Where do we go from here?: Virtual Production and the potential impact on regional filmmaking

Dr. James Fair
Principal Academic in Film & Television Production
Department of Media Production, Bournemouth University
Bournemouth, England

Abstract

Virtual Production (VP) has seen enormous growth in the last few years. The technology enables filmmakers to project locations onto a giant LED wall backdrop in a studio space, providing a photorealistic setting at the click of a button. Exciting though these developments are for the industry, our governments need to explore and understand what the trend away from traditional filmmaking may mean. There could be some hidden consequences that impact upon existing policy objectives. This paper focuses specifically upon the potential challenges that regional filmmaking may face as a result of VP; including a loss of production revenue in the local economy, possible skills migration and a threat to screen tourism. The paper argues that interventionist policy making, similar to successful tax relief schemes that have invigorated the UK cultural industries in recent years, could help steer the new technology in directions that help meet wider policy agendas, rather than usurp them.

Keywords: Virtual production, screen tourism, filmmaking, Government policy, Cultural industries.

Virtual Production

Recently there has been a growth in Virtual Production (VP) within filmmaking, with series such as Mandalorian and House of the Dragon using the technology to notable effect. VP involves filmmakers returning to the studio environment rather than location-based filmmaking. Live action footage is captured against large LED video walls (called volumes) which can screen photorealistic backgrounds at the click of a mouse. The technology utilises game engine softwares used in the computer games industry, and opens up possibilities for greater convergence between games and films.

The VP process has potential economic and environmental benefits. Productions no longer need to travel to remote locations with big crews and deal with unstable weather or unpredictable sound. House of the Dragon was based just outside of Watford, despite using many similar locations to the original Game of Thrones series, which was filmed in Northern Ireland. This convenience has led some to believe that VP will become a significant mode of production in the coming years. The pandemic has already highlighted the benefits of filming in a controlled environment and has accelerated its adoption. Even those who doubt the economic and environmental

benefits (after all, it is an expensive new technology) concede that it is much more effective than green screen in particular contexts, especially when the background is reflected on costumes or props and does not require onerous amounts of post production fixes.

There is already plentiful discussion around organisational structure and skills shortages (Bennett, et al., 2021), potential new roles (Carpio and Birt, 2022) and the technological challenges of VP (Jobin, 2022) (Shan and Chung, 2022). However, there is less discussion around the wider impact of what this technology may bring to location filmmaking, especially in regions outside of traditional production centres. This paper aims to explore some of the potential impacts that VP may have on regional filmmaking, and why that may be of concern to policymakers, industry stakeholders and regional authorities. It is not intended as a predictor of the future, or as a concrete direction for future policy to take. The paper has an exploratory purpose; asking whether we have thought through the opportunities and threats that this technology may bring, and considering whether other outcomes could be possible if we wanted them to be so?

Location, Location, Location

The potential environmental benefits of virtual production should be commended. It is an innovative solution that could reduce the carbon footprint of productions, especially those that require journeys to remote and distant, difficult locations. Last summer, Broadcast magazine championed the UK's first carbon neutral virtual production film; 'the short film was shot in just one location in London, with the action virtually taking place in ten different areas - such as the Scottish Highlands and streets of Japan.' (Miller, 2021). While carbon neutrality was the focus of the article, it inadvertently raised the spectre of a different problem.

Locations doubling as other locations is standard practice within filmmaking and has been since the start of cinema. In recent years the UK has done an excellent job of attracting international productions via tax relief and excellent resources, but also a diversity of film locations and infrastructure. But does VP damage the asset? Why visit the UK for its unique locations if they can all be recreated virtually anywhere around the world? Burns describes how:

> WPP recently used drones to scan and capture (to a 15 billion point mesh) a four-mile section of forest in the Scottish Highlands. It then used the power of Microsoft Azure cloud and the Nvidia Omniverse multi-GPU real-time platform to translate this into an incredibly detailed fly through simulation of the physical landscape on a LED wall for use in automotive advertising (Burns, 2021).

The benefit for the advertiser is obvious: this photorealistic scan can then be used multiple times on various adverts, all without the need of returning to film separate cars each time. The benefit for the environment is also clear, if it prevents the carbon

outputs of each separate visit. But the regional impact in less clear. What happens to the regional creatives who contributed to those separate productions in Scotland?

So far the UK has been the beneficiary of taking work that may have been produced in other countries. VP has in fact encouraged more production to the UK, and has been an opportunity to bring productions like Amazon's new Lord of the Rings series to a studio in Bray and Bovingdon, rather than New Zealand. The cost of production and the extended Covid lockdowns were supposedly a factor in this decision. Either way, the fact that the UK is currently attracting these productions is to be commended. The present concern is that the productions are migrating from regional bases to new infrastructure close to the existing concentration of London centric filmmaking. Amazon's studios in Bray, Shinfield studios in Reading, the Virtual Production stage at Leavesden, MARS Volume in Ruislip. All new infrastructure, all built around London. While this increasing volume of film production in the south may contribute to our economic growth overall, it may inevitably result in a decrease in regional location filming expenditure. This goes in the opposite direction of recent Governmental policy desires of 'levelling-up' or creating a 'northern powerhouse' in other regions.

A longer term concern is whether VP enables other countries and economies to use UK locations as backdrops without having to set foot in the country and contribute to the economy. The UK creative industries already attract most of their international productions as a result of favourable tax relief and it is unclear it would be seen as such a desirable location were the tax incentives to stop. The exclusivity of locations can no longer be leveraged as an additional counterweight, especially if they are widely available as computer assets that can be reused over and over again.

Skills flight?

Bennett et al. (2021) recognise that the VP process needs new skills, as the workflow requires the traditional filmmaking roles, plus expertise from games and VFX, to work alongside one another in production. Aside from the VP process resulting in specific skills shortages, a lot remains uncertain about these new roles will work in a wider context of the creative industries. For example, will these new roles be studio-based? If so, does it draw potential skilled creatives away from regional hubs towards the studio facility? What happens to existing regional, traditional production crew if their skillset is no longer needed and their content is now produced miles away in a studio?

Conversely, VP technology could potentially offer the opportunity to work remotely, which may provide a platform for regions to incentivise more creatives to locate there. This would require robust connectivity infrastructure. It is difficult to determine with the technology at such a nascent stage which way the organisational structure will go. Perhaps the skills shortage will lead creatives to have more negotiating power around freedom to work from home? Perhaps it was the allure of travelling to different locations that attracted creatives in the first place?

Optimistically, returning to a studio base has the potential for a portion of the crew to be continuously employed by the facility rather than as freelancers, especially those involved the calibration and workflow of the VP technology. This would certainly help with skills retention and may see a more significant return to apprenticeships, like the original studio system a century ago.

Pessimistically, it is possible to envisage even more precarity than currently exists. A previous example of such precarity within the VFX industry was Life After Pi (2014), a documentary detailing the unviable business model and unsustainable practices of VFX work, much of which remains today. Industry practitioners had to migrate from place to place, sometimes country to country, to find work. VP, with its shared heritage of traditional filmmaking and VFX, could also develop along similar, precarious lines.

Set-jetting and screen tourism

Aside from the income provided by productions in regional areas, and the retention and employment of a creative community of practitioners, film production has wider economic benefits (spillover) in sectors like tourism.

The BFI (2018, p.56) reported that in 2016, inbound tourists spent an estimated £597.7 million in film-related screen tourism in the UK. Eight percent of leisure visitors to Scotland (around 700,000 domestic and international overnight visitors) were influenced by time-travel TV drama Outlander. The show, particularly popular in the US, has been so successful in attracting 'set-jetters' to its filming locations the Scottish tourist board calls it 'The Outlander Effect'. Visitors to Blackness Castle near Edinburgh (scene of a heroic rescue in Season One) rose almost 400% by the time Season Five hit screens. There have also been so many Bollywood productions in Scotland that a map has been made for visitors to find the different locations (Visit Scotland, no date). In Northern Ireland, Belfast City Council estimated that Game of Thrones had

> 'in 2018 alone… helped attract one in every six out-of-state visitors to Northern Ireland which amounts to approximately 350,000 people and a spend of over £50 million' (Belfast City Council, 2021).

Yet, if we break the link between real places and the stories told about them, will audiences lose the desire to 'see for themselves'? As a wider purpose of VP is to offer seamless integration with virtual reality (VR) or metaverse experiences, where users can interact with the exact location via their VR headset (Giardina, 2022), the long-term future of screen tourism becomes threatened. Perhaps this is a good thing, given that tourism is also a major polluter with a significant environmental impact?

Again, it is possible to imagine a different outcome, where VP actually encourages tourism to areas as a result of including them in productions. It will be interesting to

see whether House of the Dragon results in specific tourism to Northern Ireland who were not fans of the original Game of Thrones. Even if this is the case, regions will be wary of reducing their local economies to tourism alone, especially if local creative talent has to leave to find significant work.

Conclusion

At this point, it is clear that VP has already led to disruption to both the film industries and the wider economies around it. The impact of the overall disruption is currently unclear. It is likely that the potential for VP has been overestimated, and rather than becoming a dominant mode of production, it simply adds to range of existing production methods, replacing some but not all. For example, there are obvious benefits of VP over green screen, if calibrated and organised properly (Jobin, 2022). For it is also clear from existing reports that VP is encountering challenges, from skills shortages to technological issues. Recently published news (Giardina, 2022) suggests that the Warner Bros Leavesden stage, used to produce House of the Dragon, has already dismantled the VP rig due to a shortage of traditional studio space. The same article argues that the VP capacity has outstripped demand, especially when there are not enough skilled practitioners to execute it properly. However, these setbacks are to be expected in an emergent field that is yet to establish itself. Ultimately the potential for economic savings and environmental benefits mean it will continue to develop and become more popular.

The challenge is managing the technology as it develops. Left to develop in a free market, there is potential for increased precarity, from migrating skills to lost revenue in the regions, and potentially lost revenue in the national economy if the production goes elsewhere. The UK has a successful track record of using interventions such as tax relief incentives to develop and support the film and TV industry. Governments should now be concentrating on the wider picture, for ways the new technology can deliver outside of the capitals. If VP means films can be made anywhere, why not encourage them to be made, and companies to be based, in areas that need economic support? For example, less than 3% of the UK's film companies are currently based in Scotland (BFI, 2021), despite more than 8% of the population living there. Seeing as the technology has much in common with the games industry in terms of skills and infrastructure, why not spread it more evenly like the games industry too? (Matteos, Garcia and Bakshi, 2022) Tax relief and infrastructure investment can be more nuanced to deliver on ambitions to improve regional economies. Governments could also choose to incentivise productions with tourism-boosting potential if they consider the long-term economic benefits to be worth the environmental impact. Those loyal to the traditional style of filmmaking will continue to reduce carbon footprints, so perhaps compromise can be reached. If not, a concern is that the good policy work done in recent years to improve regional production can be reversed with this technology, and production becomes even more entrenched around London as a result of developing existing infrastructure.

There are already examples of VP being established in regional universities to address the continuing professional development (CPD) skills gap. For example, Ulster University opened a VP studio at their Belfast campus in February 2022. This is an obvious way in which to decentralise VP, but their presence alone does not ensure creatives stay in the region once their training or education is complete. Viewed cynically, these substantial investments can be seen as a continuation of the out-sourcing of research and development risk, and subsequent training expenses, by an entertainment industry that has greatly reduced its own capacity for research, development and training because of the freelance labour model. Therefore, a wider policy emphasis should be placed on developing an economic moat that capitalises on the scale of production infrastructure and workforce, but also seeks other areas of the value chain to create opportunities for intellectual property and brand value. Universities should not be content with asking 'what does this technology do?' with an eye on training, but must ask 'what can this technology do?' with an eye on exploiting new possibilities.

Indeed, rather than reacting to VP, it is time to be bold and proactive. The technology has lots of potential to help us deliver on wider agendas like sustainability, inclusion and diversity. Can a return to studio filmmaking lead to a return of continuous employment, apprenticeships, visible career progression routes and remove precarity? Would this have a positive impact on the social class and status of the industry entrants? Can the technology enable and empower filmmakers that have previously been excluded from traditional filmmaking? Can it impact on the stories that are told and the ways in which they are told? This is especially true with the potential symbiosis that VP has with games, another valuable creative industry in the UK.

A failure to consider the wider implications of VP may lead to an example of technological somnambulism; sleepwalking into a circumstance that has far bigger ramifications than we intended or realised (Winner, 2014). While predicting the future is not an easy task to accomplish, critically engaging with the wider opportunities and threats of VP will help to prevent unnecessary and additional disruption to a valuable contributor to our industry.

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