



# Benefits of the cloud

Reimagining industrial product and production design

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# Discrete and process manufacturing in an era of digitalization

Too many manufacturers are unprepared for the rapid pace of technological growth. Data silos impede design and production efficiency, manufacturing costs are rising<sup>1</sup>, and organizations struggle to attract engineers with the right skillset.

When they do find qualified design and production engineers, manufacturers must provide them access to integrated tools and high-speed computing with less machine downtime. Traditionally, IT departments shoulder the responsibility of maintaining these tools and processes. This takes up valuable time and expertise that could be applied to reaching business goals and satisfying customers.

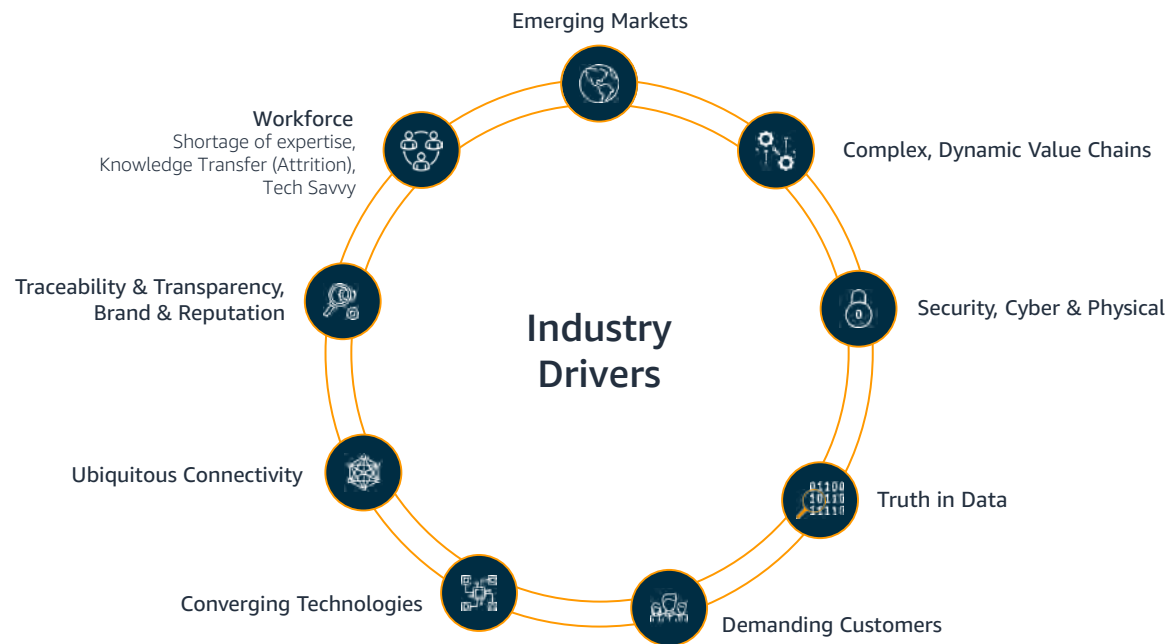
“Currently, IT refreshes once every four to seven years. In communications with Frost & Sullivan, manufacturers describe their struggles as twofold. First, they are challenged to keep up with the pace of innovation, and second, they are tasked to find a viable partner at the forefront of change. Cloud plays an important role in bridging these divides.”

—[Frost and Sullivan](#)  
[2019 White Paper](#)

<sup>1</sup>How Shifting Costs Are Altering the Math of Global Manufacturing – Boston Consulting Group, December 2018

# The state of manufacturing today

The cloud has democratized product and production design by reducing the capital investment required for innovation. The Information Technology and Innovation Foundation (ITIF) and the American Enterprise Institute credit the immense data capacity of the cloud and hosted design tools for streamlining product development, speeding innovation cycles, and accelerating time to market. Manufacturers large and small are accessing the design and production tools and processes available through cloud computing to break down silos, improve collaboration, and ultimately—delight their customers.



## Let's explore the ways the cloud has the biggest impact on product and production design.



### Lower cost of entry

Startups and small manufacturers no longer need to invest vast sums of money in software licenses and computing power. Give an engineer a \$500 laptop, and a company can go from fuzzy-front-end ideation to production to shipping in less time than ever before, using the software and platforms offered on the cloud infrastructure. Large manufacturers also need to leverage the tools and advantages the cloud offers if they don't want to be outpaced by these new startups.

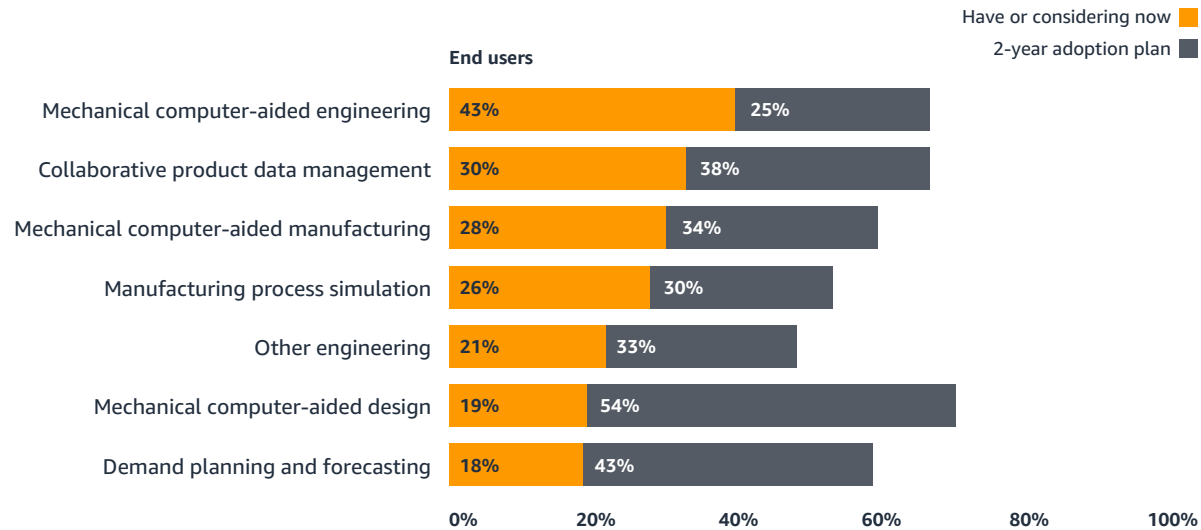


### Collaboration

The collaborative benefit of the cloud can be experienced within teams, but collaboration also expands across the entire organization and beyond to partners, customers, and end-users. Access to a centralized data lake vs. siloed pools of data and the appropriate computing power required means product designers and engineers can work together at the same time, no matter where they are located across the globe. Give designers access to data across the entire business, and they will know what customers want when they want it, what materials are available, and when production can best schedule it.

Manufacturers are already realizing the benefits of moving to the cloud for mechanical computer-aided engineering, design and simulation, and manufacturing; collaborative product data management; and demand planning and forecasting. Some of the benefits realized by both small and large organizations are improved collaboration, rapid on-boarding, better use of employee time due to functionalities, and the shift from capital expenses to operating expenses.

## Applications moving or considered to be moving to the public cloud



Source: IDC Industrial Software User and ISV Survey Sponsored by AWS, April 2018

## Why AWS?

In July 2019, for the ninth year in a row, AWS was evaluated by Gartner as the Leader in cloud IaaS with the highest score in both Ability to Execute and Completeness of Vision. That leadership role is strengthened by AWS's partner vendors.

AWS Industrial Software Competency Partners provide specialized software solutions to help manufacturers innovate faster, reduce costs, and foster collaboration in the most secure, high-performing, resilient, and efficient cloud infrastructure for industry applications.



# Imagine the possibilities



## **Use Case: Innovate faster with scalable, resource-intensive workloads.**

If you're using in-house data centers and have multiple design teams, there is often a bottleneck when you run resource-intensive workloads, such as workloads for EDA, CFD, FEA, and crash simulation. Switching to a comprehensive and trusted infrastructure like AWS with our dynamic system of global vendor partners gives you the computing power and storage you need, when you need it, without the capital investment.

AWS provides an elastic computing solution and secure design environment, so you can focus on designing and innovating products at an accelerated pace.



## **Use Case: Reduce costs without sacrificing needed infrastructure.**

Small startups often don't have the IT staff, the budget, to support a large software deployment effort. When you opt to design in a flexible, reliable, and secure infrastructure like AWS, our vendors ensure you have access to the most up-to-date software, support, and shared community knowledge, which in turn frees up your in-house IT staff. Access to our CPU, GPU, and FPGA servers on-demand in the cloud and optimized for specific applications allow our customers to switch from a capital investment to an operational expense through monthly subscription costs.

The inherent capability to make fast decisions, combined with the ability to increase simulation capability and technical agility, allows small businesses to compete with much larger organizations.

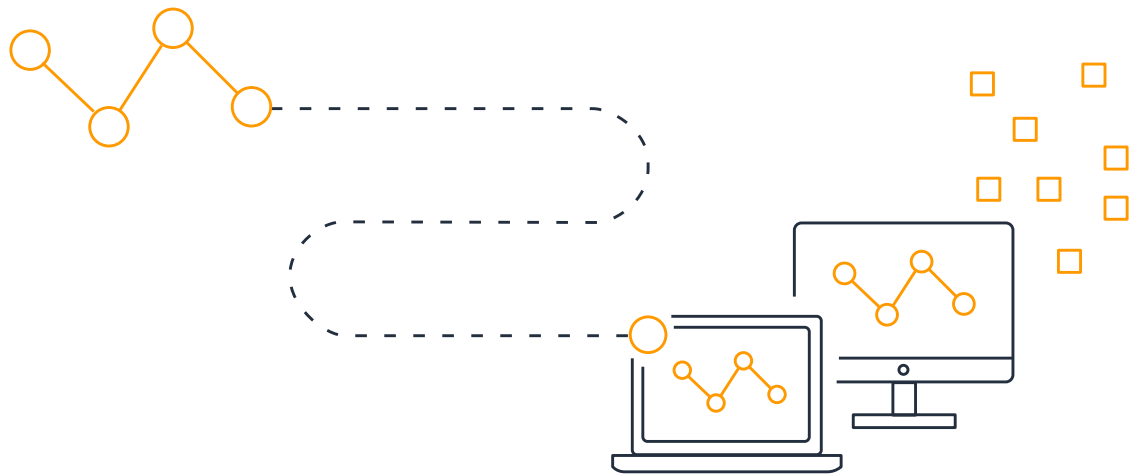




## Use Case: Improve collaboration with centralized access.

Both large and small manufacturers of customized products can experience the collaborative benefits of the cloud when they easily share technical drawings with customers.

For example, designers can create and modify drawings via DWG-based CAD software, then generate a URL that customers simply click to access a read-only file, from anywhere in the world, and on any computer or mobile device. One central location for product data also ensures teams can quickly locate and reuse existing designs.





# Next Steps

## Think big start small

Abandoning an old way of working can sometimes take a tremendous leap of faith, despite the apparent benefits. One of the easiest ways to evaluate cloud ROI is to start with a small project. Start with the following measures to begin your calculations and identify your increased opportunities.

### 1. Calculate hardware, software, and performance costs

Hardware and software costs are the most straightforward measurements because they are so tangible. First, compare what it costs to run the application or group of applications you want to migrate to the cloud. Then, dig into the cloud vendor pricing models. Don't forget to include crucial performance and security requirements, and whether you need a dedicated environment or whether a multi-tenant offering is enough.

### 2. Calculate time to deploy

Work with your organization's IT department to calculate the time spent configuring applications on in-house networks versus accessing them through the cloud. Consider less obvious data points such as the expertise required for both types of deployment, the person-hours required to implement, and the amount of training needed to start using the programs successfully. You'll want to calculate long-term provisioning of resources considering that as applications change, new equipment is often required, and unneeded equipment needs to be decommissioned.

**“Many might consider security a major threat in moving to the cloud, but in anticipating this need, cloud solution providers have invested in powerful security standards. Their performance is already resonating with extremely regulated industries, such as healthcare and financial services.”**

—[Frost and Sullivan](#)  
[2019 White Paper](#)

### **3. Measure productivity levels**

To accurately value ROI, it's important to measure resource usage. How are teams impacted during periods of peak runtime? Is there a bottleneck created due to in-house servers' ability to process vast amounts of data? If so, you want to determine the cost of teams sitting idle as they queue up to run simulations. Equally as important is the cost of overbuilding a local data center for peak load periods that only occur a few times a year.

### **4. Add up system administration costs**

Even when your design and production teams are not pushing the limits of your networks, routine procedures such as keeping up with security patches and backups are still required. Security standards continue to rise, and internal IT departments must stay vigilant against malicious attacks and data theft.

Be sure to track how much time is spent applying security measures to applications hosted in-house versus the shared responsibility security model that comes with cloud computing.

If you serve an industry that is highly regulated, you want to also factor in time spent meeting compliance. AWS manages dozens of compliance programs in its infrastructure. This means that segments of your compliance have already been completed.



# Increase the pace of innovation with AWS Industrial Software Competency Partners

AWS Industrial Software Competency Partners offer specialized software solutions for product and production design. These solutions are recommended for both large and small organizations and follow AWS best practices for building the most secure, high-performing, resilient, and efficient cloud infrastructure for industrial applications. Access the tools and patterns necessary to respond to your customers in a timely and agile fashion.

## Autodesk

Autodesk's cloud-based developer platform, Forge, connects industry data and automates workflows, empowering you to reduce costs and time-to-market as you orchestrate your design-to-manufacture lifecycle.

[Learn more about Autodesk](#)

## Cadence

EDA-optimized, secure cloud computing for the future of semiconductor design.

[Learn more about Cadence](#)

## Graebert

Create, Modify, and Share DWG or DXF Drawings in the Cloud. ARES Kudo offers all the CAD features you have come to expect to create and modify drawings in 2D, with the additional agility to run in the Cloud.

[Learn more about Graebert](#)

## Rescale

Rescale's ScaleX® Enterprise integrates with Amazon Web Services to provide the industry-leading SaaS, secure, cloud-based, high performance computing (HPC) simulation platform.

[Learn more about Rescale](#)

## Siemens

Teamcenter® software is a modern product lifecycle management (PLM) system that connects people with a digital thread for innovation to help companies develop successful products.

[Learn more about Siemens](#)

## ZeroLight

Customer-centric and scalable real-time 3D retail experiences that drive higher specification sales.

[Learn more about ZeroLight](#)

# Ready to get started?

Deliver timelier and cost-effective products to delight your customers. Contact our AWS Industrial Software Competency partners to leverage the cloud and innovate now.

[aws.amazon.com/partners/industrial-software](https://aws.amazon.com/partners/industrial-software)

## Shop Industrial Software Solutions in the AWS Marketplace

AWS Marketplace is a curated digital catalog that makes it easy for industrial customers to find, buy, deploy, and manage the third-party software they need to build solutions and run their business. Procurement professionals can leverage AWS Marketplace to accelerate innovation and enable cloud users to rapidly and securely deploy solutions, while reducing Total Cost of Ownership (TCO), and improving operational oversight.

The AWS Marketplace makes buying industrial software easy with features like:

- **Flexible Pricing Terms:** AWS Marketplace helps you to pay only for what you use with different pricing options such as Pay-as-you-go, by the hour, monthly, bring your own license (BYOL) or long term options (Annual and Multi-Year).
- **Free Trials:** No initial commitment, get a Proof of Concept (POC) started quickly with free trials. Test software solutions and make sure it's the right fit for your business need.
- **Convenient Billing:** All software solutions purchased in AWS Marketplace are billed and delivered directly to your AWS account.
- **Simplified Software Purchases:** Use a standardized contract template and reduce the time spent on contract negotiations. Enterprise Contract for AWS Marketplace helps streamline and simplify the contracting process.
- **Consulting Partner Private Offers:** Work with your preferred Consulting Partner from start to finish in your procurement process and benefit from their expertise. Get a consultation and purchase directly in AWS Marketplace through your trusted Consulting Partner.

Shop the AWS Marketplace: [www.aws.amazon.com/marketplace](https://www.aws.amazon.com/marketplace)



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