

# MANUFACTURING EVOLUTION

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# HOW MANUFACTURING HAS EVOLVED

The Manufacturing Ecosystem has outlived its original purpose due to constant changes in increasingly competitive markets. Manufacturers must now broaden their approach and focus no longer on simply the work performed within a single facility, but instead they must now consider the entire supply network from raw materials, through manufacturing and shipping to the retailers. The Best manufacturers in the business are finding new technological solutions that help them manage their entire operations from production, to maintenance, to quality control and inventory management. The goal is to improve the utilization of assets and materials and ensure the continued improvement of work procedures.

The real value of investing in Manufacturing Operations improvements is quite significant and can lead to a much better bottom line as well as improved customer service and cost effectiveness across your company.

Best practices can be established by examining the most common characteristics shared by some of these best-in-class manufacturers. These companies are:

- **Combining automated data collection with traditional methods, such as analytics and data historians**
  - **Standardizing their procedures enterprise-wide including KPI measurement, optimization, and exception handling**
  - **Make decisions based on operational metrics and financial information examined in real-time**
  - **Utilize Manufacturing Intelligence**
  - **Try Lean manufacturing**
  - **Make use of Advanced Planning and Scheduling**
  - **Use Plant Floor Automation**
  - **Use Quality Management Systems**
  - **Invest in plant floor automation and automated data collection**
  - **Have an enterprise-wide solution platform which connects all necessary business processes**
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# MEASURE YOUR EFFECTIVENESS

The value of manufacturing operations is evidenced in growth and consistency. Companies that invest in Efficiencies see increases in on-time delivery, raw material usage, and equipment effectiveness. These improvements can lead to better financial success as well as improved customer service and cost effectiveness. Manufacturers are more likely to make decisions based off metrics as well as four times more likely to standardize their procedures.

Regardless of the size of your business, boosting productivity is essential to enhancing gross profits and maintaining competitiveness. Productivity on the manufacturing floor depends on a combination of efficient employees, equipment and processes. Driving improvement in all of these areas involves examining the current practices in place and adjusting systems, employee training and even the equipment used to generate parts and components.

Before you can adopt any method for productivity improvement, you'll need to measure your existing output levels, create a baseline and implement solutions for measuring change.



## **Examine the Existing Workflow:**

The first step is all about identifying pain points in your current workflow. Analyze the people, technology and processes required for production—as well as the procedures, communication tools and resources available across the company. Consider using value mapping as an effective solution for identifying and monitoring projects for process improvement; this strategy enables managers to pinpoint issues and record how changes impact the overall system.

## **Update Business Processes:**

Share current workflow problems with project managers to develop improvement plans for the manufacturing process. This could mean re-assigning resources to different areas of the manufacturing floors, managing budgets or becoming ISO certified. Be sure to systematically evaluate performance and interpret any appropriate changes.

## **Invest in Continued Employee Education:**

The manufacturing, machining and cutting industries are constantly changing—there's always a new technology promising to make manufacturing floors more efficient than ever. Technological advancements often change the skills required for certain tasks, and workers will require access to regular training to keep up with more advanced specialist skills.

## **Have Realistic Expectations**

Client expectations, pressures regarding production and strict deadlines can contribute to unrealistic goals. When workload benchmarks on the manufacturing floor are unattainable without some compromise to safety or quality, employees become dissatisfied, preventing the company from reaching labor goals. To boost worker efficiency, it's important to set realistic, clearly defined objectives that ensure a combination of punctuality, high-quality output and safe procedures.

## **Get Smarter Machining Tools:**

Manufacturing is an industry in which an employee can only be as productive as his or her tools. While innovative machines, such as waterjet machines or CNC mills, can be costly in terms of initial setup and training, advanced equipment can have a positive long-term effect. Manufacturing companies often find that a machinery upgrade helps them stay competitive in a new and innovative market.

## **Invest in Maintenance:**

There's a link between the costs associated with downtime and the time and budget invested into preventive measures. While new equipment can boost productivity, it also requires maintenance to ensure that it continues working at an optimum level. It is important that employees know how to troubleshoot instances of system downtime, to quickly find root causes of errors. Don't be

# //// INCREASE PRODUCTIVITY

too quick to blame the tool for problems—remember to think about the process, the blueprint, the material and more.

## **Stay Organized:**

The number of lost dollars and wasted man-hours that result from a lack of organization can be surprising. One surefire way to enhance productivity in any environment is to ensure there's a well-organized place for everything—from materials, to machine tools and documents. When organizing your work area, think about the layout of your machining equipment and tools and whether they currently maximize efficiency. If not, consider rearranging your manufacturing floor to create a smoother workflow.

## **Encourage Collaboration:**

The manufacturing floor is most productive when everyone works together towards the same goal with as little waste and conflict as possible. While focusing on work is important, it's also crucial to ensure that each staff member feels comfortable as part of a team. The better the members of your team can work together, the more they will encourage a productive workplace culture.

# //// LABOR

In manufacturing, one of the largest variable components in the cost of products is labor. Labor costs can have a major impact on how manufacturers price products and invoice customers, ultimately impacting sales and profitability.

Detailed information about time on task and production efficiencies can help you better manage your workforce. But tracking tasks and the associated actual labor costs can be a very complex, time-consuming and costly effort. As a result, many manufacturers make do with standard cost estimates instead of actual costs, making accurate product pricing a challenge, if not impossible.

Despite how much is riding on labor costs, many manufacturers manage pricing and the production workforce based on estimated time and costs, without any real knowledge of how close those standard numbers really are to true labor costs.

Labor costs affect many other areas of the business as well, amplifying the impact of data inaccuracies on the financial health of the business. If costs are not accurate, engineering cannot make the best business decisions in the product design phase or search for changes that could enable more cost-effective production. Unresolved variances between payroll hours and production leave everyone guessing about production efficiencies and true costs. And finally, the overall financial management of the business is hindered.



# RECONCILING PAYROLL AND PRODUCTION

The inability to integrate time and attendance and payroll with ERP systems forces the maintenance of two disparate sources of information. Significant time and expense is associated with the redundant effort to capture data for these systems. There is also no way to easily reconcile the two systems, and neither system on its own is equipped to track 'time on task' by employee or by work team -- either for a specific work order or a specific task.

A system which primarily enables the capture of employee arrival and departure times, may show that an employee worked 40 hours. But a second set of costing and tracking numbers entered in your ERP system may only show 30 hours as the labor estimate. The manufacturer is left without the ability to determine how those additional 10 hours were spent -- and management is left to wonder what costs were not captured, where charges may be inaccurate, and whether profit margins may actually be smaller than they appear.

## INACCURATE LABOR VARIANCES

Labor variance is the difference in labor costing reported by the ERP and Time & Attendance systems. While the goal of today's manufacturers is to keep labor variances under five percent, the reality is generally 20 to 30 percent -- or higher. This variance can be the result of many factors.

For example, the ERP system may be utilizing standard costing, which states that a specific product takes five hours to manufacture. But the plant manager may be aware that newly implemented lean initiatives have reduced that time to three hours. In this situation, the company's profit margins are actually higher, but not visible. Without one consistent set of numbers driving both payroll and labor costing, a product may be priced higher than necessary, impacting competitive positioning. And sales will not realize they have leeway to lower pricing to win an order.

Controlling labor variances is even more challenging in dynamic manufacturing environments, where the collection of data is more complex. All day long, employees move between jobs and manufacturing lines, working on different products and different tasks.

In addition, there may be tasks that workers are executing that are not captured, creating the opposite scenario -- estimated labor costs are too low, reducing margins and profitability. Both situations are detrimental to the business -- yet impossible to correct without an efficient method to track and monitor actual labor costs.

# //// GUESSTIMATE' PRICING MODELS

Standard costing is really a 'best guess' at labor costing -- these numbers are often inaccurate, incomplete or out of date. Accurate job costing requires the capture of all tasks associated with a specific product or job, including direct and indirect labor in setup, production and customer service. Inaccuracies in the collection of time allocated to machinery and the use of materials can result in the inability to properly pass those charges through to the customer, reducing company profitability.

## //// REDUCED OPERATIONAL EFFICIENCIES

Traditional methods used to collect labor costing information can significantly reduce efficiencies throughout the enterprise, affecting manufacturing line workers as well as plant managers and administrators. Time consuming manual business processes silently erode worker effectiveness.

For example, workers on the production line are forced to either spend time completing paper timesheets or traveling to and from a wired time clock or PC workstation to punch in and out.

The use of manual spreadsheets is very costly to the company -- managers can and often do spend as much as one full day per week on these calculations, wasting valuable time on redundant efforts.

This duplication also extends to administrators in payroll entering and processing paper-based time sheets, as well as the inevitable errors inherent in the 'double-touch' of data due to mistakes in keying or the transcription of handwritten information.

Under-utilization of the workforce: you can't manage what you can't measure  
A highly efficient workforce is a key component in lean manufacturing initiatives. But when standard labor costs are utilized and no real-time, real-world data is available, companies cannot see where the workforce is efficient and where efficiency can be improved.

Basically, you can't manage what you can't measure -- and you can't measure what you can't track. So the inability to track time-to-task ultimately inhibits maximum utilization of the workforce. Unproductive activities remain hidden from sight -- managers don't have the information needed to understand where wasted time exists, and therefore cannot create an action plan to remove it. Lack of visibility into real-time labor metrics can lead to:

- **Overstaffing and understaffing of production lines, leading to unnecessary labor costs**
- **reduced manufacturing throughput**
- **increased maintenance and administrative costs associated with a larger workforce**
- **increased overhead costs that can further threaten profitability.**



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**mobilize one's existing labor management system**

So why don't more of today's manufacturers track labor in real time? One reason is the assumption that such a system would be very costly, would take a long time to implement or that it would be highly disruptive to the business. However, virtually every manufacturer already has the foundation in place today to support real-time labor tracking: their existing Time and attendance and ERP systems.

These back-end systems are capable of granular tracking of labor activities, but most manufacturers are only utilizing the Time and attendance system to collect attendance information. Wired systems require employees to travel to and from a time clock or desktop computer to enter data on individual tasks -- a process that is very time consuming and disruptive for workers on the production line. Paper-based solutions require redundant work processes which are time consuming and error prone.

Mobility enables manufactures to fully leverage the hidden functionality of an existing time and attendance system. Mobility effectively “untethers” the Time and attendance system, allowing its extension to the point of activity. Using a handheld mobile computer or laptop, line supervisors and line workers can capture and transmit the information required to reveal the real cost of labor in real time.

By leveraging mobility, enterprises can build on existing technology investments to create an accurate real-time labor costing system. The functionality of the existing Time and attendance system is expanded. Instead of collecting only the time an employee arrives and leaves the facility, the system collects detailed labor costing data for individual employees as well as teams, including time on task, indirect hours and quantities produced.



# THE SOLUTION

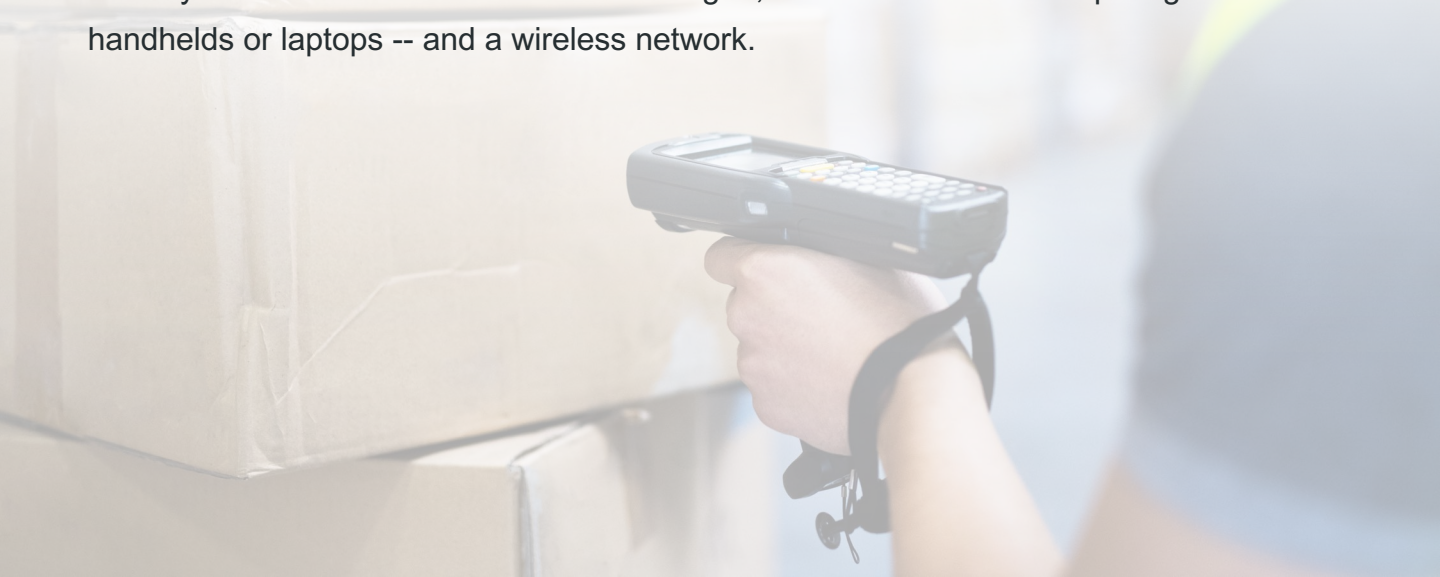
In addition, a solution at the point of activity can also track other information related to costing activities for the ERP system, such as materials consumed, equipment utilization and inventory. This single set of labor costing information is utilized to populate both the T&A and ERP systems, effectively integrating these two long-disparate systems and enabling reconciliation of payroll and production hours.

Also, mobile labor tracking solutions are extremely flexible and able to integrate easily with existing or desired workflow. The solution can be deployed for each employee, or for line leads and supervisors, regardless of whether they are on the production floor, out in the yard or even at a customer site. When workers have access to a simple-to-use application on a mobile computer, you can automate, collect and error-proof the exact time spent on any given task.

Well-designed front-line applications do much more than attempt to squeeze a browser window onto a mobile device. Developed to meet the requirements of the mobile device as well as the data collection requirements of the business, these applications combine available device functionality and best-in class application automation practices. Easy-to-navigate screens and menus, pre-populated dropdown lists of valid values, bar code scanning of work orders and other paperwork as well as employee badges and materials are all considered part of a best-in-class application.

The result? Accurate labor costing information is collected easily, cost-effectively and with little opportunity for error -- with all information available in real time.

The increases in accountability and productivity typically deliver a full return on investment in less than 12 months. And the ROI is further improved if there is an existing mobility infrastructure that can be leveraged, such as mobile computing devices -- handhelds or laptops -- and a wireless network.



# THE SOLUTION

The resulting real-time labor management system enables collection of accurate labor costing data throughout the enterprise -- from workers on the plant floor, in the yard, warehouse and distribution center as well as service technicians performing installation and maintenance on site at customer locations.

**Benefits include:**

- **Increased Job Costing Accuracy**
- **Improved Productivity**
- **Total Accountability Of Labor Hours**
- **Reduction In Data Errors**
- **Improved Payroll Accuracy And Compliance**
- **Reduced Order-to-cash Cycle**
- **Real-time Job Status**
- **Refined Costing Management**
- **Improved Overall Workforce Management And Utilization.**

# LOSSES/WASTE

Inefficiency in virtually any manufacturing category can usually be traced back to 6 universally occurring loss categories. They include: breakdowns, setup/adjustments, small stops, reduced speed, startup rejects and production rejects. Taking this approach gives you a guideline for attacking the most common causes of waste in manufacturing processes.

# MACHINE MONITORING

Machine monitoring software automatically collects data from machines and uses this data to provide real-time visualizations and notifications, as well as historical analytics to help operators and management make faster and more informed decisions. In addition to providing you with at-a-glance performance on a machine-by-machine basis, machine monitoring gives you a window onto your entire manufacturing process. If you are utilizing secure, cloud-based manufacturing software, it also puts

information at your fingertips anywhere there's an internet connection.

Machine downtime, quality issues, and poor performance can be categorized automatically or by the operator. The key to creating a truly lean manufacturing process is being open-minded. You may find through experimentation that a combination of lean techniques deliver the optimal result. Tracking Machine Performance can serve as the backbone to any lean manufacturing program



# MACHINE MONITORING

by providing real-time manufacturing analytics and allowing you to track the positive impact your lean implementations have on your productivity and efficiency over time.

# QUALITY ASSURANCE

Best practices in a company's QA program all contribute to a host of benefits, including reduced costs, dramatically increased efficiencies and, ultimately, greatly enhanced customer satisfaction.

## **INTEGRATION OF A ROBUST ERP WITH QA CAPABILITIES DELIVERS THE HIGHEST QUALITY**

While many manufacturers have yet to adopt a fully automated system to ensure the quality of their product, gradually, more and more are transitioning into enterprise resource planning (ERP) with robust QA functionality to achieve these objectives. These solutions provide the tools needed to effectively manage quality assurance objectives at every point in the supply chain – from initial evaluation to finished product to distribution. ERP systems also enable QA teams to monitor all of the systems and sub-systems in the production cycle for errors or defects so that the finished products are consistently of the highest quality, as well as safe and effective.

## **QUALITY ASSURANCE YIELDS HIGHER CUSTOMER SATISFACTION**

Quality assurance and customer satisfaction are inextricably interconnected. That's why manufacturers who rely on ERP

solutions during the production process are much more likely to deliver higher-quality products that will attract more loyal customers for the long term. An ERP system with robust QA capabilities is able to gather critical, real-time intelligence from within and without – from the manufacturing plant, distribution centers, human resources, etc., as well as from every link in the supply chain. Armed with all of this intelligence, manufacturers are not only able to produce higher-quality products; they can deliver higher levels of customer service.

## **IMPROVED WORKFLOWS MEAN REDUCED EXPENSES AND BETTER DECISION-MAKING**

Another by-product of an ERP system with integrated QA functionality is the ability to generate accurate forecasts that can anticipate future events in the supply chain and help to make workflows more efficient. Worthy ERP solutions provide a broad range of business analytics that can shed light on the effectiveness of assorted workflows,

including production planning, inventory and distribution. Studies indicate that use of ERP systems helps businesses make more informed decisions and significantly reduces costs. One such research study by the Aberdeen Group reveals that access to accurate, real-time information about daily operations helps businesses make faster, smarter decisions, enabling them to reduce operational costs by 23% and administration costs by 22%.

### **QUALITY PRODUCTS BREED LOYAL CUSTOMERS**

This is an extension of QA Best Practices #2, but it bears restating – If a manufacturer takes all the steps necessary to produce a first-rate product and deliver to its customers on time, the odds are very good that not only will they be repeat customers, but they will recommend their products to others. In other words, the benefits (and the profits) will continue to accrue over time. One additional way to earn customers' trust is to provide them with up-to-date quality assurance testing information (taken from the ERP system) on products they purchase, which reinforces the perception that the company is totally committed to quality and transparency.

### **COMPLIANCE**

Compliance is a critical issue for all manufacturers and an ERP solution with QA capabilities will instill confidence that all regulations and standards are met across the board. For starters, these systems will help manufacturers comply with all health and safety guidelines in the workplace (e.g., OSHA) and thus avoid hefty fines and other penalties that can result from non-compliance. To this end, the right ERP solution is able to collect all applicable data from integrated systems to monitor workplace safety and to prevent any potential workplace hazards. An ERP solution also facilitates generation of weekly or monthly safety reports. The system should also enable manufacturers to design their own testing procedures of incoming materials to make sure that they meet all the requirements, starting with the quality of raw materials and spreading throughout the entire manufacturing process.





People, systems and databases must all talk to each other. A formal sales and operations planning strategy with support software such as dashboards or full-blown S&P software suites can help. You might also want to create a demand and supply planning organization overseen by someone in the executive suite.

Integrating specialized demand and inventory planning software together and with related systems, such as ERP, is an opportunity and a need that the industry doesn't always adequately address. Vendors admit they spend significant time integrating their software into existing supply chain management systems.

"You want one tool that's going to be able to speak every group's language," said Noha Tohamy, a vice president at research firm Gartner.



## **TRAINING USERS OF DEMAND PLANNING AND INVENTORY MANAGEMENT SOFTWARE**

For some people, forecasting is an entirely new discipline. Companies that have successfully implemented inventory management software stress the importance of teaching the underlying methodologies before handing out the software.

Webinars, slideshows and classroom instruction can spread the gospel about your company's new planning processes. A train-the-trainer approach is one of the quickest, least-expensive ways to make people comfortable with inventory management software.

Ease of use should be high on your list of criteria when deciding between vendors, but don't ask people to take on too much at once. Let them start with the basic functions and build from there.



## **CHANGE MANAGEMENT: DUMPING THOSE OLD SPREADSHEETS AND PAPER**

Inventory managers may be reluctant to give up their old familiar ways. You might have to forbid the use of spreadsheets, for example, to get people to switch to new inventory management software. To ease the transition and build trust, sit down with your users and demonstrate the software's benefits. Ironically, it might help to simulate the software in Microsoft Excel for those who have never made the transition from paper.

Executive champions on the IT and business sides and easy-to-use software can also further buy-in, which can enable the cultural change needed to master inventory management challenges.



## **STANDARDIZING DATA**

Some companies have been tripped up by having too many definitions for the same data, such as purchase orders and product categories. Standardizing data definitions is a necessary step in building an architecture that works across all departments and locations.

You might also need to clean up the sales and inventory data coming into the system, perhaps by reformatting legacy data or writing an application that can collect the information you need.



## **CHOOSING SOFTWARE THAT SUITS YOUR BUSINESS**

The unique nature of your demand will determine which components you need. Goods can be expensive to ship overseas and delays can squash revenue gains, so a well-honed demand planning tool updated with real-time sales numbers is essential to address such inventory management challenges. But if your sales typically come from large deals, inventory management software merits more attention.

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# About Scanco Software



Since 1989, Scanco has been a leading provider of supply chain automation software and services. From our inception, we have focused on innovative warehouse management solutions with a unique technology-driven approach. Our solutions deliver unequaled efficiency and visibility for distribution and manufacturing companies around the globe.

From basic barcoding to the most complex distribution and manufacturing operations, Scanco software is positioned to grow with our customers ever-changing business needs. We are focused on providing top-tier, fully integrated automation solutions built specifically for your ERP solution. Today, thousands of world-class distribution and manufacturing companies have automated their facilities with cutting-edge Scanco technology.



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