“Technology is like chemistry: ‘Nothing is lost, nothing is created. Everything is transformed’”

VFX has evolved from the preserve of high-end movies to a common feature in episodic productions. With a choice of LED, green or blue screens, calls for standardised, time-saving tools and crossover with the gaming industry, what does the future hold?

INTERVIEW. Robert Shepherd

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Could gaming tools and personnel be utilised more to help VFX evolve in the film industry?

QUENTIN JORQUERA: Gaming tools are already at the core of the revolution which has been taking place in the VFX world for the last five years or so. Game engines such as Unreal Engine and Unity are widely used now in the film industry, and hardware like VR headsets and gamepads are being used both during prep and on-set now. Virtual production is all about fluidity of communication between storytellers and the machines, the core identity of the gaming hardware is to constantly find better ways to communicate with the machine. And it's not just about the hardware, creating animated rigs to control your computer-generated character or vehicle using a gamepad, just like a video game, allows for superfast animating in previs.

VR gaming has pushed the industry forward to create better, smarter and cheaper body-tracking systems which are now used on sets to track cameras and bodies, display virtual characters and objects. Video game developers and personnel are important in order to build the tools we need for the VFX film industry. Though I believe the human and artistic flow is going the other way around, as video game tools are being used more in the film industry, it is film people and artists who are bringing a new vibe into the video game industry.

RENE AMADOR: Yes, the real-time graphics engines and all the creative workflows that go into making the sets and characters for games are also applicable to virtual production, which is the segment of the film effects industry that uses real-time tools. In addition, beyond visual effects that are performed in post, there are now live on-set methods of virtual production that involve live green screen composites, AR elements or LED XR backdrops for in-camera effects. Technically, these on-set methods don't qualify as visual effects, since they can be realised on-set, so they're a new hybrid of traditional special effects and computer graphics.

People who find themselves generating the environments, lighting and characters for gaming will find much of the process to be identical in virtual production.

People who focus more on the interactive design side of gaming will find opportunities in UX, with more roles likely soon to come.

HE SUN: Gaming technology has been used in the VFX/film industry for a very long time, tools like Bullet Rigid Body Dynamics Solver or the concept of LODs (level of details) come from gaming tech and have been used in the VFX industry for years. Recently, the use of gaming tools and talent in VFX have become more apparent with the rise of real-time engines such as Unreal and Unity. I believe this will continue to evolve. In addition, it's not only the technology and talent that are transferable to VFX, but also the non-linear production methodology used in gaming development, and I think we'll see more of this.

LALA GAVGAVIAN: Gaming tools and the skills to use them have been integral to the filmmaking process for a long time now, particularly during pre-production. These tools can enhance the creative process for filmmakers by giving them more options, while also saving them money. One example of this is through the use of previsualisation and virtual production workflows, which allow filmmakers to bring their ideas to life earlier in the process. That's a relatively new integration made possible by advancements to game engines.

So as game engines evolve and offer new functionality, VFX users will certainly look at how they can integrate any and all new tools for their work where it makes sense.

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PHILIPP WOLF: Yes, I think that gaming tools and personnel can be utilised more in the VFX industry. The gaming industry is already ahead of the film industry in terms of real-time rendering and other technological advancements. Those could for example help to streamline the VFX production process, allowing for more efficient and cost-effective methods. This can be particularly beneficial for independent film productions.

Will there ever be a time when VFX specialists adopt standardised tools, or is the advancement of technology moving too quickly for it all to become uniform?

RA: There have been many efforts to standardise the behind-the-scenes workflow of data passing from on-set to 3D application to editing timeline; the most recent being the USD (Universal Scene Description) format. However, historically, standard formats have not always resulted in standardised tools and workflows. If you feel the industry moving rather quickly on the tech side right now, I think you're correct in likely sensing that we're in a transition. But it's not exactly clear what the industry is transitioning into. We may be moving so quickly now that more fragmentation and democratisation seems tied together and inevitable.

LG: The foundation of a VFX pipeline is often standardised and unique to each studio, and in the case of Digital Domain, it's the result of practical experimentation over our 30-year history. We also have several proprietary tools that give us a few advantages in specific fields, and those would be difficult to standardise across the whole industry. The same is true for most VFX teams that are creating new techniques and tools all the time. We have some of the best artists in the world working for us, and many of them are experts in a specific set of tools. The technology continues to advance at a rapid pace though, and new tools are frequently being introduced. Ultimately, VFX specialists adopt the tools that allow them to save time and be as efficient as possible. Expecting everyone to have the same tools and techniques isn't necessarily the best way for them to excel in their craft and stay at the forefront of their field.

QJ: It's already the case now, I can cite quite a few companies who offer standardised kits and VP services in a box. If you have an empty room and enough money, some companies can bring you all in one for the right amount of money. Now, in my opinion, this makes sense in a small-scale industry, for YouTubers, music videos maybe and certain commercials, but that also means you might take longer to have an ROI. Not every project will need the same tools, organised in the same manner. Standardised tools exist because someone invented them while pushing boundaries. Each tool was born from solving a specific creative problem. The reason why we have Steadicam today is because director Hal Ashby wanted a shot that was impossible to achieve before. It's the same with VFX, if you

are using a tool someone invented, that means you're not participating in making the industry move forward. Technology doesn't advance simply by magic, it does so because people like Méliès, Lucas and Cameron make no concessions on their artistic and technical visions.

HS: We already have the technology of USD, which aims to provide a standardised framework for VFX. But there isn't a Universal Workflow Template. As a result, VFX studios tend to customise their workflows individually, implementing USD in many different ways. My personal feeling is that it will be very difficult to standardise the workflow, due to the fact there are always different tools, artist preferences and requirements on projects, not to mention different pricing points.

But I am hoping we can reach a point where we might have a small number of key standardised workflow templates, which would include slightly tailored toolsets and working practices. I would see these as being based on the size of the team and studio as well as the type and complexity of projects.

PW: I believe it is possible that VFX studios will eventually adopt standardised tools, but the constant advancement of technology and the preference of many VFX artists to use a variety of tools make it a difficult task to fully standardise. Additionally, some studios have their own proprietary tools and pipeline that they have invested a lot of time and resources into, and they may be hesitant to switch to a standardised toolset. USD and MaterialX are steps towards standardisation, but it will take time for the industry to fully adopt it.

Do you think real-time in-camera VFX pose a threat to blue, green and LED screens, as well other technologies?

LG: Filmmakers are a diverse group of creative individuals, and they each approach the technical and creative process differently. Real-time, in-camera VFX can have many benefits, these can be attractive tools. It's important for the film industry to effectively educate filmmakers about these benefits to increase their adoption and visibility. By raising awareness and helping filmmakers understand all the pros and cons, more filmmakers may be motivated to explore and utilise these tools in their work. But what works for one might not work for another. Once they have the opportunity to see what real-time, in-camera VFX can offer, they might decide that they don't fit their needs. The technology is still a new frontier though, and it has a long way to go, so I don't believe blue, green and LED screens will be fully replaced by in-camera paradigms.

QJ: I don't understand this concept of tech vs tech. Green screens, celluloid, LED lights, these are just tools! I'm more concerned about what social media is doing to tomorrow's creative minds than about what tools they will or won't be using to tell their stories. Our industry is one of tells and myths. Was the Lumiere Cinematograph a threat to the magic lantern? Yes and no, magic lanterns have now become projectors that show movies that are shot not on Lumiere Cinematograph any more using celluloid film – but on Arri Alexa using electrosensitive photosites! We still gather with the people we love to listen and watch a story where someone else is putting a lot of effort into making it appealing. Technology is like chemistry: 'Nothing is lost, nothing is created, everything is transformed!'

HS: ICVFX has a lot of limitations, particularly camera angles and the complexity of the environment. It is an additional tool in your VFX toolbox, but it is not the solution for everything. Traditional blue and green screens are still playing bigger roles.

AROUND THE CORNER Created by Soapbox Films with ICVFX, Muppets Haunted Mansion was an award-winner

RA: In-camera effects combine the best of physical effects and virtual effects, and there's very few filmmakers that won't benefit. That's why at ARwall we are the foremost proponents and pioneers of in-camera effects for professionals, prosumers and creators working at home or in small studios.

I believe with in-camera effects we have disrupted the actual foundation of studio power; which are the sets, real estate and physical production teams. This is because with this technology we have finally reached the point where we can bring professional sets and lighting to amateur users 'on demand' around the world as a technology provider instead of services provider.

PW: Real-time, in-camera VFX has the potential to be a threat to traditional blue and green screens, as well as other technologies. However, it's important to remember that each technology has its own strengths and weaknesses, and that each has a place in the VFX industry.

A criticism of VFX is that it only lends itself to big budgets – do you see costs coming down in the near future?

QJ: I've already heard of costs for a day of shooting on LED screens for a feature being quoted from €85k to €35k now with some studios in a three-year timespan. Costs are always bound to go down; when it's not because of the equipment price, it's because of the manpower. Today, not a lot of people know how to operate an LED screen – even fewer know how to supervise it. But this is changing every day as more and more people are being trained for it, and most importantly, are gaining in experience. Wait until you have hundreds of young people, coming out of film school where they trained on LED volumes, with a loan to repay and ready to accept minimum wage in the worst conditions... Sadly, this is what usually happens and what in the end really brings the cost of production down. It isn't the technology, but the people.

I'm pretty sure that in three to four years, it will be very reasonable and common to consider shooting a €50k budget short film using ICVFX.

RA: VFX has been around a long time now and pricing has settled, but we will see it begin to drop over the next few years as a result of AI workflows that

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lower cost and time involved. It's not clear where that drop will leave the industry, but I think it's not crazy to think that small capable teams – two to 15 people – could support a complete TV show or film in the next few years; which would likely result in lower pricing and many more teams filmmakers could approach for quality effects.

We're very optimistic about the price dropping specifically in the space we have more control over, in-camera effects. There's two examples of that.

For more professional projects, at our partner stage in Burbank owned by Soapbox Films, beginning this year they now offer a $75k per week deal which includes all tech, labour and scene creation. This is a stage where shows for Warner Bros and Disney have been shot, and the team recently won an Emmy for *Muppets Haunted Mansion*. The feedback so far has been promising, people want access to this tech at a price and quality that makes sense for now and the future.

Additionally, we have something new we're working on, currently in closed beta. Our new ARFX app is a desktop and mobile app bringing *Mando*-style effects to the home user with a starting price point of $79. There is no new hardware required, the software uses your existing TV and smartphone, and you can even dial down the scene complexity to work on older machines while still getting a realistic smooth backdrop illusion. We believe, within five years, award-winning films will be shot in filmmaker's homes on microbudgets without the audience knowing that's how they were realised.

"There will always be new challenges and a demand for high-end, groundbreaking VFX as this is a technology-based creative industry"

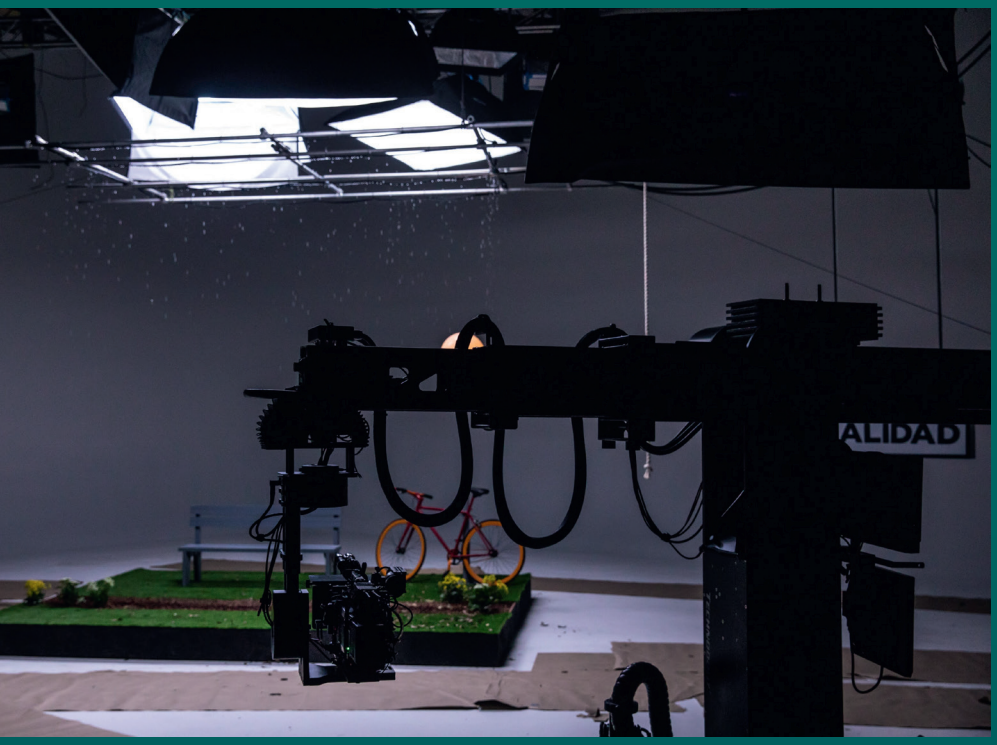
HS: The cost of VFX depends on what it is for and the complexity required. There are open source technical solutions and tools available to help manage the budget on, say, a small independent production.

Real time technology has the potential to reduce costs on productions of all sizes, but this depends on how it's used and the type of production.

Many independent productions use VFX, but the expectation of large productions will continue to raise the stakes and the bar will keep rising. There will always be new challenges and a demand for high-end, groundbreaking VFX as this is a technology-based creative industry. Naturally, we will keep pushing the envelope to produce more complex and ever-higher-quality work.

LG: One of Digital Domain's main goals over the last few years has been to offer our clients the same level of quality – regardless of the medium or platform. We use the same tools on episodics and new media experiences as we do on feature films, and our teams are able to jump between projects based on their expertise, not the budget. Because of that, we can offer the highest level of quality for something like a game cinematic or network TV commercial, just as we can for feature films. The biggest factor in the budget isn't the cost of the VFX, it's that filmmakers on all levels are seeing there are no real limits to their vision any more. We're seeing things on screen that weren't possible even a few years ago, and that tends to lead to larger budgets. But we can work with productions of all budgets and offer great results.

PW: VFX is often associated with high costs, particularly for big-budget films, due to the complexity and technical expertise required, as well as the cost of the specialised software and hardware needed to produce them. However, there are a few factors that may contribute to a decrease in costs in the near future. One factor is the development of more advanced and user-friendly software that can automate some of the more complex and time-consuming tasks associated with VFX production. This could help to reduce the labour costs and make it more accessible to smaller studios and independent filmmakers.



Another factor is proper preparation, incorporating VFX into the filmmaking process from the beginning, which can benefit the VFX workflow tremendously and reduce costs by avoiding reshoots or reworking. Plus, it can guarantee a more seamless and cohesive final product.

What impact would a recession have?

QJ: Once again, it comes down to the people. A recession will inevitably create a situation where people are more desperate to work, more and for less... Recessions usually profit the powerful! More and cheaper VFX for big productions. It also can push the film industry to produce even more as people need distractions in times of hardship. Would Charles Dickens and Eugène Sue have had such success if they were living and writing in the eighties, the era of absolute abundance in the west?

RA: The year 2022 may have been a 'peak content' year, where we won't see that many shows greenlit for a while. I think we'll see smaller budgets over the next few years and that will inevitably cause a crunch in VFX where there's a lot of pressure to optimise the creation process and automate. In the near term, using virtual production will be a choice 40% of productions in 2023 will make, the word is out that the technology's promise of reduced cost and increased flexibility may have finally delivered.

HS: Fortunately, the VFX industry has always evolved through challenging times and the entertainment industry is generally fairly recession-proof.

LG: While the film and entertainment industry has historically been able to weather economic challenges, it's always possible that studios may become more conservative with their production budgets, and even alter their schedules in response to these challenges. But in cases like that, VFX can actually play a vital role in helping to reduce costs and streamline traditional filmmaking processes through digital workflows and real-time technology. With these tools and techniques, it is possible to maintain a high level of creative productivity and storytelling quality, even on a budget. So in the case of economic challenges, VFX can actually become even more relevant.

PW: A recession could potentially have a negative impact on the VFX industry, as it would likely lead to a decrease in the number of films produced. However, it's important to remember that the VFX industry is not solely dependent on the film industry. There are other areas such as gaming, immersive experiences and advertising that may continue to grow – despite a recession.

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