

Chavant News

Clay modelers survive into the digital age

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Automotive News

June 4, 2001

Call it a modern-day Renaissance.

Four years ago, Victor Simney was living the tranquil life of a retired clay designer in Pompano Beach, Fla. Then his family asked him to return to Michigan.

Simney agreed, on the condition that he be allowed to work and stay productive.

It didn't take him long to find a job. At the age of 79, he joined Hawtal Whiting, a provider of product development services for automakers. For the next two years, the octogenarian was assigned to the General Motors Technical Center in Warren. His design career, which began at Studebaker in 1946 and ended at Chrysler in 1979, served him well in his new job: teaching young designers the art of clay modeling.

Twenty years ago, it looked as if the clay modeler would soon go the way of the dinosaur. Computer-aided design was taking off. Corporate bosses saw technology as a way to shorter design lead times and smaller payrolls. Acquisition of computer design tools increased, and the new skills began to be taught at design schools in California, Michigan and Europe. As the work force skilled in manipulating clay aged, early retirement was encouraged.

Now, the scenario is different. Jack North, a principal at Chavant Inc. in Red Bank, N.J., the leading supplier of modeling clay for the automotive industry, says, "For the past year or two, there haven't been enough modelers to go around." He also has enjoyed a "nice resurgence" in sales of clay, he says. It helps to have some staunch supporters in the design world.

Ian Callum, director of design for both Jaguar and Aston Martin, says, "I will support clay as long as I am a designer."

Mazda designer Mark Jordan believes "a good modeler is just as important as a designer."

Age of clay

Why clay won't go away

Many designers are loath to give up the creative benefits of full-sized clay models.

The malleable models:

- Offer 3 dimensions, providing better visuals than 2-D screens
- Can be painted and detailed to look like a finished vehicle
- Can be evaluated in sunlight for real-world effects of shape, color and shadow
- Can be revised in minutes by adding or subtracting material
- Provide the means to fine-tune design by hand and eye



A worker crafts a clay model of the BMW X coupe. The concept, a smaller, more sports-car-like version of the X5 sport wagon, was unveiled at the Detroit auto show in

Clay has been used in commercial modeling for more than a century. Its roots in automotive design are a little less clear. Harley Earl, General Motors' first styling boss, is believed to have introduced the medium to the automaker in the late 1920s. Before mass production, it still was feasible to go from renderings into the full-sized metal body. If the proportions weren't quite right when a design took three-dimensional shape, the body craftsman would modify it. But with the move from composite wood-steel bodies to all-steel bodies, the industry needed a way to evaluate and perfect a concept before commissioning costly tooling.

From the 1930s into the 1980s, it was common for a designer to sketch rough concepts. Some of those would be developed into detailed renderings. The best renderings would then be turned into scale models, followed by a full-sized model.

Though wood, plaster, foam or epowood could be used for modeling, clay was the most popular. It was easy to work, and changes could be added in minutes. When complete, it could be painted and detailed to look exactly like a finished car. The drawback was time. Starting with a bare armature, a full-sized clay model could easily take four weeks to develop.

CAD technology promised to speed the process from concept to prototype. The theory was that designs would take shape on a monitor and then would be projected for presentation purposes. But, says Ken Kiyouki Okuyama, director of the Art Center School of Design in Pasadena, Calif., designers soon discovered that "visually, it's much better to see the model in three dimensions (than on a two-dimensional screen)."

"It can be painted and shown to top management for the decision-making process," he says.

"We're not selling sketches to customers; we're selling cars. The translation of the 2-D property into 3-D is extremely important, and there are no short cuts. When you're going to spend so much in product development and production, it doesn't make sense to cut the corners."

Striking a balance

Still, design organizations have found ways to streamline the design process by combining the best attributes of CAD and manual modeling. At Ford Motor Co., most designs start by hand on paper. If the concept has merit, it is developed on a screen using a design program called Alias. Once on the screen, the sketch can be easily modified.

Much of the design development at Toyota also is done on the "tube," says Kevin Hunter, vice president of design at Caltly Design Research Inc., Toyota's design studio in Newport Beach, Calif. The first full-sized clay model is started digitally, with math data from the computer model, on a milling machine. With the computer-milled model, weeks of effort and hundreds of hours of skilled labor can

January.



A Mazda modeler works on a roadster; company designer Mark Jordan believes "a good modeler is just as important as a designer."



A modeler for the GM design staff plys his trade; Chuck Jordan, the former GM design chief, says he can tell on sight if a design has been primarily digital.

be saved.

But that's only a starting point.

Mazda's Jordan says "even if you're totally digital, you need that craftsmanship and human-hand touch to get the right finishing" on the clay model. Alias, he says, can't do it. "In our studio, it's really important that the designer has a chance to get in on the model and give it the finesse he wants," he says. "Then the modeler goes in and cleans it up."

That cleaning up process is particularly important to Toyota's Hunter. "What we see on the tube is quite different when you mill," he says. "Typically, we find it better to fine-tune by hand and eye in a 3-D model."

Styling bosses such as Ed Golden, Ford's director of design, agree that "a good designer and a good clay modeler form a synergy."

Golden sees some real areas of strength for CAD techniques to be used alongside the old tools of paper and clay.

Designs are started on paper, but the chain of communication is electronic, he says. The engineering group sends parameters — measurements and coordinates of the package. Once a design is fairly well developed, Golden says milling is used to block in the hard points that must be plotted mathematically in order to gather key engineering data that can be reverse-engineered by scanning the clay. Using the electronic information pulled from the clay, the master model that is so essential to tooling up for a new car can be milled out of a synthetic material known as epowood. This process would take skilled production engineers and modelers hundreds of hours. It can be done on a mill in a fraction of the time — and more accurately.

For other aspects of design, short cuts can work. Golden cites the creation of a wheel, an assembly of different sections of a pie. Once you've done one segment, you just press a button," he says. The result: a complete wheel design and many hours saved for a sculptor.

Strictly digital

At Volvo, clay plays virtually no role. The company started its involvement with Alias and Silicon Graphics Inc. in the mid-1980s and helped to develop the modern CAD tools so many studios use to at least a small degree. But where most design organizations use CAD methodology as one of many tools, at Volvo studios in Europe and the United States, CAD takes precedence. A design is started either as a sketch on paper or on computer, before being rough-modeled in Alias. Then the concept is reviewed as a virtual model before being milled as a scale foam model. Once the design is considered developed, it is milled as a full-scale model for review by senior executives.

Digital design apparently hasn't hurt. Volvo's new cars are as attractive as they've been in almost 40 years. According to Geza Loczi, director of design, and Doug Frasher, strategic design chief, at the Volvo Monitoring and Concept Center in Camarillo, Calif., the key is that they use designers to formulate models. At most companies, Alias technicians replace clay modelers.

Still, the art of clay is viewed as important. "The way we develop surfaces on a computer is the same way we do it on clay models," Frasher says. "It is important that young designers are able to build a clay model; developing a surface by the old methodology is a fundamental principle of design." In the

end, say the Volvo designers, the computer is just a tool. “It simply allows you to duplicate what you have in your mind,” Frasher says.

Still, the Volvo designers say, there’s one stage with clay where corners can’t be cut. Enough time must be allowed to review a virtual model. “People will probably walk around a physical model for two or three hours,” Loczi says. “With a computer, they expect they will ‘get it’ immediately. But you have to spend the same amount of time looking at the tube.”

Future of clay

Chuck Jordan, the former GM design chief, says he can tell the difference on sight. To him, certain designs that are known to have been primarily digital, such as some recent GM concept cars and the Pontiac Aztek, look as if “there’s been a step left out.” In contrast, Jordan says, Chrysler “surfaces are just beautiful. “They must have the most talented clay modelers in the world,” he says.

For now, clay modeling is very much a part of car design. Ford’s Golden predicts the clay age won’t last forever, though. “The day will come when we’re doing much more CAD, but it’s just not here yet,” he says. “That day will come when talented sculptors can work as well on a computer as they can on a three-dimensional form.”

Vic Simney, meanwhile, has moved on to a new job. At 83, he’s designing special-effects packages for the Ford Expedition at Blue Dot Design and Blue Dot Fusion LLC in Livonia, Mich.

“I only work in clay,” he says. “I think the field is quite a long ways off from relying on a computer.”

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