Smaller, cheaper 3-D printer offers benefits for warfighter, commercial entities

U.S. Army

REDSTONE ARSENAL, Ala. (Nov. 7, 2012) -- The mission of U.S. Army Space and Missile Defense Command/Army Forces Strategic Command, or SMDC, engineers is to seek, develop and shape technology to benefit the American warfighter, and oftentimes those ideas can be applied to commercial applications as well.

A recent project being worked by SMDC's Future Warfare Center Innovative Ventures Office since mid-September is a smaller and cheaper 3-D printer than those currently available.

"The ability to replicate parts quickly and cheaply is a huge benefit to the warfighter," said D. Shannon Berry, operations research analyst with the Innovative Ventures Office. "Instead of needing a massive manufacturing logistics chain, a device that generates replacement parts is now small and light enough to be easily carried in a backpack or on a truck."

The printer was developed with the goal of a "3-D printer in every home."

"It's made from easily replicable parts in printed plastic and laser-cut wood, so the entry price is staggeringly low: $695 compared to more than $3,000 for comparable systems," Berry said. "Considering the calibration and attention to detail needed to operate it, I think it's still short of the idea of having one in every home, but that goal is definitely something achievable in the next 10 years."

According to Berry, creating low-cost replacement parts was central to the printer's purpose.

"We do a lot of work with space-borne sensors, and we use small airborne platforms as an inexpensive stand-in when we're experimenting," Berry said. "Parts for these systems break frequently, and many of them are produced overseas, so there's a long lead time for replacement parts. The concept was that a 3-D printer could replicate those parts with less overhead in terms of time and money."

As with much of the technology developed by government agencies, there are possible commercial applications for the printer as well.

"The impact is even more significant when you look at small business that have great concepts for physical systems that could benefit the warfighter, but they do not have the funds or support in the present acquisition environment to make that system a reality," Berry said. "The 3-D printer could strongly impact the acquisitions chain, offering the ability of rapid prototyping and low-cost initial operations capability to more development teams."

SMDC's engineers have already practically used the 3-D printer.

"We are honestly still working on calibrating and scaling production with our printer," Berry said. "However, to date, we have modeled and manufactured custom sensor housings and custom casings for control boards and other exposed electronics. The machine also has the ability to replicate its own parts, so we've used it the generate spares for itself."

Although this is not the first 3-D printer at SMDC, Berry said this one is significant because of its smaller size and reduced cost.

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