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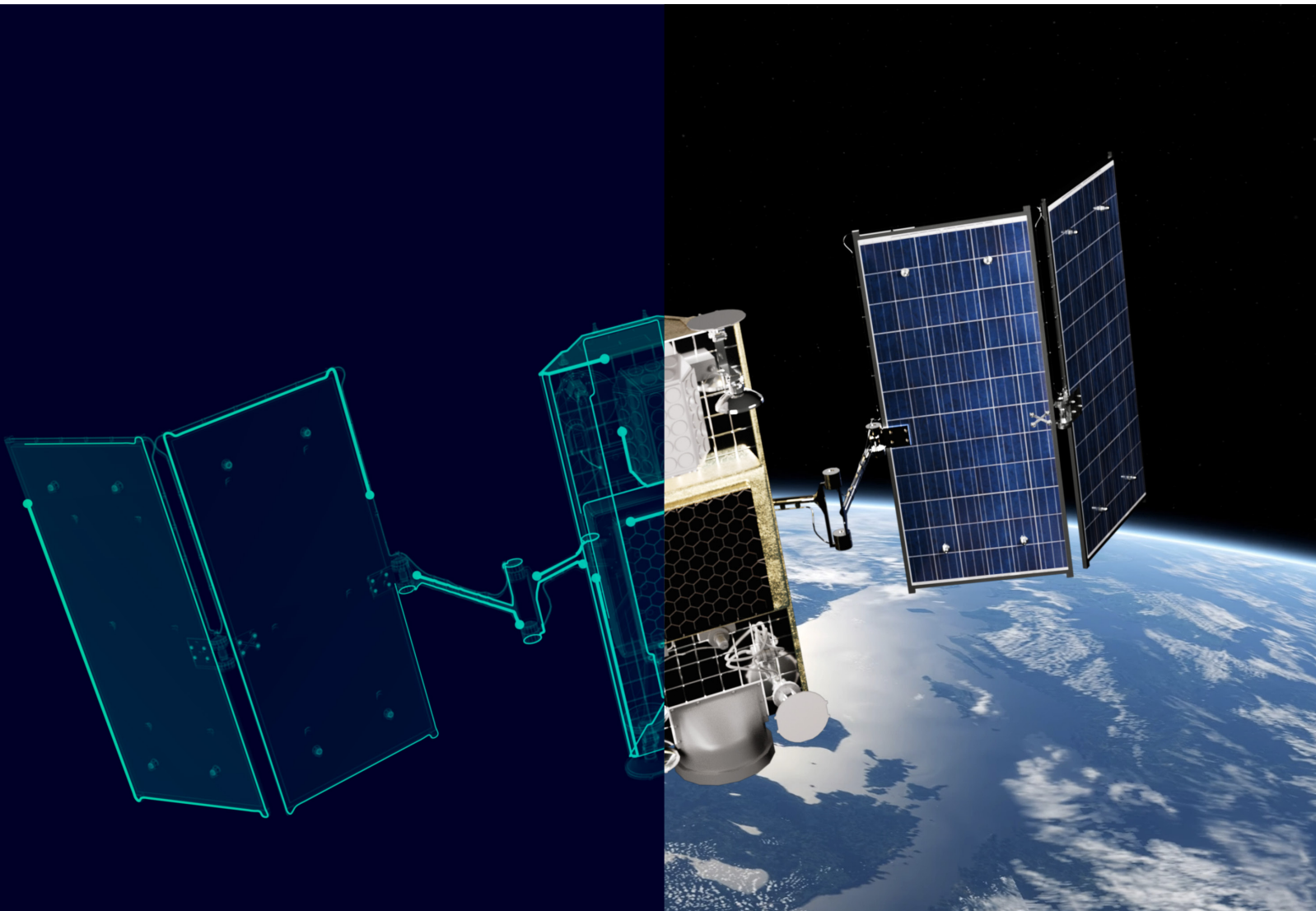
Digital transformation in aerospace and defense

Insights from a survey of aerospace and defense
OEMs and suppliers

Embarking on a digital transformation journey

Aerospace and defense companies are at the forefront of two major trends: Unprecedented innovation and increased complexity. It's become increasingly clear in recent years that digital transformation is critical to being more productive, faster to innovate and achieving program execution excellence.

While the advantages of digital transformation are quickly setting early adopters apart in a competitive marketplace, transformative change comes with challenges and doesn't happen overnight. To better understand how aerospace and defense companies are embracing and implementing digital transformation, we partnered with Aviation Week to survey North American original equipment manufacturers (OEMs) and suppliers about their experiences: Where are they in their digital transformation journey, what issues have they encountered and what is their expected return on investment? Read on to learn more.



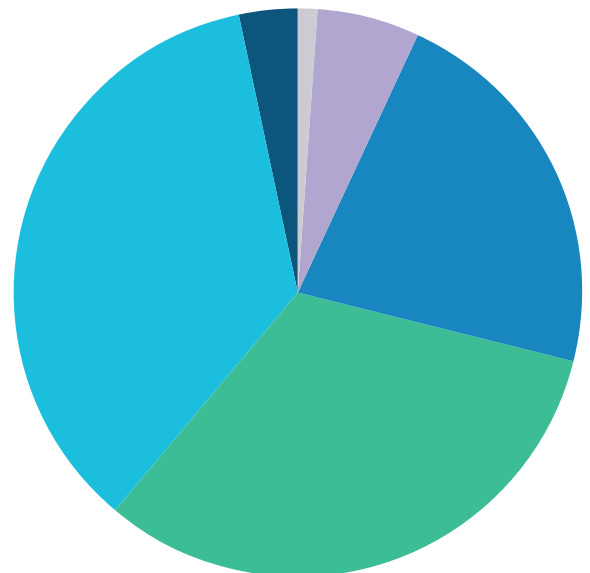
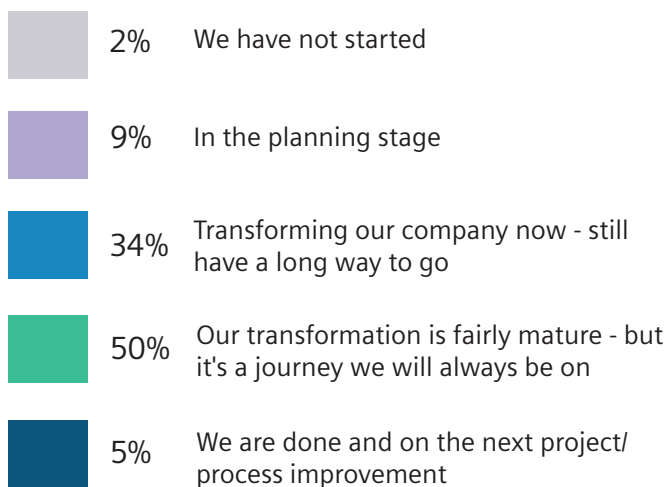
Digital transformation status

As the benefits of digital transformation become clearer and more tangible, more and more aerospace OEMs and suppliers have started their digitalization journey. A majority (84%) reported that their digital transformation journey was in progress, with 55% saying they consider their digital transformation to be mature or complete.

Digital transformation maturity can be assessed based on five levels:

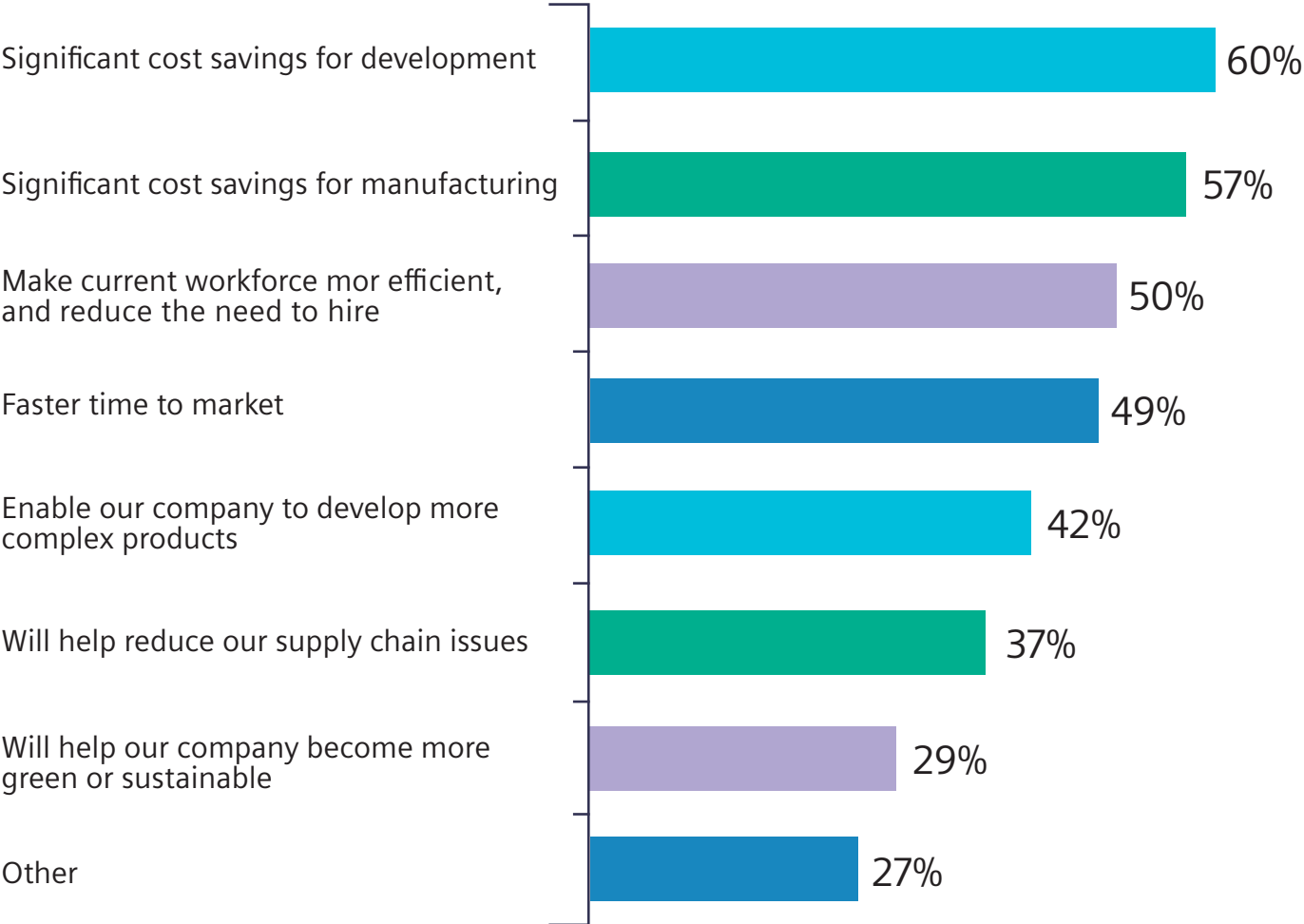
- **Configuration** – This first stage is all about a company’s ability to capture and store data, as well as attach metadata to it for easy reuse later.
- **Connection** – Following the configuration stage, the second stage focuses on linking individual pieces of data together and increasing their traceability.
- **Automation** – The third stage focuses on shifting the responsibility of mundane tasks like data processing from people to computers, allowing engineers to focus more of their time and productivity on innovation.
- **Generative design** – This fourth stage is where artificial intelligence and machine learning can revolutionize design processes by using a company’s data and inputted requirements to design products.
- **Closed-loop optimization** – In this final stage, AI can be used in generative design to generate thousands of designs and then evaluate those designs based on specified performance indicators through simulation.

What is the status of your company’s digital transformation?



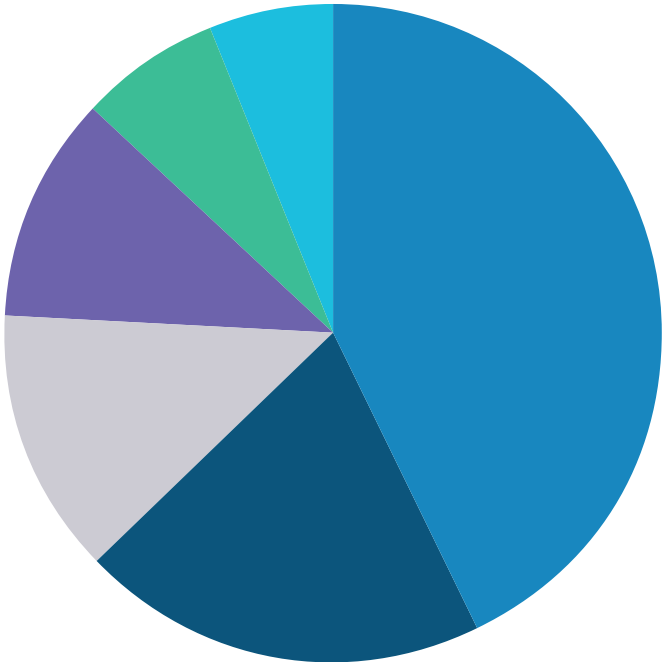
The expected benefits of digital transformation

Undergoing a digital transformation is no small task. However, with a variety of expected benefits, the investment is worth it. Sixty percent of respondents anticipated significant cost savings for development, and 57% anticipated significant cost savings on the manufacturing side. Other top benefits they expected from their company's digital transformation were a more efficient workforce (50%), faster time to market (49%) and being enabled to develop more complex products (42%).



Scope of digital transformation challenges

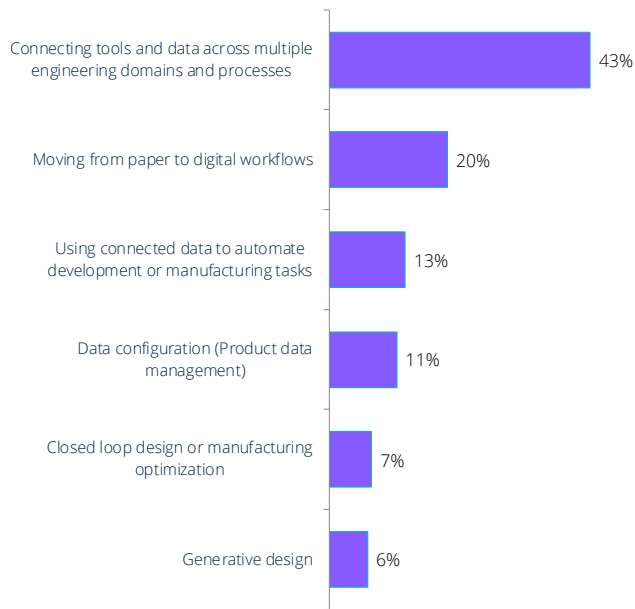
What is interesting and possibly exciting is that many haven't realized the full scope of benefits from digital transformation. Only one in four respondents said they think digital transformation includes automation, generative design or optimization. For those who haven't begun this journey, there is still time. Those ahead of you in this journey may not be achieving all they can.



- 43% Connecting tools and data across multiple engineering domains and processes
- 20% Moving from paper to digital workflows
- 13% Using connected data to automate development or manufacturing tasks
- 11% Data configuration (product data management)
- 7% Closed-loop design or manufacturing optimization
- 6% Generative design

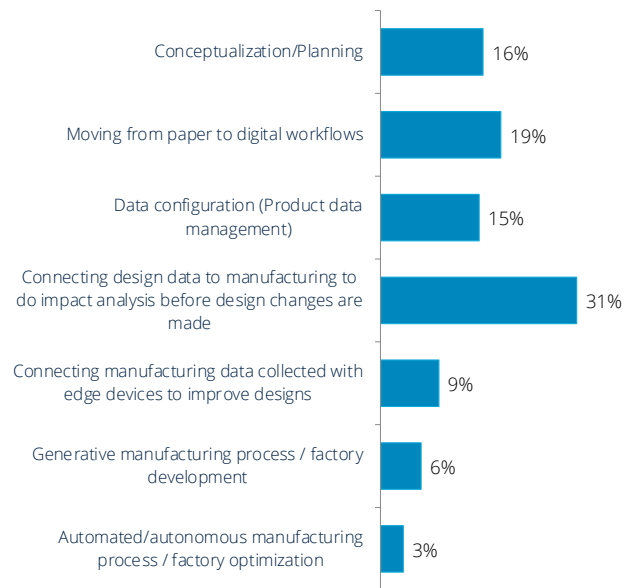
Stages of digital transformation: Manufacturing

On the manufacturing side, only one in 10 respondents reported that their company had moved beyond connection in their digital transformation journey. Around 75% of respondents were still in the data configuration and connection stages of the process.



Stages of digital transformation: Design

When asked specifically about the current stage of their design group's digital transformation, seven in 10 respondents said their company has successfully configured or connected their data as part of their digital transformation. In pursuit of a single source of truth, their aim with centralized data is to get everyone on the same page with the most accurate and up-to-date information. Just two in 10 respondents reported that their company had moved beyond the connection stage of digital transformation, indicating that there's still work to be done to advance their digital transformation maturity.



Current implementation issues

Digital transformation can be a robust task, especially when applying this new way of doing things to disconnected legacy platforms and tools. Fifty percent of respondents said these disconnected tools and systems have caused issues in their transformation journey. Forty-seven percent of respondents said that their company underestimated the scope and/or scale of the transformation process.

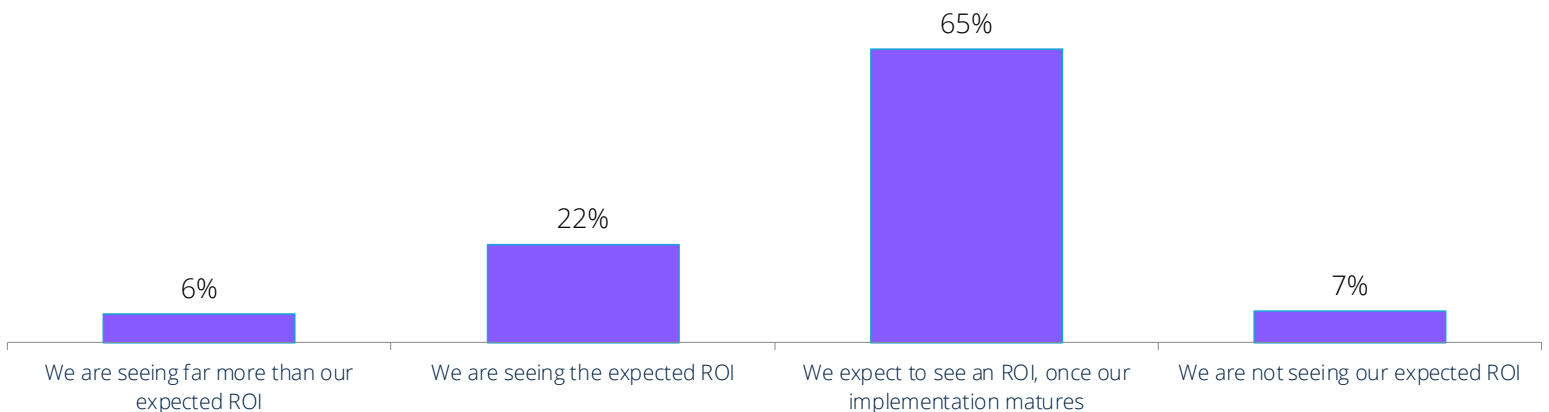
A little over a third of respondents (36%) said underestimating the cost of change was an issue, and 31% said company culture – specifically a resistance to change – was impeding progress. On a positive note, though, 11% reported experiencing no issues.



Digital transformation ROI: Expectations vs. reality

While companies shared the benefits they anticipated realizing through digital transformation, not many reported seeing those benefits yet. Over 70% of respondents said they're not yet seeing the return they expected on their digital transformation. Only 6% reported seeing a greater return on investment than they expected.

This isn't surprising given that earlier responses indicated that many of the respondents' companies had only moved through the early levels of digital transformation maturity. So while the current ROI might be lower than expected, if they stay committed to the cause and advance their transformation through the remaining levels of maturity, they could still see the ROI they anticipated originally.



Where does AI fit?

Digital transformation and the cutting-edge technologies that enable it can't be mentioned without considering artificial intelligence. AI has come a long way in the past couple of years, and companies across all industries are looking for ways to implement it into their operations.

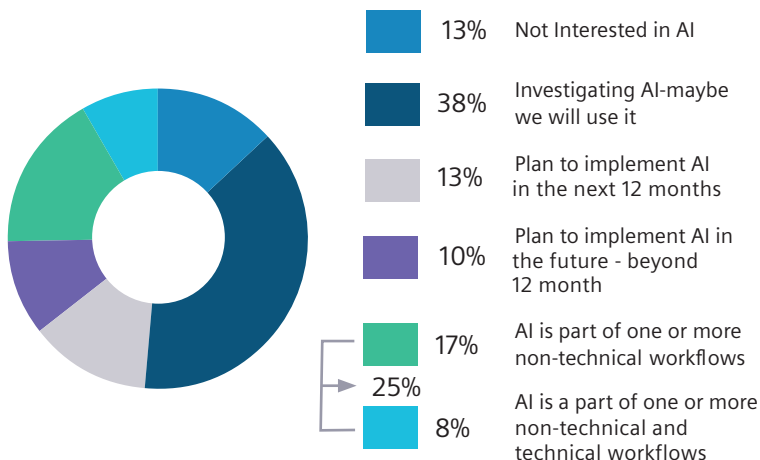
According to the survey, 87% of respondents are interested in AI today, but just 8% reported that they are currently using AI in technical workflows. Additionally, 17% of respondents reported that they're using AI in non-technical workflows.

The two leading issues keeping AI out of design or technical work identified by respondents are the need to integrate AI into digital tools or workflows (36%) and the lack of trust in AI handling proprietary data (35%).

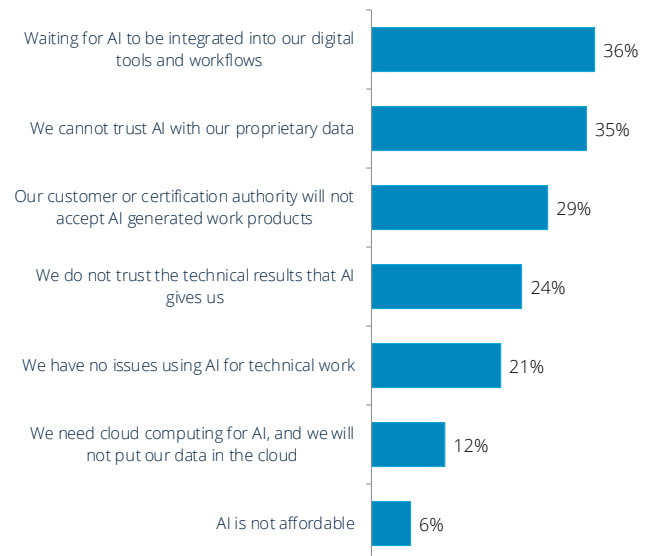
AI will continue to be a major topic within aerospace and defense. Explore the topic further with the following resources:

- [\[Podcast\] Exploring AI for the aerospace industry](#)
- [\[On-demand webinar\] AI's impact on aerospace and defense product development](#)
- [\[Blog\] How AI is augmenting design tools](#)

What is the status of AI in your company?

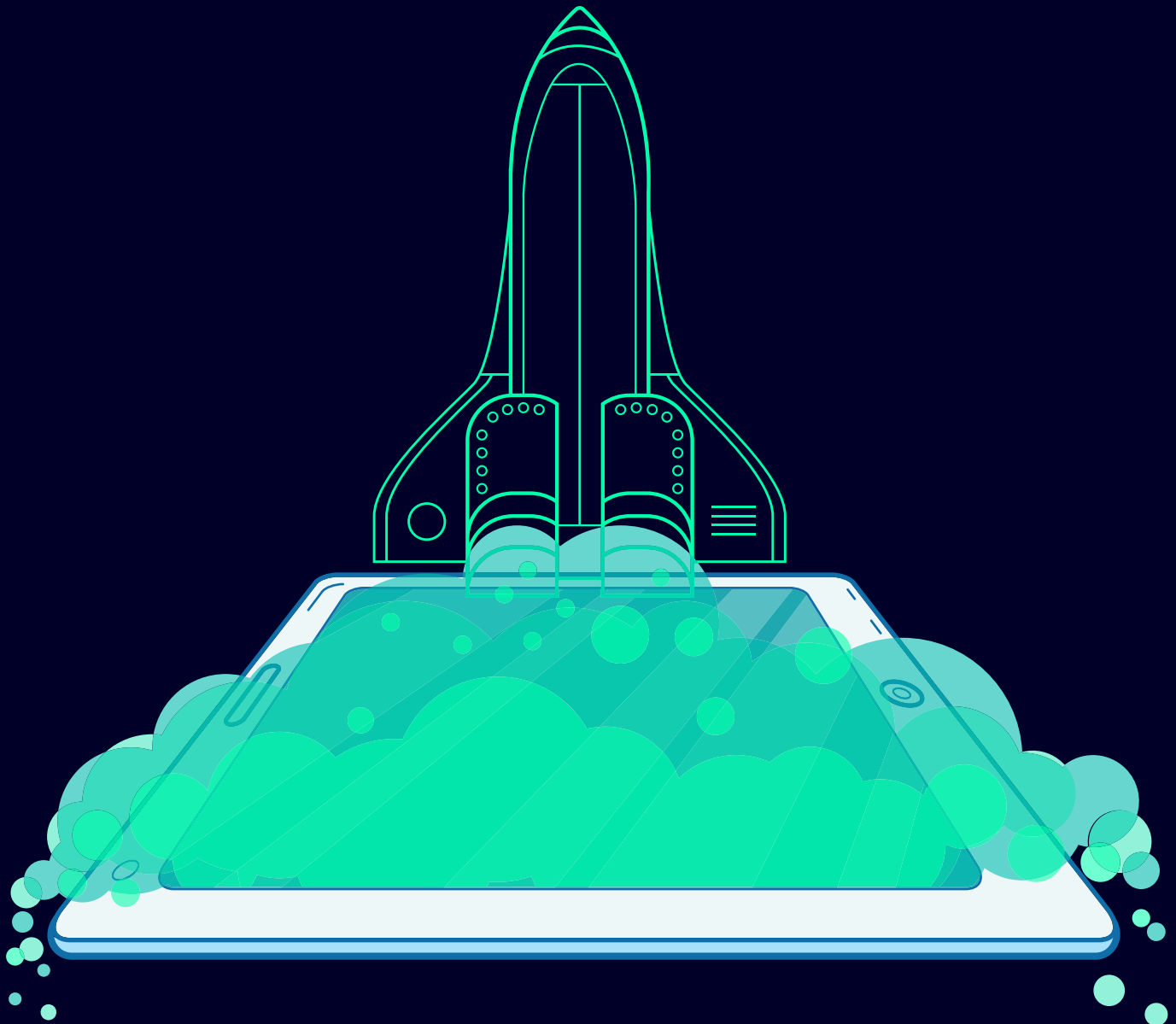


What issues are keeping your company from using AI?



Cloud-hosted applications in the transformation journey

Turning to the cloud can be the ultimate equalizer and enabler for companies of all sizes to create innovative projects in an efficient and accurate manner. A majority of respondents (56%) reported they are currently using cloud applications. Another 22% said they have plans to use cloud applications in the future. Just 10% say they have no plans to use cloud applications.

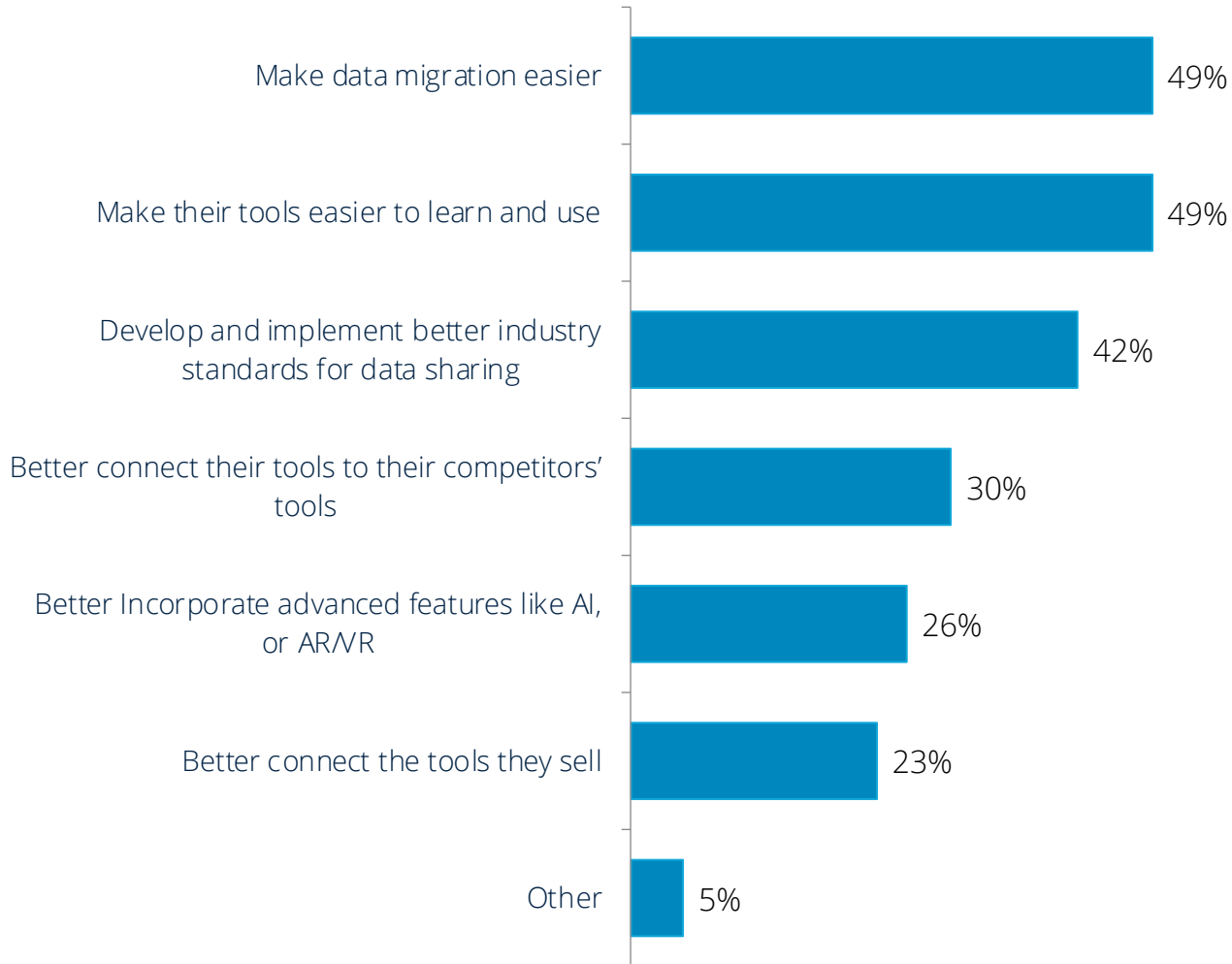


Helping A&D companies achieve digital transformation

How can aerospace OEMs and suppliers solve their data and technological integration issues to reach the results that digital transformation can provide? Respondents identified these as the top ways a software tool vendor can help with a digital transformation:

- **Make data migration easier (49%)**
- **Make their tools easier to learn and use (49%)**
- **Develop and implement better industry standards for data sharing (42%)**

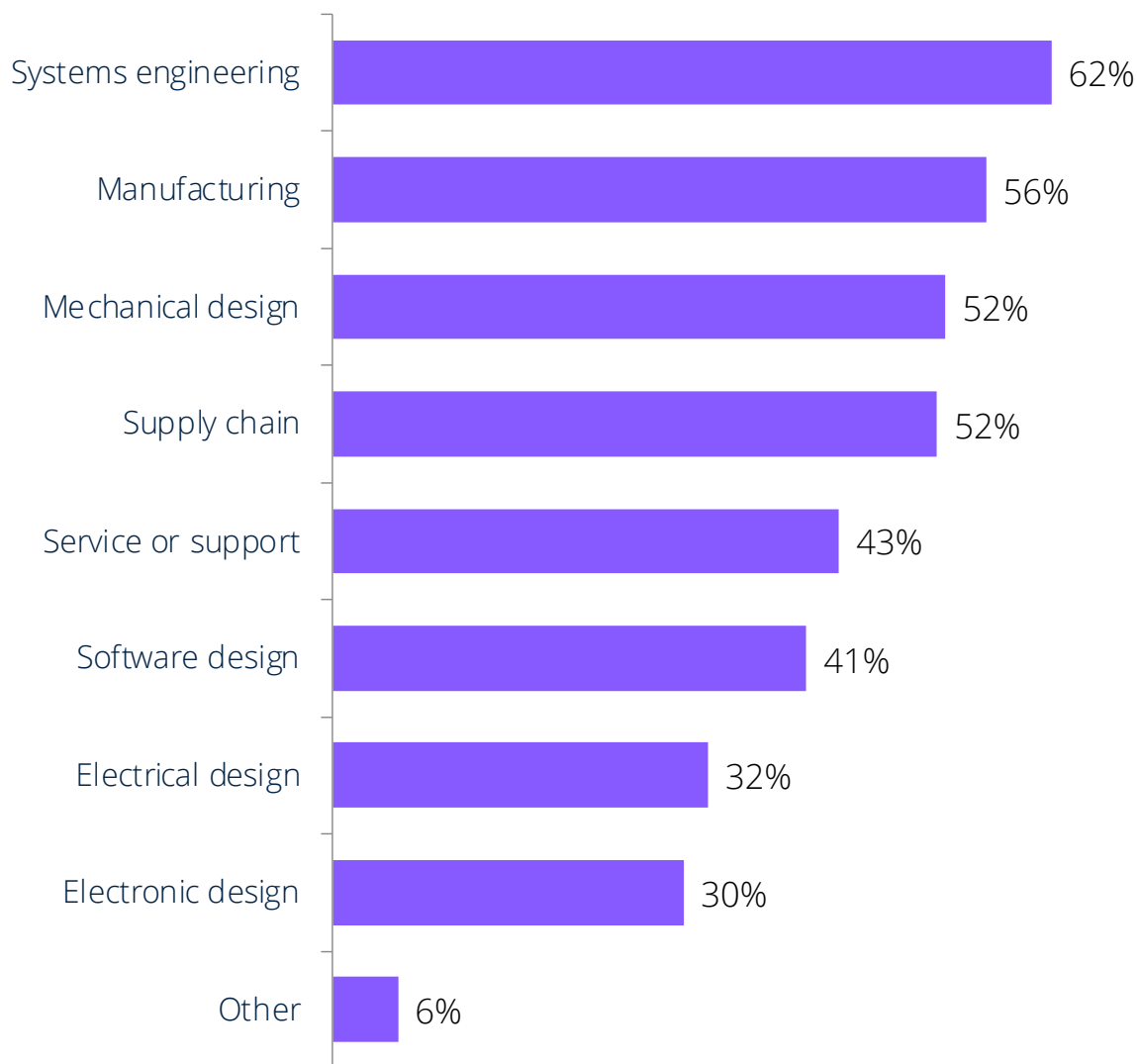
How can software vendors help with digital transformation?



Where companies are looking to invest in digital transformation

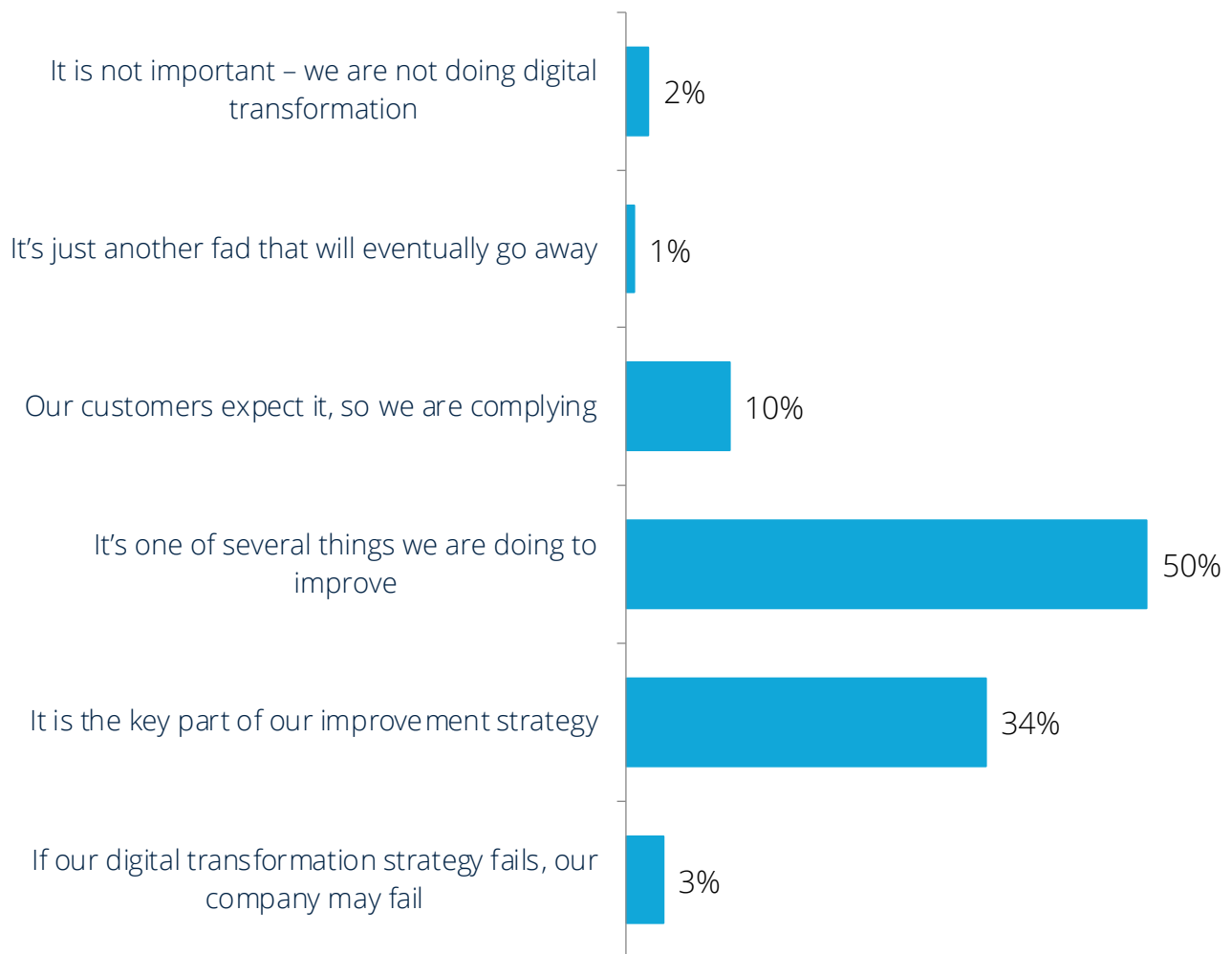
Digital transformation typically takes place across an entire company, but there are specific areas that aerospace OEMs and suppliers appear to be prioritizing. Over 60% of respondents identified systems engineering as an area of their business where they're currently investing in digital transformation. Fifty-six percent also said manufacturing was a current area of investment. These are also the top two areas respondents identified as areas of planned **future** investment.

Current areas of digital transformation investment



The critical role of digital transformation

Digital transformation as a concept is not going away. It is the primary means by which aerospace OEMs and suppliers can innovate and modernize to succeed in the present and future. Digital transformation enables synchronistic collaboration across the globe and clear visibility of best practices, past designs, future concepts and global regulations. Add on the facilitation of next-generation technology like AI, augmented reality and advanced simulation, and it's no surprise that over 80% of respondents indicated that digital transformation is one of or the main part of their company's improvement strategy.



Digital transformation is a journey

Digital transformation is critical to companies remaining competitive in the current aerospace and defense environment. More and more people are realizing this and making plans to invest in the transformation, including cutting-edge technologies like AI and cloud applications.

Learn more about how we can help you on your digital transformation journey by visiting <https://www.siemens.com/us/en/company/topic-areas/digital-enterprise.html>

Stay up to date on the latest aerospace and defense news from Siemens by [signing up for our bi-monthly newsletter](#).





Methodology

The Aviation Week Network conducted data collection and analysis on behalf of Siemens. Data was collected July 12, 2024, through August 3, 2024. The methodology used conforms to accepted marketing research methods, practices and procedures.

Informa Markets sent emailed invitations to participate in an online survey, targeting businesses that are involved in manufacturing or product development within the aviation and defense industries. Informa Markets received 143 usable responses.

Nearly half (45%) of respondents reported their company was an original equipment manufacturer (OEM). Tier 1 system suppliers represented 17% of respondents, and 13% were Tier 2 component suppliers. Almost half (49%) of respondents reported having a director or manager role or higher at their company.

About Siemens Digital Industries Software

Siemens Digital Industries Software helps organizations of all sizes digitally transform using software, hardware and services from the Siemens Xcelerator business platform. Siemens' software and the comprehensive digital twin enable companies to optimize their design, engineering and manufacturing processes to turn today's ideas into the sustainable products of the future. From chips to entire systems, from product to process, across all industries, [Siemens Digital Industries Software – Accelerating transformation.](#)

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