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THE HISTORY AND PRACTICE OF 3D ANIMATION IN NIGERIA, 2000—2018

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Abstract
This paper looks at the history and practice of three-dimensional (3D) animation in Nigeria using Lagos-based Mighty Jot Studios as a case study. It draws upon primary and secondary sources, which include one-on-one interviews with four Lagos-based 3D animators (Stanlee Ohikhuare, Richard Oboh, Philemon Otuya and Ekene Okoye) and online articles on the subject of 3D animation in Nigeria. The study discusses the local 3D animation industry by drawing on the practical experiences of the aforementioned 3D animators and a few others, some 3D-animated productions, and challenges confronting the local 3D animation industry.

Keywords: 3D animation, 3D animators, animation industry, entertainment, Nigeria, Stanlee Ohikhuare, Mighty Jot Studios.

Introduction

Animation refers to the drawing of movement,[1] the illusion of movement created by showing a series of full pictures in quick succession[2] or "the technique of filming a sequence of drawings or positions of models to give the appearance of movement."[3] It is an art that many readily associate with contemporary animated movies like *Frozen* and *Ice Age*, but its history long predates the twentieth-century production of animated films by prominent animation companies like Walt Disney and Warner Brothers. Animation dates back to the Palaeolithic era (40,000-10,000 BC), where cave drawings featured images of humans and animals with multiple legs, as if in depiction of the act of walking or running.[4] Also, a 5,000-year-old bowl was discovered in Iran, with five pictures painted on its sides showing the phases of a goat leaping up to a tree.[5] These and numerous other attempts at animation were the precedents to countless developments and inventions in animation history that birthed the robust animation industry that exists today.

The early seventeenth century saw the invention of some commercially successful animation devices that aided early experimenters in creating the appearance of movement.[6] The

* The author acknowledges the professional advice of Dr. Ozioma Onuzulike and Dr. George Odoh during the course of this study.
[1] Kai Antle, "What Is Animation?," *Science World*, 2018, https://www.scienceworld.ca/blog/what-is-animation (accessed September 3, 2018).
[2] "Animation," *Computer Hope*, last modified October 2, 2017, https://www.computerhope.com/jargon/a/animatio.htm (accessed September 3, 2018).
[3] *The Oxford Dictionary of Current English*, 4th ed., s.v. "Animation."
[4] "How Ancient Animation Was Produced," *Austin Visuals*, published October 5, 2012, https://www.austinvisuals.com/ancient-animation-production-austin-visuals-3d-animation-studio-reports (accessed September 3, 2018).
[5] Ibid.
[6] Dave Kehr, "Animation," *Encyclopaedia Britannica*, https://www.britannica.com/art/animation (accessed August 20, 2018).

phenakistoscope, invented by the Belgian Joseph Plateau in 1832, was a spinning cardboard disk that created the illusion of movement when viewed in a mirror.[7] It was followed by the Zoetrope—a rotary drum lined by a band of pictures that could be changed, which was credited to the Chinese in 180 AD[8] and William George Horner in 1834.[9]

Animation for film appears to have been pioneered by J. Stuart Blackton who created *Humorous Phases of Funny Faces* in 1906. He launched with it a successful animated film series for New York's Vitagraph Company.[10] After 1906, several other film-based animators emerged, notably Winsor McCay, Max and Dave Fleischer, Walt Disney, and Warner Brothers which was founded by three Walt Disney veterans—Rudolph Ising, Hugh Harmon, Friz Freleng.[11]

For much of its early history, animation for film was created in two dimensions, a technique that involves taking photographs of drawings on paper and placing them on transparent acetate sheets called cels.[12] Around 1898, another animation technique, *stop-motion*, emerged. The technique was labourious, requiring the animator to pose a physical object, take a picture, move the object slightly, take another picture, and repeat the process as many times as was needed so that when the photographs are successively played back, the captured objects would appear to be in motion.[13] The first known stop-motion film was *The Humpty Dumpty Circus* (1898) by J. Stuart Blackton and Albert E. Smith.[14] After almost a century, in 1995, Pixar Animation Studios created *Toy Story*, the very first entirely computer-animated feature length 3D movie.[15] This breakthrough paved the way for more creative expressions through computer generated imagery (CGI) that gave the world an industry entirely dedicated to 3D animation.

Although virtually all 3D animation today is made using CGI, 3D animation still has roots in stop-motion animation. Three-dimensional animation is a widely used technology that finds useful application in a vast range of professions: engineering, medicine, business, architecture, interior design and entertainment, among others. It is also an invaluable resource for the arts and education.[16] Above all, the entertainment industry, especially filmmaking, appears to benefit most from 3D animation technology.

3D animation began in Nigeria over two decades ago. Various 3D animation studios have emerged in the local industry, creating animated productions that showcase varying levels of expertise. One studio that seems to be ahead of others in terms of skill and the duration of its 3D animated productions is Mighty Jot Studios, which began work on its first 3D animated movie

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[7] Ibid.
[8] "How Ancient Animation Was Produced."
[9] Kehr, "Animation."
[10] Ibid.
[11] Ibid.
[12] Chavan Mayur, "The Different Types of Animation Styles," November 14, 2017, https://medium.com/marketing-and-technology/the-different-types-of-animation-styles-150a0e6f619b (accessed September 20, 2018).
[13] "The 5 Types of Animation—A Beginner's Guide," *Bloop Animation*, September 13, 2015, https://www.bloopanimation.com/types-of-animation (accessed August 21, 2018).
[14] Stopmo, "The History of Stop Motion—In a Nutshell," *Stop Motion Magazine*, June 4, 2016, https://stopmotionmagazine.net/history-stop-motion-nutshell (accessed September 11, 2018).
[15] Kehr, "Animation."
[16] "4 Unique Ways 3D Animation Is Being Used," *Virtual Media Group*, September 18, 2015, https://virtualmediagroup.net/vmg-3danimation/4-unique-ways-3d-animation-is-being-used (accessed August 16, 2018).

Lifespan in 2008, making it a pioneer of 3D animation in Nigeria. This paper traces the history of 3D animation in Nigeria from 2000—when the industry was just beginning to emerge—to 2018, the final year for which data relevant to this study was accessible during my research. It particularly discusses the promising animation careers of four major Lagos-based 3D animators—Stanlee Ohikhuare, Richard Oboh, Philemon Otuya and Ekene Okoye—as well as a few others, the contents of their locally created 3D animated productions, and the challenges they have faced in producing 3D animation in Nigeria. This study is based on participant observation at Stanlee Ohikhuare's Mighty Jot Studios where I interned in 2014, and on oral and electronic interviews with the other three major 3D animators mentioned earlier. Additional information was gathered from online articles featuring interviews with 3D animators. Stylistic and functional approaches were used in data analysis. The stylistic approach explored the types of 3D animation produced in the various animation studios, and the functional approach studied the 3D animators' clientele and target audiences, as well as the purposes served by their 3D animated productions. This research sheds light on Nigeria's budding 3D animation industry on which little has been published.

3D Animation in Nigeria

In relation to North America, Europe, and some Asian countries, Nigeria has a shorter history of three-dimensional animation. The exact time or year that the practice of 3D animation began in Nigeria is uncertain. The earliest date provided was the late 1990s,[17] and this was because the 3D animators with whom I dialogued during the course of this study spoke in reference to their own practical experiences, not having any idea about a prior attempt at 3D animation in the country. By the early 2000s, however, Nigerian pioneer 3D animators had begun learning or experimenting with 3D animation. Stanlee Ohikhuare, the founder of Mighty Jot Studios, started producing 3D animation by the end of 2001.[18] Richard Oboh of Orange VFX Studios, Philemon Otuya of MX Creative Studios and Ekene Okoye of 3D Motion Pictures Limited, all based in Lagos, began producing animation in 2006, 2008/2009, and 2011 respectively.[19] Two other studios, Mayhem Productions and Anthill Productions, began practicing 3D animation at about the same period as the aforementioned studios.

As regards the kind of animation produced in Nigeria, studios like Mighty Jot, Orange VFX, and SMIDS Animation lean towards character animation, while others like MX Creative focus on visual effects. From all indications, the forms of 3D animation produced in Nigeria when it debuted in the late 1990s were the visual effects in montages, commercials, and shows broadcast on television news channels like Nigerian Television Authority (NTA). The major reason that 3D animation has largely remained an uncommon art form and profession in Nigeria is the absence of adequately equipped schools, training centres, universities or institutes that offer courses on it. As Otuya notes, "at the time I started [3D animation], there was no school, there was nowhere to learn 3D animation in Nigeria…"[20] Interestingly, in the last few years, as "more and more people began to see the need for it," 3D animation began to garner attention from local corporate companies, and studios began offering lessons on it.[21]

[17] Interview with Richard Oboh, Director of Orange VFX Studios, Lagos, July 15, 2014.
[18] Interview with Stanlee Ohikhuare, Founder of Mighty Jot Studios, Lagos, June 20, 2015.
[19] Oboh, interview cited. Also Interviews with Philemon Otuya, MX Creative Studios, Lagos, August 6, 2014; and Ekene Okoye, 3D Motion Pictures Limited, Lagos, June 23, 2015.
[20] Otuya, interview cited.
[21] Ibid.

In Nigeria, the motivation for the practice of 3D animation is as varied as the animators who practice it. Curiosity and experimentation appear to be the leading factors that led to the emergence of the art form in the country. The individual experiences of the animators during their childhood and adult years, especially in relation to television and video games, shaped their initial interest and subsequent experimentation with the art. With respect to motivation, training, and challenges, the paragraphs that follow will discuss the 3D animation careers of Richard Oboh, Philemon Otuya, Ekene Okoye, few other 3D animators, and lastly, Stanlee Ohikhuare.

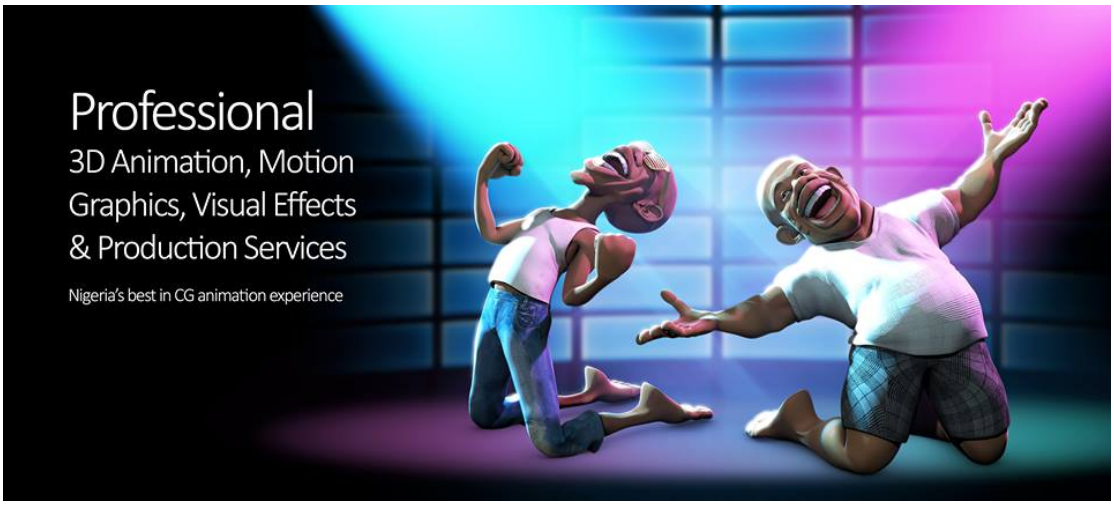
Orange VFX Studios

For Richard Oboh, the director of Orange VFX Studios and a trained engineer, the love of video games as a young boy led to his fascination with 3D animation. In 2006, in the course of his internship, he discovered AutoDesk Maya, the 3D animation software with which he first began to practice animation. His experimentation with 3D animation production quickly grew into a full-blown passion. In 2010 he moved from Benin City, where he first started to produce 3D animation, to Lagos to launch a career in the art form. Largely self- taught, he acquired his animation skills by watching online video tutorials and learning what he could from other active 3D animators. He set up Orange VFX Studios in Lagos and later employed other 3D animators to work with him. At the initial stages of his career, Oboh searched out his clients himself. Producing demonstrations (demos[22]) became an important marketing strategy. Speaking on his use of demos, he remarks:

> I did a demo one time. I made a simple dance animation, so I sold the idea to a TV station then. So, they kept playing it… It was really exciting because people had never seen an animation like that which looked Nigerian… We tried to do something with our own content, targeting our local audience.[23]

[22] A 'demo' is a showing of the merits of a product or service to a prospective consumer. See "Demo," *Merriam-Webster Dictionary*, 2018.
[23] Oboh, interview cited.

Fig. 1: *Ovie and Wale*[24]



Orange VFX has had more positive than negative reactions from audiences within and outside Nigeria. When in 2013 *Ovie and Wale*, two 3D characters created by the studio, were presented to an audience for the first time, following an unofficial leak, the reaction from viewers was quite encouraging. Within a few days of that display, the studio received calls locally and internationally from viewers making enquiries on the production. Speaking on people's reaction to *Ovie and Wale*, Oboh notes:

> There is this gap between us [Africa] and the West when it comes to 3D animation… People abroad were excited that we could even do something close. That alone got people interested in 3D animation in the first place. It was really something.[25]

The general reaction of surprise to *Ovie and Wale* resulted from the common mindset that 3D animation could not be done in Nigeria, but in more developed countries such as the United Kingdom, South Africa and India, where the industry was already well established. After the *Ovie and Wale* incident in 2013, and other 3D animation productions including videos and television commercials, Orange VFX became an accepted brand.[26] One such television commercial, made for Mobile Telephone Network (MTN), was "One World." The appeal of Orange VFX Studios is that both children and adults love its 3D animated characters.

[24] Orange VFX Studios, photograph, 2014, https://www.facebook.com/OrangeVFX/photos/a.553632371336216 (accessed September 18, 2018).
[25] Ibid.
[26] Other projects for MTN television commercials were "Access Code" and "Concert."

Fig. 2: *MTN One World*[27]

MX Creative Studios

Philemon Otuya, founder and creative director of MX Creative Studios, became interested in 3D animation as a result of the great disparity in the manipulation of visual effects in the Western and Nigerian movie industries. He notes:

> What sparked my interest in the art [3D animation] was the difference I saw between Nigerian movies and foreign movies… The visual effects here look so fake and are not interesting, so I decided to learn the art to create something that looks more realistic.[28]

MX Creative Studios is more concerned with the creation of visual effects, 3D visualization and 3D modelling than it is with 3D character animation. At the time of this study, MX Creative Studios was not creating 3D character animation because of the time involved, the poor electricity supply in Nigeria and the reluctance of clients to pay for it. Partially self-taught, Otuya acquired the knowledge and skills in 3D animation through online courses and video tutorials available on the internet. He began practicing 3D animation around 2008/2009, starting first with 3D motion graphics which basically covers television montages, TV commercials and multimedia productions. When he began practicing 3D animation, he was unaware of any local studios producing similar art. Initial responses to his creations were un-motivating. His early viewers dismissed him as a fraud, saying that he downloaded his works from the internet. Demands that he proves the originality of his work cropped up from the beginning. In one instance, he lost a bid to an Indian 3D animation studio because his clients doubted that his works were produced locally.[29] In the years that followed, MX Creative Studios occasionally collaborated with studios from the United Kingdom and India for projects on game development. While the partnering studios worked on other aspects of a game, MX Creative Studio's task was to create visual effects for it.

[27] Orange VFX Studios, photograph.
[28] Otuya, interview cited.
[29] Ibid.

3D Motion Pictures Limited

Ekene Okoye's interest in 3D animation developed from his love of video games as a boy. He eagerly played games but was also curious about how the games he played were created. He pursued his interest in 3D animation after graduating from the university. In his case, he trained in 3D animation in a South African animation school following a brief career as a moviemaker. His animation business began in 2011. At the initial stages of Okoye's career, his target audience was the African continent. With time, however, he adopted the principle, "act locally, think globally." His company's 2013 Genius Olympiad Award in the United States of America proves the effectiveness of his principle.[30] 3D Motion Pictures also occasionally collaborates with other animation studios both locally and internationally, and as Okoye notes: "some projects require the expertise of so many creative houses to achieve a particular goal… [So] we reach out to other creative media houses both locally and internationally".[31]

Other Studios

Other active companies in the local 3D animation industry include Mayhem Productions, Fusion Media and Anthill Productions. Mayhem Productions' *Mark of Uru*, created by Obinna Onwuekwe, is a 3D animated series produced for the internet because its creators wanted to publicize the series using a platform with a reach that goes far beyond Africa.[32] The series tells the story of a girl, Azuka, who was born with a birthmark similar to the tattoo of Uru, the banished village witch. Despite efforts by her mother to keep the birthmark hidden from sight, it was eventually noticed and Azuka's life became endangered. Nearly executed by villagers who wished to end her life, she was saved by a fallen spirit and his apprentice. Together they journeyed through dangerous terrains to discover the mystery behind her strange birthmark. The story resembles the typical Nigerian folklore. Unlike conventional 3D animated movies, *Mark of Uru* appears like a hybrid. The characters look two-dimensional but move like they are three-dimensional.[33]

[30] Okoye, interview cited. Major projects by 3D Motion Pictures Limited include "Bank of Industry (BOI) television commercial" (TVC), "P & G Camay TVC," "Vila Alero Wine TVC," "Fire Records brand activation" and "Lipton Yellow Label."

[31] Okoye, interview cited.

[32] Tambay A. Obenson, "Watch Full-Length Award-Winning Nigerian Animated Series 'Mark of Uru'," *Indiewire*, June 2, 2011, https://www.indiewire.com/2011/06/watch-full-length-award-winning-nigerian-animated-series-mark-of-uru152415/amp (accessed August 30, 2015).

[33] Ibid.

Fig. 3: *Mark of Uru* (2011)[34]

A notable 3D animation production by Anthill Productions is *The Sim* (Fig. 4), a science fiction short movie written and directed by Eri Umusu, the company's chief executive. The short movie is about a young girl trapped in a computer-simulated world whose survival depends on fighting aggressive opponents.[35]

Fusion Media, an entertainment company that provides premium quality Africa-inspired television series, feature length films and other forms of entertainment, produced the 3D animation series, *The O Twins*, a situation comedy centred on a Lagos-based family of four made up of 'Mom, Dad, Tami and Timi'.[36]

[34] "7 Action-Packed Made-in-Nigeria Animation Films You Should See," *Connect Nigeria*, https://connectnigeria.com/articles/2018/09/7-action-packed-made-in-nigeria-animation-films-you-should-see (accessed September 7, 2018).
[35] Judith Audu, "New Movie Alert: Eri Umusu's 'THE SIM', An Animated SCI-FI Short Film," *Judith Audu's Blog*, November 4, 2014, http://judithaudu.blogspot.com/2014/11/new-movie-alert-eri-umusus-sim-animated.html (accessed November 4, 2014).
[36] Segun Adekoye, "The O Twins 3D Animated Series to Launch Globally in 2013," *360 Nobs*, https://www.360nobs.com/2013/02/the-o-twins-3d-animated-series-to-launch-globally-in-2013-2/amp (accessed September 18, 2018).

Fig. 4: *The Sim* (2014)[37]

Fig. 5: *The O Twins* (2011)[38]

Although mention has been made extensively of 3D animators who are men, women also practice 3D animation in Nigeria. However, they appear to be fewer in number than their male counterparts. Lagos-based SMIDS Animation Studios is owned by a woman, Damilola Solesi.[39]

[37] "7 Action-Packed Made-in-Nigeria Animation Films You Should See."
[38] Adekoye, "The O Twins 3D Animated Series to Launch Globally in 2013."
[39] Amina Alhassan, "Why Animation Hasn't Made an Impact in Nigeria," *Daily Trust*, March 7, 2015.

Largely self-taught, Solesi established SMIDS in 2011 at the age of twenty-three. Besides Solesi, Orange VFX Studios' "Super Visco Static" was also animated by a woman.

Fig. 6: *Super Visco Static*[40]

Length of Local 3D Animated Productions

Local 3D animation studios strive to create their own content. More often than not, their exclusive contents are short animation clips. This is the case for both 2D and 3D animators, and the reason is the lack of funds to finance longer clips—according to Sporedust Media, a Lagos-based animation company. The downside of short clips is that the artists "never really grow to their full potential."[41] In Sporedust Media's experience, insufficient funds is also one reason that animation has not become a common aspect of local entertainment in Nigeria after more than a decade of the industry's emergence. Anthill Productions' *The Sim* runs for 3 minutes and 56 seconds, while Orange VFX Studios' *Eee Don Show* runs for 1 minute. Other studios have produced exclusive content videos that range from one to five or more minutes in length. Mighty Jot's *Lifespan*, which is of feature length[42] (1hour 30minutes), is an exception to this trend.[43]

[40] Orange VFX Studios, "Super Visco Static Remake," https://orangevfx.com/project/super-visco-static-remake (accessed September 2018).
[41] Amid Amidi, "Animation: The View from Nigeria," *Cartoon Brew*, November 20, 2012, https://www.cartoonbrew.com/ideas-commentary/animation-the-view-from-nigeria-73610.html/amp (accessed August 20, 2014).
[42] A feature film is a full-length film that is typically between 80 and 180 minutes long.
[43] According to the American and British Film Institutes, a feature film runs for 40 minutes or longer, while the Screen Actors Guild states that it is 80 minutes or longer. "What Is a Feature Film?," *Screenwriting.io*, https://screenwriting.io/what-is-a-feature-film (accessed August 31, 2018).

A Look at Mighty Jot Studios

Stanlee Aideloje Ohikhuare founded Mighty Jot Animation Studios at Ikeja, Lagos. Ohikhuare, who hails from Okpuje in Owan West Local Government Area of Edo State, graduated from the University of Benin in 2000 with a degree in Fine and Applied Arts, majoring in painting.[44] After his university education, Ohikhuare pursued a career in graphic design—which he learned by himself—and worked for a number of companies.[45] A graphic designer with many interests, 3D animation soon became part of his many preoccupations and in 2005, Mighty Jot Studios ventured into 3D animation. Its animation arm became Mighty Jot Animation Studios. Ohikhuare later expanded his interests to include photography and cinematography.

Stanlee Ohikhuare's interest in animation began when, as a child, he watched animated movies like "The Seventh Voyage of Sinbad."[46] Since establishing his own company in 2005, he has run and self-funded its productions himself. To stand out from his competitors in the industry, he applies his Fine and Creative Arts skills to his animation projects to create a unique brand. He has animated for individuals and corporate organizations alike.[47]

Fig. 7: *Mighty Jot Studios' Company Seal*[48]

In 2006, a year after starting his studio, Ohikhuare began building and training his team of animators. Within a year, the team began disbanding, frustrating his efforts to build manpower for his company. Speaking on this, he remarked: "the toughest part is training and retaining skilled manpower."[49] Another obstacle to his animation production has been irregular electricity supply, an ugly reality that pervades businesses and the private sector in Nigeria. In his opinion, "the cost of sustaining an animated project in view of the unstable electricity supply in Nigeria is enough to make anyone put such an endeavour aside."

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[44] Stanlee Ohikhuare, official website, http://www.stanleeohikhuare.com (accessed August 2018).
[45] Before establishing his own company, Ohikhuare worked as a graphic designer and illustrator in Frank Marketing Communications, Signature Folio Communications, Digiprint International among others). Ahaoma Kanu, "Stanlee Ohikhuare Set to Release First Nigerian Animation Movie," *Nigeria Villagesquare*, August 16, 2007, http://www.nigeriavillagesquare.com/articles/stanley-ohikhuare-set-to-release-first-nigerian-animation-movie.html (accessed August 10, 2018).
[46] Ohikhuare, interview cited.
[47] Among the corporate clients he worked for were Chicken Republic, Oando, Nigeria Breweries, Coca-Cola, MTN, and Celtel (now Airtel). Kanu, "Stanlee Ohikhuare Set to Release First Nigerian Animation Movie."
[48] Mighty Jot Studios, official website, 2015, http://www.mightyjotstudios.com (accessed 2015).
[49] Ohikhuare, interview cited.

Mighty Jot Studios offers design consultancy services in advertising, branding, brand activation and content creation. They produce a broad range of 3D animated projects such as television commercials (TVCs), training materials, simulations, and architectural visualizations. Between 2004 and 2005, the studio made a simulation of Lagos' 4th Mainland Bridge and Lekki-Epe road construction. Productions take two major forms: character design and animation and visual effects, usually created for television commercials, product unveiling and "impossible scenarios."

The studio's efforts at creating the first feature length animated movie, *Lifespan*, shows the unique challenges faced in the budding animation industry in Nigeria. To produce *Lifespan*, two 3D animated movies, 'Featо' and 'Taming Toti', were put on hold. Production of the movie began in 2006, with a planned release date of 2008. In 2007, Ohikhuare's team began breaking up, with members leaving one after the other. Besides this setback, financing *Lifespan* was the greatest challenge to producing the movie. With an estimated production cost of eighty million naira (N80,000,000.00), Ohikhuare set up a sponsorship page on his website tagged "Lifespan Sponsorship/Partnership."[50] He had hoped to get adequate sponsorship or partnership deals from reputable companies in Nigeria, but this did not happen, thereby causing a protracted delay in the release date.[51]

Fig. 8*: Lifespan the movie*[52]

[50] "Stanlee Ohikhuare," *BP Vision*, http://www.bpvng.com/../124-stanlee-ohikhuare (accessed July 18, 2015).
[51] Kanu, "Stanlee Ohikhuare Set to Release First Nigerian Animation Movie."
[52] Stanlee Ohikhuare, "On-Going Projects," 2015, http://www.stanleeohikhuare.com/on-going-projects.html (accessed 2015).

Lifespan The Movie has several characters—Queen Shebaz, Queen Shekil, Akpor, Opiah, Omon, Nene, Gughe, Scout, and "Baby in the Cave." The story follows the lives of a royal clan of mosquitoes inhabiting the Niger Delta region of Nigeria over 4000 years ago. They attempt to find a magical solution to malaria by going on a quest to a cave inhabited by men. Their goal was to cease transmitting malaria so that peaceful coexistence with humans could be made possible. To perform a purification ritual that will put an end to malaria, they needed to get a dose of human blood. Unknown to the rest of the clan, the queen had plotted to thwart their plan.[53] Ohikhuare's goals in producing *Lifespan* include passing positive messages about Nigeria and making people more aware of malaria. *Lifespan* is meant to be as educative as it is entertaining.

The 3D animation procedures at Mighty Jot Studios probably mirror those of other professional 3D animators elsewhere. First thing in the production routine is idea conceptualization and development, which is done by writing a script—the groundwork of the entire process. Characters are chosen to appear either in human or animal form. After refining the story comes storyboarding—a series of drawings or pictures that show the changes of scenes and actions for a movie, television show, et cetera.[54] The third step is character design. This is where the artist decides what each character will look like, their clothes and other embellishments. After character design, comes character modelling.[55]

The next processes include rigging—where characters' bones are created to enable movement—and scaling, which involves attaching the bones to the already designed body. Mapping and texturing, which give the characters the appearance of a live human or animal, come next. Animation or movement ends the main animation process, although it is not the last thing on the routine. Through animation, the characters are able to make whatever movements are necessary like running, jumping, walking, climbing, and so on. Lip synchronization makes the characters' lips move. Special effects are used to create sounds like speech, thunder or rain. After applying special effects, compositing—the incorporation of all the animation processes into the designated scene as illustrated in the storyboard, follows. Rendering the work into a video file or image sequence is done before it is passed through the editing software where voices and sounds are appropriately assigned before it is rendered for the last time and finished.[56] The postproduction stage takes care of everything afterwards, including marketing the movie.

Stanlee Ohikhuare is a prominent figure in Nigeria's 3D animation industry for several reasons. Besides his many years of experience in 3D animation, he has made several noteworthy efforts to stand out from his counterparts and break grounds in 3D character animation, which used to be uncommon in Nigeria. His animated projects have received varied reactions from audiences. There have been viewers who expressed doubt that a Nigerian can produce 3D animation in Nigeria.

Challenges Facing 3D Animation in Nigeria

While 3D animation is a huge part of the entertainment industry across the globe, and has undergone many developments over the years, in Nigeria, it only recently began to evolve. As a result, local 3D animators in the country face diverse challenges in their practice of the art. For some, it is a hobby done alongside their actual profession. For others, it is their primary occupation.

[53] Kanu, "Stanlee Ohikhuare Set to Release First Nigerian Animation Movie."
[54] *Merriam-Webster Dictionary*, s.v. "Storyboard."
[55] Modelling is somewhat like moulding the characters with clay, except that it is done using computer software.
[56] Kanu, "Stanlee Ohikhuare Set to Release First Nigerian Animation Movie."

Regardless of the category that local 3D animators fall into, their challenges are similar. The most basic drawback they face is the relatively slow budding of the industry in the country. Added to this are, in the perceived order of importance, lack of funding, poor electricity supply, high cost of keeping an animation crew, lack of local training schools for 3D animation, and the discouraging responses from viewers.

Lack of Funds: The quality of a 3D animated film, game or television commercial greatly depends on the availability of sufficient funds or the lack of it. Where the funds are sufficiently available, production and post-production requirements can be met. Moreover, animation is faster when the devices and resources for production are readily available. Even more important is the fact that individual crewmembers will get some monetary benefits for their contributions to the studio's projects. Sufficient funding is in fact the backbone of the survival of this business. Consequently, the lack of it is a threat to the practice of the art.

Poor Supply of Electricity: Beyond the need to power computers and other electronic devices, running electricity generators also demands significant spending on fuel and maintenance. These additional costs make it difficult to keep animation production running smoothly and without interruptions. Breaks in electricity supply can cause hitches to the animation process. For instance, rendering out a 3D scene in a regular computer could sometimes take hours, depending on the scene file being rendered and the computer's capacity to render that scene file. For a 3D animation-rendering machine called a render farm, whose sole function is rendering out 3D animated content, the case is a little different, as the machine renders in a matter of seconds or minutes. Despite the added advantage of high rendering speed afforded by the render farm, it requires stable power supply to function effectively.

Three-dimensional animation requires patience and time. Where a local animation studio receives a job from a corporate client, animators involved with the project may have to work round the clock in order to meet the deadline. When, in such a situation, there is a night long black out, the usual resort is to power generators, which stay on for as long as the fuel lasts. The additional expenditures on fuel and generator maintenance subtly eat into money that could be put into more beneficial use in the project. In the long run, production funds are depleted by attempts to mitigate interruptions in power supply.[57]

High Cost of Keeping an Animation Crew: Enterprising 3D animators who have hopes of establishing their own animation studio commonly face this challenge at different points in their career. Most animators started alone, somewhat like a one-man army. They sourced jobs from clients, brainstormed, modelled, rigged and did everything themselves, struggling to meet deadlines. Interviews with 3D animators show that the most difficult part of the business is starting alone. As Richard Oboh recalls, "The first challenge I had was to learn everything, to know everything. Animation has a pipeline. You have to know the whole process… You have to have a knowledge of the entire pipeline."[58] Having a crew of specialized animators reduced the workload and made production faster. In order to make things easier on themselves, creative directors employ additional help, sometimes amateurs with less skill whom they train and employ in the studio. As Ohikhuare disclosed, keeping together a crew of loyal 3D animators was difficult largely because monetary returns from animation projects, as well as those from non-animation productions, were

[57] Otuya, interview cited.
[58] Oboh, interview cited.

insufficient to simultaneously fund projects and pay crew members well, leading to employees' resignation, a setback that has several implications for the business owner.[59]

Lack of Local Training Schools for 3D Animation: The absence of local training animation schools in Nigeria is a major challenge for local amateur animators. Although local animation studios are beginning to offer informal training programmes to upcoming 3D animators, there are as yet no formal schools teaching animation in Nigeria. Consequently, local 3D animators learn to animate through a twofold process: by self-teaching and learning from video tutorials. A greater number learn animation through trial and error. Not many have the privilege of training in animation in schools outside Nigeria. Animators' experiences show that as helpful as video tutorials may be, they offer limited lessons. As such, it helps to know a professional 3D animator in person from whom one can learn. Nigeria's lack of good animation schools prolongs the animators' learning period and indirectly impacts the quality of animation productions that local animators are able to create.

Responses from Viewers: Local 3D animators have received various kinds of feedback from their audiences, ranging from positive to indifferent or negative. For some studios, the response has been positive, while other studios have received a mixture of positive and negative reactions. Since the rate of 3D animation production in Nigeria is relatively low, and the level of expertise is comparatively lesser, some local corporate companies are convinced that the best way to get a 3D animation project done is to go outside Nigeria and employ the services of foreign companies. Richard Oboh of Orange VFX disagrees with this mentality. According to him, "the mindset in most corporate companies is that you can't get it [3D animation] done here. You have to go to South Africa; you have to go to the UK, India. And you spend a whole lot more over there."[60]

Possible Solutions to the Challenges in 3D Animation Production in Nigeria

In view of the major challenges faced by local 3D animators in Nigeria, it is apparent that some possible solutions to their setbacks cannot be effected by the animators themselves. Insufficient electricity supply, for instance, is the preserve of the Nigerian government. Most other challenges encountered by local 3D animators can be surmounted by the collective efforts of the animators themselves. Possible ways by which Nigeria's 3D animation industry can be improved include: active participation in conferences or online fora on 3D animation, writing grant proposals, organizing fundraisers, collaboration with local and foreign studios, and learning 3D animation outside Nigeria.

Festivals and conferences like *Trojan Horse was a Unicorn*, *E3*, *BFX* and *FMX*, among others, offer abundant opportunities for animators to interact and exchange ideas. *Trojan Horse was a Unicorn*, held annually in Portugal, brings together artists and companies in the visual effects, gaming and animation industries.[61] Seminars are held on the most current art techniques used in popular productions. E3 (Electronic Entertainment Expo) is held specifically for 3D gaming artists, where game enthusiasts gather to discuss recent developments in the field of computer and video games. Participants get the opportunity to hear and learn from the most influential people in the gaming industry and are exposed to extraordinary new technologies. BFX, a newer animation

[59] Ohikhuare, interview cited.
[60] Oboh, interview cited.
[61] "Trojan Horse Was a Unicorn," https://trojan-unicorn.com (accessed September 17, 2018).

festival, is organized by the National Centre for Computer Animation (NCCA) in Bournemouth, United Kingdom. It is designed to celebrate and promote the visual effects industry. The NCCA also runs a training centre for animation. Lastly, the FMX (Film and Media Exchange), annually hosted in Germany for four days, runs series of workshops, consultations and presentations on current news from the CG (Computer Graphics) industry.[62] These conferences are a few among many others held annually for artists in the graphic design industry at large. 3D animators could also enhance their skills by joining internet forums on animation. A popular website is CG Talk, which monitors the latest happenings in the computer graphics industry.[63]

Project grants do not come easy. Intending beneficiaries must write a convincing proposal to prospective sponsors (individuals, institutions or the government) clearly stating what the grant will be used for and how it will be spent if secured. In some developed countries, government grants for film productions are available to prospective grantees who wish to embark on projects that they are unable to fund by themselves. In 2013, former Nigerian president, Goodluck Jonathan, offered a grant of N3 billion to Nollywood, the local movie industry, to boost capacity development and support the industry's infrastructure.[64] For Nigeria's developing animation industry, similar grants could go a long way in raising the standard of animation productions, among other benefits. Potential grantors in this case could include local art patrons and institutions like the Omooba Yemisi Adedoyin Shyllon Art Foundation (OYASAF) founded in 2007.[65]

Fundraising is another means of sourcing funds for a 3D animation project. Websites like Kickstarter could be useful in this regard. Kickstarter, arguably the world's largest crowdfunding forum for creative projects, financially supports all artistic genres—film, music, art, theatre, games, comics, design and photography, among others.[66] Projects are funded through the monetary support of random people.

Collaboration is also a great way of producing and finishing a good 3D animated project. If two or more teams of specialized animators should come together to create a story, the resulting project is very likely to turn out better than a one-studio release. Of course, animation studios cannot collaborate on all projects. Individual studios will have to create works that reflect their peculiar style and interests. However, to break into the global 3D animation community, and to create a lasting impact on the Nigerian entertainment industry, collaboration may have to come into play. If, hypothetically, Mighty Jot and Orange VFX Studios were to work together to create one unique project, the fusion of skills and styles from both sides could result in a movie that will potentially attract a much larger audience. This will boost the image of the local industry beyond the geographical boundaries of Nigeria and Africa.

Learning 3D animation in developed countries will provide local amateur animators with a much better learning experience. They will have the opportunity to interact with, and be taught by, professional animators. The U.S., for example, has many excellent animation schools. They

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[62] FMX Conference, https://fmx.de/home (accessed September 17, 2018).
[63] CGSociety Forums, http://forums.cgsociety.org (accessed September 17, 2018).
[64] Alexamade, "Jonathan Splashes N3 Billion New Grant on Nollywood," *Vanguard News*, March 4, 2013, https://www.vanguardngr.com/2013/03/jonathan-splashes-n3-billion-new-grant-on-nollywood/amp (accessed September 17, 2018).
[65] Tobenna Okwuosa, "Art Patronage, Promotion, and Publication in Nigeria: A Focus on Omooba Yemisi Adedoyin Shyllon Art Foundation (OYASAF)," *Journal of Humanities and Social Science* 19, no. 4 (2014): 33–44.
[66] Kickstarter, https://www.kickstarter.com (accessed September 17, 2018).

include the California Institute of the Arts (CalArts) in Valencia, California, University of California, Los Angeles, and Pratt Institute in Brooklyn, New York.[67] Germany has the Filmakademie and Baden-Wuerttemberg's Institute of Animation, Visual Effects and Digital Postproduction, which hosts the annual FMX (Film and Media Exchange) conference. Israel, South Korea and India, in addition, have schools that teach 3D animation. These institutions and many others provide the local 3D animator with sufficient opportunities to learn 3D animation, as long as they are able to finance their training abroad.

Conclusion

Nigerian 3D animators are pioneering a relatively uncommon art form in the Nigerian creative industry. They are trying to prove that they can replicate in Nigeria an industry already well-established in much of the developed world. Regardless of the difficulties involved, the development of the local 3D animation industry depends on animators' diligence in producing 3D animation, their willingness to invest time and other resources in the art, and on how far they are willing to go in order to get to the top. These pioneers deserve commendation for their perseverance.

[67] "Top 50 Animation Schools and Colleges in the U.S.—2015," *Animation Career Review*, 2015, https://www.animationcareerreview.com/articles/top-50-animation-schools-and-colleges-us–2015 (accessed September 17, 2018).

