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A mini-robot business grows in Brooklyn

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Published: August 14, 2009 - 11:10 am

Do-it-yourself tech guru Bre Pettis has clung to his dream that people should be able to make whatever they want, so he designed and built a robot that creates plastic product models and parts on a small scale.

As a result, his desktop three-dimensional “printer” ended up becoming a business.

Makerbot Industries has only four full-time employees, but demand for its 3-D printer is so high that the fledgling company has moved from the self-styled “hacker collective” called NYC Resistor in downtown Brooklyn, where it was born, to a 4,700-square-foot industrial space several blocks away.

“Manufacturing is totally awesome, and more people should be doing it,” said the 37-year-old Mr. Pettis, co-founder of Makerbot and a major figure in the DIY (do-it-yourself) movement, which has been snowballing along with the growth of the Web and has enabled consumers to modify or build from scratch a wide array of everyday products.

In addition to the quarterly journal *Make* and such Web sites as instructables.com and lifehacker.com, the movement has annual fairs in Northern California and Austin, Texas that draw tens of thousands of DIY’ers.

The Makerbot “prints” three-dimensional plastic objects as big as 4 inches by 4 inches by 6 inches. Shoe manufacturers, automakers and architects are among the businesses that use 3-D printers. Prior to Makerbot, most 3-D printers cost between $25,000 and $250,000, but Mr. Pettis’ scaled-down bare-bones machine costs only $750.

Mr. Pettis believes it will usher in an era of “consumer manufacturing.” Thingiverse.com, a Web site Makerbot Industries created to showcase objects made with its device, offers free downloadable design files that allow people to make measuring spoons, bathtub plugs, a shot glass, camera lens hoods, tweezers and eyeglass frames, among other objects.

“When that little knob on your washing machine breaks, you’ll end up using a pair of pliers. But now you can take a measurement, make a model and print it out, and you’ll have a new washing machine knob,” said Mr. Pettis, who’s convinced that “people are going to build businesses on this machine.”

If the Makerbot is purchased in kit form, it has to be bolted together and some cables need to be plugged in. Users control the 3-D printer’s output via modeling files that can be purchased or are free that define the object’s dimensions. Coils of a spaghetti-like plastic are fed into the machine, which takes up a little more than a cubic foot on a desktop. The Makerbot currently uses two types of plastic: ABS, which is also used to make Legos, and HDPE, which is milk jug plastic. The company will soon offer coils of PLA, which is made from corn and is biodegradable.

So far, some 200 Makerbots have been sold. One was purchased by the Willoughby and Baltic Electronics Lab, a hacker/artist/inventor space in Boston. The lab expects to use its Makerbot to produce small parts for competitive robots called sumobots, according to its executive director, Meredith Garniss.

At fabbaloo.com, which tracks developments in 3-D printing and desktop manufacturing, the Makerbot has been hailed for “blowing open” the hobbyist end of the market.

Others are helping the Brooklyn startup gain attention. In June, Makerbot Industries was one of two local companies to win a free booth at the CES consumer technology trade show in Las Vegas early next year.

Mr. Pettis started Makerbot Industries with Zak Hoeken Smith and Adam Mayer, two other hackers/DIY makers from NYC Resistor. When the new company signed a lease for its manufacturing space, it was apparent that the landlord is a science fiction buff. A clause in

the lease requires that “all robots made in this space must follow Asimov’s three laws of robotics.” For those not familiar with the great sci-fi writer Isaac Asimov’s work, those strictures require that robots follow orders, refrain from injuring humans, and protect their own existence.

“We were rolling on the floor laughing,” says Mr. Pettis of the lease requirement.

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