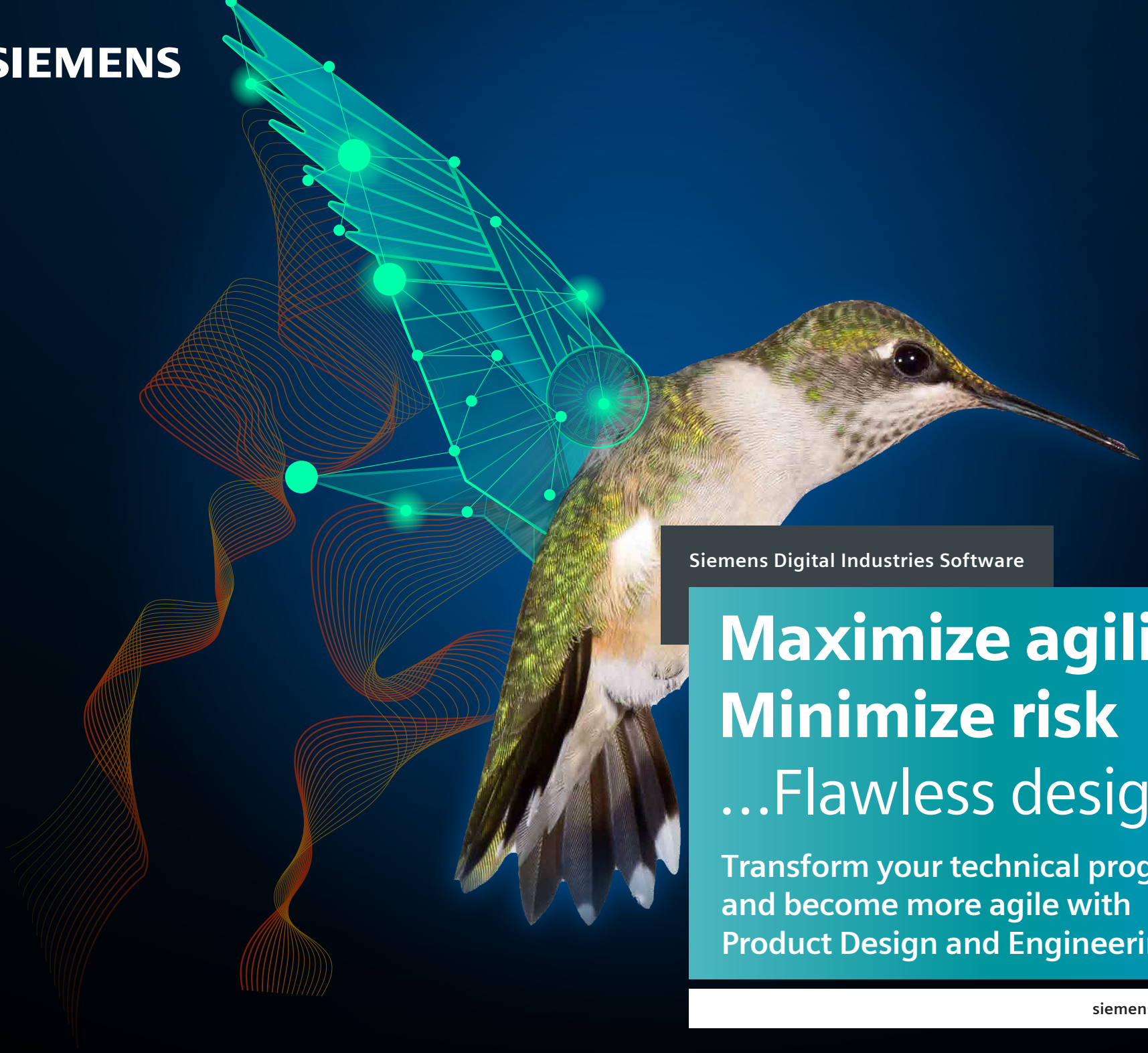
SIEMENS



Siemens Digital Industries Software

Maximize agility
Minimize risk
...Flawless design

Transform your technical program and become more agile with Product Design and Engineering

siemens.com/plm/pde

Trend #1

Pressure to reduce program cost and schedule requires new optimized methodologies

Trend #2

Increasing program complexity and integration forces companies to fully embrace digitalization

Trend #3

The electrification of products is driven by digital technologies and the need for greener solutions

Trend #4

Globalization demands optimized collaboration across teams and suppliers around the globe

These are challenging times for the aerospace and defense industry. The need to innovate along with emergence of **new technologies are causing unprecedented levels of disruption. Increased global competition** complicates the situation even more.

A **transformational effort** is required to meet today's market demands for faster product innovation at less cost, without sacrificing quality or high-performing product capabilities.

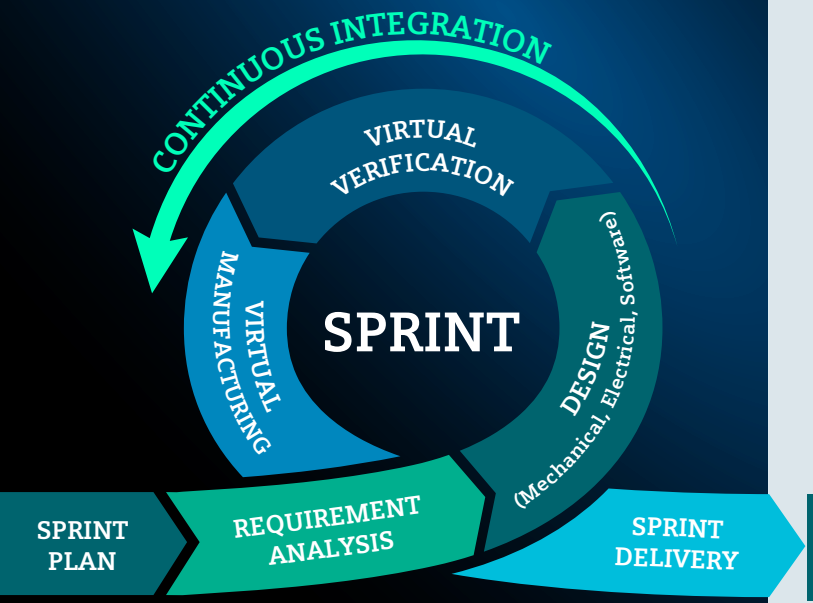
Aerospace manufacturers are facing **increased complexity in product development**. Customers expect the latest technologies to be incorporated into their products, resulting in higher levels of **integrated embedded software and cross-domain functionality**. Developing smart products of the future requires an optimized and highly flexible engineering process.

In response to the need for **green solutions** and to improve the **reliability and maintainability** of new products, more **electrical solutions** are now being incorporated into the aircraft. Electrification requires more innovation, increasing complexity further for the engineering teams.

To remain competitive in this challenging environment, companies need to **adopt a more agile engineering process**. Remote collaboration across the globe between suppliers, partners and a distributed workforce demands more advanced tools to enable a productive, **multi-disciplinary design environment**.

Imagine a powerful tool to fly your designs before you build them... Welcome to the world of agile product development

Siemens offers the most open and integrated design ecosystem in the industry to reduce costs, lower technical risks and shorten design cycles. Our Product Design and Engineering digital thread solution offers key technical disciplines to help aerospace manufacturers overcome innovation challenges of today and tomorrow.



Enable next-generation agile engineering and accelerate innovation with Siemens Product Design and Engineering

Digital transformation is opening up a whole new world of opportunities for the swift and innovative. However, these exciting **opportunities** also come with many challenges and **advanced tools will be needed** to efficiently build today and tomorrow's flying machines. Siemens **Product Design and Engineering (PD&E)** leverages the expertise gathered by supplying the industry with **innovative software solutions** and enables aerospace manufacturers to **turn complexity into a competitive advantage**.

Taking engineering agile

To develop highly sophisticated and cross-domain aerospace products, companies will need to shift away from **traditional approaches**. The only path to success will involve making full use of the **power of digitalization** to enable an **agile methodology** supporting a **collaborative, model-based design environment** with simulation capabilities and integrated data flows.

Leverage comprehensive digital twin and thread

Delivering on innovation demands higher levels of automation, collaboration and integration which can only be provided by a robust digital twin of the product. Digital twin enables accurate virtual simulation allowing teams to fly their most complex designs before they are built. It also includes advanced visualization tools to help validate designs for manufacturability and supportability.

An open and adaptable digital thread enables the usage of any design data and connects it to the entire product lifecycle needed to certify, deliver and maintain resulting in cost and time savings.

Digitalization enables agile product development

Agile product development enables aerospace manufacturers to mature complex programs faster by allowing them to rapidly meet requirements in every engineering sprint - continually testing, verifying and validating. At the end of the sprint, teams will be able to confirm what they already tested virtually. Using an agile engineering approach, new capabilities can be easily incorporated at any point in the development process to adapt to new market requirements.

Key drivers

- **Need for faster time-to-market with reduced costs**
- **Increased program complexity drives the need for digitalization**
- **Demand for reliable, mantainable and sustainable products increases the need for electrification**
- **Globalization calls for new advanced methods of collaboration**

Merge the physical and virtual worlds to maximize agility and minimize risk...

Bring benefits to both the design and manufacturing processes

Excel at agile engineering and program execution with Siemens Product Design & Engineering

In such challenging times where the aerospace and defense industry is under great pressure to reduce program costs, improve program schedules, implement new technologies and meet shifting customer demand, companies must **rethink** their product design approaches to **bring innovation to the market faster** than the competition.

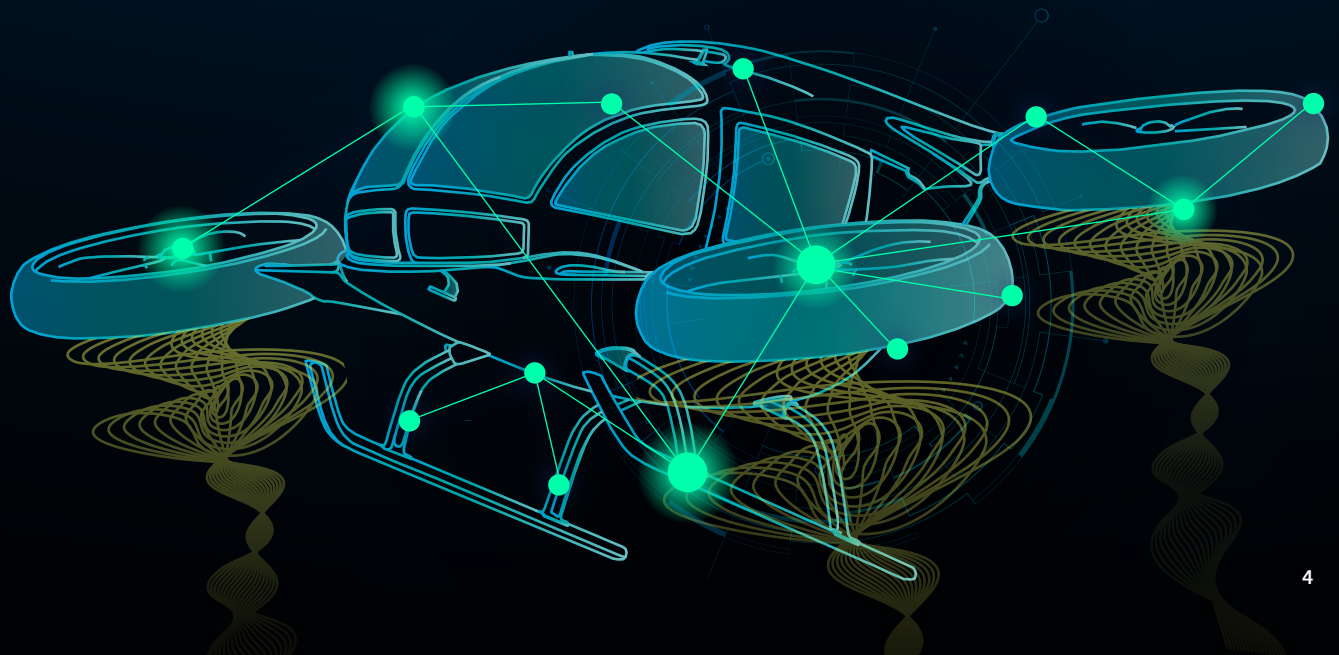
New materials and technologies allow for new aerodynamic shapes, new structural configurations and system architectures. The **possibilities are endless and exciting**.

However, **classical engineering solutions won't suffice** increased complexity. New solutions are needed to quickly implement digital technologies. Only a **digital transformation** will allow businesses to remain competitive. It is paramount to **move fast with a more agile mindset**.

The **Siemens Product Design & Engineering** comprehensive portfolio of **digital software solutions** enables aerospace and defense companies to use their **full potential** and **break the barriers to innovation** to bring the **flawless designs** of the future products to the market **on time and on budget**.

Go agile today and succeed!

- **Transform program management** to focus on maturing and delivering content
- **Implement a collaborative, multi-disciplinary design environment** to eliminate organizational silos
- **Use next-generation design** tools and 3D modeling to accurately capture the design intent
- **Ensure continuous integration and verification** through a robust digital thread and virtual testing capabilities
- **Fly it before you build it**: Use embedded analysis and simulation within the design process and connect the virtual and physical worlds to provide proof of compliance in the verification process
- Ensure **manufacturability and supportability upfront** and expand the use of virtual manufacturing to reduce the risk of changes
- **Become faster and more flexible** to respond to evolving customer needs and market demands
- **Optimize design collaboration** with suppliers and partners regardless of their location and the tools they use
- **Stay on budget and on schedule, reduce risks** and **bring innovation to the market faster**



About Siemens Product Design and Engineering for Aerospace & Defense:

Undertaking a digital transformation isn't just digitization, it's about digitalization that includes process improvement. Aerospace and defense organizations can benefit from adopting new engineering practices to keep pace with innovative new startups. These firms will also need to consider how to affect cultural change and adopt the right tools to make this work.

Using agile methodology and the power of digitalization, define a program plan that accelerates product development. Build a collaborative, model-based design environment, combining electrical, mechanical and software disciplines to foster iterative and innovative designs, using virtual verification and manufacturing to "test" the designs.

Agile engineering practices have proven their value in the software industry. As the industry undergoes rapid change, aerospace and defense enterprises have an opportunity to adopt the same approaches to succeed. Adopting agile engineering transforms program execution, enables companies to go faster, breaks down organizational barriers and increase effective collaboration and minimize risk as they become more flexible and develop innovative products.

For more information on Siemens PD&E, visit siemens.com/plm/pde or follow us on LinkedIn, and Twitter.

Siemens Digital Industries Software
Where today meets tomorrow.

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