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High Tech Rochester opens prototype lab for client companies

3-D printers and other equipment enable entrepreneurs to transform an idea in their head to a prototype in their hand

If a picture is worth a thousand words, a three-dimensional prototype must be worth a million, especially when it comes to presenting an early iteration of a product or device to potential customers, partners, manufacturers and/or investors.

Now, clients of High Tech Rochester have a new and convenient way to produce early-stage prototypes: they can take advantage of the new HTR First Prototype Lab, which features 3-D printers, a 3-D scanner, a laser cutter, computer workstations, and a large assortment of hand tools.

The Lab is located at High Tech Rochester's Lennox Tech Enterprise Center in Henrietta.

As the name implies, the Lab's output is a three-dimensional prototype. While prototypes can be crafted from wood, metal, plastic and other materials using traditional hand tools, "printed prototypes" rely on a computerized design program that instructs a moveable printer head to literally "print" thin layers of polymer resin one on top of the next, an additive process that slowly builds a three-dimensional object.

The Lab enables entrepreneurs to take a major first step toward the commercialization of their products with the creation of an early prototype "that will greatly improve their ability to assess a product's usability and appeal to potential customers," says Lab director Mike Riedlinger, HTR's program manager of technology commercialization.

"Potential customers, investors and partners can hold a prototype in their hands and get a literal sense of how it will feel and work, which is far better than a written or spoken description, and much more realistic than a drawing," Riedlinger adds. "We can't overstate the importance of this step in the early development of a product or device: the better an entrepreneur can show and explain a product, even in its preliminary stages, the better the feedback, and a key to this step is a three-dimensional model or prototype."

Funded by a grant from the Max and Marion Farash Charitable Foundation, the Lab is available for use by HTR clients of the Lennox TEC and the Rochester BioVenture Center as well as by current HTR Entrepreneur Affiliates and current HTR Growth Services manufacturing clients. These clients might use the Lab to produce their original designs or, in the case of manufacturing clients, use the lab to augment their own 3-D printing and scanning capabilities when creating more complex prototypes.



Among the HTR clients with projects currently at the Lab are Thermal Gradient, Visron, Ovitz, LighTopTech and Healthcare Originals.

Users of the Lab will benefit from support from HTR's designer-in-residence, Ben Zombek, an accomplished industrial designer and president of BZ Design.

"Our 3-D printers are really desktop versions of larger scale industrial printers, but they serve the distinct purpose of creating an early prototype," says Zombek.

"The printers are quite economical to run, are very precise and can print from any number of CAD (computer-aided design) programs," he adds. "The output is a 3-D prototype, which becomes a brainstorming tool that the entrepreneur or inventor can really take advantage of."

The Lab's 3-D printers utilize various PLA and ABS polymer resins in the form of filaments on a reel or spool. The process is additive as the printer head, following precise specifications from the CAD program, flies back and forth applying 100 micron layers of the resin, one layer at a time, as the prototype takes shape. Given the layering process, it may take several hours or longer to create a prototype. The output can be solid or a shell and the resins are available in a wide variety of colors.

The printers can produce parts or assemblies of parts as large as 10" x 8" x 6". The various hand tools the Lab stocks are useful for putting parts together, cutting away excess material and other operations.

Users can develop their designs on the Lab's CAD programs or they can bring in their own finished program.

In addition to prompting insights into a product's usability and appeal from potential customers, a first prototype provides a baseline for manufacturing if the intent is toward mass production. Manufacturers can look at a prototype and begin to create the technical specs and cost estimates that go into an entrepreneur's business plan.

Next Steps Toward Commercialization

As an entrepreneur moves a product or device through its initial stages of development, more advanced prototypes are usually needed. When clients are at this stage, HTR can provide connections to its network of resources both locally and across the state, including in the private sector, such as Visron Design (an HTR graduate), BZ Design and academic resources such as the new Makers Lab being developed at RIT's Golisano Institute for Sustainability.

And to assist in design for manufacturing, and connections to supply chain or outsourced manufacturing partners, HTR's Growth Services team (affiliated with the NIST Manufacturing Extension Partnership) can provide consultation and connections to ensure a smooth ramp up of production.

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