

Presenting Server Design

What sort of business uses animation software more commonly used in television and the movies alongside its industrial design tools? Answer – one who counts some of the leading television and film graphics companies among its client list.

Xyratex was formed in 1994 as a management buyout from IBM. It is a global company but the mechanical design R&D group is based in the south of England. The Networked Storage Systems division of Xyratex builds large-scale data storage systems that are supplied as sub-systems to specialist suppliers that cover a wide variety of industries including ISP's, medical imaging, finance and defence markets – and to the companies which develop high tech tools for media creation and editing. One of Xyratex's main media customers is Autodesk, so it is appropriate that its design tools of choice also come from Autodesk.



Mark Scicluna is the mechanical design manager for the NSS division at Xyratex, but when he joined the company as a Product Designer in 1996 he arrived with a slightly unusual background. He was an engineer by training and trade – and an AutoCAD user from his previous work in the consumer products and ship-building industries – but in his spare time he had a fascination for 3D animation. He was one of the earliest users of a product then called 3D Studio, which is now part of the Autodesk media stable under the name 3ds Max.

When Mark arrived at Xyratex the company's IBM heritage had left it with a design tool, which was expensive to maintain and really far more than it needed at that moment in its history. The Storage Systems Division, as it was then known, was effectively a start-up operation with two mechanical designers. As part of his brief to streamline the mechanical design process he moved to 2D AutoCAD, which he admits was used as "just an electronic drawing board", but which gave them immense productivity gains without the overheads typical of high-end 3D CAD systems of the time.

In 2003 the decision was taken to migrate to Autodesk Inventor, then in version 8, and the mechanical design team, which now numbers 15 people, has been 100% Inventor since

While AutoCAD met their requirements, there was pressure from outside the design office to move to a new platform. "Every customer we dealt with began to ask for 3D models of the products," Mark reported. Sometimes this request was to help integrate Xyratex storage solutions into larger installations, sometimes it was just to get a good idea of what a finished sub-system would look like. But the pressure was irresistible.

In 2003 the decision was taken to migrate to Autodesk Inventor, then in version 8, and the mechanical design team, which now numbers 15 people, has been 100% Inventor since then, being kept up to date with new releases and additional functionality by its VAR, Micro Concepts.

What makes the operation remarkable, though, is that they also use 3ds Max, the creative 3D animation tool. This provides highly finished animations of what a product will look like. This may not add anything to the design process, but it is an enormous boost to the sales and marketing effort and an excellent medium for getting across design concepts to customers.



“An account manager will come in with a hot new prospect,” explained Mark. “If we can give them a good idea of what the finished product will really look like, in the colours of the customer, in a typical installation, with the right logos in place, it makes for a very strong presentation.

“We use 3ds Max because of its sophisticated lighting and textures which allow us to create something that looks real,” he went on. “The transfer is simple – there is

a plug-in for 3ds Max to import Inventor files, which works straight out of the box. We can render out six or seven different camera viewpoints and drop them into a PowerPoint presentation, or create realistic animated fly-arounds of the product.

“We know that this marketing support is very successful in helping us to win new bids,” he added. “The quality of the design of our storage solutions is what first interest’s potential customers, but the speed with which we can develop a custom design is what helps us win them.”

And yes, Autodesk is one of those new bids that were won thanks to stunning visualisations. Autodesk’s media division sells creative tools to facilities that finish movie and television productions, and these installations need massive amounts of storage to be accessed by many users simultaneously. One stream at typical movie resolution represents as much as 80 megabytes a second. With multiple takes, layers of effects and graphics, a single movie project can need several terabytes of storage – and a typical facility will be working on many projects at once.

Xyratex developed storage solutions for Autodesk and, alongside the technical discussions on the integrity of the data handling there was a presentation of a number of different physical cabinets. These were developed in Inventor to match the existing Autodesk look for media systems, and rendered in 3ds Max to give a dramatic presentation.

While these marketing efforts are proven to be worthwhile, the core work of the team is in creating mechanical designs using Inventor. But surely a data storage sub-system is a pretty fixed thing: a number of disk drives with associated electronics and a power supply?

“Our major design drive at the moment is to take advantage of everything getting smaller,” Mark explained. “Over a very short time we have moved from 3.5” full height drives to half height drives to low profile drives. Now 2.5” drives are becoming suited to enterprise class systems so we are taking advantage of those. It all means we can fit more drives into a smaller space.

“Electronics, and even power supplies, are becoming ever more miniaturised,” he continued. “Optimising space is very important for our business. We have to keep moving to stay ahead.”

The NSS division of Xyratex does not sell anything under its own name: it is all sold to OEM systems suppliers. So the design team has to draw together modular elements and customise them for each application. This, and the continuing development of the modules as new drives and electronics become available, mean that the design team is constantly busy and using many of the tools in Inventor.

“Electronics, and even power supplies, are becoming ever more miniaturised,” he continued. “Optimising space is very important for our business. We have to keep moving to stay ahead.”

For example, each part of a storage system will be hot-swappable to eliminate downtime, which means each module has to be designed to be easily removed and replaced. Engineers under pressure may not be as gentle as they might when replacing modules – firmly seating a drive with a sprung pre-load is bound to help, goes the theory – so Xyratex uses the component level stress analysis tools provided in Inventor to ensure mechanical integrity and robust design throughout.



The designs use die casts, injection mouldings and sheet metal work, and the team has high praise for these functions in Inventor. “We can use very sophisticated curves and geometries in the plastic mouldings,” Mark said, adding “and people cannot speak highly enough of the sheet metal functions – they are very powerful in realising complex geometry.

“We are also big users of rapid prototyping, using external SLA/SLS companies,” he continued. “You can visualise all you want, but sometimes it is good to touch something. Thanks to Inventor we can realise a 3D

design very quickly – a couple of days.” That said, Xyratex is working with VAR Micro Concepts on developing a virtual prototyping strategy for the future.

All in all, Mark Scicluna is impressed with what Autodesk and Inventor brings to his department. “Autodesk’s breadth of interest is very attractive. We see true benefits from Autodesk working in different industries – not just the media products but also other industrial processes like automotive.

“Software developments in other niches can be quickly transported across the Autodesk range, and that cross-over helps us in the design process,” he concluded. “We pay a lot of attention to the aesthetics and ergonomics of our enclosures, as well as to the detailed mechanical design, and Autodesk systems help us add flair and to differentiate our products in an increasingly competitive marketplace.”

To learn how Micro Concepts, together with Autodesk Inventor, can help make your company become Number 1 in your market – call 01223 716200 or visit www.microconcepts.co.uk