

# THE STATE OF 3D PRINTING

By  sculpteo

2020 Edition

The data you need to understand the 3D printing world  
and build your 3D printing strategy

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# Welcome

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Clément Moreau  
(CEO & Co-Founder Sculpteo)

I'm happy to welcome you to the 6<sup>th</sup> Edition of The State of 3D Printing. The goal of this annual report is to offer you a complete overview of the additive manufacturing world, in order to help you to improve your 3D printing business strategy.

Shaping the future of additive manufacturing starts with understanding what are the uses and the expectations of 3D printing users around the world. This is why we started this ambitious research project, and we are always amazed to see the support we receive from users around the world who take the time to answer the survey. Indeed, more than 1600 individuals answered this survey, which makes it our biggest survey in six years!

The data you will find inside this report is interesting for anyone involved in the additive manufacturing industry. I am sure this complete study can help you get a better understanding of the whole industry, giving you the best insights to build or improve your 3D printing business strategy.

After six years, we can see a clear evolution in the applications of this technology. Companies identify the opportunities of additive manufacturing for their business, grow their investment and show true confidence about the future of 3D printing for their professional uses. Our respondents also mention their expectations, needs, and barriers. As 3D printing experts, we have to take this into account. At Sculpteo, our mission is to help our customers deal with the challenges they encounter to take their businesses to the next level.

No doubt that the future of 3D printing will continue to be game-changing. I wish you an instructive and pleasant reading of this 6<sup>th</sup> edition of The State of 3D Printing!

- Clément

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# Key Findings

## Consistency is the Achilles heel of 3D printing

For Additive Manufacturing to be a significant part of any manufacturing ecosystem, the industry must develop machines and materials which produce consistent results.

**51%** say Quality Control is their top challenge for using 3D printers

**62%** think the 3D printing industry needs more reliable technologies to grow

## 3D printing is consolidating its position in certain manufacturing industries

Many industries are beginning to consolidate their use of 3D printing as the role of 3D printing becomes more defined within their manufacturing processes. Users are becoming more mature in their knowledge and application of additive manufacturing.

**80%** have used 3D printing at their companies for more than 2 years

**33%** expect up to a 50% increase in investment this year, more conservative than previous years

## 3D printing can be seen as cost-prohibitive

For AM to be a more ubiquitous manufacturing method, the cost per part at scale will have to continue to decrease to appeal to more industries/sectors.

**More than 50%** use SLS, Jet Fusion, SLM/DMLS, and Binder Jetting through external services to counter machine/maintenance costs

**59%** say the cost of entry is a limiting factor for the adoption of 3D printing

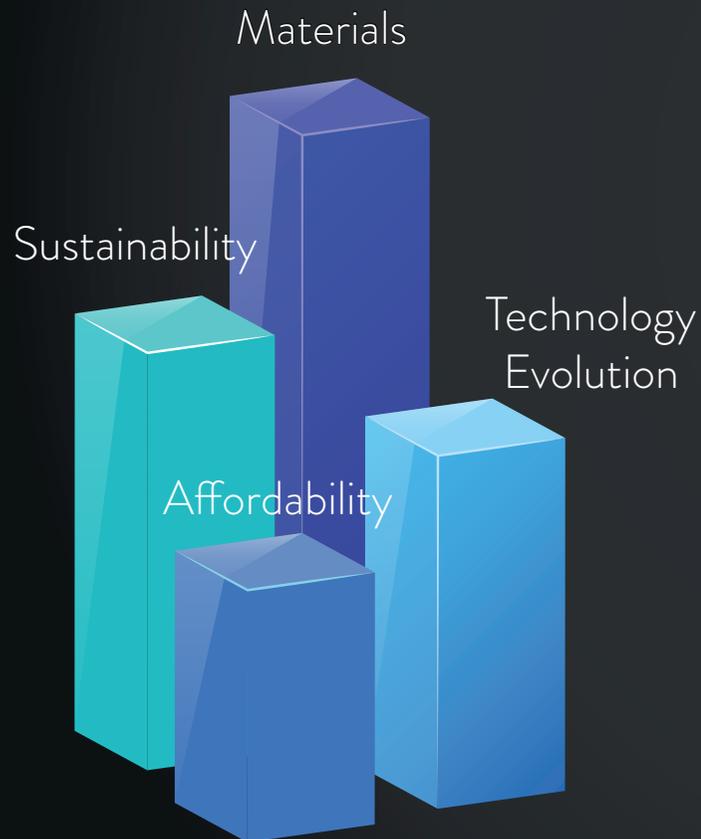
## Changing perceptions: Moving additive manufacturing from prototyping to production technology

While there is an increase in the use of 3D printing for production, the benefits of AM are still only seen at the prototyping or small series stage. The industry has to educate the manufacturing world to change this perception and demonstrate a real added value for production with 3D printing at scale.

**More than 60%** see a significant improvement in cost per part using 3D printing

**52%** use 3D printing for production vs 68% for prototyping

# Trends



## Materials

- New and affordable materials
- Improve the quality and consistency of low-cost prints
- Increase post-processing technologies for better finishes
- Multi-material print

## Sustainability

- Biodegradable and bio-sourced printing materials
- On-demand and local production to reduce shipping and environmental costs
- 3D printing for renewable energy and energy efficiency

## Technology Evolution

- Improve usability of software and printers
- Mass production: Printing speed and 3D scanning
- Generative design

## Affordability

- Lower cost for 3D printers and materials (metals, resins)
- Post-processing cost reduction
- Design and tools sharing

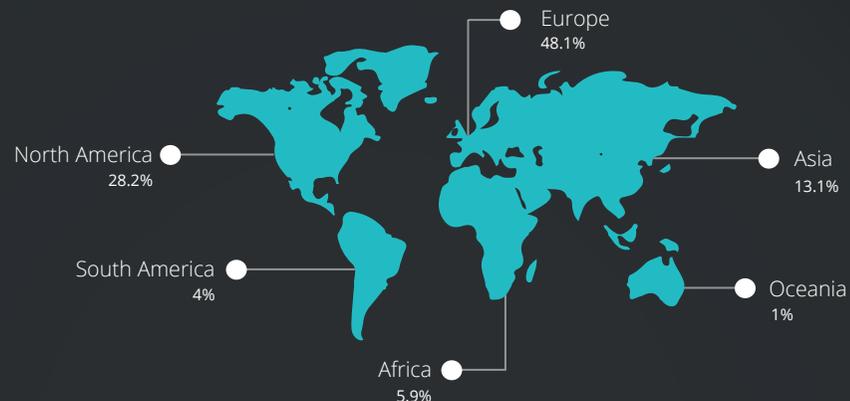
# Who are 3D Printing Users?

This year, more than 1600 people from 71 countries answered this survey, making it the biggest and most representative edition of The State of 3D Printing yet. This year's report is also the most diverse, with a larger representation from Asia, Africa, and South America.

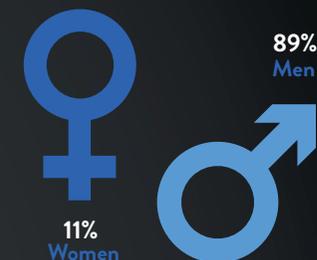
Regarding the educational background of 3D printing users, we can see that 62% of them have an engineering background. We also notice that these users are mainly engineers and CEOs.

How is the knowledge of 3D printing users evolving? 71% of respondents have used 3D printing for more than 3 years; a large majority of them having used this technology several times a month and 31% even use it daily. We can tell that respondents are heavy users, who clearly identified their 3D printing opportunities and tend to use it with a long-term perspective.

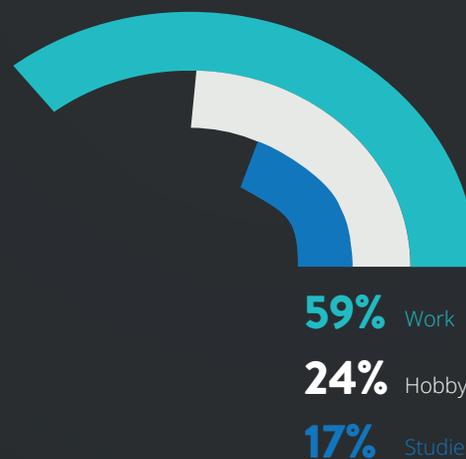
## Geography



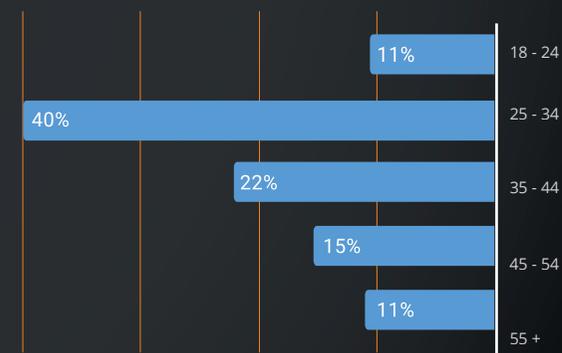
## Gender



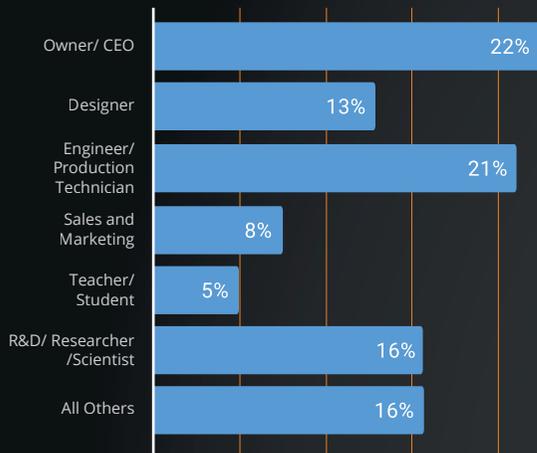
## Primary Context for Using 3D Printing



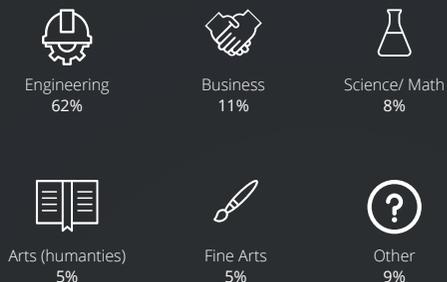
## Age



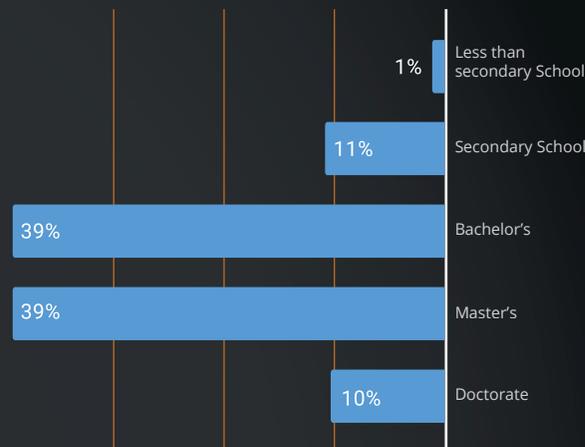
### Role



### Educational Background



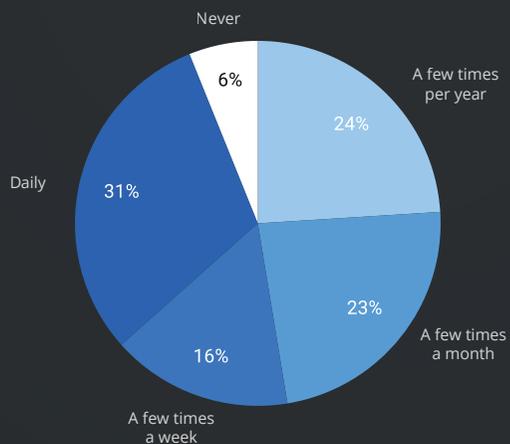
### Educational Attainment



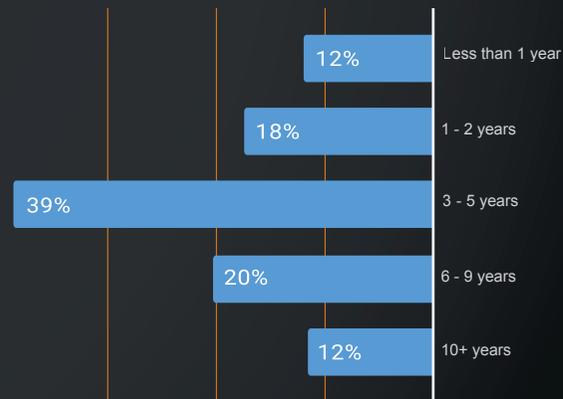
### Industry



### Frequency of Use of 3D Printing



### Years of Experience in 3D Printing



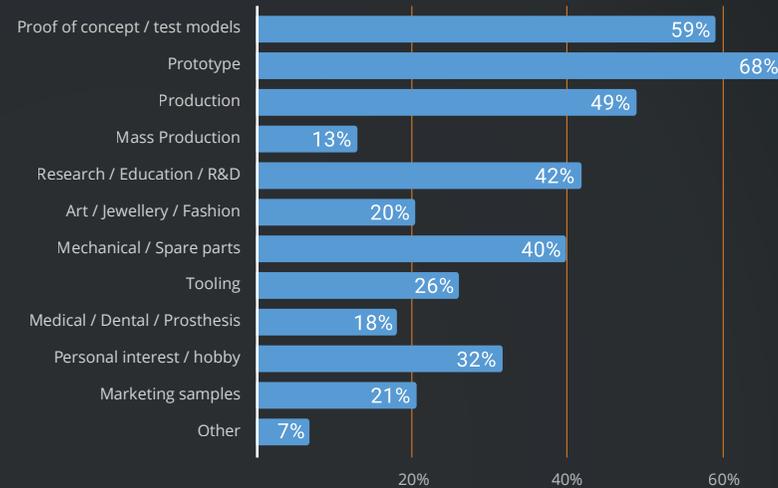
# How is 3D Printing Used?

3D printing offers more and more possibilities, allowing the uses of additive manufacturing to evolve. Indeed, we can tell that companies are feeling more confident about this 3D technology. 68% of our respondents are eager to use additive manufacturing for more applications and 44% will start using new 3D printing technologies. A majority of users print SLS, Jet Fusion, and metal technologies through external services: as they do not have to operate their own machines, using these services is encouraging them to try new technologies.

Which 3D printing technologies and which post-processing are the most popular? Let's find out!

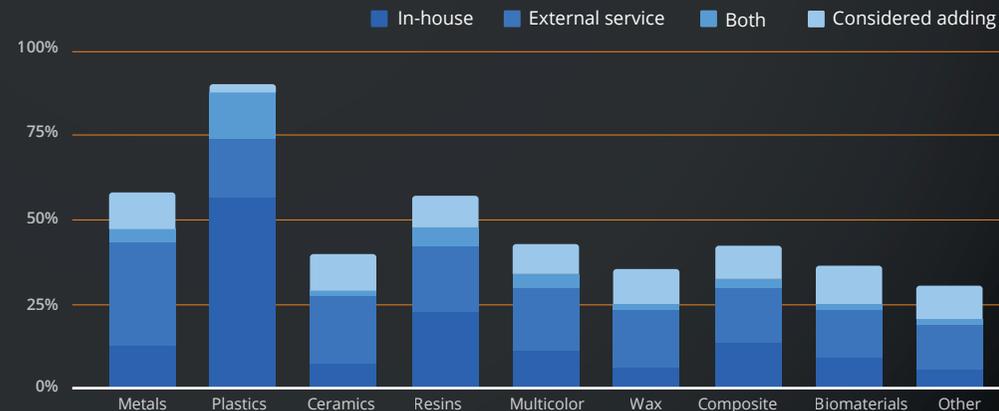
Once again, production with 3D printing continues to rise. We see an increase in the use of 3D printing for research, R&D, and education which corresponds to increased demand for new materials and technologies in the market.

Q: What is the purpose of your 3D prints?



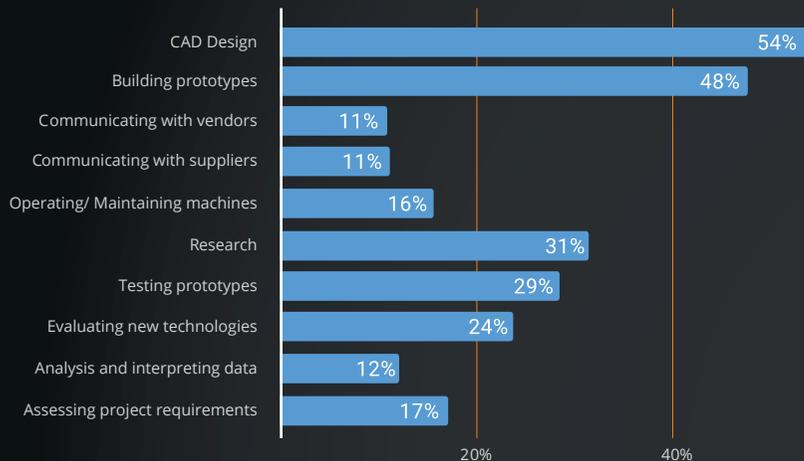
The use of resin materials grows both through in-house and external services, while most users make use of metals through external services.

Q: Which 3D printing materials do you use?



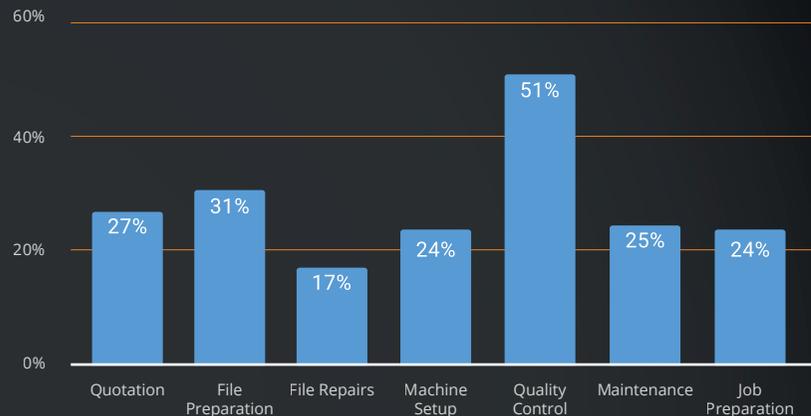
**Design, testing, and building prototypes remain the top areas where 3D printing users spend their time.**

Q: What are the top areas in which you spend your time?



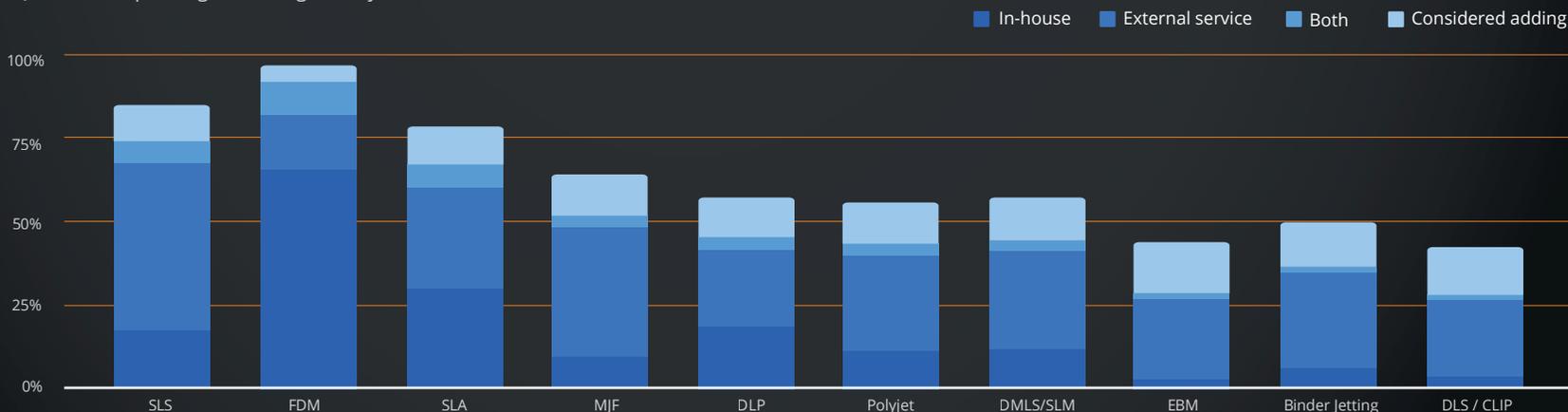
**Consistency and quality control continue to be the main issue for users looking to scale their use of 3D printing.**

Q: What are the top challenges for using your 3D printers?



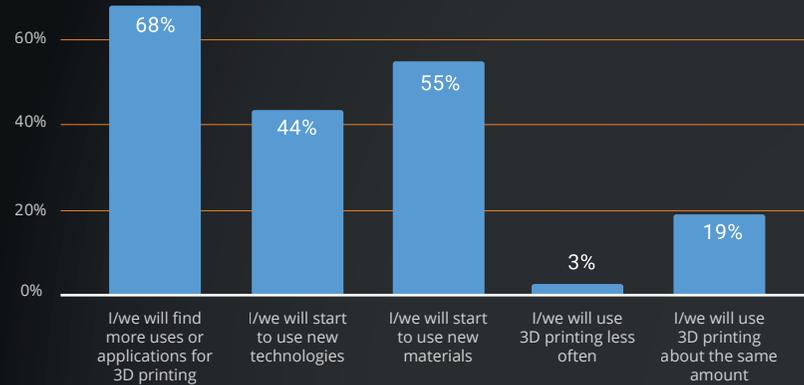
**The majority of users benefit from SLS, Jet Fusion, and metal technologies through external services rather than owning and operating machines internally.**

Q: Which 3D printing technologies do you use?



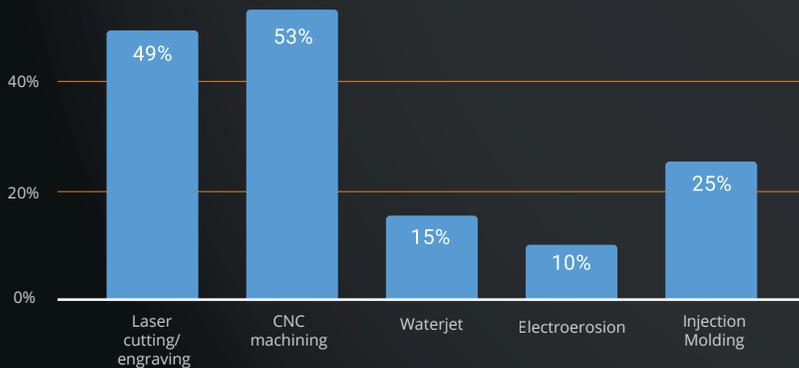
**3D printing users are keen to explore new uses/applications, technologies, and materials.**

Q: How do you expect your use of 3D printing to evolve over the next year?



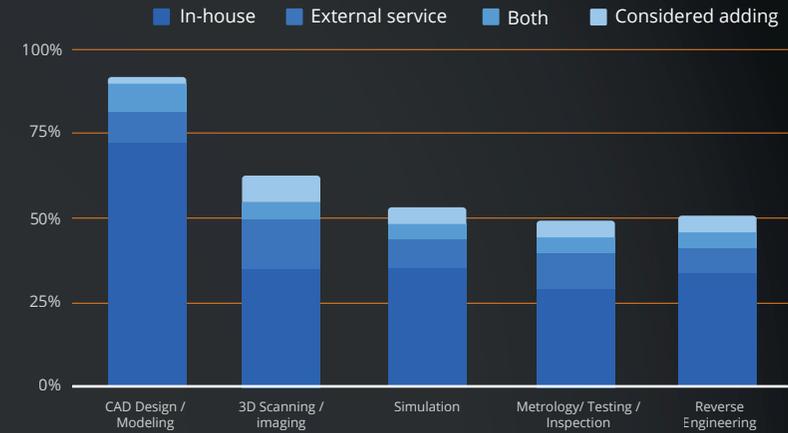
**3D printing is commonly used alongside many traditional manufacturing methods such as laser cutting, CNC machining, and injection molding.**

Q: What other manufacturing methods do you use alongside 3D printing?



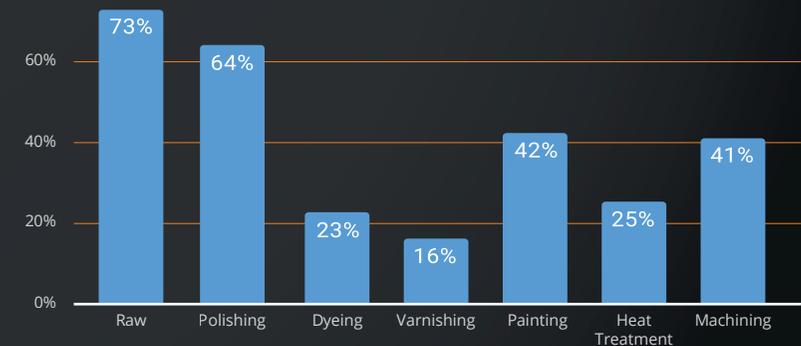
**Companies prefer to develop internal resources for design, engineering, and testing processes.**

Q: Which 3D printing processes do you use?



**Polishing, painting, and machining are the most common post-processing for 3D printed parts.**

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



# What is the View of 3D Printing?

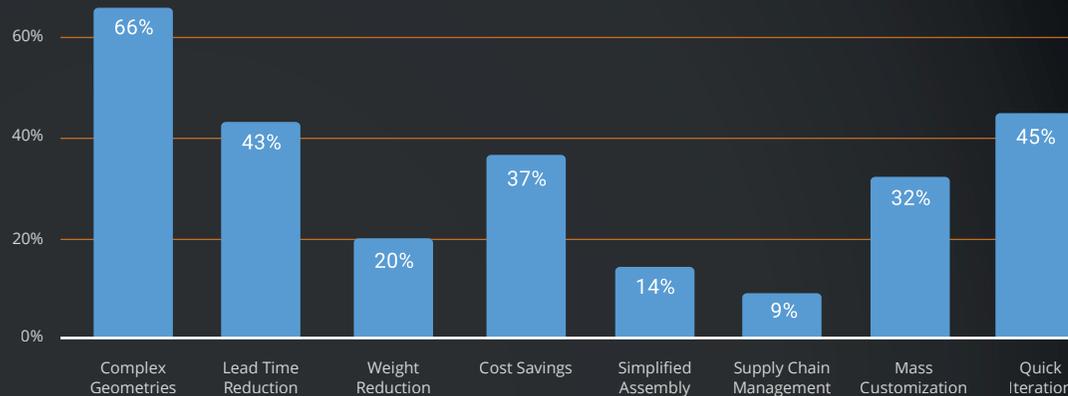
What do respondents think about 3D printing technologies? In this section, we take a look at the main 3D printing benefits for users and their businesses. How are they improving their manufacturing processes?

66% are making the most of this technology to create parts with complex geometries. Iterations, lead time reduction, and cost savings are mentioned as the most important benefits of this technology for our respondents.

In this section, we also take a look into the future of the industry and the factors affecting its growth and adoption within businesses. Where does additive manufacturing need to improve to accelerate its adoption? That is what you are going to discover right now.

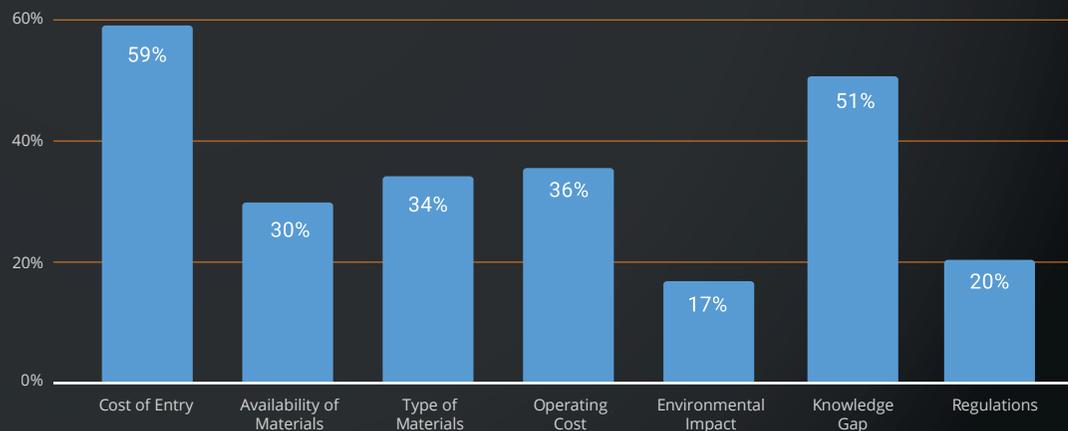
As technologies and materials become more democratized, more users are seeing the benefits of cost savings by using 3D printing. Many users also find time savings with quick iterations and overall lead time reduction.

Q: What are the top benefits of 3D printing?



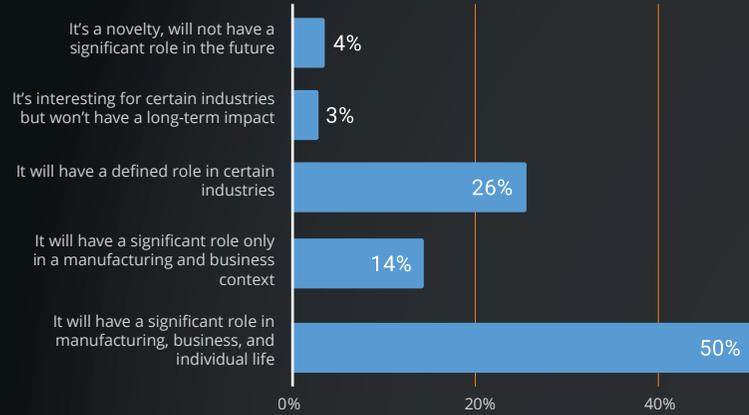
Cost of entry and the knowledge gap are viewed as limiting factors for the adoption of 3D printing.

Q: What factors will limit the adoption of 3D printing?



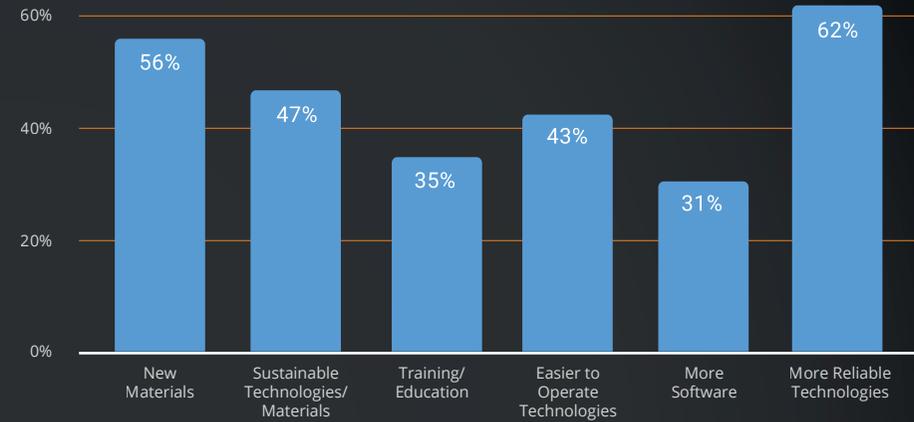
**The role of 3D printing in a business/manufacturing context continues to solidify.**

Q: How do you view the potential of 3D printing?



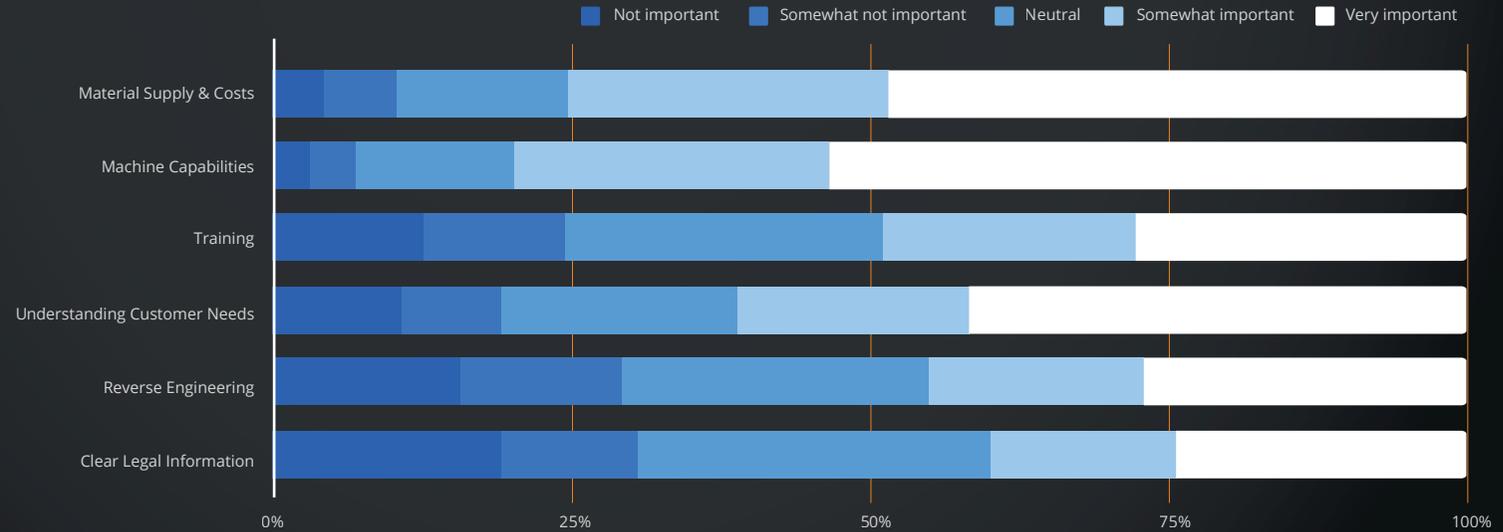
**New materials and reliable technologies are demanded by more than 55% of the industry.**

Q: What does the 3D printing industry need to grow?



**Machine capabilities and consistency of 3D printed parts are of the highest importance for more than 80% of users.**

Q: How important are the following factors for your 3D printing activity over the next year?



# 3D Printing Business Strategy

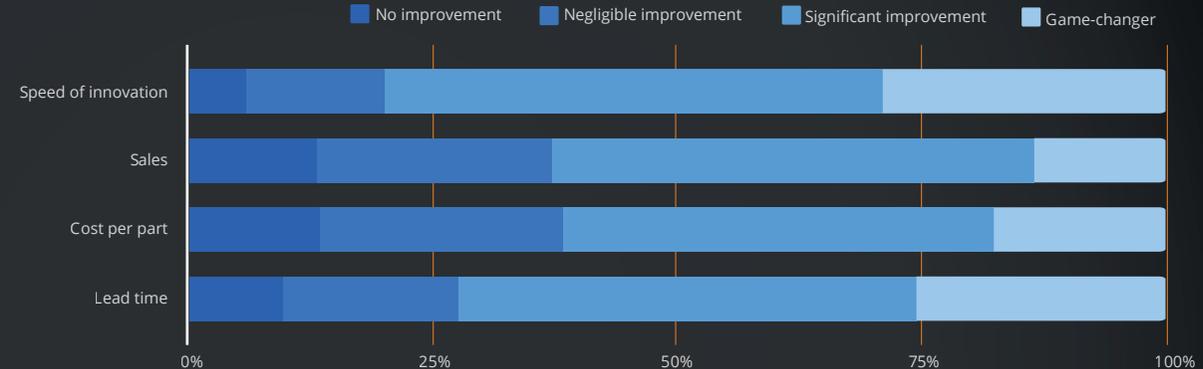
Additive manufacturing is a huge competitive advantage. Thanks to some great 3D printing benefits such as lead time reduction and speed of innovation, a large majority of respondents are seeing 3D printing as a real game-changer for their business.

When it comes to money, you will see that investment for 3D printing uses is really increasing. A majority of these users are increasing their investment in 2020! You will notice that a large majority of the respondents are using 3D printing for several years, and are still planning to invest more in this technology in the upcoming years. The business world is confident about its use of additive manufacturing.

Let's see how 3D printing is becoming a real asset for companies by changing and improving their business strategy!

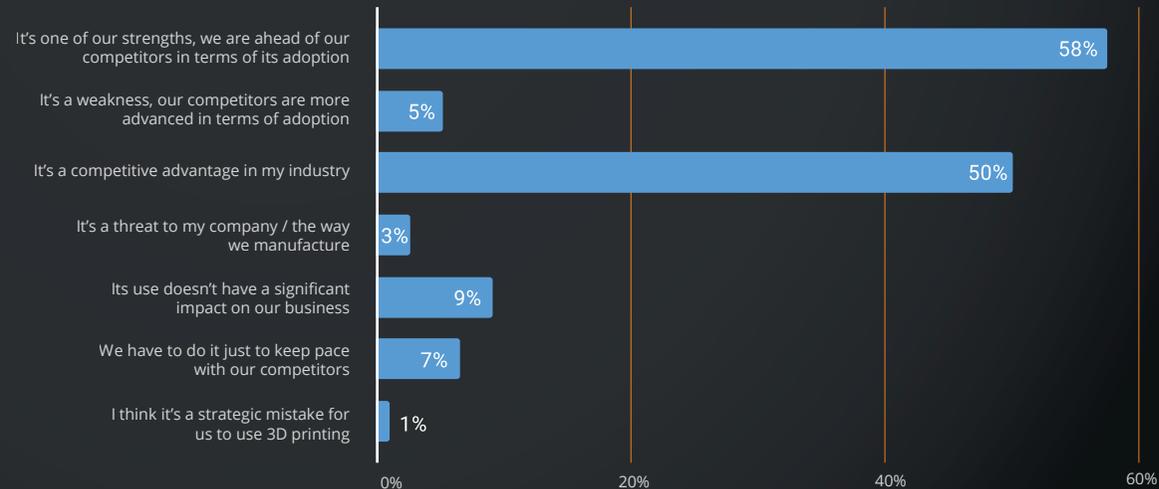
63% see a significant or game-changing impact on their sales. The reduction of lead time and speed of innovation are the most important measures of success for 3D printing activities.

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



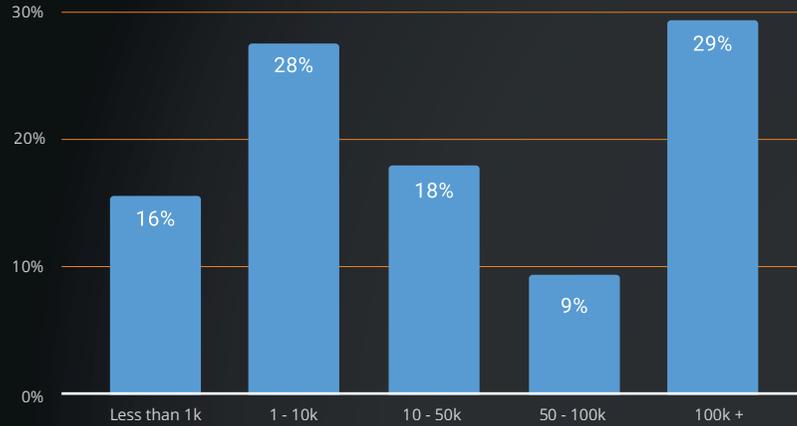
Nearly 60% see 3D printing as one of their strengths relative to their competitors.

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



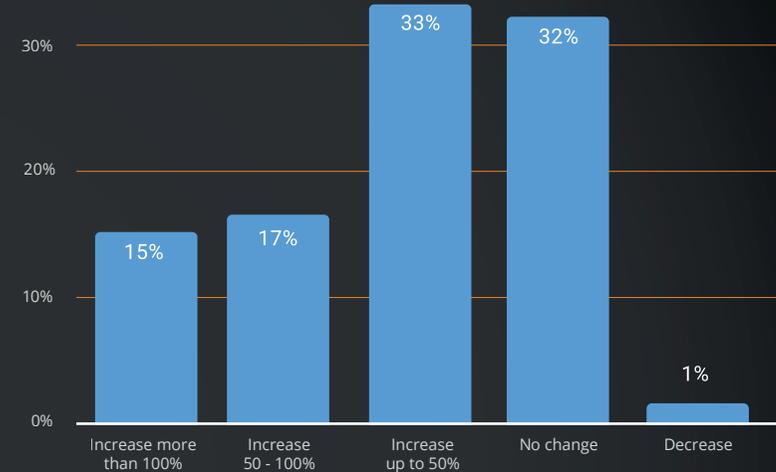
**Nearly 30% of users invested more than 100k in 3D printing last year.**

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



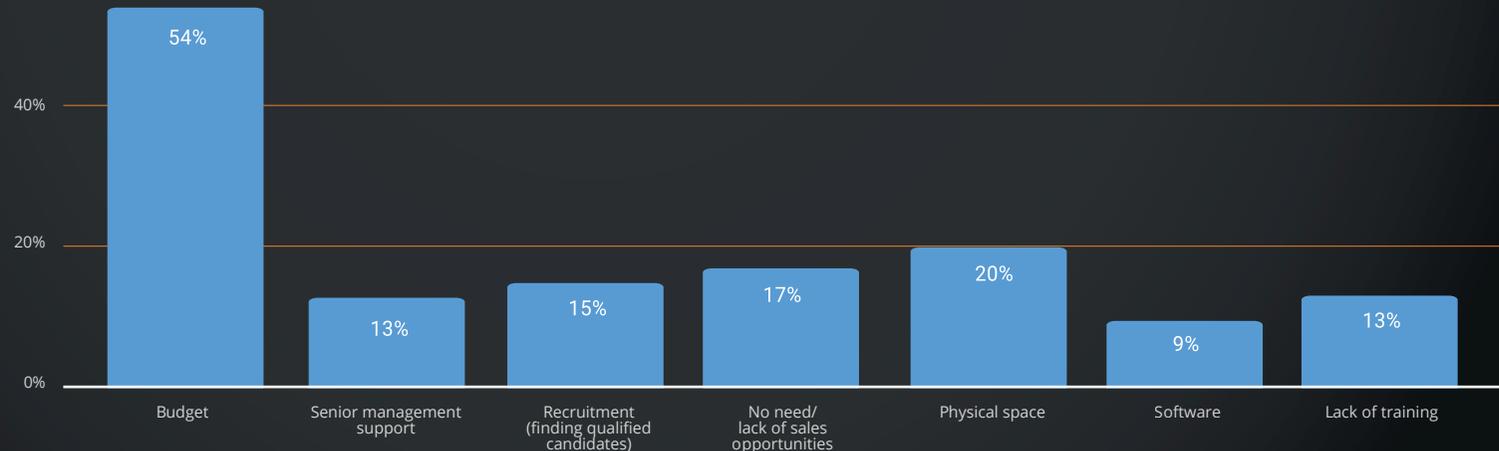
**65% of businesses plan to increase their investment in 3D printing in 2020.**

Q: How do you expect your investment in 3D printing to evolve in 2020?



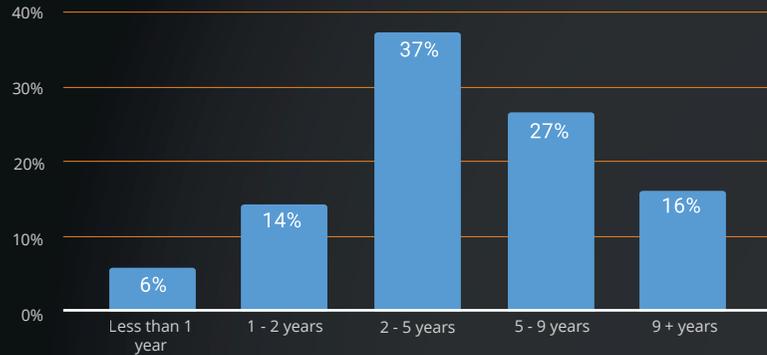
**Budget remains the biggest barrier to expanding the use of 3D printing.**

Q: What are the barriers to expanding the use of 3D printing in your company?



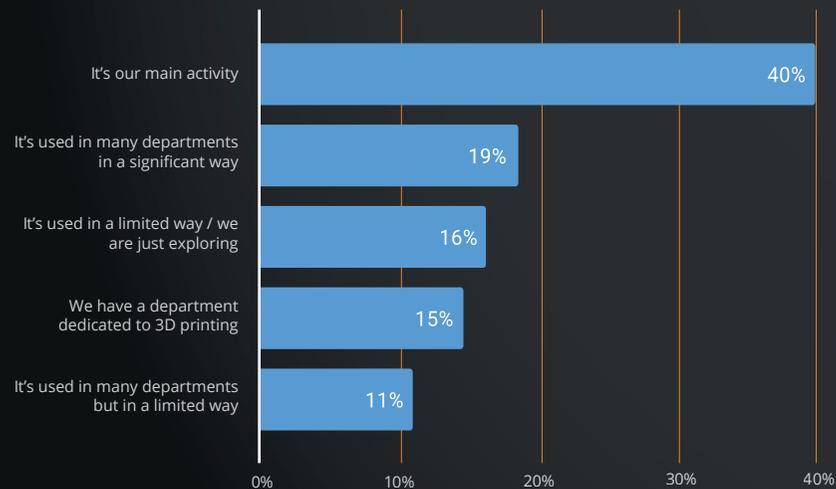
**Experience with 3D printing grows within companies, with more than 80% having used 3D printing at their company for more than 2 years.**

Q: How long have you used 3D printing at your company?



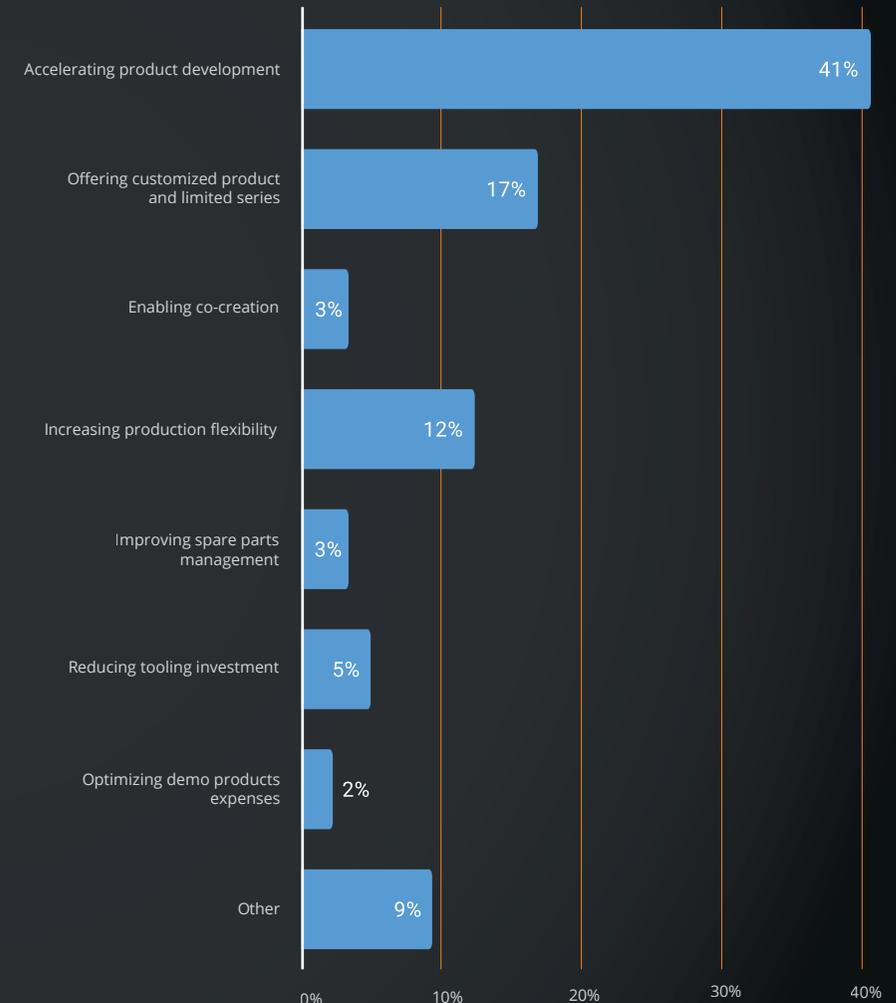
**The integration of 3D printing into manufacturing processes continues to grow, 74% are using 3D printing in a significant way at their companies.**

Q: What is the extent of the use of 3D printing in your company?



**As competition increases, accelerating product development becomes an even more important focus for 41% of companies using 3D printing (up 5% from last year).**

Q: What is your top focus related to 3D printing in 2020?



# Power Users

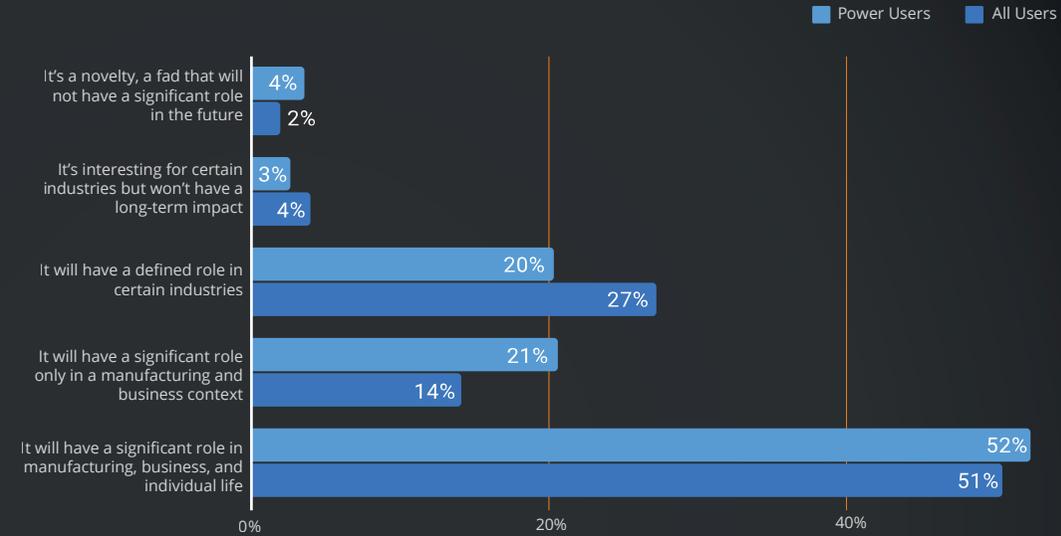
Who are the Power Users? They are a special segment of 3D printing users who have more experience with the technology. We classify users who have been using additive manufacturing in the context of business for more than two years and, they have invested at least \$10k in 3D printing last year as Power Users. How are they using this technology and what are its advantages for their businesses?

The priority for Power Users is being at the forefront of innovation and benefiting from better lead times. For these aspects, these users are seeing additive manufacturing as a game-changer! 70% of these Power Users consider this technology as a strength and a chance to be ahead of their competitors.

How are Power Users investing in 3D printing? How are they using this manufacturing technology in 2020? Let's find out!

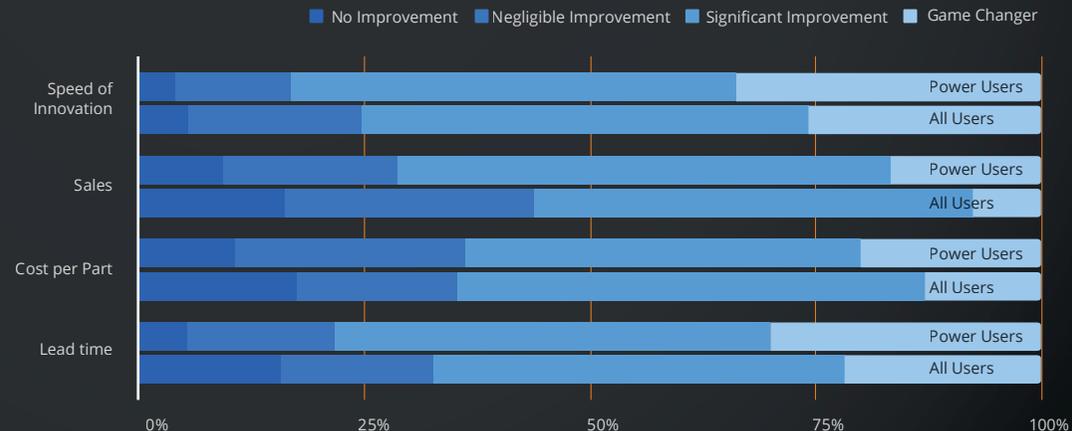
## Power users see the potential of 3D printing for business/manufacturing.

Q: How do you view the potential of 3D printing?



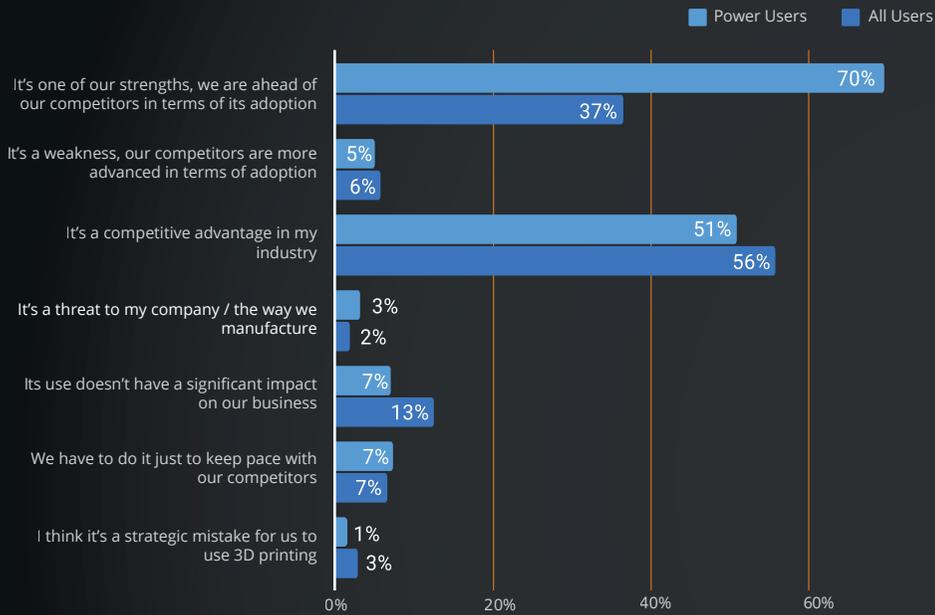
## Power users see 3D printing as having an even greater impact on their business with respect to speed of innovation and sales.

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



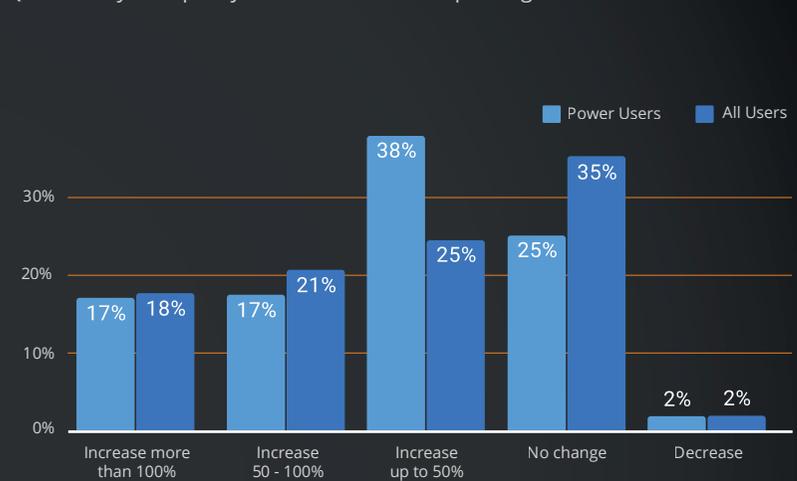
**70% of power users believe 3D printing is one of their strengths and a competitive advantage.**

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



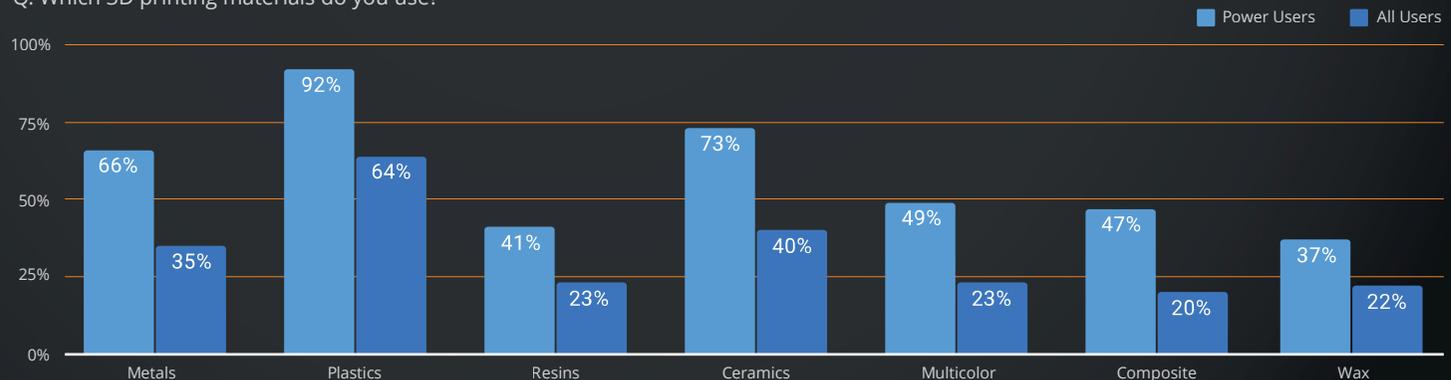
**Power users are more conservative in their budget for 3D printing for the coming year, with nearly 40% expecting an increase of up to 50%.**

Q: How do you expect your investment in 3D printing to evolve in 2020?



**Power users continue to lead the way with the use of metals and ceramics, being more enterprising than all users with other, developing technologies.**

Q: Which 3D printing materials do you use?



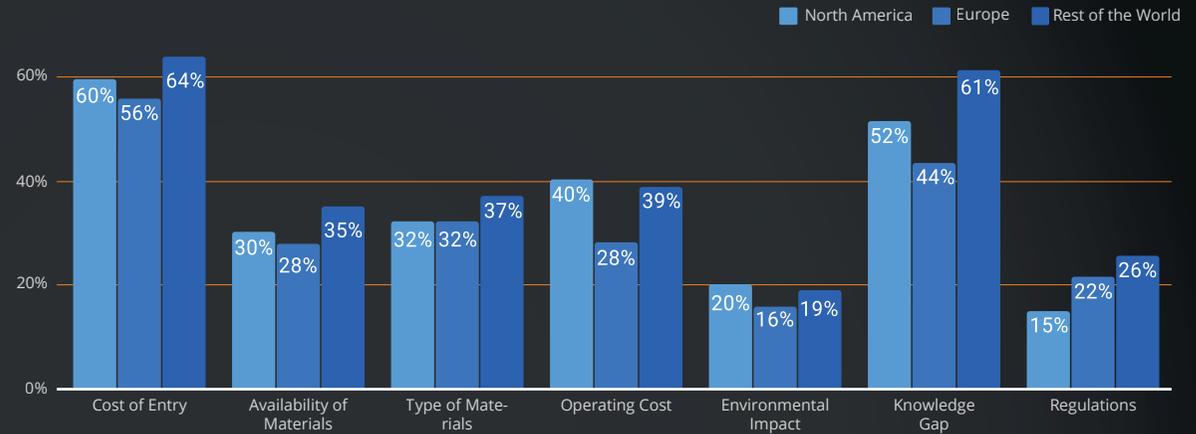
# North America vs. Europe vs. Rest of the World

With this new edition of the State of 3D Printing, we have insights about the uses of 3D printing in 71 different countries. As the use of 3D printing continues to grow all over the world, we think it's now interesting to take a closer look at how it is used between North America, Europe and the rest of the world.

Do people have the same expectations or barriers, and how are they investing when it comes to additive manufacturing? This is what you are about to discover.

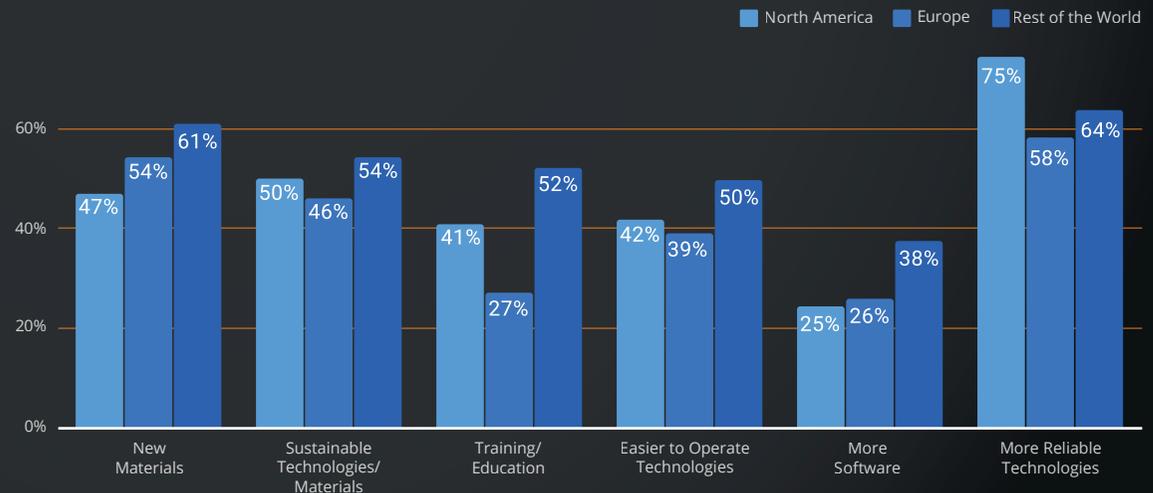
**The knowledge gap and cost of entry are commonly viewed as limiting the potential for adoption of 3D printing.**

Q: What factors will limit the adoption of 3D printing?



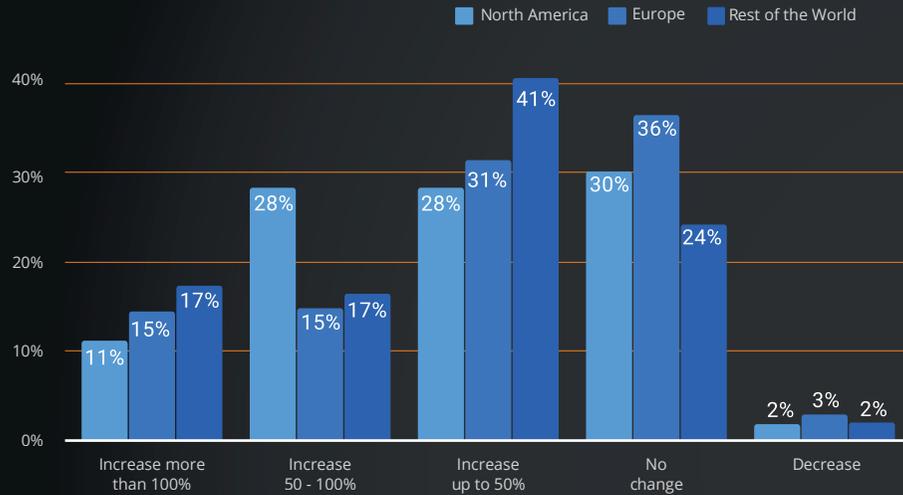
**Reliability and new materials are universally seen as key elements to grow 3D printing; while sustainability remains a top concern.**

Q: What does the 3D printing industry need to grow?



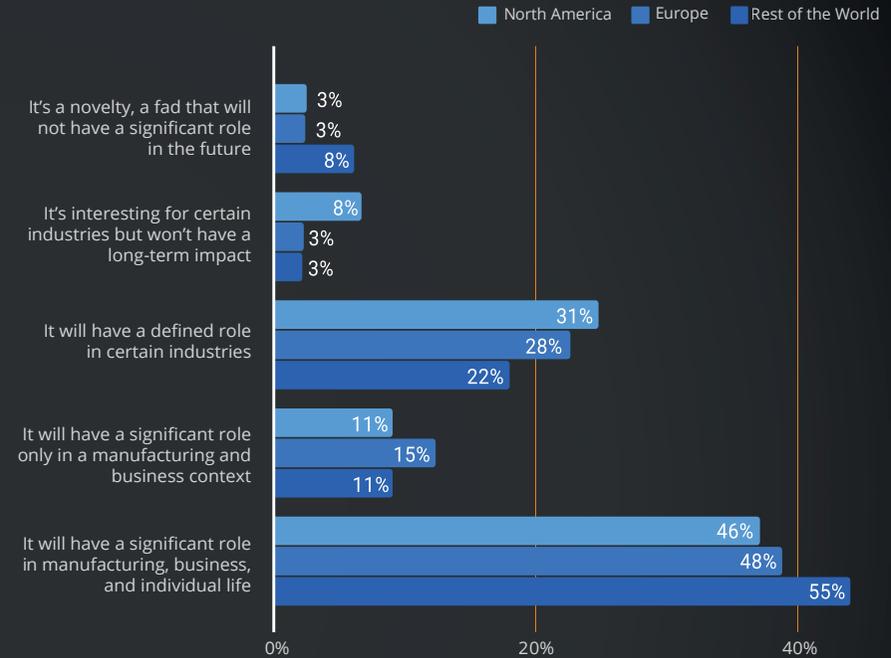
The Rest of the World is *all in* for 3D printing activities with more than 70% reporting they expect to increase investment in 2020.

Q: How do you expect your investment in 3D printing to evolve in 2020?



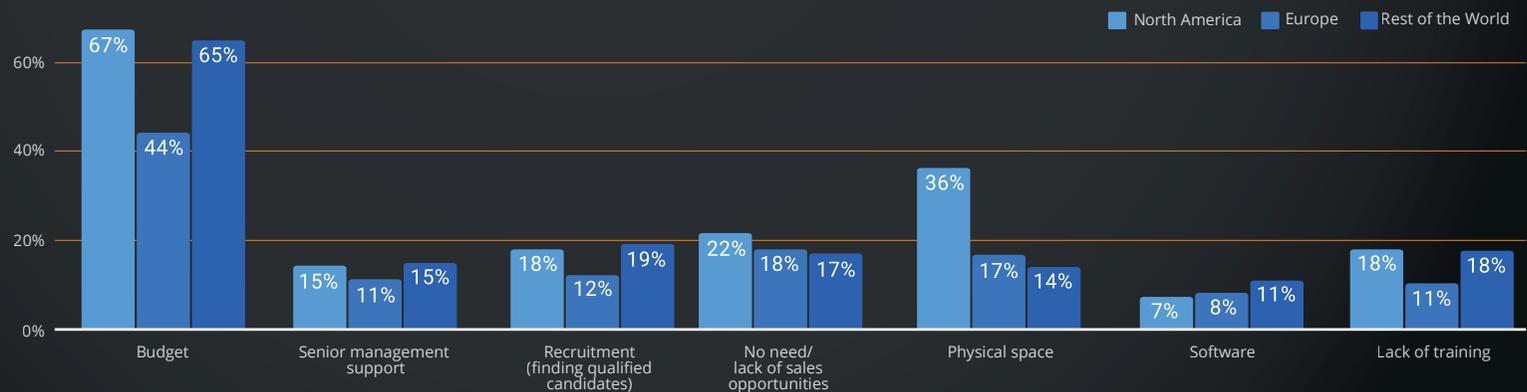
More than 60% of Europe and the Rest of the World are optimistic about the potential of 3D printing in manufacturing and personal life.

Q: How do you view the potential of 3D printing?



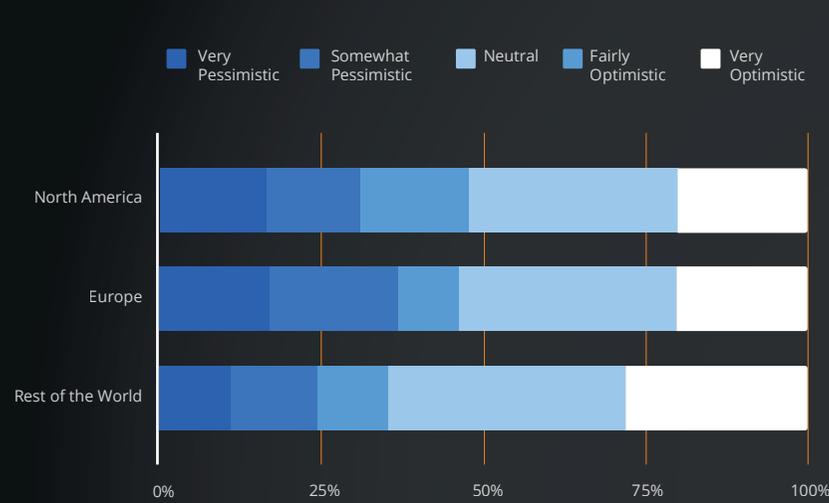
Budget is the top barrier to expanding 3D printing activities for all respondents, but even more so for North America and the Rest of the World.

Q: What are the barriers to expanding the use of 3D printing in your company?



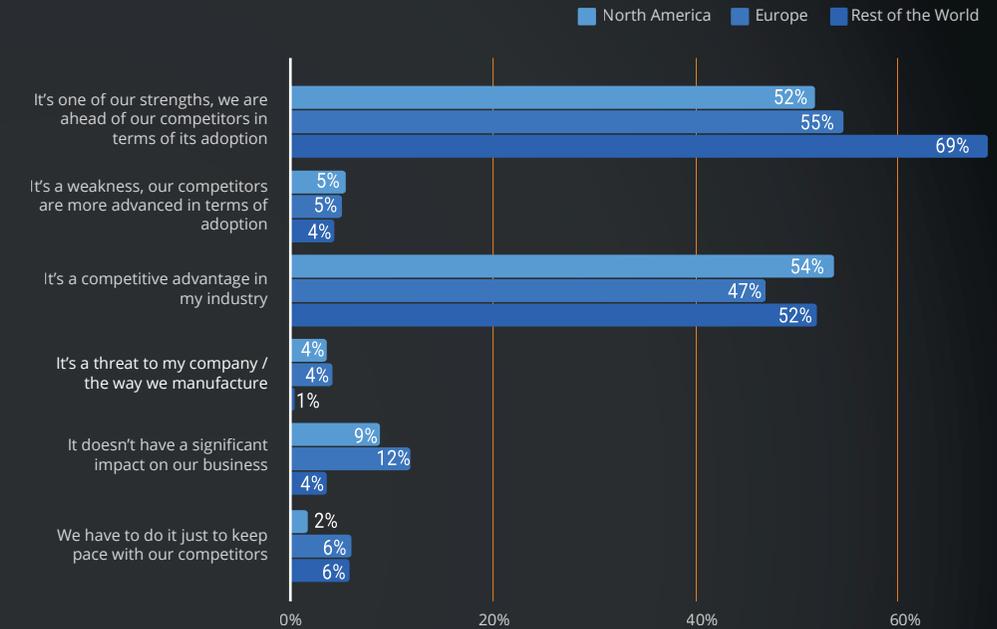
**The Rest of the World is the most optimistic about hiring potential for 3D printing activities.**

Q: Generally, what is your outlook on hiring for your 3D printing activity?



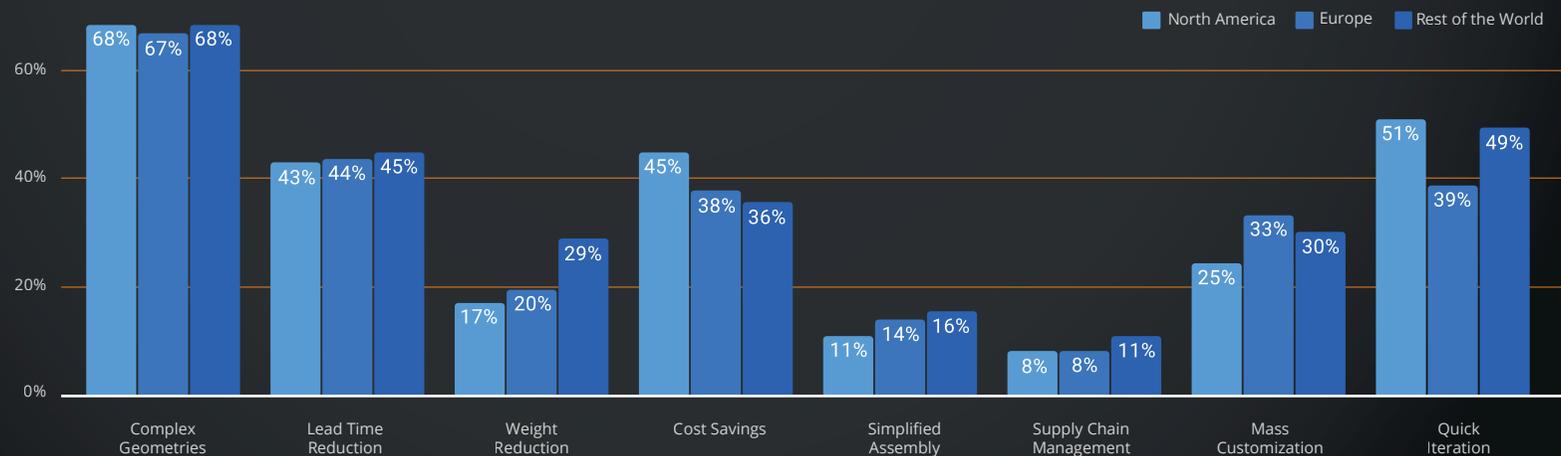
**Nearly 70% of the Rest of the World respondents report that 3D printing is one of their strengths relative to their competitors.**

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



**Complex geometries, quick iteration and lead-time reduction are universally seen as the biggest benefits of 3D printing. North American users also cite cost savings as a major benefit.**

Q: What are the top benefits of 3D printing?



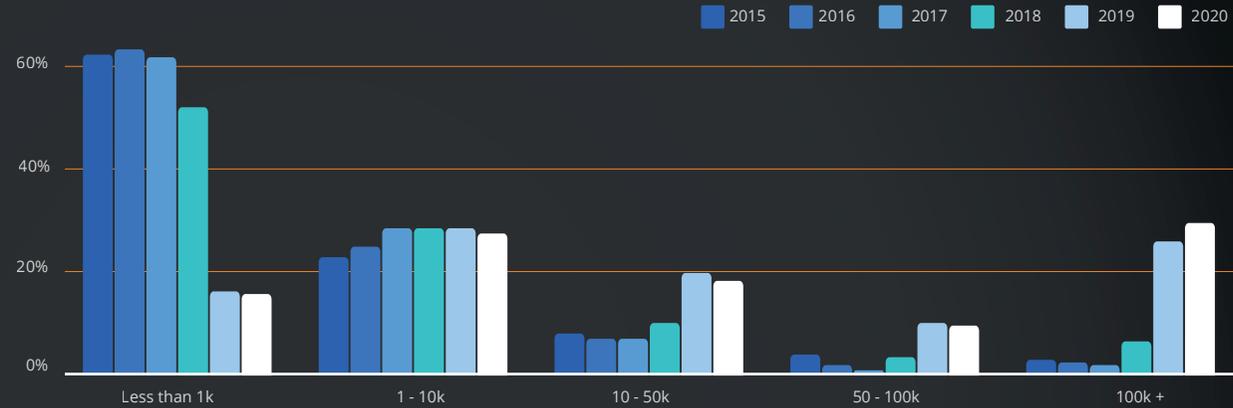
# Six Years of The State of 3D Printing

The State of 3D Printing provides a snapshot of the 3D printing industry each year since 2015. How did the use of 3D printing evolve during the last six years? Let's take a look at the responses from the last reports we made.

As you may know, additive manufacturing is evolving quickly, respondents are using new applications and discovering new 3D printing advantages. Needs and expectations are also evolving over the years. How is materials use changing and growing, how are the trends evolving? Let's see what exactly the key findings are for the last six years, according to our respondents.

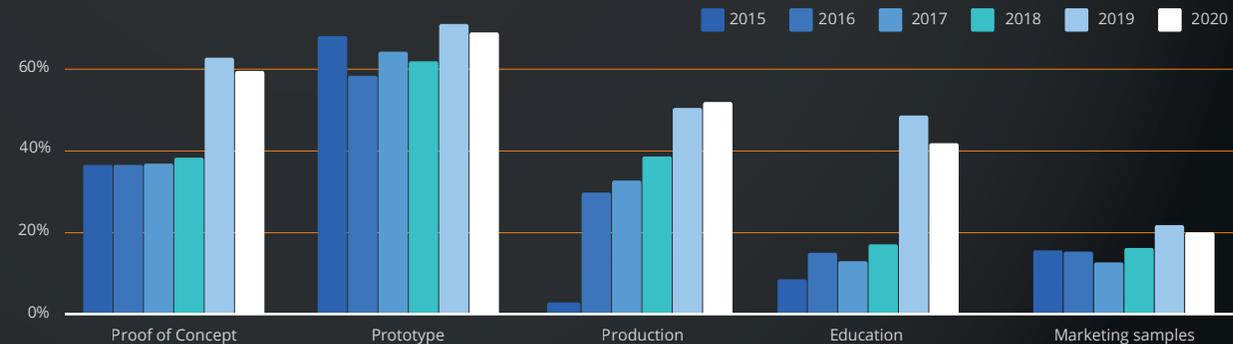
**More and more companies are making big investments of more than 100k in 3D printing.**

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



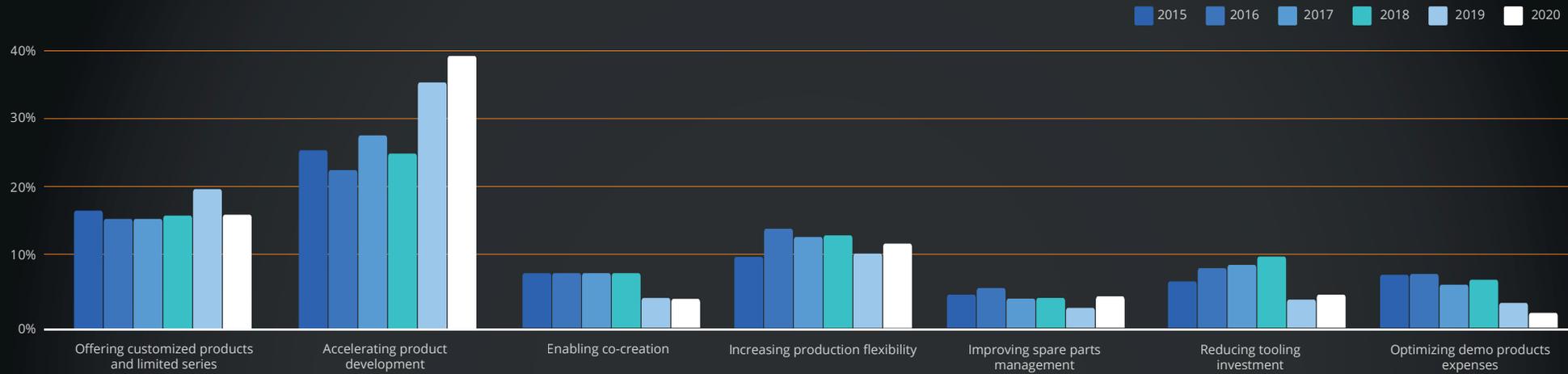
**Scaled production with 3D printing continues to grow, becoming as common as prototyping and proof of concept applications.**

Q: What is the purpose of your 3D prints?



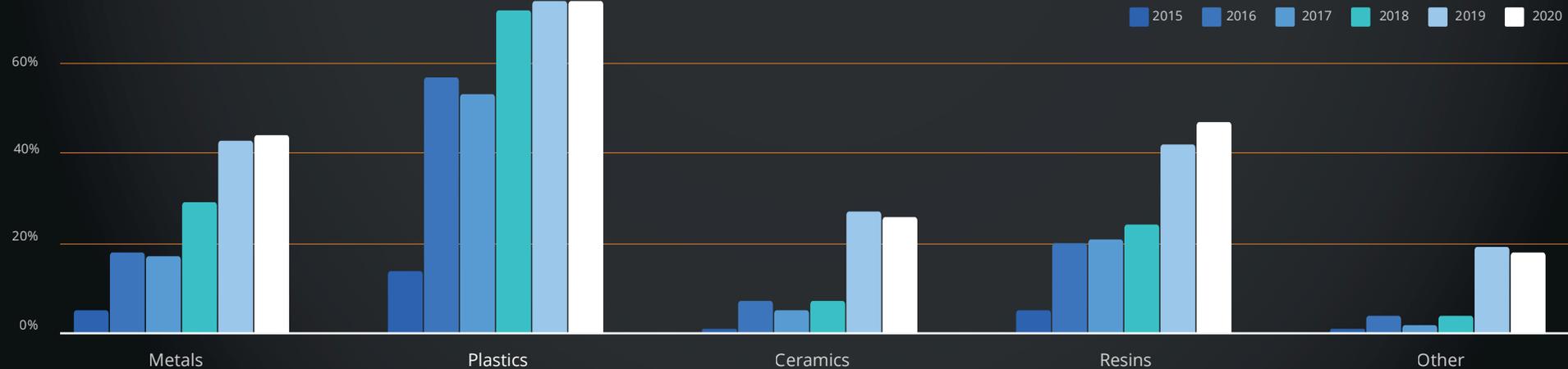
**Accelerating product development and offering customized products and limited series remain the top focuses for businesses using 3D printing.**

Q: What is your top focus related to 3D printing?



**Resin materials continue to increase in market share with strong growth over the last two years.**

Q: Which 3D printing materials do you use?





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