



Why Small Manufacturers Need an ERP-Driven Bill of Materials to Compete

Introduction

Small and mid-sized manufacturers that leverage an ERP-driven bill of materials (BOM) are winning loyal customers and gaining efficiencies over competitors mired in the traditional ways of managing their production processes. With a BOM managed and driven by ERP, modern manufacturers have full knowledge of inventory and production at their fingertips. This enables them to streamline data sharing with partners, respond faster to customer requests, and collaborate in line with rapidly advancing expectations from customers and supply chain partners.

By moving away from spreadsheets and/or QuickBooks to ERP, an SME manufacturer improves their business in many ways. Today, they can:

- Tell customers exactly when a production request can be fulfilled
- Accurately predict the volume of scrap or side components a production run will yield
- Automatically place replenishment purchase orders—with no human involvement—when stock for critical items and components runs low

Having an ERP-driven BOM is the key to gaining an unfair advantage in today's hypercompetitive markets, particularly when competing against vendors that lack ERP capabilities regarding their BOMs.



Understanding the Bill of Materials

A BOM, also known as product structures, is the list of raw materials, sub-assemblies, intermediate assemblies, sub-components, and the associated quantities to manufacture a product. The lowest level of the BOM includes the components and raw materials a manufacturer purchases from supply chain vendors. The next level includes sub-assemblies or additional components purchased by the company. The final level is the completed assembly of the end product.

Depending on the industry, such as in process industries like food and beverage and chemicals, manufacturers call BOM components 'ingredients' and the BOM a 'formula' or 'recipe'. Figure 1 illustrates a basic BOM and its hierarchy for a bicycle.

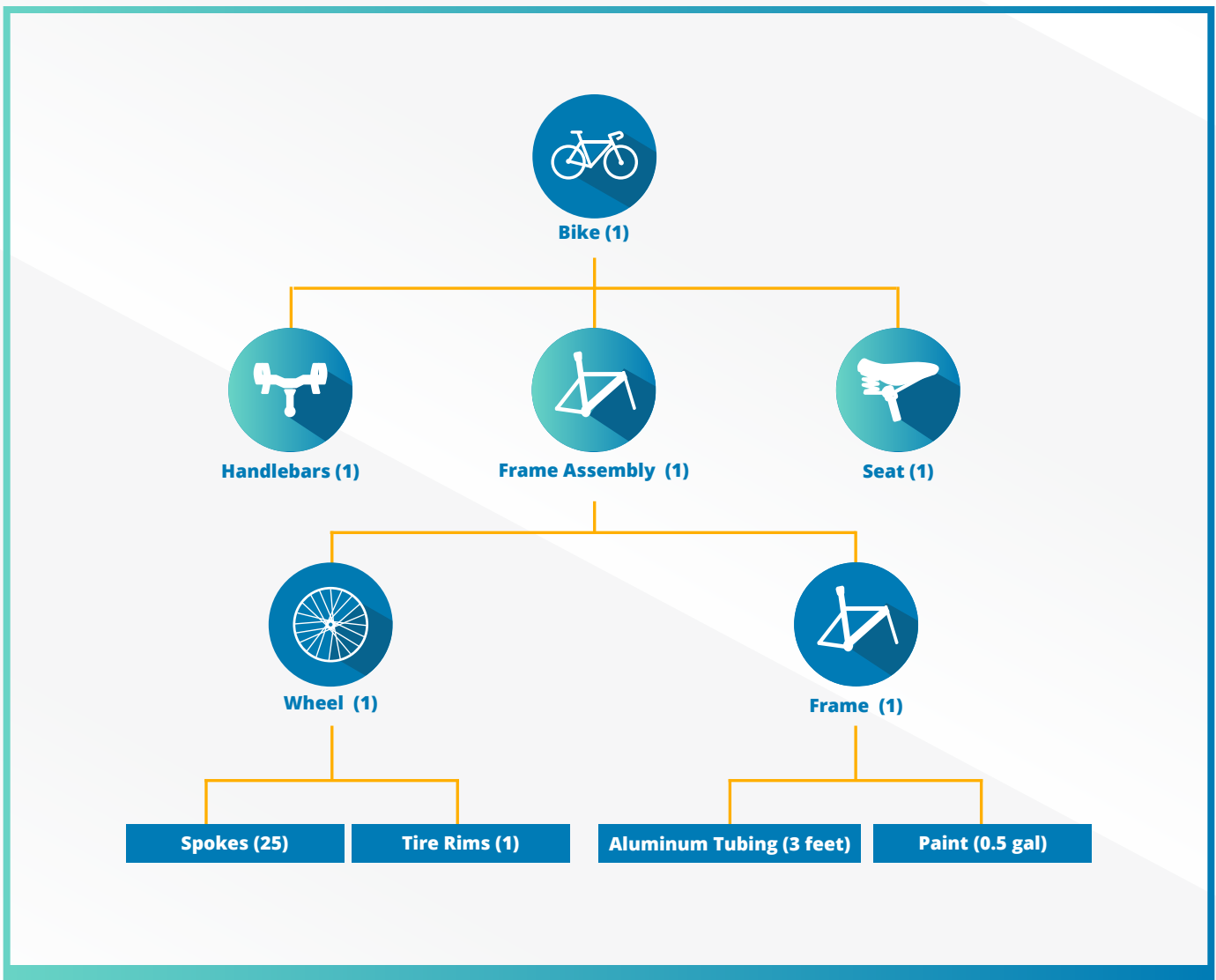


Figure 1 Sample Bill of Materials (BOM)

Getting to Know the Information Within the BOM

BOMs contain varying amounts of information, depending on the complexity of a manufacturer's product and manufacturing processes. Following are the essential elements in nearly every BOM.

Parent item	The item created from the BOM—in this case, a bike.
Component or assembly	The part number or description of the item.
Quantity	The quantity of the components required to build the parent item.
Scrap factor/yields	The amount of a component lost during the manufacturing process. For example, if one kilogram of plastic is lost for every 100 kilograms used, the scrap factor is 1%. Put into output, the yield for the plastic is 99%. This information allows a manufacturer to plan the component volume necessary to fulfil order requests. Scrap can occur during the assembly process or when a machine/process is manipulating the component material.
Routing operation	A document associated with a product (the parent item) that lists all production operations or stages, including the order in which the finished product will be made. This provides the basis for scheduling the capacity of production resources, usually machines. Optimal production scheduling occurs when a manufacturer can relate materials/components to routing steps.
Phantom flag	For manufactured sub-assemblies, this determines whether the sub-assembly is built independently or with the parent assembly. A manufacturer might assemble some sub-assemblies for a product and store them in inventory for future use. However, some components exist as sub-assemblies to be built only during the assembly stage of a product's production time—never to be held in inventory.
By-Product	A secondary product derived from a production process that isn't the primary product or service being produced. Automotive gasoline, for example, is a by-product of oil refining. Some by-products are valuable; others are not.

By using all the information within a BOM, a manufacturer can optimise operations across multiple departments to speed the business, improve efficiency, and grow more profitably.

An Accurate BOM Is a Game-Changer

As a product moves through the manufacturing process, employees at various stages have different responsibilities for using and handling the BOM. Each employee manages the BOM information based on their function as it relates to the end product.



Here's a summary of how various departments commonly use the BOM.



Production

In manufacturing, the BOM is called the 'production BOM'. It tells employees which materials they'll need for the production order. For a materials requirements planning (MRP) system to run effectively, a production BOM is required. It lists the parent items that are finished products and the child items (components) needed to create the parent item. It's a detailed display of all required components for a production work order and the resources necessary for production.

ERP can dramatically affect production profitability. Efficiency and pricing experts use ERP to extract views of the production BOM to calculate the costs of components, assemblies, finished products, and the associated material movement costs. This aids in pricing products and understanding how and where to optimise for cost. Working off the same BOM, production leaders and purchasing professionals can collaborate to make tradeoffs between the quality, types of components, and the machines that work on them.



Purchasing

The BOM helps with planning purchases. At the remedial level, it can tell purchasing managers how much of a component and sub-assembly are necessary immediately versus over time. Referring to the bicycle example, a purchasing department can review the BOM to learn how many spokes they need for a wheel. This allows them to determine a final order quantity of spokes based on the forecast of bike production volume. Knowing the scrap/yield allows purchasing to order the right number of 'extra' components to match the desired production volume of bikes.

ERP helps SME manufacturers innovate around purchasing to merge customer satisfaction and cost-efficiency. Because of ERP, the trend of using available-to-promise (ATP) has skyrocketed. By inputting the BOM into ERP, manufacturers quickly derive the quantities and delivery due dates—across all customers—based on the forecasted product demand. Using ERP's trending data for production orders and volumes (even seasonally adjusted), allows manufacturers to determine inventory levels and operation capacity. Upon adding appropriate scheduling, purchasing leaders can easily compute ATP. This advanced use of pre-planning prepares companies for unexpected production requirements and leads to increased speed and efficiency when compared to a pull strategy (i.e., acting only when customers demand product).



Sales

BOMs are equally critical for sales when examining the cost of production and considering factors such as margins, logistics, and delivery. Most manufacturing BOMs include descriptions of packaging materials, product literature, and instructions so sales professionals can entice customers with product attributes.

ERP closes the gap between sales and production, ensuring that any salesperson can appropriately set customer expectations regarding when and how much of a product is deliverable. The BOM within ERP displays the available inventory, resources, and time to complete production of various order quantities. This means salespeople can input a customer's desired order amount and offer assurances regarding production volume and delivery dates.



Services

Many manufacturers have transformed how they make revenue and earn profits in the last decade. Instead of relying solely on product sales, many achieve higher profits from post-sales service contracts, ad hoc repairs, warranties, and internet of things support. Back to our bike example: the manufacturer may include repair kits as a subset within the original production BOM, or repair kits may not be included. This is where ERP can help.

Using ERP, the manufacturer can view all BOM information years after production and understand how a bike was designed, manufactured, and delivered. This makes it easy to carry out after-sales services. The more complex a product is, and the higher the costs of in-field failures, the more profits a manufacturer can command around post-sales service offerings.



Salespeople who service key customers rarely want to say no to an order request, so they often promise to deliver whatever the customer wants. Failure to deliver, however, can critically damage the relationship. To avoid this, a modern ERP system incorporates BOM reporting.

For example, the 'Sales – A/R' menu option within SAP Business One enables a salesperson to select 'Sales Quotation', 'Estimate', or 'Sales Order'. After selecting '**Sales Order**' for a product, its BOM is referenced automatically. From there, the system prevents over-promising by presenting a "Can I Deliver" button to the salesperson.

When clicked, the system displays a 'Sales Order Supplication' report, which shows if there is enough inventory on-hand to deliver the order.

The salesperson can even click to expand the BOM and see the status of the components/ingredients and ensure they're available to build what the customer wants.

To prevent the production teams from using the new order's inventory of components/ingredients for other orders, the salesperson can launch a work order that allocates the inventory. This further ensures that promises will be kept for the customer in question—no fire drills required to satisfy their request.

BOM Accuracy Suffers Without ERP

Just as an accurate, well-managed BOM increases sales revenue and improves margins, a poorly managed BOM leads to lost profits and higher costs of goods sold. Without ERP to maintain the BOM and provide role-based views for different people and departments, errors occur. Therefore, attempting to manage BOM data in spreadsheets or basic accounting software is a losing proposition.

Without ERP, BOMs are subject to inaccuracies caused by:

1. No single version of truth

It's challenging to reconcile data across systems, especially when using manual inputs. If quantity data isn't uniform, the risk of ordering too much or too little inventory increases, resulting in costly excess or missed delivery dates.

2. Data errors

Errors in the components in the BOM will lead to scrap due to excess inventory or the need to rework manufactured items.

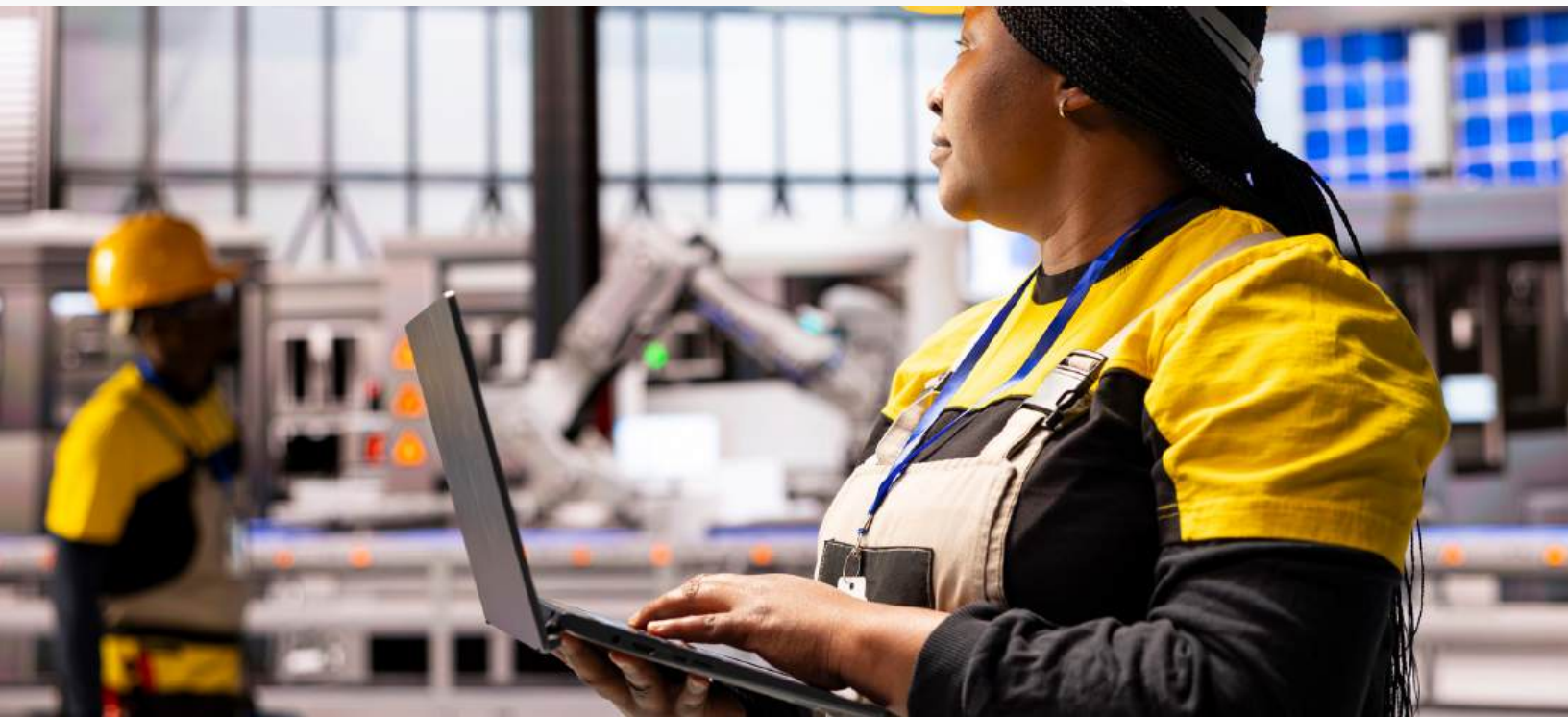
3. Inaccurate part information

Many parts and assemblies undergo revisions. When those revisions aren't captured and communicated across the company, a manufacturer can have entire production runs become worthless and further delay manufacturing the products.

Slower time to market, lower profit margins, and angry customers remain the norm for manufacturers that fail to ensure BOM accuracy with ERP.

SAP Cloud ERP Makes BOM Accuracy Role-Specific

SAP cloud ERP underpins the most successful manufacturing companies by integrating BOMs and BOM-related data across the business. By eliminating siloes and centralising the information in a single database, BOMs can be created, updated, and shared company-wide to improve accuracy and collaboration.



SAP cloud ERP also supports role-based access, ensuring each employee has the visibility they need to manage BOMs data effectively and contribute based on their expertise. In addition, each department—including purchasing, sales, production, and service—can optimise its processes to streamline operations, gain efficiency, and boost profits.

Unlike spreadsheets and basic accounting software, SAP cloud ERP provides real-time access to standardised inventory, customer, and financial data. Automated data movement and built-in checks reduce errors, data duplication, and confusion. The result is a single version of truth for BOMs.

About Vision33

Vision33 transforms business processes and results for customers by delivering value through the promise of technology and its benefits for growing businesses. For over 30 years, Vision33 has helped companies integrate and automate their processes and applications to better serve their customers, employees, and stakeholders.

With over 1,000 customers worldwide, Vision33 helps businesses make successful technology investments to outperform their competition and lead their industries. Vision33's nearly 400 employees offer product expertise, business experience, and innovative technology leadership. Whether

it's a global company with 100 subsidiaries or a small business, Vision33 works alongside every customer to meet their goals.

Vision33 also has formal partnerships to resell, implement, and support leading ERP applications, is a leader in cloud deployment, and has developed exclusive products, including Saltbox Integration Platform and Lumiya.

When you're ready to take the next step, speak with a qualified Vision33 consultant in your area.

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