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Improves Product
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A modeling tool combined with Internet communications and RP transforms the way one company develops products.

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Few, if any, industries operate under greater time and cost pressure than promotional toy makers. These companies usually have only a couple of months to design and manufacture toys that must meet rigid safety restrictions, demanding licensor approval standards and very low-cost targets. Additionally, the manufacturing volumes of these products can be huge — often tens of millions of pieces — while production line times must stay short.

Understandably, promotional companies are always looking for the means to improve their product development process. Los Angeles-based **Equity Marketing** — a leading developer of promotional toys — has found such an edge in a new computer modeling tool called the FreeForm modeling system from **SensAble Technologies** (Woburn, MA) — a modeler manufacturer. Equity has combined FreeForm modeling with standard Internet communications technologies and rapid prototyping to transform the way it develops products. This new, digital process slashes cycle time in half and creates tremendous cost savings by tackling time-consuming tasks in parallel.

Though executed faster, the steps Equity Marketing used to take to design and develop promotional toys are broadly similar to many other companies. First, designs are roughed out on paper and approved. Then skilled sculptors working with clay and wax create detailed character models. These physical models are used for a series of safety tests, management reviews and licensor approval meetings. More durable prototypes are cast from the sculptures and air mailed to Equity's Hong

Kong office for input regarding manufacturability and development of any internal components that are needed.

The physical modeling that lies at the heart of this process can be time consuming and inflexible — often requiring decision makers to set up, travel to and attend meetings to review physical prototypes. Casting and mailing prototypes to those not in driving distance consumes even more time. But there is simply no substitute for skilled sculpting

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when it comes to capturing character details that create a compelling product, especially as many promotional products are based on popular media properties and must meet licensors' strict approval standards.

The prospect of breaking dependency on physical modeling without sacrificing model detail and quality led Equity to adopt this new modeling system that incorporates touch into computer modeling. Working with the interface in hand, a pen-like stylus that provides 3-D force feedback, sculptors can feel model material yield as they cut, smooth and blend features with an ease, intuitiveness and control possible only with touch.

Working with the system's "virtual clay," Equity's sculptors can create highly



Marge Simpson toy in "Spooky Light-Ups" series for Burger King.

Photo courtesy of Equity Marketing.

organic toys with the flexibility and expressiveness of physical modeling, yet experience all of the productivity advantages of a digital tool. Once their core modeling could be done digitally, Equity was able to leverage digital communications and rapid prototyping to transform design and development from a serial process to a faster, more flexible one.

Equity leveraged its new digital workflow for the successful Halloween "Spooky

Light-Ups" series for Burger King® — a line of promotional toys based on characters from 20th Century Fox's *The Simpsons*™ series given away in "Big Kids Meals." The computer modeling system used by Equity allowed its sculptors to handle the intricate character models three times as quickly as with physical tools — in five days instead of three weeks.

Patrick Piggott, principal at **Piggott Studios** (Garrison, NY) — a toy and collectables prototype sculpting house which sculpted the Simpsons characters — says, "By using the FreeForm modeling system, we were able to make changes in size and proportion to the Simpsons characters incredibly fast. We could easily capture the Simpsons' expressions and



Patrick Piggott working on Grandpa Simpson model.



Mike Barbato of Equity Marketing holds the Marge Simpson toy.

Photo courtesy of Equity Marketing.

unique character qualities sculpting. Overall, the system allowed for an extremely fluid design process.”

Perhaps more significantly, Equity was then able to use the digital output to collaborate more efficiently during the rest of the production process. Managers reviewed model images via e-mail instead of waiting for meetings. Safety consultants and licensing representatives from 20th Century Fox could likewise be brought into the loop earlier and decisions could be made more quickly. In each case, the week-long feedback cycle was cut by half or more thanks to digital communication’s greater efficiency compared to air freight and meeting travel.

Manufacturing specialists in Hong Kong began their review weeks earlier using FreeForm model files that were sent to them electronically. Potential production issues were addressed early in the process, cheaply and easily. Whenever physical models were needed, they were quickly created using a solid imaging system from **3D Systems** (Valencia, CA) — a provider of solid imaging products and solutions that help reduce the time and cost of designing products and facilitate direct and indirect manufacturing.

As independent reviews took place, sculptors could quickly iterate the digital Simpsons models to accommodate feedback instead of having to physically resculpt. Upon reaching final approval, Equity output the figures on the solid imaging system, cast hard resins off of the prints and sent them to Asia for tooling. In the end, Equity was able to develop toys that were safe, true to character and easy to manufacture in about half the time that their previous non-digital workflow would have required.

The flexibility and responsiveness of Equity’s digital process proved particularly important for the Marge Simpson toy. The FreeForm system allowed Piggott to quickly model six distinct iterations of the Marge figure in real-time in order to find a workable solution for safety consultants, manufacturing and licensor concerns. The final child-safe design agreed upon was one in which Marge’s arm is raised above her head.

Mike Barbato, director, development engineering at Equity says, “Creating six different iterations while sticking to the tight development timelines would not have been possible with our previous modeling methods like clay and wax. We probably would have had to abandon creating the Marge toy all together.”

Leveraging new digital technologies allowed Equity Marketing to cut its already rapid design and development timelines by about half. Getting to production earlier generated huge cost savings for Equity in the form of reduced tooling costs. Generating the huge unit volumes involved in the few weeks available requires a large number of mold tools running non-stop. Each day cut from the design and development process means a day added to the production run. More time for production means fewer mold tools are needed.

According to Equity, savings from just one project more than pays back the entire cost of the computer modeling system seats, computers and solid imaging system. The Equity team plans to use the FreeForm modeling-based workflow for about 95 percent of its future modeling projects.

As a result of the company’s success with a digital pipeline, Equity is continuing to search for even greater improvement, evaluating how to extend the electronic modeling pipeline further to include digital mold creation.

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