

## SBD Explores: Additive Manufacturing

### How additive manufacturing can provide strategic value to OEMs

#### 10-minute Insight

Fifteen car makers have announced plans in recent years to leverage additive manufacturing (also known as 3D Printing) within their production process. But why?

Additive manufacturing has many use cases that can be applied to automotive, from helping deliver personalized user experiences to optimizing scaling of manufacturing. Many of these use cases are now crossing the realm from early-stage exploration to real-world implementation.

**This insight explores how additive manufacturing can benefit the automotive market and what challenges still remain to be solved.**

#### Target audience

Product planning Strategy

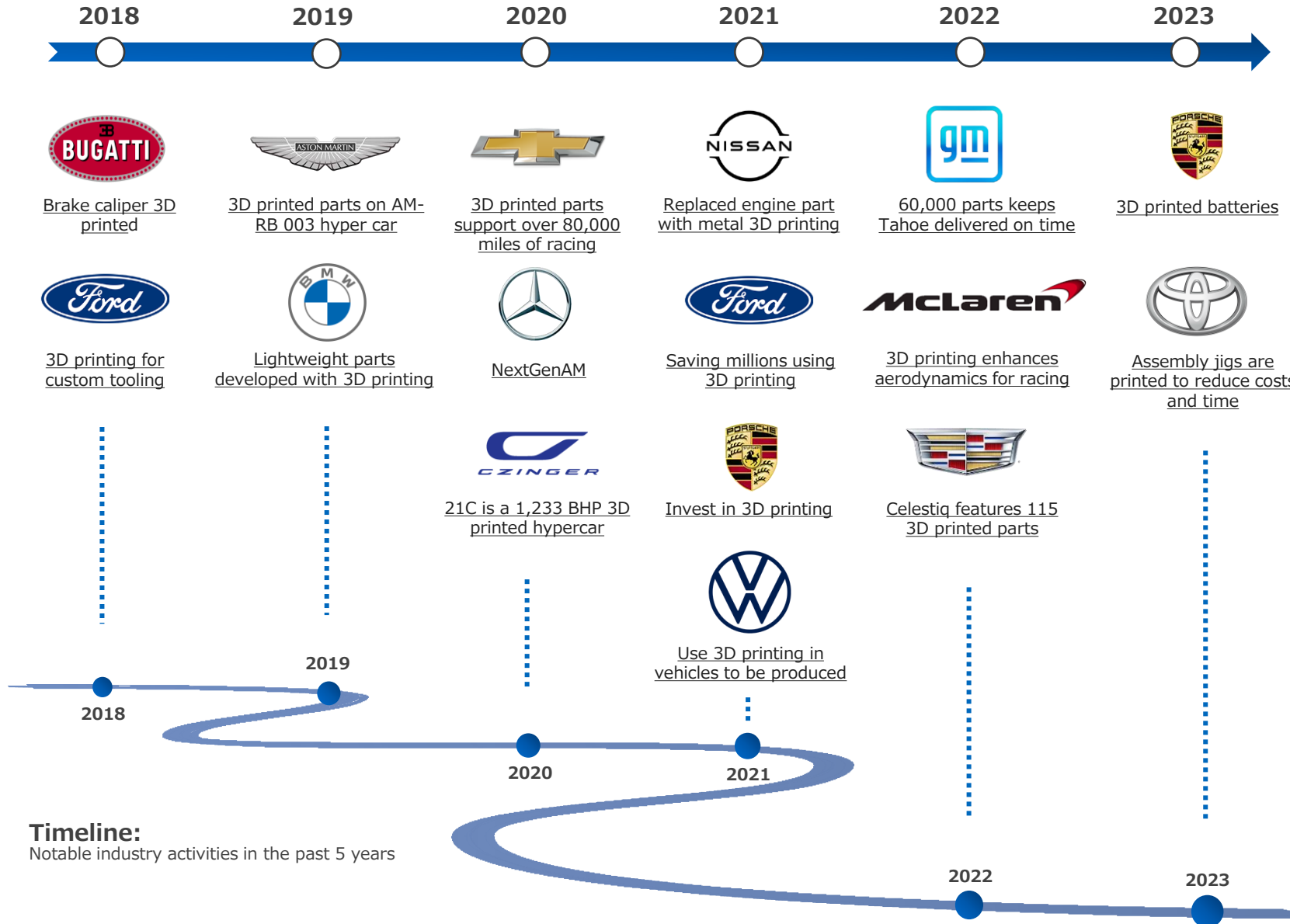
Marketing Engineering

#### Focus market(s)

Global



# What is happening?



## Key takeaway

The automotive additive manufacturing market has grown in the past 5 years. Several OEMs have adopted additive manufacturing in the assembly of vehicles or within the vehicle itself.

- [GM](#) utilizes additive manufacturing to make components for the Chevrolet Tahoe before the injection molding tools are ready.
- [Nissan](#) has replaced a damaged water pump (a complex component) with a 3D printed version. The part can be printed in 40 minutes.
- [Bugatti](#) became the first OEM to print titanium brake calipers in 2019.
- [VW](#) 3D prints the center caps within their VW Van and electroplate them to look like metal.
- [Ford](#) prints a 'pully' that is used on the assembly line, which traditionally costs \$180 but now only costs \$0.50.
- [Ford](#) is using printed components to attract a new generation of buyers. Using files provided by Ford, owners can design and print custom add-ons for their Maverick.

# Why does it matter?



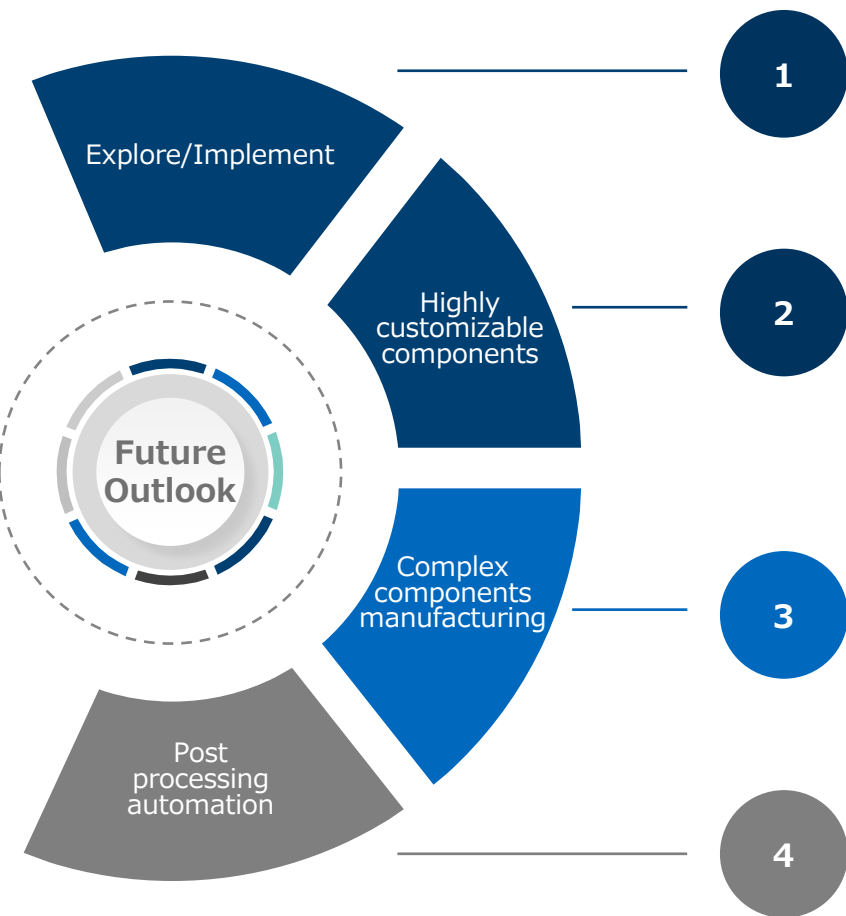
## Additive Manufacturing Current Use Cases



## Key takeaway

By using additive manufacturing OEMs are discovering ways to create new consumer experiences, produce components with enhanced design characteristics, and reduce manufacturing time and costs.

- **Reduce Costs** via quick turnaround on prototypes and production line tool. Costs can also be reduced by digital storage of legacy/spare components and assembly line tools.
- **Improve CX** by allowing owners to personalize their vehicle and by providing a range of high-quality finished components.
- **Enhance Design** of complex components with reduced weight and increased strength can easily be produced. Post processing for a quality finish can be minimized for components that are non-consumer facing.
- **Streamline Production** by utilizing additive manufacturing to meet unanticipated demand. Save time on producing hundreds of small unique components by substituting traditional methods with a single print.



1 OEMs will look on a tactical and opportunistic basis to see where additive manufacturing technology can add value to their strategies.

2 More OEMs will create new consumer experiences by adding customized components on high-end models/trims.

3 Additive manufacturing will exceed traditional manufacturing in terms of unique complex components production for mid-scale production.

4 Challenges to automate post processing for metal printing will still pose an issue for mass scale production.

## Key takeaway

**Additive manufacturing will increasingly help OEMs optimize the production of components. However, high-volume additive manufacturing of components is still far away.**

- Right now, additive manufacturing can be used to reduce overhead costs through digital storage of components and create new consumer experiences through custom components.
- Mid-term advancements will help solve limitations for traditional manufacturing. Additive manufacturing will be used to make components which traditional manufacturing struggle with, on greater scales.
- Post processing automation is a major hurdle, especially with metal printing. This will need to be solved before additive manufacturing will be able to replace traditional methods for mass scale production.

# Who to watch out for?



## Trend Setter

## Reasons to watch them

## Perspective

## Key takeaway



- HP has a range of metal printers that use "metal jetting" to produce high-quality metal components.
- Can produce components in various metals, including stainless steel, tool steel, and inconel.

"HP Metal Jet Solution Services provide your business with a comprehensive suite of onboarding, maintenance, and professional services to help you achieve the most value with HP Metal Jet technology." -[HP 3D Printing Website](#)



- Desktop Metal have over 650 patents.
- They can print with 250 different materials using various printing methods.

"With the ability to quickly print a wide variety of tooling and fixtures - from a complex set of pneumatic jaws used in a gear chamfering process to relatively simple press tools - engineers were able to cut the lead time for tooling by more than 60 percent, from three to four weeks to just five to 10 days." -[Desktop Metal Automotive Use Case](#)



- Range of technologies for automotive printing:
  - Selective Absorption Fusion ([SAF](#))
  - Programmable PhotoPolymerization ([P3](#))
  - Stereolithography Technology ([SLA](#))
  - Fused Deposition Modeling ([FDM](#))

"One of the key advantages of using 3D printing in automotive manufacturing is the ability to produce complex, custom parts quickly and cost-effectively. This can be particularly useful for low-volume production runs or for creating one-off prototypes and concept models." -[Stratasys Website](#)



MakerBot

- MakerBot has produced a printer that can manufacture carbon fiber.

"With a 3D printer by your side, you can work with the assembly technicians to design and produce tools to save time, reduce human strain, and increase line consistency. Create a digital library and print gauges, drill jigs, alignment fixtures, and ergonomic tools - all on-demand." -[MakerBot Website](#)

**Looking beyond traditional manufacturing partners is key to executing additive manufacturing strategies effectively. What types of traits should OEMs look for in a potential partner?**

- OEMs looking to create new consumer experiences will need to consider partners that work on additive manufacturing of components in different colors while producing a high-quality finish.
- New components can be developed by working with printing companies specializing in new printing techniques and materials.
- Quick turnaround of components can be achieved by partnering with companies with established technology and the scalability needed to achieve production goals. Reliable printers will be needed to achieve this goal. Experimental materials and printers may cause issues for this use case.
- Constant repeatability will be essential to ensure multiple prints stay uniform to design specifications.

# How should you react?



# 1

## Explore

Start by exploring opportunities to implement additive manufacturing in use cases that are non-consumer facing.

# 2

## Prioritize

Evaluate where additive manufacturing can help realistically achieve KPIs. Avoid hype-driven adoption of additive manufacturing that doesn't align to business needs.

# 3

## Partner

Focus on a broad range of partnerships with additive manufacturing companies to see who can help achieve long term goals.

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