| United States

3D Printing comes of age in US industrial manufacturing

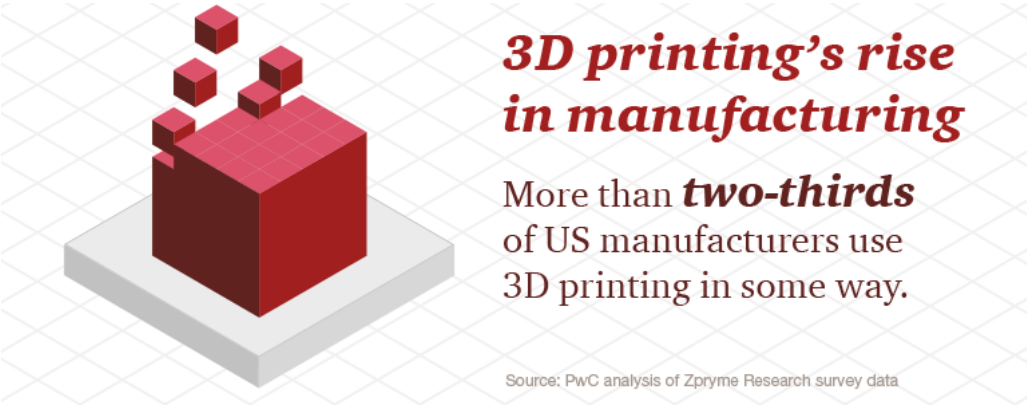
Has 3D printing (3DP) finally come of age? It's become clear that the technology, also known as additive manufacturing, is crossing from a period of hype and experimentation into one of rapid maturation. 3D-printed parts and products are quickly making their way into end products—from a printed car to athletic shoes to a printed NASA rocket engine. Manufacturers of all stripes are building 3DP programs and are likely to continue to expand those programs as advancements in 3D printers, software and printing materials (or "inks") make adoption easier and more cost-effective.

Two years ago, PwC published results from its first "Disruptive Manufacturing Innovations Survey" in which we sought to take a snapshot of how—and to what extent—US manufacturers were adopting 3DP into their operations and how they expected the technology to play out in the future. In this report, we share findings from a second survey posing the same questions to see what's changed over two years. Not surprisingly, manufacturers are still very much at the vanguard of 3D printing adoption and innovation.

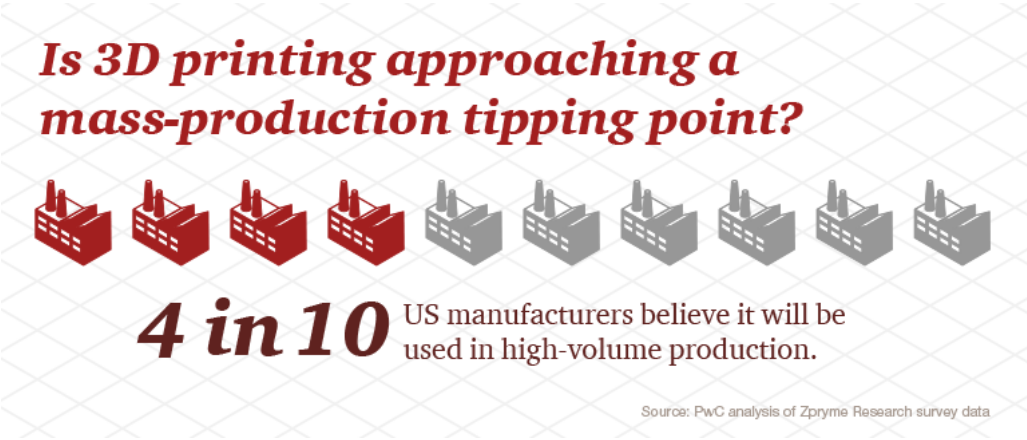
According to our new survey, we find some interesting shifts in how 3D printing is being applied by manufacturers from just two years ago. Highlights from our latest survey include the following…

7 ways 3D printing is disrupting US manufacturing…

1. More making, less tinkering
While roughly the same percentage of US manufacturers are currently adopting 3DP in some way (roughly two-thirds) a higher percentage (51%) are using it for prototyping and final-products compared to two years ago (35%); meanwhile, fewer are simply "experimenting" to determine how they may use the technology (17% vs 29% two years previously).

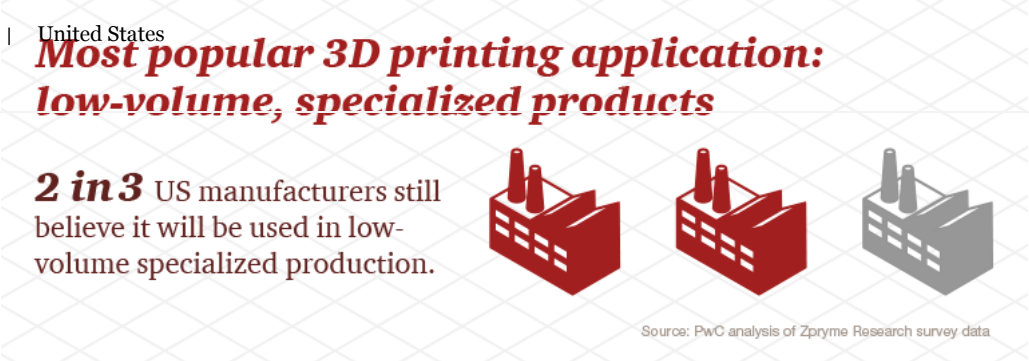


2. Expectations rise for 3D printing of high-volume—and low-volume--production More manufacturers (52%) expect 3D printing to be used for high-volume production in the next 3-5 years, compared to two years ago (38%).



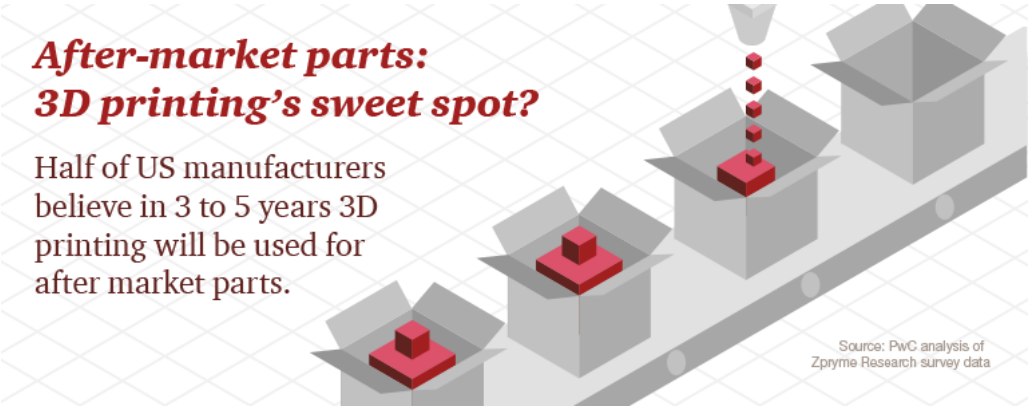
…Meanwhile, those expecting 3D printing to be used for low-volume, specialized products in the next 3-5 years slipped slightly to 67% from 74% two years ago.

| United States



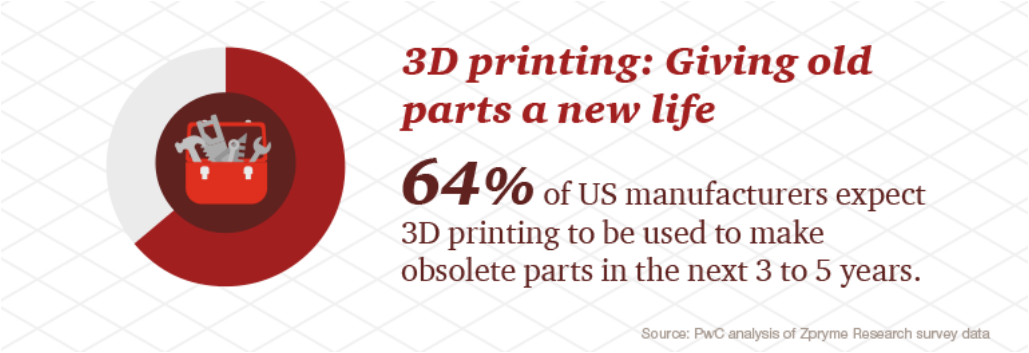
3. Most manufacturers believe 3D printing will be more useful in producing after-market parts than newly developed products

Manufacturers are evenly split on 3D printing's role in after-market parts production. Just over half of US manufacturers (52.8%) believe that, in the next 3-5 years, 3D printing will be more useful in producing after-market parts or products, slightly down from 57% two years ago.



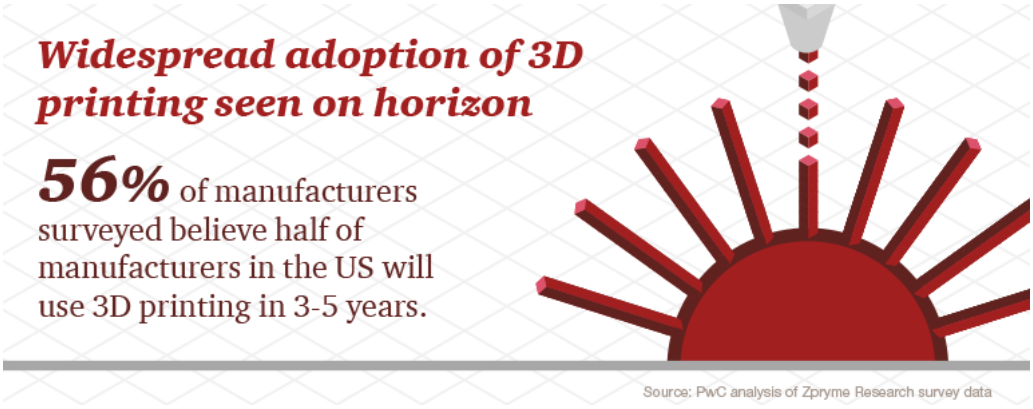
4. 3D printing seen useful to produce obsolete parts

64% of manufacturers expect that, in the next 3-5 years, 3D printing will be used to produce older, obsolete parts—down slightly from 2014, when 70% believed that would be the case.



5. Most manufacturers see majority of all manufacturers in the US adopting 3D printing technology

As mentioned earlier in this report, roughly two-thirds of US manufacturers surveyed are already using 3D printing in some way. Yet, when asked if they feel it is likely that more than half of their peers in the US will adopt 3D printing in the next 3-5 years, just 56% believe that that would be the case--perhaps suggesting adopters of emerging technologies assume that they are further ahead in the adoption curve than their counterparts.

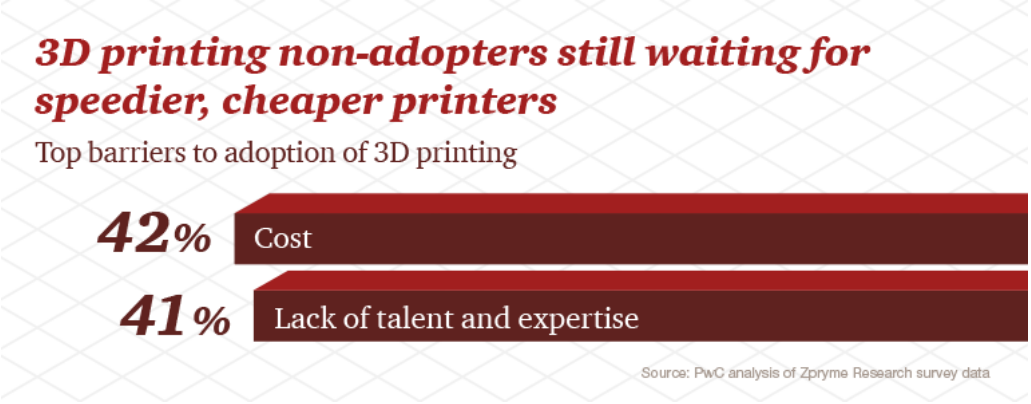


6. Cost and quality lead adoption barriers

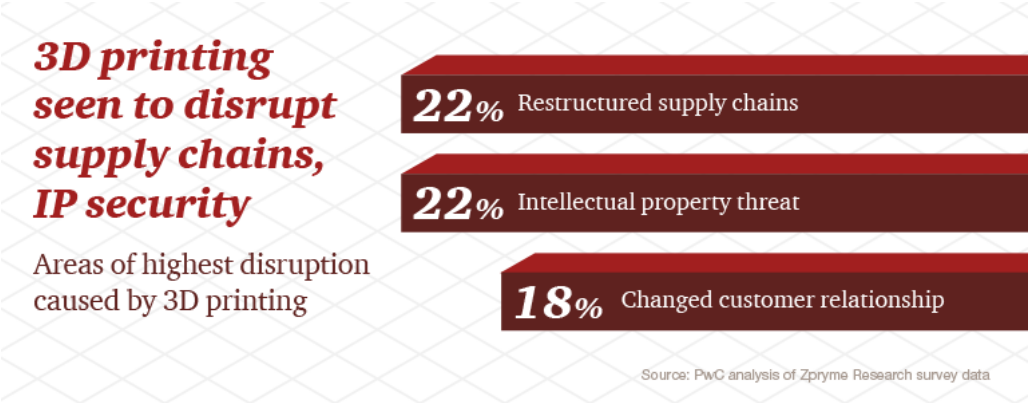
+ United States

The most commonly cited barriers to adopting 3D printing among manufacturers are cost and lack of talent and current expertise (41.3% and 42.1% respectively), followed by uncertainty of quality of the final product (33.1%) and printer speed (25.6%). [Note: survey participants could choose any barriers that applied them; therefore, percent totals of all choices add up to greater than 100%].

Interestingly, manufacturers from our 2014 survey cited quality of the final product by far as the greatest barrier (at 47%), followed by lack of talent and expertise to exploit the technology, followed by cost concerns.



7. 3D printing seen to disrupt supply chain, threaten intellectual property Manufacturers are equally split on what will be 3D printing's most disruptive effect, with 22% saying it will be in restructuring supply chains, and another 22% that it will be threats to intellectual property, and 18% believe that it will be changed relationships with customers. Two years ago, the stand-alone, number-one concern was supply chain disruption.



Previous reports on 3D printing

- 3D printing and the new shape of industrial manufacturing
- The road ahead for 3-D printers