Challenging Reality: The Shift from Physical to Virtual
A closer look at the virtual revolution

We've come a long way since the early days of virtual reality, when computer-generated imagery (CGI) was used in science fiction thrillers to visualize the future of mankind. George Lucas and company first used an animated 3-D wireframe graphic back in 1977 in Star Wars: Episode IV. Today, 3-D wireframes are not only used in film, but have become effective in product design for everything from automobiles and airplanes to cell phones and gym shoes. Virtual reality has truly become a reality.

The design industry has experienced a process shift that was unimaginable until recently. CGI and virtual design now play a key role in the development of many materials, processes and products. Various industry sectors have adopted CGI technology to improve the entire product lifecycle, from the initial concept/design and development phase through marketing and sales. Fantasy now becomes reality in a cost-efficient and time-saving manner with the help of virtual reality.

RTT USA, Inc. (rttusa.com) utilizes the power of computer-generated visualization to help designers and marketers challenge the boundaries of reality. RTT doesn’t simply sell boxed software, and its capabilities go far beyond a 3-D render house. RTT’s solutions are supported by industry experts who help tailor and implement their products specifically to each client’s needs.

CHANGING THE TRADITIONAL MINDSET
RTT’s proprietary software, RTT DeltaGen, creates product prototypes using computer-generated virtual reality and the manufacturer’s engineering data. This process is referred to as virtual prototyping. Product images are created in real time with staggering realism so designers can change a product’s look, feel, orientation and materials instantly, eliminating the need to create various physical prototypes.

Not only does virtual prototyping save valuable time and money, it also helps designers reduce a product’s carbon footprint. CGI single-image rendering can give designers a pre-produced view of something, RTT’s real time visualization technology provides a full, live experience from any angle and with various color/material options.

A second component of RTT’s services is virtual marketing. Images created by virtual prototyping provide marketing departments with a wide range of creative freedom before the actual product is ever manufactured.

“Products that are highly customizable, such as furniture, can look completely different based on variables like fabrics and finishes,” says Kieron Bux, Director of Business Development for RTT’s architecture and design division. “It’s difficult to visualize the final product just by looking at a demo swatch. We enable visual communication with precise realism so companies can communicate exactly what their product will look like to the consumer before it’s sold. There is less room for misinterpretation with this type of clear-cut visual communication.”

The possibilities are endless. Product showrooms with limited space can now use virtual configurators that showcase every possible variable – and all that’s needed is a computer and a screen to bring these products to life.

THE EARLY ADOPTERS
There have been various early adopters of the shift from costly and time-consuming physical prototypes to the more cost-efficient, sustainable and time-saving virtual prototypes. This transition has proved successful in the automotive, consumer goods and apparel industries.

RTT DeltaGen was mainly responsible for helping a transportation manufacturer avoid a $1 million mistake. Product engineers suggested a door redesign, but when the manufacturer used RTT DeltaGen to build a virtual prototype it became apparent that the door would not open correctly if built as designed. Had the physical prototype been built...
without the virtual representation, it would have resulted in a total of 11 errors at a cost of $120,000 per error.

On the consumer goods side, RTT collaborates with Eastman to create virtual prototypes for consumer electronics concepts. Eastman has utilized RTT DeltaGen to bring a Glow Phone concept from sketch phase into 3-D. Eastman plans to use the concept from sketch phase into 3-D objects, providing these companies with a competitive edge.

One tool that RTT’s material team uses to speed up the material sampling process is Live Texture Capturing, which provides a live video feed that automatically assigns materials placed under a camera lens to virtual 3-D forms. This enables designers to quickly visualize how a material will ultimately appear on a product. If it’s not the desired look, the designer can try different materials until the perfect match is found. This saves time and money and allows the designer to explore and examine hundreds of options before making a final choice.

Recent success in automotive interior prototyping has sparked interest from other industries, such as footwear and apparel. Faced with increasingly shorter time-to-market deadlines, these companies are required to make faster decisions about the final product design. RTT’s virtual material solutions have given designers the ability to accurately and quickly visualize different materials on 3-D objects, providing these companies with a competitive edge.

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RTT’s latest Web-based software package allows companies to apply virtual materials to their products in a Web environment. Companies can save several million dollars per year and minimize their environmental footprint by reducing or eliminating the manufacturing of materials samples/demo swatches and replacing them with virtual samples. This software enables companies to select the correct material asset by simply testing material shaders virtually using any Web browser that is Mac- or PC-compatible. In addition to the software, RTT’s experts provide strategic counsel and customized training to facilitate the move from a physical to virtual material process.

RTT’s materials team has partnered with Art Center College of Design’s Color, Materials and Trend Exploration Laboratory (CMTEL) to produce Material Intersections (accd-cmotel.com/vcmotel.html), a podcast series that connects the tactile and technical worlds in an aspiring narrative format to promote advanced thinking in material applications. The short video productions focus on a different material trend each month. The inaugural podcast examined how materials interact with light and human touch. Other topics have included materials re-imagined, artisanship, smart materials and adaptive environments.

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This new virtual process is a critical component of today’s product design process.

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Innovation Lab Web site at innovationlab.eastman.com/InnovationLab/materials/Tritan. Manufacturers of consumer products, such as apparel and footwear, design dozens of products each day. Traditionally, designs are often sent offshore where dozens of prototypes are built and sent back to the manufacturer’s facility. This multiple-week lag time means that by the time the designers are able to see their work, they have likely moved on to new concepts. This process is completely reversed with RTT’s software because it allows immediate feedback.

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Materials: The Common Denominator

While the end products created across a wide spectrum of industries may differ, the one common thread that links all industries is materials. Many designers are adopting virtual techniques to experiment with different materials to improve a product’s quality and appeal.

“Materials must be sustainable in design, manufacturing, usage and recycling,” Bux says. “Virtual prototyping conserves valuable resources and promotes the importance of sustainability, a critical component of today’s product design process.”

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Adapted as an exercise by Ely Padilla, Manager of Education Services, IIDA

exercise:
1) What is CGI and how does it relate to interior space?
2) How can designers benefit from virtual prototyping?
3) Name three virtual prototype early adopter categories.
4) What is live texture capturing?
5) List three benefits of creating virtual materials without having to produce physical material samples.

After reading this article you will be aware of:
• How technological advances are used to promote sustainability in the development process of materials and products.
• The concepts of computer generated imagery, virtual prototyping, live texture capturing and material intersections.
• How to save time, money and costly mistakes.

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