



ARTICLE

BRINGING ENGINEERING DOCUMENTS INTO MANUFACTURING WORKFLOW



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Manufacturing begins with information long before production starts. Engineering drawings, CAD files, specifications, bills of materials, work instructions, change orders, and inspection documents guide how products are made, inspected, maintained, and changed. When that information is difficult to find, outdated, or disconnected from the people who need it, the effects can reach the production floor.

Engineering documents also move through unusually complex lifecycles, spanning design and review, revision, production, distribution, and eventually archival. Digital transformation is therefore less about eliminating paper than it is about maintaining reliable connections between information and the people and processes that depend on it. Done well, document workflows can reduce time spent searching for information, simplify revision processes, and help lower the risk of errors.

Large Format Still Has a Place in Manufacturing

Like many other industries, manufacturing firms have spent decades digitizing their operations. CAD platforms have transformed design, resources are coordinated through enterprise resource planning systems, and activities have become more connected through manufacturing execution systems. Yet many engineering documents that start in digital format don't remain exclusively digital throughout their useful lives. For example:

- It might be easier to review a complex assembly drawing at full scale instead of a workstation.
- A technician may need a large format schematic next to a piece of equipment.
- If accessing a screen is impractical at a particular workstation, production personnel might choose to rely on printed drawings or instructions.

The challenge isn't so much choosing between paper and digital; it's managing the movement between them. Large format printing, scanning, and digital document management can therefore be seen as parts of the same workflow. A drawing that's printed for production should stay connected to its digital source and revision history, while a marked-up drawing from the factory floor should have a straightforward route back into the digital workflow when those annotations need to be reviewed.

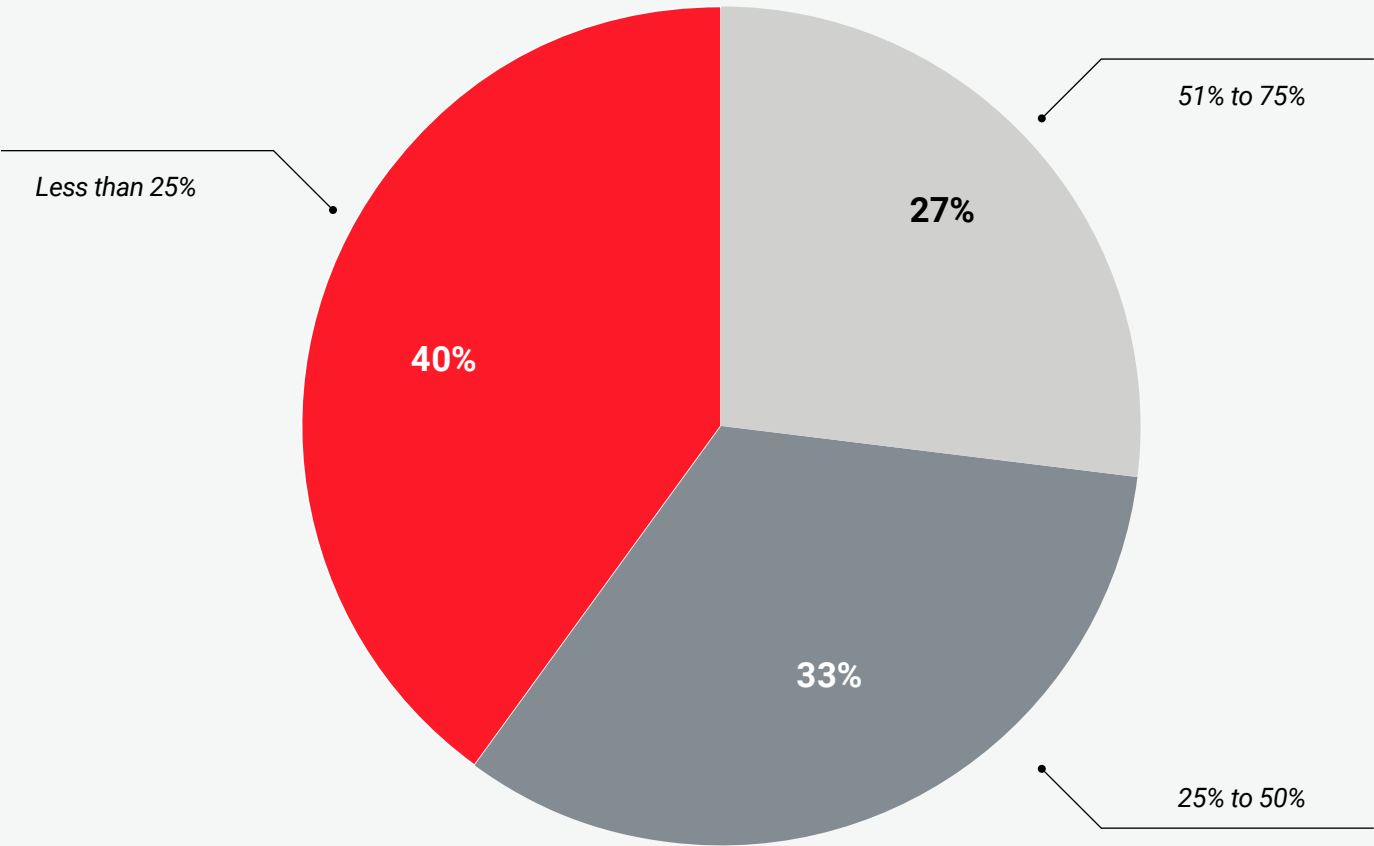
This hybrid environment will likely persist because engineering documents serve different purposes throughout their lifecycles. The format that works best during design won't necessarily be the right choice during assembly, inspection, troubleshooting, or maintenance.

Keypoint Intelligence®'s research supports this continued hybrid environment. About 60% of manufacturing respondents state that at least a quarter of their business content is paper-based rather than digital. On average, 37% of content was paper-based.

Figure 1: Share of Paper-Based Content

What percentage of your company's business content is still paper-based as opposed to digital?

Mean: 37.1% Paper



Starting With Engineering Change Workflows

Modernization in engineering can seem overwhelming, but not every document process needs to be improved at once. The places where documents change are often great starting points. Engineering change orders (ECOs), for example, can affect drawings, specifications, bills of materials, work instructions, and supplier documentation across design, production, quality, and document control.

Workflow Risk	The Fragmented Process	The Integrated Approach
Obsolete Drawings	Workstations retain outdated printed copies after a revision is released	Controlled distribution helps identify and replace superseded versions
Supplier Misalignment	Suppliers may continue working from locally stored, outdated files	Centralized document access helps keep suppliers aligned with active revisions
Inspection Errors	Quality teams may inspect against a different revision than production used	Connected workflows keep production and inspection information aligned to the same revision

Physical output also needs to be included. Updating a digital repository is insufficient if an old large format drawing stays posted on the production floor. Document control must extend all the way to the point of use, and this can only happen with an effective workflow that updates both digital and printed copies.

The Impact Reaches the Production Floor

Engineering document management may happen away from the machines that create the product, but its impact reaches the production floor. Accurate, accessible information can affect several areas:

- **Reducing time spent verifying information:** Operators can spend less time determining whether a drawing is current before starting work.
- **Limiting rework and disruption:** Working from the correct revision reduces the risk of rework, additional inspections, scheduling disruptions, or components that don't meet requirements.
- **Supporting faster maintenance:** Technicians can troubleshoot equipment more efficiently when current electrical and mechanical diagrams are readily accessible.
- **Keeping quality and production aligned:** Quality teams need assurance that the specifications used during inspection match the version production was instructed to manufacture.

Document workflow improvement should therefore be evaluated as an operational issue, not simply an administrative one. Faster retrieval matters, but the larger benefit is having reliable engineering information available when someone needs to make, inspect, repair, or approve something.

Breaking Down Engineering Information Silos

Engineering information tends to spread across systems over time. Native CAD files might be stored in one repository, PDFs in another, specifications on shared drives, and supplier documentation in email. Printed drawings and marked-up copies may also be distributed throughout the facility. Each storage method might make sense on its own, but together they can make it difficult to determine which source can be trusted.

Consolidating every engineering document across an organization at once can quickly become overwhelming. Product lines may have different naming conventions, revision practices, legacy systems, and regulatory requirements. A more practical approach is to establish a reliable system of record for a defined workflow, product family, or engineering process, with clear rules for naming files, identifying revisions, approving changes, and distributing documents. The model can then be expanded elsewhere.

Legacy paper must also be part of this discussion. Large format scanning can bring older drawings and schematics into the digital environment, but scanning alone doesn't make that information useful. Files must be indexed, organized, and connected to a document structure that all employees understand. Exchanging a physical archive for a disorganized digital pile is not progress.





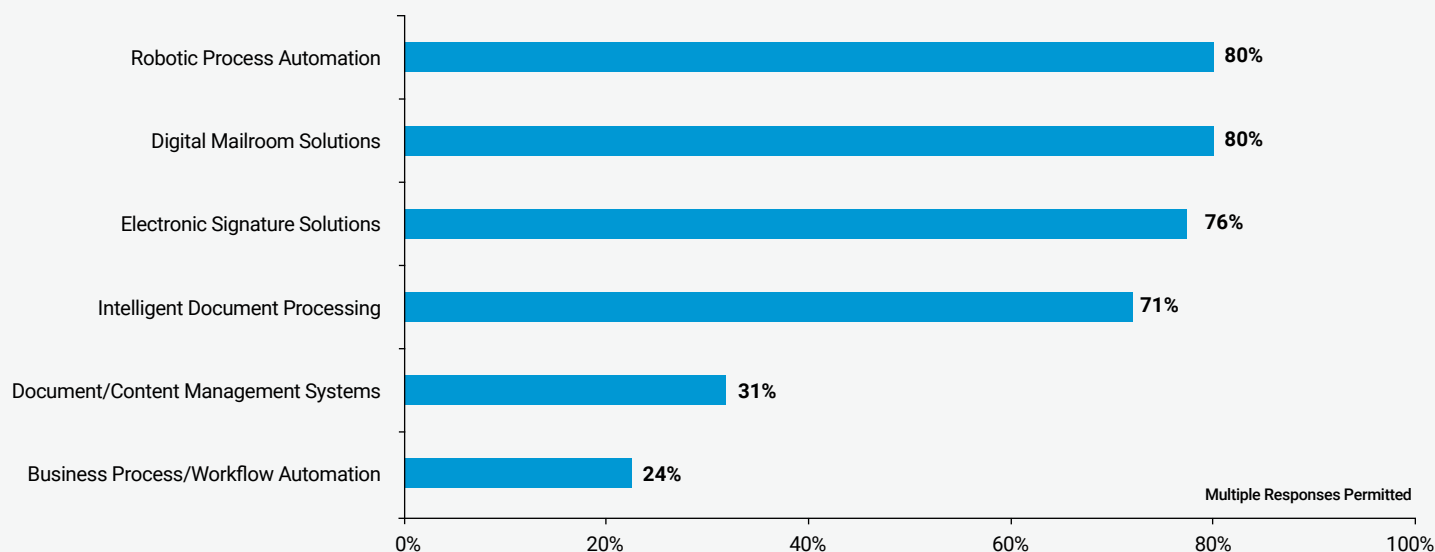
The Right Role for Automation

Automation can help streamline and reduce friction from engineering document workflows, particularly where tasks are repetitive and governed by established rules. Drawings can be routed automatically to predefined stakeholders, revisions can be set to trigger notifications or approval requests, and documents can be captured and indexed according to established conventions. Workflow systems can also keep track of when information was reviewed or released.

The distinction is that automation supports the process rather than replacing engineering judgement. A system can route a revised specification to the appropriate reviewer or recognize that a drawing requires approval, but an engineer must still determine whether the information is technically sound. Predictable, repetitive, and easily verified processes are therefore good starting points for automation. Most manufacturers are not starting from zero. Nearly 80% of manufacturing respondents to Keypoint Intelligence®'s research use business process/workflow automation and document/content management systems. The opportunity is to extend and improve automation already in place.

Figure 2: Workflow Automation Technologies

Which of the following workflow automation technologies has your organization implemented?



N = 50 Healthcare Respondents in the United States

Source: Digital Transformation IT Decision-Maker Survey; Keypoint Intelligence 2025

Maintaining Control Through the Transition

Improving document accessibility can't come at the expense of document control. As engineering information moves into new workflows, revision histories, permissions, approval records, and traceability remain essential, particularly when documents are shared across teams or with outside suppliers and contractors. The goal is to make information easier to access while maintaining clear control over which versions are current, approved, and ready for use.

Clear rules for document status and ownership should be established before migrating information or automating workflows. Employees need to know what constitutes an official version, who can make changes, who can release it, and how superseded copies are handled. The same controls should extend to large format output, with processes for identifying, replacing, and disposing of obsolete printed drawings.

Connecting Design Information with Manufacturing

Engineering document transformation must be seen as an ongoing effort because products change, equipment improves, suppliers come and go, and manufacturing processes are altered. The information supporting these activities must evolve too. Instead of attempting to digitize the greatest number of documents, the best strategy is to create reliable, consistent connections between engineering information and the people who use it. This means that digital repositories, large format printing and scanning, revision control, workflow automation, and physical documents must be viewed as pieces of a larger information lifecycle. They might all play a different role, but each one must lead employees back to accurate and trustworthy information.

Manufacturers already understand the importance of controlling what happens on the production floor. Applying the same discipline to the engineering information that guides production can reduce uncertainty, save time, and help keep processes aligned. The information behind every manufactured product should be as controlled as the manufacturing operation itself.

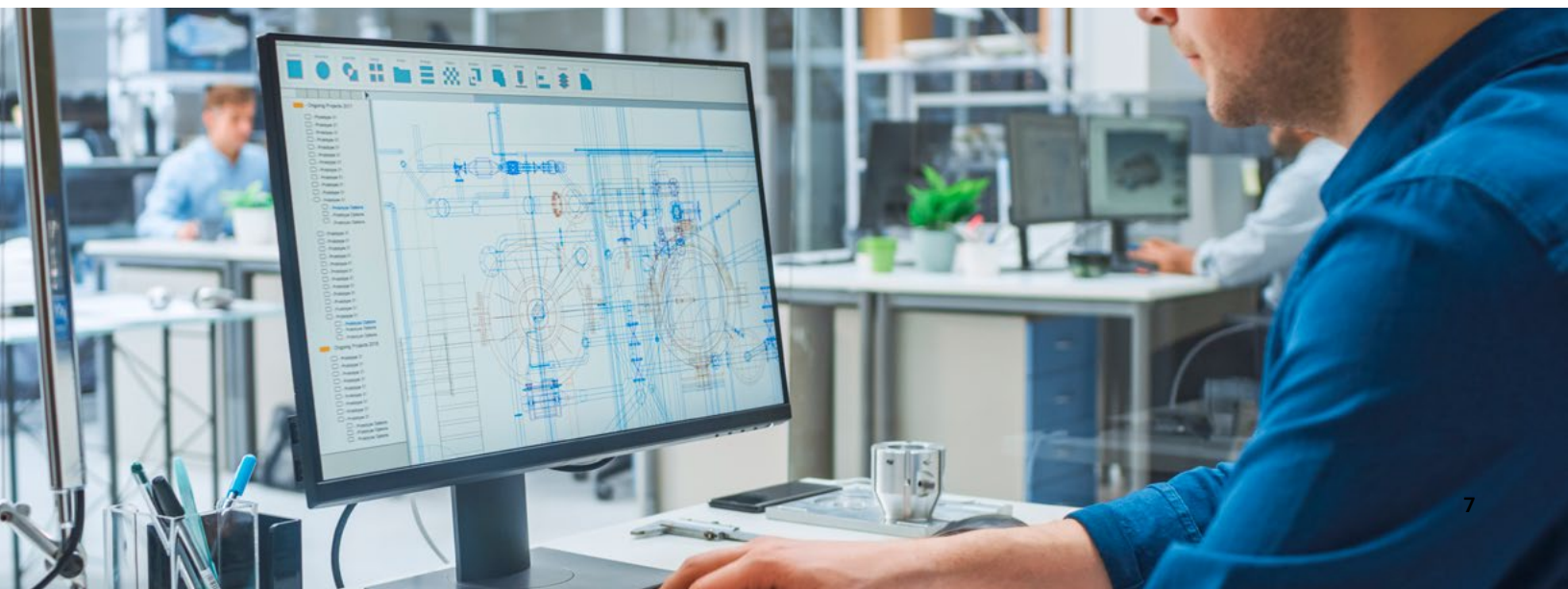
Help prevent outdated revisions and fragmented workflows from impacting shop floor productivity.

Align your digital data directly with physical, large-format floor output to support documentation accuracy across your manufacturing operations.

If you're ready to take the next step, connect with Canon to explore what's possible for your organization.

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¹ Source: Keypoint Intelligence®, 2026 Digital Transformation Survey, U.S. Manufacturing respondents (N=50).





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