

THE STATE OF 3D PRINTING

2022 EDITION

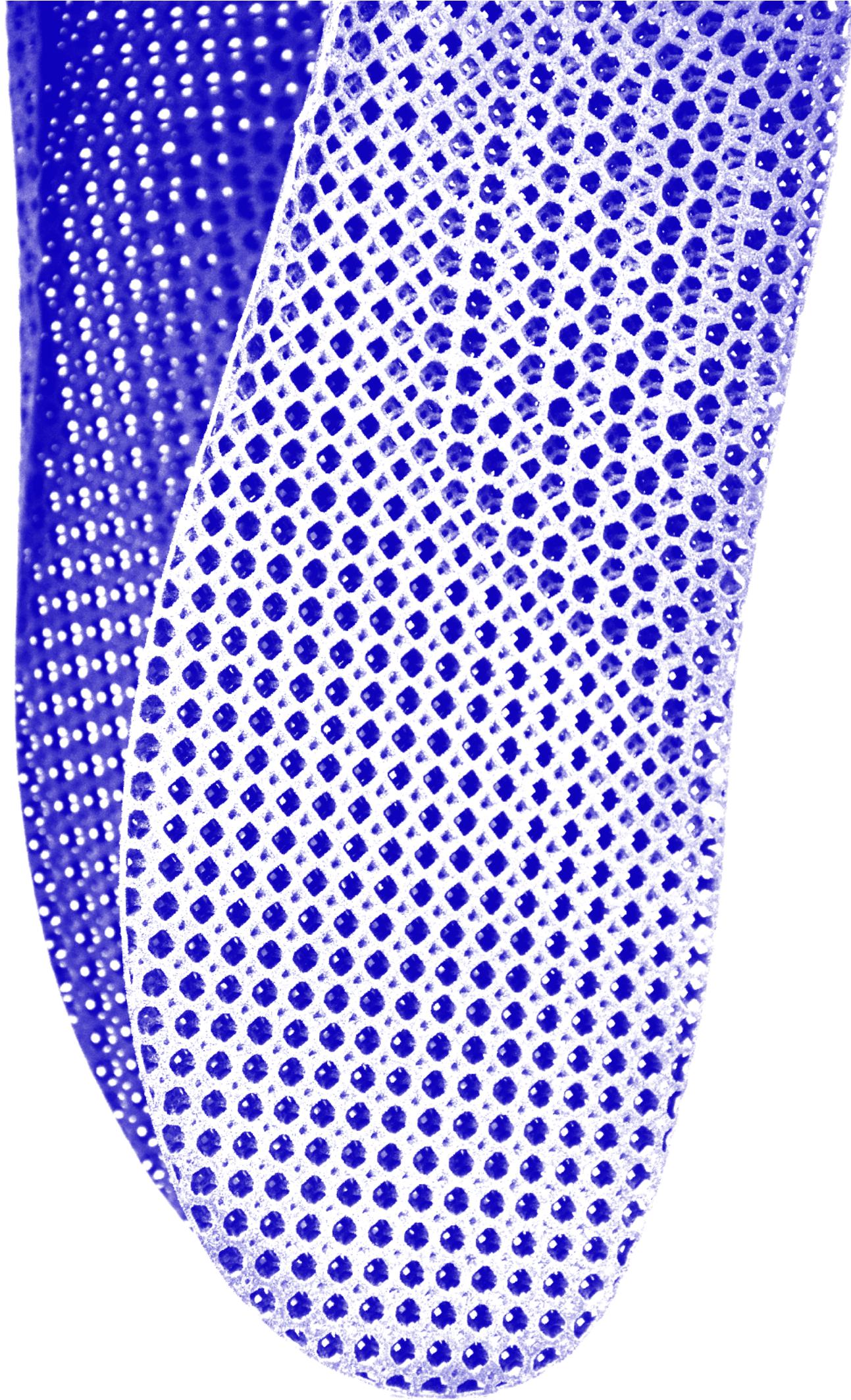




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Alexandre d'Orsetti

CEO of Sculpteo

"I'm happy to welcome you to the 8th Edition of The State of 3D Printing."



Each year, this report has helped actors in 3D printing to understand the evolution of its use, and the needs, expectations, and barriers faced by 3D printing users. Our survey has been answered by people from different horizons, countries, and industries, allowing us to build an overview of the industry and its evolution on a global scale.

Thanks to your invaluable answers to our survey, we've been able to analyze the 3D printing industry for the last eight years. We've seen many significant changes, such as recognizing 3D printing as a serious manufacturing technique and alternative to injection molding. We also saw how significant challenges such as COVID-19 affected users. This year we decided to highlight a growing concern for all industries, which might be the biggest challenge yet: sustainability. According to this report, 81% of the respondents are following sustainable objectives. How do companies face these sustainability objectives, what role is additive manufacturing playing, and how can this technology evolve to meet these crucial objectives?

After working in the additive manufacturing industry for several years, seeing the development of new advanced materials and how applications multiply from year to year, I can tell that the future of this game-changing technology is promising. I look forward to working with all of you to continue building on the future of 3D printing. I wish you an informative reading of this 8th edition of The State of 3D Printing!

KEY FINDINGS

41%

41% affirm that Additive Manufacturing is helping them to reach their sustainable objectives

25%

25% are using Additive Manufacturing to accelerate their product development

33%

33% find that budget is the biggest limit for 3D printing adoption

84%

84% are optimistic about the potential of Additive Manufacturing in the future

63%

63% are looking for options to recycle 3D printed parts



Part 1

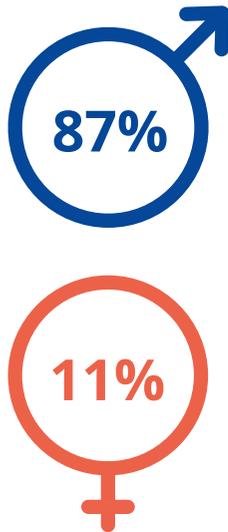
3D PRINTING USERS

Who are 3D printing users? Discover the profile, educational background, and 3D printing experience of the users who participated in this study.

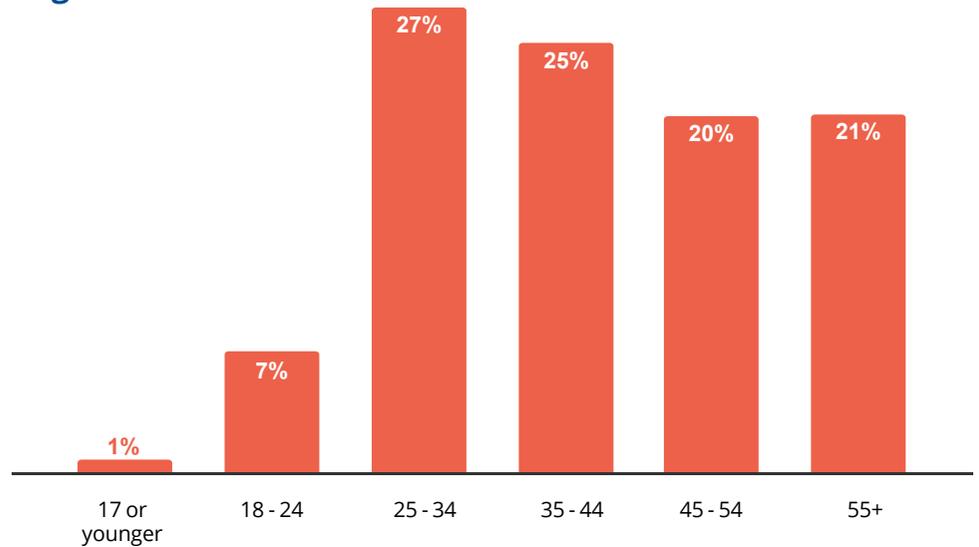
We built this report with the participation of 3D printing users from all over the world, allowing us to present a global view of the use of Additive Manufacturing. We notice that these **users are mainly CEOs, engineers, and designers**.

We have also noticed that **users are gaining more experience**, as the number of people with five years of experience has increased from 35% to 49% since last year, also 72% are using 3D printing regularly. We can tell that respondents are heavy users who understand their 3D printing opportunities.

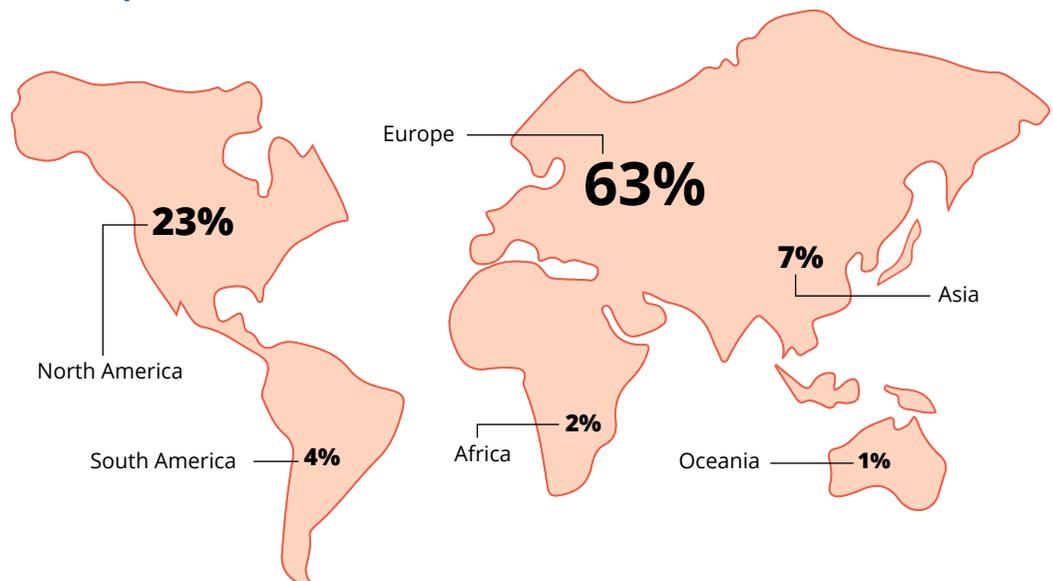
Gender



Age



Location of the respondents

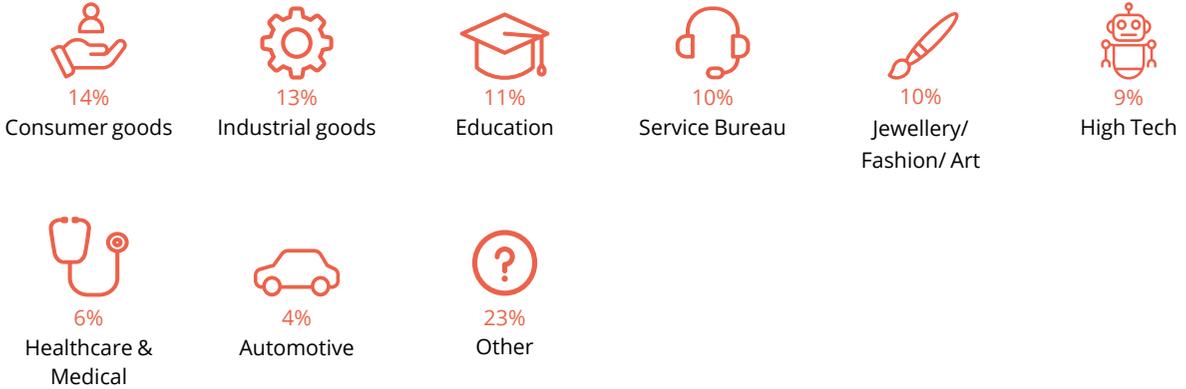


Role

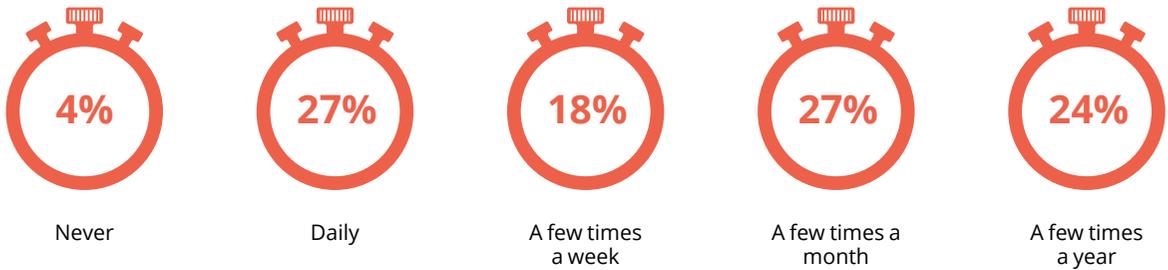


Regarding the industries of the participants, **the most represented ones are Consumer goods** (14%), **Industrial goods** (13%), and **Education** (11%).

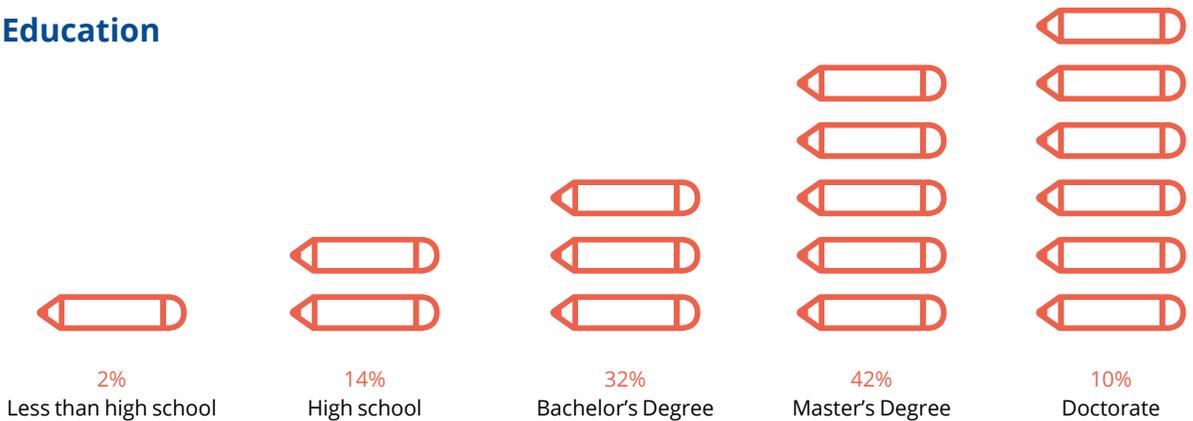
Industry



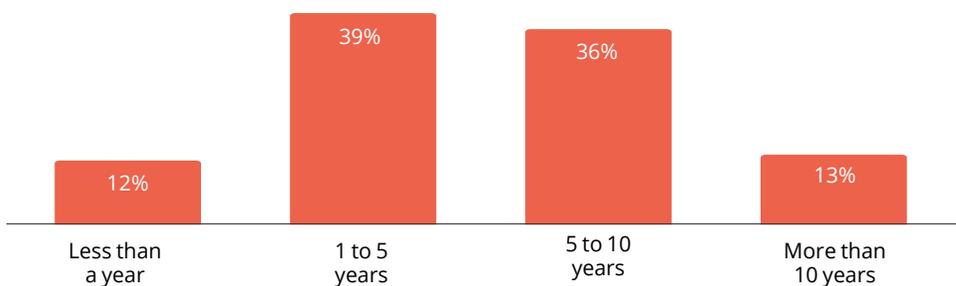
Frequency of use

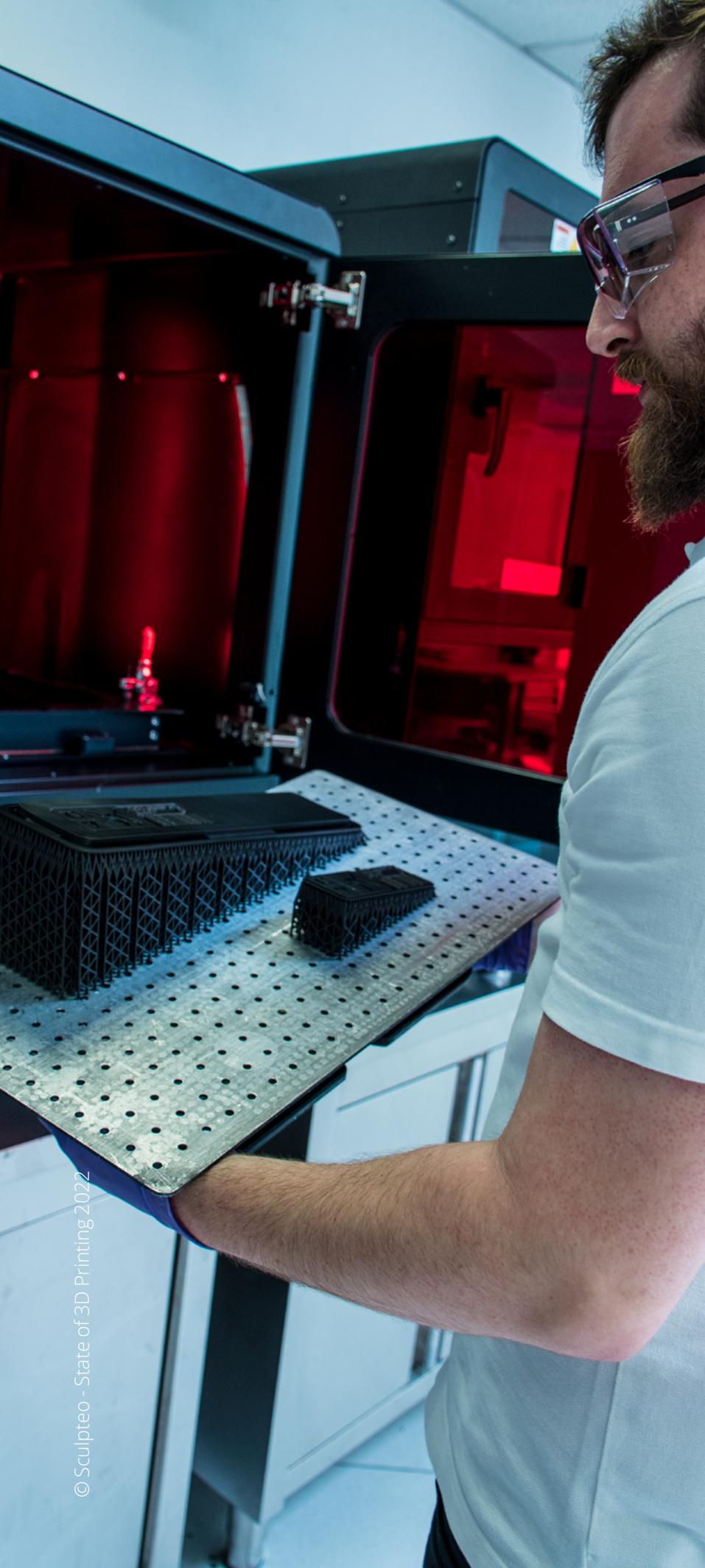


Education



Experience in 3D printing





Part 2

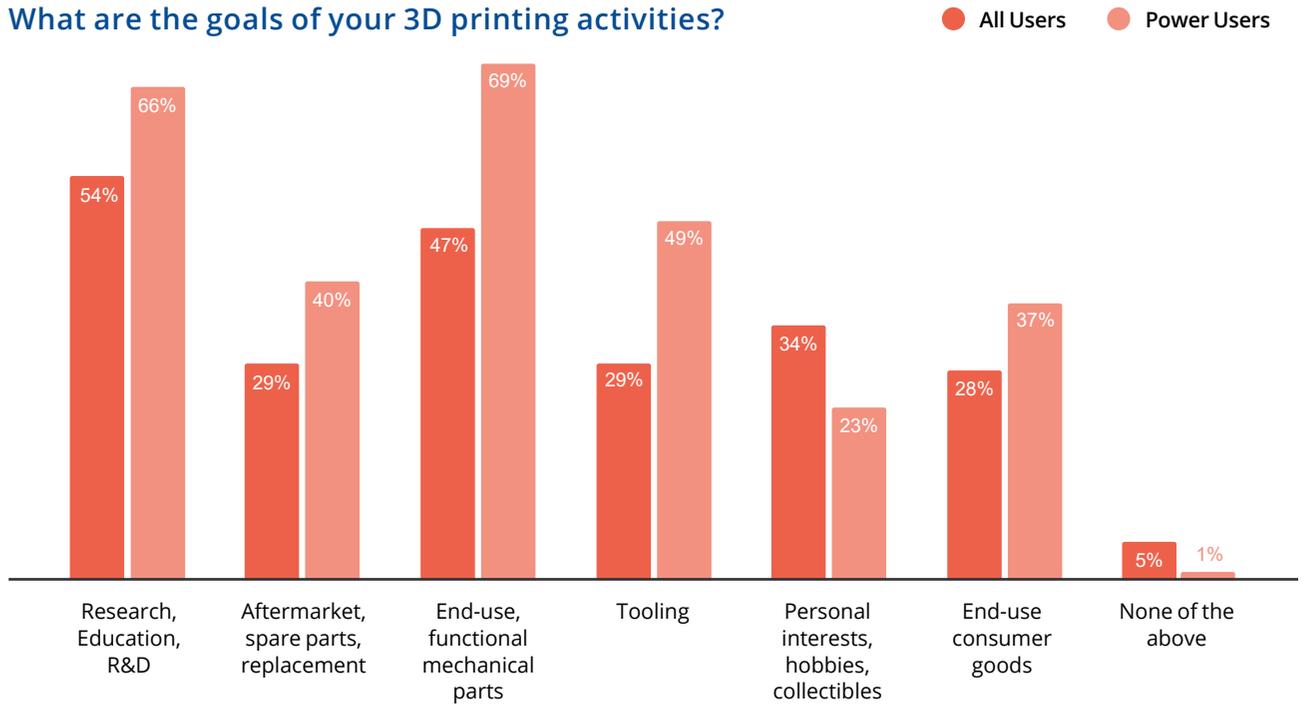
3D PRINTING USE

Learn more about the use and potential of 3D printing thanks to the participation of 3D printing users worldwide.

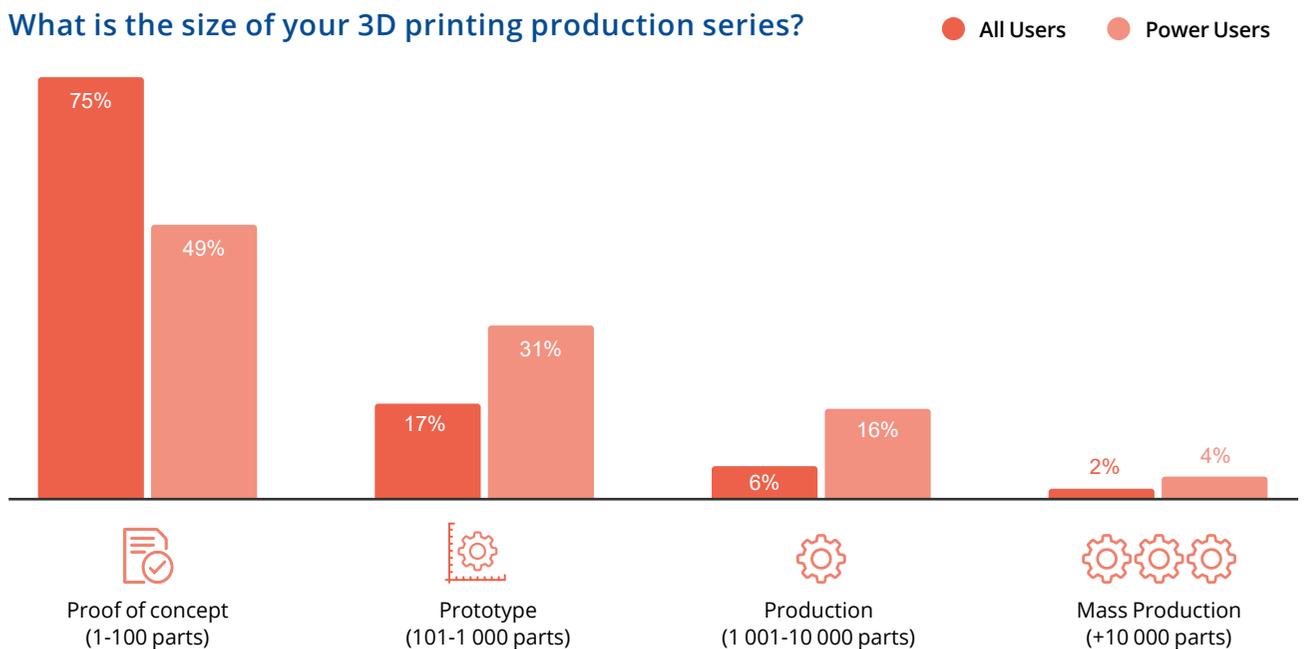
Additive manufacturing confirms its position as a genuine manufacturing solution used for Research / Education / R&D and for end-use purposes. We can see that **most respondents use additive manufacturing when they need less than 1 000 parts**. Indeed, this technology offers considerable advantages in developing projects that create few parts.

“Power Users” are a particular segment of Additive Manufacturing users who have more experience with the technology. Power Users are more mature in their use of this technology, which tends to lean more toward **end-use/functional parts (69%), R&D (66%), and tooling (49%)**.

What are the goals of your 3D printing activities?



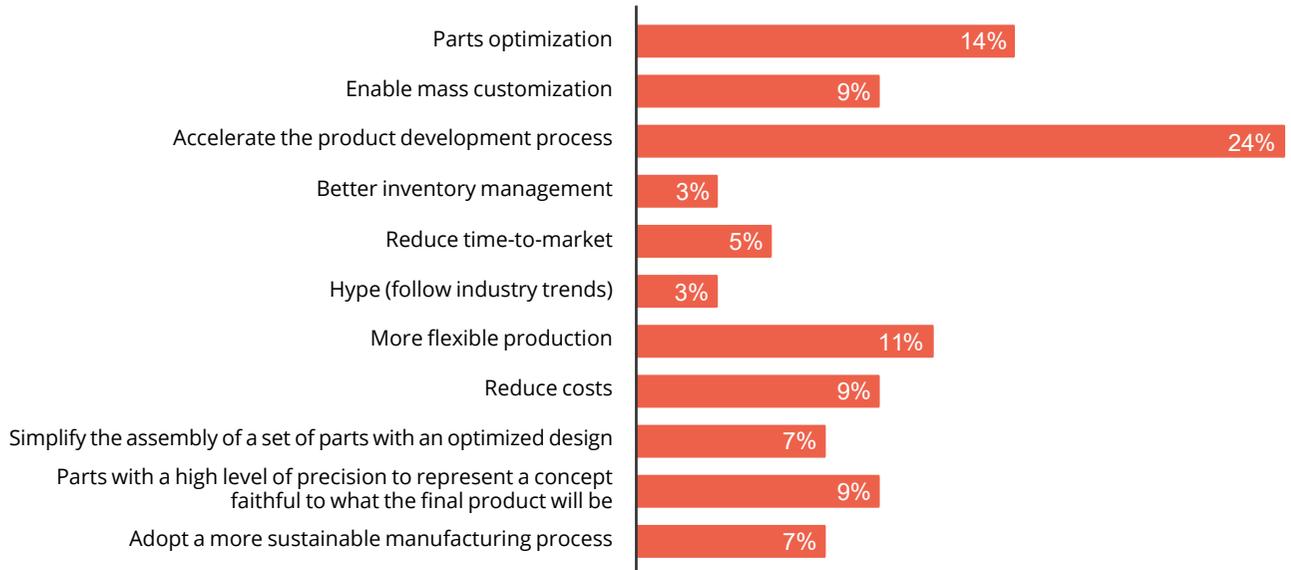
What is the size of your 3D printing production series?



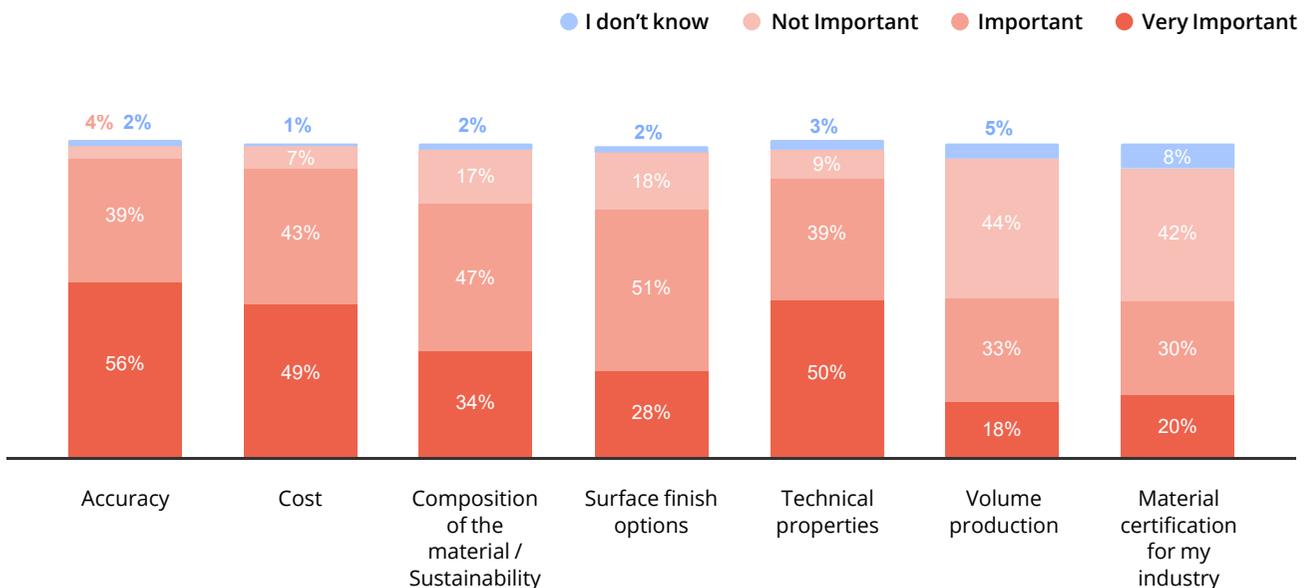
Part optimization is a growing focus for 3D printing users. One fourth of users **use additive manufacturing to accelerate their product development process**, which aligns with the strong use of additive manufacturing for proof of concepts and prototypes.

Regarding the choice of 3D printing materials for their projects, users are looking for accuracy, specific technical properties, and a cost-effective option. **More sustainable materials** are also important for 81% of 3D printing users.

What are you achieving with 3D printing?

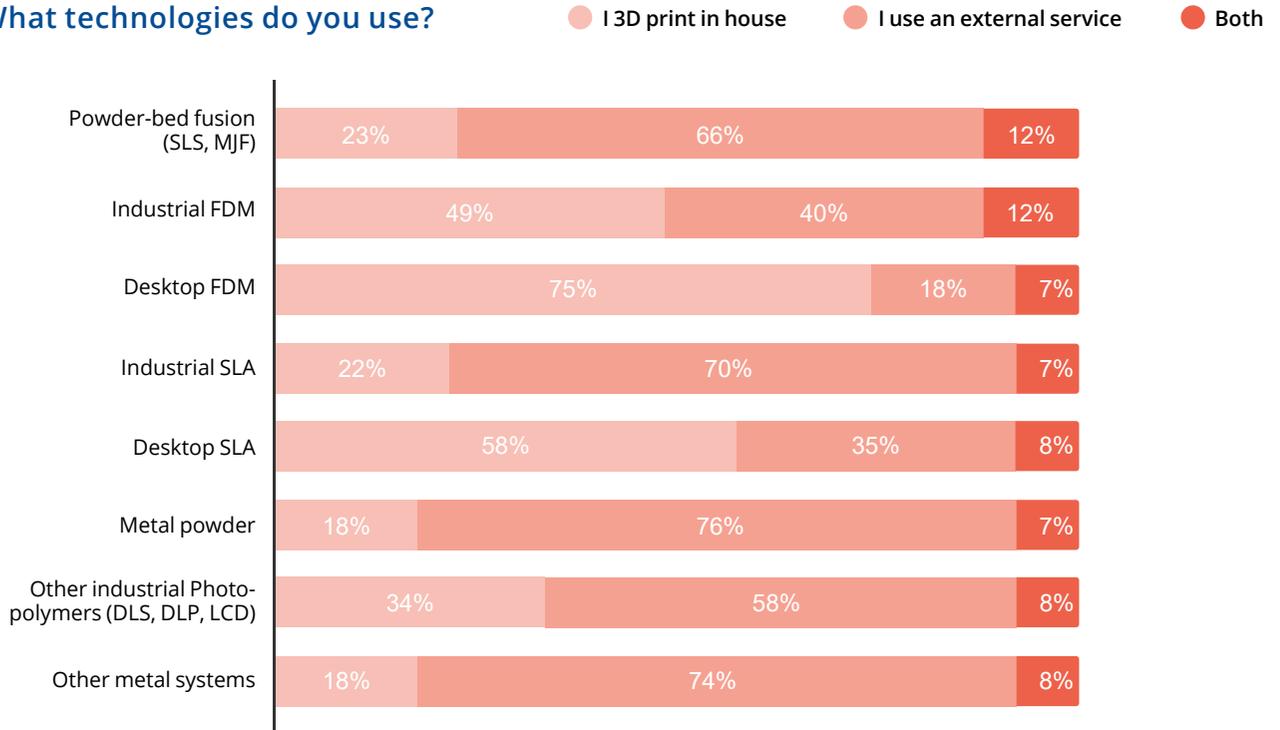


How important are these factors when choosing a 3D printing material?



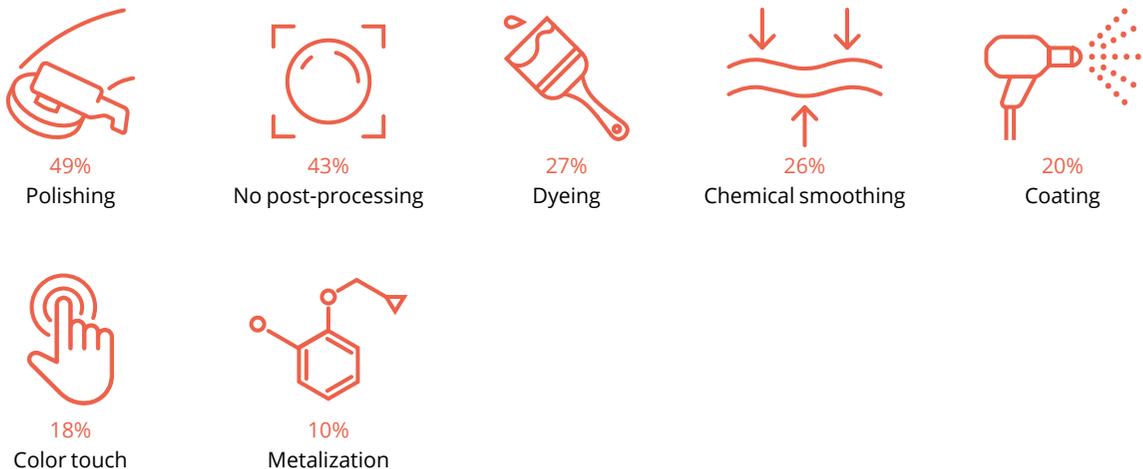
Industrial 3D printing techniques such as powder-bed technologies (**SLS, MJF**) are increasingly used **in-house**; companies understand this manufacturing technique's full potential and are investing in machines. However, **most users still benefit from powder-bed and metal technologies through external services** rather than owning and operating machines internally.

What technologies do you use?



Polishing is the most common post-processing used. The variety of answers shows a great diversity of post-processing, highlighting a natural interest in a part with excellent quality and a finished aspect. Part quality and post-processing have always been a challenge for the industry. Still, we can notice that **more advanced post-processing is also emerging**, like metalization, which is used by 10% of our respondents.

What types of post-processing do you use on your 3D printed parts?





Part 3

POWER USERS

How is this category of people using additive manufacturing? Let's focus on this particular segment of users making the most of this technology.

We qualify users as “Power Users” when they have been **using additive manufacturing in the context of business for more than five years** and have **invested at least \$10k in 3D printing** over the last year. This category of users leads the way in how 3D printing is used. Let’s learn more about the benefits of using additive manufacturing in their businesses.

Power users are usually men, but they appear to be older than the general population of 3D printing users, which explains the maturity of their use of AM and their higher investments. Power users are mainly owner/CEO, researcher/R&D/scientist and engineers.

Gender

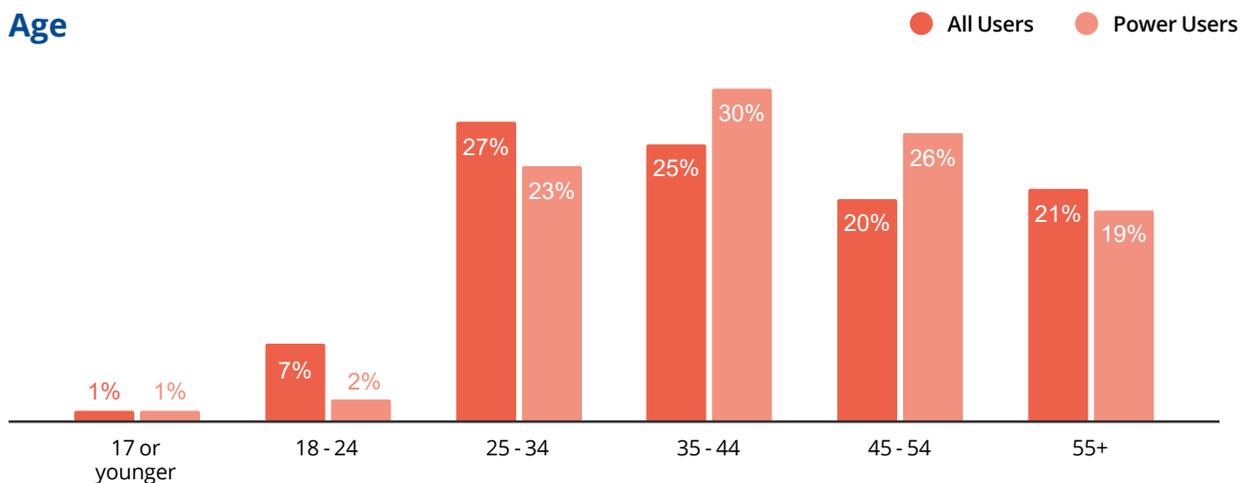
All users 87% / 11%



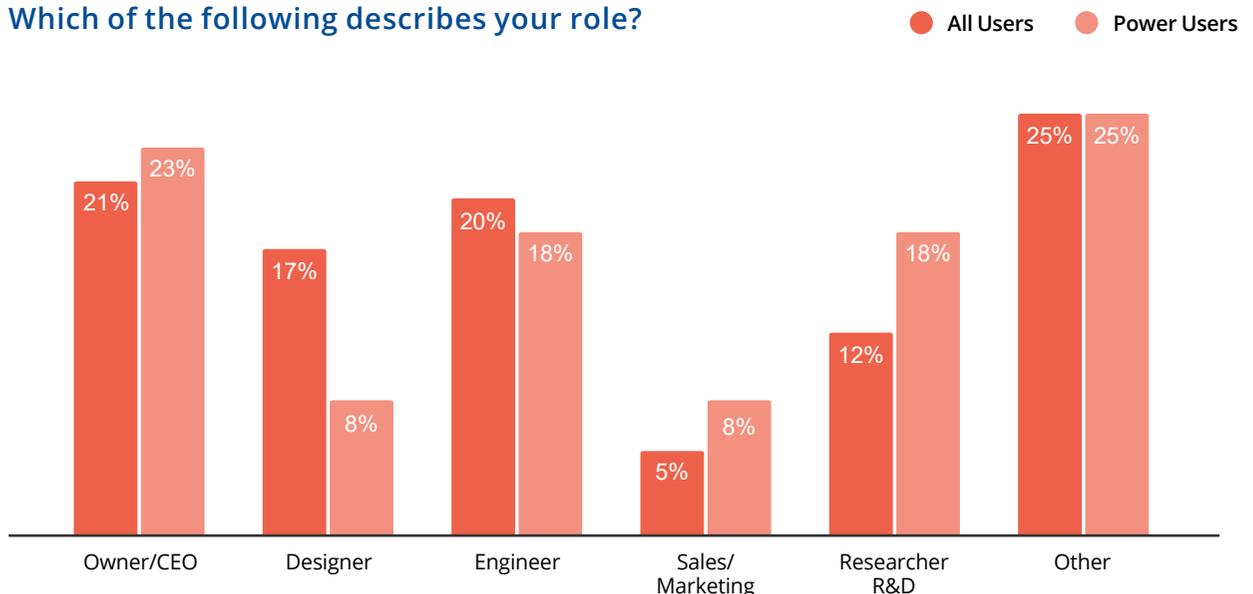
Power users 92% / 7%



Age

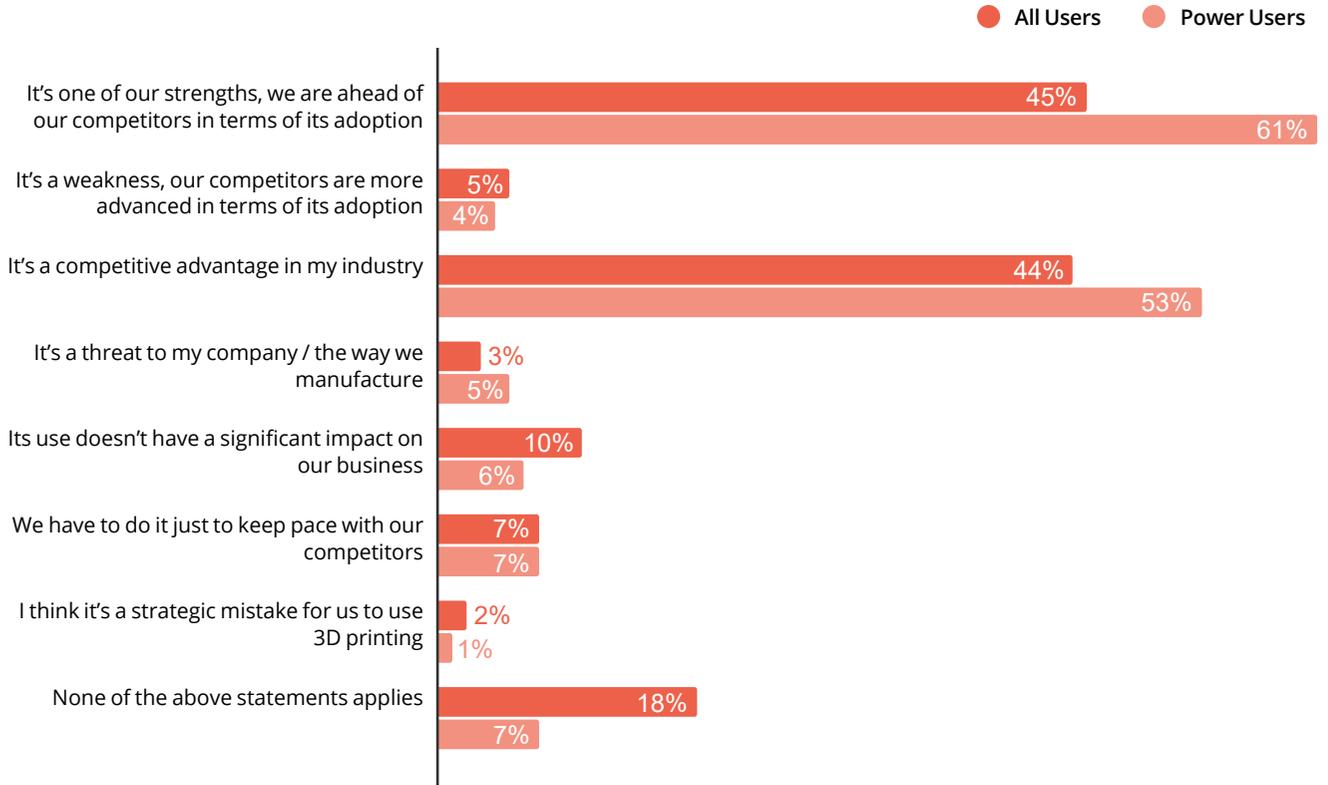


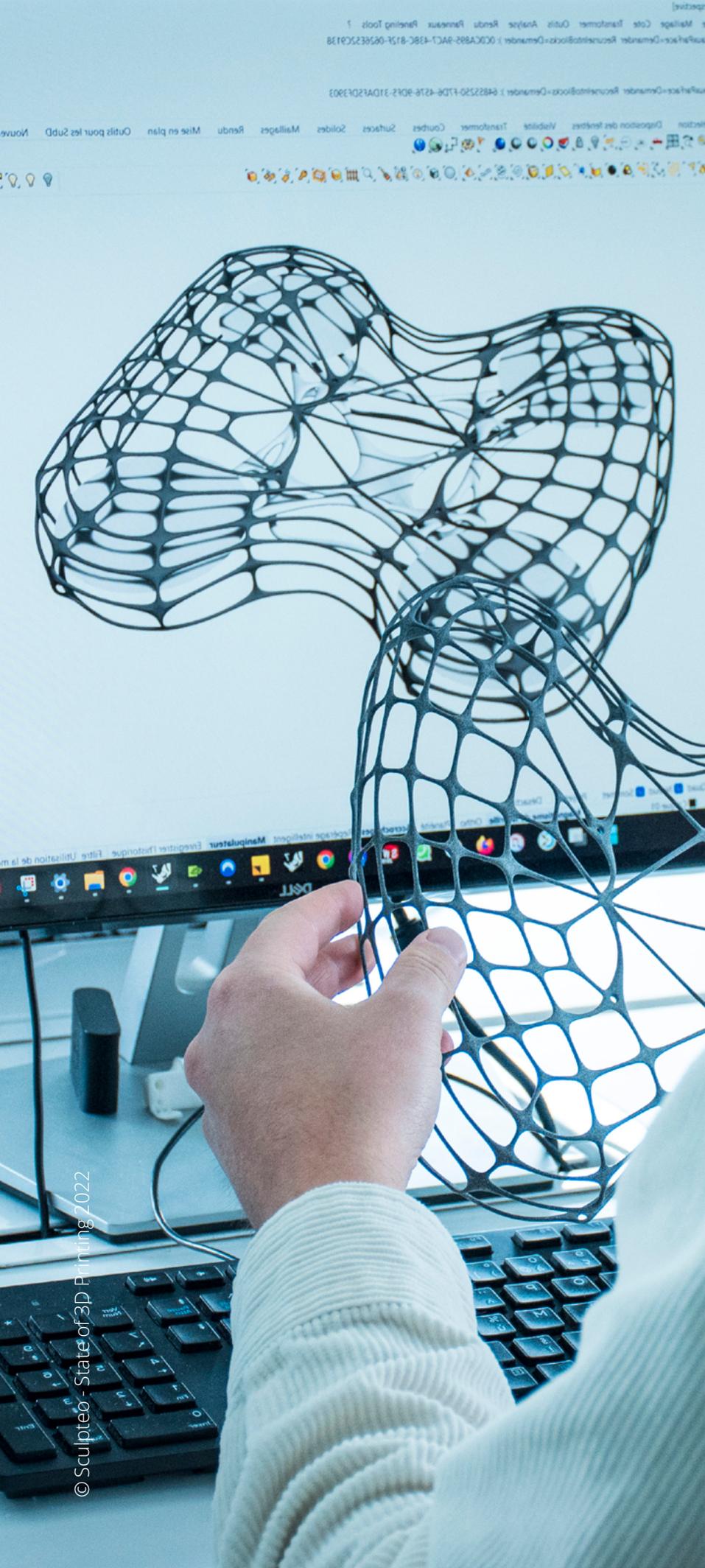
Which of the following describes your role?



Among the characteristics of power users, the high investment in their 3D printing activity and the number of manufactured parts show their understanding of AM compared to general users. Powers users are much more advanced in adopting this manufacturing strategy and are confident about it.

How do you assess your use of 3D printing as a part of your business strategy?





Part 4

STRATEGY

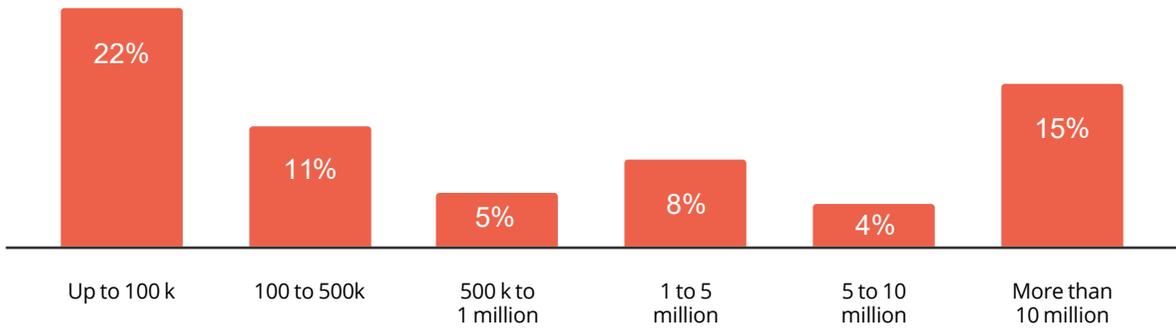
Additive manufacturing is now an exciting asset for companies, changing and improving their whole business strategy. Let's see how it can become a real game-changer.

More prominent companies are going to be spending more of their budget on additive manufacturing, finding new exciting opportunities, and reaching a new level by using additive manufacturing for production and not only for their product development process. They consider **this technology a reliable manufacturing process** that can fulfill their requirements.

How much did you invest in 3D printing last year?

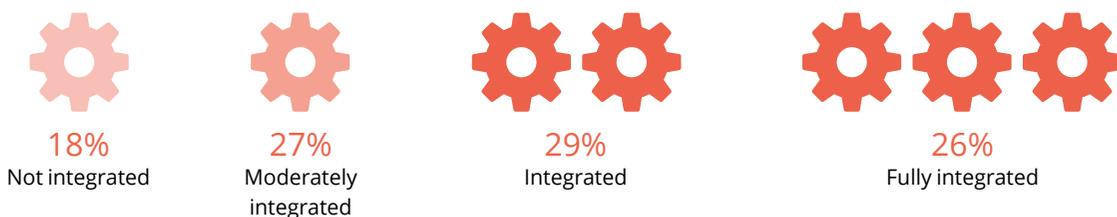


What is the annual revenue of your company?

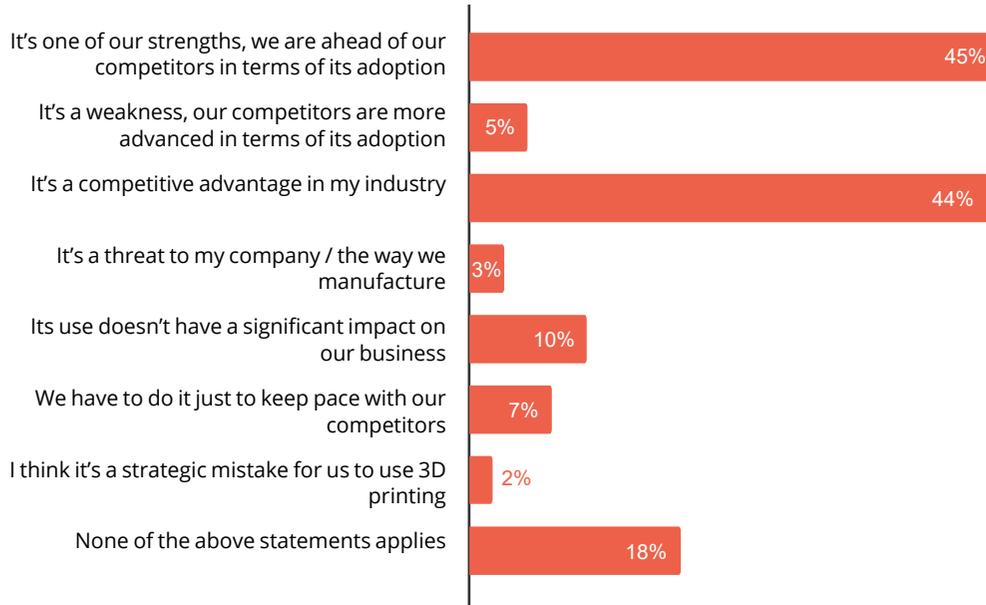


Most respondents strongly use additive manufacturing, saying that 3D printing is integrated or fully integrated into their global strategy. Proving the added value of this technology, **89% of 3D printing users see it as a strength or a competitive advantage**. Early adoption of 3D printing allows businesses to be more competitive, according to 61% of respondents, who align their budgets and priorities to keep up with their competitors.

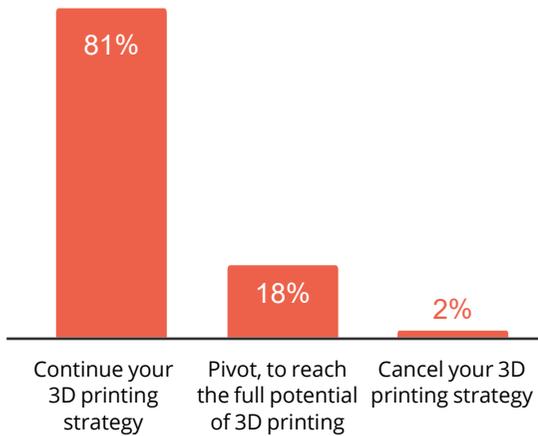
To what extent is your 3D printing strategy integrated with your overall strategy?



How do you assess your use of 3D printing as a part of your business strategy?



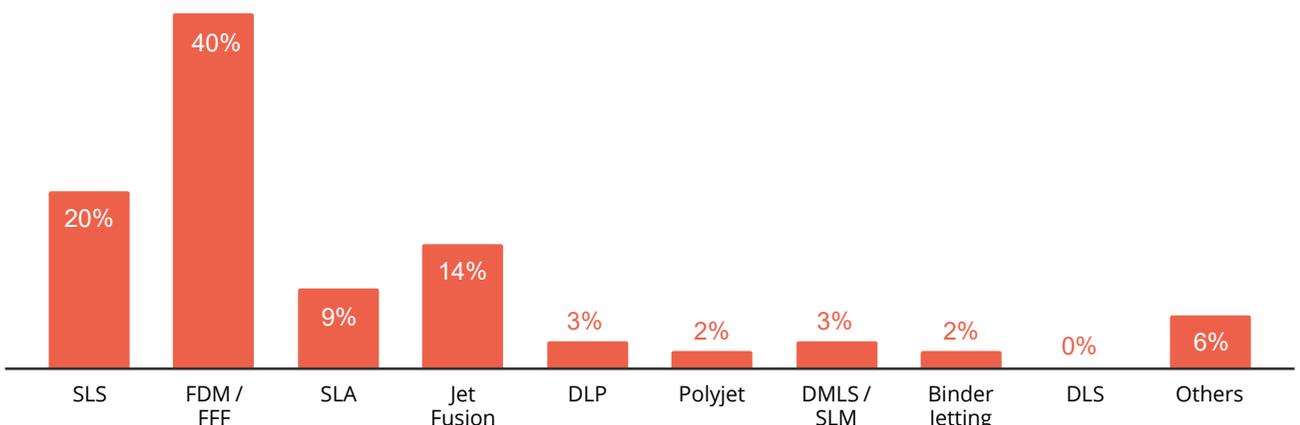
For the upcoming year will you...?



81% are satisfied with their 3D printing strategy. Time is precious, and 3D printing users understand the benefits of **speed of innovation and lead times** so well that they point this out as the main game-changer.

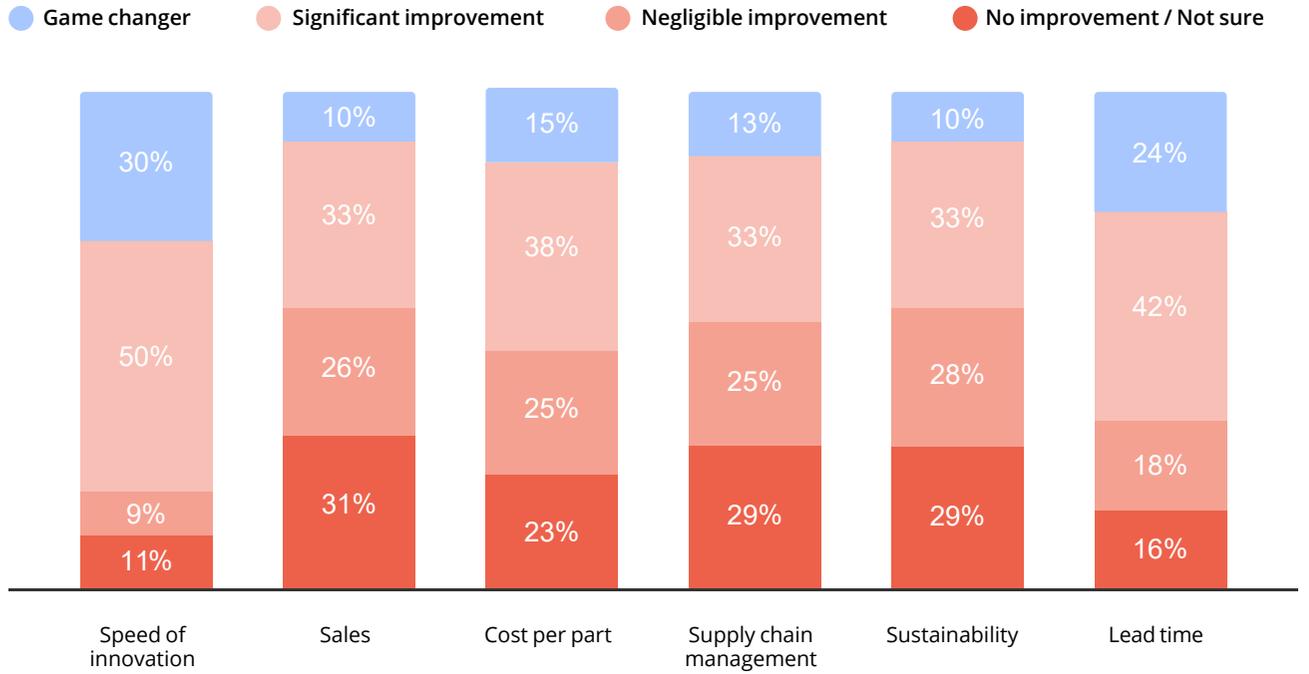
FDM and SLS are the two most cost-effective printing techniques. FDM is a promising technology for proof of concepts and prototypes, which are the primary purposes of 3D printing users answering this survey. SLS, MJF, and SLA are the three other vital technologies in the 3D printing industry.

Which 3D printing technology is the most cost-effective in your strategy?



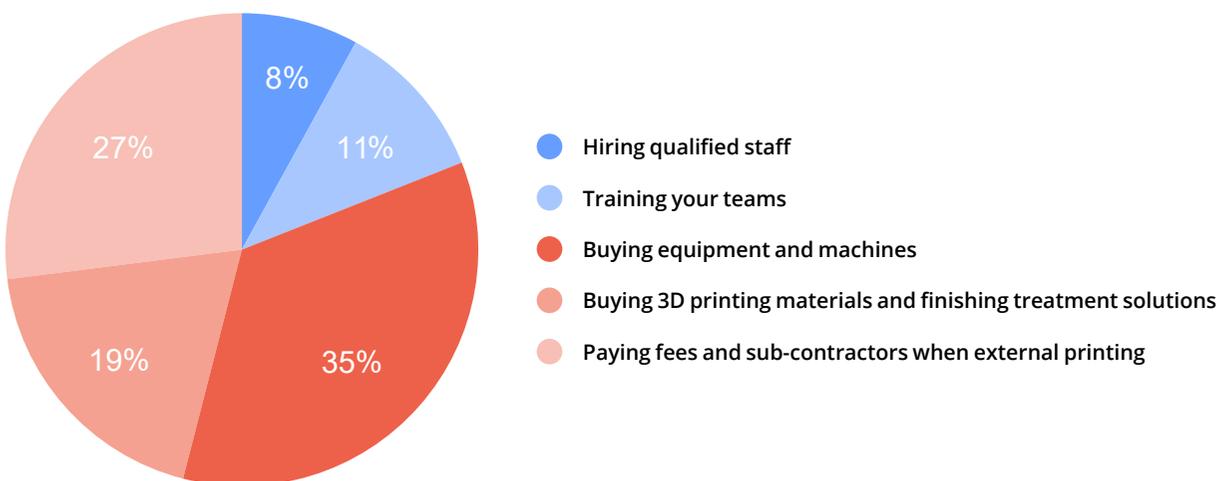
Saving time has a significant impact on the budget of a company and represents a real competitive advantage. Speed of innovation, development time, and lead time reduction plays a crucial role in today's business strategy.

How do you measure the success and impact of your 3D printing activities?



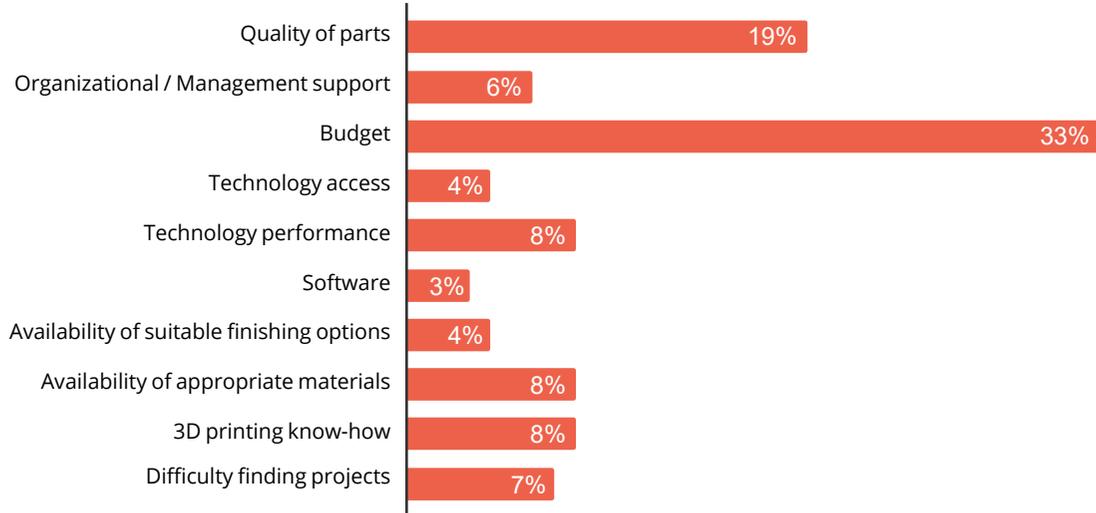
35% of investments done in 3D printing are made to purchase equipment and machines. However, these significant investments can also become the first barrier to expanding the use of additive manufacturing for some companies.

What is the main investment of your 3D Printing strategy development?



Budget is the most significant limit for 33% of the respondents, which also explains the massive use of FDM technologies, the most affordable technique for people starting to use additive manufacturing. Quality of parts is also a limiting factor for 19% of these 3D printing users, which explains the **growing demand for accuracy and a need for new 3D printing materials and finishing options** on the market.

What factors limit your strategy result?





Part 5

VIEW ON THE FUTURE

Are 3D printing users confident about the future of 3D printing? What could be improved to facilitate the adoption of this technology? Let's find out.

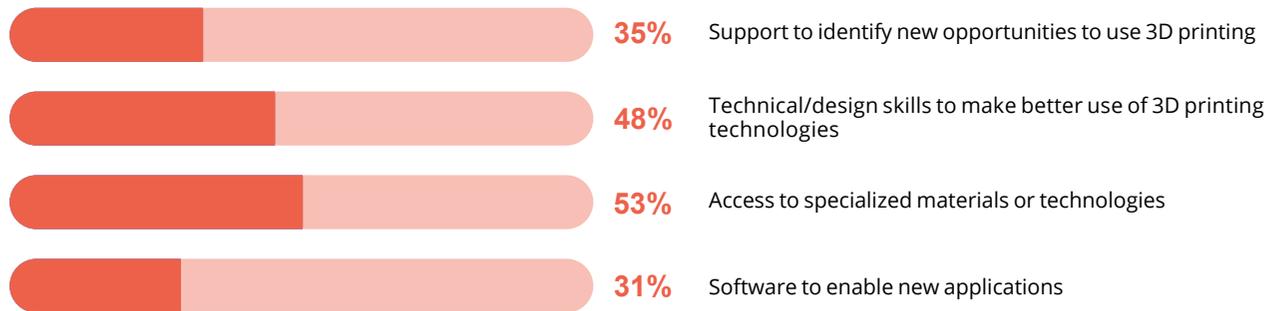
84% of the users are optimistic about the potential of additive manufacturing in the future. The development of this manufacturing technique is promising, with its ability to meet sustainability goals with a great quality and to identify opportunities.

How do you view the potential of 3D printing in the future?

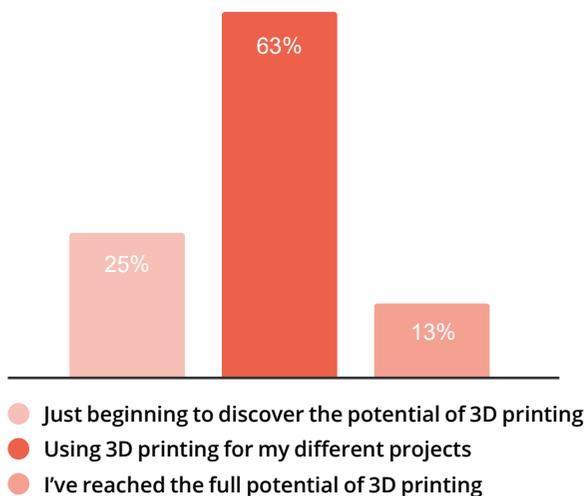
- +++ 58%** **Very optimistic**, it will have a significant role in manufacturing, business, and individual life
- + 26%** **Optimistic**, it will have a significant role only in a manufacturing and business context
- 10%** **Neutral**, it will have a defined role in certain industries
- 2%** **Pessimistic**, it's interesting for certain industries but won't have a long-term impact
- 2%** **Very Pessimistic**, 3D printing is a novelty, a fad, that will not have a significant role in the future

Only 13% are confident about using 3D printing to its full potential, meaning that their use of 3D printing should still grow for 87% of the users. To improve the adoption of this technology, 53% of respondents to this study are **asking for more specialized materials**. In comparison, 35% need support to identify business opportunities, and 48% point out a need for more design skills to create good designs for 3D printing.

How do you need to make progress in 3D printing adoption?



How far along are you in implementing your strategy?





Part 6

SUSTAINABILITY

3D printing users share their points of view on sustainability and 3D printing. What role does 3D printing have to play in helping companies follow their sustainability objectives?

81% of these 3D printing users follow sustainable objectives, a number we expect to grow in the upcoming years. While 41% affirm that AM is helping them to reach their sustainable goals, another 40% are still looking for more sustainable manufacturing options. These results encourage the 3D printing industry but show that **the market must evolve to meet users' sustainability expectations**.

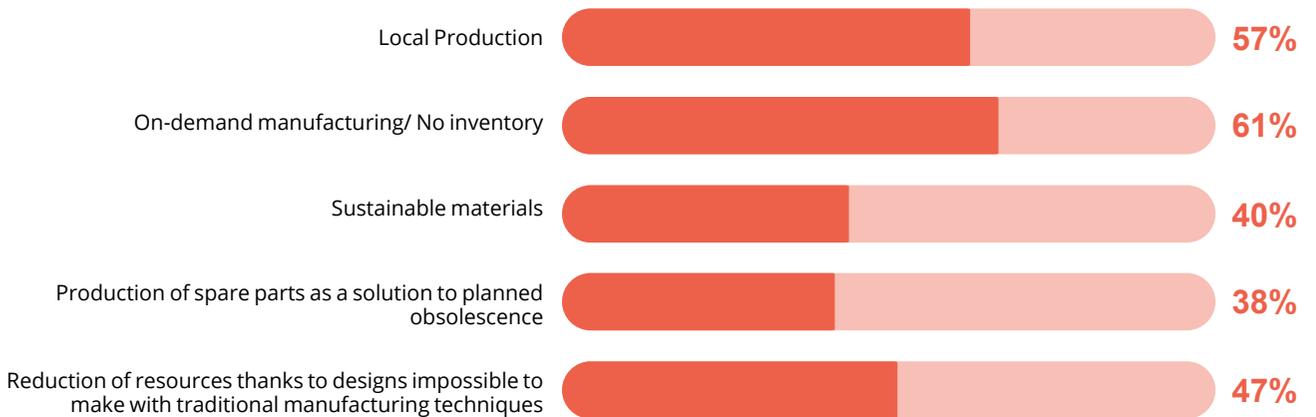
Is your business strategy following sustainable objectives?



For 61%, on-demand manufacturing is the leading sustainable advantage of 3D printing. **Only producing what you need when you need it** and avoiding the constraints of inventory is a promising option made possible with 3D printing.

47% are pointing out the importance of the **design opportunities offered by 3D printing**. For them, 3D printing reduces the need for many resources thanks to designs that are impossible to make with traditional manufacturing techniques.

How do you think 3D printing is advantageous to making your business more sustainable?



How sustainable is 3D Printing?

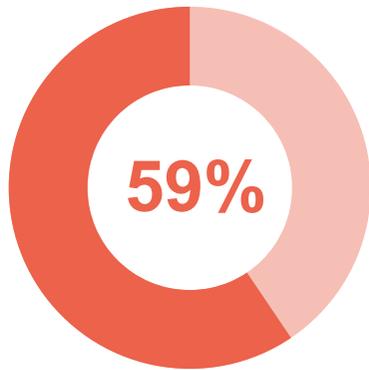


94% of the respondents think additive manufacturing is sustainable.

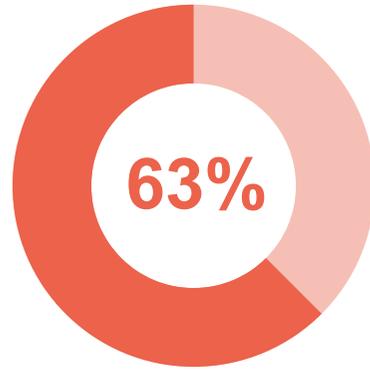
Additive manufacturing is a technique with several advantages for making businesses more sustainable.

Recycling is a concern for 63% of the respondents looking for options to recycle 3D printed parts. In comparison, **59% want more sustainable materials**, a demand being considered if we see the evolution of bio-sourced materials launched on the market during the past few years.

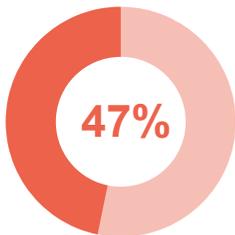
What are the three main sustainable aspects 3D printing should improve?



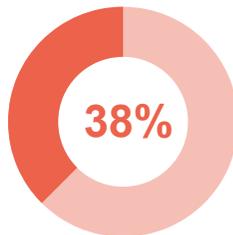
Development of more sustainable materials



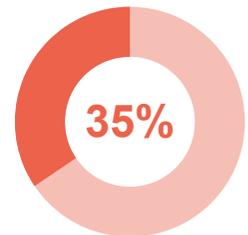
More recycling options for 3D printed end of life parts



Make progress with the reusability of the powder with technologies such as SLS



Transparency of environmental data



Reduction of CO2 emissions

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