand the downstream impact of shifts in demand, supply, or capacity.

  Unreliable MRP output is one of the most common causes of production stoppages. For example, shortages can halt a line because procurement was working from a forecast that didn’t reflect a configuration change made two weeks earlier. Demand-driven planning closes that lag.

- **End-to-end order awareness**
  When manufacturers can track orders across planning, production, and fulfillment, teams stay aligned around shared priorities. Sales, operations, and finance work from the same information, reducing internal friction, and improving customer communication.

  For example, when a customer calls asking about their order, the answer shouldn't require three phone calls and a spreadsheet lookup. It should be visible to anyone in the system.
- **Quality and cost control that scale with change**
  Flexible manufacturers embed quality processes throughout production, supporting traceability, consistency, and regulatory requirements even as configurations change. This reduces rework and protects customer trust.

  As an example, when job costs are only visible at period end, the order has already closed at a loss. Rework and returns from order entry errors alone consume 3–5% of revenue. (Quality Magazine / McKinsey) Catching cost variance during production, not after it, is where that money is recovered.

The role of cloud, AI, and integrated manufacturing platforms

Cloud-based manufacturing platforms reduce the constraints of legacy systems by offering automatic updates, continuous innovation, and lower barriers to scaling. Manufacturers still running legacy ERP systems need planned upgrade cycles, dedicated IT resources, and significant internal coordination just to stay current. Cloud-based platforms remove that maintenance burden, and the system improves without the manufacturer having to manage it.

Artificial intelligence adds another layer by delivering guided workflows, intelligent automation, and institutional knowledge capture. For example, the people who know how to configure a complex order, estimate a job accurately, or spot a cost problem early are a handful of senior engineers and estimators. When they leave, that institutional knowledge leaves with them. Embedded AI encodes those rules — configuration logic, pricing constraints, at-risk order signals — so they're accessible to the whole team, not held by two people.

When planning, production, quality, and finance run in separate systems, every handoff is a liability. Integrated platforms bring everything into a single source of truth. Solutions like **Sage X3** are designed to support this level of integration, helping discrete manufacturers plan, execute, and control operations in real time while adapting to change.

How Sage X3 supports flexible manufacturing

Sage X3 connects the full order-to-delivery cycle in a single system — from customer configuration and quoting through BOM and routing definition, MRP-driven materials planning, shop floor execution, job costing, and financial close. A change in one function reaches the rest. The floor builds to the right spec. Costs are visible per order, not per product family at period end.

Sage X3 has built-in intelligence that encodes configuration logic and pricing rules as AI-assisted workflows. At-risk orders can be surfaced early with real-time answers about order status, capacity, cost, and quality. With capabilities like automated recommendations, guided processes, and real-time analytics, manufacturers gain practical decision support where it matters most. Discrete manufacturers using Sage X3 experience the following benefits:

- Quote in hours, not days — AI-assisted configuration enforces pricing rules and validates buildability before an order is committed
- Multi-level BOMs and routings generate natively from customer configurations, with engineering changes flowing automatically to planning and the shop floor
- Job costs tracked at the order level, with variance analysis available before the job closes — not at period end
- Full forward and backward lot traceability, with recall capabilities in minutes
- Supports MTS, MTO, CTO, and ETO in a single system, scaling across sites and entities without additional infrastructure

Here are the real-world results from Sage X3 customers and industry experts:

- S&S Hinge cut quote cycle time by 75% and added more than 100 new customers in a single year.
- A Forrester Total Economic Impact study found a 213% three-year ROI with payback in under six months.
- Russell Sigler scaled from $250M to $1.3B across 35 locations on a single X3 instance.

If your operation is outgrowing the systems holding it together, you're not alone. See what an AI-powered SaaS ERP can do for your operation. **Learn more**

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