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The State of 3D Printing

2019 EDITION

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

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Welcome

Clément Moreau (CEO & Co-Founder)

Welcome to our 5th edition of the State of 3D printing! This annual report will give you all the information you need to know about the current state of the 3D printing industry. This year, we are happy to announce that more than **1300 individuals answered this survey**, which makes it our biggest survey in five years! It has been answered by 3D printing users all around the world, people coming from different horizons, countries, and sectors, which allows us to have a great **overview of the industry and its evolution on a global scale.**

The State of 3D Printing is the largest study you will find about 3D printing. It is interesting for anyone involved in the additive manufacturing industry and its evolution through the years, but also for 3D printing professionals, such as material and 3D printer manufacturers, to understand the needs of companies using this 3D technology. If you are about to start using 3D printing in your company, this resource will offer you relevant data to help you **build your 3D printing business strategy**.

This 5th edition is also the perfect occasion for a little throwback! The use of this cutting-edge technology is continuously evolving, companies were not using it the same way five years ago, and today.

You are about to see that the **future of additive manufacturing is quite promising, with 51% of respondents using it for production applications** we can see that 3D printing is not just a prototyping technology anymore! Its use is still growing and businesses keep making the most of this technology for more and more different applications. We know that **additive manufacturing can help you bring your business to the next level**. We wish you a pleasant reading of this 5th edition and hope that you will find all the information you need about the 3D printing industry!

- Clément Moreau

Key Findings

51%

Of respondents apply 3D Printing technologies for **production**

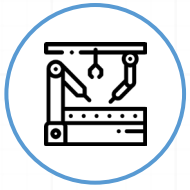
80%

Say 3D printing has had a **significant improvement** on their speed of innovation

63%

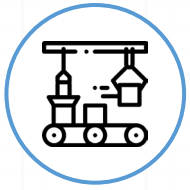
Believe 3D printing will have a significant role in a **manufacturing and business** context

Mass Production



Affordability

Printing Speed



Adaptability

Multi-material prints

Metal printing

Trends

What do users say are the most promising sectors, applications, materials, and 3D printing technologies?

Software

Education

Generative design

Bioprinting

Medical

Sustainability

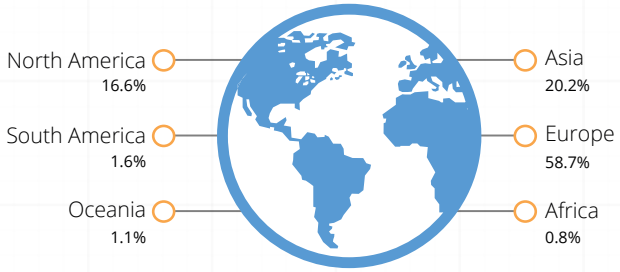
Who are 3D Printing Users?

This year, more than 1300 people answered this survey, making it the biggest edition of The State of 3D Printing yet.

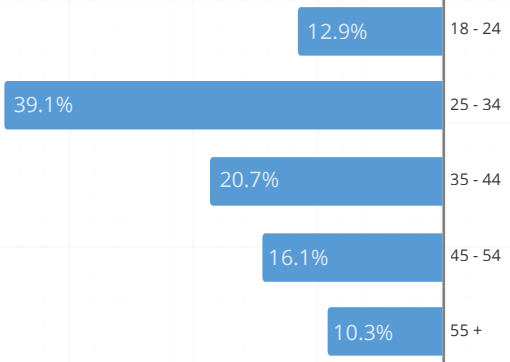
This is also the most diverse edition of The State of 3D Printing with the largest representation from Asia in the last 5 years. Another exciting development is the increase of women respondents, marking the highest representation of women in the industry with 13%! Moreover, this new edition shows that additive manufacturing is quite a young industry, with 53% of respondents under age 35.

Let's take a closer look at the people of 3D printing!

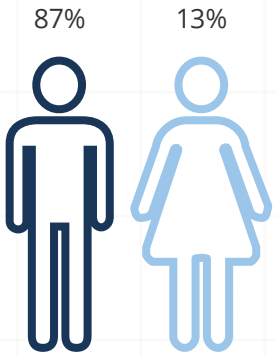
Geography



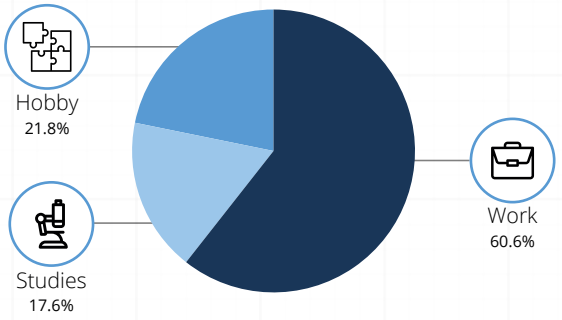
Age



Gender



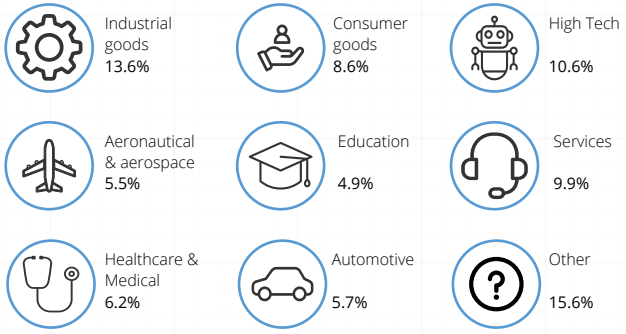
Primary Context for Using 3D Printing



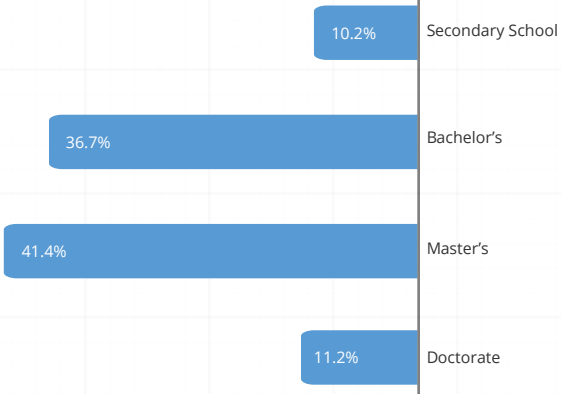
More than **70% of respondents use 3D printing at least a few times each month**. We can tell that respondents are heavy users, who are also highly educated when it comes to additive manufacturing.

Indeed, we can see in this study that more than **50% of the people who answered this survey have at least have a Master's degree**, with more than 64% from an engineering background.

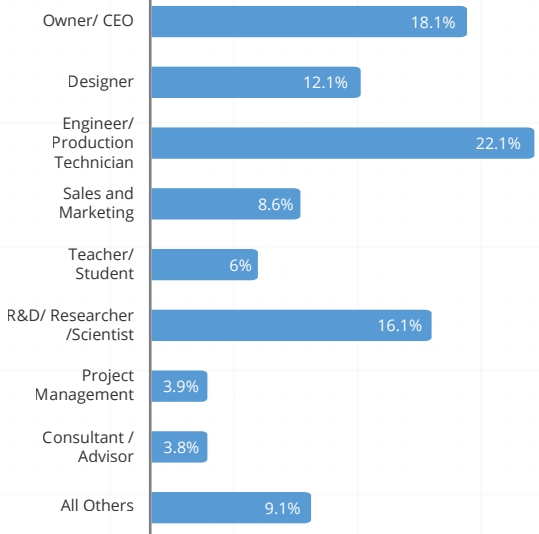
Industry

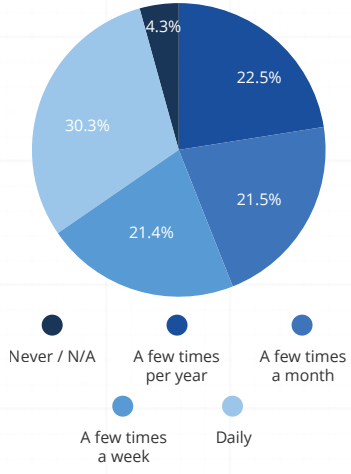


Educational Attainment



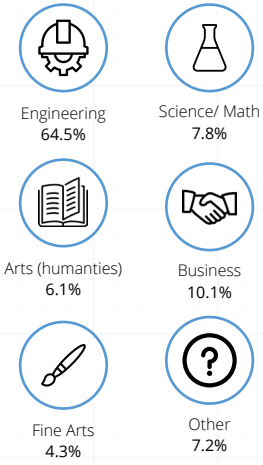
Role

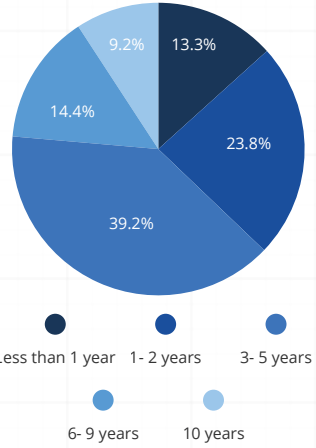




Frequency of Use of 3D Printing

Educational Background





Years of Experience in 3D Printing

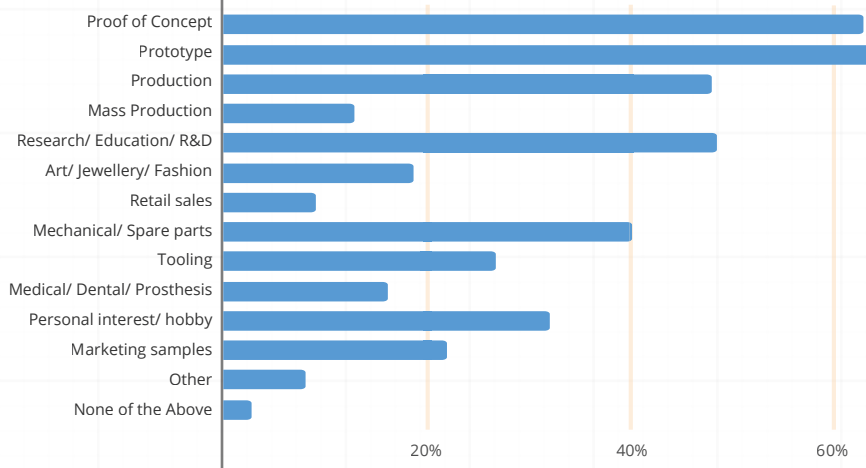
How is 3D Printing Used?

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. They really understand all of the benefits of 3D printing, and are starting to use it for more different purposes than before. 3D printing helps them to go through new challenges, from research to simulation, and from prototypes to production. See how individuals and companies use 3D printing, which technologies and materials they use, and the challenges they face.

Which 3D printing technologies are the most popular? Is the use of metal 3D printing still growing? Let's find out!

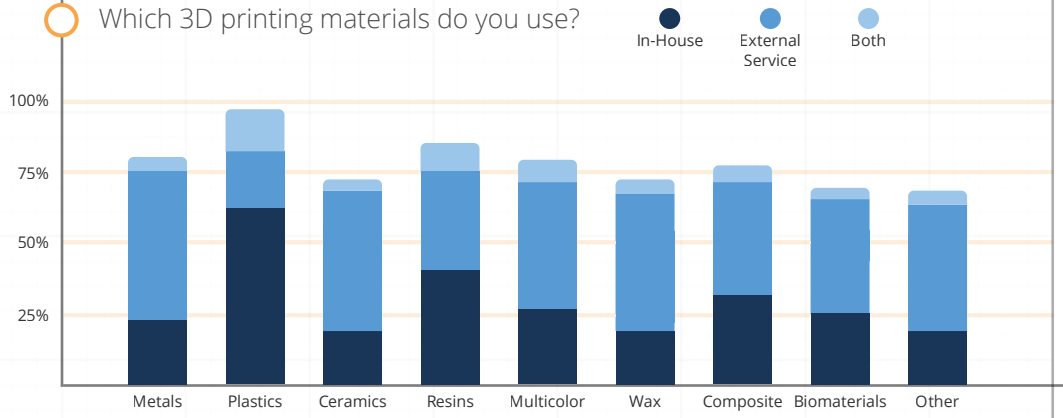
- Proof of concept and prototyping dominate 3D printing applications
- Increase of 3D printing for production up to 48% from 38% in 2018

What is the purpose of your 3D prints?



- 50% of metal 3D printing is fulfilled by external services

Which 3D printing materials do you use?

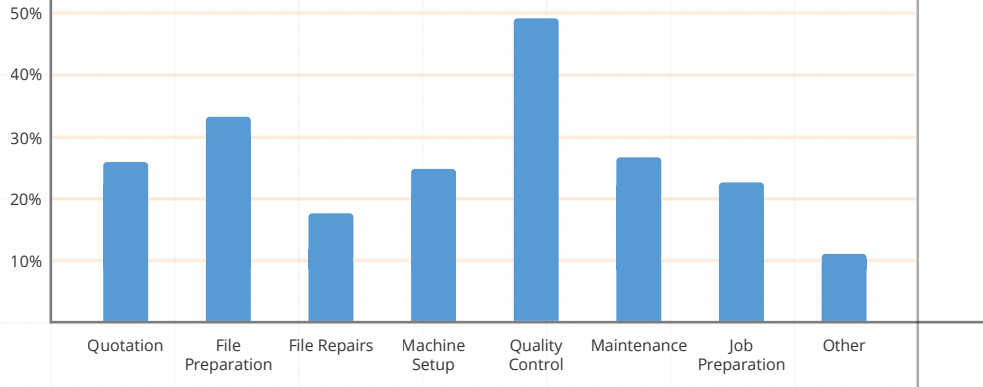


Nearly **50% say quality control** is the top challenge of using their 3D printer

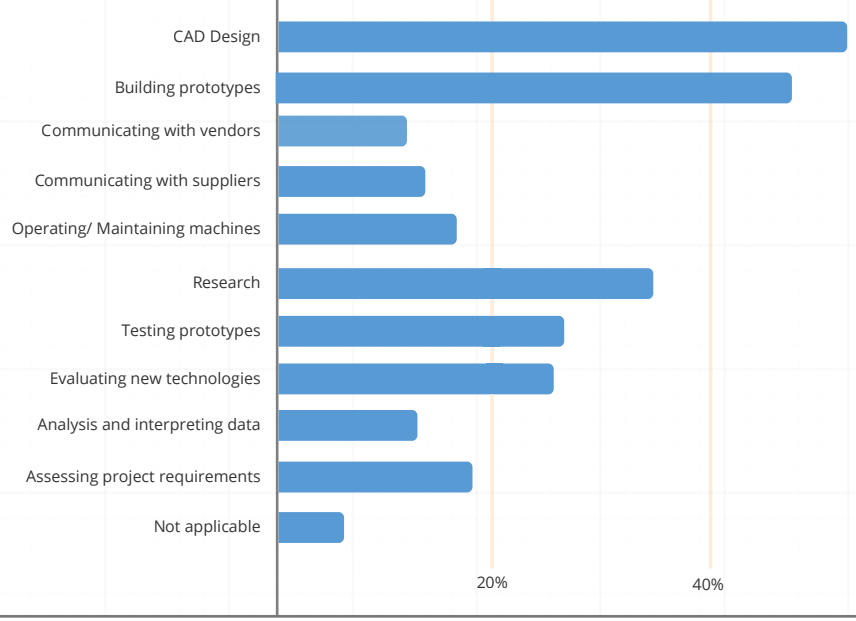
FDM dominates while **SLS, Jet Fusion, and Polyjet adoption grow through external services**

As 3D printing is used primarily in a prototyping context, CAD design, building and testing prototypes, and research are the top uses

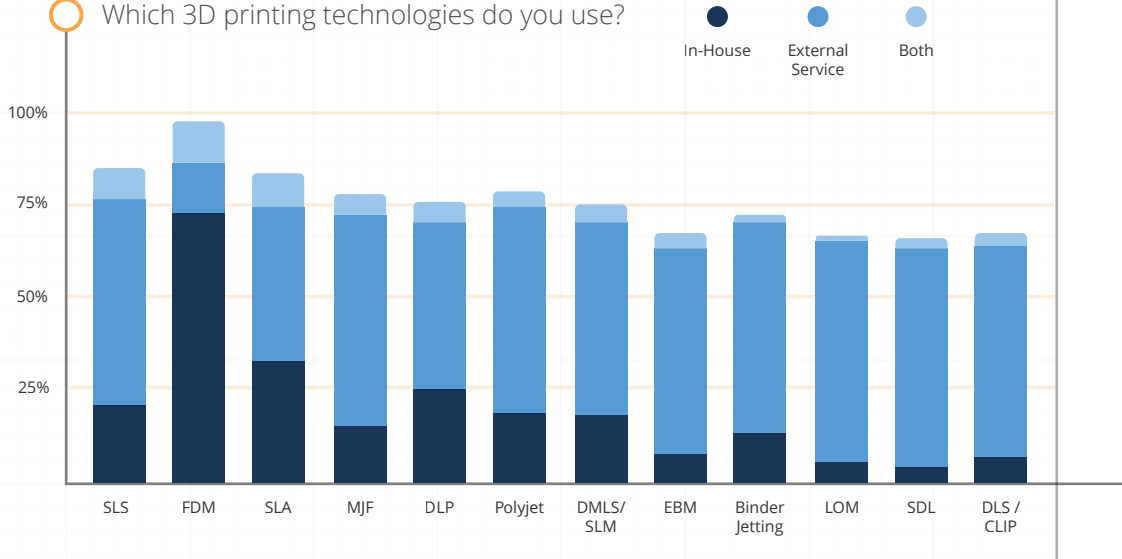
What are the top challenges for using 3D printers?



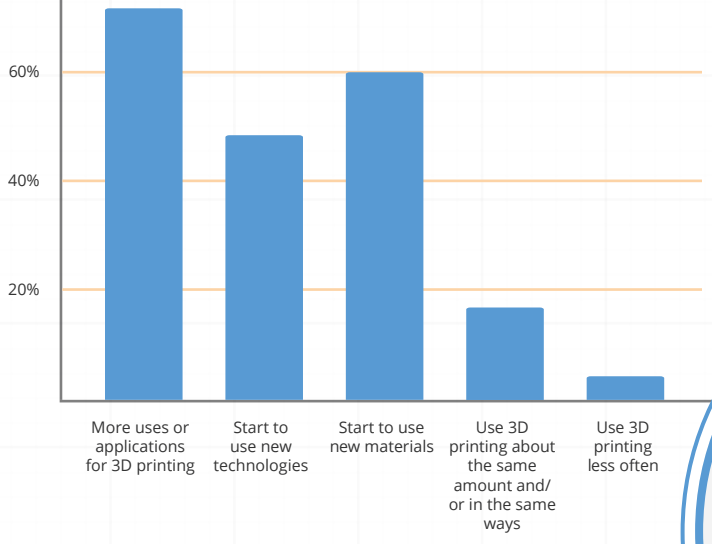
In which areas do you spend your time?



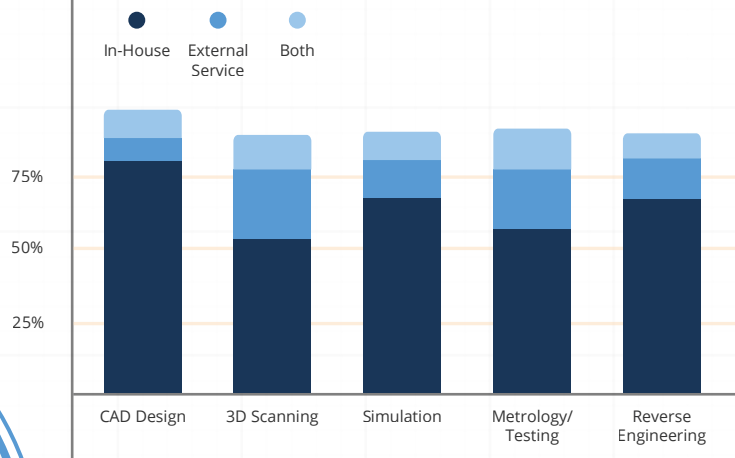
Which 3D printing technologies do you use?



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



Which 3D printing processes do you use?



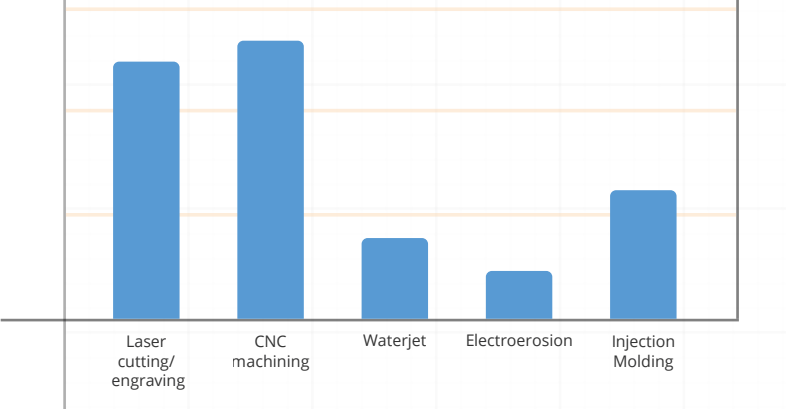
More than 70% will find new applications for 3D printing

More than 60% use CAD design, simulation, and reverse engineering internally

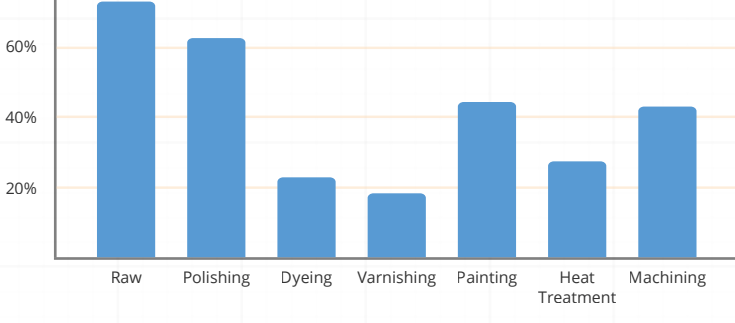
Laser cutting and CNC machining are the top manufacturing methods used alongside 3D printing

More than 70% leave parts unfinished

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



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



What is the View of 3D Printing?

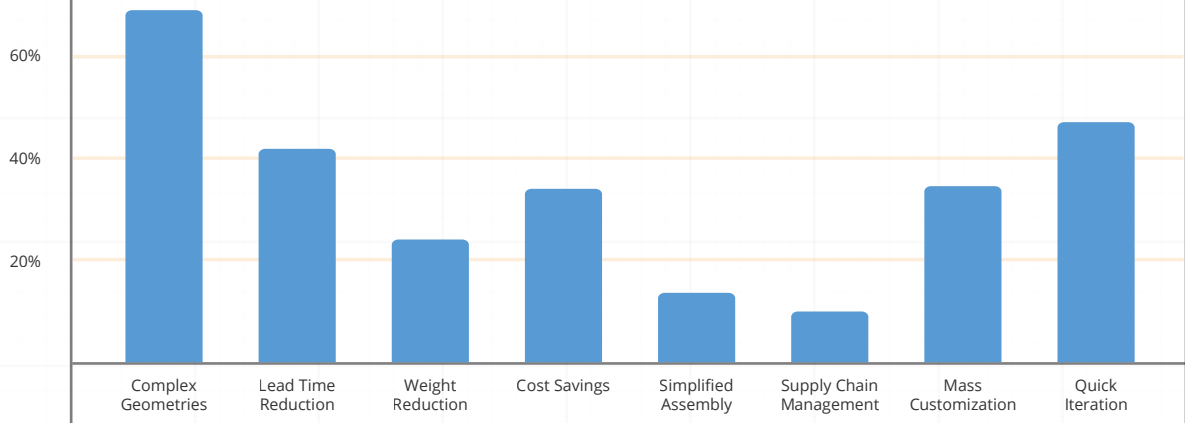
What do respondents think about 3D printing technologies? In this section we take a look at what 3D printing users believe are the main benefits of additive manufacturing for businesses and see how it is really improving both their manufacturing process and the quality of their products.

We also look into the future of the industry and the factors affecting it's growth and adoption for companies.

3D technology is promising and evolving quite rapidly, but our respondents also tell us about all the points that still need to be improved in additive manufacturing in order to accelerate adoption.

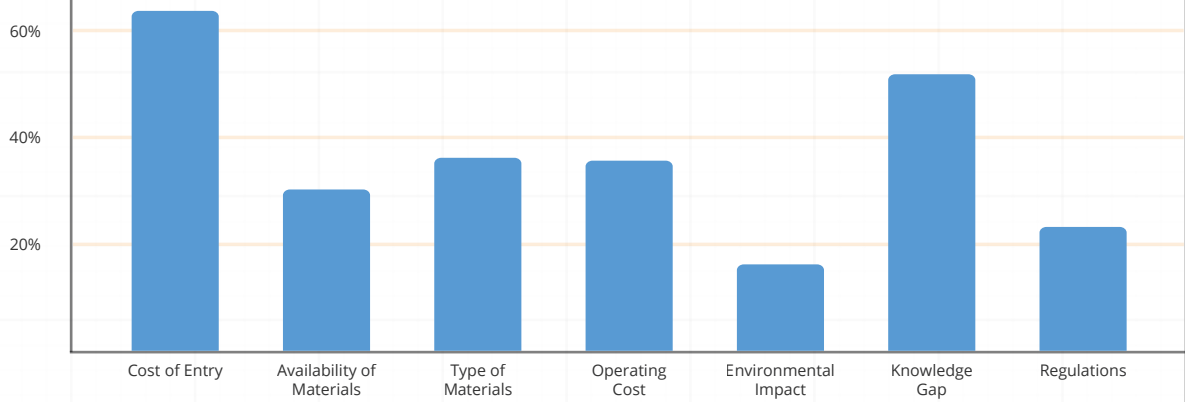
- Complex geometries such as lattice structures are a strong benefit as seen by nearly 70% of respondents
- More than 40% see quick iterations and lead time reduction as benefits

What are the benefits of 3D printing?



- Cost of entry is a blocker to adopting 3D printing according to 64% of respondents
- 52% believe the knowledge gap in 3D printing is limiting its growth

What factors will limit the adaptation of 3D printing?

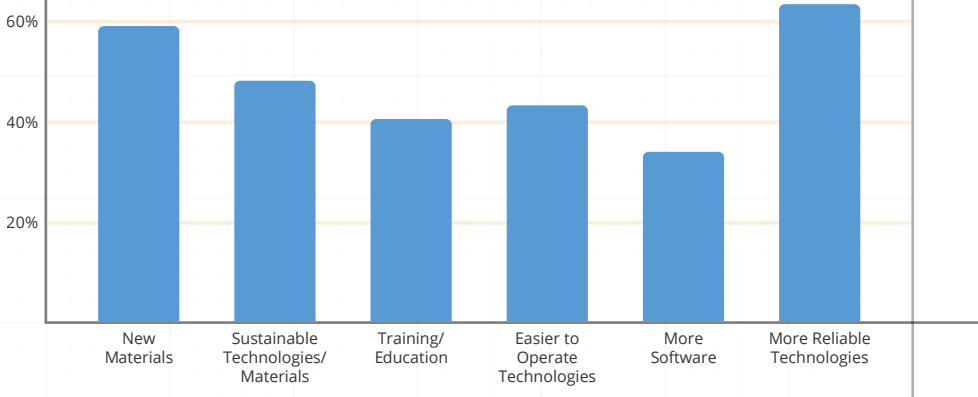


64% of respondents believe the 3D printing industry needs more reliable technologies to grow

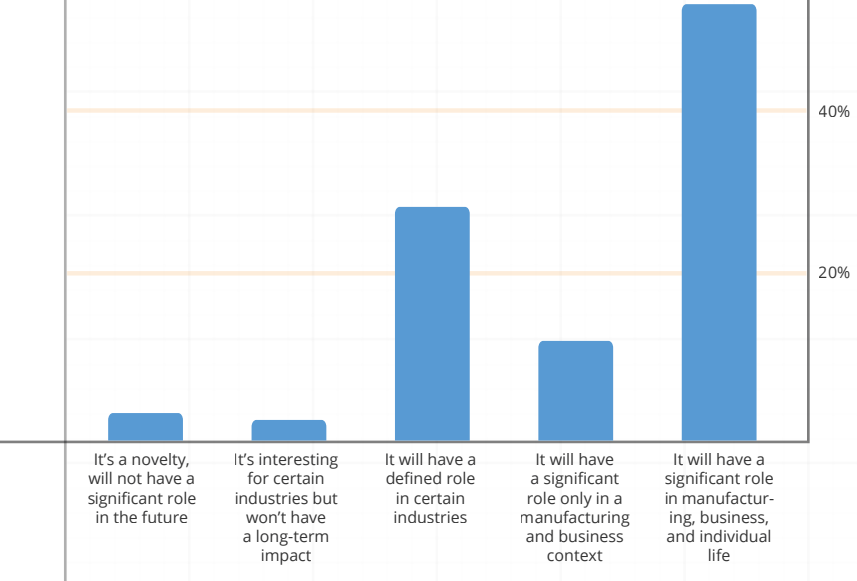
Understanding customer needs, training, and material and supply costs are important factors for 3D printing activity over the next year

53% believe 3D printing will have a significant role in business, manufacturing, and individual life

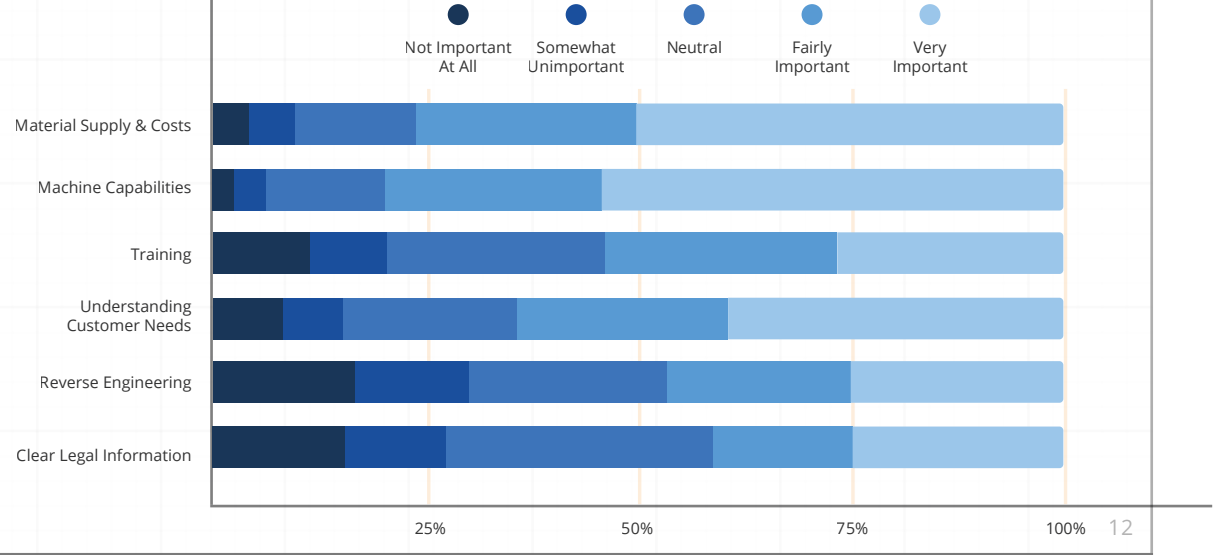
What does the 3D printing industry need to grow?



How do you view the potential of 3D printing?



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



3D Printing Business Strategy

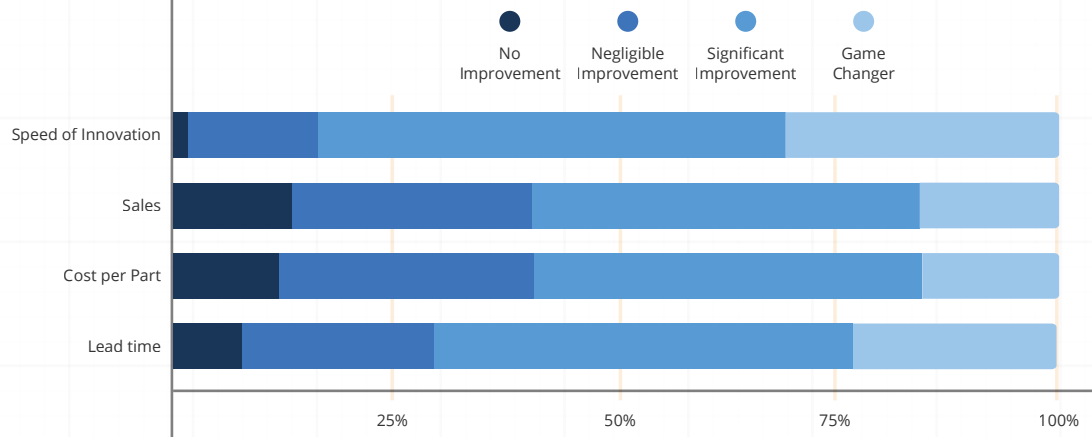
Additive manufacturing has a big role when it comes to business strategy and in most cases, it's a huge competitive advantage. Our respondents tell us more about how they measure the success and impact of their 3D printing activities for their business. The majority, report significant improvements and we clearly notice a growing interest in additive manufacturing for a variety of applications.

When it comes to money, you will see that investment for 3D printing uses are really increasing. We can see from previous years that companies are really becoming confident using this technology and are spending more money.

Indeed, you will see 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. As you will see, 3D Printing is currently helping them to develop and significantly improve their whole manufacturing process.

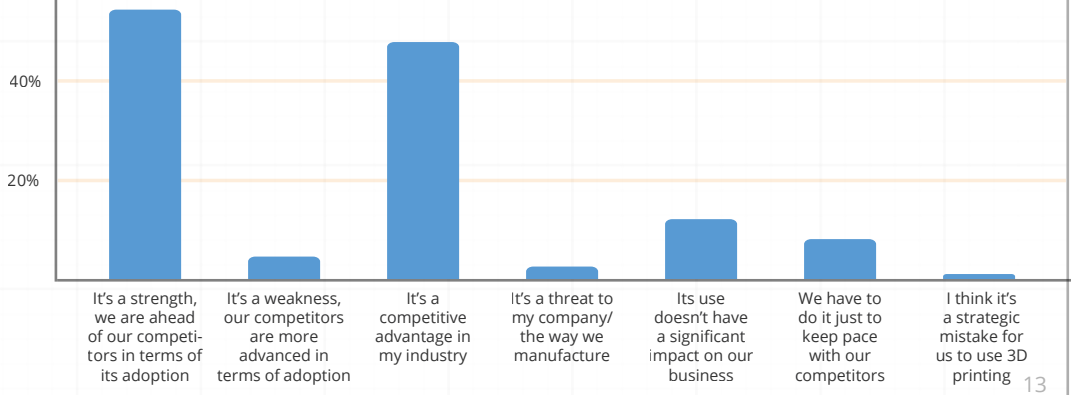
- 13% are unsure of how to measure the success of 3D printing activities
- More than 80% say 3D printing had at least a siginificant improvement on their results in speed of innovation
- 70% see significant or game-changing results in lead time

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



- Nearly 50% of businesses see 3D printing as a competitve advantage in their industry
- 55% say it's one of their strengths and that they are ahead of their competition in terms of adoption

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

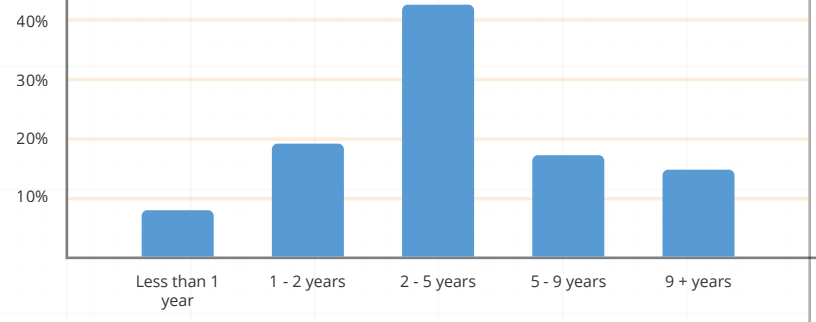


More than 73% of respondents have used 3D printing at their company for more than 2 years

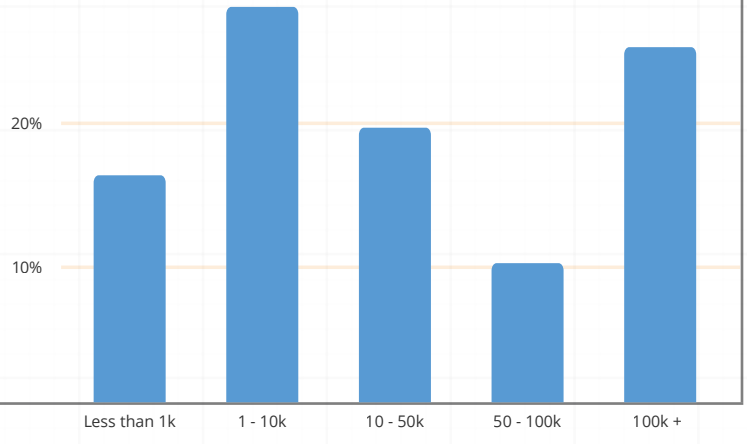
Nearly 40% use 3D printing as their main activity with an additional 36% using it in many departments in a significant way or have a department dedicated to 3D printing

25% invested more than $100k in their 3D printing activity last year

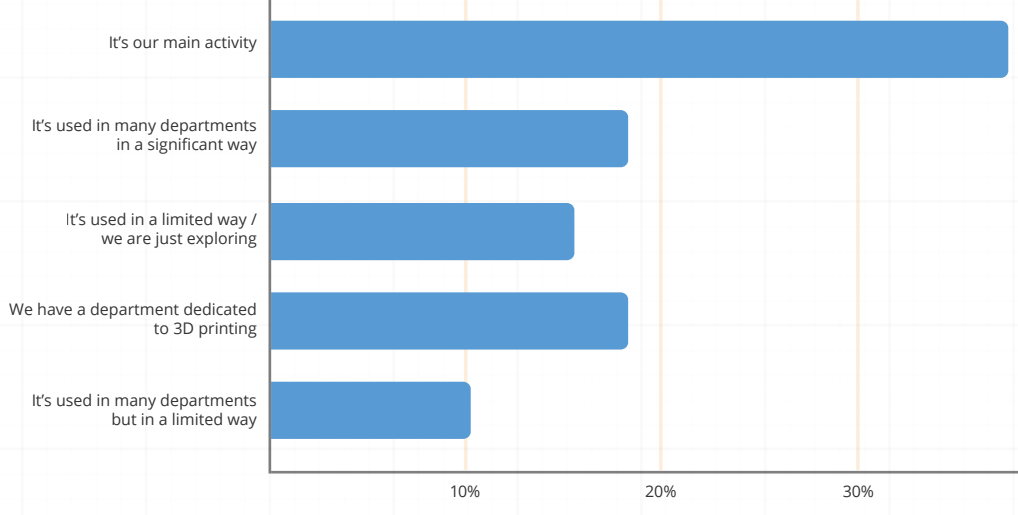
How long have you used 3D printing at your company?



How much did your company invest in 3D printing last year?



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

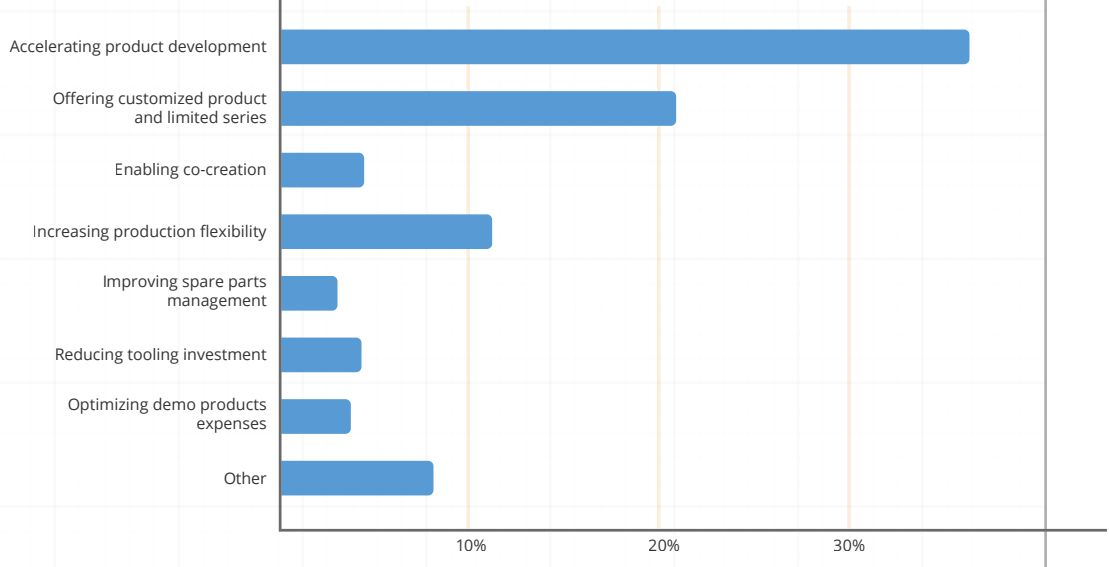


Accelerating product development, is the top focus of businesses re-garding the use of 3D printing

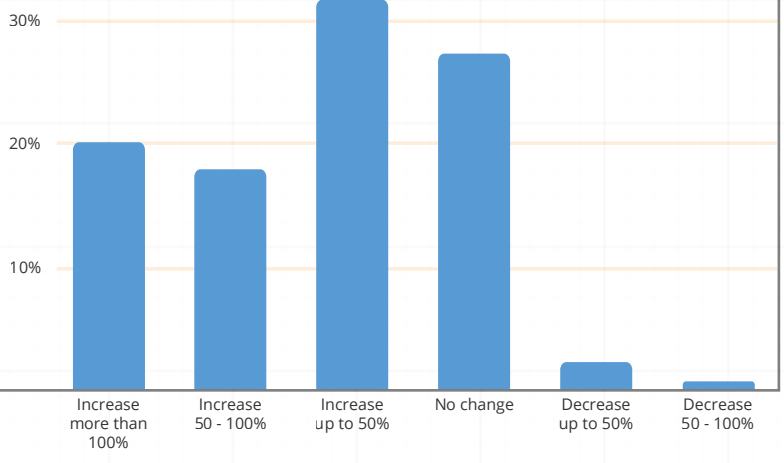
Nearly 60% say a lack of budget is a barrier to expanding the use of 3D printing

Nearly 70% of businesses plan to increase their investment in 3D printing in the next year with 20% saying they will increase their investment by more than 100%

What is your top focus related to 3D printing in 2019?



How do you expect your investment in 3D printing to evolve in 2019?



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

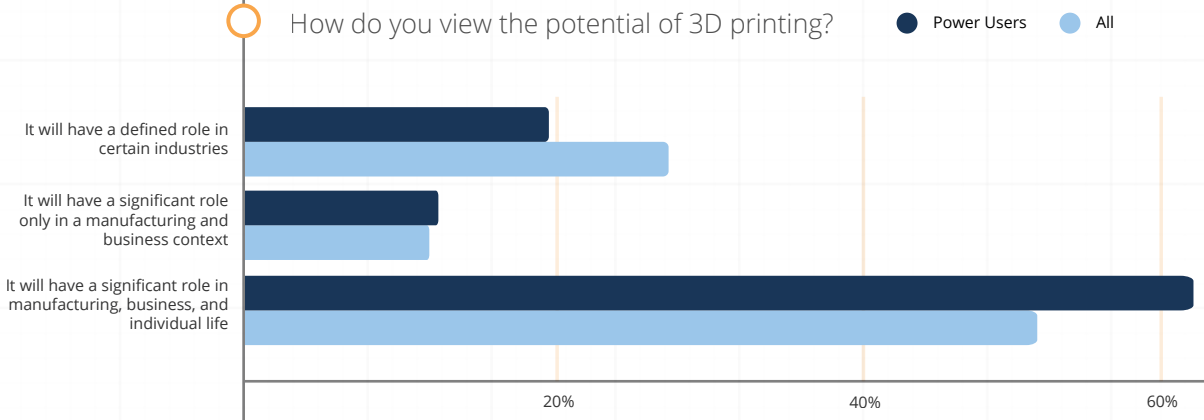
Power Users

Who are Power Users? This is a special group of 3D printing users, using additive manufacturing in the context of work for more than two years. Their use of 3D printing is significant, and they have invested at least $10k in 3D printing last year. This section focuses on their views and uses of this technology.

Power Users really see the potential of additive manufacturing in all aspects, and are positioned at the forefront of innovation. Indeed, this technology is becoming essential to their businesses, and is often integrated throughout different levels of their companies. What do Power Users think about the potential of 3D Printing? Will they continue to invest? Let's find out!

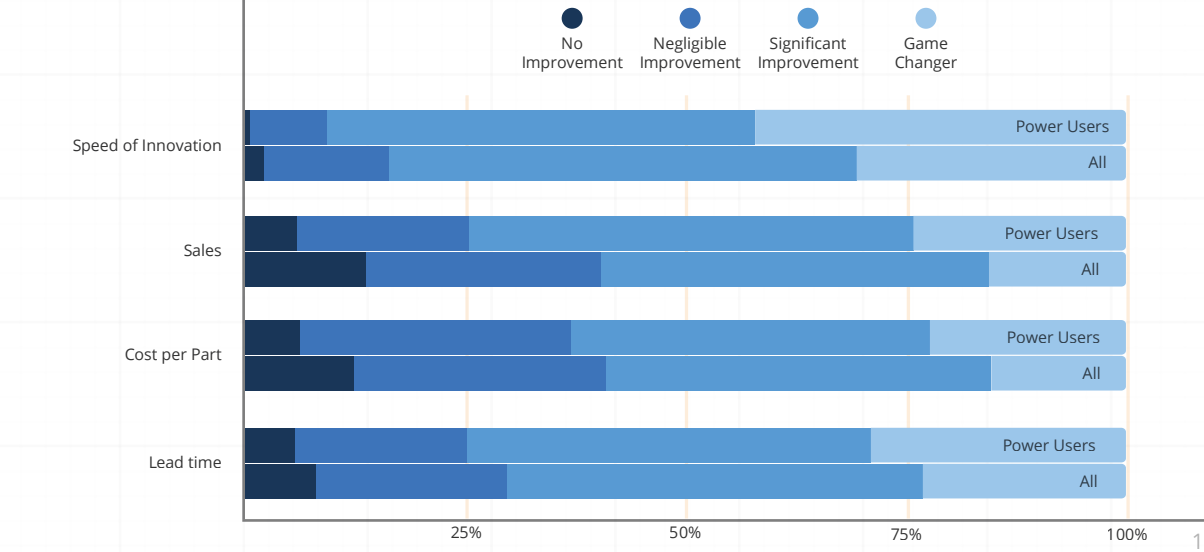
- Power users are more optimisitic than all users about the role of 3D printing in the future, 63% believe it will have a significant role compared to 53% of all users

How do you view the potential of 3D printing?

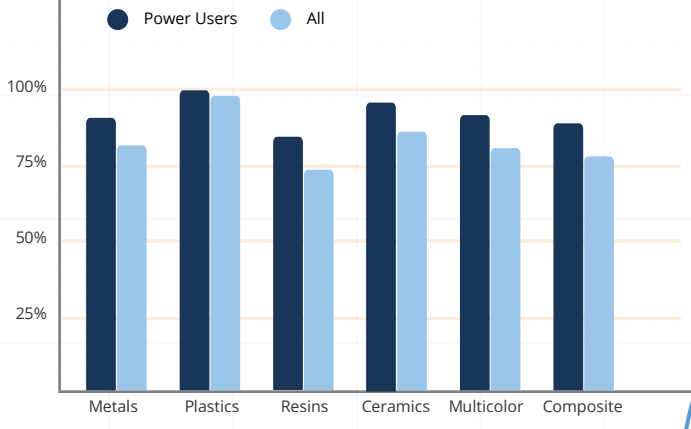


- Power users see 3D printing as having a greater improvement on speed of innovation and sales than all users

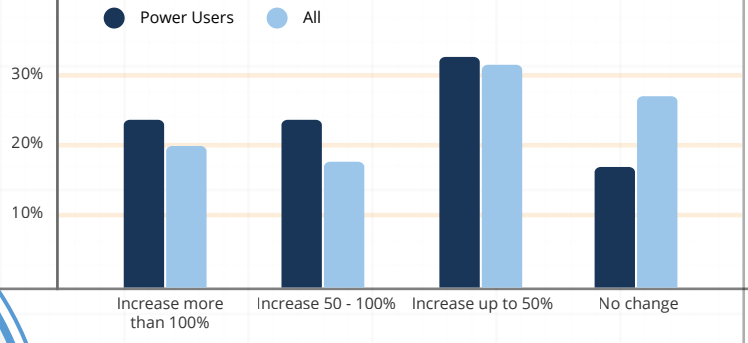
How do you measure the success and impact of your 3D printing activities?



Which 3D printing materials do you use?



How do you expect your investment in 3D printing to evolve in 2019?



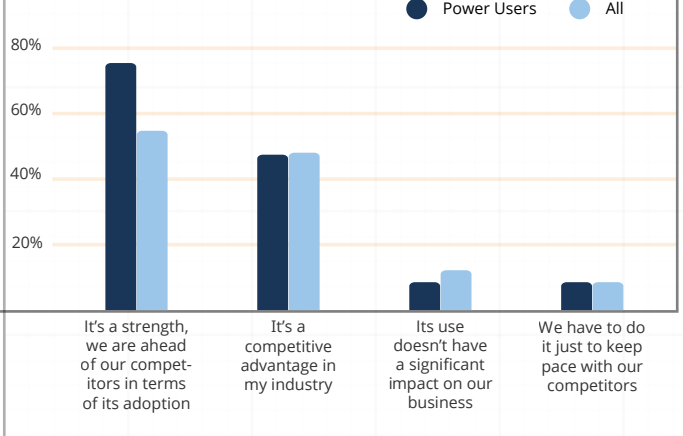
47% of power users will increase their investment by at least 50%

Power users use more metal, resins, ceramics, and composite materials than all users

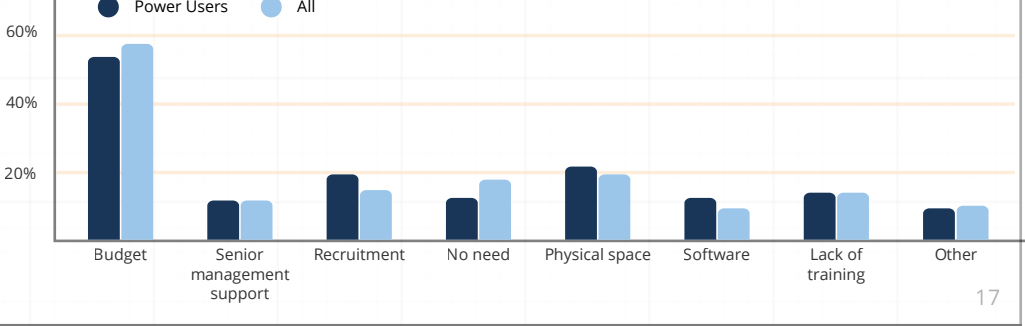
More than **75% of power users see 3D printing as a strength** relative to their competitors

Budget is less of a barrier but recruitment and physical space are more pressing concerns to expanding

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



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



Sector Analysis - Consumer Goods

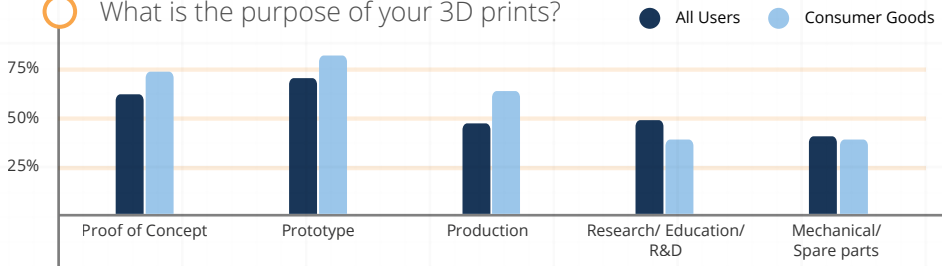
From eyewear to washing machines, the manufacturing process of consumer goods can be improved, as well as the products themselves, by using 3D printing.

How is the consumer goods industry implementing 3D printing technology? Additive manufacturing really offers new possibilities to this sector in terms of prototyping, production, and customization. 3D printing is a real asset for the consumer goods sector, helping manufacturers to save time and money, and to create better products.

Let's see what the main benefits of 3D printing are for this sector, and what are the expectations for the upcoming years!

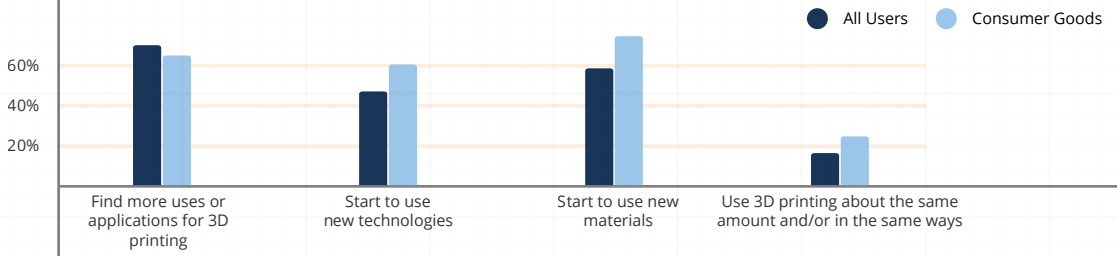
- 3D printing is still mostly used for prototyping and proof of concept in this sector. It is followed by production of small batches, for 64%, which is much more than all users

What is the purpose of your 3D prints?



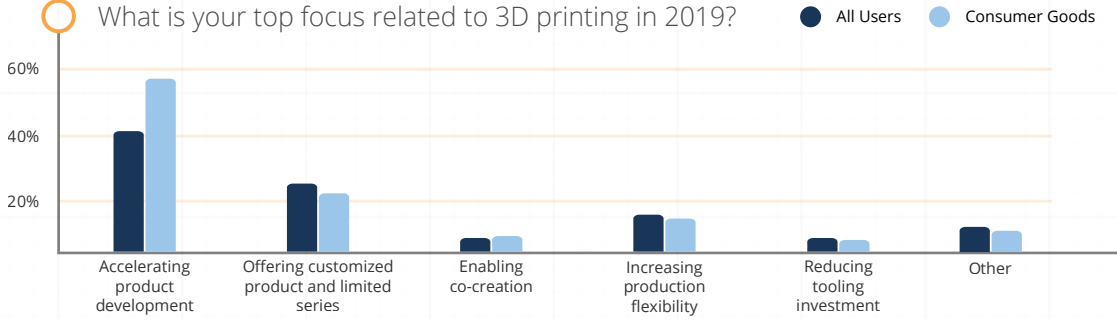
- 76% of respondents in the consumer goods sector are planning to use new 3D printing materials in the upcoming year.

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

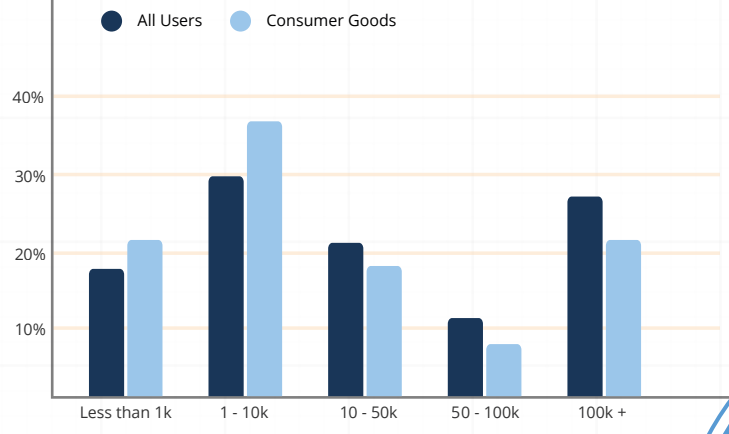


- The main focus is to accelerate product development. Customization comes second, as a huge advantage for consumer products

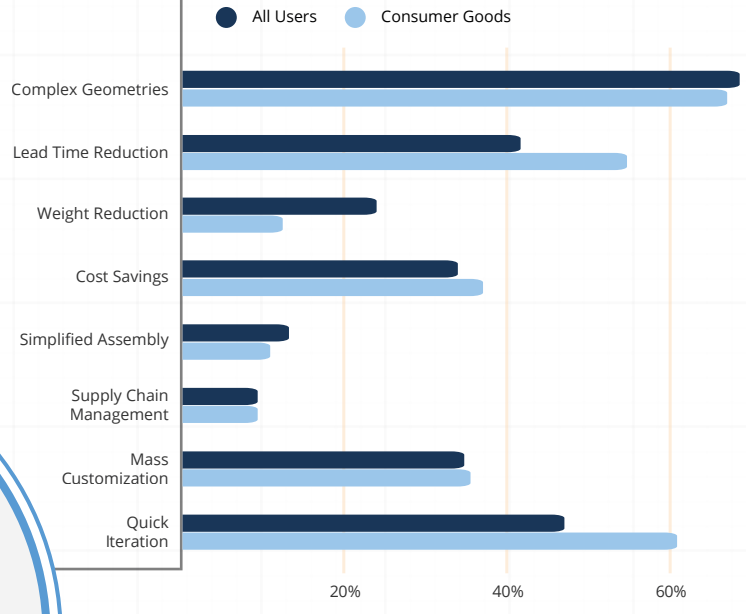
What is your top focus related to 3D printing in 2019?



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



What are the benefits of 3D printing?



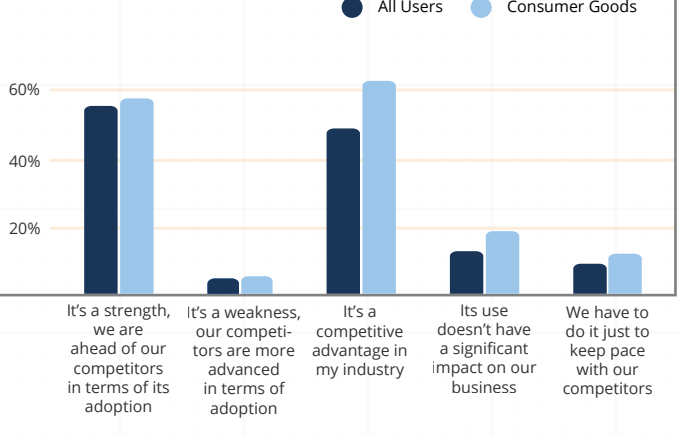
48% of respondents invested more than $10k in 3D printing

Complex geometries and quick iterations are the main benefits for consumer goods

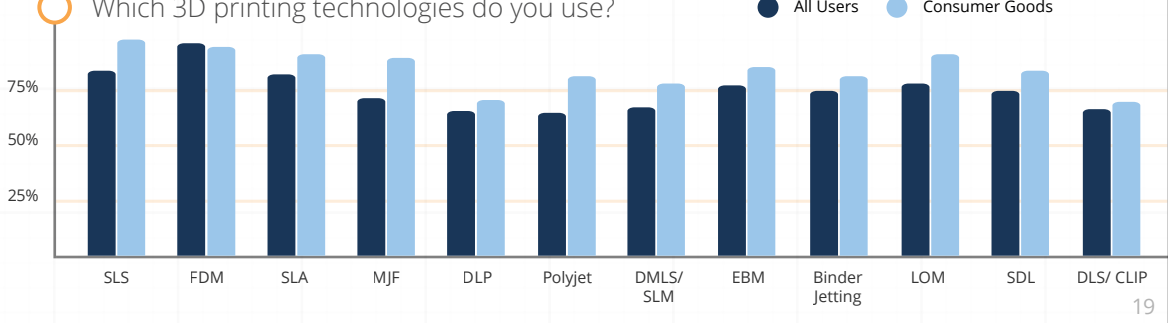
60% of respondents see 3D printing as a strength, they are ahead of their competitors

Consumer goods uses more printing technologies than other sectors

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



Which 3D printing technologies do you use?



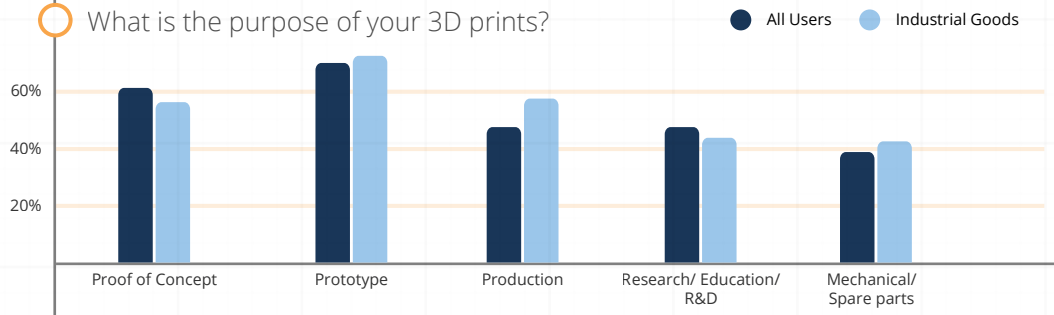
Sector Analysis - Industrial Goods

The industrial goods sector produces machinery parts, tools, components or any goods for use or consumption for many different industries. Industrial goods can improve many different types of production processes, but we now know that 3D printing can improve the production process of industrial goods themselves and many business have applied it.

What technologies and materials are they making the most of? How is the use of additive manufacturing evolving through the years? You will find all the answers in this section.

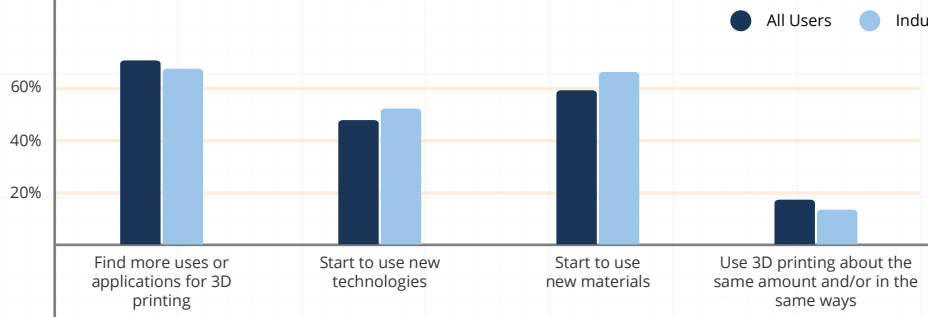
- 74% of respondents in this sector are using it for prototyping and a growing 58% for production

What is the purpose of your 3D prints?



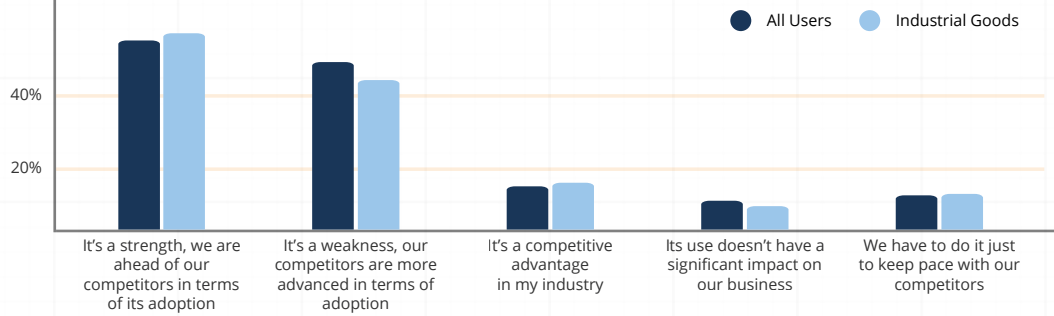
- 68% of respondents will find more uses or applications for 3D printing

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



- 57% say 3D printing is one of their strengths when it comes to their business strategy and they are ahead of their competitors

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

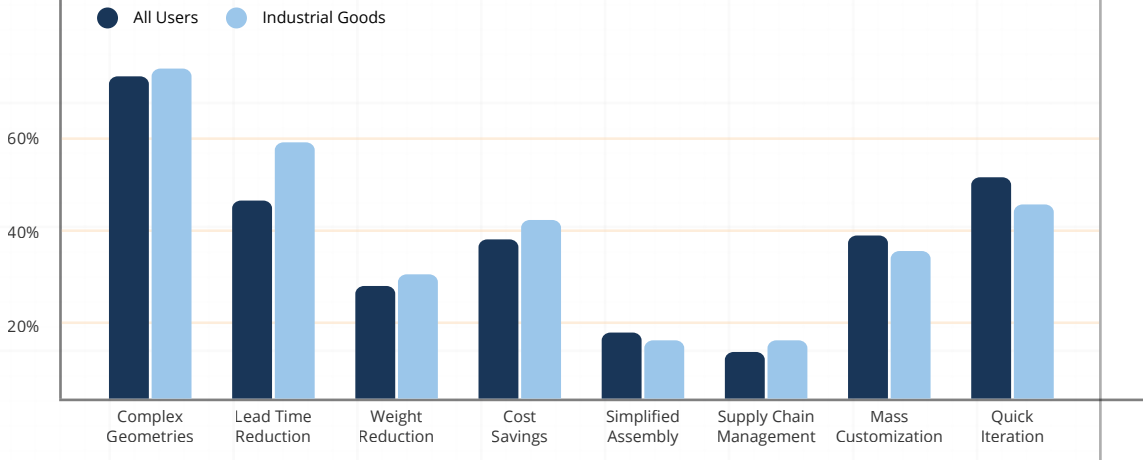


The main benefit is the possibility of creating complex geometries, for 71% of respondents, followed by quick iteration

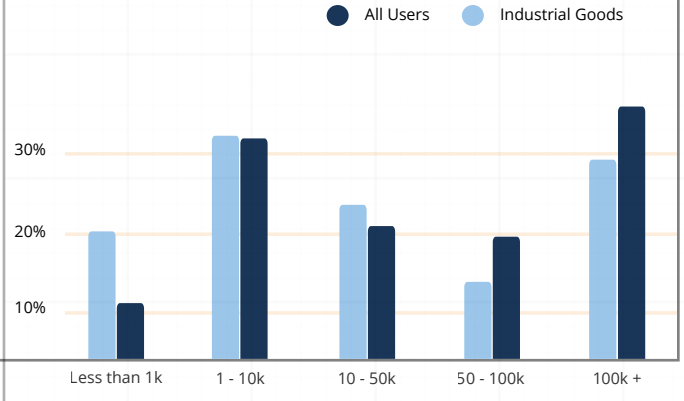
FDM/FFF is the first 3D printing technology used by 96%, SLS comes second with 86%

32% invested more than $100k, it's the sector where businesses are investing the most money

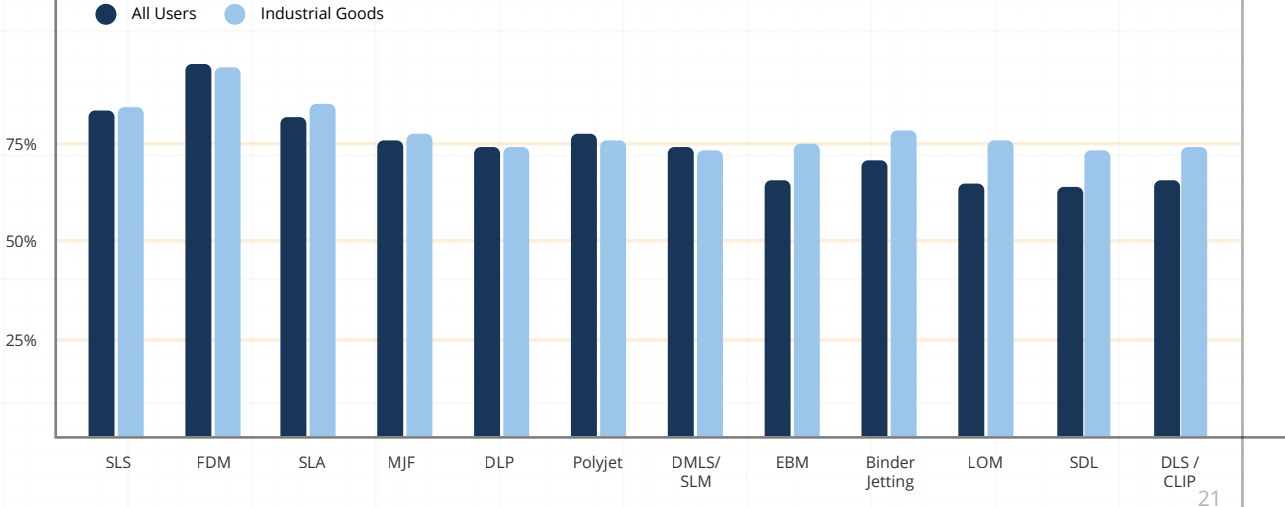
What are the benefits of 3D printing?



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



Which 3D printing technologies do you use?



Sector Analysis - High Tech

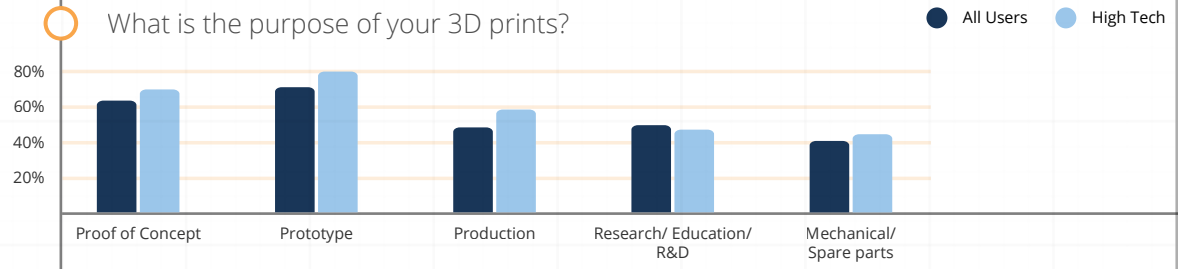
How is additive manufacturing used for advanced technologies? You will see that the uses of 3D printing are a little bit different than consumer and industrials goods.

Discover their top focuses and the main 3D printing benefits they see by implementing 3D technology in their sector.

In this sector, the use of 3D printing is still evolving, and it is quite promising! Additive manufacturing is a great strength for them, and new applications might be found for high-tech in the upcoming years.

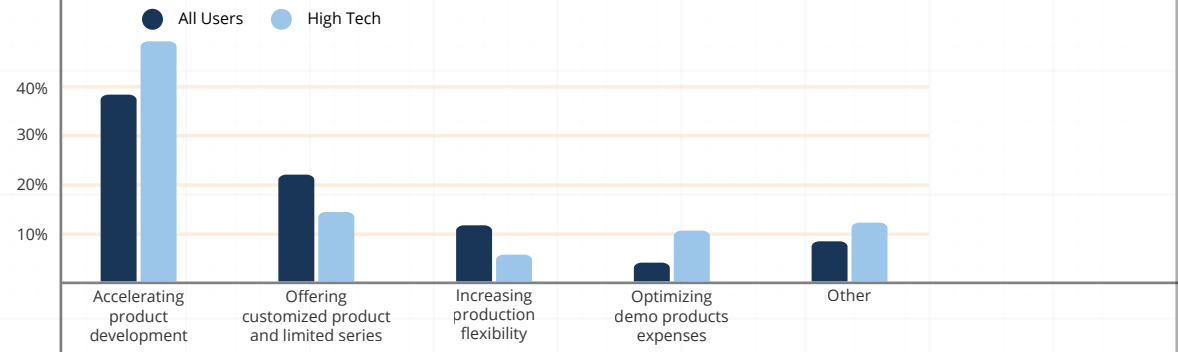
- The main use of 3D printing for high tech is prototyping for 80% of the respondents

What is the purpose of your 3D prints?



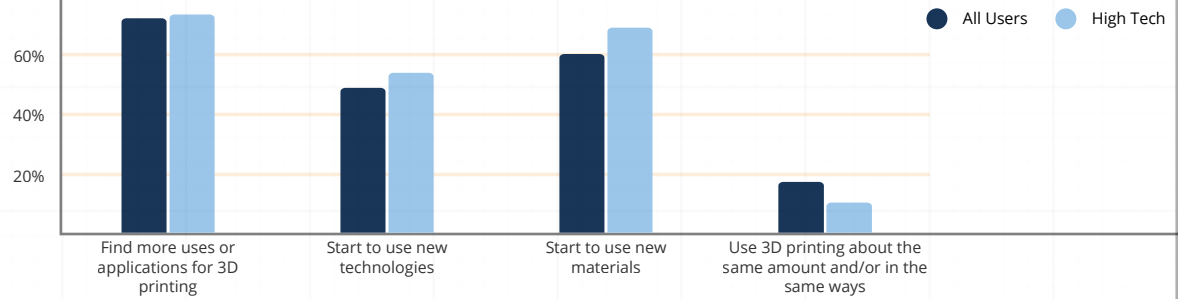
- 47% use 3D printing to accelerate product development

What is your top focus related to 3D printing in 2019?

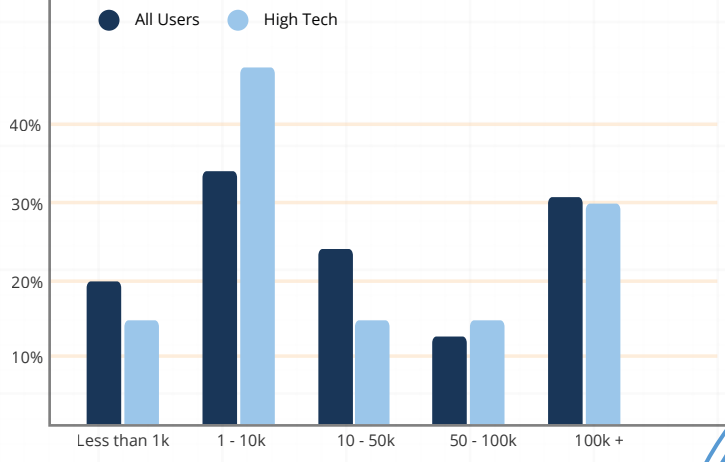


- 73% will find more uses and applications of 3D printing

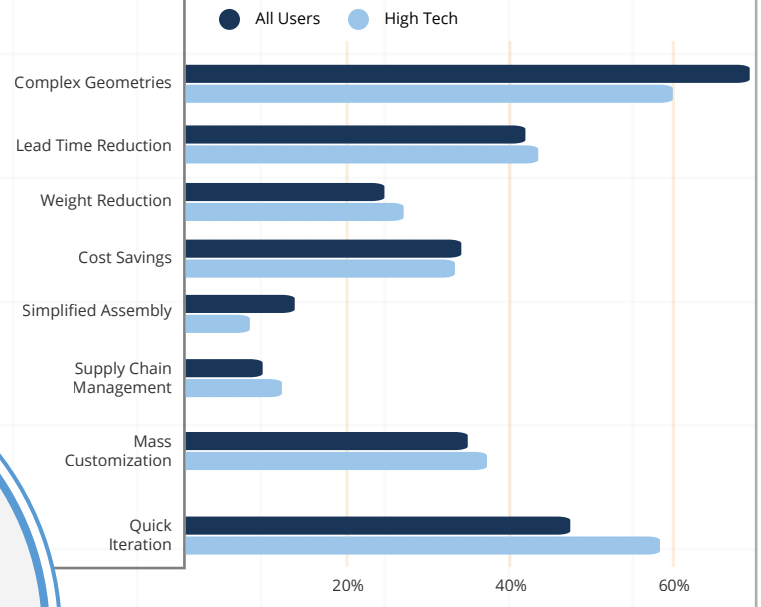
How do you expect your use of 3D printing to evolve over the next year?



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



What are the benefits of 3D printing?



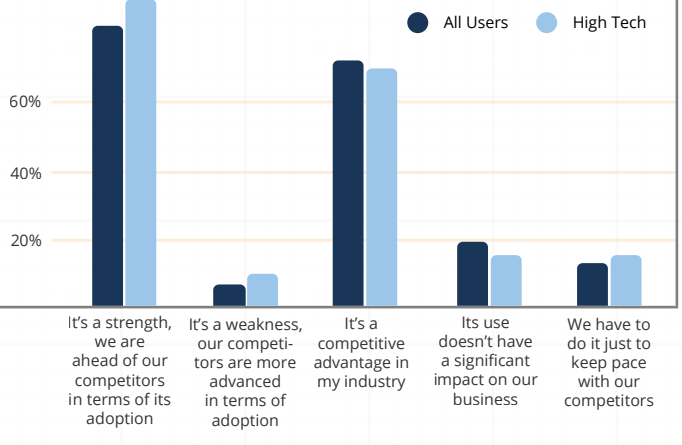
55% invested more than $10K in 3D printing activities

Complex geometries and quick interactions are the main benefits

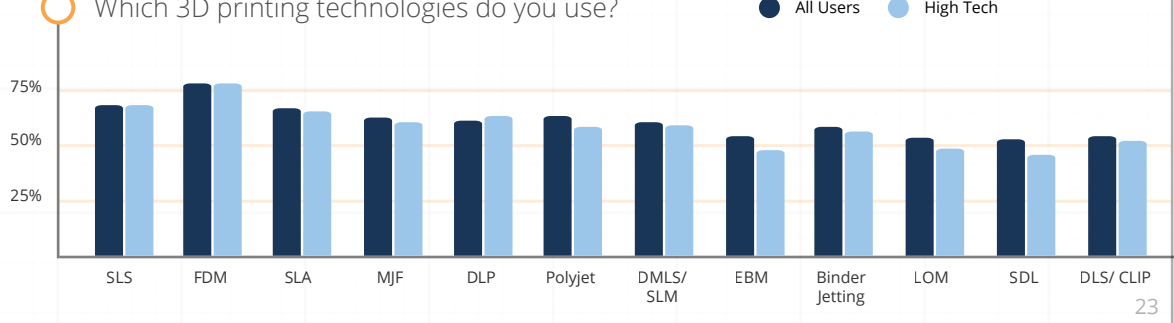
3D printing is a strength when it comes to business strategy

FDM/FFF is the first 3D printing technology used with 97%, and SLS comes second with 84%

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



Which 3D printing technologies do you use?



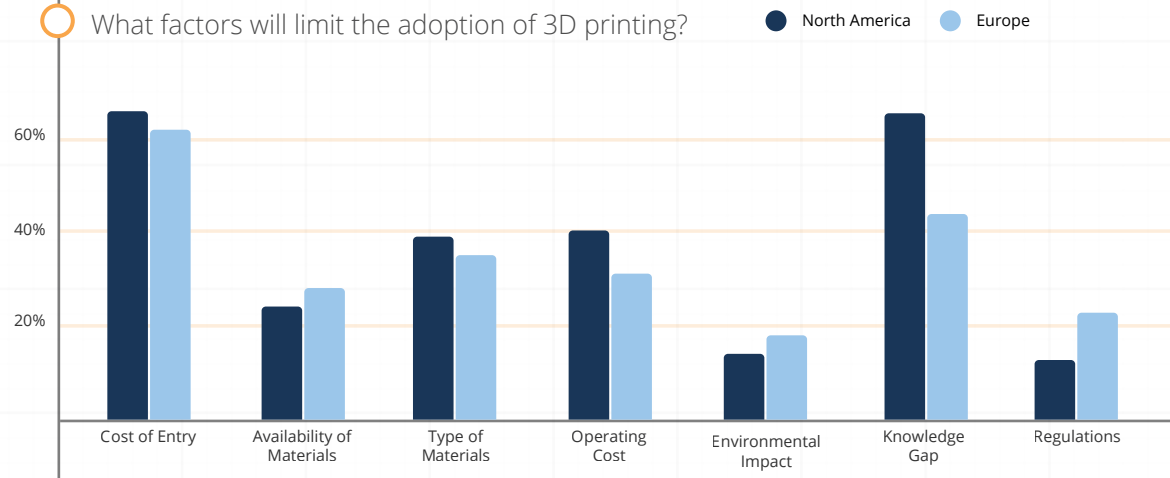
North America vs. Europe

As the use of 3D printing continues to grow all over the world, we take a closer look at how it is used between North America and Europe.

Do people have the same 3D printing expertise level, the same needs, and expectations? That is what we are about to discover in this section of The State of 3D Printing.

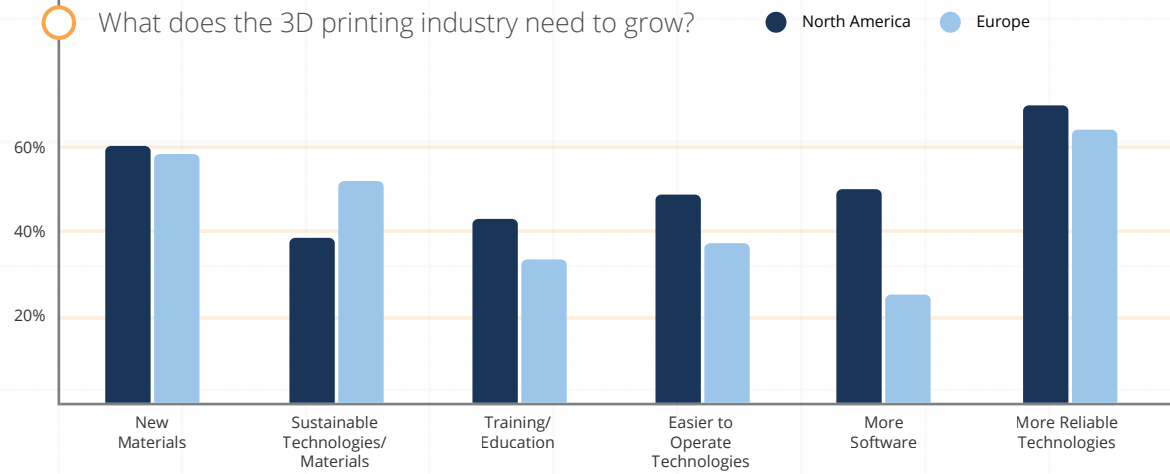
- 65% of North Americans see the knowledge gap as a significant limiting factor in the adoption of 3D printing vs 43% of Europeans

What factors will limit the adoption of 3D printing?



- Europeans place a greater importance on sustainability to grow the 3D printing industry

What does the 3D printing industry need to grow?

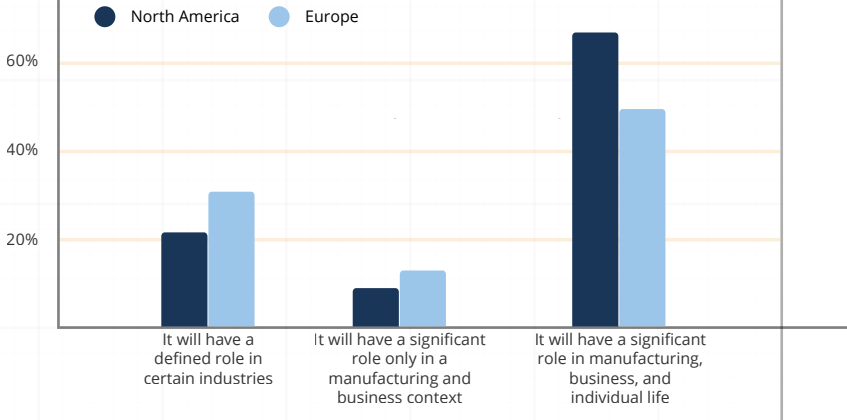


North Americans are more optimistic about the potential of 3D printing

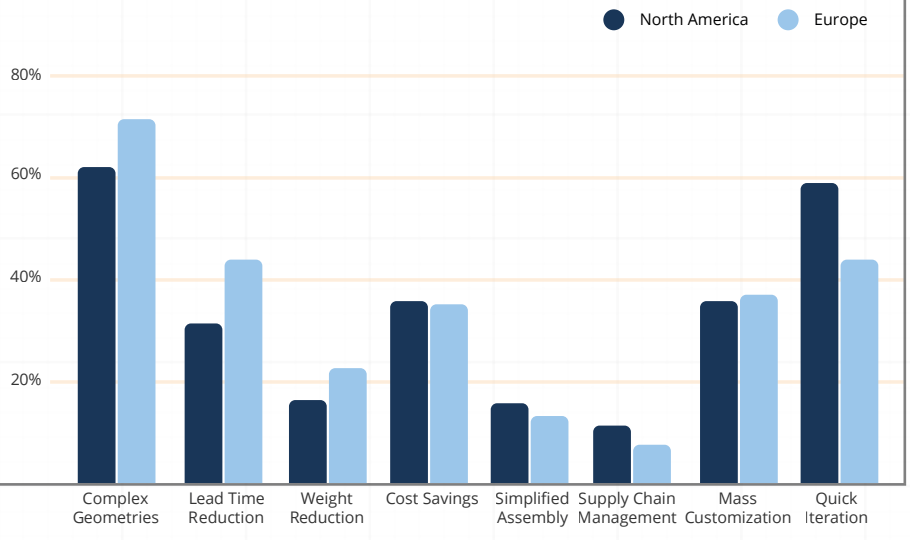
Budget and physical space are the greatest barriers to growing, particularly for North America

Europeans see complex geometry and decreased lead times as the greatest benefits

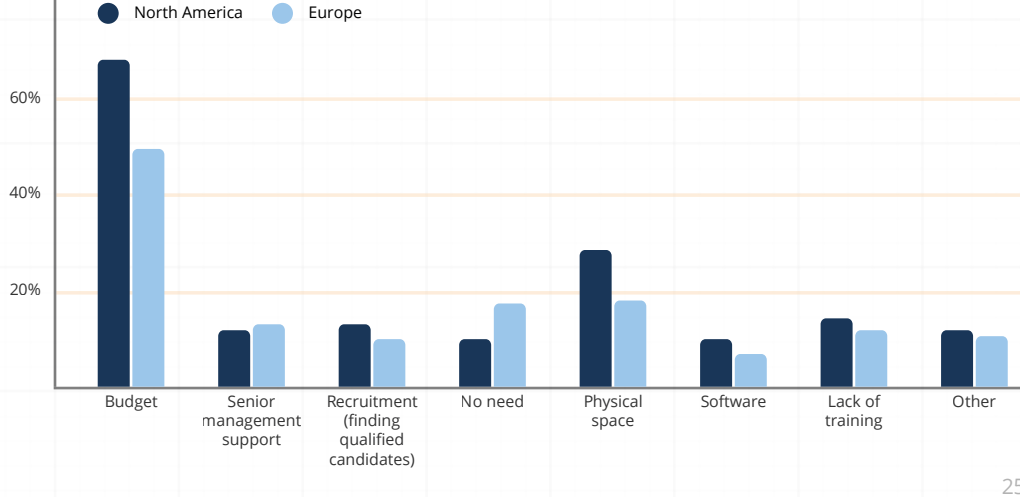
How do you view the potential of 3D printing?



What are the benefits of 3D printing?



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

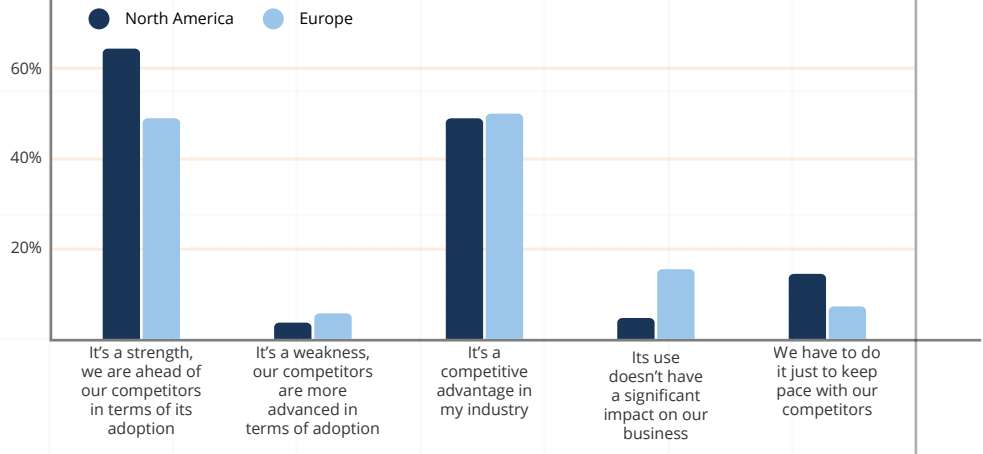


European companies are less sure of the benefit of 3D printing as a part of their business strategy

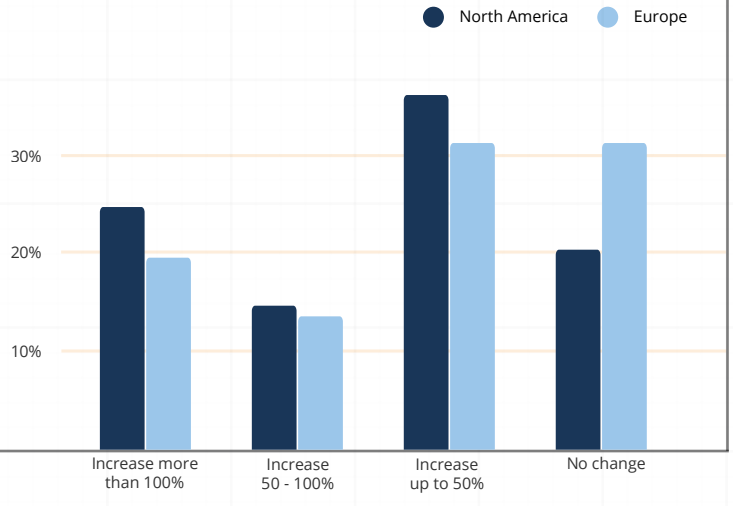
North America is more optimistic for hiring qualified candidates for their 3D printing activity

North American companies are "all in" for investing in 3D printing

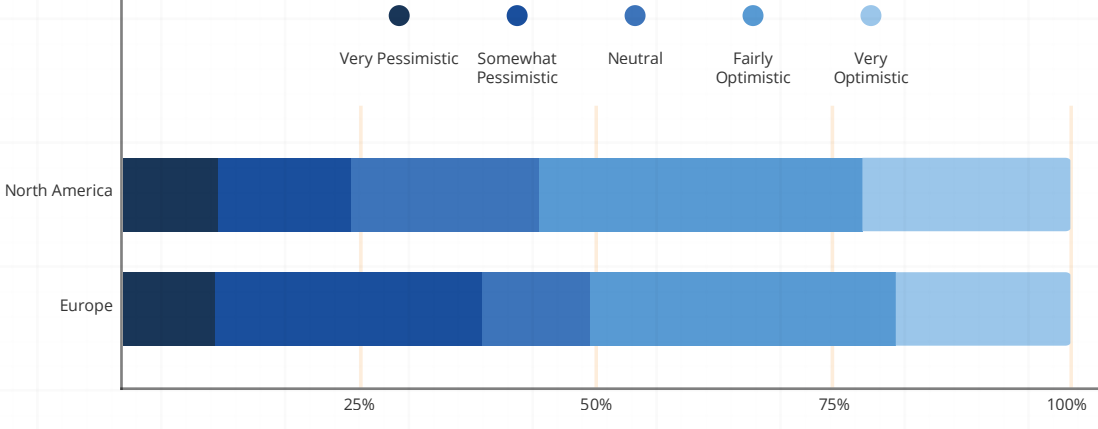
How do you assess your use of 3D printing as a part of your business strategy?



How do you expect your investment in 3D printing to evolve in 2019?



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



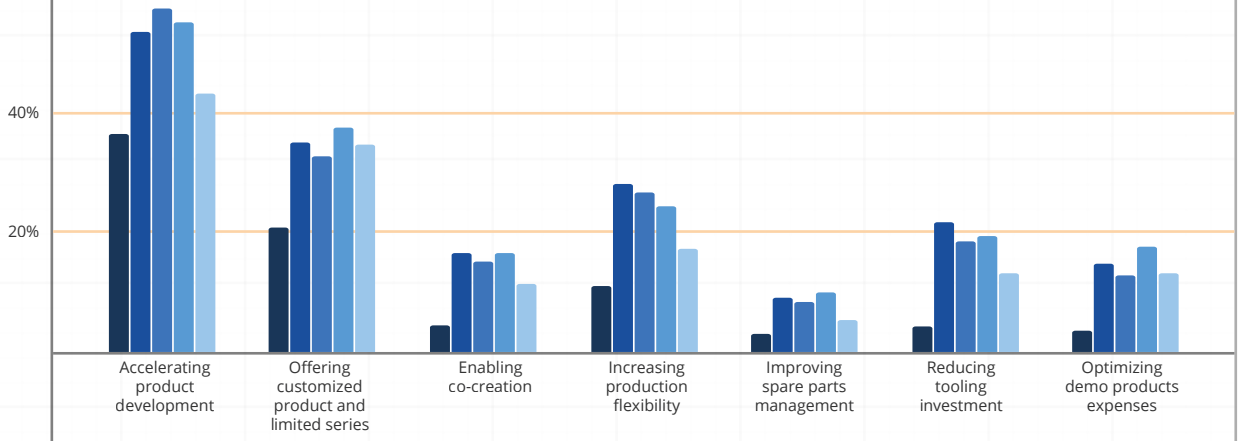
5 Years of The State of 3D Printing

How did the use of 3D printing evolve during the last 5 years? Let's take a look at the responses to certain key questions from the last 5 years.

Additive manufacturing is evolving quickly, and 3D printing is constantly used for new applications, more production, new 3D printing materials, new benefits, and growing budgets. Let's see what exactly the key finding are of the last five years, according to our respondents.

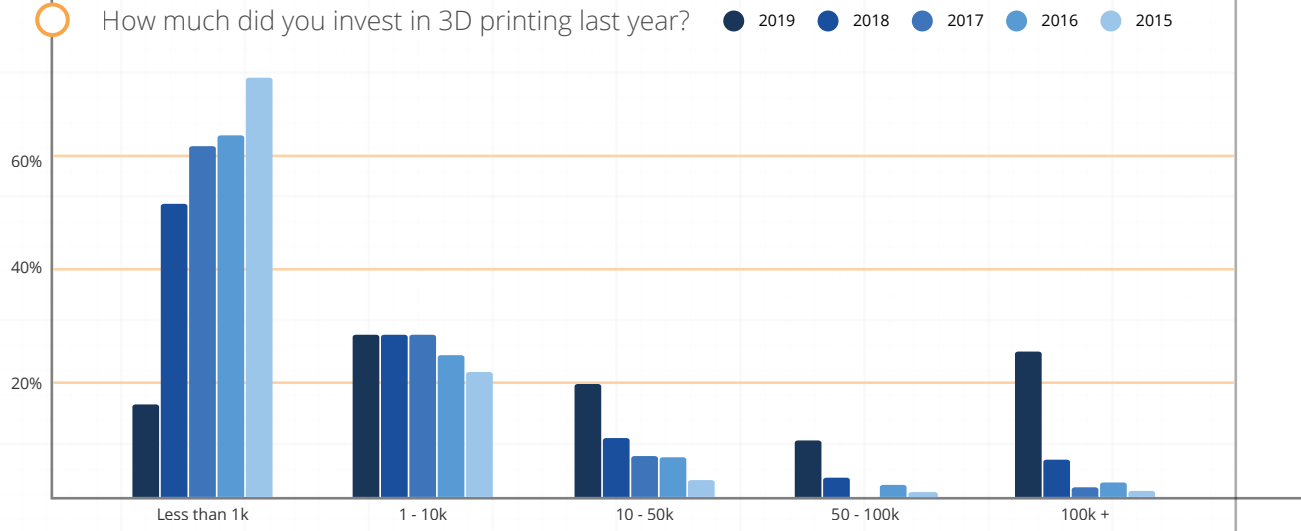
- Accelerating product development continues to be a top priority

What is your top focus related to 3D printing in 2019?



- Companies invest more than ever in their 3D printing activity: 25.6% report investing more than $100k

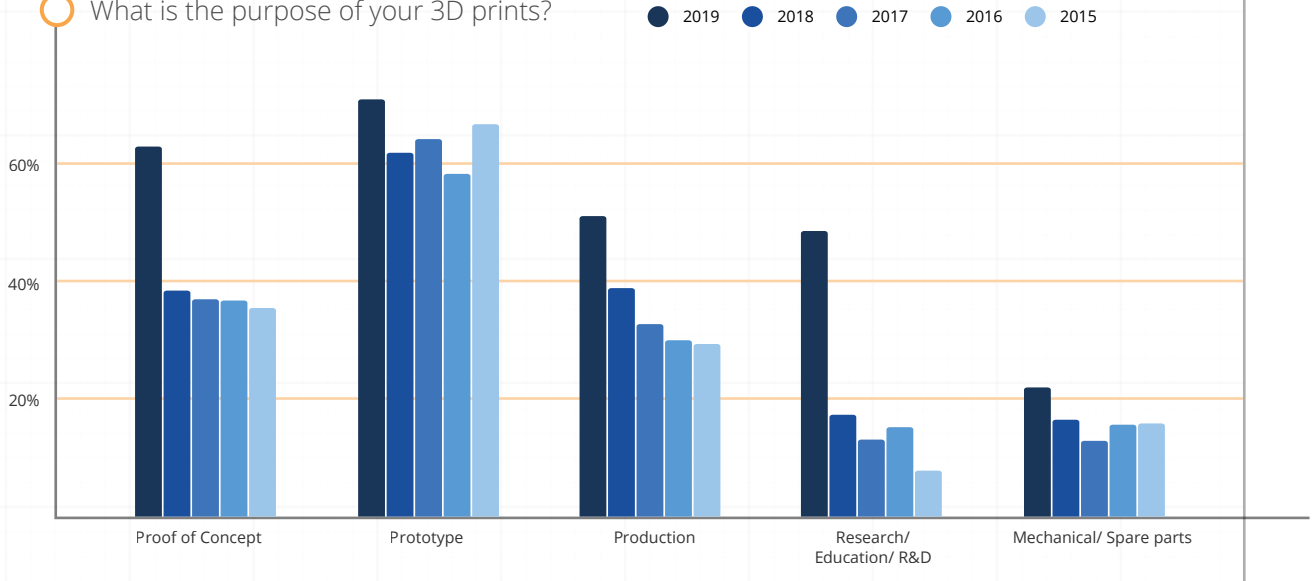
How much did you invest in 3D printing last year?



The use of 3D printing for production rapidly increases to 51% from 38.7% in 2018

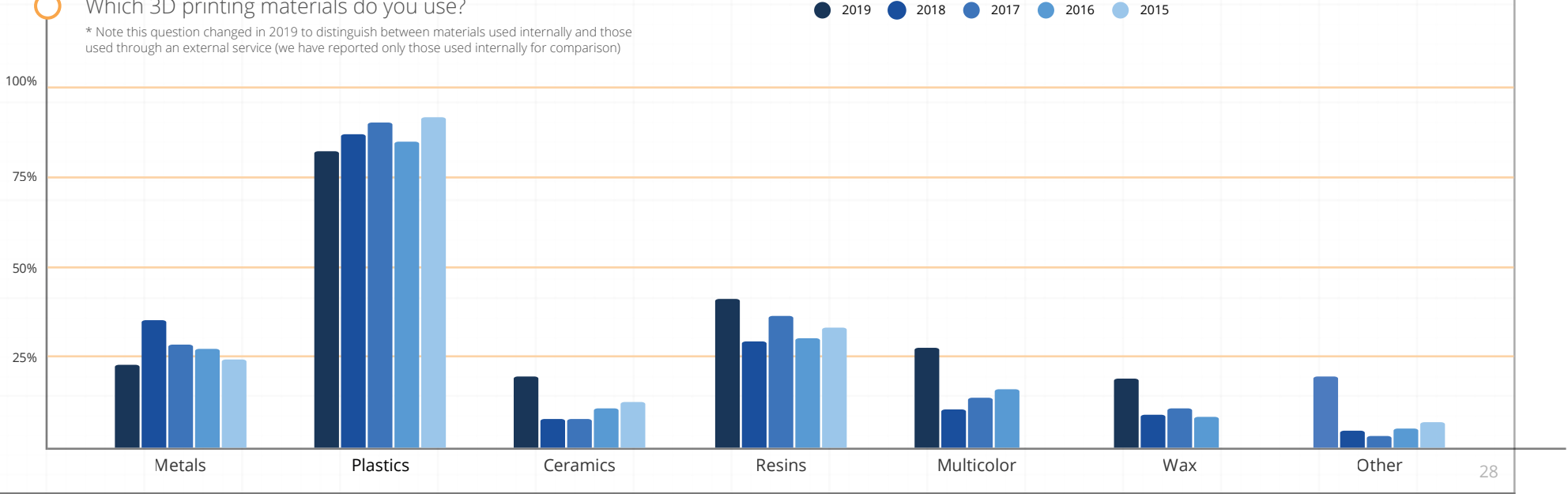
More diverse materials are used in a variety of applciations

What is the purpose of your 3D prints?



Which 3D printing materials do you use?

* Note this question changed in 2019 to distinguish between materials used internally and those used through an external service (we have reported only those used internally for comparison)



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