Acumatica
The Cloud ERP

Prepare for the Factory of the Future with Acumatica Manufacturing Edition

A Digital Transformation Playbook for Progressive Manufacturers

MANUFACTURING TECHNOLOGIES AND CONSIDERATIONS

Who could imagine a day when we would see products printed in plastic and metal on a 3D printer, or batteries that are grown from viruses, or contact lenses that zoom in like binoculars with the click of your eye? Technology is vital for manufacturers to design and produce high-quality products. Technology is just as crucial to manage business processes.

Growing manufacturers and those using entry-level accounting or legacy manufacturing ERP systems must **modernize factory and business operations** to remain competitive. To maintain their competitive edge, manufacturers may need to replace their business system or acquire bolt-on applications with limited integration and high installation, maintenance, and support costs.

This playbook provides manufacturers with an overview of manufacturing ERP features and advice for connecting ERP applications with innovative manufacturing technologies. In addition, it includes a self-assessment to determine **what steps to take next** with strategies to execute on technology implementations, setting a future-proof platform for growth.

5 SIMPLE STEPS TO A FACTORY OF THE FUTURE

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FEATURES

Introduction to Manufacturing ERP

There are eight feature categories manufacturers need to consider when modernizing their manufacturing operations and business systems. These are general features, accounting, order management, inventory management, product design, production management, planning and scheduling, and analytics and reporting. These feature sets are crucial to every factory modernization project. They provide manufacturers with the tools they need to eliminate manual data entry, streamline business processes, connect to modern manufacturing technologies, and improve visibility into all manufacturing business transactions.

"Many older ERP systems were not designed to be easily extensible, but Acumatica attracted us because it was designed from day one to be an application development platform for the modern cloud computing era. As customers grow, many of the new features they need are already there, or can be configured quickly, sourced from third-parties, or extended by in-house staff."

– NATHANIAL FAIRWEATHER, MANAGING DIRECTOR, TRIODE

GENERAL FEATURES

Creating a modern factory relies on innovative technologies. The application platform is crucial. It should be developed in modern programming languages and database applications. You should have the option to deploy in the cloud or on-premises with easy connectivity to external systems. The system should provide multiple levels of security for accessing the system and the database.

Other features to consider include customizable workflows, real-time inventory updates, and flexible packaging definitions. Unit of measure conversions for sales, purchasing, manufacturing, and inventory are also important.

Do not underestimate the value of ERP publishers, vendors, and consulting partners. All of them are essential to the success of your factory modernization project.

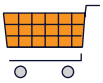
ACCOUNTING

Manufacturing today is global, and it is going to continue to expand globally in the future. Accounting systems must support international tax and localization such as use-tax, value-added tax, and both GAAP and IFRS accounting standards. Multicurrency is a must-have in today's global economy.

Look for applications with a broad set of applications including general ledger, accounts payable, accounts receivable, cash management, fixed assets, payroll, project accounting, deferred and recurring revenue, and time management.

Understand how automation streamlines financial processes with automated bank feeds, mobile expense management with automation fueled by artificial intelligence. Do not neglect multi-company allocations and consolidations and intercompany accounting.

ORDER MANAGEMENT



Manufacturers require flexible sales management with embedded CRM, native connections to B2B and B2C storefronts, and connected point of sale applications with omnichannel returns and exchanges. Sales applications should support back orders, item substitutions, stock reservations, and drop-shipments. Pricing, promotions, and discounting must be flexible. Procurement applications should provide flexibility with requisitions, vendor bidding, and blanket purchase orders. Integration with EDI, transportation and logistics, warehouse management, shipping applications, and other systems is essential.

PRODUCT DESIGN

Increasing product complexity is forcing manufacturers to adopt modern computer aided drafting and design (CAD) and product lifecycle management (PLM) applications with augmented and virtual reality powered by artificial intelligence. Look for CAD and PLM software that connect with your ERP to harmonize engineering and manufacturing bills of material, track compliance, and manage engineering changes.

PRODUCTION MANAGEMENT

Modern manufacturing ERP systems provide the tools you need to manage and analyze production order details, costs, and resources with manufacturing data collection via mobile devices for clock-in and clock-out of jobs, material issues, and real-time job costing.

PLANNING & SCHEDULING

Nimble manufacturers rely on advanced scheduling algorithms, demand forecasts, and capable to promise (CTP) calculations to harmonize material plans with advanced planning and scheduling (APS) to ensure timely material purchases, optimized stocking levels, and maximized resources.

INVENTORY MANAGEMENT

Modern factories manage inventory with real-time data to minimize carrying costs and increase turns with fewer stock out scenarios to improve on-time deliveries. Look for ERP applications with native barcoding and flexible warehouse management including locations, bins, containers, and slotting.

Manufacturers of perishable goods need systems to manage expiration dates, lots, and stock rotation. Item creation tools including imports and matrix items are crucial for manufacturers across industry segments. Look for systems that support multiple kitting scenarios with disassembly functionality. Evaluate physical inventory cycle counting and ABC ranking to improve inventory accuracy and warehouse layouts for high-volume and low-volume inventory.

Picking should support multiple methods such as batch, wave, and zone picking. Manufacturers with perishable inventory should look for first-expired-first-out (FEFO) picking. Other picking features include cart and container management for transactions.

Replenishment should support min/max, safety stock, reorder points, demand forecasts, vendor lead times, and more.

Consider systems that natively support small parcel, less than truckload (LTL), or truckload (TL) carriers. You may also require route and delivery management if you own your own fleet and manage direct customer shipments.

ANALYTICS & REPORTING

Consider ERP applications with easy-to-use, native reporting, flexible inquiries with drill-downs to source transactions, business events for email, and role-based dashboards with key performance indicators. Harness connected business intelligence with Microsoft Power BI for improved visibility into every part of your business and operations.

TECHNOLOGIES

Manufacturing Technologies

There are a plethora of modern technologies transforming today's manufacturing processes. Additive manufacturing with 3D printers, connected machine-to-machine (M2M) integrations, connected Industrial Internet of Things (IIoT) devices, wearable technologies, and other advancements are disrupting manufacturing operations. Be prepared with a future-proof ERP application designed for low-code or no-code integrations using Open APIs to streamline and automate operations.

"We had no idea on what we were missing out by running our legacy ERP system compared to Acumatica. We're seeing gains in all sorts of areas including data entry and just about every functional area. The customizable dashboards allow for quick and important business decisions. I've been managing my staffing and overtime from a dashboard."

– MATT SHORT, VICE PRESIDENT, MONAHAN PARTNERS

WMS, BARCODES, RFID, & IIOT

Even the smallest manufacturer has tethered barcode readers and the ability to print barcodes on reports and labels. Systems should support the standard GS1 Global Trade Item Number barcode format. Barcodes work with varied devices including mobile devices, ruggedized tables, and specialized scanners. RFID tags provide the same automated data capture features as barcodes with zero human intervention supporting the Industrial Internet of Things (IIoT) for wireless connectivity. Automate factory and warehouse operations with advanced Warehouse Management Systems (WMS) and Manufacturing Data Collection (MDC) for improved labor reporting, material movement, picking, packing, shipping, and put-away. Barcoding is affordable and supported in midmarket ERP applications. RFID and advanced IIoT devices are more complex to setup with a longer-term payback.

Acumatica includes WMS and MDC with barcoding for advanced automation.

CAD & PLM APPLICATIONS

Synchronize engineering bills of material and items from CAD or PLM applications with manufacturing bills of material and inventory items in your ERP system. Modern design applications are moving to the cloud for increased computing power and online collaboration with customers and suppliers. Arm yourself with connected product lifecycle management applications and innovative artificial intelligence with machine learning for generative designs and digital twins for testing and virtual analysis. Manage engineering changes for the full product record and engineering disciplines. Connectivity eliminates duplicate data entry, automating the hand-off from engineering to manufacturing.

Reduce the engineering to manufacturing hand-off for shorter design cycles and production times with Acumatica for Arena Native Connector and marketplace applications for CAD integration.

ROBOTICS, SCADA, PLC, & M2M

Systems and devices are increasingly connected. Modern applications provide open APIs for connecting ERP and other applications with robotics, supervisory control and data acquisition (SCADA), programmable logic controllers (PLC), and machine-to-machine (M2M) communication.

The Acumatica Device Hub, Open APIs, and no-code / low-code integration simplify machine and device connectivity.

MOBILE & WEARABLE TECHNOLOGY

Today's manufacturer demands access to systems and information. The factory of the future will employ wearable technologies such as virtual reality glasses for accessing information, factory communication, and hands-free transaction processing. RFID badges provide employee location for passive attendance and reporting. Exoskeletons promise to improve health and safety for workers, and mobile apps empower remote employees.

Acumatica provides mobility to access every system process and data anytime, anywhere, on any device through secured connections and mobile apps.

CLOUD COMPUTING & BIG DATA

Cloud computing enables manufacturers to focus on manufacturing instead of the systems and infrastructure supporting their operations. Cloud computing is cost-effective providing scalability for increased computing power when needed. Big data and analytics provide deep insights with actionable information to manage complex supply chains and advanced processes.

Acumatica is the fastest-growing cloud-native ERP application for midmarket manufacturers. Flexible reporting tools, robust inquiries, role-based dashboards, and native Microsoft Power BI connectivity provide everything manufacturers need to gain new insights into every facet of their operations.

VIRTUAL & AUGMENTED REALITY (VR/AR)

Virtual reality (VR) and augmented reality (AR) are not just for product engineering. Manufacturers can leverage VR and AR throughout manufacturing operations for employee training, quality control, guided picking, material handling, and more.

Start by documenting operational procedures with multimedia videos in Acumatica wikis. Acumatica is the ideal platform for future VR/AR automation projects.

ADDITIVE MANUFACTURING (3D PRINTING)

Additive manufacturing is gaining traction. Costs for 3D printers and materials are dropping fast, making them an affordable alternative for manufacturing and replacement parts and supplies. Connect 3D printers with CAD and PLM to automate print jobs and connect data with your ERP system for production reporting, scheduling, and material planning.

Manage 3D printers as work centers in Acumatica Production Management and connect with printers via Open APIs to capture production information.

CONNECTIVITY, CUSTOMIZATION, & TOOLS

Modern applications and devices are built for connectivity. Specialized applications are available for complex connectivity to eliminate one-off custom integrations. Make sure to evaluate connectivity and customization tools for each modern application and system you implement.

Acumatica provides the most comprehensive application suite available for midmarket manufacturers. Tailor the system with more than 100 specialized applications from the Acumatica Marketplace and leverage technology experts from the world's best partner channel to build-out additional capabilities with ease.

AI, ML, & VIRTUAL ASSISTANTS

Artificial intelligence brings impactful change to manufacturing including material planning and production scheduling. Machine learning improves on artificial intelligence enabling the system to make better decisions based on human feedback. Virtual assistants make it easier for manufacturers to access information and to perform transactions in a hands-free environment for warehouse and production tasks such as voice-directed picking, put-away, and production reporting.

AI with ML is built into the Acumatica platform for expense management, accounts payable automation, and other processes. Access the platform for additional AI and ML automation.

CYBERSECURITY WITH BLOCKCHAIN

Manufacturing systems are vulnerable to cyber-attacks and ransomware that bring your business to a screeching halt. Modern applications provide multiple levels of security for systems and data using encryption and advanced techniques such as blockchain.

Acumatica, Amazon Web Services, and Microsoft enforce multiple levels of application and database security with antivirus applications and a robust intrusion detection system (IDS) to identify any attempt to compromise the confidentiality, integrity, or availability of your data, or to circumvent security controls.

CMMS FOR PREVENTATIVE MAINTENANCE

Throughput is essential for every manufacturer. Ensure machine and tooling resources with computerized maintenance management systems to minimize downtime.

Identify slow times for planned maintenance of machines and tooling. Block out dates and times for maintenance activities. Specialized maintenance applications are available from the Acumatica Marketplace.

QUALITY MANAGEMENT SYSTEMS (QMS)

Quality is paramount for manufacturers. Take control and leap-frog competitors while improving brand reputation and customer retention by connecting quality management data, systems, and processes with your ERP and other business applications for improved profitability.

Gain deeper insights into product quality with native Acumatica manufacturing reports and inquiries. Advanced QMS is available through connected marketplace applications for non-conformance, quality testing, and other activities.

MANUFACTURING EXECUTION SYSTEMS (MES)

Manufacturing Execution Systems connect your shop floor and top floor. Know what is happening in real-time – which machines are down, which production orders are over budget, and which customer orders are late. Adjust work center resources to increase capacity and throughput. Automate data collection in real-time from mobile devices from the shop floor.

Acumatica's Manufacturing Data Collection (MDC) application provides light MES features to clock-in and off production orders with material transactions from mobile devices. Advanced MES apps are available from marketplace vendors.

COLLABORATION & SELF-SERVICE PORTALS

Many CAD, PLM, and ERP systems provide online collaboration portals for customers and vendors to share in design, create and manage orders, access inventory stock status, configure products, and manage vendor inventories. Improve the design process with agility to adapt supply chain strategies for disasters and pandemics with real-time access to information anytime, anywhere.

Tailor the Acumatica Customer Portal to provide access to accounting and order information. Acumatica's unique user licensing enables you to setup customers with secure access online.

ASSESSMENT

Your Digital Transformation Journey

Every manufacturer is different, and so too is their factory modernization journey. Companies on entry-level accounting systems have few tools to connect systems. Established manufacturers on legacy ERP systems also have difficulty connecting to today's technologies. Your manufacturing needs vary depending on your industry, the types of products you make, and your customers. Complete the self-assessment survey to determine where you are today and what next steps you should take.

"We've been able to locate every product in our system, barcoded by location . . . it allows us to be able to move inventory throughout the warehouse, transfer it to new locations, and essentially keep track of every single product that we have within the warehouse."

– CHAD TREADWELL, SVP OF OPERATIONS, FSC LIGHTING

CURRENT STATE SURVEY

Complete the survey below by clicking the boxes in each column. Then, count your results and enter the total at the bottom.

ERP READINESS	TRUE	FALSE
We are currently using an entry-level accounting or legacy ERP system.		
It is challenging to connect current software to external systems or devices.		
Our current ERP system does not provide a framework for AI with ML.		
We often run out of stock and struggle to manage production schedules.		
Engineering CAD and PLM are disconnected from the ERP application.		
We rely heavily on manual data entry for manufacturing transactions.		
We stock or manufacture items in more than one physical location and perform transfers between warehouses and plants.		
Mobile access to systems and data requires unreliable VPN connections.		
We struggle to manage quality and compliance.		
There is limited visibility into real-time production information.		
Our systems are prone to fail and vulnerable to cyber-attacks.		
Our current ERP system offers minimal tools for customer and vendor self-service and collaboration.		
TOTAL		

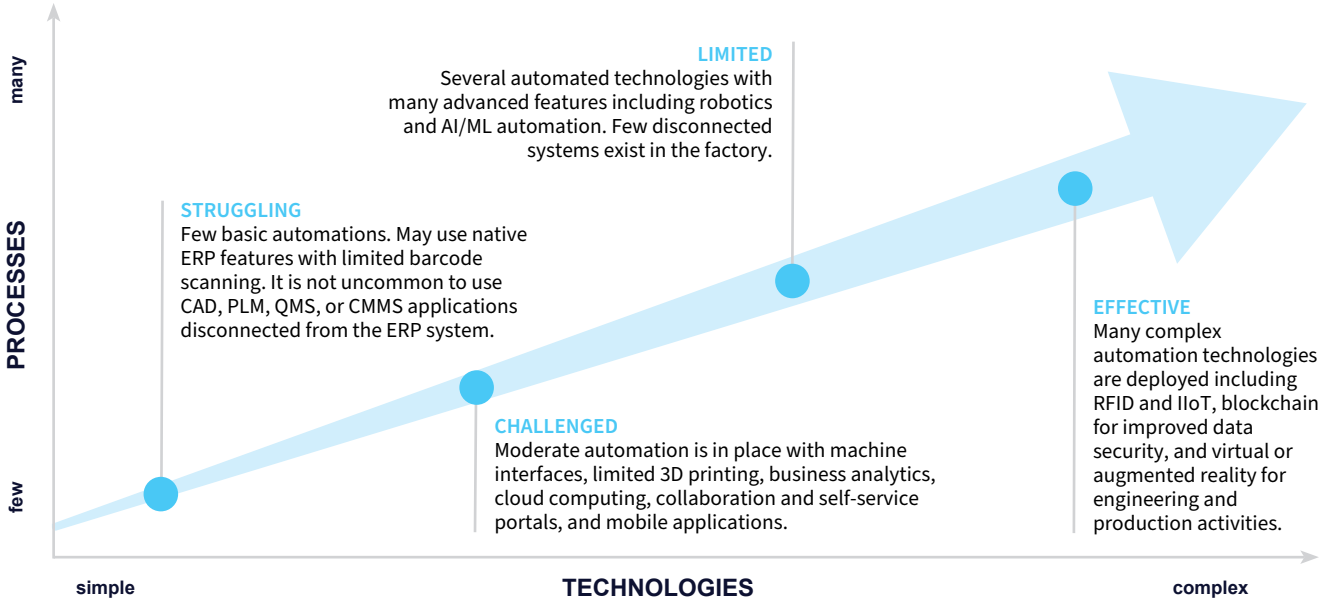
CURRENT STATE ASSESSMENT RESULTS

Add up all the true answers. Use the table below to see where you are at today.

9-12	**Struggling**	It is time to find a real ERP system to modernize your manufacturing operations. Your current systems limit your ability to adapt and grow.
6-8	**Challenged**	You are stretching beyond the capabilities of your ERP system. You must invest in customizations or third-party products to make it work. Replacing your current system is strongly recommended.
3-5	**Limited**	Your current systems meet many of your needs. Next, look for customizations or third-party products to improve manufacturing operations. Then, start planning for an ERP replacement.
0-2	**Effective**	You have a robust ERP platform to modernize your manufacturing operations. Stay current with product releases and look for ways to improve processes using native functionality and new features.

Discover Why Manufacturers Rely on Acumatica for Digital Transformation

The strategies you implement to automate your factory depends on how far you are in your digital transformation journey. Manufacturers who are just starting will have few automated processes using basic technologies. Manufacturers further along will have more automated processes using progressively more advanced technologies. The first step is to understand where you currently are before developing a digital transformation plan. Use the diagram below to chart your journey.



STRATEGY

Steps to Digital Transformation

It is challenging to modernize manufacturing operations without a comprehensive plan. You have technologies in place today but are they the right ones to take you to the next level? You have implemented features in your ERP system, but are they set up correctly, and are there other features you could use? Set a solid foundation by researching options, prioritizing activities, and developing a detailed plan.

STEP 1: FOUNDATION

Modernizing factory operations is easier when you build on a modern ERP system. It will be much more difficult and costly to modernize if you use basic accounting or older ERP systems with few integration options. Many manufacturers use a patchwork of technologies. Maintaining integrations between too many applications is costly and inefficient.

1. **Review Current ERP Software Features:** Does your current business system provide a modern platform with an open architecture to connect to modern manufacturing applications and technologies? Are there modules available that you can purchase to improve factory operations? Are there features you could implement to improve business processes?

2. **Upgrade or Replace ERP Systems:** Consider upgrading or replacing your current ERP software before any factory modernization project. You may be surprised to find that new versions of the software provide features to improve operations. Conversely, you may discover that there are better options available for manufacturers in your industry.

STEP 2: RESEARCH

It is critical to research and document factory automation technologies so you can prioritize modernization activities. First, review the detailed manufacturing assessment section to see which features your current applications provide and where there are functional gaps for future needs. Then, conduct a thorough business process review to identify processes that can be improved through automation.

1. **Research Existing Capabilities:** Document manufacturing capabilities available in your current (or potential replacement) ERP system. How are these capabilities used in the system today? Can they be improved, or should they be replaced?

2. **Identify Modernization Initiatives:** Start small and work on high-priority modernization activities first. Review the detailed manufacturing assessment to identify gaps. You can then work on filling gaps for future requirements.

3. **Review Potential Technologies:** Contact your ERP partner to learn more about available modules, features, or third-party applications to improve manufacturing operations. Do these applications and features fill most of your current and future gaps? Are they easily connected? What are the costs?

STEP 3: PRIORITIZE

Review the list of functional gaps from the detailed assessment section. Rank each one based on cost and potential benefit. It is essential to start small with a few high-priority activities. Look for ways to get more out of your current applications first. Be mindful of cost. It is easier and less expensive to implement barcoding throughout your plant than to replace everything with RFID. Further, many advanced features can push you into costly and unnecessary MES, QMS, and CMMS systems.

1. **Improve Existing Manufacturing Processes:** Review previously completed modernization projects. Often, you can find ways to improve processes by tweaking setups or configurations. You may also discover innovative technologies to improve on previously completed modernization projects.
2. **Implement New Manufacturing Processes:** Creating a modern factory takes time. So do not try to do everything at once. Instead, consider activities that can be implemented quickly using existing functionality or where you can leverage previous investments in technologies for adjacent innovations.

STEP 4: DEVELOP A PLAN

Develop a plan that defines the desired goal, supporting technologies, and a timeline and process for conducting the implementation from start to finish.

1. **Goals & Desired Outcomes:** It is vital to outline the expected results clearly. Document the current state beforehand so you have a benchmark to use as a measure of your success.
2. **Factory Automation Technologies:** Document which technologies will be used, dependencies, connection points with other systems, known limitations, and provide contacts for assistance.
3. **Timeline:** You may not have a start date for the project, but you can develop the detailed phases and timeframes to complete each step in the process.
4. **Contingency Plans:** Define contingency plans in case you run into technical issues or other conflicts that prevent the completion of the project.

"I see Acumatica as a foundation for us to be able to grow our business . . . Acumatica works very well with third party software. Tableau is our reporting solution and the integration to our data warehouse with Acumatica is outstanding. Also, EDI – MAPADOC software running with a virtual network on SPS Commerce . . . I highly recommend Acumatica for any type of company who is going through a transformation and is looking to grow their business."

– KEVIN BOYLE, DIRECTOR OF INFORMATION TECHNOLOGIES, SPECIFIED TECHNOLOGIES, INCORPORATED

EXECUTION

Creating a Modern Warehouse

It is time to execute the modernization project once you have defined your plan. Remember that you do not have to automate everything simultaneously. It is easier to start with simple technologies such as barcode scanning or connections to disparate quality, maintenance, or shop floor applications. Execution covers four phases: preparation, go-live, review, and continuous improvement. Each phase is essential for the successful roll-out of new warehouse strategies.

PHASE ONE: PREPARATION

The time it takes to prepare will depend on the project's complexity, including the technologies used and the scope of changes to systems and processes. Preparation should start well in advance of your desired go-live date. It should include a review of the project plan with project owners, internal staff, users, technology providers, and consultants.

1. **Plan Review:** Review the implementation plan with the team. Set the start date for the project and assign dates to each step in the project. Consider the contingency plan to ensure there is a process in case something goes wrong.

2. **Team Preparation:** Notify participants of timelines and their roles and responsibilities. A conference room pilot (CRP) improves success rates dramatically.

"New processes are in place, we have greatly reduced the amount of paper used and the hours needed to process it . . . We couldn't do that with Sage or the processes we had. Now that we are in the cloud, we can use a phone or iPad to access information."

– ANITA EASLER, CUSTOMER FULFILLMENT MANAGER, AFF|GROUP

PHASE TWO: GO-LIVE DAY

Successful go-lives are well-organized. Identify one person as the project lead. The project lead orchestrates each step in the project.

1. **Coordination:** The project lead orchestrates the implementation, delegates tasks to team members, and guides the entire project. They make decisions based on feedback and chart progress throughout the process.

2. **Documentation:** The actual go-live should be as close as possible to the planned implementation. Last-minute changes inevitably happen along the way. Document changes with details for future review.

PHASE THREE: REVIEW

It will take time for things to settle into place after you complete the project. Therefore, give users time to adapt to new processes while providing time to collect data.

1. **Go-Live Notes:** Review the go-live notes for last-minute changes to the project plan. Identify if there are any follow-up activities to fine-tune the process.

2. **User Feedback:** Talk to users about new processes and technologies. What do they like? What do they dislike? Do they feel they are beneficial? You will find that users have some of the best ideas if you take the time to ask them.

3. **Analytics:** Review the early results. Were you able to meet or exceed your goals? If not, why? What can you do to improve the process? Make sure to continue monitoring results long after each new process improvement project.

PHASE FOUR: CONTINUOUS IMPROVEMENT

Application upgrades and other issues impact the original project. New versions of the software or hardware can provide increased value.

1. **Maintain Technologies:** Stay current on the latest updates of your ERP software and connected technologies. Set up a sandbox for testing upgrades. Review product road maps and understand technology lifecycles.

2. **Improve Processes:** Look for ways to use existing features and technologies to improve processes and automation further. Go back to original technology implementations and implement more advanced features or tweak setups to get value and streamline additional processes.

3. **Explore New Opportunities:** Look for ways to use existing features and technologies to improve processes and automation further. Go back to original technology implementations and implement more advanced features or tweak setups to get value and streamline additional processes.

Make the Leap to Digital Transformation with Acumatica Manufacturing Edition

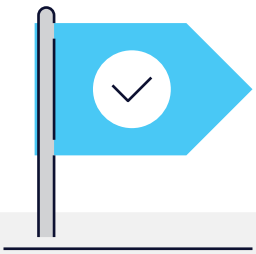
A modern factory is crucial for manufacturers to thrive in today's digital economy. Unfortunately, entry-level business applications and legacy ERP software force many manufacturers to invest in costly customizations or complex, expensive, and disconnected hardware, systems, and processes.

Manufacturers need to understand how modern technologies can transform their businesses through automation to improve quality, increase throughput, bolster sales, cut costs, and increase profits.

A disciplined strategy is critical to the success of manufacturing digital transformation. The strategy establishes a solid foundation, provides research, and defines priorities for the modernization plan. In addition, a four-phased execution approach ensures system and process implementation success.

Acumatica Manufacturing Edition is designed for make-to-stock, make-to-order, batch process, and project-centric manufacturers. Acumatica provides unparalleled manufacturing depth with an extensive suite of connected manufacturing business applications for production, estimating, engineering, material planning, scheduling, and product configuration.

Acumatica provides the best business and industry management solution for transforming your business to thrive in the new digital economy. Built on a future-proof platform with an open architecture for modern technologies, rapid integrations, scalability, and ease of use, Acumatica delivers an unparalleled experience for users and customers alike.



"Acumatica has an open platform, which was a huge selling point. The company looks for outside innovation and to work with as many ISV's as possible to provide a multitude of solutions. We believe in that ethos because that's how we operate."

– FRANKLIN SHIRAKI, CFO
FIREWIRE SURFBOARDS

ABOUT ACUMATICA

Acumatica Cloud ERP provides the best business management solution for digitally resilient companies. Built for mobile and telework scenarios and easily integrated with the collaboration tools of your choice, Acumatica delivers flexibility, efficiency, and continuity of operations to growing small and midmarket organizations.

Acumatica
The Cloud ERP

Business Resilience. Delivered.

Learn more about how Acumatica can work in your business by visiting us online at algorithminc.com.