

# Process -vs- Discrete ERP Systems

## 8 Questions to Ask When Searching for Software



Sorting out the differences between the two main types of manufacturing software can be mind boggling for companies when searching for an ERP system. Companies can mistakenly purchase the wrong ERP system causing headache and a significant loss of revenue. Avoid the pitfalls of making the wrong decision by using this checklist to help you determine the software that best fits your manufacturing process.



## As a manufacturing company grows, so do its challenges...

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As a manufacturing company grows from small scale production to a full-sized manufacturing operation, management challenges grow along with it. Many businesses start out using simple accounting systems and spreadsheets, but soon need a more advanced management tool that allows for automation and integration of the many different business and manufacturing processes. The challenge for corporations as they begin looking at software options is in understanding the differences between the two main types of manufacturing software: process and discrete.

Companies that have limited information, especially small ones, start looking for software under the most basic parameters: usually budget. Because smaller companies don't have the capital that larger companies do, they often eliminate more expensive software systems without understanding the potential consequences. Discrete manufacturing software systems are often less expensive than process systems, and it's common for manufacturing companies to make the mistake of buying a discrete software package when it is most likely unable to address their unique business challenges.

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### ***Discrete manufacturing***

*varies from Process Manufacturing. In discrete manufacturing, the manufacturing floor works off orders to build something. Examples include toys, medical equipment, computers and cars.*

*The resulting products are easily identifiable. In process manufacturing, the products are undifferentiated, for example oil, natural gas and salt. - Wikipedia*

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Another challenge in understanding software system differences is that discrete and process manufacturing systems look similar in several respects. They both have a general ledger, accounts payable, accounts receivable, bank reconciliation, sales orders, purchase orders, and distribution features. They also commonly have an inventory system and bills of material; they are, however, very different.

Further compounding the problem, demonstrations of discrete software packages may at times present only portions of the software functionality, leading the viewer to believe that the system has all the needed operation capabilities. For example, the demonstration may only show how the system can use raw materials and create finished goods, and leave out the multiple levels of creating a finished good that are of-

To succeed, the software system must meet specific operational requirements.

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ten needed for process manufacturing. Demonstrations of a discrete package often leave out information pertaining to laboratory research and development, quality assurance, or compliance reporting because discrete software typically isn't capable of those functions. Demonstrations may show how products can be created in "gallons" or "liters" but fail to demonstrate any type of measurement conversions.

One of two things happen after a manufacturer buys the wrong software package: the company either has to change its manufacturing process to fit the software or it has to pay for extensive modifications to make the software work – or sometimes both! Either way, the manufacturer gets the short end of the deal, and it's usually very costly.

Avoiding this pitfall starts with obtaining the right information and selection criteria. The American Production and Inventory Control Society (APICS) defines discrete manufacturing as "The production of distinct items such as automobiles, appliances, or computers." Discrete packages may not manufacture food well and may not accommodate recipes and/or formulas properly. Extended utilities in the system may not work well to distinguish measurements in a formula versus measurements in eaches.

Process manufacturing, on the other hand, is defined as "Production that adds value by mixing, separating, forming, and/or performing chemical reactions. It may be done in either batch or continuous mode." Some examples of products that are derived from a process mode of manufacturing include food, beverages, paints, chemicals, pharmaceuticals, and dietary supplements.

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*Process manufacturing is the branch of manufacturing that is associated with formulas and manufacturing recipes, and can be contrasted with discrete manufacturing, which is concerned with bills of material and routing.*

*The simplest and easiest way to grasp the definition of process manufacturing is to recognize that, once an output is produced by this process, it cannot be distilled back to its basic components. In other words, "once you put it together, you cannot take it apart". A can of soda cannot be returned to its basic components such as carbonated water, citric acid, potassium benzoate, aspartame, and other ingredients. Juice cannot be put back into an orange. A car or computer, on the other hand, can be disassembled and its components, to a large extent, returned to stock. Process manufacturing is common in the food, beverage, chemical, pharmaceutical, consumer packaged goods, and biotechnology industries. - Wikipedia*

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That should make things a little more clear, but there are a few more questions you can ask to make absolute certain that you are buying the right software system. Answer the following eight “either-or/yes-no” questions to help you determine which type of software best fits your manufacturing process needs.

**1. Am I assembling a bike or a mixing a batch of soup?**

Well, maybe not literally, but it is important to understand the difference between these two concepts. If you are making an item that is put together in pieces, such as a bike, you can use discrete software. A bike is an assembled item, made in “eaches”; it could be taken apart and all the pieces can be put back into the bin they came from. On the other hand, if you are making a can of soup or something “gooey” made through a process, you will need process manufacturing software. Materials that go through a chemical change, such as cooking, mixing, blending, encapsulating, or tabletting will result in a new product that resembles nothing of the original materials that went into it. In other words, it cannot be taken apart and put back on the shelf.

**2. Do I need serial numbers or lot numbers?**

Manufacturers building the bike or other discrete items may need serial numbers on their parts and products. Manufacturers of food, beverage, cosmetic, or dietary supplement products, on the other hand, need lot numbers. Lot numbers are critical for lot traceability should a product recall become necessary. Serial numbers are allocated through a discrete software system, and lot numbers through a process software system.

**3. Can I reduce batch sizes without halting production?**

Think about what would happen if you’re producing a bike and you suddenly run out of bike chains. Production stops. You can’t have a bike without a chain. On the other hand, if you are making soup and you run low on potatoes, you can reduce the size of your batch, or if you run out of potatoes completely, you can switch to another type of soup production that uses similar ingredients. Process manufacturing software allows manufacturers to manipulate their batch sizes based on material inventory, which discrete systems typically cannot do.

Use this section as a worksheet and track your responses here:

Process	Discrete
<input type="checkbox"/> My production is more like mixing a batch of soup.	<input type="checkbox"/> My production is more like assembling a bike.
<input type="checkbox"/> We use lot numbers.	<input type="checkbox"/> We use serial numbers.
<input type="checkbox"/> Yes, I can reduce my batch size without stopping production.	<input type="checkbox"/> No, I would have to halt production to make any changes to the BOM.

**4. Am I counting individual units, or are my units measurable by weight and volume?**

Upon reaching completion of a product, the next step in the process is to proceed on to packaging. The label on the packaging indicates what is inside the package. In a discrete manufacturing system, there will be one final product in the end that goes into a package. Using our bike as an example, the label would indicate that there is one bike in the box. Conversely, labeling for a processed product will include a list of ingredients for weight percentage. Soup, for example, will not just be labeled soup, but will have all the ingredients listed in order by volume. Or, in the case of a manufactured chemical product such as paint, Material Safety Data Sheets also require percent calculations. Such calculations are figured automatically with a process manufacturing software system.

**5. Does my bill of material need to display formulas and recipes, or products listed in eaches?**

A discrete bill of material lists products or parts needed to complete construction in eaches. If you are making one bike you will need exactly 1 chain, 2 tires, and 2 foot pedals. A process bill of material (also called formulas), however, is quite complex. There are often multiple levels in one BOM based on what types of materials and/or products go into a final product. Manufacturing BOM's also need to be editable based on material availability, quality control, scheduling availability, and type of packaging. This BOM complexity is only available through a process manufacturing software system.

**6. Do I need unit of measure conversions?**

If not, a discrete system may be adequate. Measurement conversions are needed regularly in the process manufacturing industry. Companies purchase raw materials and products in one unit, stock in a different unit, and formulate production in yet another unit. Conversions are sometimes needed based on batch size; and conversions between standard measurement and metric may also be needed. A discrete software system does not have the flexibility needed to convert materials to match the required quantity. A process system performs these types of conversions automatically.

Process	Discrete
<input type="checkbox"/> My units are measured in weight and volume.	<input type="checkbox"/> Each unit is counted individually.
<input type="checkbox"/> The BOM displays a formula or recipe.	<input type="checkbox"/> The BOM lists products in eaches.
<input type="checkbox"/> Yes, I need to be able to convert units of measure.	<input type="checkbox"/> No, I do not need this function.

**7. Do I need a system that will track research and development?**

In most cases, discrete manufacturers will not be tracking any type of research and development. On the contrary, the formulas of a process manufacturer are core to the company function. One soup product may have had 100 different recipes before the final product was complete. A process software system tracks all of the different formulas and formula revisions, plus it allows formulators to make changes and analyze the outcomes. Lastly, because formulas are the vital piece of a manufacturing company, they need protection. A complete software system will provide security through various user defined security settings.

**8. Do I need quality control and quarantine capabilities?**

Again, if not, a discrete system will likely be adequate. Typically in a process manufacturing scenario, some type of quality control testing is done on raw materials in processed items and unfinished goods. Materials often enter the system in a quarantine status and are not released until they pass the required quality control tests. Tracking each material can be quite complicated. This type of quarantine management is automatically controlled through a process manufacturing software system. Consistency is also key to product success. The quality control of this type of system also contributes to batch consistency and producing the same final product each time the process is run. Additionally, a process system allows QC results to be brought into the system and allows users quick access to QC and lot information.

**Evaluate Your Results**

How did you answer each question? More importantly, how did your list of potential ERP software options change? Eliminating software packages early in your selection process that are not designed for your business will enable a more efficient and successful ERP selection. Choosing and investing in the appropriate software will provide the right tools to address your business challenges, save significant costs in software modifications, and provide a much better return on your investment.

-- Tim Sands, Business Development Lead,  
ProcessPro® software

Process	Discrete
<input type="checkbox"/> Yes, we need to track R&D as well as formula revisions.	<input type="checkbox"/> No, we do not track R&D functions.
<input type="checkbox"/> Yes, QC is needed at various steps throughout the process.	<input type="checkbox"/> No, we do not need quarantine capabilities.
Total Your Results	
Process <input type="checkbox"/>	Discrete <input type="checkbox"/>

## **About the Author**

Tim's experience includes nearly 20 years in the sales and consulting field. His business development experience in the process manufacturing industry includes ERP qualification and systems selection. Tim's involvement in the process manufacturing industry includes several associations including Natural Products Association, Organic Trade Association, Private Label Manufacturers Association and more. Currently, Tim manages the Business Development Department for ProcessPro, developers of ProcessPro® *Premier* ERP software. Tim's primary focus is working with manufacturers in the process manufacturing industry and specifically manufacturers with GMP and FDA requirements.

## **About ProcessPro® *Premier***

ProcessPro® *Premier* is proud to be the leading ERP software for the highly-regulated process industry. Excelling in the small to mid-sized market, ProcessPro® *Premier* provides an affordable solution to those who must adhere to strict QC and government regulations including FDA, cGMP, 21CFR Part11, Bioterrorism, HAACP, and more. ProcessPro® *Premier* seamlessly integrates all aspects of plant operations, from beginning order entry through manufacturing, packaging, shipping, and accounting.

This fully-integrated, real-time solution rises above other industry software in production capabilities, financial integration, user interface, system functionality, flexibility and more. ProcessPro® *Premier* is available with full source code and can be customized to fit your organization's unique business needs. For more information, visit [www.ProcessProERP.com](http://www.ProcessProERP.com).

Many accounting systems with MRP or ERP modules as options do not have the true functionality needed for process manufacturing. ProcessPro® *Premier* is one of the truly vertical packages available for process manufacturing for any of the process markets: food/beverage, pharmaceutical/nutraceutical, chemical/inks/coatings, and cosmetics/personal care.

## **Resources**

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