



# Manufacturability Insights

Reduce Manufacturing and Supply Chain Risk,  
and Get to Market Faster

Manufacturing issues can have a significant impact on a company's bottom line. In addition to the costs associated with delays, these issues can also lead to increased costs for rework, scrap, and warranty claims.

## Manufacturability Insights

Manufacturability is the foundation of producing products efficiently. Ensuring good manufacturability will reward you with:

**Reduced costs:** Shorter production times, for example, can save labor costs. Efficient processes can also reduce waste to save material costs.

**Improved quality:** Products that are easy to manufacture are less likely to have defects.

**Faster time to market:** Products that are easy to manufacture can be produced more quickly.



**"Eliminate Engineering Change Orders (ECOs)  
due to manufacturability issues, get to market  
faster, with more profitable products."**

Use manufacturability insights to accelerate new product introductions (NPI), to identify VAVE\* opportunities, verify feasibility earlier in the design phase, and optimize manufacturing for both cost and carbon equivalent emissions.

Using aPriori Manufacturability Insights inside aP Design and aP Pro, eliminate the risk of zero bid RFQs, by catching issues earlier, providing actionable, quantified guidance on how to redesign to:



Reduce product cost

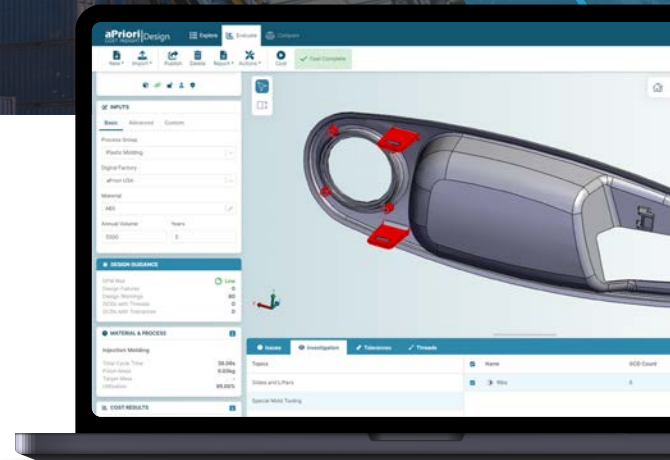


Improve quality



Optimize production

\*Value Analysis and Value Engineering



**Unlock the value in  
your digital twins with  
automated manufacturing  
insights that include:**

### Product Cost Management

- Should cost
- Make vs. buy

### Sustainability

- CO<sub>2</sub>e footprint
- Design for Sustainability

### Design Guidance

- Design for Manufacturability (DFM)
- Design to Cost (DTC)

### Manufacturing Optimization

- Machine selection
- Process routing

## Unique Platform Features

**Digital Factories:** Create a digital twin of your in-house or supplier factories to simulate a variety of machines, materials, processes, overhead rates, and more.

**Manufacturing Process Simulation:** Using the data extracted from 3D CAD models and aPriori digital factories, aPriori evaluates manufacturing feasibility, calculates cycle times, determines material usage, and tooling needs. The result is real-world manufacturing and product analysis with actionable manufacturability guidance in seconds.

**3D CAD Geometric Intelligence:** Fully automate geometric analysis from 3D CAD models rapidly for single parts and complex assemblies with aPriori plug-ins. aPriori now integrates ecoinvent's respected life cycle inventory database into its 3D CAD analysis engine.

**Automated Analysis and Guidance:** Get automated alerts to improve design. aPriori analyzes 3D CAD files when they are checked into your product lifecycle management (PLM) system and sends detailed recommendations for engineers to eliminate manufacturability and cost issues.

## Companies Can Reduce the Risk of Manufacturability Issues by Following These Best Practices:

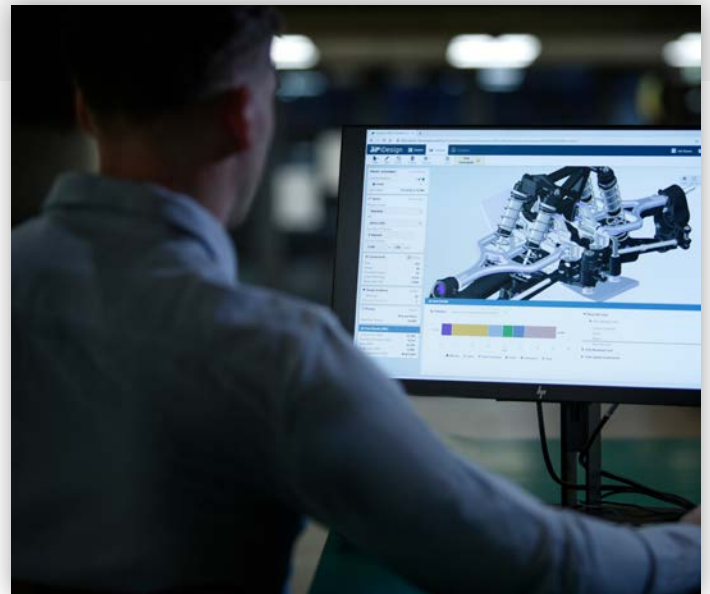
- ✓ **Introduce Design for Manufacturability (DFM) checks into the design process:** This will help to ensure that the product is designed for optimal manufacturing by catching and addressing issues earlier.
- ✓ **Design out cost:** Identify and address complex or time-consuming design features.

- ✓ **Ensure that there is clear communication between the design, manufacturing, and sourcing teams:** This will help to avoid problems with product manufacturability and help to ensure suppliers meet production specifications.

Product design determines up to 80% of a product's cost, but design engineers rarely get visibility into it.

The Society of Manufacturing Engineers (SME) reports that manufacturability issues account for 30% of production delays. If the product is not designed well for a given process, this exposes a huge risk of product launch delays, cost overruns, warranty and quality issues. Considerable time and expense may be required to fix the design flaws.

By taking steps to ensure that products are designed for manufacturability and that the production process is properly managed, manufacturers can reduce the risk of delays and improve their overall efficiency.





## Rafael Uses DFM to Reduce Costs and Improve Sourcing

Rafael, an Israeli aerospace company, uses aPriori as their enterprise digital manufacturing simulation software including DFM analysis. The company used aPriori to identify an almost impossible undercut in the design. By correcting the design issue, Rafael reduced the component's cost by more than 50%. The new design was not only far more cost-effective but drew many more bids from potential suppliers.



## Carrier Transforms Business with DFM Checks from aPriori

Carrier wanted to break down manufacturing siloes and empower their engineering team to leverage the power of aPriori to streamline should costs and quotations without interrupting or delaying the design process. Carrier uses aP Design to deploy and conduct late-stage cost modeling as it goes through the traditional gates such as the PLM as well as the design process. aPriori helps Carrier innovate and validate new value streams efficiently and cost-effectively.



## How Spirit Aerosystems Uses aPriori to Identify Early Cost Outliers

Before aPriori, Spirit's fabrication group's quoting process required input from many subject matter experts for different manufacturing processes such as machine fabrication, hard tooling, chemical finishing, heat treatment, and assembly. With aPriori, initial cost models can be generated automatically in the digital factory. This shift jumpstarts the quoting process, allowing work to begin consistently as soon as the full project parameters are received from the customer. Using simulated manufacturing in a digital factory configured to reflect Spirit's manufacturing facilities, aPriori can model product costs just minutes after a customer CAD file is received.



## WANT TO LEARN MORE?

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