Acumatica
The Cloud ERP

Manufacturing Metrics That Really Matter

HOW TO DEVELOP ACTIONABLE MANUFACTURING AND BUSINESS KPIS FOR SUSTAINABLE GROWTH AND STREAMLINED OPERATIONS

Manufacturing is all about precision and quality. Parts are made to exact dimensional specifications, precise formulations, and measured against fastidious engineering standards. Managing manufacturing businesses and operational processes requires the same attention to detail to boost sales, contain costs, improve efficiency, and grow profits.

Mark Twain once said, “If the metrics you are looking at aren’t useful in optimizing your strategy—stop looking at them.” This is undoubtedly true for manufacturing executives who measure the wrong things expecting to find hidden insights to grow their businesses magically.

Most manufacturers pay careful attention to metrics to drive daily decisions, improve quality, reduce risk, and guide operational excellence through their organizations. However, executives often struggle to make sense of the information due to data issues, lack of strategic vision, missing benchmarks, and a focus on lagging indicators. Further, departmental metrics do not always align with corporate goals, and manufacturing leaders experience “paralysis by analysis” with too many metrics.

This ebook explains the importance of tracking key performance indicators, diverse metric types, and common mistakes made by manufacturing executives. Discover the most important metrics to monitor for continuous improvement and align goals for actionable metrics to drive growth and efficiency throughout the organization.

GETTING STARTED WITH MANUFACTURING METRICS


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How Metrics Improve Manufacturing Operations

Metrics are everywhere in manufacturing organizations, from accounting to sales and quality to production. Monitoring data helps manufacturers increase sales, improve product quality, reduce costs, fend off competitors, and develop innovative products and services. For example, an Aberdeen benchmark survey shows that manufacturers that reported against KPIs for five or more years were more likely to achieve best-in-class status than those who did not actively monitor KPIs.[1]

"With Acumatica, we can double the size of the business without doubling the space and the people because we have power in the information. We can work more logically, provide better service and save millions in labor by not having to double the staff size."

– BEN LEINSTER, CEO, AFF | group

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EFFICIENCY

Throughput and operational efficiency are critical for manufacturers. It is easy for manufacturers to capture efficiency benchmarks for receiving, production, picking, and order fulfillment activities. Once established, manufacturers monitor efficiency changes over time. These metrics enable them to understand if they are improving or spot problems early before impacting profits and customer satisfaction.

COMPETITIVENESS

Manufacturing competition is fierce. Metrics enable manufacturers to monitor customer loyalty, total customer value, market share, and market growth for strategic business decisions. Understand your weaknesses, capitalize on market opportunities, and fortify your strengths to fend off competitors.

ALIGNMENT

Manufacturers must establish corporate goals that drive alignment with metrics throughout the organization. For example, Eli Goldratt's monumental book, The Goal, highlights how optimizing machine utilization runs contrary to reducing bottlenecks or constraints to improve throughput, which is far more critical for manufacturers.

PROFITABILITY

There are only a few ways to increase profits and profitability—sell more, reduce costs, or increase prices. Metrics help manufacturers improve sales opportunities and win rates. They also identify waste and inefficiencies that increase costs. Monitoring the correct information also allows manufacturers to optimize pricing based on value, demand, and competition.

REDUCED RISK

Key performance indicators are often used to predict and negate risk associated with quality issues, incorrect machine setups, and increased costs. Establish KPIs to monitor risk scenarios proactively.

DECISION-MAKING

Metrics are essential for strategic planning. Areas where metrics assist decision-making includes safety stock levels, capital investments, marketing, expansion into new markets, and new product launches.

OTHER BENEFITS

There are many additional benefits to establishing metrics. These include improved employee satisfaction, increased inventory turns, carrying costs reductions, and improved customer retention.

[1] Control Engineering: *What KPI metrics do best-in-class companies monitor?*



Avoid These Common Metrics Mistakes

Measuring performance only works if you have accurate, complete, and timely data. Unfortunately, manufacturers often focus too much on lagging indicators rather than proactively monitoring leading indicators before problems erupt. Finally, too many companies focus on internal issues without comparing themselves against industry peers.

BAD DATA

Relying on metrics to drive business decisions is dependent on your ability to collect accurate, complete, and timely data. Inaccurate and delayed information results in poor choices, unhappy customers, and missed business opportunities.

LACK OF STRATEGIC ALIGNMENT

What is the goal for your company? This is a crucial question to answer before you establish key performance indicators. For example, if your goal is to gain market share, then investing in marketing and sales with reduced margins may not be a bad idea. Conversely, if your goal is to increase stakeholder value, you should decrease costs and increase sales margins.

LAGGING VS. LEADING INDICATORS

Lagging indicators identify what has already happened. Therefore, manufacturers need to use a mix of both lagging and leading indicators to monitor metrics to identify problems before they happen and to understand the ramifications of issues afterward.

MISSING PEER BENCHMARKS

Many companies think they are great at what they do, and others are constantly chasing their competitors' every move on the assumption that they are doing things better. Therefore, it is essential to benchmark your performance against industry peers whenever possible. Look for associations and independent consultants to help establish peer benchmarks.



Metric Types

Use descriptive analytics to identify lagging indicators to understand what happened. Expand into diagnostic analytics to determine why things happened and predictive analytics to recognize when they might happen again. Prescriptive analytics help to avoid issues before they occur. Advances in technology have created a fifth metric category—cognitive analytics—here artificial intelligence with machine learning improves metrics and automates procedures to mitigate issues without human intervention.

DESCRIPTIVE

Descriptive analytics is commonly used for lagging indicators. This is because they help understand what happened. However, descriptive analytics provide a foundation for other types of metrics.

DIAGNOSTIC

Diagnostic metrics help manufacturers to understand why something happened. They are often based on descriptive analytics collected over time with formulas or artificial intelligence to spot anomalies discover how interrelated operations or processes impact each other.

PREDICTIVE

Predictive KPIs use descriptive and diagnostic metrics to identify the likelihood of future performance. Examples include machine break-down forecasts or customer bankruptcy predictions that may result in excessive bad debt write-offs.

PRESCRIPTIVE

Prescriptive analytics combine descriptive, diagnostic, and predictive metrics to suggest how to prevent issues from occurring before they happen. They often rely on mathematical modeling and business rules.



Strategic Metrics Every Manufacturer Should Consider

There are thousands of financial, sales, manufacturing, and operational metrics that manufacturers develop and monitor to drive improvements throughout every aspect of their business. But what are the most critical metrics that transcend industry segments that everyone should consider? Below are recommendations for key performance indicators that successful manufacturers use to grow strategically.

FINANCIAL



Revenue: Total sales of products and services generate revenue, a lagging indicator measured against sales targets and adjusted for seasonality or market fluctuations. Monitor new revenue separate from recurring revenue, which is easier to predict.

Expense: Expenses should be categorized and monitored separately as direct variable costs such as materials and labor impact cost of goods sold and fluctuate with sales. Conversely, overhead costs like rent and equipment are indirect fixed costs independent of sales or production volume. You may also want to breakout non-manufacturing costs such as marketing, sales, consulting, and other expenses.

Cash Flow: Cash flow is vital for manufacturers who often purchase materials months before actual customer demand. Operating Cash Flow metrics are dependent on accurate net income calculations, non-cash expenses, and working capital analysis.

SALES AND MARKETING



Estimates/Quotes: Your sales pipeline is a leading indicator of future revenue and manufacturing demand. Companies that experience lower estimate conversion rates or reduced quote volume will inevitably see revenue drop and decreased manufacturing demand in future periods. Monitor estimate and quote levels and conversions for better revenue forecasts.

Marketing Leads: Manufacturing sales can be a lengthy process. It is vital to maintain and grow a pipeline of leads through various marketing activities. Measurement of lead volume, marketing activities, and conversion rates are leading indicators of future sales.

Customer Metrics: Manufacturers should monitor several metrics related to customers. These include total customer lifetime value, customer retention (or churn), customer acquisition costs, and customer growth in customer revenue and number of accounts.

OPERATIONS



Staffing: Staff availability and efficiency are crucial for managing daily operations. Monitor attendance, performance, and employee utilization.

Operating Margin: Also called Return on Sales (ROS), operating margins measure profits after paying variable costs before interest or tax. They are a vital metric to measure topline operational performance.

Quote-to-Cash Cycle: Quote-to-cash is the time from customer quote to cash receipt. This topline metric reflects efficient order cycles, fulfillment, and accounts receivable collection business processes.

MANUFACTURING



Throughput: Throughput is a critical metric for manufacturing businesses. Measure throughput using production volume by units produced or as a percentage of total production capacity.

Schedule Attainment: Analyze actual production completion dates compared to required dates to understand how manufacturing performs against customer requests and requirements.

Utilization and Efficiency: Monitor labor and machine utilization and efficiency to spot issues and identify ways to reduce costs and improve profitability.



Align Strategic Corporate Goals with Departmental Metrics

Managers must review metrics with executive leadership to ensure that departmental KPIs do not conflict with corporate goals. Further, many departmental metrics support topline corporate initiatives. For example, order cycle times impact quote-to-cash, and inaccurate inventory directly correlates with material planning and scheduling, which is detrimental to throughput. Make sure to document metrics and specify why you measure the results, how the data is collected, and what goals you expect to achieve. Below is a list of metrics to consider for each area of your business. Select metrics that are easy to measure and beneficial for impacting positive change in the organization.

"Acumatica helps us better analyze our sales and gives us the ability to analyze more categories with much more clarity. We have a lot more real-time visibility into what other entities are doing, which allows me to be more effective and keep better tabs on what's going on and helps us make more strategic financial decisions."

– FRANKLIN SHIRAKI, CFO, FIREWIRE SURFBOARDS

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PRODUCTION

- Work-in-Process (WIP) Analysis by Order
- Standard Cost Variance
- Production Backlog
- Cost Per Unit by Product Line
- First Pass Yield
- Scrap/Rework (Pieces, Cost, Rates)
- Overall Equipment Effectiveness (OEE)
- Overall Operations Effectiveness (OOE)
- Manufacturing Lead Time

ESTIMATING

- Estimates Completed
- Estimate Backlog
- Estimate Delivery Cycle Time
- Estimate Accuracy
- Estimate Win Rate

MATERIALS AND PURCHASING

- Demand Forecast Accuracy
- Stock-Out Percentage
- Vendor Performance
- Material Lead Times
- Rush Orders
- Material Costs

ENGINEERING

- Engineering to Manufacturing Handoff
- Change Order Cycle Time
- Bill of Material Accuracy
- Engineer Efficiency / Utilization
- ECR/ECO Backlog
- Pending Approvals

SCHEDULING

- Late Jobs (Percent, Number, or Days Late)
- On-Time-In-Full Order Percent
- Downtime (Planned vs. Unplanned)
- Setup / Changeover Time
- Manufacturing Cycle Time
- Machine, Tooling, and Resource Utilization
- Bottleneck Resources

OPERATIONS

- Order Cycle Time
- Procure-to-Pay Cycle Time
- Employee Retention / Turnover
- Employee Satisfaction
- Reportable Health & Safety Incidents
- Compliance Issues

"Managers can now drill down within Acumatica and see where an actual number is coming from, instead of having to ask accounting to find it."

– YURI DOROVSKIKH, IT MANAGER, OFS INTERNATIONAL

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QUALITY CONTROL

- Cost of Poor Quality
- Product Defects / Complaints
- Quality Returns
- Corrective Actions
- Non-Conformance
- Vendor Quality
- Quality Audits
- Time to Resolution

SALES AND MARKETING

- Cost Per Click (CPC)
- Website Traffic / Bounce Rates
- Website Conversion Rates
- Cost Per Lead (CPL)
- Marketing Qualified Leads (MQL)
- Lead Conversion Rate
- Aged Leads Report
- Aged Opportunities Report
- Sales Accepted Leads (SAL)
- Sales Qualified Leads (SQL)
- Opportunity Win Rate
- Customer Acquisition Cost
- Time to Payback
- Sales Analysis (by Rep/Region/Product Line)
- Sales Cycle (Time from Lead to Sale)
- Return on Advertising Spend
- Customer Engagement
- Customer Satisfaction – Net Promoter Score
- Lost Sales with Reason Codes
- Quota Attainment by Rep
- Sales Activities by Rep
- Average Sale Price
- Email Delivery, Open, and Response Rates

INVENTORY AND WAREHOUSE

- Inventory Accuracy
- Inventory Valuation
- Inventory Turns
- Carrying Costs
- Order Fill Rate
- Pick/Pack Accuracy
- Pick/Pack Cycle Time
- Returns and Exchanges
- Receipt/Put-Away Cycle Time
- On-Time Deliveries
- Transportation Costs
- Labor Utilization
- Days Sales of Inventory
- Physical Inventory Cycle Count Time

FINANCIAL

- Actual versus Budget
- Days Sales Outstanding
- Aged Accounts Receivable
- Bad Debt Write-Offs
- Credit and Collections Activities
- Aged Accounts Payable
- Gross Profit
- Net Profit Margin
- Working Capital
- Current Liquidity Ratio
- Return on Assets
- Debt to Equity Ratios
- Profit and Loss
- Shareholder Equity
- Revenue Per Employee (RPE)

Discover How Manufacturers Succeed with Acumatica

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Technology for Improved Metrics Management

Defining metrics and key performance indicators is easy. The tricky part is collecting the data and presenting it in a meaningful way to internal stakeholders. Manual data manipulation and spreadsheet analysis delay information and results in data accuracy issues. Consequently, most manufacturers rely on specialized ERP applications and connected business intelligence to streamline data collection with automated alerts or notifications. Modern cloud ERP applications like Acumatica provide manufacturers with a foundation to combine data from multiple systems with configurable inquiries, tailored reports, actionable role-based dashboards, and dimensional data analysis to ensure data integrity and timeliness. In addition, create custom workflows to manage actions across business units and departments to facilitate change throughout the organization.

"I love, love, love the generic inquiries we can build. It gives us better data for analysis of our business processes, so we can see what we are doing well and take a deeper dive where we need to improve."

– SCOTT STARKWEATHER, PRESIDENT, BOULDER CREEK STONE

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DATA COLLECTION



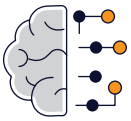
Automate data collection to improve data accuracy. Configure imports from external apps for comprehensive and timely analysis.

Modern ERP applications provide tools to capture information through machine interfaces such as programmable logic controllers (PLC) and supervisory control and data acquisition (SCADA) applications. Improve data accuracy with optical character recognition for scanned documents or barcode scanning for warehouse and manufacturing transactions.

Online customer portals and automated vendor bidding facilitate collaboration with customers and vendors to improve data accuracy. Prepare for the factory of the future by setting a solid foundation with a modern ERP application to connect to the industrial internet of things (IIoT) with RFID tags. Connect data from manufacturing execution systems (MES) and warehouse management systems (WMS) for a holistic view of operational data.

Automate time entry with mobile time entry, manufacturing data collection, and supervisor approvals on any device, anytime, anywhere.

ARTIFICIAL INTELLIGENCE



Artificial intelligence with machine learning makes it easier than ever to improve data accuracy for metrics. Modern ERP systems like Acumatica embed artificial intelligence with machine learning into the core application platform.

Leverage artificial intelligence to streamline accounts payable, expense matching, bank reconciliation, and other business processes.

Machine learning enables the system to improve on data collection and processing tasks. For example, you can "teach" Acumatica to recognize expenses from business supply companies as office supplies that are coded automatically to the corresponding general ledger account.

Artificial intelligence and machine learning can be leveraged in operational and manufacturing scenarios. For example, ERP vendors like Acumatica are exploring opportunities to use AI to spot pricing anomalies and improve material planning and production scheduling.

"Reporting is fantastic in Acumatica. Recently when a salesman and I were looking something up, we pulled it up immediately because finding information in Acumatica is relatively straightforward and simple. He said to me, 'You realize what you just did would have taken us six hours in the old system.' That's just one of Acumatica's tremendous benefits. It's a matter of just clicking a couple of buttons, and we can get every piece of data we're looking for."

– CHAD TREADWELL, VP OF OPERATIONS, FSC LIGHTING

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DASHBOARDS



View key information and metrics with real-time dashboards customized by individual, role, or department. ERP Dashboards are a convenient way to display essential data to immediately tell what you need to know and what to do next. With Acumatica ERP dashboards, you can monitor current financial, operational, and organizational information and analyze real-time trends and KPIs related to your job. Manage complex data through live dashboard widgets with flexible visualizations, including:

- Custom inquiries
- Charts and Gauges (line, column, bar, etc.)
- Data tables
- Data from external sources
- Power BI tiles
- Key Performance Indicators
- Shortcuts to forms, reports, and dashboards

Live dashboards empower users with drilldowns to view source transactions in greater detail. In addition, every Acumatica dashboard is mobile-ready and compatible with any web-enabled device.

POWER BI ANALYTICS



Acumatica leverages business intelligence tools, such as Microsoft Power BI, to aggregate data from multiple sources, extract actionable information for strategic decision-making, and present it visually to stakeholders. With Power BI, data from various systems can be aggregated, organized, and analyzed. Combine data from Acumatica with external data, such as CRM applications, Manufacturing Execution Systems, or Quality Management Systems, to gain new insights into operations. Use Acumatica generic inquiries to expose Acumatica data via an Open Data Interface (OData) for visibility by Power BI.

REPORTS AND INQUIRIES



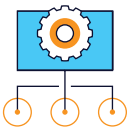
ERP systems track all company transactions, such as accounting, sales, inventory, and manufacturing. Reporting functions access the raw information from the ERP database.

Each Acumatica application comes with a complete set of actionable reports and generic inquiries that can be used out-of-the-box to access real-time data. Reports are easily tailored, and new reports can be created using Acumatica's Report Designer without coding experience. The Generic Inquiry writer accesses any data in Acumatica—including data stored in customized fields—and publish it, export it to Excel, or format it for OData. The OData formatting option exposes the data for business intelligence tools like Microsoft Power BI.

Acumatica supports multi-dimensional reporting using subaccounts with segmented keys. Break down information into smaller facets to view items by price, color, size, store location, or dimensions that you select. With Reporting and Generic Inquiries, you can:

- Schedule reports to run as needed
- Generate signed PDF documents
- Customize reports with your branding
- Create data views with filters and formatting

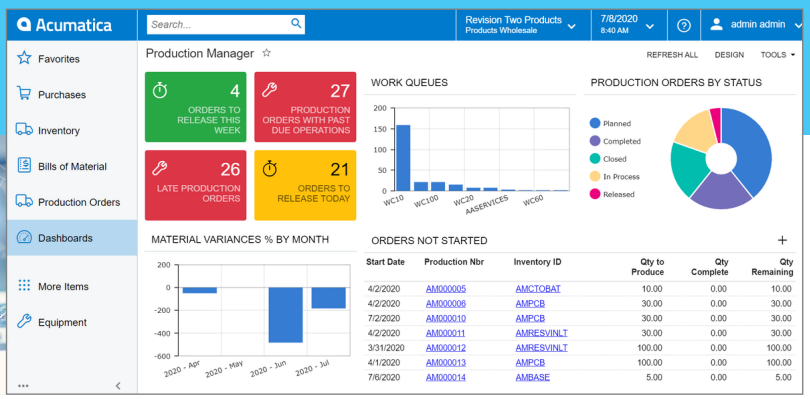
NOTIFICATIONS WORKFLOW



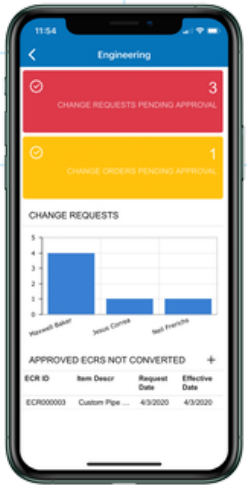
Generic Inquiries are used with Business Events to push notifications to management and users alerting them to potential issues so they can take proactive actions in real-time. In addition, custom workflows can be triggered to send alerts and notifications to employees, customers, or vendors. For example, trigger customer communication when sales order shipments are completed, notify vendors of low stock by warehouse location, or alert warehouse staff when back ordered parts are received or produced to inventory and available for shipping.

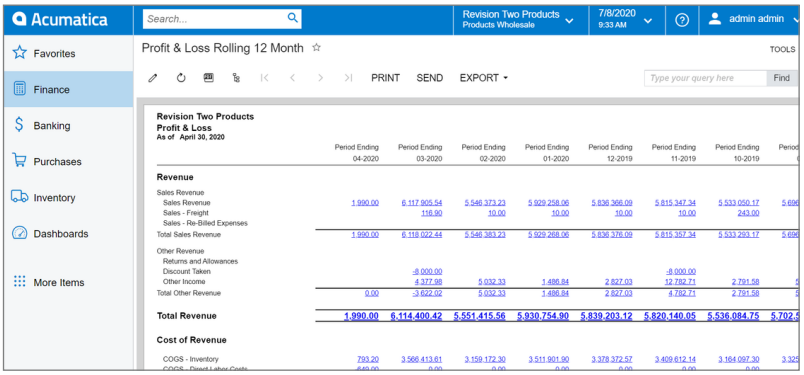
Acumatica Analytic Applications

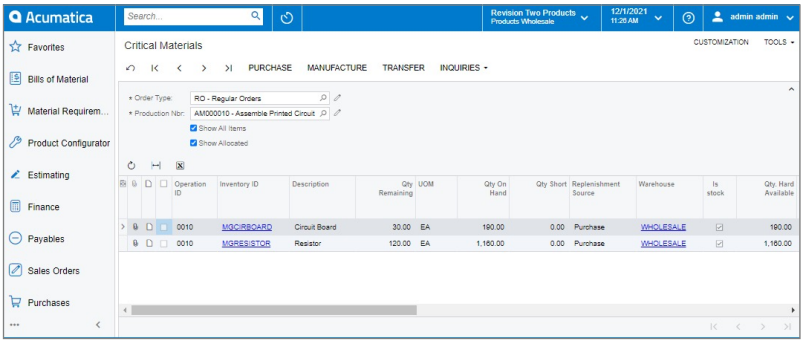




- Role Based Dashboards
- Interactive Reports
- Configurable Generic Inquiries
- Native Mobile Apps







Discover a Better Way to Manage Metrics with a Comprehensive ERP Application Built on a Future-Proof Cloud Platform

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Execute on Actionable Business Insights

Metrics are meaningless without action. Therefore, every company must develop plans to continuously monitor and improve metrics with documented procedures to act on insights gained through key performance indicators. Measures should include training and corrective actions with project management to coordinate activities.

"[In the future, we are considering] integrated customer ordering, integrated distributor information, and enhanced Power BI dashboarding . . . Data is available from anywhere in the cloud, so people can do their jobs from the office, airport or home"

– DEREK SZABO, MANAGING DIRECTOR DEVIL'S PEAK BREWING COMPANY

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DOCUMENTATION

Make sure to define every metric and related calculations or formulas. Identify stakeholders by name or role responsible for managing each metric and subsequent corrective actions. Establish timeframes for reassessing metrics periodically. For example, metrics established today may not be relevant next year due to the elimination of product lines, and metrics may need to be adjusted to account for expansion into new markets. Modern ERP applications like Acumatica include embedded wikis for documenting sales and operating procedures (S&OP) such as metrics. Wikis are an ideal platform for metrics management as they link seamlessly to ERP screens and tasks. Further, wikis support attachments such as documents or images.

BUSINESS PROCESSES

Acumatica's Visual Workflow Engine enables power users to see and modify states, actions, transitions, valid values, and enabled fields to control workflow without coding. Leverage ERP workflows to manage corrective actions and trigger business events to create and assign tasks for users in the system.

TRAINING

Employee training is crucial to ensure that existing and new employees understand the importance of metrics and their role in data collection, assessment, and corrective actions. Leverage embedded wikis as training aids for employees, create training videos on wiki pages and generate recurring training tasks with CRM to ensure that employees review metric policies and procedures frequently.

CORRECTIVE ACTIONS

What happens when metrics identify issues? First, business leaders must have a documented corrective action plan in place. Next, embedded CRM is useful for logging cases or reported problems, documenting actions, and assigning user corrective action tasks. Finally, business workflows alleviate communication and facilitate collaboration across departments. For example, financial metrics may indicate cash flow problems. Corrective actions may involve sales and marketing, warehouse management, and manufacturing teams to boost marketing campaigns while initiating short-term cost-reduction activities.

PROJECT MANAGEMENT

ERP applications like Acumatica provide native project management applications to streamline the implementation of new metric initiatives and related tasks. Project accounting empowers management to coordinate activities across teams with timelines, mobile time entry, and collaboration with external resources such as specialized business consultants or technology firms.



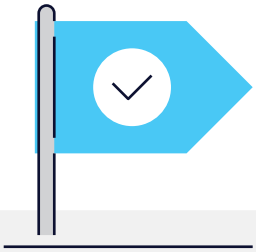
Manufacturing Metrics Made Easy with Acumatica

Metrics provide manufacturing leaders with real-time business insights to remain agile and drive innovation throughout their organizations. However, manufacturers with disconnected systems and legacy ERP applications struggle to connect data across disparate platforms with few tools to streamline metric management.

Modern cloud applications like Acumatica empower manufacturing executives and departmental managers with real-time insights through role-based dashboards, live reports, and inquiries with drilldowns to source transactions. In addition, dimensional business intelligence and automated business events and workflows empower leaders with tools to manage their business objectives efficiently.

Built on a future-proof cloud platform with native artificial intelligence and machine learning, Acumatica provides unparalleled manufacturing depth with robust financials, native customer relationship management, and powerful business intelligence applications.

Boost sales, maximize resources, and improve profits with best-in-class applications for production, estimating, engineering, material planning, scheduling, product configuration, and manufacturing data collection. Acumatica Manufacturing Edition is designed for make-to-stock, make-to-order, configure-to-order, engineer-to-order, repetitive, and project-centric manufacturers.



"We love Acumatica's dashboards. We are in the process of integrating Microsoft's Power BI to pull information for our sales team reports to send to our distributor agencies, and the overall transparency of Acumatica has been very helpful to me."

– SHIVANI RAVAL
DIRECTOR OF OPERATIONS
FIDELUX

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 www.acumatica.com.