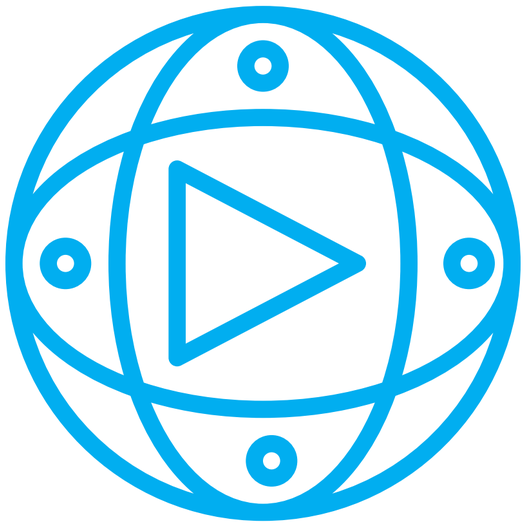
Media Tech Intelligence Briefing

Virtual Production

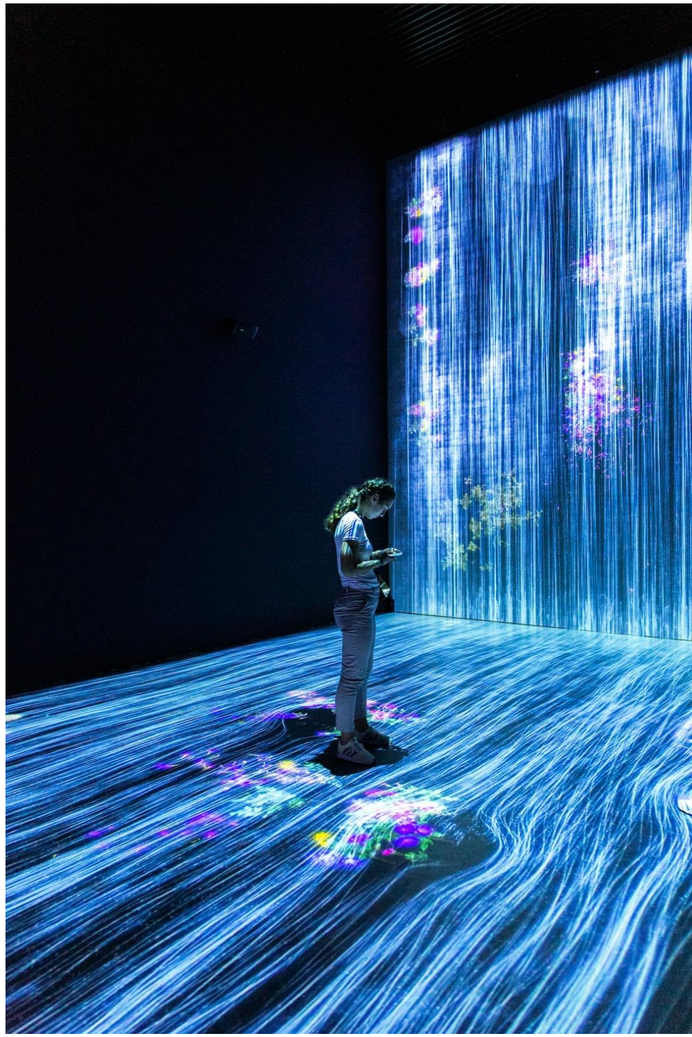
October 2022



Virtual Production

Adoption surged during the pandemic

The production process has been going through a transformation from physical to digital, then remote, and now – to virtual production. The adoption of virtual production technology surged in 2020 due to a number of pandemic-driven factors, such as travel restrictions, the need for greater collaboration, budget constraints, an increase in global viewing time, and the rise of OTT. With the increasing number of streaming services and increasing demand for content, production is under significant time and cost pressure, shifting workflows from post to earlier production stages, resulting in cost savings, better collaboration, and greater creativity. Virtual production has additional benefits, such as sustainability and allowing for scene reproducibility (e.g., reconstructing certain weather conditions at any time). The rapid increase in GPU power has fuelled the exponential growth of virtual production over the past few years. However, talent scarcity and high upfront costs are hindering VP technology adoption.

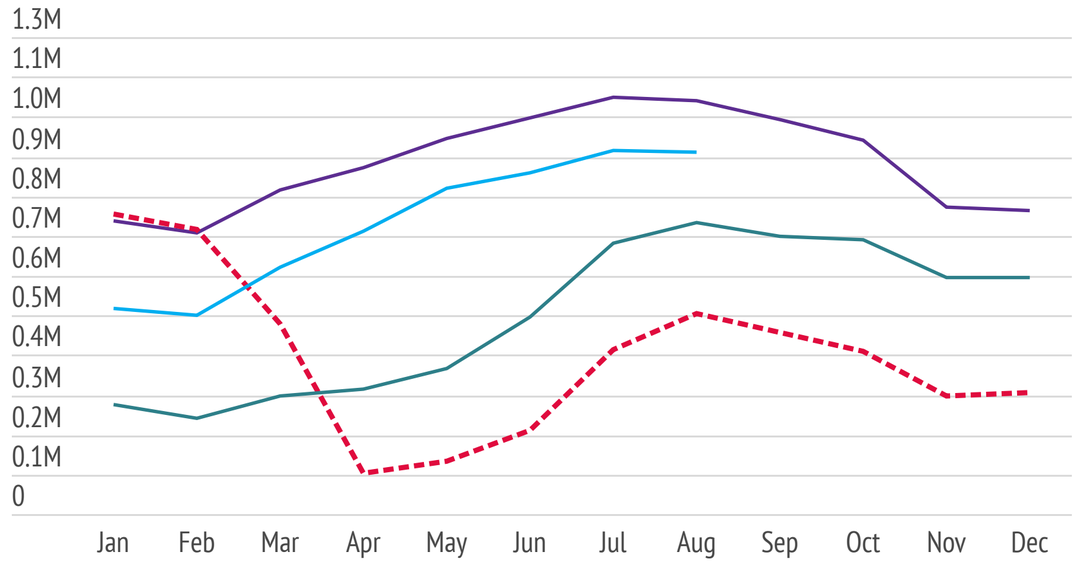


Virtual Production

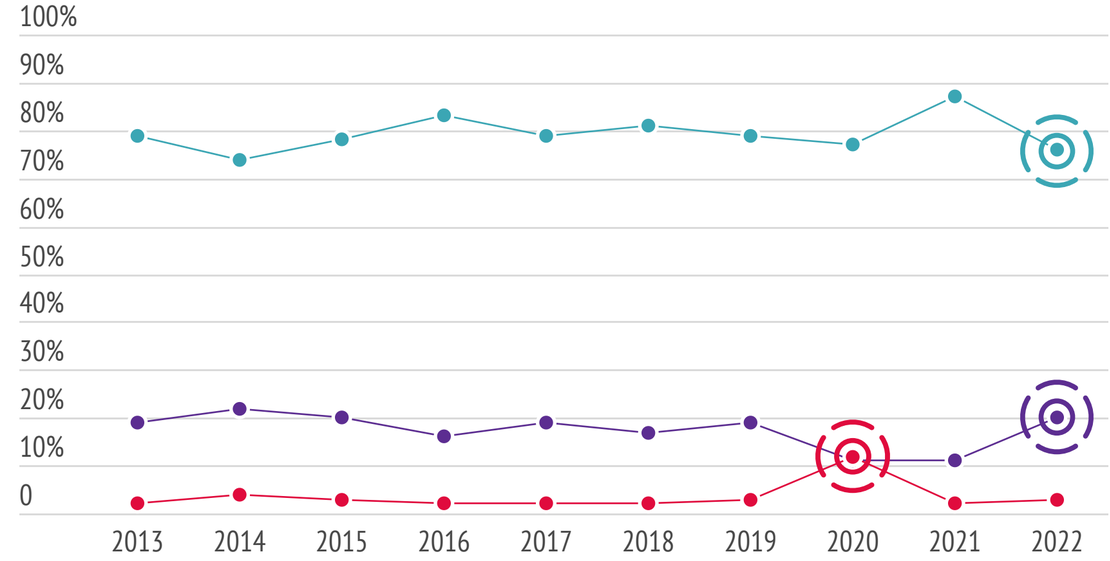
Post-pandemic recovery

Pandemic-induced travel restrictions became a significant barrier to content creation and production, paving the way for VP. Flights data shows that although the number of flights has almost reached the pre-pandemic level (2019), traveling is still disrupted by the increased number of delayed flights.

Monthly number of flights worldwide, 2019-22



Delayed and cancelled flights in the US, 2013-22

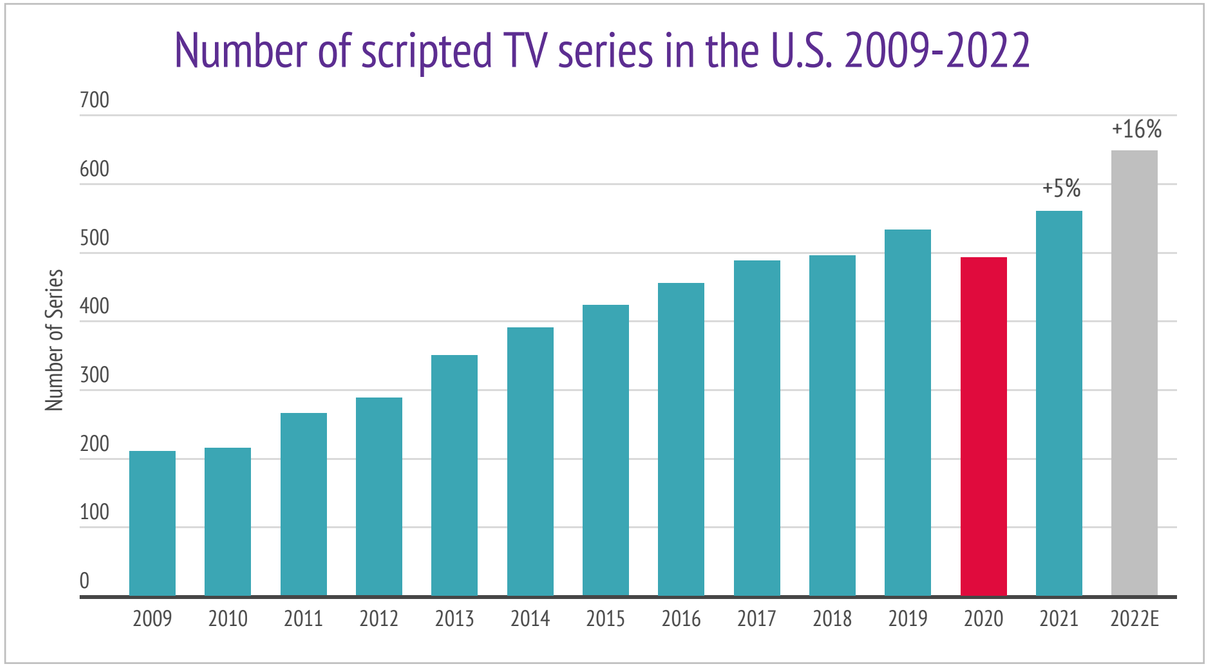


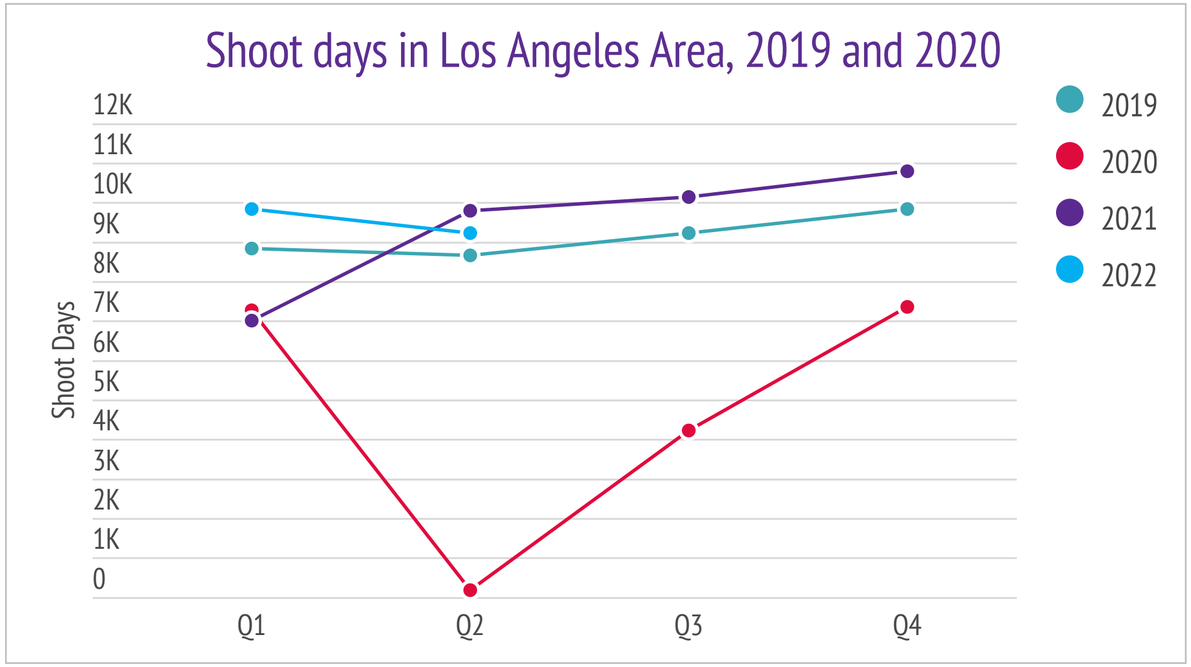
Sources: IABM, European Organisation for the Safety of Air Navigation

Virtual Production

Post-pandemic production restart

Production has restarted to accommodate the increased demand for content, and virtual production comes at hand, offering flexible content production technology. The number of scripted series increased by 5% in 2021 compared to the pre-pandemic period (2019), while in the first half of 2022, the increase was 16% compared with the same period in 2021.





Sources: IABM, FX Networks Research, FilmLA

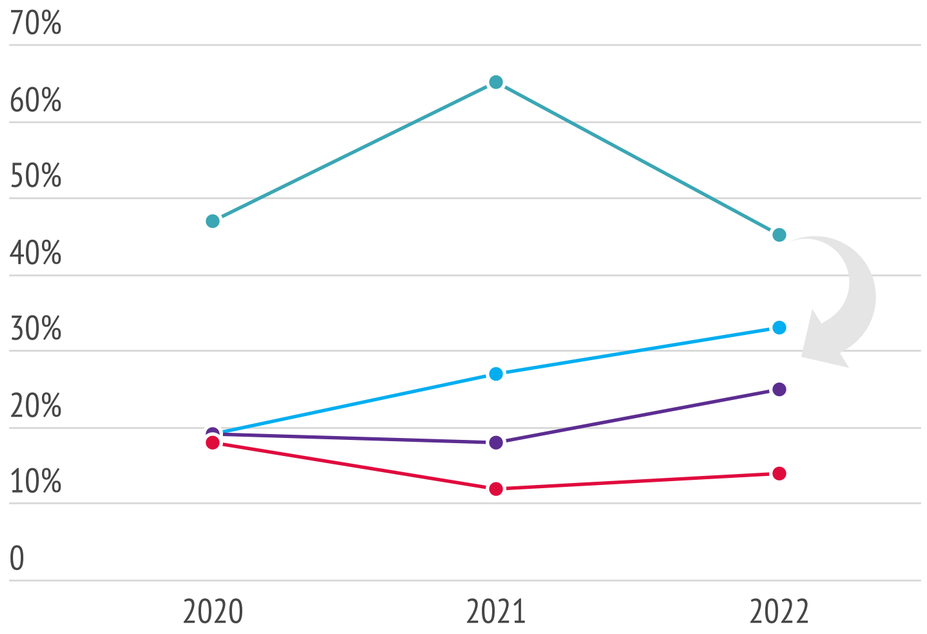
Virtual Production

Investment in shifting from remote to real-time production

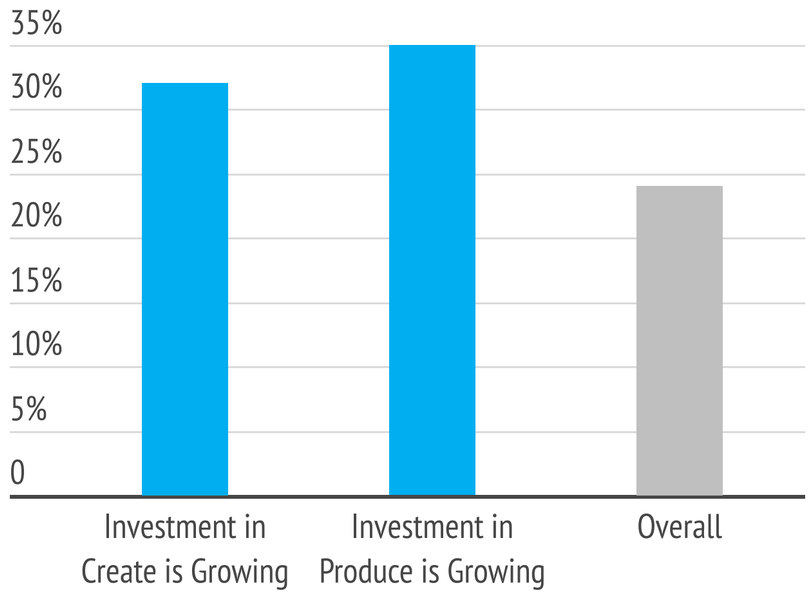
Investment in Create and Produce is shifting from remote to real-time production. The increase in real-time investment is mainly driven by the growing investment in content creation and production.

- Remote Production
- Real-Time Production
- Real-Time Production Graphics
- Post-Production

Dynamics of the investment outlook in Create and Produce



% of businesses investing in real-time production based on the investment outlook in Create and Produce



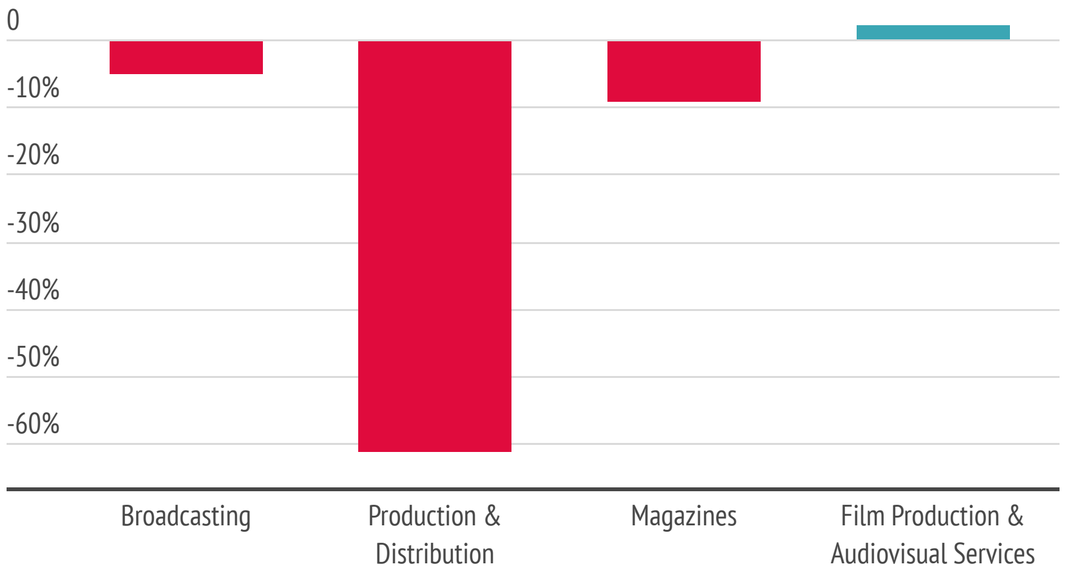
Source: IABM

Virtual Production

Broadcasters are embracing virtual production

Broadcasters affected by lower volume in visual effects are shifting investment to virtual production. For instance, in August 2021, NEP Group created a virtual production business segment - NEP Virtual Studios - by acquiring three businesses - Prysm Collective, Lux Machina, and Halon Entertainment.

TVA Group Revenues Q2 2022 YoY change by business segment



> *In the Film Production & Audiovisual Services segment, we **were affected by lower volume in visual effects, which led us to review our service offering** in this category to better position ourselves in the market. Accordingly, **we are embarking on a shift that will ultimately deliver integrated virtual production** and solid expertise in this area to help clients carry out their visual effects projects.*
>
> Pierre Karl Péladeau, acting President and CEO of TVA Group

Source: IABM, Company filings

Virtual Production

Economics

Virtual production economics differs from traditional production. To evaluate the total cost of production, it is important to understand its components.

Eliminating travel costs

Virtual Production enables shooting multiple location scenes in one day and eliminates the need for the whole crew to travel to a remote location, allowing to save the cost of moving people and equipment between locations.

Reusing rendered scenes

Virtual Production allows using the same digital environments for different scenes thus reducing production costs.

A lot of processing power required

Virtual production requires a lot of processing power, which is partly offset by modern game engine technology and optimization but can still result in a large expenditure.

Talent scarcity

Virtual production requires talent with a specific skill set, such as VFX engineers, artists, and supervisors, and it is expensive due to low supply.

Source: IABM

Virtual Production

Creative collaboration

Virtual production encourages an iterative process that begins at earlier content production stages. Moving the post-production VFX process into the actual shoot increases creative collaboration between talent. Post-production teams can see the result in real-time and impact the (pre-)production process. The iterative creative production process mentioned earlier in this Briefing adds flexibility by speeding up turnarounds in virtual sets. The open-source nature of VP technology offers endless opportunities for technology development. For instance, Netflix has developed an extensible and customizable plugin for Unreal Engine to simplify production workflows by automating the setup process. Netflix's partners can further customize this plugin to suit their specific needs better.

> *We see virtual production as an approach to production that connects all parts of the production process (pre- through post), and requires an advanced culture of planning.*
>
> Andy Fowler
> VP, Production Innovation, Netflix

Sources: IABM, IBC365

Virtual Production

Sustainability

Virtual production reduces CO2 emissions by reducing traveling and virtualizing the production process. According to a recent study conducted by Quite Brilliant, virtual production has less than 1% of the carbon footprint compared with traditional production. Virtual production eliminates the need for studios to keep a large number of real sets. By reusing rendered scene footage multiple times, virtual production technology makes the content production process more sustainable. And this is true not only regarding environmental impact but also brings reproducibility of scenes disregarding weather conditions and other factors.

> *"Using virtual production technology called The Volume, The Mandalorian production **reduced carbon emissions by an average of 30 tons per location** eliminated. (...) The LED set lights used in The Volume also use **70% less energy than traditional lights**, which further reduces the show's carbon footprint."*

Disney's 2020 Corporate Social Responsibility Report

Sources: IABM, IBC365, Variety, Quite Brilliant

Virtual Production

Technology democratization

Technology democratization is a major driver of VP technology adoption.

As processing power becomes cheaper, VP becomes more affordable. The open-source nature of Unreal Engine and Unity 3D's open-source repositories make VP more accessible to a broader range of developers, increasing creative collaborations.

With more scenes being captured worldwide for use in virtual environments, assets cost declines. As mentioned earlier in this briefing, some media companies are experimenting with their own plugins for gaming engines.

The pricing policy of gaming engines makes VP more affordable. For instance, Unreal Engine is free to use for creating linear content, like films, as well as for custom projects, internal projects, and game development.

Source: IABM

Virtual Production

Anticipated development areas

Faster calibration may significantly improve virtual production sets. With nanosecond calibration, anyone running a VP stage would see their setup times drastically reduced and benefit from faster camera tracking.

We expect AI/ML technology to accelerate the development of Virtual Production. AI models predicting camera behaviour will potentially improve the speed and accuracy of camera tracking and calibration by automating the setup process.

Virtual production companies are currently working on the integration of imaging enhancements such as ACES and HDR reproduction into existing virtual production workflows.

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We want VP systems to be able to calibrate the position of a piece of content, then adjust it according to the position of the camera - all with minimal latency. This means LED images will always look accurate from the camera's perspective

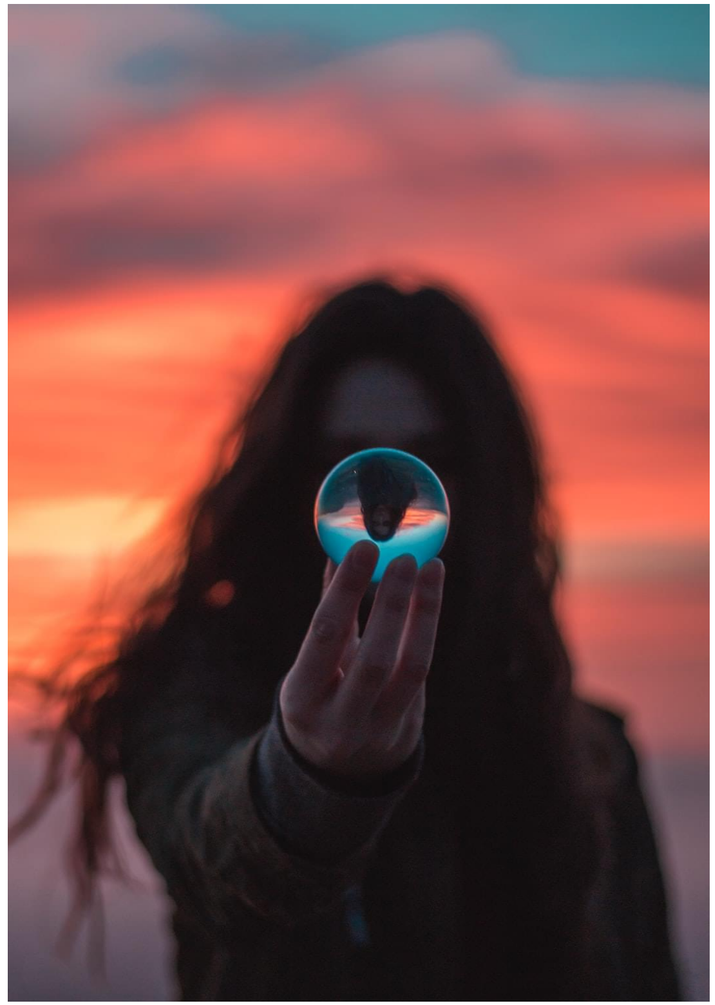
Ed Plow
CTO, disguise

Source: IABM

Virtual Production

Future Outlook

Virtual production technology is currently at a very early stage of adoption, and we will continue to track it in our research. Factors such as the end of social distancing restrictions coupled with inflation and supply chain disruption can slow down the adoption of VP technology but will not stop it from further development. The advancement of virtual production may further shift production workflows toward earlier stages of the content supply chain, enabling greater collaboration and accelerating creativity.



Currently, Virtual Production technology at the highest level such as LED stages is at a very early stage in its lifecycle, and hence challenging to execute

Andy Fowler
VP, Production Innovation, Netflix

Sources: IABM, IBC365