



Bluestreak

QMS + MES
Quality Management +

Bright AM™

Additive Manufacturing
Manufacturing Execution System

Understanding
the
Pieces/Parts
of
Software Automation
Versus
Quality Management

Software Automation

There is a fine line between excessive software automation and effective quality management especially in job shops.

When upgrading work order processing and quality management software in the pursuit of modern digital transformation, be very careful, because if software automation goes too far, it can destroy your effective quality management and production personnel will not be held accountable for what they do on each job.



Service-based manufacturing companies and 'job shops' like heat treating, coating, plating, surface finishing, fabrication, and forge, are always looking for ways to improve their production processes (whether paper-based or with electronic job travelers) through some type of Process transformation. Oftentimes, through some type of new computer-based technology, companies attempt to streamline and improve operational efficiencies, but beware!

Every company is on its own unique path when it comes to the way they go about their niche craft. But, even though two companies provide the same end service using the same type of equipment, they might each go about it a totally different way from the other. One might have several extra operation steps embedded in their overall Part Process, and they may want to formally track each job step on the production floor via the software, with time/date stamps, load counts, direct/indirect labor counts, etc. Others may have individual steps in their Process that do not require formal tracking.

Another thing to think about which should be considered, is the actual skill levels of the production staff workforce, which may differ dramatically within the various Work Centers across the plant. Continuous attrition makes this workforce dynamic change almost weekly (some have told me daily). Also, what about individual commitment levels, each person's unbridled attention to detail, a conscientious focus on each separate job step task, and general attitude at the time?

Many business owners and C-level executives, when asked about what causes them the most headaches on a regular basis, and is the hardest part of a business to manage effectively, almost all say, staff issues or workforce management, including hiring, retaining good employees, and training to ensure each person does their job correctly.

Weakest Link

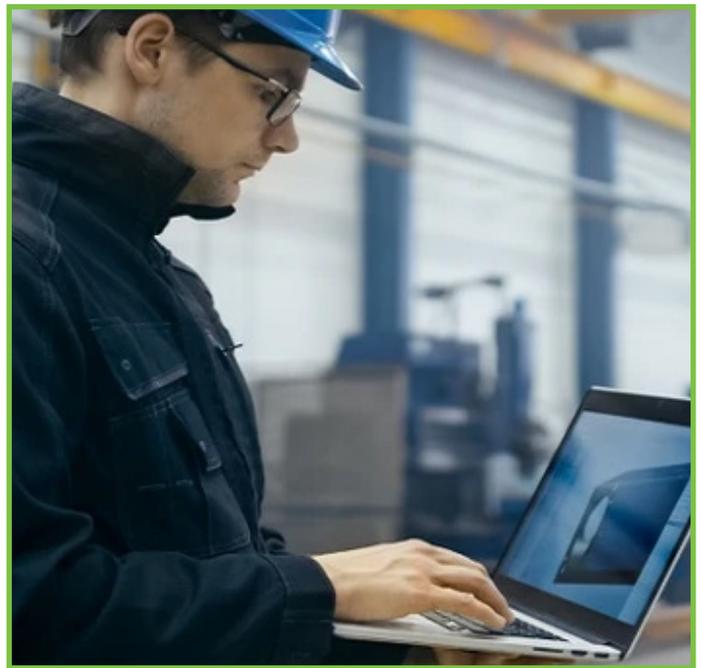
In most companies, whether you're talking about security, including data or cyber security, the **weakest link** is always the people, whether past or current employees. In this discussion we will focus on those employees that currently work there.

Your workforce directly affects the way you do business, and the overall quality of each completed job; everything from receiving parts, work order entry, releasing the job to the floor (with the right production Process attached), Specification requirements, operating instructions included with each production step in the Process, Part inspections and shipping.

As you know, and have undoubtedly witnessed many times in your own shop, human nature of the individuals involved in completing each of these steps, will invariably, at some point, try to cut corners to improve throughput and increase production. They may try to eliminate key steps in a critical Process; say they did something when, in fact, they did not; say they checked and verified something during part processing when they didn't; say they examined the Part thoroughly for defects when the word thorough isn't even close to what they actually did during the quality inspection. I'm sure you can think of many more examples you can add to this list through your own personal business experiences.

At this point, it is important to clarify what I am saying so you do not get the wrong idea. I want to make sure everyone understands that the individuals comprising your workforce are truly your greatest business asset. Without the right people operating your expensive equipment, and carrying out the necessary job steps required to successfully fulfill each order, you don't have much of a business.

But, in addition, have the mindset that your operating software is just as important an asset as a new piece of equipment or a great employee! If proper software automation is implemented correctly, it should prove to not be an expense to the business, because the production savings alone will pay for the cost of the software, with some left over to add to the bottom line, and increase profits.



For too long, the cost of the right software has been shown on the wrong side of the ledger.

It would behoove most businesses to spend time documenting bottlenecks, problem areas, noticeable areas of improvement, cost of rework, scrap, waste, losing a customer due to poor quality or not meeting deadlines, etc. Then, with these important metrics in hand, you can ensure that the new software addresses and satisfies these critical requirements.

Quality is Key

Since quality is always a key ingredient in a successful business, let's talk more about that.

Let me ask you a question... Have you ever been in a boardroom or meeting of company executives when one well-intentioned individual stated that the main company goal was higher quality? And everybody nods their head "yes"? Well, that sounds good if you're just blowing smoke by coming up with an easy non-confrontational comment that everyone would agree with; basically stating the obvious, and hoping everyone thinks you are a smart person.

Now, this might burst that person's bubble of demonstrable mental aptitude... BUT, the goal of every company has NEVER been high quality. The GOAL is making more profit, now and in the future. QUALITY is really not the main goal of the company, even though it is stated on every businesses' website and in their corporate literature, because that's what the prospective customers want to see. I get that! But let's take a reality pill here! QUALITY is a "Necessary Condition" for increasing your business, and it has a direct impact on sustainable profit margins.



So, in your quest to satisfy this 'necessary condition,' make sure your company is not just focused on looking for ways to make it easier for your shop floor workforce; streamlining what they need to do as part of a specific job requirement; removing operational steps that THEY don't feel are necessary; or just simply speeding things up on the production floor to get more work out the door during the same 8-hour shift.

Because this 'necessary condition' has sometimes taken precedence over everything else in the plant, some companies have made a choice to implement software with an electronic traveler on the production floor that can automatically track jobs on to the next step in processing, sometimes automatically tracking several sequential job steps through at the same time, just so a production floor operator can reduce the number of 'clicks' on a computer workstation, or eliminating the entry of any information about what they just did (or did not do) on each of those individual job steps.

I absolutely agree with electronic job travelers/work orders to reduce paper in the shop and the need for staff to write things down on that paper. Handwritten forms are highly susceptible to errors and misunderstandings in processing requirements, test results, quality inspections and compliance. Then, you also have the issue that no one in the office can read what they quickly scribbled anyway; so what's the point?

Job-step Tracking

Your production control software should make it easy for your plant workers to do what they do best in their particular area of processing. It should collect all the required information electronically, so there is no question about how a job-step was processed and completed, with the appropriate sign-offs and compliance assurance documentation, collected automatically as the job is moving through the production floor towards completion.

Speaking about job steps, which are actually individual operations within your pre-set Processes, let's talk about that automatic job-step tracking notion that I mentioned earlier. Some fairly new software on the market scene is touting how it can save time in job processing by automatically tracking through multiple job steps at one time. If it is not necessary for it to be tracked individually as the job is being completed, then why were the individual job steps built into the original Process to begin with?

When this automatic job-step tracking occurs out in the plant, the supposedly faster production and work order management software is making some huge assumptions, namely:

- that the same person completed those skipped job steps
- that your workforce and individual production operators did everything right and according to the customer or in-house Specification requirements;
- that the person actually doing the work was qualified to do that job step (or even qualified to use that particular piece of equipment);
- that the correct (or qualified) piece of equipment was used on that job;
- that the test results or quality inspections were all within acceptable ranges;
- that there were no nonconformances associated with the job steps that were automatically tracked;
- that the equipment (or personnel) performed perfectly with no degradation affecting Part outcomes;
- that no Parts were actually damaged during that particular step in production;
- that the job was done in full compliance, with proof in the job documentation;
- that NO CAPA was associated with any of those job steps to verify that the assigned corrective and preventive actions were taken and verified during job processing;
- that they don't need to know how long each of the individual job steps took to complete

Two Key Questions

*Here are two questions of tactical importance that **MUST** be considered:*

Two Key Questions...

1. Are fewer software clicks for your production staff more important so you can get jobs done faster?
2. Or... is quality management, individual accountability and preventing rework more important so jobs get done right the first time?

If you chose #1... by eliminating key quality checkpoints and signoffs, your software is making a very risky assumption that will hurt your business. It is assuming that everything was done right on a particular job step, and therefore, automatically passing the job on to the next operational step in your production Process without the documented V&V (verification and validation). You know what they say about the word [ass.u.me](http://www.ass.u.me)?



You rely on your software to track, control, analyze and then 'feed' specific information to the entire workforce in real-time, so everyone can better manage their day-to-day duties and responsibilities for the betterment of the business. With that said, make sure your production management software is used appropriately to reduce rework and increase profits, but not at the cost of quality.

Since individual people are involved in completing every part of a job properly, their inherent desire to cut as many corners as possible to meet production quotas screams for continuous accountability. Without it, quality will suffer dramatically, rework and production costs will increase, unhappy customers and fewer orders will follow, and profits will ultimately take a nose dive. The right software, implemented properly, with an effective workforce training program, will help with this required accountability, while reducing rework, and your overall costs associated with running your business, and shoving subpar Parts out the door hoping no one will notice.

Do NOT Cut Corners

YOU CANNOT CUT CORNERS IF YOU WANT TO BE KNOWN FOR HIGH QUALITY and COMPLIANCE.

As a wise heat treating industry leader once said, "the best heat treating is done by the best heat treaters".

As the capable workforce keeps shrinking, this has a detrimental effect on the inspection and testing of Parts, looking for defects and/or discrepancies. Testing methods, as a component of quality assurance, primarily nondestructive testing (NDT), continues to advance with higher accuracy while improving throughput and efficiency in the process, depending on how the Part is to be used, the Part's material classification, failure modes, etc. With these advancements, testing and inspection techniques have become more automated with preset tool settings/controls to ensure repeatability. A good software system should be able to connect directly to a piece of equipment used for testing and automatically populate the test results into the job testing step so that an operator does not have to enter each test result manually, which can be error prone due to being in a hurry or simply 'fat fingering' a test result with the wrong number.

Quality Management System (QMS) software should be designed to effectively help your most precious business resource... quality-oriented people out on the floor and in every department; working to run the business out of one fully integrated software and database system. In other words, not a bunch of separate disjointed systems, each with their own separate database silos of information, causing double data entry, very prone to errors and miscommunications; not



'talking' to each other, and causing the various departments within your company to also function disjointed with improper up-to-date information that they need to make the right business decisions at the time they are required.

Software automation or some form of digital transformation, should not be used simply as a crutch to enable "warm bodies" to get something done more quickly. And, an added benefit of properly designed, implemented, and well-thought-out staff training, for the chosen quality management and production control software, is that thorough job documentation will happen automatically as each job progresses, which will dramatically speed up and ease the conducting of audits. Configured and set up properly, your software will take all of the stress away from audit preparation, saving you many hours of time each year that can be spent on activities that increase business and profits.

So... choose a software platform that gives you the flexibility to configure it the way your business functions, and allows you to:

- build in all of the required quality checks and sign-offs that you need for both your internal and external auditors;
- manage each job to the right Specification requirements (and the right version of the Spec);
- tie integrated quality management directly to individual operators on the production floor, and track everything in real-time;
- automatically notify a supervisor of certain plant activity triggering events;
- holds individuals accountable for what they do, and does not allow them to do something that would cause the job to be done in a non-compliant way;
- provides a complete and permanent audit trail of exactly what happened on each individual job step.

Your workforce is one of your biggest investments (in dollars and time). We all know there is a labor shortage, a lack of individuals with the right skills, and a challenge to keep the employees you have hired and trained. Training people takes a lot of time and repetition, so it must be done, and there's no getting around that. But your software provider should also train your staff on the proper way to use their software so that it improves your overall business very noticeably, and effectively shows them how it is much better than the way they are doing things now. It should make them more efficient at what they do, with fewer errors, but with very effective, and documented, quality management.

When training and mentoring your staff, think of the word **'P-E-O-P-L-E'** as an acronym... **P**owerful **E**veryday **O**pportunities to **P**ersuade that are **L**asting and **E**thical. Why not let your software take care of the "persuasion" piece right at the time the work is being done, with the appropriate checks and balances that lead to increased profits?

POOR QUALITY has a **COST** - **EXCEPTIONAL QUALITY** is **FREE** -- so **DO IT RIGHT** the **FIRST TIME**. Your people will feel much better about performing their job duties when they are not being blamed for production errors. The right software can help them tremendously.



Buyer Beware

BEWARE of software providers that:

- Are so desperate that they offer you a doughnut for your time (no joke);
- Did not design their system specifically for your type of business requirements;
- Outsource customer support to third party organizations;
- Do not have continuous new development so the software stays on the cutting edge;
- Do not track EVERYTHING that each user is doing;
- Cannot interface with your ERP or other key systems to share critical data;
- Do not have a customer self-serve portal;
- Allow you to invoice a job (or a partial job) before the Parts have been completed for what you intend to invoice;
- Allow shop floor operators to skip tracking of parts through critical job steps and quality control steps through the software's built-in automation features;
- Do not have document management with version control, change approvals, and change acknowledgement;
- Do not have Part sampling plans built into their Part-specific control plans;
- Do not provide for automatic contract review at order entry to reduce errors or omissions;
- Do not connect with equipment control systems, charting or SCADA systems;
- Do not interface with other software systems when critical data needs to be shared on the production floor;
- Cannot interface with your customer's ERP system, or make use of EDI/EDE (electronic data interchange or data exchange);
- Do not offer multiple KPI (key performance indicator) dashboards by department;
- Do not have an extensive workforce training program;
- Do not have the ability to provide instant Notifications of any triggering event to personnel, supervisors, customers, drivers, sales, shop floor, front office, quality managers via automatic text messages, internal mail, and/or email;
- Do not allow various forms of media attachments on individual job steps, such as pictures, videos, diagrams, specifications, instructional documents, etc.;
- Do not help you protect your data and your customer's data through cybersecurity best practices, such as NIST 800-171 or CMMC;
- Do not track direct and indirect labor used during each job step of processing;
- Do not formally manage and document RISK, CAPAs, Nonconformances, customer complaints, or give you the ability to generate a CERT;
- Do not enforce regularly scheduled equipment maintenance or calibration checks by preventing operators from selecting a piece of equipment that is no longer qualified;

Buyer Beware

- Does not allow you to freeze Processes when you do not want them to be changed;
- Do not allow for making Control Plans editable or non-editable on work orders, depending on requirements;
- Do not maintain a complete revision history of a Process, so you can see what changed, who made the changes and why, as well as what orders are connected to a given revision;
- Allow non-conforming Parts to automatically enter the next step in processing;
- Do not ensure that the most current revision of your quality manual and/or operating policies & procedures are centrally located and easily accessible to any user, including those on the production floor;
- Do not allow you to create customer-specific, part-specific, or process-specific control plans that automatically attach to the appropriate work orders;
- Do not allow you to specify the exact user-defined data collection requirements at specific operation steps, as well as when the data needs to be collected during that operation step;
- Does not provide manageable user-defined risk templates with scorable risk questions and answers to determine the overall risk in processing a particular Part;
- Does not satisfy outside auditors checking for proper Risk Analysis procedures;
- Does not require every applicable customer Part that is quoted to have a risk analysis completed before the quote can be printed or emailed to a customer;
- Does not provide for tracking and managing workforce training and/or recertification requirements and timeframes;
- Does not allow for multiple types of job scheduling and equipment utilization views;
- Does not provide for SPC (statistical process control) analysis to look for detrimental Process variations, to help with predictive maintenance, and using 'run rules' to highlight non-random or out-of-control conditions in equipment operating parameters;
- Does not enforce user viewing restrictions within the software for ITAR, EAR, etc.;
- And finally, do not select software that was not specifically designed to be 'extensible', giving you the capability to configure, set up, and change the way the system works based on your own businesses' unique requirements and production process; as well as giving you the ability to turn 'on' or turn 'off' certain data entry fields on screens, change the order the data fields appear on the screen, and change the Label of what the data field is called on the screen.

Contact Us

AND, this is worth restating... If you are using the right software in the right way, the savings alone will pay for the software, and improve your profits, month after month, in perpetuity. Your software, along with your trained workforce, really NEEDS to be one of your most important business ASSETS going forward. You should also be using a good browser-based software that allows your management team to access real-time data from anywhere, any time, and on any device (obviously with proper multi-factor authentication), so they can better manage their part of the business whether in the office or out of the office.

Feel free to contact me if you have any questions or to discuss your operations and how to make the necessary improvements that you are looking for. Or, if you want to know which software that outside auditors have said they LOVE. Email me at ron.beltz@go-throughput.com.



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