



Virtual prototyping saves time

of many people know that millions of wind-up products have been sold since groundbreaking design was achieved by a local design company using the latest in 3D modelling software back in 1998. The beauty is that these wind-up products do not require replaceable batteries, but rely on personally-generated power. The products, designed by Roelf Mulder and Byron Qually -now directors of Cape-based Dot Dot Dot Ex Why Zed Design - were awarded SABS Design for Development 1997 and SABS Product Design 1998 Awards. The wind-up products were designed for Freeplay, and are being sold under the Freeplay branding - even as far afield as Harrods in London, where one wind-up radio is donated to Africa for every two sold.

Taking up the story, Roelf Mulder, MD of Dot Dot Dot Ex Why Zed Design, says: "Part of our brief was to design, firstly, a radio, and then a flashlight that would be suited for use in Africa, where power can often be a problem - hence these wind-up products run without batteries. Today a number of Non-governmental Organisations (NGOs) are using the Freeplay products in remote areas for conducting Aids awareness campaigns. Freeplay soon moved close to 40 000 units a month all over the world - a strange success for a product that belongs in the mechanical age but found recognition because it came from Africa.

He says it all started when he and a friend, Chris Steyns, embarked on the design of the FPR2 wind-up radio. "Trevor Bayless from the UK invented the constant torque clockwork spring and made an adaptation into a wind-up radio. The first product - the FPR1 wind-up radio - produced in the UK in the 1990s, sadly, had a very short lifespan. But

Chris Steyns saw an interview with Trevor Bayless on BBC television and got the idea to make it into a commercial product here in SA. We got together with Chris and designed the FRP2. We managed to design this model with 3D software, which meant we literally connected lines in a 3D space."

Freeplay flashlight - without battery - breaks new design barriers with 3d design software, Pro/ENGINEER

However, while it was a success, when we were approached to design the wind-up flashlight, I quickly realised that our old 3D modelling software would not be advanced enough to handle all the design complexities, iterations and timescales. That's when we discovered the 3D design software, Pro/ENGINEER, developed by Nasdaq listed product development company PTC - now represented in sub-Saharan Africa by productONE.

"For the flashlight, there were absolutely no design parameters set, as there were with the second version wind-up radio. We had to design from scratch. Our existing software would not have been capable of handling all the different design parameters. But, with Pro/ENGINEER, we had the luxury to explore four design iterations - and the fourth one went right from design, to a quick prototyping and then straight to tooling in only four months."

He says that because of the parametric relationship between design details afforded by Pro/ENGINEER, it was possible for the designers to design rapidly, making changes on the fly that were backwards compatible. With Pro/ENGINEER you simply start sketching the design, in 3D, integrate the specifications, and produce a 3D image with true both-way integration between design and dimension.

Commenting further, Mulder says that with the wind-up radio - because of time constraints and inadequate software - his team was forced to limit the design exploration. "With the wind-up flashlight, we were able to - and needed to - explore different types of concepts. We had this luxury thanks to the intuitive design capabilities of Pro/ENGINEER - and it didn't absorb too much time."

Dayne Turbitt, MD of local Pro/ENGINEER distributor, productONE, says that in the competitive design and manufacturing field, time-to-market is critical. "If a company has a new design concept, it is important that they get this to market before their competitors introduce a similar product. In addition, by being able to design in 3D, and by being able to make design changes dynamically - and by being able to allow your suppliers, client and the design team to view the changes in real-time over the Internet - the design changes are significantly reduced. There is often no need to actually manufacture a prototype. The software will allow a prototype to be built in the digital environment and this virtual prototype will be able to be manufactured once all the parties are happy with every aspect of the design.

What Roelf and this team managed to do is quite admirable. They were capability point of view, and from a time-to-market perspective." e

