

Above and Beyond the Floor Plan

Andrew Chary Architect uses 3D printing to create intricate models that have his clients beaming.

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Andrew Chary knew a 3D printer was in his future the minute he saw the intricately detailed models at an ArchiCAD seminar in 2007. The principal of [Andrew Chary Architect](#), a high-end custom residential home designer in upstate New York, recalled how the 3D-printed models conveyed every aspect of the home design, down to the brick and roofing materials.

Chary has owned his Z Corp. Z450 3D printer for a year now. Using a CAD file as its guide, the machine generates full-color 3D models in a high-performance composite material, building layer by layer. The maximum finished model size is 8" x 10" x 8". Chary chose the Z450 because it is fast, self-contained, and office friendly, he said. "It doesn't require a special room or special equipment. It's like a big copier."



A cutaway model of a cabin by Andrew Chary Architect shows precise detail of a stone fireplace, wood paneling and floors, a beamed ceiling, and windows, all produced in full color using the Z Corp. Z450 3D printer.

The firm uses the Z450 to create partial and full models of all types, including homes, outbuildings, and site master plans with land contours. Architects take 3D models of project variations to meetings with clients and public officials. "You always have a holistic view of the plan, Chary said.

A Machine to Call Your Own

3D printing service bureaus are sprouting up around the country as the technology grows in popularity -- many offering 24-hour turnaround. For Chary, however, using a service bureau wasn't an option.

Having a 3D printer in-house offers fast results for the firm and instant gratification for clients, Chary said. Plans are constantly evolving architects are continuously enhancing and updating designs, and

the in-house machine can produce an updated model in mere hours. "I'm thrilled to have the ability to turn out models rapidly," Chary said.



Having a Z Corp. Z450 3D printer in house is a big plus for Andrew Chary Architect.

Once a client sees a model, "we usually get client feedback in a day or so," he said, and recalled a time last year when the firm presented a model to a Lake Placid municipal review board and received rapid approval of a project proposal. Overall, Chary believes the 3D printer pays for itself in the credibility it brings the firm, the increased sales, and more.

The only time-consuming part of the process is preparing CAD files for the 3D printer, Chary reports. Perfecting textures and complex products such as windows, beams, planks, and shingles requires some time and effort.

Tangible Satisfaction

The advent of 3D visualization software was a giant step for architectural firms: "That was awesome," Chary said. But they soon realized that many clients don't fully understand what they are seeing in an on-screen walkthrough. For example, Chary explained, "The software doesn't convey perspective, such as the

relative size and locations of rooms. The walkthroughs don't excite clients. Models do.

"Holding a model in your hand, there's a light bulb that goes off. It's almost like a fourth dimension -- you see things better when you hold it in your hands, turn it around and upside down. It's a whole new perspective. People are extremely surprised to see the models [of their projects]," Chary said. "They light up like it's a toy.

"Now the client is all of a sudden in control." Chary says seeing the 3D-printed model "results in intelligent questions and an understanding of the design that is gratifying." Builders also respond to seeing the connections in a model, Chary said. "It excites them and gives them confidence."

The fact that the Z450 can add annotations to a model such as text, arrows, and texture maps has led to another perk that delights Chary clients: seeing their name emblazoned on a model of their home to be.



Chary knows that in the world of 3D printing, he's a leader among AEC firms. "We went to a Z Corp. user group meeting and found out we were one of only a few architecture firms using a 3D

A 3D-printed model of a boathouse by Andrew Chary Architect includes annotations showing direction, scale, and the project name. printer throughout the entire design process," he recalled -- for uses including master planning and site adjacency to opening model of a house including windows, furniture, etc. Architects even use the models in-house for roof checking. "They offer an overview that's not possible on a computer screen," Chary said. "We even use [the 3D printer] for problem solving, using the model to represent the existing structure and clay to explore possible solutions."

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