

Pacha Mama

Real-Time Animated Film
Workflow

Pacha Mama

About the Project

Noitom, the team behind a series of industry-leading motion capture solutions designed for every type of creator, challenged themselves with the quick turnaround of a creative project that would take hundreds of traditional animators months to complete.

“Pacha Mama ” is a nine-minute, real-time animated short film shot completely with a virtual production environment in Noitom’s Miami studio. The production used **NoitomVPS**, Unreal Engine and Noitom motion capture suits. The team created a custom character rig, Pedro, with a primary focus on real-time animation driven by Axis Studio.



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The Plot

The film follows Pedro, a boy determined to save the world, on his quest to find the Tree of Life. Seventy scenes take viewers along for the ride as Pedro journeys from his lush homeland turned wasteland through a desert sandstorm, up jagged mountain cliffs and into a snow covered forest. Befriending a bear along the way, Pedro must summon his strength and courage to find the Tree of Life, plant its seed and save the dying earth.

Watch Pacha Mama :

<https://vimeo.com/manage/videos/532433500/6f73d0f2f2>



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The Challenge

The team faced the challenge of creating a short film in a very brief period of time with minimal crew. Noitom's small production crew consisted of a director, technical director, Unreal environment artist, character designer and motion capture supervisor as well as two mocap performers. Several crew members worked on the production remotely, an additional challenge for the team.

The mocap data was captured live in only two, eight-hour days. When factoring in background design, rendering and post-production, the entire project was completed in eight days. Working with **NoitomVPS** cut production time by providing high-speed motion data that was accurate and ready to use, allowing the data to integrate seamlessly with Unreal Engine. Once the mocap data was captured, the shots were edited almost immediately because mocap clean up was not required, simplifying the post-production workflow.



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Workflow

Remote Collaborative Workflow

Unreal Engine 4

Source control and multi-user collaborative workflows were established to work in parallel during the entire process of creating the short.

Source control from Perforce was essential to ensure proper asset management and collaboration.

Artists worked from home and synchronized assets with the main studio location.

Unreal Engine's multi-user editing allowed the creative director, technical director, and technical artists to collaborate during the preproduction and preparation phases.

- Director - New York
- Technical Director - Miami
- Technical Artists - West Palm Beach

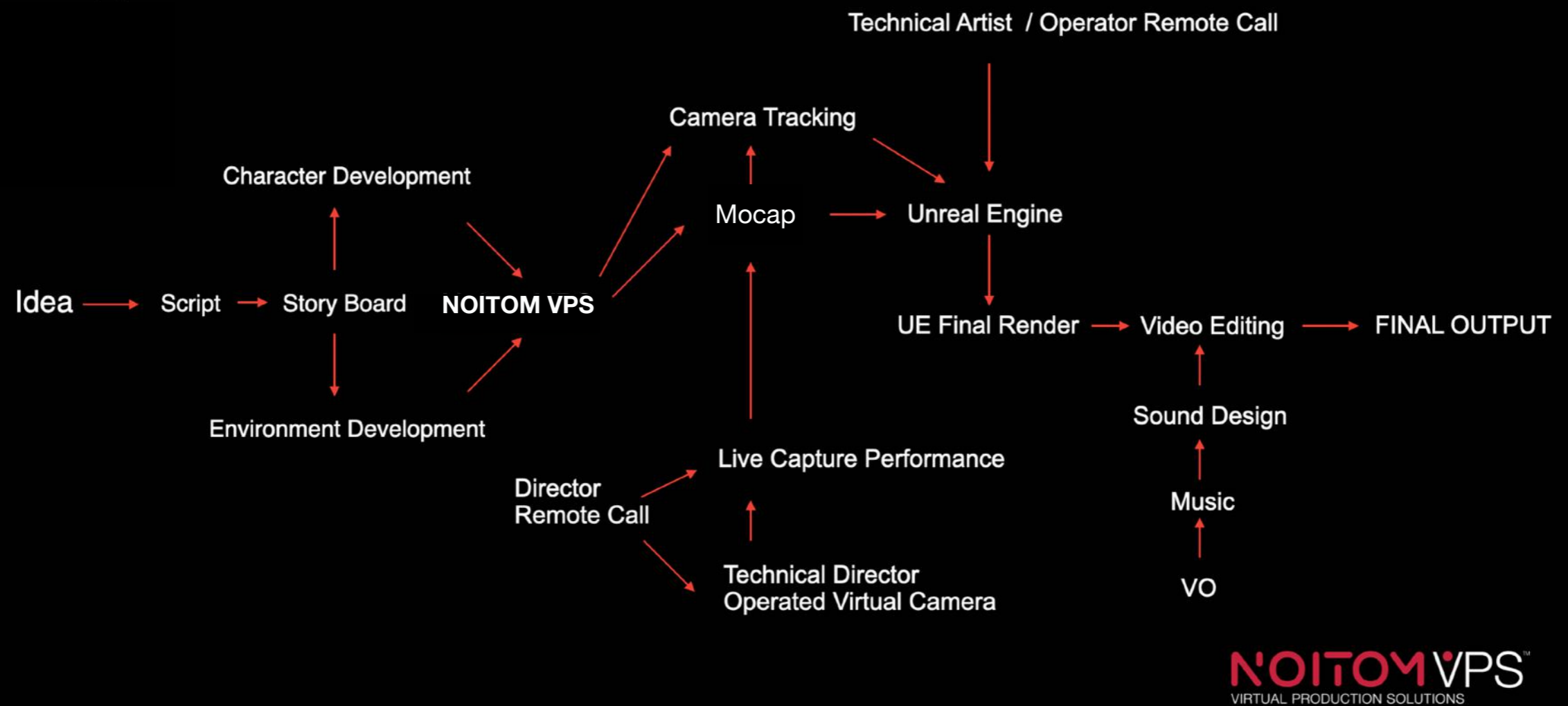
Watch this video for more information:

<https://vimeo.com/manage/videos/541822811/privacy>



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Workflow



NOITOM VPS
VIRTUAL PRODUCTION SOLUTIONS

Pacha Mama

Workflow

NoitomVPS Pipeline

Hardware

- Eight Qualisys M3 Cameras created the capture volume of 5 meters x 7 meters.
- Perception Neuron Studio suit and hybrid expansion kit were used for motion capture.
- iPhone XR mounted on a custom helmet rig was used for Facial Animation.

Software

- Axis Hybrid Manager was used to manage and calibrate cameras and track hybrid trackers for body and prop tracking.
- Axis Studio analyzed body movements and synchronized actors' location and poses, before forwarding the data to Unreal through a Live Link Plugin.
- Unreal Engine received mocap data and prop tracker data to drive characters, virtual cameras and props.

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Pre-Production

Environment Design

- Technical artists developed eight unique landscapes in Unreal Engine from various marketplace assets and custom assets created in Cinema 4D.
- Custom textures were downloaded from Quixel Bridge.
- Quixel Mixer and Photoshop were used for texturing custom-built 3D assets.
- Source control was utilized to remotely sync scenes from the technical artist in West Palm Beach, Florida, to the workstation at Noitom's studio in Miami, Florida.



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Pre-Production

Character Development

Character Design:

- Our protagonist was modeled, textured with PBR Textures, and rigged less than one week into pre-production.
- The supporting characters were purchased from Sketchfab Marketplace.

Character Tech:

- The protagonist and supporting character were rigged using the Axis Studio skeleton for seamless connection with the motion capture suit.
- Characters were processed for blend shapes using Facelt, a Blender plugin that supports the Apple ARKit for facial animation.
- Our technical animator gave the characters a manual pass to improve facial animation and Unreal Engine preparation.



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Production

Virtual Production

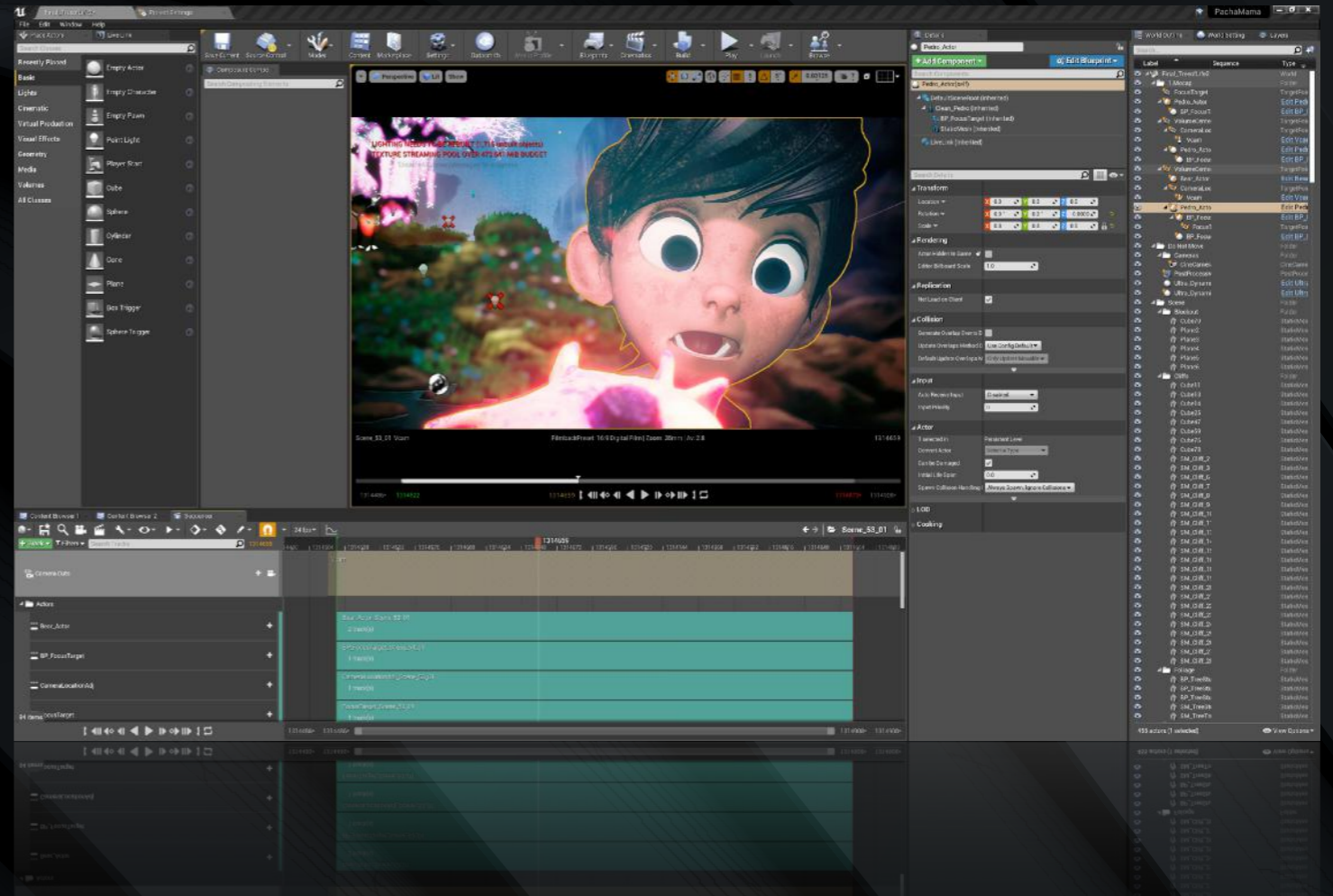
- The technical artist served as an assistant director from his remote location in West Palm Beach, controlling Unreal Engine to manage and run the system, record the performances, and ensure all the scenes were set up correctly before shooting.
- The technical director operated a virtual camera and helped facilitate the on-site preparations in the Miami studio.
- On-site preparations included camera calibration, wanding, actor preparation and live technical support.
- Actors wore Perception Neuron Studio suits with hybrid trackers and helmet rigs with iPhones for face capture.
- The director monitored the shoot live through Zoom from New York City via web cameras and referencing monitors strategically placed throughout the Miami studio. Zoom enabled the director to communicate directly with the crew and actors while visualizing the animation in real time.
- At the end of each shoot day, the project was synchronized so the director, technical artists and technical director could make changes and tune the project for final render.



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Post-Production

- After each shoot, the technical artist reviewed the footage and finalized the shots before uploading the footage to the director and editor in New York City.
- The shots requiring additional work with lighting, effects and final touches were completed by the technical artist, rendered out and delivered to the team in New York for the final round of editing, color correction and sound mixing.



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Time

Even when animated productions run on schedule, a 10 minute film can take as long as four months to complete when produced by a large animation studio using traditional 3D animation techniques. Utilizing NoitomVPS for “Pacha Mama” slashed production time to eight days by capturing accurate and ready-to-use motion data, integrating it seamlessly with Unreal Engine, and simplifying the production and post-production workflow.

Estimated Time	Traditional Animation work flow	NoitomVPS
Pre-Production		4 Days
Character Modeling	4 days	4 days
Character Rigging	3 days	3 day
Layout & Environments	30+ days (Building environments from scratch)	4 days (Using Unreal environments from The Marketplace)
Facial Blend Shapes	5 days	1 day
Production		2 Days
Motion Capture	N/A	2 days
Facial Animation	3 weeks	N/A
Manual Animation	3 weeks	N/A
Talent	N/A	2 actors
Crew	20+ people	5 people
Post-Production		2 Days
Effects/3D Animation	30+ days	N/A
3D Lighting	Multiple days	N/A
3D Rendering	Multiple days	1 day
Post-Production/ Editing	Multiple days	2 days
Music & Sound	Multiple days	1 day
Total Production Time	4+ months	8 Days

***Pre-production and post-production workflow steps are performed simultaneously.**

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Estimated Cost

Animation is often considered expensive, but the costs involved fluctuate depending on artistic styles, media platforms and technology applied to the production. For example, the budget of a full-length 3D animated film like “Toy Story 3” is \$200 million. Using 3D animation, the cost was \$194,747 per minute of the finished 103 minute film. The production of “Pacha Mama” was completed on a budget of \$61,200, meaning each minute of the nine-minute animated short cost \$6,800 to create.

Pacha Mama crew & cast cost per week (Eight 8-hour workdays)

Crew + Cast	Daily Rate	Weekly Cost
Director	\$3,000	\$24,000
Technical Director	\$1,500	\$12,000
Environment 3D Designer	\$500	\$4,000
Technical Animator/ Rigger	\$500	\$4,000
Mocap Supervisor	\$600	\$4,800
Editor	\$600	\$4,800
Sound Design	\$1,000	\$4,000
Talent x 2	\$900	\$3,600
	Total	\$61,200

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Why NoitomVPS?

Budgets and running times of the top grossing animated feature films

Titel	Budget (est.)	Run time	Cost Per Second
Frozen	\$150,000,000	102 minutes	\$24,510
Toy Story 3	\$200,000,000	103 minutes	\$32,362
Despicable Me 2	\$970,761,885	98 minutes	\$12,925
Finding Nemo	\$936,743,261	100 minutes	\$15,667
Shrek 2	\$919,838,758	93 minutes	\$26,882
Up	\$731,342,744	96 minutes	\$30,382
Pacha Mama	\$61,200	9 minutes	\$113

In terms of 3D animation cost, the examples above **averaged a budget of \$24,156 for every second** of animation that makes it into the final cut, or just under **\$1.5 million per minute**. This does not include marketing or distribution costs, which can exceed the cost to produce the film.

Using the NoitomVPS technology gives smaller studios the bandwidth to successfully complete larger productions while reducing time and cost for production and post-production.

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Awards

The team's innovative work paid off, earning Noitom two 2021 Gold Telly Awards for Use of 3D Animation and Remote Production in Non-Broadcast.



- Executive producer : Roch Nakajima
- Director/ Editor : Ignacio Segura
- Technical Director : Alberto Alvarez
- Technical Environment Artist : Brandon Martinez
- Technical Character Artist / Talent (Pedro): Ledis Molina
- Mocap Tech / Talent (The bear) Alex Alvarez
- Mocap supervisor : Daniel Cuadra
- Sound Tech / Remote broadcast : Nicolas Matiz
- Story by: Elisabeth barker & Ignacio Segura



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