

Threshold Digital Research Labs animates on demand with IBM.

Overview

■ **Challenge**

Despite increasingly complex animation requirements, Threshold needed to shorten the time required to produce a film, while keeping its costs low. Threshold also needed access to a scarce pool of talent from around the world while maintaining control of its processes.

■ **Why Become an On Demand Business?**

Threshold required flexible access to powerful computing resources to handle huge yet unpredictable peaks in processing load. To create a more flexible, global workplace, it needed a way to automate its processes to make designers more responsive to changes in the animation workflow.

■ **Solution**

Threshold engaged IBM to create an on demand e-studio system that provides an unlimited growth path with limited, variable costs. The system automates the flow of animation in progress across the world to create a unified corps of designers working around the world.

■ **Key Benefits**

- Production cycle reduced to 18 months, half the length of most animated films
- Expected 25 percent reduction in overall IT spending
- Expected 12 to 15 percent reduction in overall labor costs



A scene from Threshold's upcoming full-length animated feature, *Foodfight!*, which will include 138 speaking characters, more than 6,000 "extras" and 174 sets with nearly 5,000 buildings — all digital.

Since digital animation exploded onto the scene a decade ago, it has steadily reshaped the film industry—a notion underscored by the fact that last year's top-grossing film was digitally animated. For the "virtual studios" involved in making these films, increasingly powerful tools have rendered the word "impossible" virtually obsolete, with artists limited only by their imagination. As the capabilities of digital filmmakers have risen, so has the level of audience sophistication, resulting in ever-rising expectations for visual fidelity. The price for failing to meet these expectations is

"We have to deliver the highest quality product on a world-competitive budget. The reality of our business now is that we have to do things faster, cheaper and better. The IBM solution has enabled us to meet this challenge."

— George Johnsen, Chief Technology Officer and Chief Animation Officer, Threshold Digital Research Labs

On Demand Business Benefits

- Threshold reduced the length of its production cycle to just 18 months (half the length of most animated films), speeding time-to-market and reducing capital costs.
- Threshold has eliminated the need to invest millions in infrastructure, cut its exposure to obsolescence risk and enabled staff to focus on the business of animation.
- Threshold expects to cut its overall IT spending by 25 percent.
- The company expects workflow and asset management improvements to cut its overall labor costs by 12 to 15 percent

paid at the box office. However, like the movie industry as a whole, digital production companies are also under increasing pressure to speed production cycles while at the same time reduce their costs. Faced with these pressures, Threshold Digital Research Labs (www.threshold-digital.com)—a rising star among digital animation studios whose clients include SONY Pictures, Paramount, Miramax and Disney—opted to adapt key elements of its strategy to succeed in an increasingly demanding environment. George Johnsen, Chief Technology Officer and Chief Animation Officer, looked at the steady rise in animation sophistication and concluded that neither Threshold nor its competitors would be able to afford the kind of computing power they would need in the not-so-distant future. “We saw that the entire industry was going to be over its head very quickly as far as their horsepower needs,” says Johnsen. “We were looking for a way to secure all the capacity we would need—but also keep our cost structure low and flexible by avoiding big fixed investments.”

Needed: unlimited processing power, seamless collaboration

A glimpse of the basic animation process shows why ample computing power is so critical. To create a digitally animated character, an artist at a workstation first builds a model or “object” (e.g., a person) and then textures it with light, color and other elements to make it look real. To bring the model alive, the animator then creates an instruction set that tells the objects within that character what to do at a particular point in time. The execution of the instruction set—known as rendering—is where the really heavy lifting starts. In this process, the instruction set is sent back to a high capacity system where the instructions are executed and rendered into frames. The more objects and functions in the frame, the longer it takes to render. Considering that a frame can take as long as 48 hours to render—and there are thousands of frames in a typical film—the intensive processing requirements become quickly apparent.

In addition to computing resources, Threshold also has to assemble and manage its human assets—the artists performing the animation—to achieve a huge design volume in the shortest possible timeframe. With the pool of talented designers distributed across the world, the company viewed a distributed workforce strategy, with a global team of designers working collaboratively and seamlessly toward a common goal, as the ideal approach. While entirely consistent with Threshold’s virtual studio business model, the use of virtualized animation resources still presented major operational challenges. Indeed, to make this strategy work,

Threshold needed to manage these globally decentralized resources so that they functioned as an efficient, yet flexible unit. Equally important was the need to track and manage the super-complex workflow and version control that decentralized animation entailed, since a scene can be modified several times—by several different designers—after it’s created. Losing control of this process can mean costly delays. In short, Threshold needed a way to gain unlimited scalability, while keeping their costs variable and controllable; thus enabling it to avoid the large fixed investments its competitors had made. Further, to realize its vision of a distributed workforce, Threshold needed a way to manage globally collaborative processes as well as its animation assets so that artists could more easily respond to changes in the animation workflow. Above all, says Johnsen, the solution had to let designer focus on the art—not the technology. “Technology has to serve art in our business,” says Johnsen. “It has to become transparent so that artists are not limited by their paintbrush.”

A shorter, less costly path to the box office

After fielding proposals from a number of vendors, Threshold selected IBM to build an e-studio platform that provides the company with on demand access to a powerful pool of backend resources—all delivered on a pay-as-you-go basis. Designed by IBM Media & Entertainment and Digital Media Solutions teams, the solution perfectly complements Threshold’s virtual studio model by giving it world-class computing horsepower whenever it needs it. So as projects inevitably become more complex and rendering-intensive, Threshold can simply add servers to meet the demand and pay only for what it uses. The use of open source technology like Linux further accentuates the solution’s cost and flexibility benefits. To facilitate Threshold’s distributed workgroup initiative, IBM developed a portal that links the company’s global network of designers, while at the same time providing advanced workflow and version control capabilities. If, for example, a designer changes a scene, the system automatically notifies the next person accessing it of the change, all but eliminating the chance that designers will mistakenly work on “outdated” scenes. By streamlining the animation workflow, the solution cuts costs and the length of the production cycle, thereby shortening the time required for the movie to generate cash in-flow.

On the front end of the solution, designers perform animation using the IBM Digital Content Creation solution, IBM IntelliStation workstations and their preferred animation software. The backend of the solution—running in IBM’s Deep Computing Capacity On Demand Center in Poughkeepsie—is made up of several clusters of IBM eServer BladeCenter servers, each of which is controlled by an IBM eServer xSeries x445 server. Operating in grid-like fashion, the system follows a distributed intelligence model, with specific tasks assigned to each cluster, thus maximizing performance and efficiency during the rendering process. The solution’s portal component runs on IBM WebSphere Portal, which was selected due to its flexibility,

Key Components

Software and Solutions

- IBM WebSphere® Portal
- IBM WebSphere Application Server
- IBM Digital Content Creation Solution

Servers

- IBM eServer™ xSeries® x445
- IBM eServer BladeCenter

Workstations

- IBM IntelliStation®

Services

- IBM Media & Entertainment and Digital Media Solutions
 - IBM Deep Computing Capacity On Demand Center (Poughkeepsie)
 - IBM Watson Research Laboratories
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“Anyone can make us a great deal on boxes. What IBM brought to us was a solution to our business challenge, not ‘here’s a bunch of boxes—now change the way you do business.’ ”

—George Johnsen

native localization capabilities and ease of use. Johnsen explains: "WebSphere Portal will enable us to manage people in a far-flung environment using a toolset that is stable and reliable all over the world. We also see its localization features as critical to managing jobs and assets—and keeping the whole thing synchronized." To store and manage its millions of animation objects, Threshold plans to employ IBM DB2® Universal Database™, which will work in tandem with an asset management solution developed at the IBM T.J. Watson Research Center.

Process improvements resulting from the solution have enabled Threshold to shorten its production cycle to just 18 months—more than twice as quickly as most animated films. Given today's large movie budgets, the ability to bring films to market more quickly also translates into lower capital costs. Becoming an on demand business has also produced big savings by eliminating the need to invest millions in an infrastructure that would be utilized during only a fraction of the production process, and would greatly increase the company's exposure to obsolescence risk. Ultimately, Threshold expects to cut its overall IT spending by 25 percent. On the process side,

the company expects workflow and asset management improvements to cut its overall labor costs by 12 to 15 percent.

For now, the company plans to build on its success through follow-on initiatives, like the addition of IBM Lotus Instant Messaging to further improve the collaboration of its virtual design team. The company is also working with IBM to make its systems even more intelligent and autonomic, and thus better able to handle the steady growth in animation complexity without missing a beat—or a frame. Best of all, says Johnsen, Threshold gets to focus on what it does best. "IBM was the only company that approached us with our business processes in mind first and foremost," says Johnsen. "That's the kind of teammate we need to help us stay ahead."

For more information

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