The New York Times
Bits The Business of Technology

APRIL 5, 2012, 3:15 PM

Pentagon Pushes Crowdsourced Manufacturing

By STEVE LOHR

Designing and building things for the United States military is a notoriously slow-moving and costly endeavor. The time from idea to manufacturing for a new armored personnel carrier or a tank is typically 10 to 20 years.

The Defense Advanced Research Projects Agency wants to change that, and drastically so. It seeks to cut the design-to-production cycle to two to four years.

So how are they going to do it? Crowdsourcing and prize contests are crucial ingredients in the speed-up recipe.

The crowdsourcing effort will rely on a software initiative, called Vehicleforge.mil, which will be a Web portal for gathering, sharing and testing ideas.

G.E. Research

Darpa, a government-sponsored research program, has enlisted scientists from the Georgia Tech Research Institute, Vanderbilt University, University of Pennsylvania, and a team from the Massachusetts Institute of Technology and General Electric. The work is getting under way in earnest now, with the first of three prize challenges scheduled for next year.

G.E.'s research arm announced its collaboration with M.I.T. on Thursday. Earlier in the week, researchers from the company, M.I.T. and the Pentagon agency, Darpa, discussed the project and its potential significance for the military and beyond.

The near-term target, they said, is to collaborate on a design for an amphibious vehicle for the Marines. The first contest, with a $1 million prize, is planned for early next year. It involves mobility and drive-train subsystems for the vehicle. Next, about six months later, will be the design for the chassis and other subsystems, a contest that will carry another $1 million prize.

In 2014, there will be a $2 million prize for the best design for an entire vehicle. Individuals, small teams and businesses and major defense contractors are welcome to compete and contribute, said Lt. Col. Nathan Wiedenman, a Darpa program manager. The goal, he said, is to "democratize the design process."

At G.E., the view extends well beyond military vehicles. "This is about changing the paradigm so you can rapidly design and manufacture complex systems of all kinds," said

Joseph Salvo, manager of the business integration technologies lab at G.E. Research. If successful, the approach could have a big impact on G.E., the nation's largest manufacturer of industrial equipment, including jet engines, power generators and diagnostic medical devices.

Crowdsourced software design, of course, is old hat. That is the open-source model that gave us the Linux operating system and the Apache Web server years ago.

But what is different about the Vehicleforge.mil project is that it is essentially a software "engine" that contributors use to plug in simulated components. Then, the new part or subsystem can be tested, virtually.

"You attach these simulation services to explore the behavior of complex systems," explained David R. Wallace, a professor of mechanical engineering at M.I.T. "That allows you to predict problems earlier to get a better design faster."

There are plenty of software simulation tools used in manufacturing. It is a niche industry — computer-aided design. But the software is often difficult to use and expensive, so mainly big companies use them.

The Vehicleforge.mil program, Dr. Wallace said, will allow solo inventors or small teams to tap into those capabilities. A vehicle body and chassis design, submitted as code, could be plugged into the Vehicleforge.mil platform and tested for aerodynamics by in a virtual wind tunnel, for example.

"The design models all hook up together," Dr. Wallace said. "It's an emergent way to design complex systems."