

# 2023 Global Digital Twin Survey Report Vertical Breakdown: **Automotive**





# TABLE OF CONTENTS

INTRODUCTION 03

KEY TAKEAWAYS 05

SECTION 1: ADOPTION AND USAGE 08

SECTION 2: IMPACT 13

SECTION 3: EXPECTATIONS 17

CONCLUSION 23

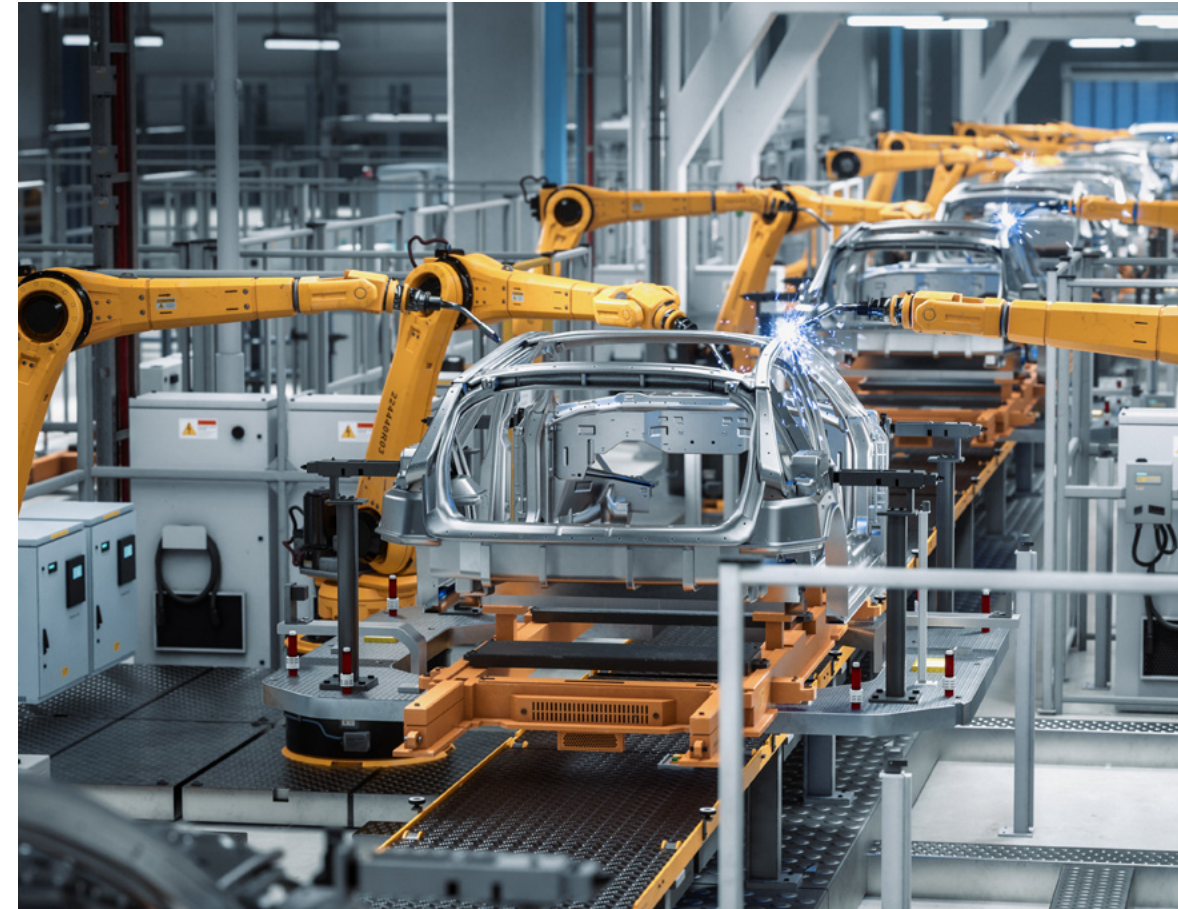
METHODOLOGY 25

# Introduction

In 2022, Altair set out to paint the most comprehensive picture of the digital twin landscape by surveying more than 2,000 industry professionals from around the world. With that data, [we compiled a detailed report](#) that showed how industry professionals viewed, adopted, and used the technology, how people of different organizational stature understood digital twins, how organizations were using the technology to further their sustainability efforts, and much more. From that data, we're shining a spotlight on the automotive industry and its relationship to digital twin technology.

In this report, we'll examine the automotive sector to understand how the industry has used, is using, and will use digital twin technology. The data suggests that the automotive industry is a leading adopter of digital twin technology even though a large proportion of respondents still have limited experience and expertise with it. However, the data suggests that the industry's use of digital twins is only set to grow in the coming years as organizations face ever more competitive markets, stringent environmental regulations, and the growing digitalization and electrification of vehicles. The industry is pushing full bore to ramp up its sustainability efforts via digital twin technology, using the technology to reduce waste and make vehicles more energy efficient. Amid the worldwide race to develop game-changing electric vehicles (EVs) that reduce emissions, digital twin technology is poised to play an integral part in product development. For an industry that has so long had an outside impact on people's daily lives around the world, digital twin technology has the potential to revolutionize the way we think about transportation and its role in society.

Read on to discover all things digital twin technology as it pertains to the automotive industry.







# KEY TAKEAWAYS

```
mirror object to mirror  
mirror_mod.mirror_object  
operation == "MIRROR_X":  
mirror_mod.use_x = True  
mirror_mod.use_y = False  
mirror_mod.use_z = False  
operation == "MIRROR_Y":  
mirror_mod.use_x = False  
mirror_mod.use_y = True  
mirror_mod.use_z = False  
operation == "MIRROR_Z":  
mirror_mod.use_x = False  
mirror_mod.use_y = False  
mirror_mod.use_z = True
```

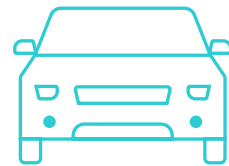
```
selection at the end -add  
ob.select= 1  
ob.select=1  
context.scene.objects.active  
"Selected" + str(modifier)  
mirror_ob.select = 0  
bpy.context.selected_objects  
objects[one.name].select
```

```
nt("please select exactly  
OPERATOR CLASSES
```

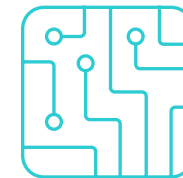
```
ator):  
the selected  
x"
```

# Key Takeaways

Before diving into the detailed results, here are some of the key findings the data presented.



**76% of automotive respondents surveyed said their organizations already leverage digital twin technology, the second-highest proportion of the 11 industries analyzed behind only the heavy equipment industry (77%).** The automotive sector's response was seven points higher than the overall survey's average (69%).

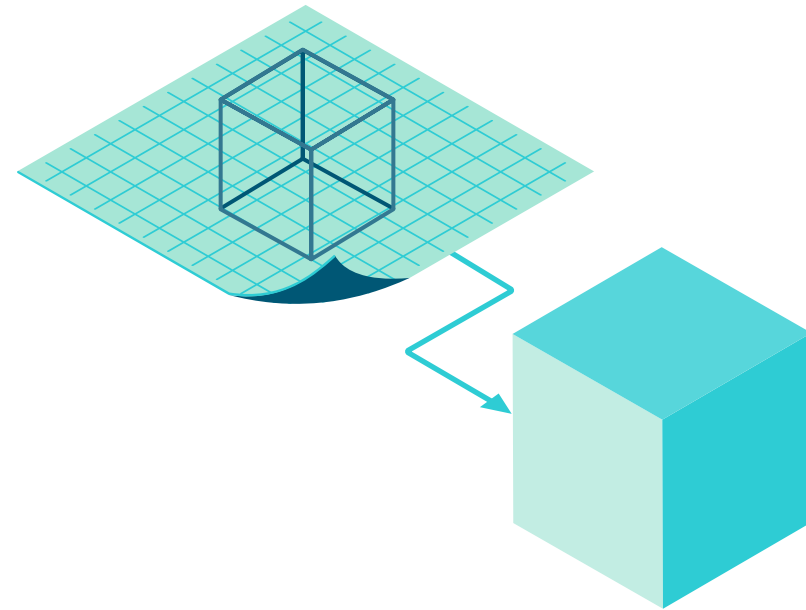


**97% of those who already use digital twin technology said the technology better informed the development of new products,** which was two points above the overall survey average. And **92% said digital twin technology has helped them create more sustainable products and processes.**





**The automotive sector was also the most likely industry to say it's currently using digital twin technology to reach their sustainability objectives at 63%** – eight points higher than the overall survey average.

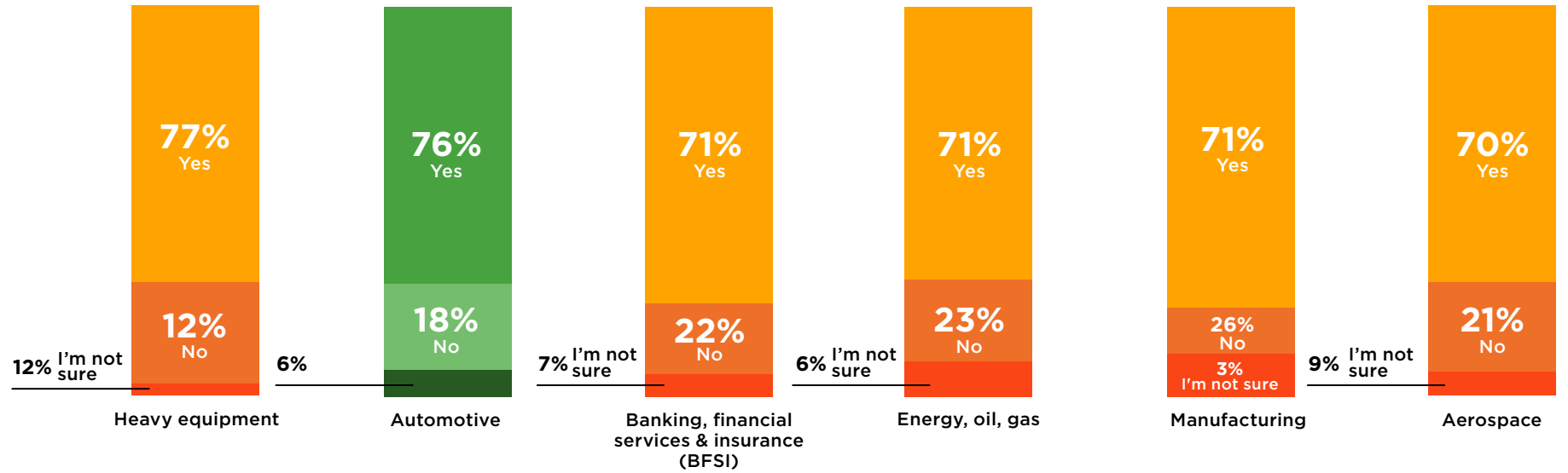


**38% of automotive respondents said they believed digital twin technology will make physical prototyping obsolete within the next four years or sooner.**

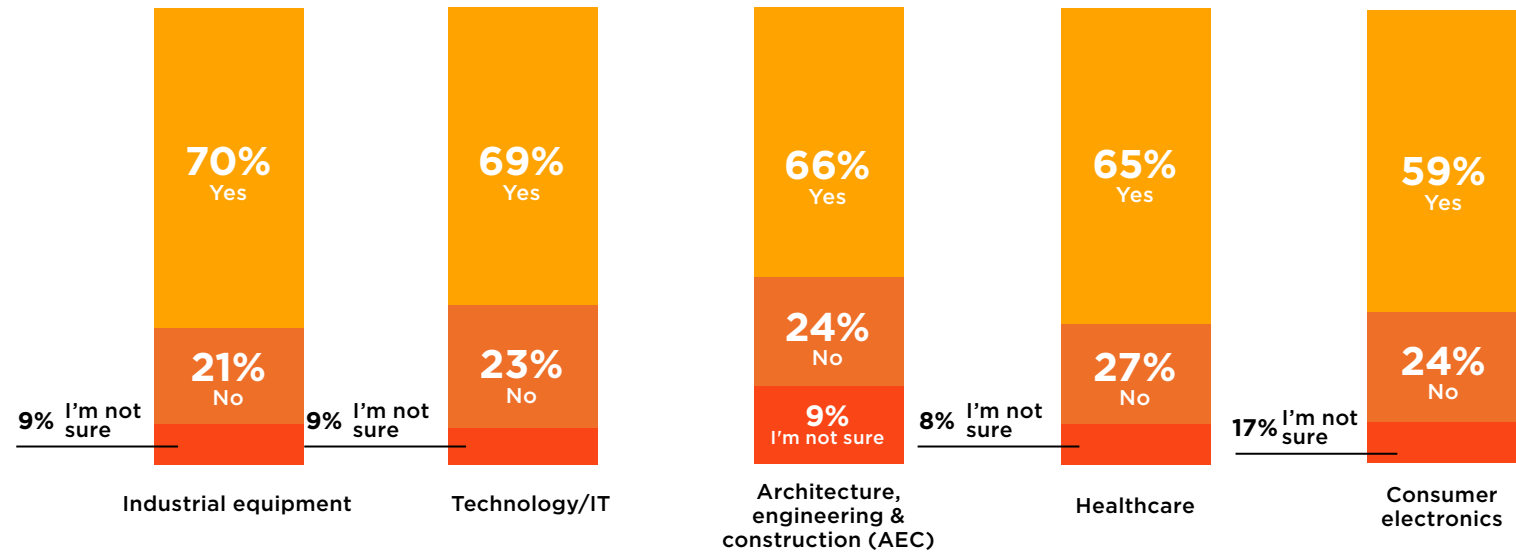


SECTION 1  
**DIGITAL TWIN  
TECHNOLOGY  
ADOPTION  
AND USAGE**

**Of the automotive respondents, 76% said their organizations already leverage digital twin technology.** For this question in the overall population survey’s 2,007 responses, only the heavy equipment industry had a higher proportion of affirmative responses (77%). The automotive sector’s response was seven points higher than the overall survey’s average (69%).



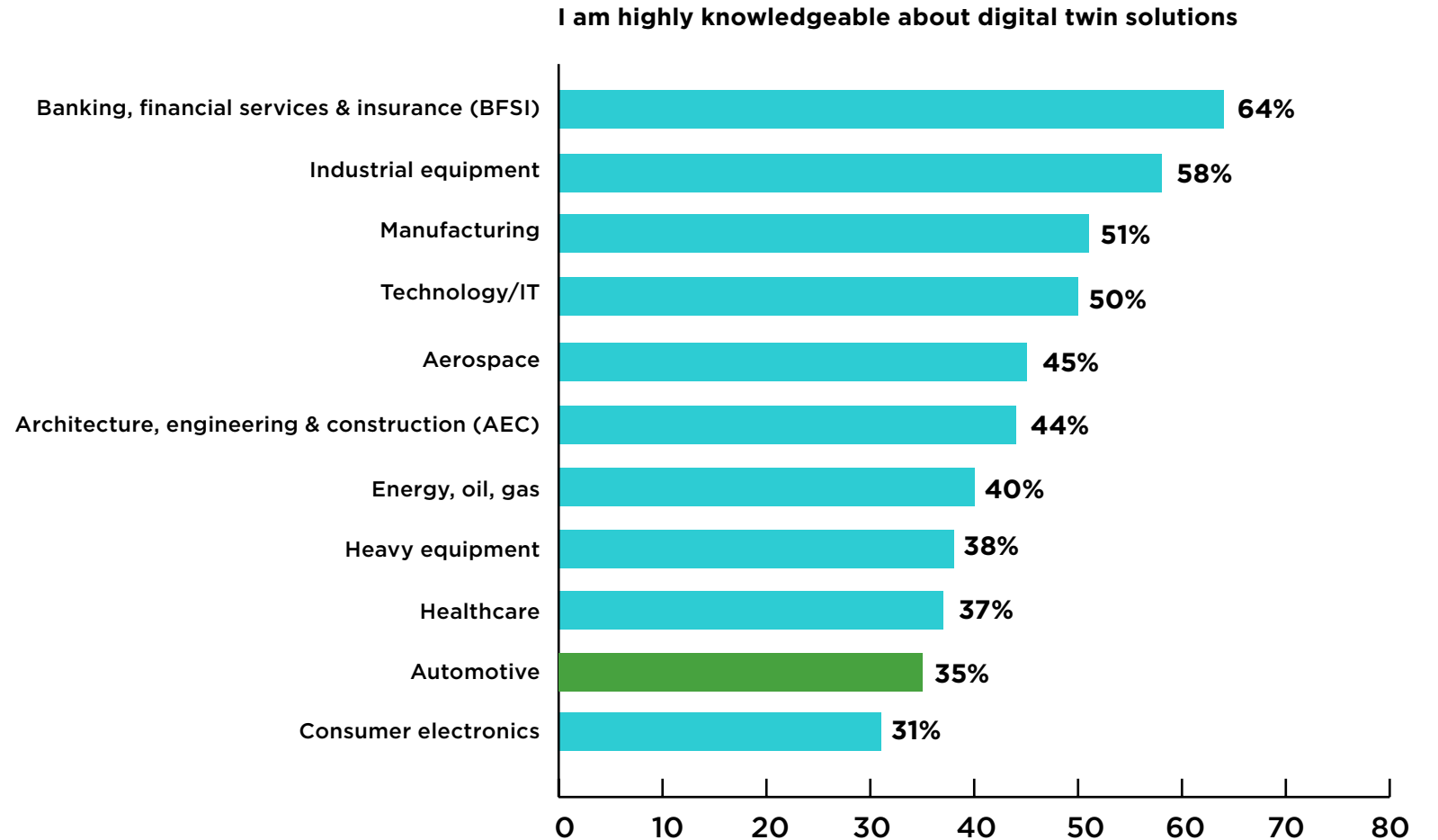
► Does your organization leverage digital twin technology?





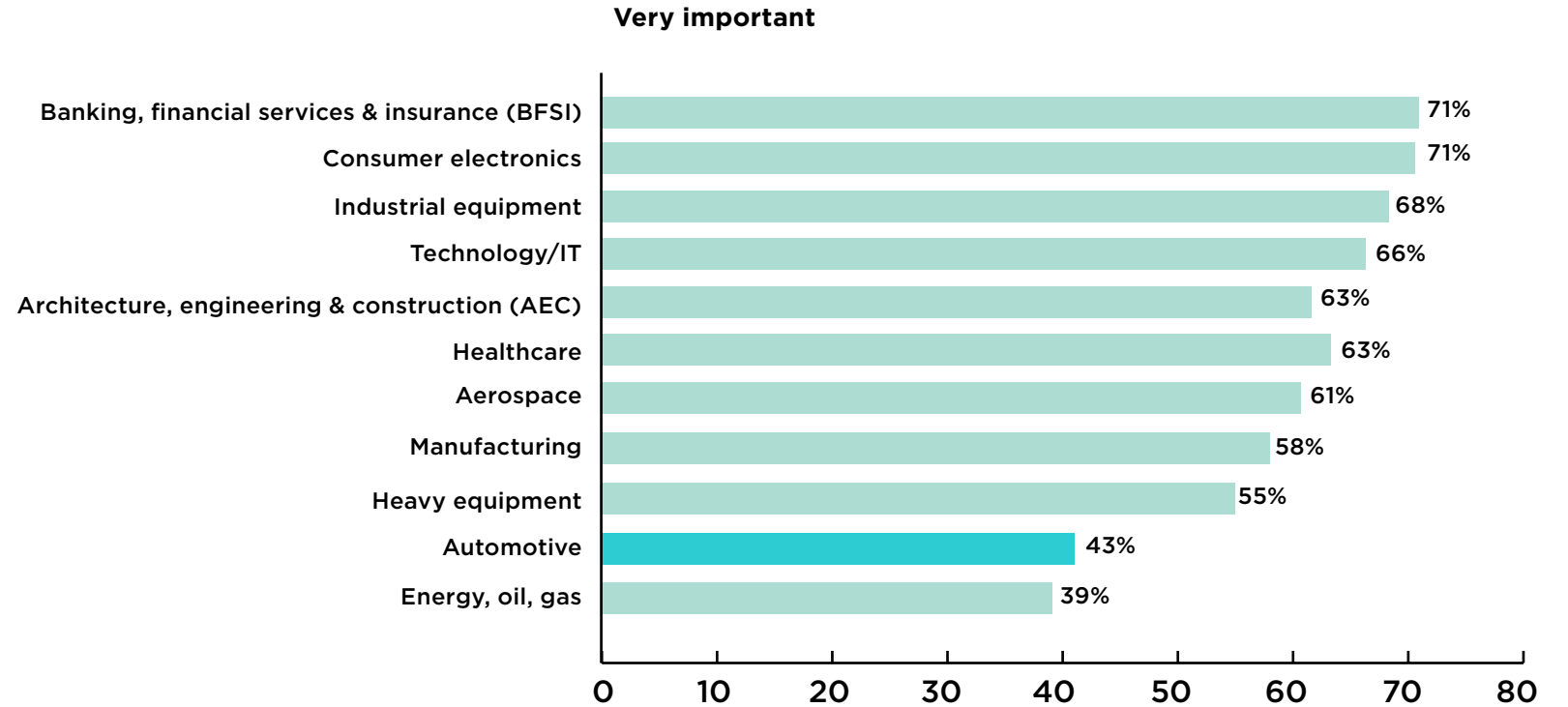
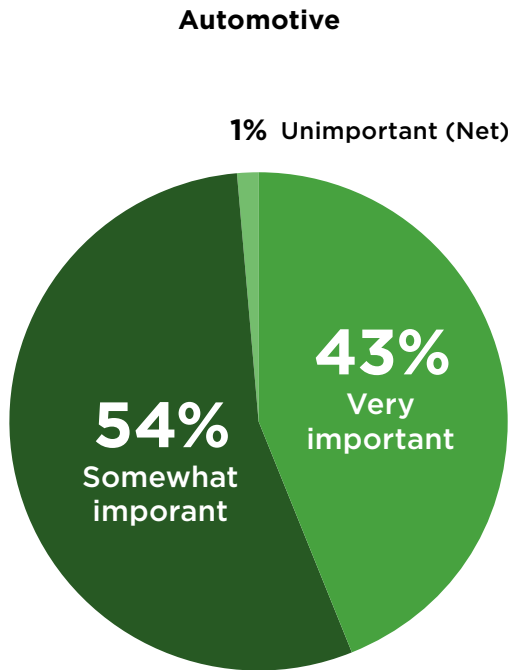
Interestingly, **although 76% of respondents said their organization leverages the technology, only 35% of automotive respondents said they are “highly knowledgeable about digital twin solutions” – the second-lowest percentage ahead of the consumer electronics industry (31%). Overall, this proportion of responses on “digital twin knowledgeable” was 15 points lower than the overall survey average.** Moreover, 15% of automotive respondents said they “find digital twin solutions to be confusing,” and 36% said they have an idea of what digital twin solutions can do but are “unaware of their full potential.”

► Which of the following statements best describes how you feel about digital twin technology?



Of respondents who said their organizations leverage digital twin technology, 97% said it was “important” to their organization – in line with the overall survey’s average. **However, just 43% said it was “very important,” which was 20 points lower than the overall survey average (63%)** and the second-lowest proportion out of all the industries surveyed.

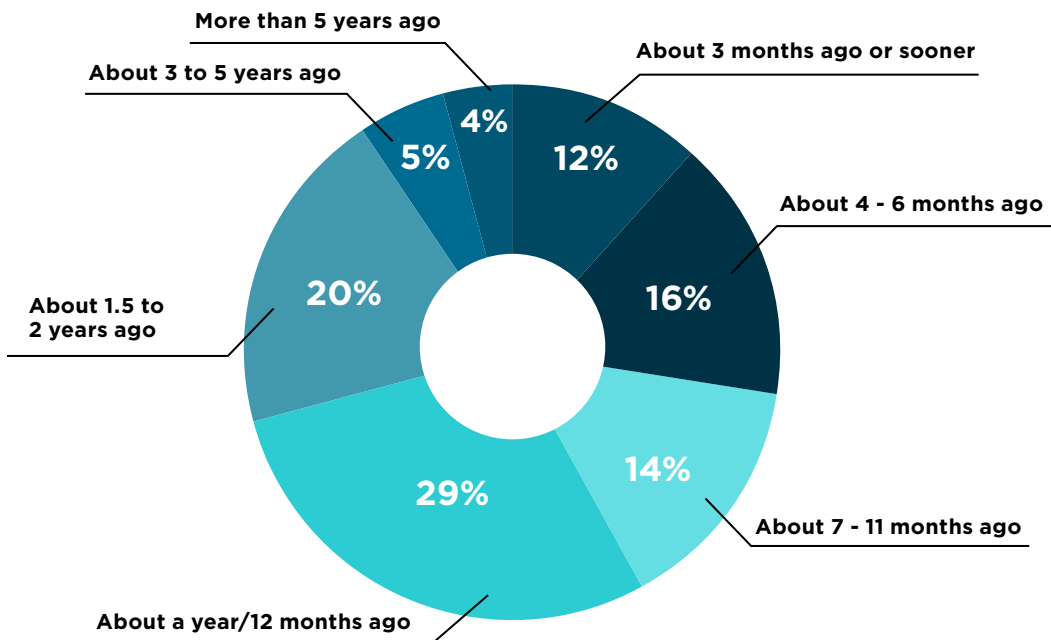
► How important are digital twin solutions to your organization?





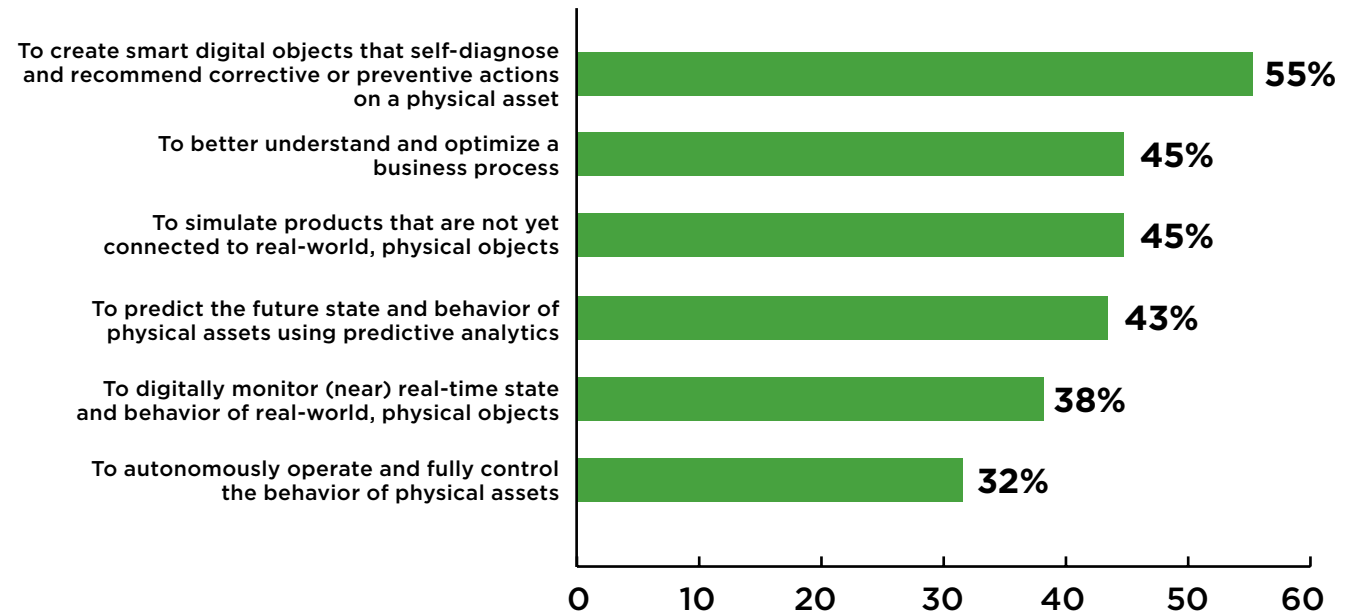
Of respondents who said their organization already uses digital twin technology, 28% said their organization began investing in digital twins within the past six months or sooner; 29% said about a year ago, 20% said about one and a half to two years ago, and 9% said three or more years ago. The automotive industry was more likely than other industries in the survey to have adopted digital twins within the past six months by five points.

► When did your organization begin to invest in digital twin solutions?



Automotive respondents said they were most likely to use digital twin technology to “create smart digital objects that self-diagnose and recommend corrective or preventative actions on a physical asset” (55%), “simulate products that are not yet connected to real-world, physical objects” (45%), and “better understand and optimize business processes” (45%).

► How does your organization use digital twin technology?





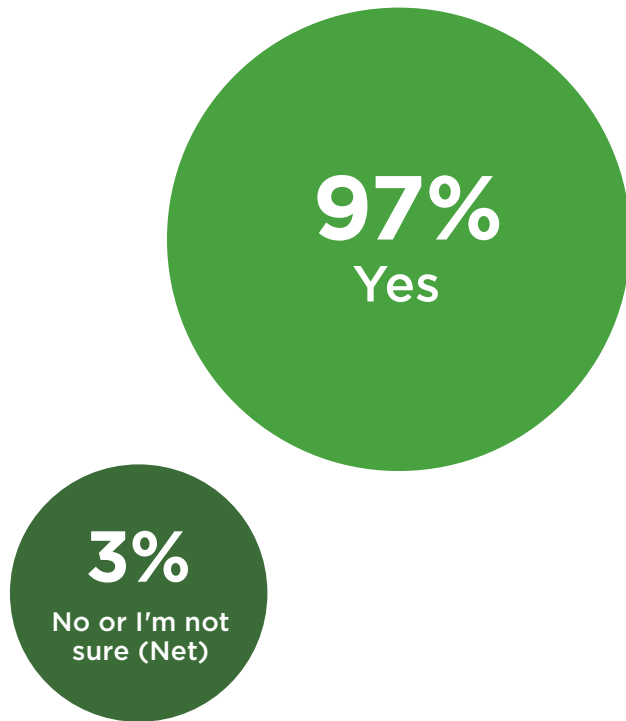
## SECTION 2

# IMPACT OF DIGITAL TWIN



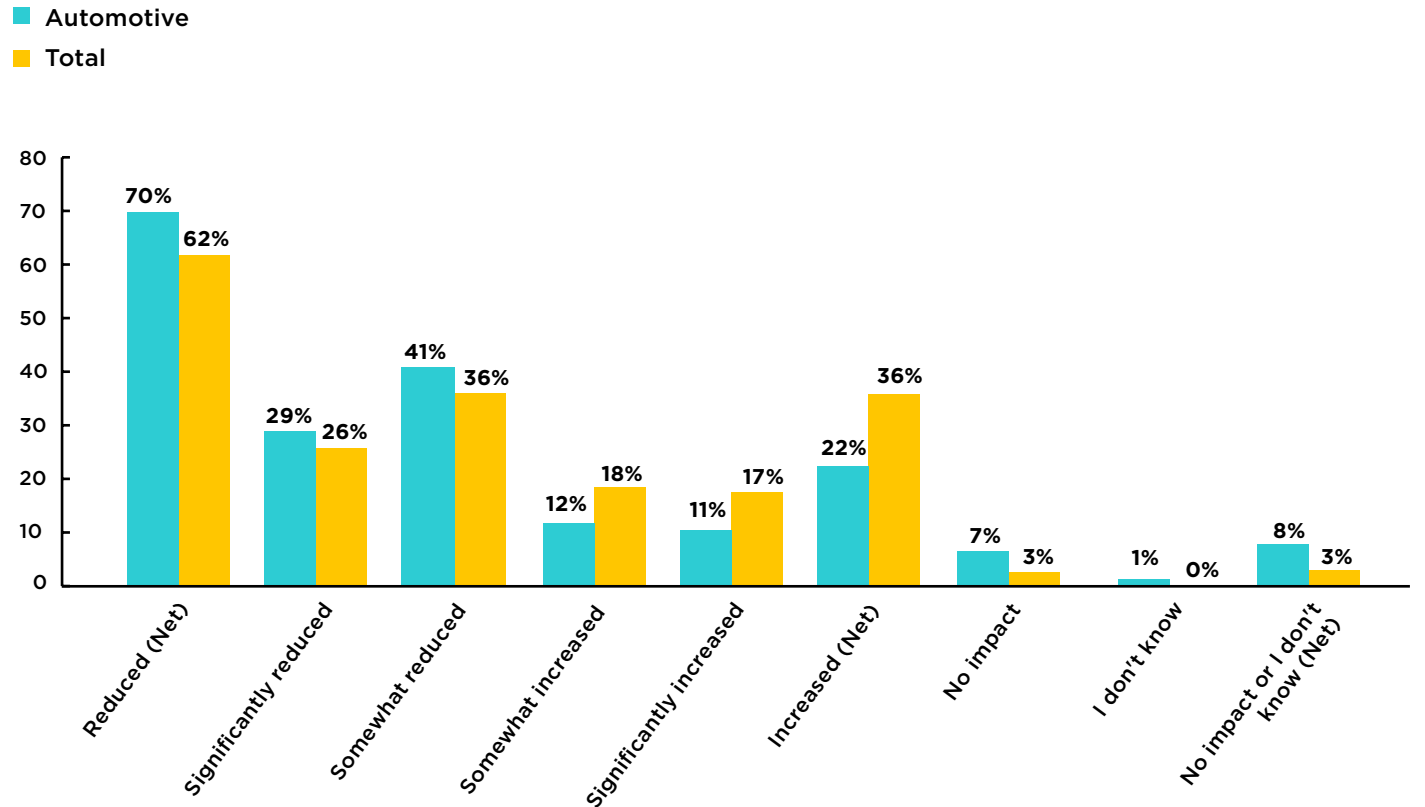
An overwhelming majority of automotive respondents already using digital twins have found it impactful. In fact, **97% said the technology better informed the development of new products**, which was two points above the overall survey average.

► Does digital twin technology better inform the development of new products?



**More powerfully, 70% of those who use the technology said it has “significantly” reduced maintenance and warranty costs – this response was eight points above the overall survey average.** In addition, just 22% said the technology has increased maintenance and warranty costs, a percentage 14 points lower than the overall survey average. More generally, 37% of automotive respondents named “reduced costs” as digital twin technology’s main benefit, 12 points higher than the overall survey average.

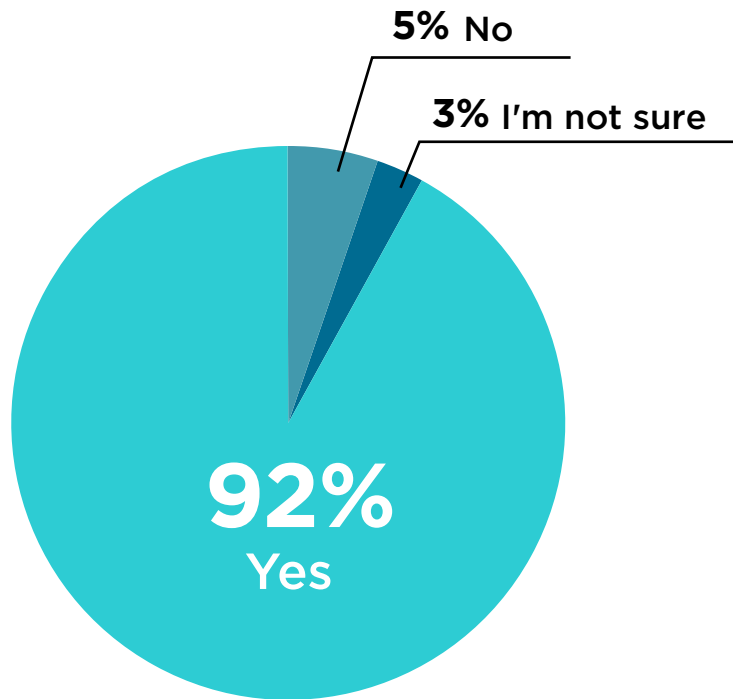
► Please fill in the blank with the response that best applies to you: Using digital twin technology has \_\_\_\_\_ maintenance and warranty costs at my organization.



Automotive respondents also indicated that digital twin technology is helping their organizations meet their sustainability objectives.

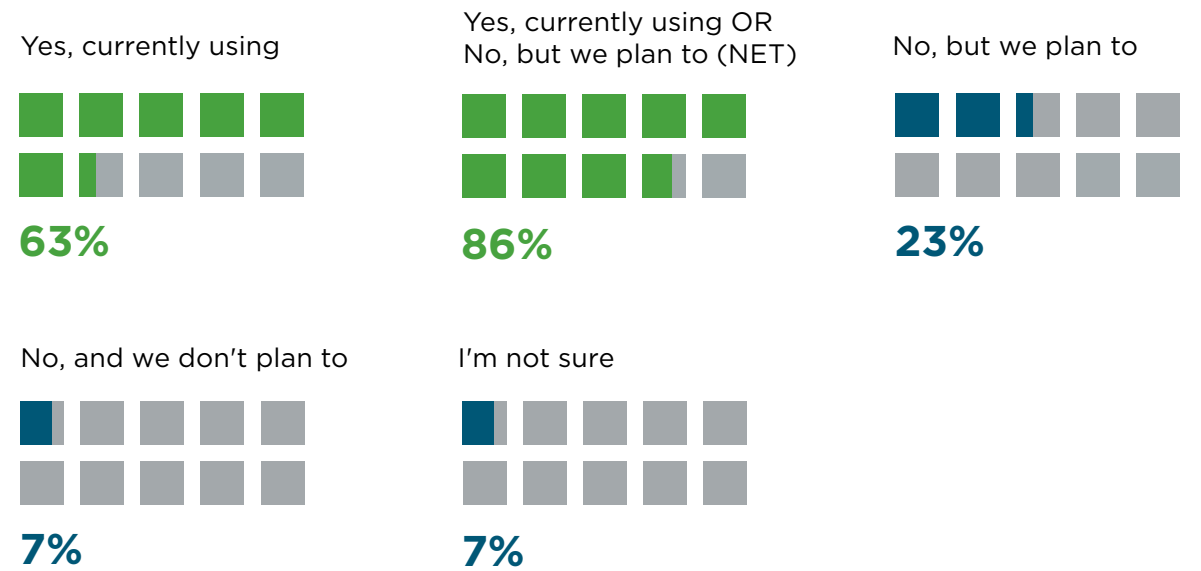
**92% of those that use digital twin technology said it has helped them create more sustainable products and processes.**

► Has digital twin technology helped your organization create more sustainable products or processes?



**Importantly, the automotive sector was also the most likely industry to say it's currently using digital twin technology to reach their sustainability objectives at 63% - eight points higher than the overall survey average.**

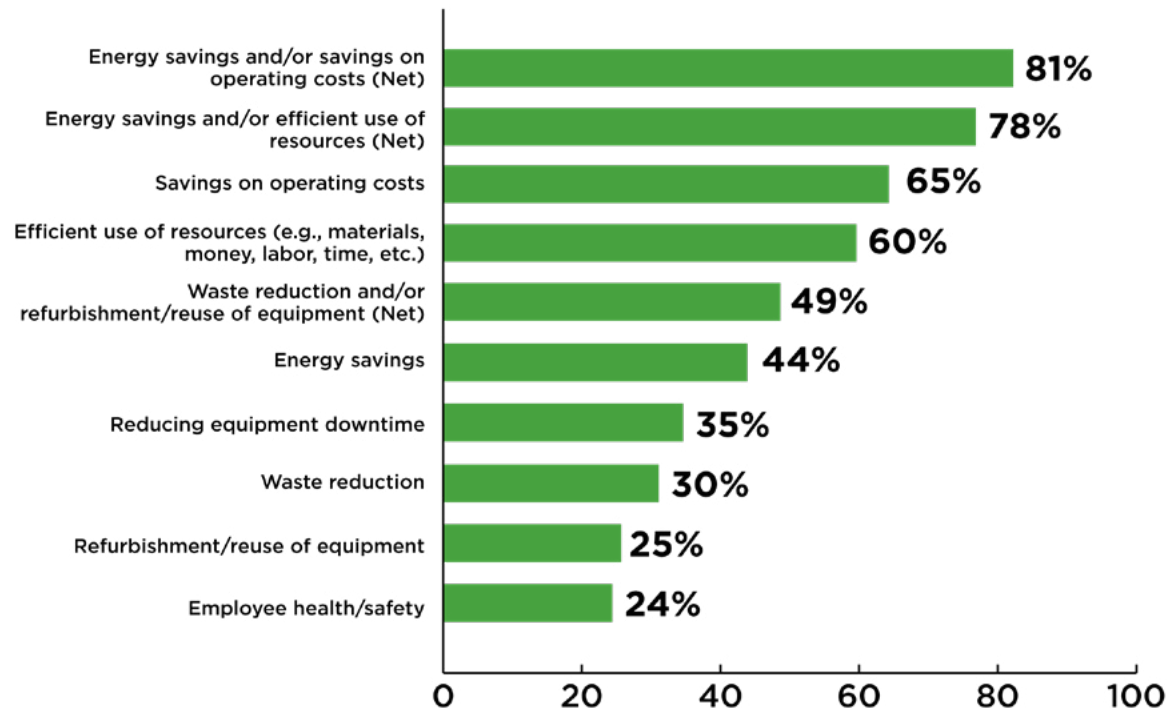
► Is your organization using digital twin technology to reach its overall sustainability goals?





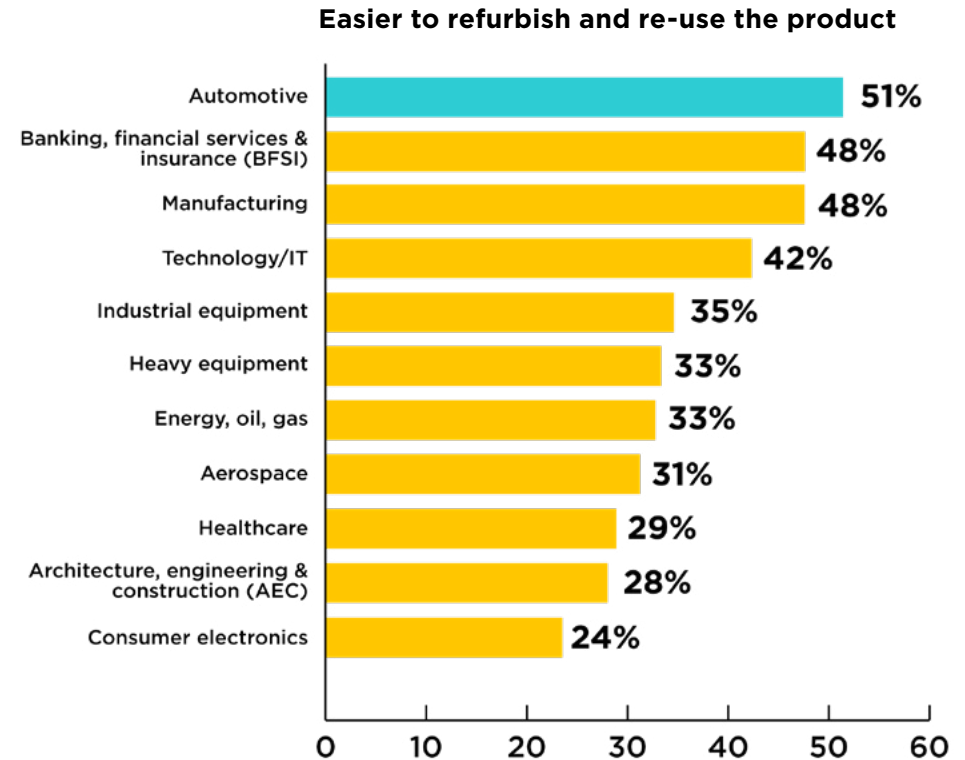
The more we dig into the data, the more we see how the automotive industry is pushing to reach its sustainability objectives via digital twin technology. For example, **78% of automotive respondents who use digital twin technology named energy savings and/or efficient use of resources** as ways the technology helps their organizations meet their sustainability objectives.

► How does digital twin technology help your organization reach its overall sustainability goals?



Moreover, **the automotive industry** was the **most likely to say that digital twin technology made their products and processes easier to refurbish and/or reuse at 51% - 10 points above the overall survey average**.

► Thinking of your organization’s products or processes that are more sustainable thanks to digital twin technology, how have your organization’s products or processes become more sustainable?





## SECTION 3

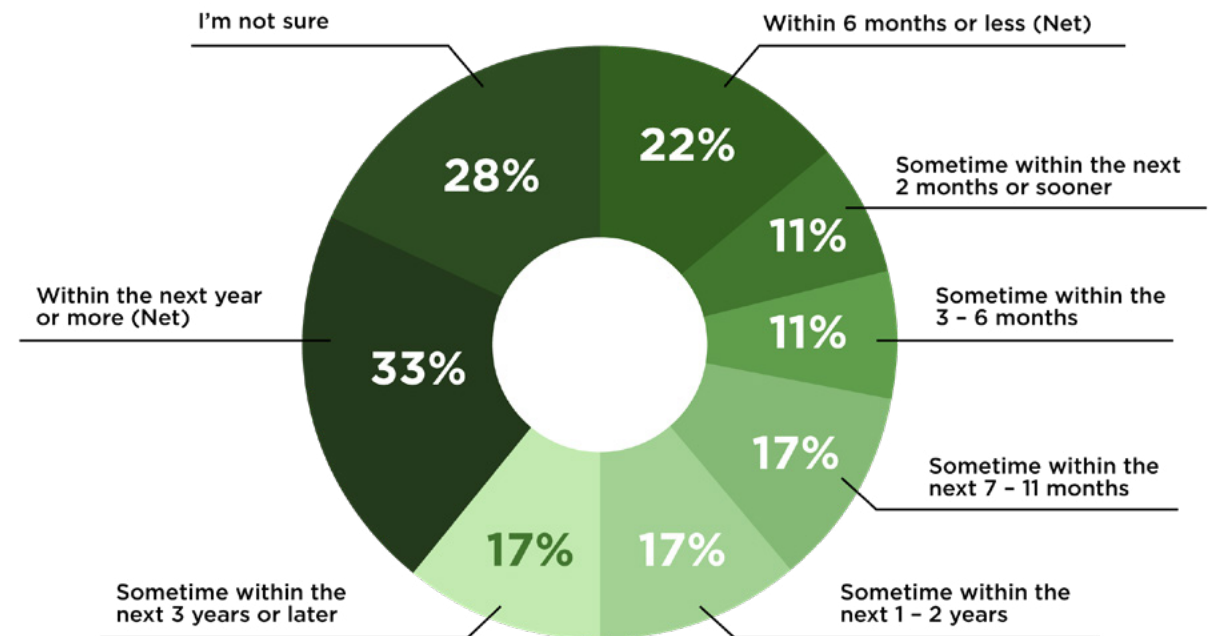
# EXPECTATIONS OF DIGITAL TWIN



Based on the data, it's clear that digital twin technology is widely used within the automotive industry. And according to other data points in the survey, we can expect this trend to increase in the coming years and decades.

Of respondents who said their organization **doesn't** currently leverage digital twin technology, **22% said they expected their organization to invest within the next six months or less - this was the second-highest proportion of such responses behind just the consumer electronics industry (29%). The automotive industry's proportion for this question was 11 points higher than the overall survey average.** This response data suggests there's a growing desire to adopt digital twin technology - and do it fast. Moreover, 33% of automotive respondents said they expect their organization to adopt digital twin technology in a year or more, which was 11 points **lower** than the overall survey average, further reinforcing the need to adopt digital twin quickly.

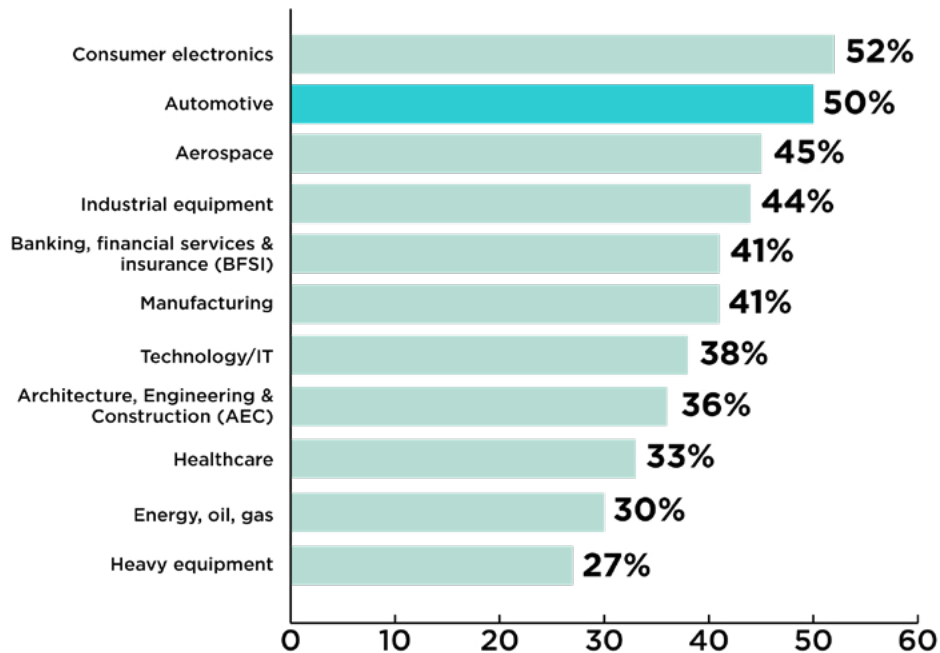
► When do you expect your organization to adopt digital twin technology?



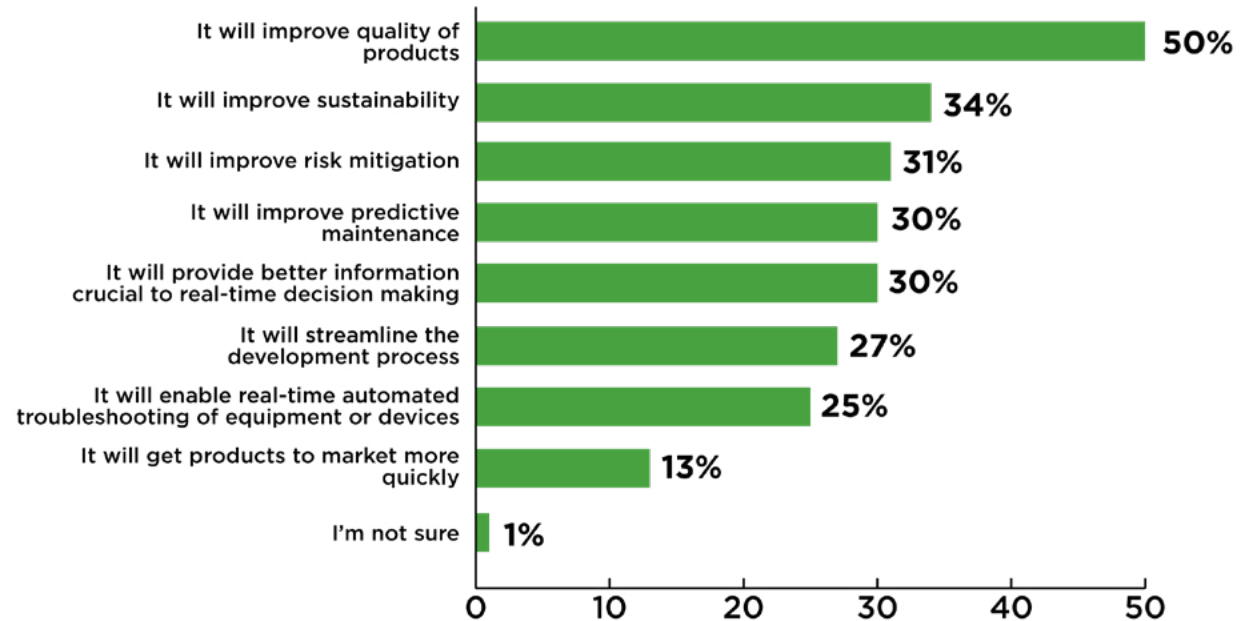
Overall, **the automotive industry was the most likely to say that digital twin technology will improve product quality in the future at 50%, 11 points above the overall survey average.** This is another aspect that will be vital in the race for better, more durable EVs. Below, you can see all of the industry’s responses to this question. For this question, respondents could choose multiple answers.

► **What significant roles, if any, do you anticipate digital twin solutions to have in the future?**

**It will improve quality of products**



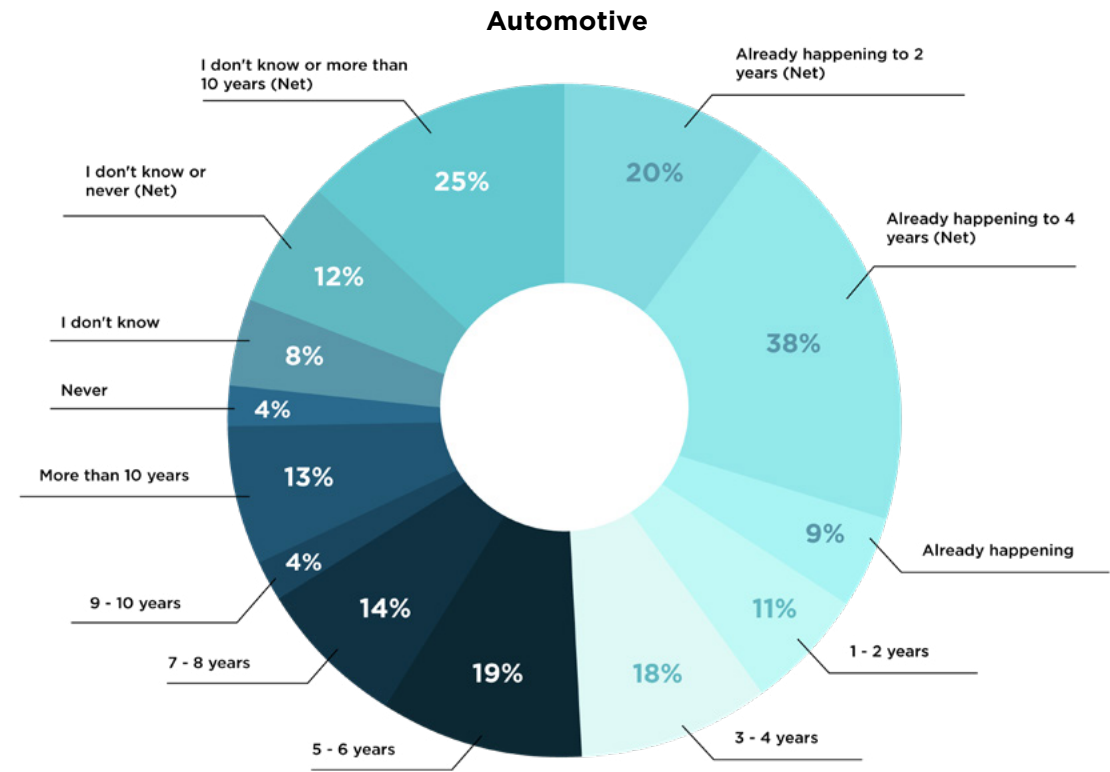
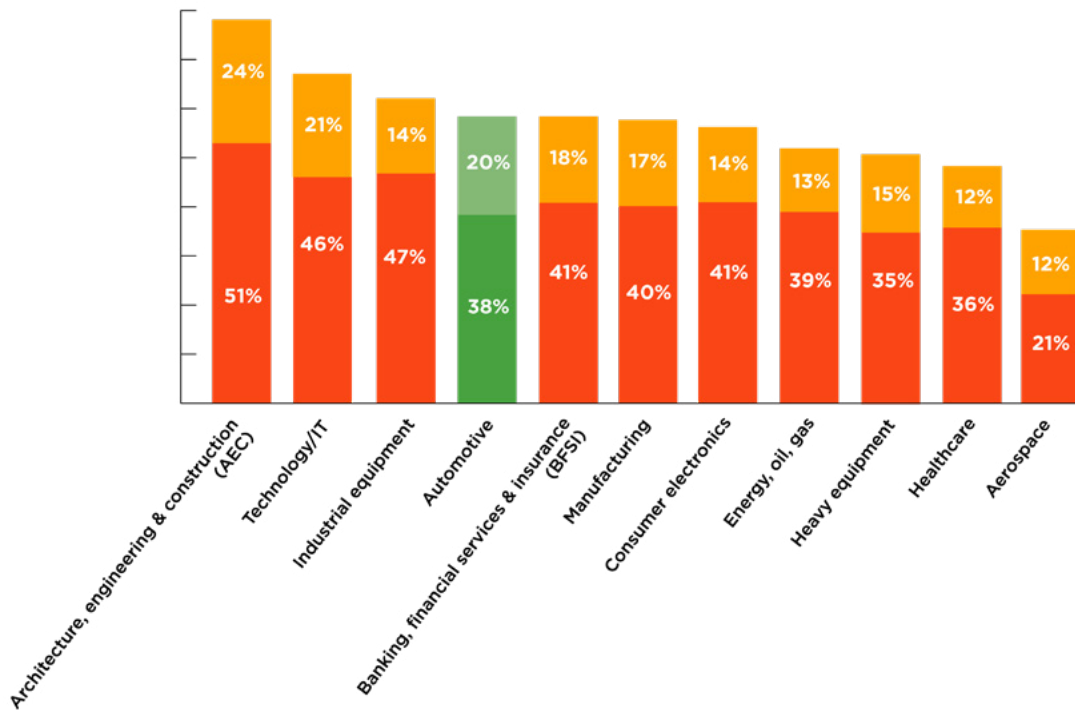
**All responses (Automotive)**



And in what has proven to be one of the survey’s most fascinating questions regardless of sector, **38% of automotive respondents said they believed digital twin technology will make physical prototyping obsolete within the next four years or sooner.** This response was five points **lower** than the overall survey average. That said, 20% said this would happen within **two years or sooner**, one point **above** the overall survey average. These figures are noteworthy coming from an industry that pioneered dynamic physical prototyping and is still synonymous with the process today.

► When do you expect digital twin solutions to make the need for physical prototypes obsolete?

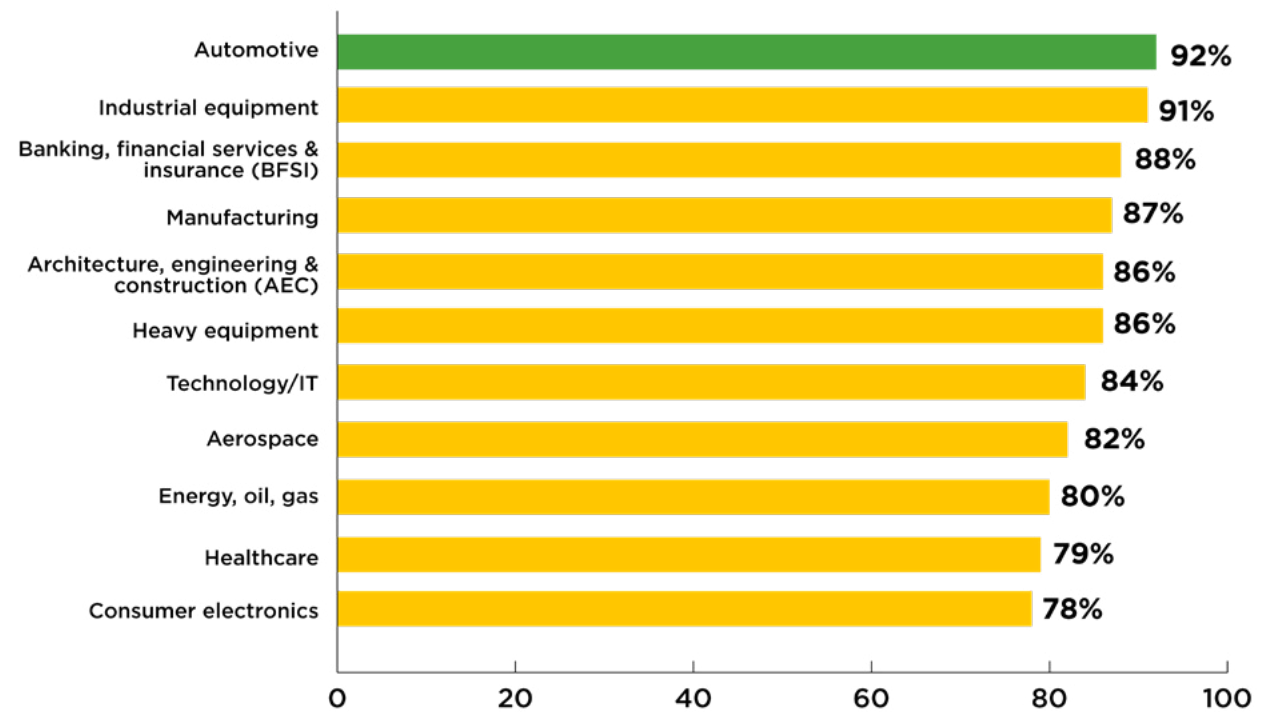
- Already happening to 2 years (Net)
- Already happening to 4 years (Net)





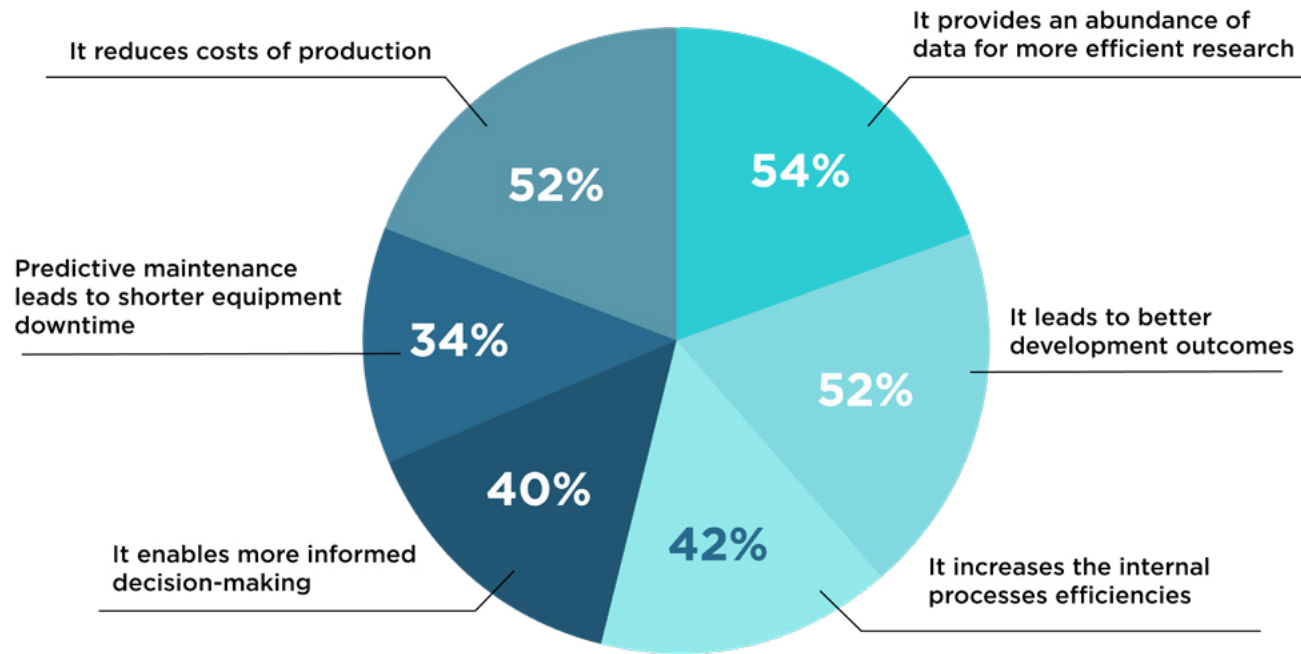
Lastly, the data suggests that there is a great desire among non-senior leadership employees that senior leaders and executives become more familiar with digital twin technology and its benefits. Among non-senior leadership automotive respondents, **92% said they believe leadership would be more likely to invest in digital twin technology if they better understood its benefits – a figure seven points higher than the overall survey average and the highest figure among any other industry in the survey.**

► Do you believe your leadership would be more likely to invest in digital twin solutions if they better understood the benefits of digital twins?



Below, you can see what specific aspects of digital twin technology non-leadership employees wished their organizational leaders knew more about.

► **What do you wish your leadership understood about the benefits of digital twins?**







# CONCLUSION



# Conclusion

The data suggests that digital twin technology is already widespread throughout the automotive industry, and that its use will only broaden in the coming years and decades.



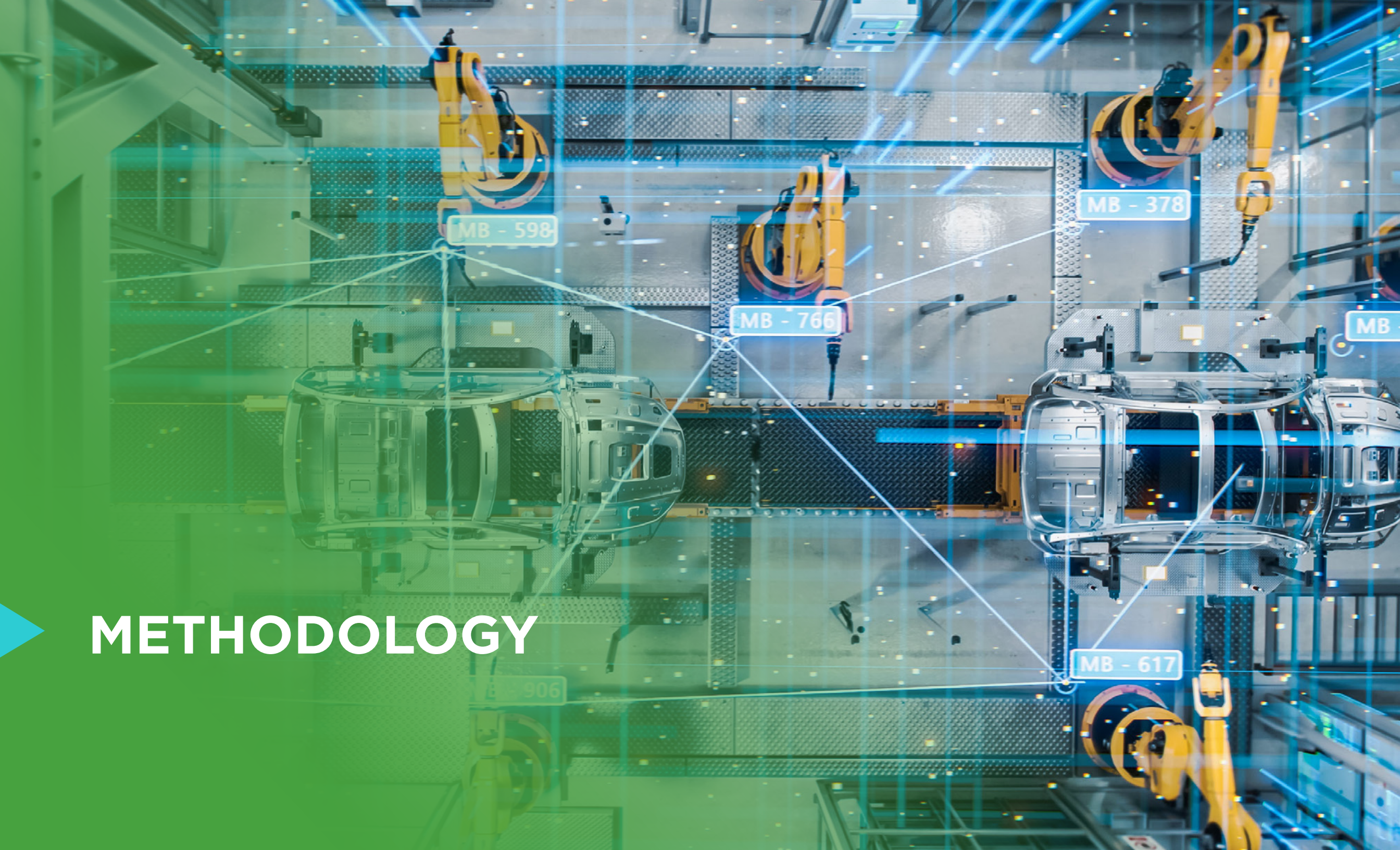
**76% of automotive respondents surveyed said their organizations already leverage digital twin technology, the second-highest proportion of the 11 industries analyzed.** That said, the automotive industry appears to be at the start of its digital twin journey and hungry for a better understanding of its benefits and use cases – **just 35% said they are “highly knowledgeable about digital twin solutions,” which was the second-lowest percentage out of all industries.** This proportion of “knowledgeable” responses was **15 points lower than the overall survey average.**

Moreover, while 97% of those that use digital twin technology said the technology was “important” to their organization, **just 43% said it was “very important,” which was 20 points lower than the overall survey average (63%) and the second-lowest proportion out of all the industries surveyed.** This suggests automotive organizations still feel that the technology isn’t embedded within their legacy processes or that it may be a big, but not indispensable, part of their operations quite yet.

The automotive sector is using digital twin technology to pursue sustainability objectives in many areas and feels that the technology is impactful in that regard. **92% of those that use digital twin technology said it has helped them create more sustainable products and processes.** Additionally, **the automotive sector was the most likely industry to say it’s currently using digital twin technology to reach their sustainability objectives at 63% – eight points higher than the overall survey average.**

Lastly, the numbers suggest those in the automotive sector who **don’t** currently use digital twin technology are looking to do so as quickly as possible. Of respondents who said their organization doesn’t currently leverage digital twin technology, **22% said they expected their organization to invest within the next six months or less – the second-highest proportion of such responses behind only the consumer electronics industry (29%), and a total 11 points higher than the overall survey average.** In an industry where all organizations are looking to develop the next generation of EVs – and get to market as soon as possible – digital twin is poised to be a vital technology.





# METHODOLOGY

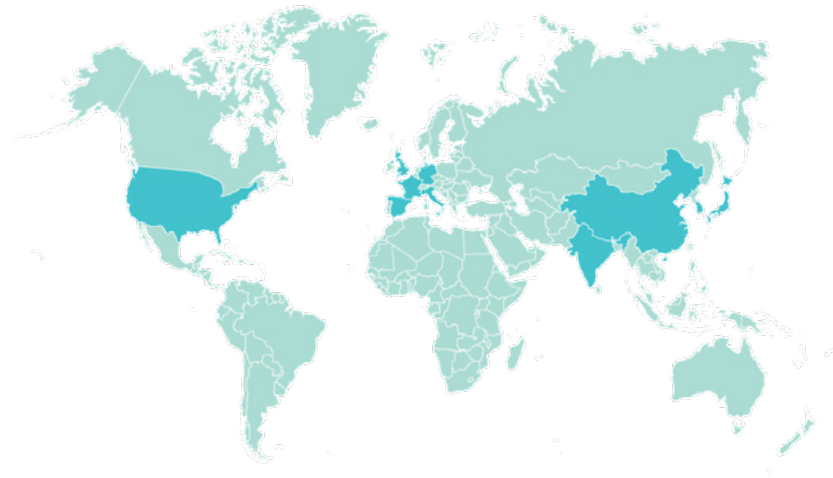


# Methodology

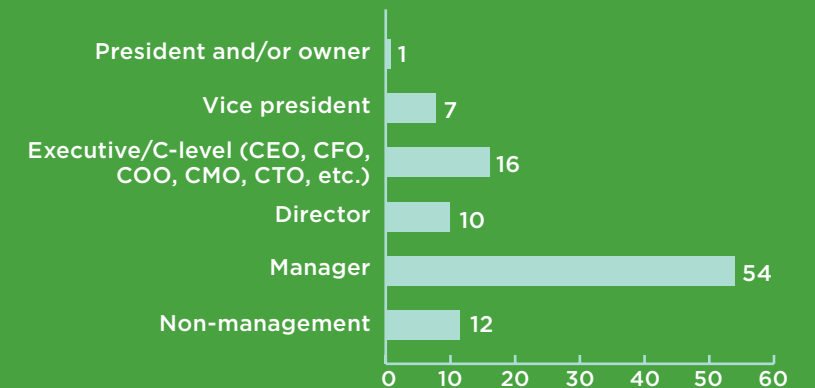
Altair commissioned an independent, international online survey of 2,007 professionals employed throughout many target industries who perform job functions related to data science, IoT and analytics, software engineering, research and development (R&D), engineering, information technology (IT) and information systems (IS), product development, and executive management.

**While the original survey targeted 11 key industries, this report is focused on the respondents only from the automotive sector.** Below is a breakdown of the number of automotive sector respondents by geographic region:

- United States (N=200)
- China (N=200)
- France (N=200)
- India (N=206)
- Germany (N=200)
- United Kingdom (N=201)
- South Korea (N=200)
- Italy (N=200)
- Japan (N=200)
- Spain (N=200)



**Below is a breakdown of these 100 respondents' position level within their organizations:**



The overall sample's margin of error was +/- 2% with a confidence interval of 95%. Fieldwork was conducted in May 2022 by Atomik Research, an independent market research agency.





#ONLYFORWARD

© Altair Engineering Inc. All Rights Reserved. / [altair.com](http://altair.com) / Nasdaq: ALTR

