Manufacturing ERP failure:
6 common causes

Your comprehensive guide to the root causes of failed manufacturing ERP software projects

Guide highlights

Shop floor buy-in

Data migration

Production scheduling

Inventory management

Contents

Lack of shop floor buy-in

Individuals who work on the manufacturing shop floor are too often forgotten when the conversation turns to ERP systems. They rarely walk up to 'mahogany row', where the executive suites are, and many speak a different technical language causing ERP communication to become lost in translation. But these shop floor ERP users are part of the enterprise team and manufacturing ERP can fail without their understanding and buy-in for system goals.

Shop floor ERP users operate high-tech, expensive equipment. They test and assemble your products to meet your customer's expectations. They are also the source of much of the data a manufacturing ERP runs on. These three facts instantly demonstrate their value when it comes to avoiding ERP failure.

Shop floor ERP transactions

Shop floor users sign on to jobs, and their time setting up or running production, is accumulated. They enter the number of units completed or failed at operations throughout the manufacturing process. Their ERP transactions record work that has physically moved to another assembly area within the plant. Component parts are backflushed from inventory based on those shop floor ERP transactions. They request unplanned inventory from the stockroom to replace damaged parts and record quality data in the manufacturing ERP.

"Manufacturing shop floor ERP users are important for far more than their technical skills. Respect them as a part of the ERP project and you will be rewarded."

All of these transactions made by shop floor ERP users become data processes in your manufacturing ERP. Processes that let your customers know their orders will be on time. Processes that are used to plan whether the shop should work overtime or not. Processes that can be used to track whether your products meet quality standards. Processes that will be used to ensure compliance.

When your shop floor ERP users do not provide the data that fuels these processes, ERP failure ensues.

Giving shop floor ERP users the tools for success

To avoid this data deficiency, your system must make it easy to record time and completion transactions. You could provide integrated terminals at convenient locations on the shop floor or even implement wearable technology. Perhaps your shop floor ERP users are busy welding parts together and their supervisor has told them the pallet must be completed before lunch. They should not have to walk to a remote cleaning area and wash up before entering the required data. If they are wearing gloves and safety equipment, then a keyboard is probably not the best input method. This example is just one of many which highlight the importance of hardware requirements when it comes to shop floor ERP adoption.

Beware of over control. If shop floor users need to record a production fault, just let them do so. Requiring supervisory approval for a shop floor ERP transaction is a sure-fire way to block the transaction from even being entered. Most failures can be analyzed after the fact. When additional material is needed, just issue it to the job. If a transaction is difficult and skipped, the material will still be used but purchasing will only learn about it in the future when you run out because the ERP inventory record was incorrect.

As well as avoiding strict approval requirements, it is important not to force shop floor ERP users to copy data from other sources into the ERP. Automate and link equipment to the ERP directly. Your extruder already tracks how many feet were squeezed through and your saw can track how many centimeters were cut. There is no need to enter the data manually within your manufacturing ERP too, doing so will lead to system resentment and abandonment.

Explain the ERP production scheduling process and be sure the shop floor users understand it. Yes, they will have to tear down a perfectly good setup that will be needed again tomorrow, but the job in between might be for a new customer who will bring much new business if the order is delivered on time. Explaining the rules that drive your production scheduling is all the propaganda you need to ensure adoption of your ERP productions schedule.

Manufacturing shop floor ERP users are important for far more than their technical skills. Respect them as a part of the ERP project and you will be rewarded.

Inadequate data migration

There are several categories of data that can significantly affect the success of any manufacturing ERP system. Carefully testing each category of data and managing the migration can dramatically reduce the risk of system failure.

Configuration data

Configuration data is often company-wide and related to every module, sales, inventory and others. You set the number of decimals here. If you want manufacturing jobs to be five digits starting with 40001, this is where you make that definition. These are a small set of data and might be set manually using the legacy settings as a model. Test the settings carefully as the legacy system might have a different field or value definition to that of the new ERP. Linking component serial number data from one ERP to component lot number from another would lead to failure. This is an exaggerated example, the differences between your systems may be more subtle.

Master data

Master data will significantly affect the way your manufacturing ERP behaves. There are settings at customer, supplier, employee, part, operation and resource level. These can be tricky. The person who wrote the field definition is probably not a manufacturer and has likely never even worked in a manufacturing plant; this often translates into cryptic default field names.

During implementation, you might find a setting that reads in exactly the same way as you planned to operate your ERP in your plant. But in testing, you discover this setting works in tandem with another setting in another module to create a system behavior completely unexpected and unacceptable. Setting a sales order fulfillment to automatically generate a certificate of compliance might be exactly what is desired but later you learn that you also forced automatic generation of part lot numbers you did not want. There can be millions of possible setting permutations which mean some have never been tried and tested by you or your consultants; even the ERP provider can be taken by surprise.

You will discover these problems in testing. The results of a transaction are not as expected. You document that a setting should be imported differently next time. With the next round of testing, that setting is corrected but another transaction fails because another data set reacted to your changes.

So you are testing both transactions and data migration at the same time. If you fail to take both these areas of testing into account, your implementation schedule will dramatically underestimate testing requirements.

Transactional data

The final category of data is transactional. These are sales order shipments and purchase order confirmations. Every shop floor user starting work on a job/operation creates a transaction and another will be recorded when that job is complete and the number of units completed is recorded. These transactional data are voluminous. They could go back years in your legacy system. Because of this, queries and reports can run slowly which might be considered a minor failure unless you are able to filter the data carefully.

While you are migrating data for each round of testing, track the sequence of migration and the length of time each import takes. You will learn that often one data set must be moved ahead of another or system errors will result. The scheduling is important too. When go-live is here, you will have a lot of work to complete in a short time. Confidence that the migration will be complete at 7:00 AM means you can have people ready to verify that data one last time and return to work quickly.

Incomplete testing

Testing is only one phase of ERP implementation in a manufacturing environment, but many consider it to be the most important phase. Whether you choose an off-the-shelf package that claims best of breed features or decided to customize or develop your own manufacturing ERP application, there is one important, common factor – both need to work in your business and deliver the improvements you used to justify the new ERP. Unless you test extensively, you rely on hope.

What should be tested in manufacturing? Everything

Write a purchase order and receive it. Receive one line to inventory and another to expense or capital assets. Does the PO receipt pass through incoming quality inspection as it should? Do you see the inventory quantity increase? Do the debits and credits on the finance side align the way you expect? Start with simple tests like this one. You will probably find the results are good but there will be cases where it doesn't work as expected. Dig as deep as is necessary and understand what went wrong. Was it a training deficiency related to the person testing? Was there a data migration issue? Maybe there was a configuration setting you had overlooked. Fix the problem and test again until you know the result will be what you intend.

You will always fix problems that completely stop an ERP processing transactions, but any small problems left unfixed will still be a failure, even if only to a small group of users. One example may be procurement of a wire component that is bought by weight of a reel but is used by length. What formula converts pounds to centimeters? Testing would have shown you had to buy in length or change the process to issue by weight. This situation would make inventory valuation much more difficult than it should be.

Be sure you can retrieve quality data to satisfy any compliance requirements. Your customer wants to know the people working on their products have documented training. Test that the ERP can store training data related to production workers. Test the ERP to verify that users who lack the necessary training cannot start work on any production jobs related to that customer. Failure here could lead to the loss of an important customer or certification.

A staging environment

The final consideration when it comes to testing your ERP is the construction of your system testing environment. There are a couple of different options here, but the ideal scenario for most is the creation of a staging system. This staging system should be an exact replica of the database you constructed during data migration in which your test process can be applied without the risk of process disruption. If constructed correctly, this staging system can then push successful changes to a live or pre-go-live iteration of the system. In a manufacturing environment, this means users from all departments can test processes along the production chain with the knowledge that rigorous testing is not a risk to system health.

Thorough testing is the only way to be certain your manufacturing ERP provides the results you want.

Failure to integrate with suppliers

Your goals for your manufacturing ERP system may include improving supply chain visibility and reducing the lead time for procuring parts from suppliers. At the same time, you want the quality of purchased materials to improve. These goals might suggest you need to share some of your data with suppliers and, in turn, receive data from them. Exporting and importing data through integrations can greatly expand the functionality of your manufacturing ERP. In the case of supplier management, missing out on these integration opportunities can leave your manufacturing ERP system in the dark.

ERP-to-supplier communication

Supplier integration begins with some simple and obvious data. Do you have up-to-date contact information? If your automated system emails to the supplier are not going to someone who can and will reply, your most simple ERP integration fails at this point. You should already have the basics, such as the lead time for each item you order and where that order is manufactured. If a supplier updates their lead time to 9 weeks, but your integration with their CRM was implemented incorrectly, your procurement team will be working from incorrect data leading to order delays and customer loss - a recipe for manufacturing ERP failure.

Little adjustments to your ERP processes can vastly improve the chances of integration success. If you call a part "ABC" and you know they call it by their catalog number "1234", ensure your ERP has a field for their catalog number and all outbound communication references both data points.

Supplier-to-ERP communication

Receiving data from your supplier is equally important as the data your ERP sends to them. Suppose your order is for a circuit board with an integrated circuit and additional components. Your bill of materials might specify a certain component you have always used in the past. ERP integration with the supplier could indicate what you really want is a component with eight leads that runs at 3.2 volts. Your supplier may already have a source for a generic component they have used successfully for years at a much lower cost. Missing such an opportunity can vastly reduce the potential for a successful ERP implementation.

Supply chain visibility means communicating with your suppliers. You might have asked for shipping

information at the time of shipment. This type of request was standardized years ago using EDI and is called an advance shipping notification (ASN). Do you have the ability to receive EDI communications in your ERP or through an additional service? If not, this particular supplier communication will fail to arrive. Equally important is whether your manufacturing ERP allows you to plan your work around the date within the ASN? What value is receiving a supplier communication if it is not acted upon. It is worth noting some ERP systems only include this feature as an optional higher-cost add-on, so make sure you know where you stand when you agree your ERP purchase.

Keep in mind that your supplier is just the business that provides your manufacturing components. Third parties, such as transportation providers and distribution centers, are often also part of the supply chain. So remember to integrate ERP with these links in the chain.

Poorly monitored scheduling

For many of us, scheduling is one of the primary objectives to justify the investment of time and money in manufacturing ERP. Get it wrong and you are on the road to ERP failure.

Where is the job in production? Will it be done on time? The customer just called, can you insert one more job into today's production? Will you need to add a third shift next month when that big order hits the shop? You fell behind in production last week, how can you arrange the work to catch up with the least overtime?

Manufacturing ERP scheduling is part of the answer to all these questions. In addition, scheduling goes beyond your shop. Scheduling also drives material requirements. When you schedule a job to run at the end of next week, you also schedule the material you have to purchase and receive at the beginning of next week.

Common scheduling failures

Many scheduling issues can lead to manufacturing ERP failure. One of the most common failures is when a schedule for the week is set and an assumption is made that the planned production will be done by the end of this week.

Scheduling a manufacturing operation is the result of many assumptions. As manufacturers, we assume work will be done at a certain pace. But that pace is not certain – it is an average over time based on different processes, different individuals, or it is an engineer's dream.

"Scheduling can be the heart of a well-running manufacturing process. Scheduling can also lead to ERP failure when not monitored and maintained frequently."

If an assumption is made that materials will be available at the time required in the schedule, what happens if the supplier's truck was caught behind a traffic accident on the highway? Is your manufacturing ERP integrated with your supplier distribution updates? Do you assume subassemblies from all previous operations will all arrive as scheduled for the next operation? Scheduling a manufacturing plant cannot be static. Ideally, the schedule will be recalculated by your ERP every time an event occurs or an ERP transaction is recorded.

If you achieve this level of real-time scheduling, the schedule you produce might be perfect. However, if you cannot communicate changes quickly, you will be constantly juggling balls and when one falls, you have to pick it back up and hope no one tosses you any more while you are blinking.

You can use manufacturing ERP scheduling in many different ways to reduce the risk of failure. You have finite and infinite tools at hand. You can schedule forward and backward. You can split jobs and combine the operations from multiple jobs to run simultaneously. Imagine a shop floor user sees two jobs waiting in the ERP's production queue; one is easy and they have just enough time to complete it by the end of their shift, the other is difficult and will probably not be complete when their shift is due to end. Do they check your schedule? Or, do they cherry-pick the easy work? You know the answer.

Scheduling can be the heart of a well-run manufacturing process. Scheduling can also lead to ERP failure when not monitored and maintained frequently.

Inventory inaccuracies

Unless your SKU is in stock, you can miss an order. Miss enough orders because your manufacturing ERP isn't connected to your warehouse, and ERP failure will ensue. Manufacturing of all disciplines depends on accurate inventories. An MRP module can compare demand to on-hand inventory. Scheduling of production jobs is based on when the inventory is available. Where is the inventory? In the warehouse. You must integrate ERP with your warehouse for a successful implementation.

Just about every manufacturing ERP today includes inventory and warehouse management tools. Manufacturers with special requirements can also integrate warehouse and yard management tools from other providers. So where do failures in ERP inventory management arise? People.

Inventory transaction inaccuracy

A small manufacturer will create hundreds of ERP inventory transactions every day. A transaction volume of tens of thousands daily is common. The ERP users who issue parts and put those parts away must stay up-to-date with all those transaction processes. If warehouse users don't know how many parts are on hand or where they are, neither will the users in production or sales. The discipline of recording every inventory transaction quickly and accurately is important. Give the warehouse staff scanners and barcode devices, linked to the ERP, to help ensure speed and accuracy.

Buyers depend on inventory accuracy to manage purchasing. Most learn to trust the ERP system and the users recording transactions. There are some, though, who might have been burned years ago who still insist on a manual stock check before placing a purchase order. There isn't time in a busy shop to check inventory several times a day.

Production schedule deviation

Production staff who decide which jobs to start and don't follow the schedule can also lead you on the path towards a failed manufacturing ERP project. The planners have usually devoted much time to building a schedule within your ERP system that best fits the availability of time and inventory whilst meeting the demands of customer orders. Alternatively, you have invested in a scheduling automation module that computes this "best" schedule for you. When production staff pick their own jobs, your existing schedule will have been a waste of resources and will often utilize the time and inventory planned for another job.

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Once inventory discipline is well established in all departments, there is one more discipline that is important for manufacturing ERP success. Establish an ERP cycle counting process that selects items for sample counts regularly based on transaction and dollar volumes. Follow that process – never let any excuse keep you from that job. Make the counts, correct the inventory levels, understand what caused the difference and correct the root cause. Manufacturers can have more than 10,000 items on hand and an error on any one will lead to a failed ERP transaction.Accrue enough of these failed transactions and your whole manufacturing ERP system will be on shaky ground.

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