3-D software key to designing many of today's consumer products

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While developing an electric bicycle for his San Rafael, Calif., company, Marcus Hays had planned to insert a battery into one of the bike's supporting tubes. But then he did an analysis of his concept with three-dimensional computer-aided design software.

The technology revealed another way the bike could be built.

"We learned that if we changed the shape of the tube slightly, literally by a half an inch in one direction, we were able to reduce the cost of our goods by approximately $350,000 dollars in the first 100 bikes," said the 53-year-old founder of Pi Mobility.

In years past, anyone designing a new product had to laboriously draw their idea on paper and then erase their work or start all over on another sheet if their boss or some customer insisted on a last-minute alteration.

But that has changed with the advent of three-dimensional computer-aided design software. Used for everything from guitars, cars, toys and furniture to houses, electronic gadgets, candy bars and clothing, 3-D CAD technology allows products to be sketched out and easily modified in stunning displays that can be tilted, spun around, flipped over and viewed in countless ways.

As a result, the task of making many products has become more efficient, less expensive and quicker than ever before, according to those who use the technology. Moreover, they say, because of the software's

growing adoption by businesses, store shelves in the future will be filled with an increasing variety of new merchandise.

"The consumer will benefit definitely from this," predicted Nicholas Talesfore, who uses the technology at his Campbell, Calif., company, ID-3D Design, to help others create items for sale. But "the downside," he added, is there are going to be a lot of obsolete products, because newer products will come out every six months or three months."

Although 3-D CAD has been around for half a century, its use has exploded as the technology has improved. Just about every type of consumer industry employs it today, from makers of luxury yachts to golf clubs to health products. San Jose, Calif.-based Align Technology, for example, says its technology can create 3-D digital images of patients' teeth, which then can be turned into veneers, inlays, crowns and bridges.

With 3-D software, instead of having to erase or redraw product concepts when adjustments are required, alterations can simply be plugged into the computer, which instantly displays the new version on its screen. That lets designers not only experiment with different colors, textures and shapes, but also substitute parts or add features to the model, and see the changes automatically reflected in every view they look at.

With a click of a mouse, they also take a virtual trip inside the proposed product to examine its components in detail, run simulated stress tests to determine how well it would hold up in actual use, and even get color-coded warnings about parts that wouldn't fit together if the item was built according to its blueprint.

The software also enables product designs to be displayed on Internet sites or sent via mobile devices to others in the business for their

suggestions. The same approach can be used to lure buyers, since products depicted in 3-D tend to be far more impressive than those shown in a two-dimensional image.

Hays of Pi Mobility set up a Web page where potential customers could check out a 3-D representation of his electric bicycle, which sells for $3,995 to $8,995.

"It helped enormously," he said, noting that he's sold several hundred bikes so far.

"It enables you to get a look at a product in the very early design process," added Anye Spivey, CEO of Lion Hound Technology in Oakland, Calif., which used the services of ID-3D Design to create a Bluetooth iPod nano watch case that fits on a person's wrist so they can listen to music while exercising without getting tangled up in headset wires. "And when you are selling an idea to investors, that is a critical component."

In this social media era, soliciting opinions about product designs is bound to become much more common, predicted Keith Perrin, senior manager for manufacturing at Autodesk, a San Rafael company that provided the 3-D CAD software used by Pi Mobility.

"In the next couple of years, you are going to see a massive change in the way people share information," he said. "It's going to turn into more of a tribal thing, where I ask others, 'What do you think of my design?' The younger generation expects that sort of collaboration."

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