

WELCOME TO THE JUNGLE

MPC & Technicolor Attain New Artistic Heights in Jon Favreau's *The Jungle Book*.

■ Customers

- Director Jon Favreau
- The Walt Disney Company

■ Challenges

To create immersive imagery, creatures and “photo-real” scenery for this children’s adventure story based on a Disney animated classic.

■ Solutions

MPC talent and teams in London and Bangalore created over 50 creatures and the spectacular landscape of author Rudyard Kipling’s tale, while Technicolor delivered a slate of immersive Extended Dynamic Range 3D & 2D (and HDR) versions of the film for the global theatrical market.

Director Jon Favreau has created a wonderfully immersive adventure with his new film, *The Jungle Book*.

The film pays tribute to the original Disney 1967 animated classic, while also providing an homage to author Rudyard Kipling’s original children’s story. This innovative project will likely carve out its own influential niche for its technologically complex methodology.

To tell the adventure of a human boy named Mowgli, raised by wolves in an Indian jungle and who is being forced to flee back to humanity, Favreau opted for a cutting-edge “virtual production” process that the head of Disney production called “one of the most technologically advanced films ever made.”



To help him achieve his vision, Favreau’s team of cinematographer Bill Pope, ASC, production designer Christopher Glass, animation supervisor Andrew Jones, and visual effects supervisor Rob Legato, ASC, who also served as second unit cinematographer turned to Technicolor and their flagship visual effects facility, Moving Picture Company (MPC). As the lead VFX vendor on the project, MPC created most of the photo-real creatures and backgrounds in *The Jungle Book*—a total of 1,200 shots under guidance from MPC VFX supervisor Adam Valdez, who collaborated closely with Legato and the project’s on-set visual effects supervisor, Michael Kennedy.

Technicolor’s global reach proved central for a project of this scope, because the company is one of the only entities in the world that could provide the precise combination of services in different categories that the project needed. The technological infrastructure and flexibility to rapidly upgrade and alter pipelines as needed, the award-winning artists with pre-existing relationships with these particular filmmakers, and the well-honed global collaboration techniques allowed Technicolor’s various entities and artists to all share data and communicate in real-time with filmmakers spread out across two continents.

The highly sophisticated production and finishing processes involved:

- Pre-visualizing every shot in the movie to create a roadmap of sorts. MPC used a combination of digital filmmaking, motion-capture, and video-game production tools to allow the filmmakers to view in real time virtual sets and elements comped together with live actors and CG characters in order to make detailed cinematography and lighting decisions for final shots built later.

- Next, they filmed a single human actor, Neel Sethi, who plays Mowgli, in native stereoscopic 3-D on a series of sets, pieces of sets, and on greenscreen and motion-capture stages. The goal: to combine his image and movement seamlessly with sophisticated, photo-real, character animation and background animated elements producing what eventually evolved into a stunningly photo-real “animated” movie.

“It was simply the kind of project that needed that volume of skilled crew, coordination, training, and pipeline to be able to manage the production—and ensure a continuous performance of characters and visual style,” Adam Valdez recalls. “We were able to use our Bangalore, India, facility a lot on this project. It can be hard for some companies to have multiple sites working on the same show of this volume, building shots and synchronizing data, but we have been at it for many years. Then, there was the experience it takes to manage all those people toward a single result, creatively and technically. And because we are part of Technicolor, we could more seamlessly share data with them when they were finishing the movie. And even before that, during production, early on, I was able to work closely with Bill Pope, Rob Legato, Steve Scott [Technicolor VP of Theatrical Imaging and senior supervising finishing artist], and the whole color science team at Technicolor to create a viewing look-up table [LUT] for [on-set viewing] of the imagery. **We were more powerful as a collective on this show, and I think that showed in the work.**”

■ A Whole New Level of Photo-realism

“People have done some of this kind of work for years” noted multiple Oscar winner Rob Legato, “but *The Jungle Book* allowed MPC, which previously had not been known for focusing on animals, to show what they are capable of in terms of photo-real work, and they upped their game. Now, they are at the highest level for this kind of thing. And it was a major effort—they had to change their whole system to allow us to create photo reality in every aspect of every animal. So now, it’s not a cheat, it’s not a fake.

The light looks the way it looks, because that is the way that light really looks when it interacts with the world around it. It got so good, to the point where the eye thinks it must be real.

“In fact, there were a few shots they sent me that I found it hard to believe there was no [live action photography] in the background shot. It was magnificent, and it fooled me, even though I knew what they were doing. **To me, that is a whole new level of realism.**”

Valdez emphasizes that the creation of photo-real creatures of the number of different species, volume, detail, and quality seen in *The Jungle Book* was not, in and of itself a brand new development. What was different in *The Jungle Book* was that MPC was tasked not with creating a single species of animal, nor a single hero creature or a few leading animals, nor only for selected shots or sequences. Rather, **MPC was tasked with creating virtually the entire cast of the movie outside of Mowgli and the digital primates that WETA added—more than 50 different species, and many as leading or supporting characters, with crucial roles to play and different kinds of actions to engage in from start to finish.**

The character animation work had to be done at MPC by hand, key-framed, rather than motion-captured, both because it was obviously not feasible to mo-cap dozens of species of wild, and usually dangerous, animals, and also because they were, despite the photo-realism, required to act—in particular, the creatures were required to talk. This was a key element of MPC’s work—making animals talk without destroying the illusion of believability.

“The animators studied real animal movement and behavior extensively on the one hand,” Favreau explains. “On the other hand, we were selective about what types of behaviors we would pick out, so that when they spoke, the physical movements did not go beyond what that species is capable of.”

■ Virtual Production Re-imagined

Animation and visual effects on the post-production side, however, were not the only aspects of MPC’s role in the show. Valdez says that the nature of the virtual production methodology required MPC to be strategically woven into the entire production effort on the front end, as well.

MPC artists were called upon to build digital sets during the virtual camera layout phase of the job, operating in collaboration with Glass, Jones, and the Digital Domain virtual production team that handled the physical implementation of the virtual camera process on stages at that company’s facility in Playa Vista, California.



(MPC’s team in Bangalore ventured to the jungles of Goa to shoot reference stills.) Filmmakers could now see those elements comped together with the live-action actor in real-time as they planned both live-action and virtual shots in great detail.

The other “key aspect,” as Valdez puts it, of MPC’s involvement on the front end involved the way the company worked with the production designer, cinematographer, and gaffer Bobby Finley to help Pope design lighting in the computer using digital simulations of lighting tools they were well familiar with.

“Chris Glass provided gorgeous illustrations. He and Bill Pope worked closely together on the look of the movie and exactly how he wanted to light it, what the color shemes should be, and so on,” Valdez noted. “What we did was mock up in the computer a lighting package that emulated what Bill and Bobby Finley would be using on set, limiting the tools to Bill’s specific approach to lighting. If Bill wanted big bounce silks, or soft boxes, or whatever, we came up with a small package of computer lights—a digital lighting kit that mimicked those basic lighting tools. We mocked up a version of the sound stage, and then, scene by scene, we worked with Bill to refine the lighting. We ended up being able to show him images, and say this is a very authentically rendered image of a light [he preferred]—not a cheap videogame version, but a completely accurate version of a sky dome, a certain amount of fill, any specials, all indicated in a realistic way.

■ Finishing Color at Technicolor

Meanwhile, Technicolor’s color science and color grading work, and its finishing services, were, in fact, central to bringing *The Jungle Book* together.

Technicolor’s team of finishing artists, including Steve Scott, Mike Sowa and Charles Bunnag, used Autodesk’s Lustre Premium 2016 color-grading system for the project. While Scott personally graded the 2D version of the movie, Sowa partnered with him to seamlessly grade and incorporate additional visual effects into each reel.



Sowa was also responsible for grading the work for the various 3D and large format versions of the film, including IMAX, Barco, Cinemark and Dolby, etc. These EDR versions of the movie were necessitated to meet the unique needs of those specific theatrical formats. (Those versions are generally labeled as EDR, but the nomenclature around “extended dynamic range” remains in flux. With the deployment of OLED technology, the home displays are reaching qualitative new heights that nearly match the best of theatrical presentations. Both are part of the ever-growing list of “deliverables.”) Additional finishing work included Technicolor Senior conform editor Bob Schneider’s efforts, while the company’s Marketing Services department deployed colorist Adam Nazarenko and producer Ellen Wang to ensure that four domestic and 14 international trailers were presented correctly, along with a Super Bowl spot and a theme park piece.

Scott says *The Jungle Book*’s production method made it much different from most movies his team works on, because unlike a traditionally photographed feature film, these filmmakers had ultimate control over their environment and lighting. However, after putting all the pieces they created on stages and in the computer together, the movie then needed more “finessing” in the finishing suite, under the watchful eyes of Favreau, Pope, and Legato, to make all the pieces match seamlessly.

“We brought our point of view about what works well for the dynamics of this picture, and that was a wonderful experience,” Scott says.

“We worked real hard on many classic issues, and used many of our tricks in terms of continuity passes when it comes to dealing with photo-real characters—things like how to draw the viewer’s attention to certain areas of the frame, or keep the focus in certain places. These were such beautiful images, and digital files with such high dynamic range, that we had to be very careful to make sure we weren’t missing something, and to make sure we got all the information out of each file that we possibly could.”

Thus, at the end of the day, in Scott’s opinion, despite the many technical innovations pulled off by Technicolor on this project and others in recent years, Technicolor’s “artistic foundation” is what brought Favreau to the company and made the collaboration such a success on *The Jungle Book*.

“The company’s philosophy is to have people who have backgrounds or artistic foundations in art,” he says. “We’ve strategically built a global roster of such people. This movie is also a natural progression of a lot of great work that has been done around the industry. But when you look at the depth and artistry behind these photo-real characters and how they perform—characters like the panther Bagheer [Ben Kingsley] or the bear Baloo [Bill Murray], you see this movie is the logical next step. And really, it took a company with our technological know-how and our artistic and creative know-how to help filmmakers like Jon and Bill Pope and Rob Legato do something like this. **We will kill ourselves to work on movies we feel will define the artistry of our times, and this movie is definitely one of those.**”

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