

# BUSINESS 2.0

PAGE 42 • JULY 2007

## IS IT REAL, OR IS IT AUTODESK?

TODAY'S 3-D DESIGN SOFTWARE IS SO TRUE TO LIFE THAT ENGINEERS CAN SEE HOW THEIR PRODUCTS WORK EVEN BEFORE THEY START TO BUILD THEM. **BY KHARI JOHNSON**

**D**ON GRADIN DISASSEMBLES, upgrades, and rebuilds escalators for Kone, the giant Finnish manufacturer of people-moving machinery. He compares the laborious process of fitting the new escalator parts into the old frames to assembling a 4,500-piece metal jigsaw puzzle. It used to take him a year. Now it takes just 12 weeks.

Why the dramatic improvement? Gradin attributes it to virtual-prototyping software that allows his team to build 3-D replicas of their escalators and quickly test how the new parts will mesh with the existing mechanism. "It's basically taking the body off a car's chassis and replacing everything else," Gradin says. The software that lets him plan and troubleshoot his projects in advance is, as far as he's concerned, "life changing."

Welcome to the cutting edge of product design. At its heart is the same kind of computer programs that architects and industrial designers have used for years to create 3-D models of their projects. But a new generation of software has added physical dimensions such as mass, friction, and tensile strength so designers can see not just what their projects will look like but how they will actually work.

The competition for virtual-prototyping software has been heating up for some time. Companies like Dassault Systems were first to the stage, offering industrial-strength programs that were expensive (a single copy of Dassault's CATIA cost \$19,000 in

### PEOPLE MOVER

Kone has retrofitted escalators for Trump Tower in New York, O'Hare Airport in Chicago, and the Moscone Center in San Francisco.

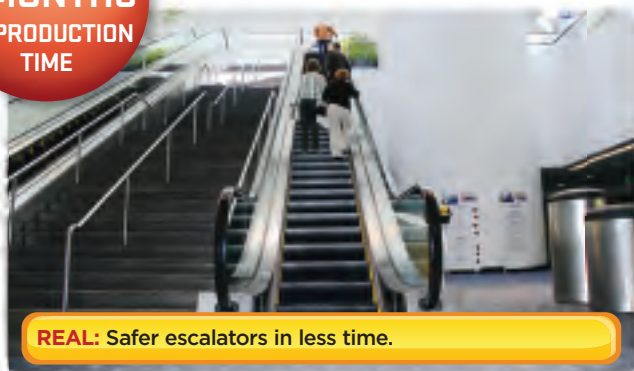
**AUTODESK:** Catches mistakes earlier in the process, likened to assembling a 4,500-piece jigsaw puzzle.

New components must fit into the existing structure.



**SAVINGS:**

**9 MONTHS  
OF PRODUCTION  
TIME**



**REAL:** Safer escalators in less time.

1998) and hard to use. But it was Autodesk, the San Rafael, Calif., company whose PC-based AutoCAD programs have long dominated 2-D drafting, that finally broke the market open. Not only does Autodesk's \$5,300 Inventor software cost a fraction of earlier programs, but it's packed with convenient features and is considerably easier to use. For example, designers can now make click-and-drag changes to the core dimensions of an object and redraw the screen; in older programs they would have had to start over.

For Autodesk, a \$1.8 billion company, the virtual-prototyping market represents a rich opportunity. Just one in 10 Autodesk customers now uses 3-D, but it's one of the fastest-growing product types, with revenue increasing at more than 20 percent a year. "It used to be that 2-D was the way to communicate,"

## WAVE CUTTER

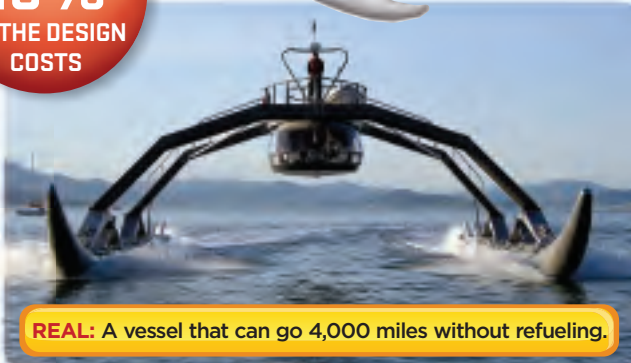
The Proteus uses jet engines and a catamaran design to skip over the waves.

**AUTODESK:** Tests the interaction between the springs and hulls before the first boat hits the water.

Springs at the ends of the two arches are attached to inflatable pontoons.

SAVINGS:

**10%**  
OF THE DESIGN  
COSTS



**REAL:** A vessel that can go 4,000 miles without refueling.

## SPEED DEMON

California-style mountain and street models from Marin Bikes are sold by mom-and-pop stores around the world.

**AUTODESK:** Tracks 40 precisely calibrated components of the frame.

The frame and its swing arm must interact properly while the bike is in motion.

SAVINGS:

**4**  
PROTOTYPE  
STAGES



**REAL:** No physical prototypes required for the Quad XC mountain bike series.

FROM LEFT: COURTESY OF MARINE ADVANCED RESEARCH AND MARIN BIKES

says Autodesk CEO Carl Bass. "You design something, make a blueprint, and give it to somebody to create. 3-D models make for much more effective design, engineering, and communication."

That's what Ugo Conti experienced when his company, Marine Advanced Research, used Autodesk's Inventor to prototype his so-called spider boat. Conti's designers were able to fine-tune his vision of Proteus, a catamaran that glides on the water's surface rather than forcing its way through the surf. The digital prototype they created assured them that springs in the boat's frame would allow it to bend properly as the twin hulls skipped across the water. Only a prototype of the boat has been built, but Conti tested it near Orcas Island, Wash., earlier this year and reports that the digital versions of Proteus compared well with the physical boat. Results of his tests indicate

that the finished version should be able to travel more than 4,000 miles—roughly the distance from New York to Stockholm—without refueling.

For Marin Bikes, a bicycle design and manufacturing company in Novato, Calif., virtual prototyping has dramatically increased the rate at which it introduces new models. Jason Faircloth, the product manager and designer for Marin, says that since the company started using 3-D testing software two years ago, it's gone from releasing three new bikes a year to as many as 24. The frame design process that once involved up to six physical prototypes now requires only one or two. The models may be virtual, but that's the sort of time savings that translates into real money. ■

*Khari Johnson (kjohnson@business2.com) is an editorial intern at Business 2.0.*