Q+A

Sanjay Das
Chief technology officer
at Tippett Studio

Wizards behind the curtain

Sanjay Das is chief technology officer at Tippett Studio, a visual effects and animation production house based in Berkeley, California. The Academy Award–winning studio has worked on major Hollywood movies including the *Twilight Saga* series, *Ted*, and *Harry Potter and the Deathly Hallows Part 2*.

Q: *What challenges does your business face, and how does that affect your IT strategy?*

A: Visual effects have a very complex production pipeline. A common problem we face on a daily basis is the realistic integration of filmed images with computer-generated ones, such as the wolves in the *Twilight Saga* movies.

To integrate one *Twilight* wolf in a five-second shot, you might have 10 people working over four to six weeks. It's a new era of moviemaking! The stars, Robert Pattinson and Kristen Stewart, will film their scene next to a cardboard cutout of a wolf, while artists at Tippett Studio are digitally creating the character that will interact with them in the final composited scene.

From a business standpoint, one of my biggest challenges is to make filmmakers and studios aware of what we can do and to make the technology visible. This is especially important considering the not-so-level playing field faced by California-based digital effects and animation companies. We are competing against facilities in the United Kingdom, Australia, and New Zealand, which offer tax incentives and rebates for doing the work out there. Throw in Canada—Vancouver is becoming "Hollywood North"—and we have to compete with incentives that range from 20 to 45 percent in tax credits.

A big onus falls on technology to help us reduce our operating costs and continue to innovate so that we can differentiate ourselves and remain competitive.

Q: *Sounds like a full plate. What moment represents a tipping point for your industry and technology?*

A: I don't think I can really pinpoint one, since advances in technology are made incrementally on a regular basis and have contributed to the evolution of film creation.

We've gone from black-and-white to color, from analog to digital, and from shooting on film to incorporating digital shooting and using digital cameras.

Then there's the screen revolution: from 35 mm to D-Cinema with increasingly higher resolution moving from 2K to 4K to IMAX; higher frame rates; and now stereoscopic 3D format, like *Avatar*. That really challenged the rules of the game. I am a big proponent of creating a really immersive movie experience, but 3D technology is still in its infancy. I think the jury is out on whether it will be sustainable in its current form.

Q: *What's the Next Big Thing?*

A: For me, it's all about scale and interactivity. Four years ago, we used to do about 200 to 300 shots in our studio, and today we can easily do up to 1,500 shots. However, it takes anywhere from 2–10 hours per frame, depending on complexity, to turn the geometry data into digital images. The Next Big Thing will be to create images on the fly using technology.

Currently, we don't have the computing speed to be able to crunch the data locally on workstations for real-time output. The way it works today: a computer graphics artist packages up the geometry data, puts it in a queue, and sends it to a render farm where a cluster of machines crunches the geometry data to turn it into images.

My dream: the computer graphics artist pushes a button, and within the local machine itself, real-time

images emerge with each alteration made—whether a change in lighting, texture, or animated performance.

Q: *How are you managing the explosion of unstructured data?*

A: Our business revolves around unstructured data, primarily the images that we create. Once someone has created content, different artists will touch it as it moves through animation, particle effects, lighting, and so on. During this process, multiple versions of the image are created. Version control and accuracy of information become a huge concern. There's no pertinent off-the-shelf solution out there, so every studio must handle it differently.

We track a shot's metadata through our own database. But that is only viable for a certain period of time, maybe two or three years. Recently, we've had to retrieve images from a movie that was done 10 or 11 years ago for reference or for a special edition rerelease—which creates a backup and archiving predicament.

We're looking at ways of organizing data so one can actually access and restore it in a meaningful manner and in an organized way. It's a universal problem for studios, and what we have now are proprietary solutions rather than commercially available ones.

Q: *Have you adopted a cloud strategy?*

A: I think the cloud is a promising way to address part of the unstructured data problem, because it allows us

to put our data out there. But there's a level of integration that needs to be reconciled. In my back-of-the-envelope cost-benefit analyses, it's not been that compelling yet.

And then questions from a security and privacy standpoint arise with regard to my clients—the major movie studios such as Walt Disney Studios, Universal Studios, and Warner Bros. Entertainment. Some studios have not yet embraced the cloud and fear that it's not going to be secure. Studios are aptly secretive about their upcoming work, and so coupling that with security and privacy concerns over the cloud doesn't make it the right strategy for us just yet.