HP Executive Discusses Company's 3D Printing Plans
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HP Inc., Palo Alto, Calif., last week announced an expansion of its 3D printing business. Steps included expanding a partnership with BASF to bring out polypropylene (PP) as a material for additive manufacturing and boosting professional services to consult with customers about 3D printing.
Jon Wayne, head of Global Commercial Business, HP 3D Printing and Digital Manufacturing, talked to SME Media by email about the state of HP's additive manufacturing business.
In the interview, Wayne discusses how HP's 3D printing business has evolved. He also talks about the novel coronavirus (COVID-19) has highlighted the importance of 3D printing.

SME Media: What were your major adjustments after beginning your 3D printing push?
WAYNE: HP entered the market in 2016, and those four years and counting have brought incredible progress – more than 50 million parts have been 3D printed on HP's Multi Jet Fusion platform.
One of the biggest advancements, however, is the one we're witnessing today. The COVID-19 pandemic has been an indisputable watershed moment for the 3D printing industry, and it highlights a vital element of change that HP began consciously investing since inception: global partnerships. The benefits of a strong partner ecosystem have only become more and more evident as of late.
As more industries adapt or expand the use of 3D printing, the HP Digital Manufacturing Network has played a key role in helping our customers around the world accelerate digital manufacturing transformation.
We've seen 3D printing enable customers to go from prototyping to producing fully functional end-use parts at scale, across both plastic and metal parts. HP's Metal Jet and Multi Jet Fusion technology have lowered the barriers for 3D printing adoption by giving customers radically faster build speeds, high-quality functional parts, and breakthrough economics.
Last week's announcements are a continuation of this digital manufacturing acceleration. As our technology, materials portfolio, and partner ecosystem evolve, so does our ability to transform industries.

SME Media: What industries have done the most to adopt 3D printing and why?
WAYNE: We have seen a variety of industries including automotive, industrial, consumer goods and health care adopt 3D printing technology and begin engraining it into their production strategies.

Much of this impact we've seen stems from deep partnerships. For instance, HP has partnerships with leading industrial companies such as Siemens and BASF to accelerate the design and production of 3D printed at scale.

Likewise, our latest partnership with [German engineering solution provider] Oechsler is intended to help our customers across automotive, home and commercial appliances, and medical industries expand their digital manufacturing capabilities. We are working with them to develop applications with the new polypropylene (PP) and other materials. PP allows automakers to replicate a traditional material that's used for a wide variety of interior, exterior and under-the-hood parts. These parts, such as ducts to help direct air and gas flow and gas/liquid separators, offer significant advantages to automotive customers.

HP has also worked closely with design and engineering companies, suppliers, and leading automakers like Volkswagen, all looking to leverage the power of additive manufacturing. Volkswagen is using HP Metal Jet in a multi-year design and production roadmap for the high-volume manufacturing of metal parts. Already, they've hit a production run milestone of more than 10,000 high-quality parts. In subsequent phases Volkswagen will integrate Metal Jet printed structural parts into the next generation of its vehicles.

And as new platforms such as electric vehicles enter mass production, HP Metal Jet is expected to be leveraged for the lightweighting of certified structural metal parts and more.

SME Media: What are the criteria you examine when adding a partner company?

WAYNE: Industrial alliances and new ecosystems are critical to accelerating the adoption of 3D printing and digital manufacturing broadly. When examining partner companies, we evaluate their specific differentiation within the industry and how it complements our solutions, their end-to-end 3D printing capabilities for production at scale, as well as their manufacturing and quality processes—again, to help us continue HP's mission to expand our customer's digital transformation journeys and to strengthen the potential of the HP Digital Manufacturing Network.

We recognize that many companies look to digital manufacturing service providers to help speed development of new products, shorten time to market, create leaner supply chains, and reduce their carbon footprint.

The value of the Digital Manufacturing Network has only multiplied over the past few months in wake of COVID-19. The entire 3D printing community has come together to help fight this pandemic. The ability to very rapidly shift existing expertise and capacity to help combat COVID-19 has proven effective as HP and its global community of partners and customers have produced more than 2.3 million 3D-printed parts to help healthcare workers on the front lines. With the increased availability of more advanced technologies and platforms that unlock the full potential of 3D printing for production at scale, the HP Digital Manufacturing Network is a critical first step to integrate disruptive 3D printing solutions into an organized supply and demand ecosystem that factors in standards, regulations and robust quality management to help industry pioneers on their digital transformation journeys.

SME Media: How close is 3D printing to being "mainstream"?

WAYNE: Evolving value chains and innovations across the industry are pushing 3D printing to become more mainstream and we're already seeing a shift toward production.

HP customer and partner SmileDirectClub was already revolutionizing the way millions of people can achieve a straighter smile. SmileDirectClub is powering its digital differentiation and rapid manufacturing expansion of clear aligners with HP's Jet Fusion 3D printing solutions. SmileDirectClub is operating one of the largest 3D printing factories in the U.S. with the capability to produce nearly 20 million, individually unique, 3D printed mouth molds annually. Our latest announcements and expanded partnerships continue to demonstrate our efforts to drive 3D printing to become more mainstream and will enable our customers to scale their industrial 3D production.

Here, too, the benefits of 3D printing have become more evident in the wake of the pandemic. During the COVID-19 crisis, customers like SmileDIrectClub and others were able to quickly pivot their production to 3D print millions of parts for face shields, ventilators and respirators, and nasal swabs because of the flexibility of 3D printing.

The power of this agile ecosystem and technology capabilities are proving themselves in the most demanding of circumstances. Companies the world over are now re-evaluating their manufacturing and supply chain strategies, going forward we expect they will look at how best to incorporate 3D printing and digital manufacturing.

SME Media: What are your priorities for the next 3-5 years?

WAYNE: For manufacturers and consumers alike, COVID-19 has been a reminder of infrastructure fragility and an accelerant for change. The global supply chain was upended in ways never seen before, and 3D printing proved to be part of the solution.

HP plans to continue delivering on our long-term plan to deliver increasingly capable 3D printing solutions to enable our customers to create new designs, a higher mix of parts, and more deeply integrate 3D printed parts into their manufacturing strategies.

Supply chains are transforming forever; creativity and design are being viewed through new lenses; entire ecosystems are realigning; and environmental sustainability is playing a major role in future plans. Companies and industries that aren't embracing change will be passed by as others re-write the rules. HP will continue to focus on delivering offerings across industries and verticals to push industrialization ahead.

Digital manufacturing is a rapidly growing industry with endless possibilities to reinvent the way we manufacture. Considering the recent progress of the technology, 3D printing is clearly headed for a bright future. We're truly in the midst of the new Industrial Revolution and the disruptive properties of 3D printing technology will be at the forefront.

FRANKFURT, GERMANY – November 16, 2021— This week at Formnext, the world's largest additive manufacturing event, HP Inc. is showcasing new customers, expanded partner programs and ecosystem, and innovative production applications developed with its Multi Jet Fusion and Metal Jet 3D printing platforms. HP is collaborating with L'Oréal, the world's largest cosmetics company, to scale industrial additive manufacturing and explore entirely new cosmetics packaging and applications. To meet the growing demand for more agile 3D production and mass personalization across industries, HP is also expanding its Digital Manufacturing Network (DMN) of parts providers.

"3D printing is unlocking new levels of personalization, business resiliency, sustainability, and market disruption," said Didier Deltort, President of Personalization & 3D Printing, HP Inc. *"HP is excited to reconvene with the additive manufacturing community at Formnext. Together with our partners and customers, we will continue to pave the path to mass production with advancements to our Multi Jet Fusion platform, the commercial launch of HP Metal Jet, and investments in software, services, and partner capabilities."*

L'Oréal and HP Collaborate to Makeover Cosmetics Industry

HP is collaborating with L'Oréal to increase production flexibility and to create innovative new packaging and customer experiences. L'Oréal turned to HP Multi Jet Fusion to quickly respond to shifts in its manufacturing processes and production lines. The companies worked together to quickly design and scale up large volumes of adjustable 'pucks' enabling L'Oreal to convey, fill products, and label them with better agility, resulting in a 33 percent cost reduction and 66 percent time savings. The ability to customize the pucks has also proven valuable throughout the COVID-19 pandemic, providing L'Oréal with added agility in response to changes in consumer purchasing behaviors. L'Oréal plans to use HP's Digital Manufacturing Network to scale the pucks across its global supply chain, and meet its sustainability goals by efficiently producing the parts when and where they are needed.

At Formnext, L'Oréal and HP are showcasing examples of the custom pucks, as well as unique textures for luxury cosmetics only possible with HP's 3D printing solutions. The companies are exploring the design and production of a variety of new applications that take advantage of the advanced capabilities of HP's Multi Jet Fusion platform. The design of unique textures as well as innovative lattice packaging is a result of the joint collaboration between L'Oréal, HP, and the Alternative and Atomic Energies Commission, le Commissariat à l'énergie atomique et aux énergies altertatives, (CEA) announced last year.

"Customer-centric innovation and sustainable products are at the center of all we do," said Anne Debauge, Director of Digital Transformation, Packaging & Development, L'Oréal*. "We share HP's vision to overcome our current limits through new technologies. 3D printing gives us this entrepreneurial freedom to offer new customer experiences. Thanks to this collaboration, we are already gaining in agility in our factories and wish to go further by creating new services."*

"Across large industries and new verticals such as cosmetics, our customers want to be more agile and address the growing demand for personalized products," said Guayente Sanmartin, Global Head of HP's Multi Jet Fusion business. "With more than 100 million parts produced

and growing, we are proud of Multi Jet Fusion's impact during these volatile times. Our work with L'Oréal is a bright example of the unlimited possibilities enabled by 3D printing. From increasing manufacturing flexibility to reimagining traditional products, there is an enormous opportunity to help transform markets."

Path to Production: Parts Providers Taking Advantage of Services, Subscriptions, Software, and Automation

HP is expanding its global Digital Manufacturing Network with new certified parts providers, ensuring the highest standards for quality and reliability as demand grows for Multi Jet Fusion production. The network now includes both Manufacturing Partners and Multi Jet Fusion Production Professionals leveraging HP 3D printing solutions to design, produce, and deliver parts at scale. More than 30 new Multi Jet Fusion Production Professionals are delivering qualified local production services.

To assist in the management and automation of complex 3D printing workflows and large-scale additive manufacturing fleets, HP Digital Manufacturing Network partners and parts providers such as Forecast 3D, Jawstec, Weerg, and ZiggZagg, are embracing HP's portfolio of additive manufacturing offerings including 3D Factory Services, software solutions including HP 3D API and HP 3D Center, and hardware solutions such as HP Automatic Unpacking Station. ZiggZagg is also the latest partner to take advantage of HP's 3D-as-a-Service (3DaaS) business model to more quickly scale by unlocking capital flexibility and improving business agility. The model proved hugely beneficial during the volatility of the COVID-19 pandemic and is being increasingly adopted across HP's customer base.

HP and its customers are showcasing final parts and innovative new applications at Formnext in Hall 12.1 Booth D61:

- BASF 3D Printing Solutions GmbH and Oechsler AG: the companies have developed a fully custom 3D-printed full bucket auto seat using Multi Jet Fusion and the BASF ULTRASINT TPU01 powder. Oechsler has developed a unique elastomeric lattice design ideal for luxury and sports cars automotive seats and highly custom features.

- Impress: the largest technology-driven European orthodontic chain, is using the HP Jet Fusion 5210 solution to help scale production of clear dental aligners in its new production facility located in Spain.

- 2021 Purmundus Challenge Finalists: the following customers have used Multi Jet Fusion to develop applications recognized in this year's Purmundus Challenge. Winners will be announced at Formnext.
    - ATHOS: preparing to commercialize the perfect personalized climbing shoe, providing unmatched comfort and better performance.
    - Glaze Prosthetics: the durability, light weight, and ability to personalize the Symbious active hand has exceeded the expectations of upper limb amputees.
    - Odisei Music: this travel sax is the world's smallest and lightest electronic saxophone and has more than 1200 users around the globe.

Disrupting Metals Manufacturing with HP Metal Jet

HP will also be showcasing momentum around its Metal Jet platform at Formnext, including new parts and progress with partners like GKN and Volkswagen. Volkswagen is integrating HP Metal Jet produced final parts for the A pillar of the T-Roc Cabriolet. The structural parts have passed crash test certification and weigh almost 50 percent less than conventional components. As HP continues to validate production applications with partners and customers it is moving toward broader commercial Metal Jet availability in 2022.

"Our early Metal Jet partners and customers such as GKN, Parmatech, Volkswagen, Cobra Golf, and others, are successfully demonstrating our metals mass production advantage," said Ramon Pastor, Global Head of HP's 3D metals business. "As we continue to advance our technology, materials, and capabilities, we remain on track to launch in 2022. We look forward to delivering industry leading efficiency, cost savings, and design freedom to help the industry accelerate and scale digital manufacturing."