3-D Printing Presses Ahead
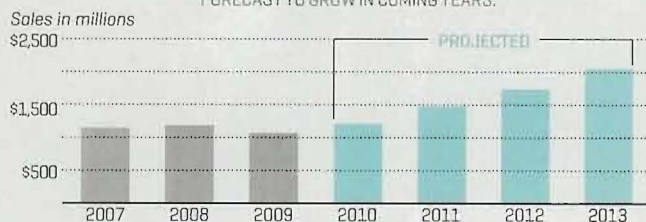
SALES OF 3-D PRINTERS, MATERIALS, AND RELATED SERVICES ARE FORECAST TO GROW IN COMING YEARS.

Sales in millions

PROJECTED

$2,500

$1,500

$500

2007 2008 2009 2010 2011 2012 2013

SOURCE: WOHLERS ASSOCIATES

Autodesk printed this sculpture, called "Metatron," based on a design by artist Bathsheba Grossman.

THE FUTURE IS NOW

Manufacturing 2.0

THREE-D PRINTERS ARE COMING TO A DESKTOP NEAR YOU. SHOULD DESIGNERS AND FACTORIES BE WORRIED?

By Johnny Ryan

Objet's Connex printers instantly make 3-D items.

THREE-DIMENSIONAL PRINTING IS pretty wacky sounding. Imagine hitting "print" on your home computer and instantly manufacturing any number of plastic, titanium, clay, or silicone objects—a pair of earrings, say, or a new toy for your kid.

Corporations already use 3-D printers to make product prototypes before embarking on mass manufacturing. Now a handful of technology companies, including HP and Google, are looking for ways to bring 3-D printing to consumers and small businesses—a trend that could have profound implications for manufacturing and design. Here's why: The blueprints or files for 3-D printing are digital and, as a result, can potentially be edited by anyone—if the designer permits.

Enthusiasts believe that such intense user input will lead to improved, more consumer-friendly products. A vibrant "crowdsource" community of designers already has formed around do-it-yourself 3-D printing—echoing the make-your-own-computer scene from the late 1970s that popularized the PC.

Brooklyn-based MakerBot Industries sells $1,300 3-D printer kits, and through its Thingiverse website lets would-be Ertés and Eameses share files of their designs. Google SketchUp, a free 3-D modeling program, also gives people the ability to design objects and share blueprints.

Of course, many artists might not appreciate tweaks and revisions to their designs by total strangers. And manufacturers fret about the potential for counterfeiting and intellectual-property theft that could accompany a proliferation of 3-D printers. In the very distant future, 3-D printers might make assembly lines obsolete for some objects (big, complex items, such as automobiles and televisions, not so much), but it could also allow an entrepreneur to sell goods without incurring upfront factory costs—he could simply send instructions to a customer's 3-D machine.

Some designers welcome the ongoing feedback that the web can offer. "It is without question a blessing: Crowdsourcing simply makes better designs," says Bathsheba Grossman, a Santa Cruz, Calif., sculptor who employs 3-D printing tools and has used audience feedback to modify her designs. "I live in Crowd World; it's been the making of me." Indeed, the noncommercial printable objects movement today is largely limited to toys and tchotchkes. Thingiverse's gallery of popular designs is a hodge-podge of robots, small appliances, and offbeat art.

Analysts predict that the 3-D printing phenomenon will soon move well beyond artists and tinkerers. Wohlers Associates, a Colorado research firm, predicts sales of 3-D equipment, materials, and services will grow from about $1.2 billion last year to $5.2 billion in 2020. HP, in partnership with Stratasys, an established maker of 3-D machines, recently started selling a desktop version for architects. "Three-D printing is already a game changer for professionals," says Carl Bass, CEO of Autodesk, which makes 3-D design software. "It will become a game changer for consumers." And if the collaborative spirit of the web prevails, it may change the game for many manufacturers and designers too. **⬛**

Johnny Ryan is the author of A History of the Internet and the Digital Future.