

White paper

Using color 3D printed models to improve presentation outcomes



Introduction

Forget words. Forget pictures. Forget videos. A 3D presentation model can often be the best way to introduce a new idea or tackle a complex problem. Tangible, physical models can facilitate higher levels of understanding, and in turn, lead to successful outcomes.

Traditionally, 3D printing has been a popular medium for producing presentation models due to its ability to produce geometrically complex and relatively affordable parts in a short period of time. Although the majority of 3D printer users only print in one color—black or white—those who do 3D print full color models or opt to paint their monochrome 3D models have seen a profound impact. The addition of color enhances the informational and emotional significance of presentation models and can lead to more business and better solutions.

Recently, there has been a surge of interest in color 3D printing, in part due to new product launches, like the [HP Jet Fusion 580 Color 3D printer](#), which can print functional parts in full color. With the introduction of these new solutions and the democratization of full color 3D printing, organizations from across all sectors should be empowered to produce models that will wow audiences and lead to positive outcomes.



How architecture firms use models to win business

There has been a resurgence in demand for physical architectural models, according to Joey Skinner, COO of WhiteClouds, a service bureau that specializes in 3D printing color models.

“They are a people magnet—whether it’s used to win new business or as a sales tool or just as a display,” said Skinner. **“People love looking at their own miniature neighborhood.”**

When 3D printing architectural models in color, it is easy to capture small details and provide a more holistic view of the final product. Computer renderings often don’t satisfy customers’ demand for a complete picture of the product and monochrome models lack realism, Skinner explained.

Furthermore, these 3D printed models often have multiple uses.

“With our color models, construction firms win contracts, architects get design approval, and sales offices sell, for example, new units in an apartment complex,” Skinner said. **“They are even used to gain community support for new developments.”**

At Rios Clementi Hale Studios (RCH Studios), a multi-disciplinary design firm that specializes in architecture, urban planning, and graphic, interior, exhibit, and product design, color models are also a fundamental part of the design process.

“A 3D model is easier for people to understand than any other medium,” said Clancy Pearson, senior associate and director of design technology at RCH. **“Seeing the different textures and color helps people understand the project.”**

Currently, RCH paints monochrome 3D-printed parts to add color to its models. However, Pearson sees a strong use for 3D printing in color—it could save time and the color won’t chip.

In the future, RCH expects to ramp up its production of color 3D models.

“Creating color models has always been a worthwhile investment—we would never not add color,” Pearson said. **“Our models always wow the customer.”**

How product models impress customers

Similar to architectural models, product models can be a central part of a company’s design and sales process. Those who produce product models say that 3D printing, especially in color, can help them save time and money and help them win more business.

“There is a cool factor to having a realistic color 3D product model,” said Skinner of WhiteClouds, which also counts producing product models as a core element of its business. **“At trade shows, it brings people into exhibits.”**

On the other hand, inside of design firms like notNeutral—RCH Studio’s product design branch, which produces a variety of drinkware—3D printed models are used as tools to present design ideas.

With color 3D printing, Pearson explained that designers could experiment with different final colors of products like coffee cups. Designers could print representative cups in a matter of hours instead of ordering a sample from a factory, which would take weeks. Finally, when the design is finished, the 3D sample could be given to the end customer as an artifact of the design process.

“Customers love to keep samples like these,” Pearson said. “Seeing the product with color adds a whole new dimension of value.”

How medical models are used to solve problems and improve experiences

At hospitals, 3D models are used as communication aids. Teams of doctors discuss and study models of their patients’ organs to determine the best medical solutions and then use these models to explain procedures to patients.

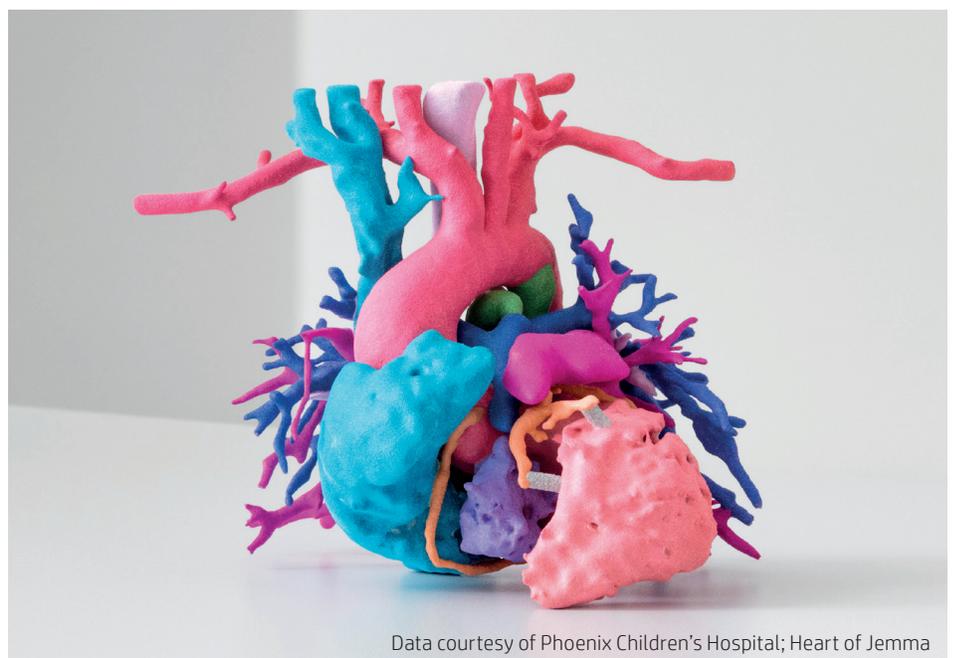
In many ways, 3D printing is an ideal solution for producing medical models since they are complex, unique to each patient, and needed within a short time frame. Often, models need to be created and studied within a few hours of surgery.

At Phoenix Children’s Hospital, adding color to 3D printed models is essential. By color-coding organs, ventricles, and blood vessels, it is significantly easier to communicate, explained Justin Ryan, PhD, a research scientist leading the hospital’s Cardiac 3D Print Lab.

In fact, a team of clinical educators in Phoenix created a specific color-coding system for their 3D models, the majority of which are hearts of infants or young children. Blue shades represent vessels that are supposed to be on the right side of the heart while red shades are supposed to be on the left side of the heart. Green represents anything that should not be in the area at all.

These color 3D models have proven to be incredibly valuable to families trying to understand the complexity of their children’s conditions.

“We see color 3D models playing a huge role with families, helping them make sense of extremely complex medical jargon,” said Ryan. “And patients’ families have really embraced 3D printing technology. We have a Foundation group here—Heart Effect—which raised \$40,000 so more patients can get 3D models of their hearts printed.”



Data courtesy of Phoenix Children’s Hospital; Heart of Jemma

3D models at Phoenix Children's Hospital are also used in surgical consults, where they are passed between about 20 doctors who use them to discuss different surgical procedures. Having a physical model that the doctors can reference is critical to ensuring everyone in the room understands each proposal. These planning discussions with 3D models have been shown to save money and time in the operating room.

“Surgeons who use our 3D printed models to prepare for complex cases have been shown to save as much as 90 minutes in the operating room,” Ryan said. **“With each minute of operating room time costing potentially more than \$100, the impact of these models is significant.”**

In the future, Ryan expects to see more hospitals using color 3D printing. Right now, children's hospitals have a strong use case for 3D printing since children's organs are small and it can be hard to decipher details. However, he also sees 3D models soon being used more frequently with adult patients, for example, to investigate systematic heart failure.

Summary

Adding color to presentation models is adding value to presentation models.

With HP Jet Fusion Color 3D printers, the ability to print strong, functional full-color parts in a fraction of the time¹ is now at the fingertips of creators across the world. We can't wait to see their ideas.

Connect with an HP 3D Printing expert or sign up for the latest news about HP Jet Fusion Color 3D Printing at

hp.com/go/Color3DPrint

Learn more about HP Multi Jet Fusion technology at

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¹ Based on internal and third-party testing for HP Jet Fusion 580 and 540 3D Printers, printing and cooling time is a fraction of the time of the printing times of comparable plastic fused deposition modeling (FDM), stereolithography (SLA), and material jetting solutions from \$20,000 USD to \$120,000 USD on market as of June, 2017. Testing variables for the HP Jet Fusion 580 3D Printer: Part quantity: 1 full build chamber of parts from HP Jet Fusion 3D at 10% of packing density versus same number of parts on above-mentioned competitive devices; Part size: 30 cm³; Layer thickness: .08 mm/0.003 inches. Competitor testing variables are comparable.

