The Power of Unifying Product Development Teams and Data

Moving from Insights to Impact:
The Advantages of the aPriori Cloud
and aP Workspace

aPriori

Keys to Successful Collaboration During Product Development

aP Workspace is purpose-built to support the varying requirements of different departments – and enable teams to collaborate seamlessly regardless of role, task, or location. Learn how aPriori's Manufacturing Insights Platform with aP Workspace helps you work more efficiently, simplify collaboration with other departments, and gain insights to make product development decisions quickly and confidently.

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Introduction

What are the biggest obstacles holding you back in your day-to-day responsibilities? For most product development and manufacturing teams, the biggest hurdle is getting the right information quickly.

Challenges in finding the correct data for a project – and delays in getting information from other departments – can slow down your progress, hinder your productivity, and make it difficult to meet your deadlines.

Collaboration shortcomings can lead to costly delays, unnecessary mistakes, and undercut competitiveness. So, it's not surprising that 93% of manufacturing companies surveyed by Tech-Clarity say they need to improve collaboration among departments.
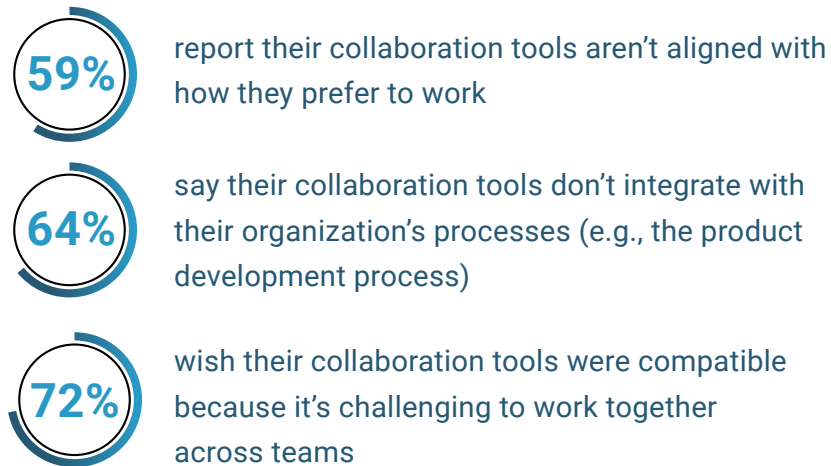
And as product development and manufacturing become increasingly complex, it's even more critical that teams from multiple departments collaborate seamlessly around reliable product data.

93%

The percentage of manufacturers that need to improve collaboration among departments according to Tech-Clarity

Frustrations – and Limitations – of Standalone Collaboration Tools

Collaboration isn't a one-size-fits-all approach. A *Harvard Business Review* survey of employees and business decision-makers globally highlights the challenges and limitations of today's collaboration tools.

59% report their collaboration tools aren't aligned with how they prefer to work

64% say their collaboration tools don't integrate with their organization's processes (e.g., the product development process)

72% wish their collaboration tools were compatible because it's challenging to work together across teams

Integrate Collaboration into Your Product Development Process

aP Workspace addresses these challenges by enabling product design, sourcing, and manufacturing teams to bring their diverse perspectives together and collaborate around a unified set of data. The result: faster and more robust decision-making. **aPriori's purpose-built workspace for product manufacturing enables users to comment on 3D CAD model data and have project-related information at their fingertips.**

With aPriori, cross-functional product manufacturing teams collaborate to optimize product designs for cost, sustainability, and manufacturability.

And aP Workspace increases efficiency by allowing teams to:

- Keep their current processes and use their existing systems
- Drill down/review 3D CAD model parts, cost assumptions, etc. in a single workspace
- Take advantage of powerful task management tools
- Maintain information for traceability and understanding why decisions were made

Learn more about __aP Workspace's__ collaboration capabilities specially designed to address the speed and complexity inherent in today's product design process.

Improve Your Productivity

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Personalize your Workspace

Use a collaboration platform that enables you to personalize your online workspace to fit your project and team needs. Set up your workspace based on how you and your team like to work – and make it easier for everyone to contribute to a project's success.

The aPriori Advantage

✓ Customize, filter, and automatically save views of data based on what is most relevant to you and your team. This includes project scenario views such as cost data, design for manufacturability (DFM) data, and sustainability metrics

✓ Make decisions quickly with a single workspace that combines top-level KPIs with the ability to analyze supporting data (e.g., drill down to investigate why manufacturing cost is high)

✓ Eliminate wasted time navigating through email chains, outdated documentation, or spending time building extensive reports

Personalize your project scenarios to have important information at your fingertips – including flagged DFM risks, cost drivers, and more.

Understand DFM Risks   Analyze Cost Drivers   Investigate Cost Outliers

2 Simplify Task Management

Robust task management is essential to running efficient product development projects with multiple cross-functional team members.

Task management tools integrated into collaboration platforms enable you to create, assign, and track tasks in a centralized system. You can personalize/filter your list to focus on your priorities and monitor the status of all tasks.

For example, you can filter parts and components by task or common theme – such as parts with the highest DFM, cost, or sustainability risks.

This single, cloud-based solution is designed to keep everyone on the same page. aP Workspace – combined with aP Generate – helps facilitate greater analysis and faster decision making at scale. aP Generate provides automated analysis, and alerts users via email reports that list parts with cost or manufacturability risks.

aP Workspace allows product development teams to assign tasks, answer questions, and provide additional feedback. You can also filter these collaboration events easily to prioritize your tasks.

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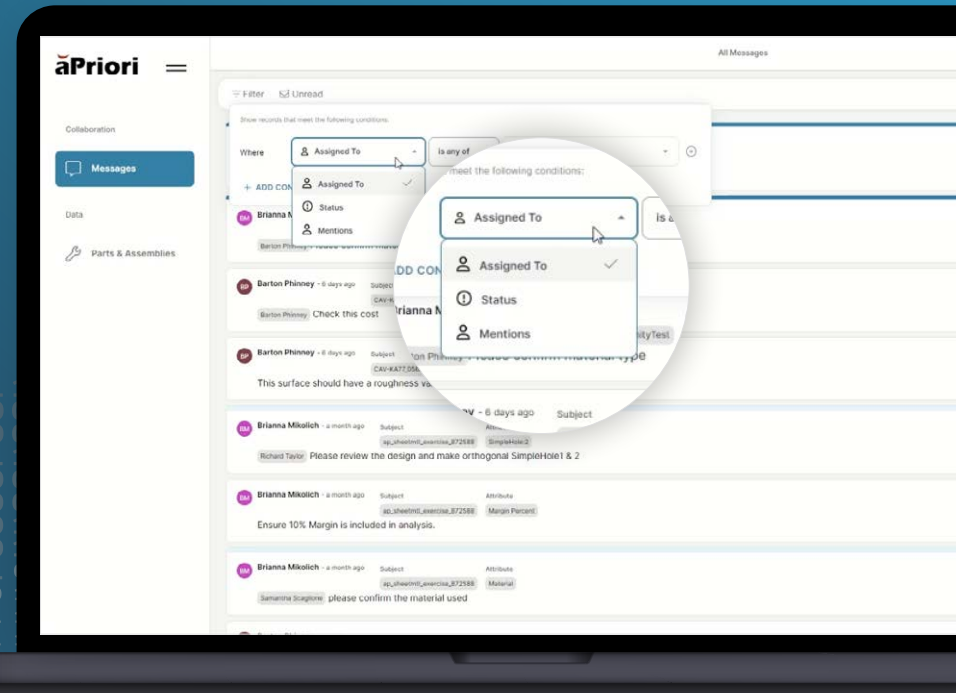
aP Generate sends an email summary of all parts analyzed and flags the components with the highest potential for manufacturability, cost, and sustainability issues. To streamline task management, users can click on the part number in the email to review the design and associated design guidance in aPriori.
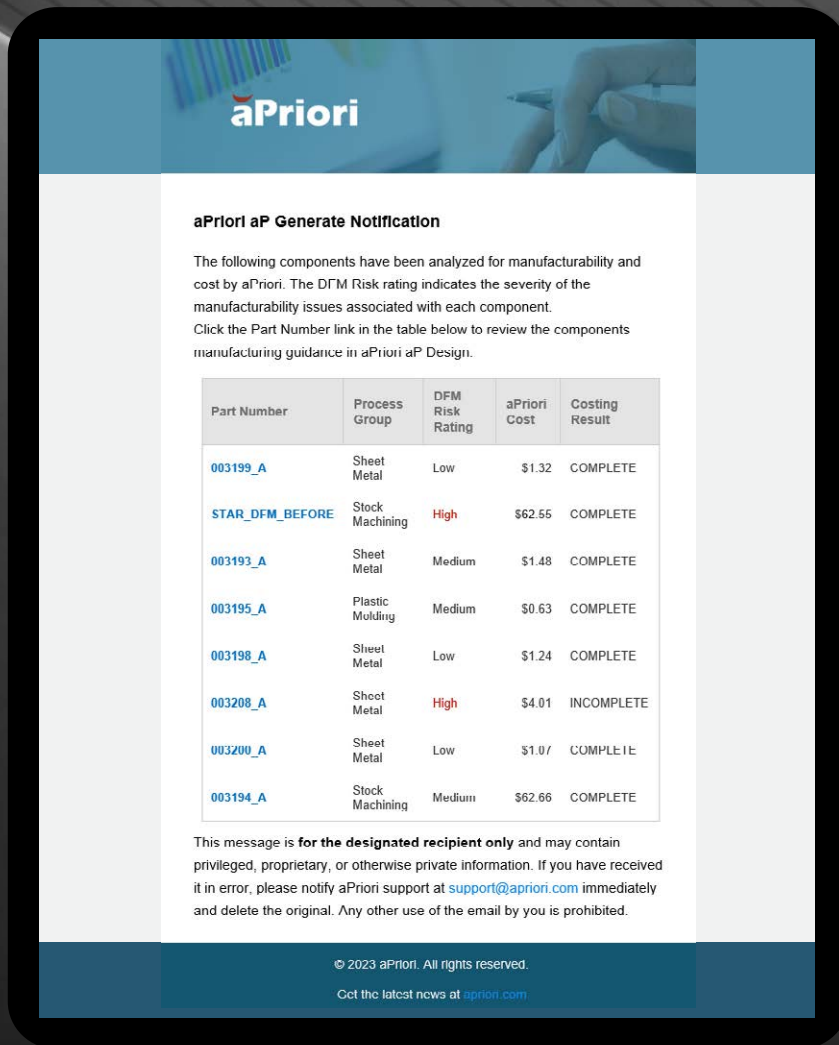
The aPriori Advantage

⊘ Manage multiple projects at scale with enhanced task management

⊘ Personalize your workflow through saved filtering to match how you manage your tasks and your time, including:

  • Parts & assemblies filtering: Shared scenarios within the aP Workspace Parts & Assemblies tab can be filtered by attributes including DFM risk, cost maturity, create date, process group, component type, scenario name, and component name

  • Filter messages by type: unread, assigned, or mentions

⊘ Prioritize and focus on the most critical tasks, and make time to focus on high-value activities including new product innovation

  • Email notifications:

    - Comments/tasks assigned to you, that mentioned you, and projects you are invited to

    - Reports containing all updated parts that have been automatically analyzed

    - Review a broader set of backlogged designs to spot outliers and identify parts that need immediate attention

  • Risk identification and guidance:

    - Receive manufacturability risk alerts to help prioritize part designs for further analysis. The DFM Risk rating indicates the extent and impact of each part's manufacturability issues

    - Gain automated manufacturability guidance without spending valuable time manually assessing each part design

# 3 Maintain Traceability and Access Decision History

Manufacturers sometimes use previous designs as a foundation to accelerate new product development. But without the decision history to provide the reasoning for engineering decisions, teams that draw from commercialized products could unwittingly add risk to their new product designs.

aPriori provides three ways to track the conversations and design updates during a product's evolution:

1. Review project conversations and associated files in aP Workspace to get detailed insights regarding decisions and reasoning

2. Access part details for every design update in your product lifecycle management (PLM) system. aP Generate can automatically add part data to your PLM system to help you:

   a. Track a product design's evolution

   b. Monitor the costs, carbon, and manufacturability of each revision to gauge if you are on track or meeting your goals

3. Use aP Design to compare versions quickly to understand the differences between designs and iterations

Cost engineering, sourcing, and other departments have a single location for the conversation history and reference data for product design and manufacturing decisions. aPriori users can easily review information for this project and use this analysis to accelerate future projects.

This image shows a visual of a GCD that was changed in the CAD with the conversation history around it for increased traceability.
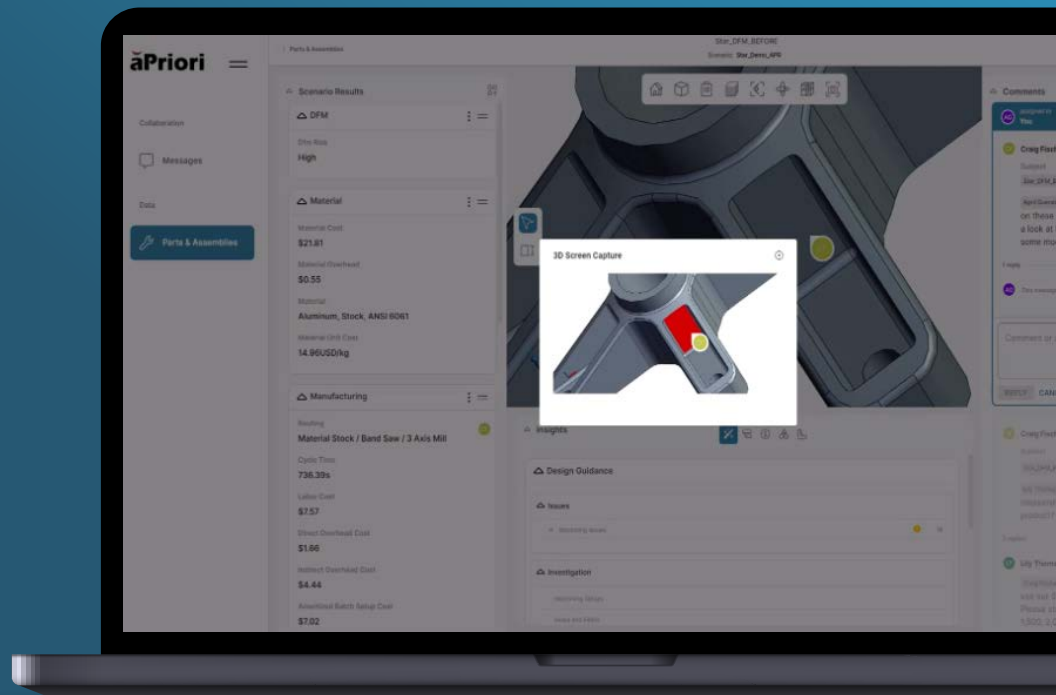
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The aPriori Advantage

✓ Incorporate insights into your development process automatically to provide clarity today and help to retain corporate best practices for future projects in a central repository

✓ Design scenario changes in aPriori are updated automatically in aP Workspace — so you're always using the latest information for analysis and collaboration

✓ Use aP Workspace as the "central point of truth" to help individuals and teams understand product design decisions throughout the product lifecycle and gain additional context via comments associated with each decision

✓ Publish data reports automatically to your PLM system with aPriori's aP Generate. This enables you to preserve snapshots of design iterations and associated insights throughout the product's evolution to address cost, DFM, and sustainability requirements

Collaborate with Added Context

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# 4 Gain Contextual Feedback with 3D CAD Model Commenting

Work in your native environment to make comments with precision and context. Our 3D CAD tagging capabilities enable users to explore potential issues for a specific design area. When other users view your comments, the 3D model appears how you positioned it.

This purpose-built capability for product development streamlines collaboration, helps to increase clarity regarding questions and providing feedback, and helps to ensure that everyone on the team is aligned with design intent and the specific issues being addressed.

The aPriori Advantage

- ✓ Identify and eliminate potential cost, manufacturability, or sustainability issues earlier and more quickly

- ✓ Pinpoint potential cost or manufacturability issues and start discussions based on the exact parametric attributes within the 3D model

- ✓ Automated scenario version updates to ensure the team is using the latest version. (Published scenario changes are saved automatically – there's no need to upload revisions manually)

- ✓ Quickly validate and resolve issues as a team:
  - Streamline meeting conversations and offer visibility to cross-functional teams for analysis
  - Eliminate version control issues by centralizing 3D CAD design updates and associated comments

Gain precision and contextualize your comments by tagging and commenting on 3D CAD models. aP Workspace is purpose-built for teams across the product development lifecycle to collaborate effectively in their native design engineering environment.
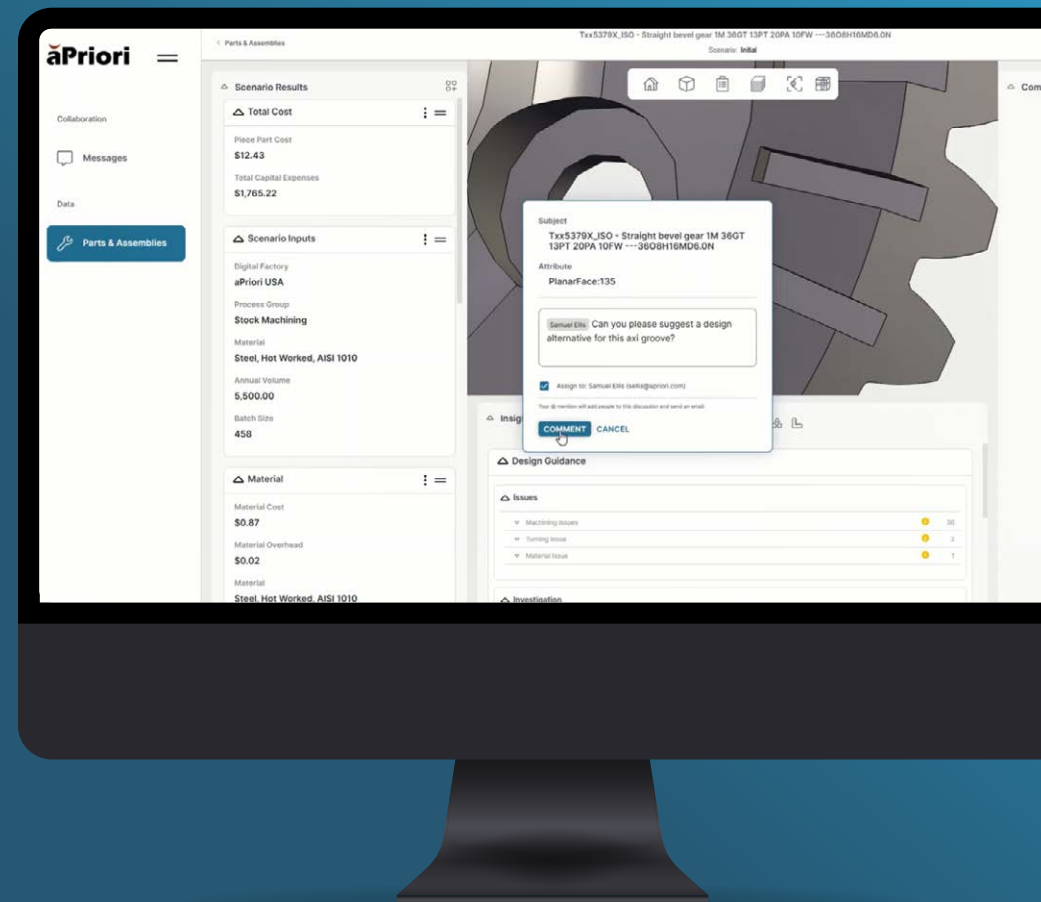
# 5 Incorporate Sustainability into Early Design Decisions

Because 80% of a product's early design determines its environmental impact, it's imperative to have visibility into the CO_2e emissions impact of your design choices – and to understand the tradeoffs among cost, DFM, and sustainability.

aPriori provides automated analysis to evaluate the carbon footprint of a 3D CAD model and identify opportunities to lower carbon emissions at the beginning of new product development.

The aPriori Advantage

- ✓ Bring sustainability experts into design discussions earlier

- ✓ Address multiple scenarios, conduct if-then analysis, evaluate how design changes impact carbon and cost, etc.

- ✓ Create custom sustainability cards to start discussions or obtain feedback on a product's carbon footprint easily

- ✓ Address (comment) on sustainability drivers, and examine multiple avenues to reduce a product's carbon footprint:
  - Processes supported
  - Material carbon
  - Process carbon
  - Logistics carbon
  - Total carbon

With a unified view of the product development and manufacturing process, manufacturers can understand a product's CO_2e impact during early design phases and then evaluate opportunities to reduce a product's carbon footprint. Product design and production teams can simulate design alternatives using different materials and manufacturing processes to meet CO_2e emissions, cost, and performance targets.

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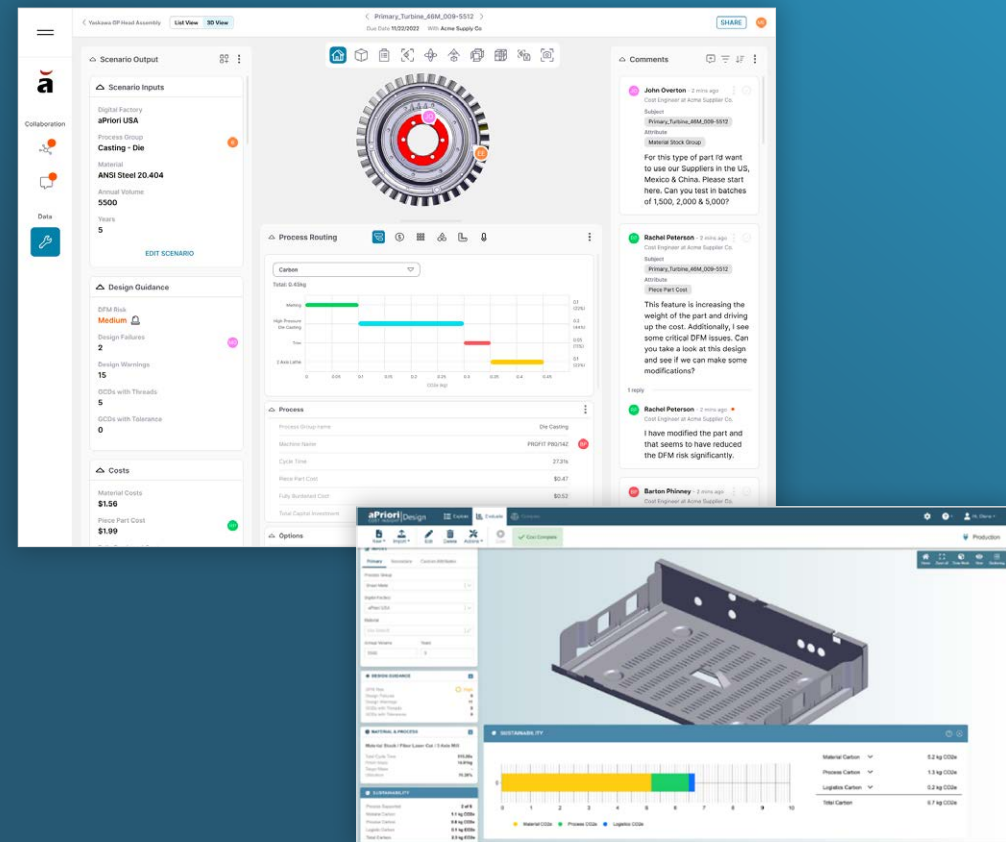
6 Communicate Key Metrics Visually

aP Workspace provides visual snapshots, called insights, that break down key areas of data to review.

By providing information graphically, you can easily summarize top-line project data visually without requiring project contributors to create their own reports or dig through mountains of data to draw conclusions.

This helps teams collaborate over complex issues by using visualized clusters of information to find ways to use materials more efficiently, identify cost drivers that may not be noticeable at first glance, and address other challenges.

The aPriori Advantage:

- ⊘ Illustrate data associated with key metrics for cost, manufacturability, and manufacturing process

- ⊘ Drill down quickly to get additional details (e.g., view a cost breakout by material, labor, direct overhead, setup, investment, and other categories)

- ⊘ Share information in a simplified view that empowers multiple stakeholders to act on information quickly and confidently

Use aP Workspace insight cards to view important product design information graphically that help to illustrate the source of key cost drivers, breakdown the cycle time for each manufacturing process, and more. We've included three examples. Manufacturers are using the information to streamline design review meetings and communicate important issues across multi-disciplinary teams.
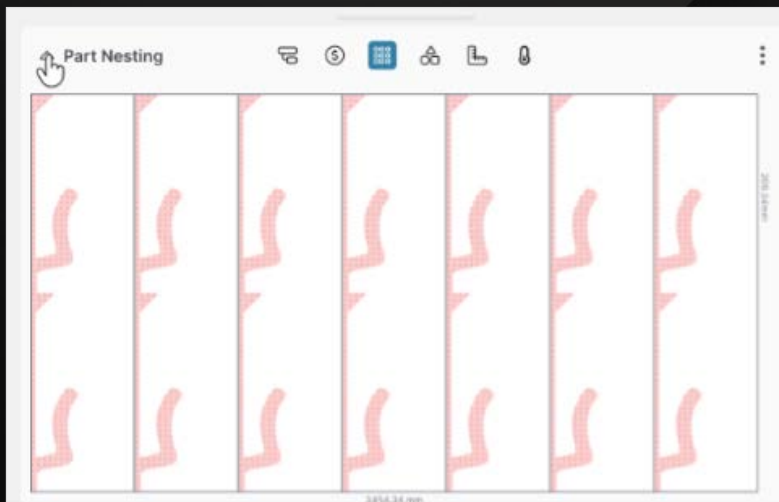
1. Understand which manufacturing processes will take the most time.
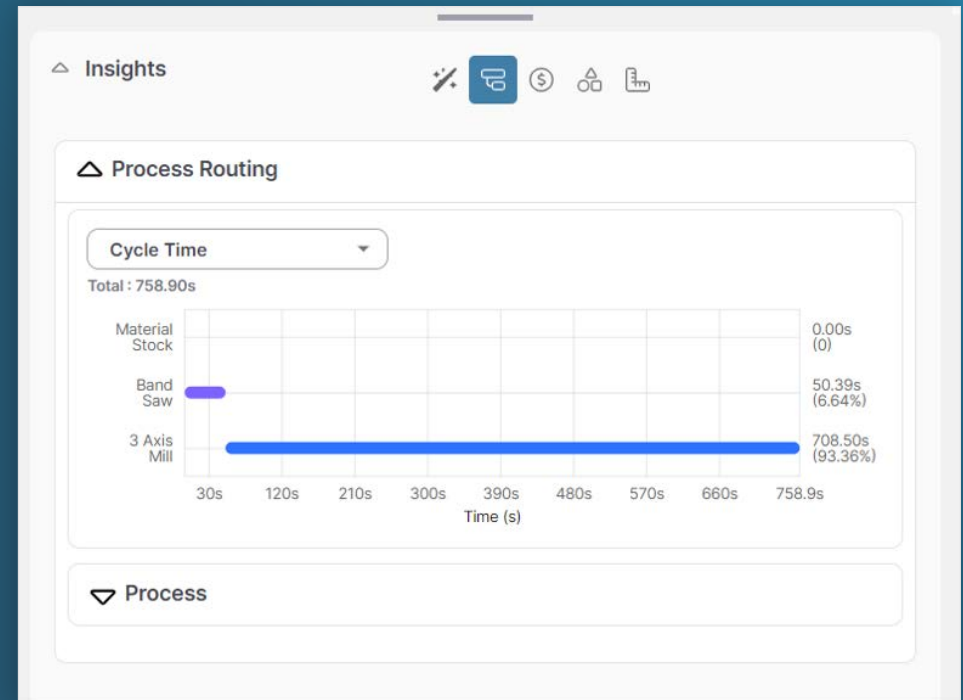
2. Identify cost drivers quickly.

3. Review opportunities to increase efficiency and reduce waste.


Visually Show Manufacturing Analysis Highlights

Use insight cards to address central design considerations including: DFM, process, material nesting, material & stock information, and GCDs.

- **Routing:** Manufacturing process routing tree

- **Cost:** Simple breakdown of primary costs

- **Part nesting:** Details on part spacing, orientation, and utilization during manufacturing

- **Materials stock:** Raw material used to make a part

- **Material properties:** Material density, dollars per kilogram ($/kg), and other properties

- **Design guidance:** Displaying DFM issues, high-cost features, tolerances, and threads

- **Assembly tree:** Provides visibility into the parts of an assembly that are used when calculating cost elements within a scenario

Scale Quickly and Accurately
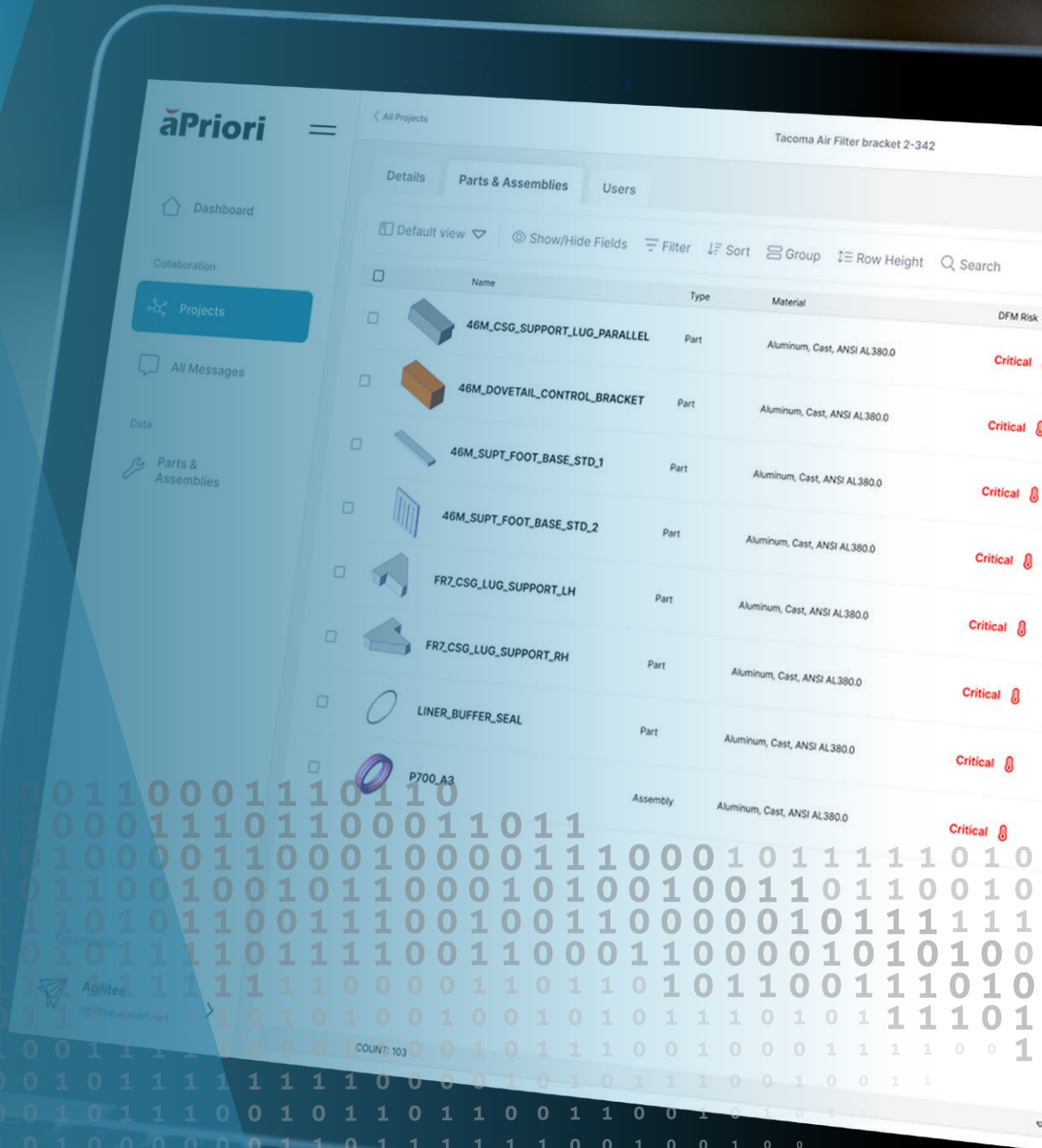
# 7 Identify Issues Quickly with Automated Analysis

Automation and collaboration are central to accelerating product development.

aPriori integrates with your PLM system to generate automated insights and alerts at scale to identify potential issues, such as design risks and cost outliers. Product development teams can then use aP Workspace to address potential issues quickly and effectively.

The aPriori Advantage

- ✓ Get automated analysis continually as soon as a part in your PLM system is ready for analysis

- ✓ Receive customized alerts that are most relevant to your job, which will help you prioritize your tasks

- ✓ Drill down into the alerts to analyze the issue – and get aPriori's design guidance to understand how to fix the problem

- ✓ Work can happen in parallel cross-functionally to investigate the same product design issue (e.g., a design engineer can review aPriori's design recommendations while a cost engineer can click on additional cost details from the alerts)

- ✓ Collaborate in aP Workspace to assign tasks, offer feedback and review findings, etc.

aPriori provides automated summary of components analyzed for manufacturability and cost with further detailed reports attached. Users can quickly review a component's manufacturing guidance details/recommendations.
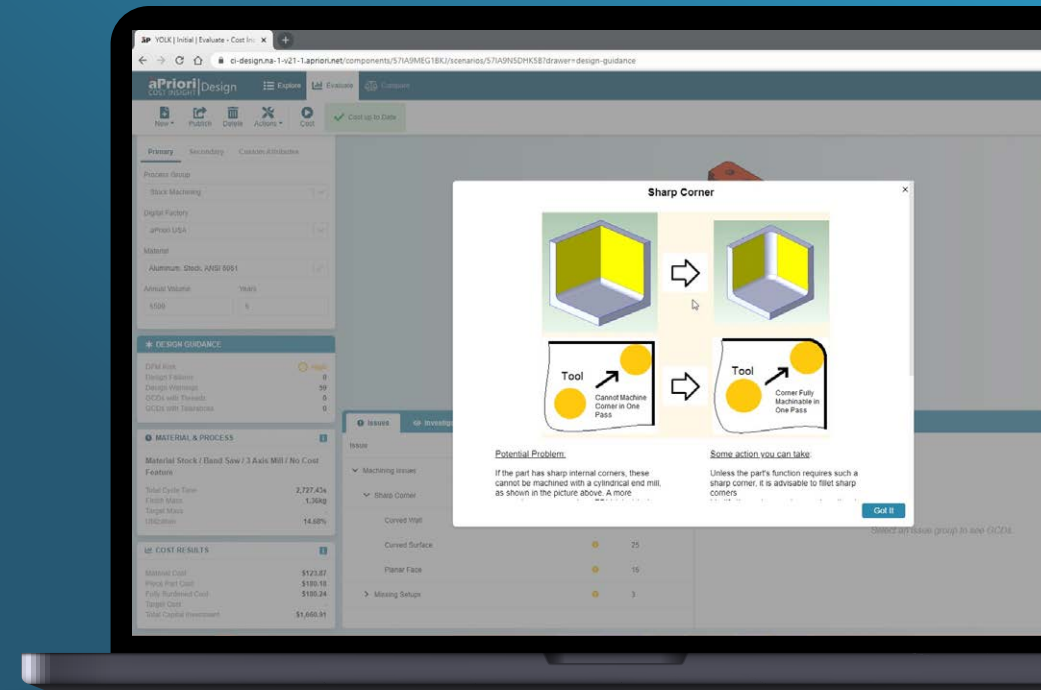
Evaluate Multiple Options Simultaneously

Explore design options at scale with the breadth and depth of our real-time analysis. With matrix and bulk analysis features, you can test one part with myriad variables simultaneously, or upload and analyze multiple parts at once.

Matrix analysis enables teams to assess the cost implications of different design choices for a single part (3D CAD model). This feature provides data to evaluate multiple scenarios quickly, such as production volume changes across regions.

Teams use bulk analysis to evaluate all designs (parts) in a product digital twin. With this top-level view of a product or assembly, users can identify outliers in parts where cost reduction is possible. And they can even see the entire cost breakdown of a component by clicking on its outlier data.

The aPriori Advantage

- ⊘ Evaluate numerous design and manufacturing options simultaneously with matrix analysis, including:
  - Manufacturing region
  - Production volume
- ⊘ Use bulk analysis to gain insights such as:
  - Labor costs
  - Direct overhead costs
  - Material costs
  - Indirect costs
- ⊘ Use team collaboration to refine manufacturing scenarios based on team feedback

Use bulk analysis to quickly get a snapshot of part and component data at scale. And use our out-of-the-box reports to identify and investigate the largest cost outliers easily. Teams use this information to negotiate for more competitive pricing and make fact-based decisions.

# Balance Multiple Project Initiatives Seamlessly

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aPriori makes it easy for you to collaborate at the project level to gain additional efficiency.

The same co-working process to address individual components also scales easily for teams to collaborate on groups of parts or assemblies. Importantly, this enables teams to evaluate make vs. buy, onshoring vs. offshoring, and other strategic decisions at the product level.

The aPriori Advantage

✓ Collaborate quickly and easily on a group of parts and assemblies

✓ Streamline communication for strategic initiatives such as:
  - Evaluating design options for new product development
  - Identifying and prioritizing value engineering projects
  - Analyzing opportunities to reduce a product's carbon footprint
  - Pinpointing components that require supplier renegotiation based on cost outlier analysis
  - Considering reshoring benefits and drawbacks

aP Workspace enables you to streamline communication for project initiatives such as NPI projects with several components, selecting VA/VE candidates, and collaborating on similar components for cost or carbon reduction.
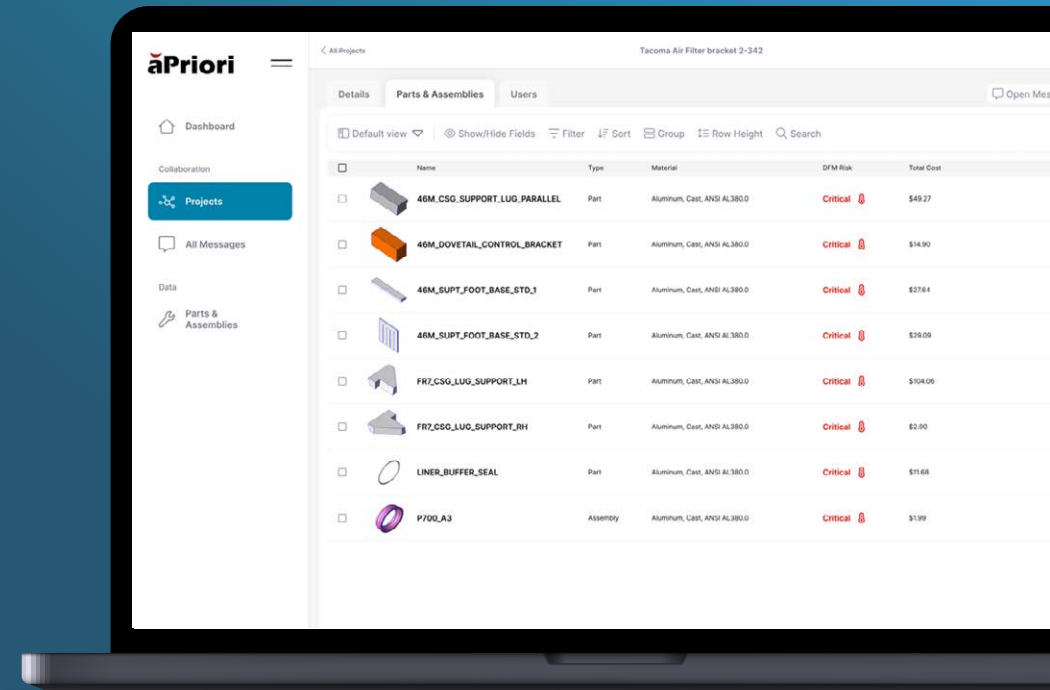
How to Select the Right Collaboration Capability

10 Keys to Selecting the Right Collaboration Capability

When you evaluate a collaboration tool – or any new capability – think of what it can do, how it fits into how you work, and if it integrates with the systems that you and other departments rely on. Standalone collaboration tools typically have limited value because they only enable teams to share static information (i.e., a snapshot of an old cost report).

Accelerating time to market requires teams to work from a centralized set of information that continually evolves with the design project. Cross-functional teams also need to maintain and access an audit trail of each discussion that is easy to understand and follow.

Think about how collaboration can fit seamlessly into how you currently work and share information with other departments:

Think Big
Typically, organizations implement many technologies based on short-term needs instead of addressing longer-term advantages – such as how to combine data from different departments to establish a robust data repository for effective decision-making.

Embed Collaboration into your Process
If your organization is not utilizing the same data, in the same language, and using the same collaboration processes, then there is no clear consensus or means for identifying disjointed data insights that lack validity. Additionally, institutional knowledge can be lost without cloud-based data sharing and storage.

Eliminate Siloed Information
Tools with limited capabilities create significant gaps in data. Examples:
- How can design engineers get feedback from cost engineers or hand off final product designs to be sourced easily?
- How can sourcing teams provide supplier design feedback to product design teams for future development?
- How can the best sourcing and cost decisions be made if all product development teams cannot access, let alone consider, all pertinent data?
- How can sourcing identify material cost issues if the team can't access the necessary data?
- Conversely, how can cost engineers forecast material costs if they lack insight into the supply chain and associated suppliers?

Work Faster with Integrated Task Management
Delays in receiving critical data and feedback also lead to inefficient task management. The problem is compounded without task management capabilities to help you manage your assignments, find requested information easily, and get visibility into the overall project status.

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11 | Checklist

Must-have Co-working Features

- ✓ Integrate with your existing CAD and PLM system to create a continuous digital trail throughout the development cycle to "design, optimize, and finalize" product development

- ✓ Take advantage of automation:
  - Have your 3D CAD designs analyzed automatically for cost, manufacturability, and sustainability every time they are uploaded to your PLM system
  - Get an itemized list of potential issues (and recommended fixes) sorted by severity level
  - Collaborate with your team on appropriate issues flagged in your PLM system

- ✓ Personalize views to access the information that you need quickly

- ✓ Show designs and data in multiple ways to address issues around cost drivers, sourcing alternatives, etc.

- ✓ Simplify collaboration by commenting directly on 3D CAD files

- ✓ Manage tasks (your tasks, assigned tasks, etc.)

- ✓ Review decision history for background regarding current and future design projects.

Learn More about aP Workspace

Visit our aP Workspace web page, watch our webinar, or contact us to learn more about purpose-build collaboration for product manufacturing teams.

- Webpage: aP Workspace

- Webinar: Turning Manufacturing Insights Into Action with Cloud Collaboration

- Contact us for additional information

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Why aPriori?

aPriori provides a unique, end-to-end digital twin solution that empowers manufacturers to unlock and identify new opportunities rapidly for innovation, growth, cost savings, and sustainability. With aPriori, customers achieve a ~600% ROI within three years and payback within six months of adopting our software platform.

And companies use our automated manufacturing insights to eliminate product cost, improve productivity, and reduce their products' carbon footprint. aPriori also boosts manufacturers' digital thread investments to deliver business value at scale, increase agility, and minimize risk. To learn more about aPriori's cloud and on-premise solutions, visit **www.apriori.com**.

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