

Your Guide to Efficient Information Management in Manufacturing

The Key to Compliance, Productivity, and Customer Value



What to Expect from This Guide

This guide provides a detailed overview of how generative AI and intelligent information management (IIM) increase efficiency, compliance, and customer value in your manufacturing plant. Whether your operation is looking to streamline processes, reduce costs, enhance productivity, or facilitate more streamlined access to information, this guide is the ideal starting point in your search for the perfect solution.



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State of Manufacturing

Challenging Times

Over the last several years, U.S. manufacturing plants have faced several significant challenges, including:

- ✓ Supply chain disruptions
- ✓ Competition against foreign low-cost labor
- ✓ Workforce shortages
- ✓ Energy transitions

These challenges bring additional costs and risk to an industry with already razor-thin margins, leading to a crucial need for increased productivity. In fact, in 2022, the [market share for U.S. manufactured goods](#) reached a record low of 66%.

This is partly because the supply chain shortages resulting from the [COVID-19 lockdown](#) shook faith in lean manufacturing methods that helped increase productivity, eliminate waste and bottlenecks, and enhance the customer value chain, resulting in a need for new ways to stay competitive.

An Effective Solution

While best practice revisions to lean operations restore faith in this cost-effective method, the lean mindset doesn't have to stay exclusive to the warehouse or factory floor.

Information-based processes, from quality assurance and safety compliance to administration and customer service, all contain untapped productivity and customer value that can be leveraged with the right tools and practices.



Benefits of Intelligent Information Management in Manufacturing

Intelligent information management (IIM) significantly streamlines information-based processes, enhancing collaboration, efficiency, and customer service.

Using IIM, Manufacturers Can:

Gain Clear Information Visibility Across Departments

In manufacturing, information is often needed across multiple departments, and when tracked on paper or through a decentralized system, much of it can remain inaccessible.

For Example:

- ✓ Repair guides written by engineering must be archived there for potential revisions but are often needed to support customers.
- ✓ Job travelers on the plant floor may also be needed for quality assurance audits, customer inquiries, and engineering to ensure components are being assembled to specification.
- ✓ Bills of lading are crucial for warehousing, quality assurance, and accounts payable/receivable to ensure the delivery and quality of goods.

Intelligent Information Management provides clear visibility of these records to ensure productivity, communication, and collaboration across all departments.

Automate Inefficient and Bottlenecked Processes

Manual information-based processes in manufacturing can lead to bottlenecks, errors, and delays, slowing production and impacting the bottom line. These tasks include:

- ✓ Job Traveler Completion
- ✓ Supply Management
- ✓ Audit Preparation
- ✓ Quality Assurance

IIM solutions automate these processes by capturing information with flexible, digital forms or OCR, automatically

routing it along each process's workflow, sharing it with other digital systems, and providing clear, compliant access to this data to the departments that need it.

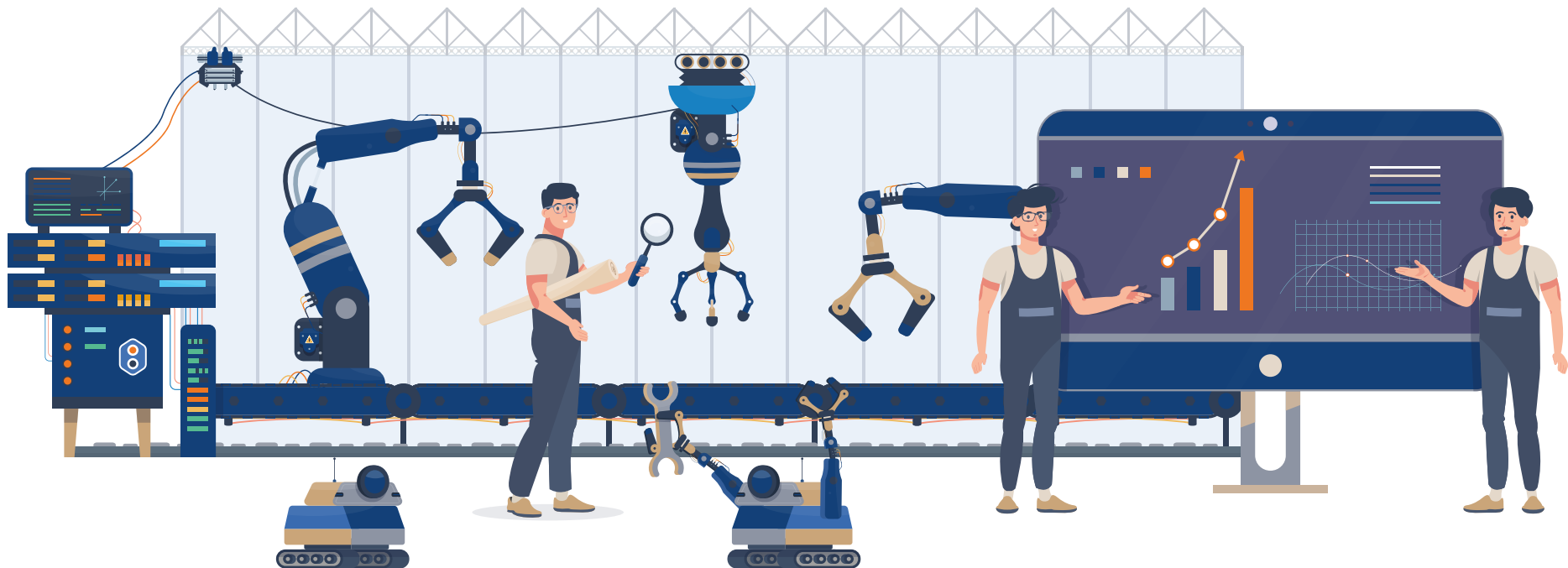
Maintain Regulatory Compliance

Manufacturers face strict regulatory requirements, ranging from quality assurance specifications and plant safety measures to general administrative retention for accounting, employment, and contract documents.

IIM solutions help manufacturers maintain compliance by centralizing information often collected across the plant and ensuring these records are accessible in record time for inquiries or audits.

Enhance Customer Value

A crucial part of any lean manufacturing initiative is providing high customer value at minimal cost. IIM solutions enable manufacturers to meet customer specifications and swiftly respond to inquiries about quality, recalls, repairs, handling, and more. This allows manufacturers to create fruitful business relationships with far greater efficiency.



Key Features to Look For



Seamless Integration with Existing Systems

Manufacturers frequently rely on various digital solutions, including enterprise resource management, inventory management, and customer relationship management systems. By integrating with these systems, manufacturers close data silos and ensure information visibility across departments. These integrations also automate processes such as general ledger coding, inventory management, batch comparisons, and more.



Generative AI Capture

With complex line-item data and unstructured records like metal trace reports common amongst manufacturing processes, the ability to digitize and leverage this data quickly and accurately should be a critical consideration for manufacturers. While this information would have been cost-prohibitive or even impossible to extract in 2021, recent breakthroughs in generative AI have enabled manufacturers to utilize this data in a cost-effective manner, fueling their processes, enhancing productivity, and informing crucial business decisions.



Workflow Automation and Customization

In manufacturing, even information-based processes are systematic, repeatable, and workflow-driven, making them key contenders for automation. Whether you work in the warehouse, on the factory floor, or in quality assurance, engineering, or administration, being able to route information through automated workflows streamlines processes and heightens the visibility of tasks that need attention.

4

Comprehensive Compliance Management

Compliance is non-negotiable in manufacturing, where adherence to industry standards and regulations is critical. An ideal IIM solution should provide comprehensive compliance management features, including automated retention scheduling, audit trails, and user-based access permissions on a highly secure platform. This ensures that your plant can effortlessly maintain records for all relevant regulations and can produce these records for audits with ease.

5

Scalability and Flexibility

As your manufacturing demand and output scale, your capacity to manage information will need to scale with it. Transaction documents, quality assurance records, and inventory records are just a few of the document types that increase in volume with product demand. What's more, all need to be managed, processed, and archived as efficiently as possible. Choose an IIM solution that is scalable to your demand and is capable of expanding into additional processes as your automation efforts continue.



Ensuring Compliance

Quality Assurance

To build credibility, adhere to industry best practices and regulations, and create opportunities in new markets, countless manufacturers opt to comply with standards from the International Organization for Standardization (ISO). These strict guidelines involve regular audits for documents, including:

- ✓ Design and Development Records
- ✓ Inspection Reports
- ✓ Material and Component Test Results
- ✓ Calibration Records
- ✓ Non-Conformance Reports

Customers may also perform their own audits to ensure the quality of their purchases, often needing additional documentation such as compliance certificates and regulatory approvals.

Safety

The Occupational Safety and Health Administration (OSHA) has strict policies for maintaining workplace safety with penalties including:

- ✓ \$16,131 in fines for initial and inadvertent violations.
- ✓ \$161,323 for repeated or willful violations.

This makes retaining documents like training records, facility safety inspection reports, and additional safety documentation absolutely crucial, but the sheer volume of these documents and the decentralized locations in which they are produced can pose significant challenges in managing them.



Administrative

Audits for administrative records are common across all industries, and manufacturing is no exception. Accounting, Human Resources, and Contract Management teams all have mandatory retention schedules for frequently audited documents. Below are some examples:

Human Resources:

- ✓ I-9 Employment Verification Forms
- ✓ W-4 Tax Forms

Accounting:

- ✓ Invoices
- ✓ Purchase Orders
- ✓ Sales Orders

Contracts:

- ✓ Vendor Agreements
- ✓ Sales Agreements
- ✓ Employment Contracts

A Single Compliance Solution

By automatically archiving documents across each of these compliance areas in secure repositories based on departments and individual needs, they can be retrieved through a simple search, saving immense amounts of time and effort. Intelligent information management solutions can also set automatic reminders for upcoming audits and expiring retention periods to remove non-mandated, compliance-hindering records swiftly.



Building Customer Success

For manufacturers, effective information management is vital to delivering exceptional customer service. Manufacturers can ensure quick and easy access to the information needed for prompt and accurate responses by centralizing and organizing all critical documents. By digitizing documents and searching key index fields, customer service teams will have instant access to records such as:

- ✓ **QA Documents:** like material safety data sheets and bills of lading, to meet customer concerns about material handling and delivery
- ✓ **Product Manuals:** To address concerns about product usage
- ✓ **Repair Guides:** for any complex components, machines, or vehicles manufactured at your plant
- ✓ **Job Records:** for contracts, purchase orders, or custom order information, neatly indexed and

This streamlined approach allows your customer service teams to address inquiries and issues more efficiently with immediate access to the information they need.



Automation By Department

Intelligent information management can add efficiency and automation to each department in your plant. Below are some examples.

Simplifying Quality Assurance

Crucial to any successful manufacturing operation, quality assurance ensures that products meet industry and customer standards and specifications. However many of the processes involved can be tedious and time-consuming to manage. By streamlining the flow of information, intelligent information management increases efficiency in processes such as:

1. Audit Preparation

Documents such as inspection reports, material test results, calibration reports, and more are needed to prove compliance with ISO and customer specifications. Intelligent information management solutions provide an easily searchable repository to compile these records in little to no time.

2. Enhance Traceability and Supplier Vetting

Maintaining a high level of traceability is crucial for QA departments, especially when vetting supplier quality or analyzing contamination sources. Intelligent information management enhances traceability in multiple ways, including:

Supplier Vetting

IIM solutions provide a centralized repository for all material test reports, bills of lading, and related documents, ensuring the quality and safe delivery of raw materials. By indexing these records with supplier and batch information, manufacturers can effortlessly investigate bad batches and hold suppliers accountable.

Process Audits

With immediate access to documents like job travelers, maintenance logs, and inspection reports, QA specialists can see exactly which part of each process failed to meet specifications. These documents can even be captured digitally from the start, with portions of these records filled out in a live web form at each relevant process stage. This ensures accuracy, reducing the need for data validation.

3. Improve Data Analysis and Batch Comparisons

Quality assurance analysts must often compare data from material batches against previous results to ensure quality consistency, prevent defects, and vet processes and suppliers. Intelligent information management systems make it easy to locate specific data points and perform side-by-side comparisons. Data points from these reports can even be lifted for use in automatic comparison for even further time savings and efficiency.

Enhancing Customer Service

Customer service is a critical component of any manufacturing operation. Assuring customers of quality, addressing defects and complaints, and answering inquiries about specific orders are all crucial to building a consistent customer base. Intelligent information management (IIM) solutions provide customer service departments with the tools they need to efficiently track, access, and manage customer-related data in order to:

1. Efficiently Manage Product Use Documentation

When purchasing any materials or components from manufacturers, customers are provided documentation on how to use and handle the goods in a safe and effective manner. This documentation includes material safety data sheets (MSDS) and product manuals. Having access to these records in your customer service department allows them to address inquiries regarding product use, resolve disputes stemming from improper use or handling, and remedy concerns that may have been unclear in this documentation.

2. Verifying Customer Inquiries

In cases where customers raise concerns about product quality or delivery, having access to material test reports (MTRs), inspection documentation, job travelers, bills of lading, and other tracing records becomes essential for verifying and addressing those complaints. IIM solutions allow customer service teams to quickly retrieve the documents associated with a specific product batch to verify whether they meet the required specifications.



3. Streamlined Access to Customer Job Portfolios

Each order from a manufacturer involves a portfolio of customer documentation including contracts, purchase orders, and, in the case of custom orders, design specifications, and job cost records. IIM solutions make it easy for customer service teams to manage and access customer documentation, even linking it as an entire portfolio using shared index fields. By providing a centralized platform where all records related to a specific job number are stored and organized, customer service departments can quickly respond to inquiries about these specific jobs.

Organizing The Design Process

1. Centralized Management of Design Documents

Design departments generate a variety of documents, including engineering manuals, repair guides, design specifications, and revision histories. Managing these documents efficiently is critical to maintaining design integrity and ensuring that everyone on the design team is working from the most up-to-date information. IIM solutions provide a centralized platform to store and access all this information.

2. Enhanced Collaboration Across Departments

Manufacturing design often requires shared documentation between the design team and other departments, such as engineering, production, and quality assurance. For example, QA teams must verify that the produced goods meet the quality standards outlined in these documents. IIM solutions facilitate this collaboration by providing a shared repository where

documents can be accessed and updated based on permissions and workflows.

3. Streamlined Change Management and Version Control

Design changes are inevitable and managing them effectively is vital to maintaining design integrity. IIM solutions offer essential version control and audit trail features that allow design teams to track annotations, limit and control access to specific document versions, and keep a detailed record of which changes were made and when. By utilizing these features, design teams ensure the entire plant is working with the latest information while maintaining the traceability of past revisions.

Fueling Production

Production is the engine of any manufacturing operation, where efficiency, accuracy, and timely execution are paramount. Intelligent information management (IIM) solutions are essential for optimizing the production processes by fueling it with all the necessary information for each task. This includes:

1. Streamlined Access to Production Documents

In manufacturing, production teams rely on a wide range of documents, including work orders, assembly instructions, job travelers, and quality checklists. IIM solutions centralize the management of these documents, making them easily accessible to production staff while controlling and tracking changes. This ensures that everyone on the production floor works with the most current information available.

2. Improved Job Traveler Management with Web Forms

Job travelers are essential to process traceability in manufacturing. Detailing every step from raw material handling to final assembly, they ensure that any defects or quality concerns can quickly be addressed and remedied while providing insight into possible process improvements. Paper job travelers are easily mismanaged, getting lost or misrouted throughout the production process. IIM solutions, particularly those with web form functionality, allow these documents to be completed digitally and are automatically routed to ensure each process step is noted at the correct point and time

Optimizes Warehousing

Warehousing plays an essential role in the manufacturing process, serving as the hub for storing raw materials, work-in-progress items, and finished goods. Efficient inventory management is vital to maintaining a smooth production flow and meeting customer demands. Intelligent information management (IIM) solutions provide warehousing teams with the information they need, such as inventory levels, shipment documentation, and transactional records.

1. Enhanced Inventory Management and Visibility

Accurate inventory management ensures that production lines are always supplied with suitable materials and that finished goods are ready for shipment. IIM solutions lift line

item data from invoices, sales orders, and other documents to fuel enterprise resource management systems with data for accurate inventory estimates. This allows manufacturers to identify shortages or overstock situations and make ordering or relocation decisions accordingly.



2. Streamlined Receiving and Put-Away Processes

The receiving and put-away processes are key to maintaining an organized and efficient warehouse. IIM solutions streamline these processes by digitizing receiving documents and automating data capture.

Using mobile devices to scan barcodes or QR codes, warehouse workers can automatically update your plant's inventory management system with the received quantities and storage locations. This automation reduces manual data entry errors, speeds up the receiving process, and ensures that materials are quickly and accurately put away in their designated locations.

3. Automation of Warehouse Documentation

Warehousing involves extensive documentation, from packing lists and bills of lading to inventory reports and compliance certificates. IIM solutions automate the storage and retrieval of these documents and can even produce summary reports of documents, such as bills of lading, using generative AI.

And by capturing crucial data points, IIM solutions can work in tandem with your inventory management system to generate packing slips and labels based on order information, ensuring that all shipments are properly documented and labeled. These documents are then linked to the corresponding inventory records, making it easy to track and retrieve them as needed.

This reduces the administrative burden on warehouse staff and ensures that all necessary paperwork is accurate and up to date.

Streamlining Accounting

Accounts Payable

Manufacturing plants manage numerous vendors for raw materials, components, certifications, training services, and more. These vendors are frequently paid on credit, requiring efficient invoice management and timely payments. By automating the accounts payable process, manufacturers can reduce errors, build better vendor relationships, reduce operational costs, and take advantage of early payment discounts.

Steps to Effective Accounts Payable Automation

1. Invoices are scanned, and data is extracted using OCR
2. Extracted data is validated for accuracy and quality
3. Invoices are routed to approvers, where they can be confirmed or denied
4. A payable invoice is created in the ERP or accounting system of your choice
5. The invoice is archived in an ECM system to meet regulatory standards

Accounts Receivable

Manufacturers also provide many components and finished goods on credit, often requiring manual data entry into financial management systems, follow-up reminders for payment collection, and organized management of invoices and purchase orders. These time-consuming and error-prone activities can be drastically improved with intelligent information management by:

- ✓ Capturing purchase order and invoice data to be shared with a financial system
- ✓ Prompting automatic payment reminders based on the information within these documents
- ✓ Providing convenient access to transaction records to answer incoming questions about payment and services

Simplifying Human Resources

HR Onboarding

Time-consuming and often requiring follow-up, onboarding forms can be an impeding factor in getting new hires to full productivity in high-turnover fields. Implementing an IIM solution with web forms grants HR staff visibility into onboarding completion. It simplifies these forms with guided workflow-based questions that show only the essential fields. In addition, fields repeated from previous forms like name, address, and phone number can be remembered and filled automatically, while totals and tax calculations on forms such as the W-4 and W-9 can also be automated. The result is a fast and painless onboarding experience.

Managing HR Documents

Human Resources departments are responsible for vast amounts of documentation, including:

- ✓ Payroll Information Sheets
- ✓ Employment Contracts
- ✓ Tax Forms
- ✓ Employment Authorization Forms
- ✓ Safety Training Forms
- ✓ Equipment Certification Forms

Retaining employee hiring and payment information is mandatory to protect your plant from potential litigation. Failure to produce forms like the I-9 employment verification or the W-4 and W-9 tax forms can result in steep fines that are thousands of dollars per violation. Intelligent information management solutions allow your institution to effortlessly archive and retrieve these records when called on, protecting you from financial and legal liability.

Transforming Legal

Manufacturers must navigate the legal landscape to adhere to agreements and resolve disputes. This involves excessive amounts of information, ranging from contracts and records to communications and evidence, that can only be managed with a proper information management system in place.

Contract Management

Contracts, including vendor agreements, union contracts, sales contracts, and more, often have hectic sign-off and approval processes and multiple versions stored sporadically, creating chaos and confusion when term disputes arise.

The ability to search these records in full-text and control which versions of the documents are displayed by default can settle these disputes with clear, convenient information access. Workflows for these contracts can also streamline signing and approval while notifying staff of upcoming expiring terms.

Litigation

Litigation involves countless records ranging from notifications, filings, and correspondences to transcripts, briefs, and memorandums. It's no wonder litigators often face accessibility and storage issues for the documentation involved. Intelligent information management solutions can capture the entire contents of these records, facilitating easy searches for the records needed. As these records are stored digitally, litigators can forgo offsite storage for these records, resulting in additional cost savings and convenience.

E-Discovery

All organizations try their best to avoid legal disputes, but should the need arise, being able to produce the records necessary for the case and scan their contents for relevant information can ensure a swift resolution. IIM solutions can extract crucial data from legal documents and search them entirely, including the machine-printed body and handwritten information within the margins. Even documents not typically maintained in your IIM solution, such as email files, can be captured and searched.



User Adoption

Change is conflicting for most people, and it can be difficult for people who have worked one way for decades to adopt a new approach. Despite this, there are a few key ways to help your manufacturing plant embrace change and take advantage of the newfound benefits.

- ✓ **Help Your Staff Feel Vested:** Involve them in the solution selection process. Hear their concerns and input and explain the factors that led to the final decision. This will help ease concerns about the suddenness of the change and show them that you are working with their best interests in mind.
- ✓ **Assign Someone to Manage The Transition:** A primary point of contact for any questions or concerns can help ensure a smooth transition and act as a liaison between your staff and your solution provider for additional assistance.
- ✓ **Provide Tools For Success:** Solution education, customer support, and self-help resources such as a knowledge base all ensure your solution kicks off without a hitch and your workforce can hit the ground running.



Security

With fast-paced operations dependent on various digital systems, manufacturers have become a common target for ransomware attacks. These attacks aim to shut down operations by taking over crucial software systems until a ransom is paid. According to the [2024 IBM X-Force Threat Intelligence Report](#), manufacturing has remained the industry most attacked by cybercriminals for the third year.

This makes choosing a highly secure solution absolutely critical. Key considerations for determining a secure solution include:

Account-Based Access Controls

By ensuring each user's account for your solution only allows access to the information they need to do their job, you not only enforce privacy compliance within your organization you also limit potential breaches of sensitive information, should that account be compromised.

Data Encryption

Encrypting data while it is stored and transmitted ensures that, if intercepted, it can't be deciphered without access to an authorized account for your solution.

Two-Factor Authentication

Well-designed two-factor authentication systems can reduce the risk of account compromise by 40-50% ([Cybercrime Magazine](#)). Requiring users to verify their log-in attempts can

often stall hackers and alert account owners, providing ample time to adjust login information, cancel an account, or take other preventative measures.

Single Sign On

Tying employee accounts together and tracking login activity under one domain gives system administrators crucial oversight to track suspicious activity and catch breaches before they cause damage.

Compliance Certifications

Cloud solution providers with certifications in system and organization controls (SOC) compliance have been proven to work according to a high information security standard, ensuring your plant's data is in safe hands.



Manufacturing Success Stories

HARCO Laboratories

Founded in 1951, HARCO Laboratories is an award-winning designer, manufacturer, and international distributor of components for a wide array of aerospace and industrial applications. These solutions include temperature-measuring devices, sensor units, and cables for airframes and engines.

Each manufactured component involves countless documents, the sheer volume of which can hinder the achievement of crucial objectives. For HARCO, accessibility issues involving time-consuming searches and costly offsite storage were chief concerns.

Square 9 streamlined this accessibility, simplifying processes involving sales orders, work orders, and financial records. Square 9 even integrated with HARCO's Infor VISUAL ERP system, fueling it with data needed for further automation.

HARCO's IT manager, Brian O'Connor, estimates that Square 9 has saved the company \$1000 monthly. Once all documents are archived digitally, an additional \$16,000 in annual off-site document retrieval fees are expected.

Buckley Associates

Headquartered in Hanover, Massachusetts, Buckley Associates is a manufacturer, distributor, and manufacturer's representative of heating, ventilation, and air conditioning (HVAC) products serving the northeastern United States.

Processing between 200 and 300 sales orders a day across 6 locations, Buckley Associates' most significant challenges were accessing these orders and maintaining a consistent process for them across locations.

Square 9's GlobalSearch proved to be an effective solution. It provides secure browser-based access to these records and adapts easily to Buckley Associates' ERP solution.



"With GlobalSearch, all our offices follow the same procedures and headquarters has immediate access to these documents. This is especially important when we are trying to bill customers at the end of the month."

- Robert Buckley III

Director of Information Technology at Buckley Associates



square9
Taking the Paper Out of Work

How Square 9 Can Help

Square 9 is an industry trailblazer in the field of intelligent information management, taking the paper out of work and ensuring a productive, hindrance-free environment where information can flow freely. Easy to learn, highly supported, and backed by world-class service and extensive education. Square 9 solutions are designed to help you take your organization to the next level.

Square 9's HR Automation solutions are designed to ease onboarding, simplify employee requests, and provide secure, compliant access to all the information human resources professionals need to meet the challenges of their role.

Contact Square 9 to get a no-obligation discovery session and see how transforming your human resources department can lead to a more efficient, informed organization.

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