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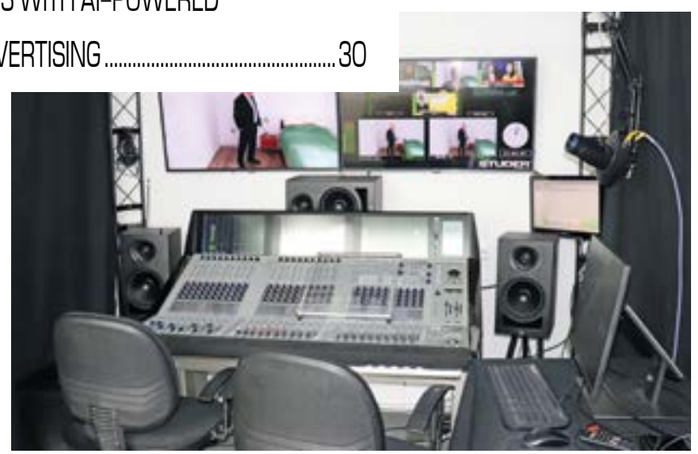

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director of the Karaganda regional branch of JSC «Republican television and radio corporation «Kazakhstan»

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29 Daria TISHCHENKO

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30 Kuat BAHRIDINOV

Director of Nur.kz Internet Portal LLP, Kazakhstan

30 Saurabh MUDGILL

Technical Specialist, Video Engineering at Optus, Australia

REFLECTIONS ON THE FUTURE

Moore's Law, with ever-increasing CPU core counts, has accelerated the shift from ASIC-based to COTS-based solutions in broadcasting

Cloud-based solutions and AI are set to transform broadcasting, helping to reduce operational costs and increase efficiency

By Phillip Grossman, editor-in-chief at TFT1957

The Evolution of the TV and Film Industry Over the Past 75 Years

As the age-old adage goes, «the only constant in life is change,» and the television and film industry has seen its share of change over the past 75 years. However, it is the rate of change over the past 5 to 8 years that has been extraordinary.

A Look Back: The Technological Advancements in TV Standards

It's hard for many of us to realize that the NTSC standard was adopted in 1941 (PAL in 1967) and remained in place for over 50 years before SMPTE 259M was adopted in 1989 and started being implemented. This was quickly followed by SMPTE 292M, which defined SDI in 1998 and laid the foundation for HD. Finally, in 2006, SMPTE 424M was adopted, simplifying HD via a single SDI connection at 2.970 Gbps (3G SDI).

The Last Decade of Technological Disruption in Broadcasting

If we look back over just the past ten years, we have seen the introduction and adoption of SMPTE 2022-6/7, SMPTE 2110, UHD/4K, 8K, OTT/streaming, virtual production, targeted advertising, and many more adjacent technologies. This accelerated rate of change was further impacted by the global pandemic of 2020, which hastened the adoption of these technologies.

How Moore's Law and COTS Accelerated Broadcast Technology

We have also seen Moore's Law in effect, with the ever-increasing core counts in CPUs and increased capabilities of GPUs enabling the transition from purpose-built ASIC/FPGA-based solutions to solutions utilizing common off-the-shelf technology (COTS). The increased capabilities and adoption of COTS-based solutions have assisted in fast-tracking many of the new technologies and capabilities available to our industry.

Choosing the Right Technology for Business Growth in Broadcasting

It is easy to see how daunting it may be for engineers and business leaders to sort through all the available technologies to identify which will enable their businesses to grow and be profitable. Which technologies or capabilities will help increase their viewership and reduce operational costs? The good news is there is a lot to choose from, but the bad news is also that there is a lot of technology to choose from, with varying levels of impact on an organization's bottom line.

While the number of 'eyeballs' hasn't changed, the time available to engage viewers has increased with the rise of smart devices and tablets

The Influence of Tablets and Smart Devices on Viewer Engagement

It used to be that we focused on the "number of eyeballs," but the number of "eyeballs" has been more or less fixed over the past 15 to 20 years. However, with the release of Apple's iPad in 2010 and other manufacturers following suit with their own tablets, there was an increase in the amount of time available for companies to attract "eyeballs." Which technologies will help an organization capture this additional viewership?

IBC 2024: The Future of Broadcasting Technology

So here we are on the dawn of IBC 2024 (I believe it's my 15th) with many companies displaying the latest and greatest technology to help your business optimize and grow. What will we adopt as a standard in our business models (UHD, 8K, streaming, SRT, JPEG XS, AI, etc.)? What technology will help us tell better stories? I don't believe there are any wrong answers, just less right ones.

In my opinion, I believe we may see a slowing of the rate of change, and the current set of technologies available to the industry will be tested and validated, tending towards new general standards and business models. Things like 8K, XR/AR, and artificial intelligence will become tools more so than standards. I believe we will see larger "ecosystems" being developed by various manufacturers, simplifying the adoption of these new technologies and placing them in the hands of more creators and small up-and-coming broadcasters.

With the adoption of UHD/4K, 8K, and OTT, the broadcast industry faces the challenge of integrating new technologies

The Intersection of Art and Science in the Future of Television

The reason I enjoy the television and film industry and look forward to going to work each day is that it is the perfect intersection between art and science. What does the future of our industry hold? No one really knows. However, what I do know is that it will be exciting.

THE YEAR 2030: AI OR ENGINEER?

FORECAST BY 64 EXPERTS FROM 16 COUNTRIES

1. How will the broadcasting industry and broadcast technologies change in the next 5 years?
2. If we model the world of broadcasting and broadcast tech in 2030, what role will AI play?
3. How will AI change your business segment?
4. Which professions will AI displace in the broadcasting technology industry by 2030?

Jeremy Courtney, Lawo: Generative AI is proving to be extremely powerful

Jeremy Courtney, Senior Director, CTO Office, Lawo, USA

1. How will the broadcasting industry and broadcast technologies change in the next 5 years?

In the ever-evolving world of media production, the broadcast industry increasingly expects flexible, adaptive production workflows. IP is now widely used and is the enabling factor for agile workflows that can be orchestrated and started at the push of a button.

In modern production setups, new devices and signals are dynamically discovered and securely provisioned, and signal processing, signal formats and production functions can be provided or fine-tuned on demand by the user. This increasingly lives up to the orig-

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Alex Gattari, Etere: Cloud mania will end

Alex Gattari, CTO at Etere

1. First of all, I believe that this cloud-mania that's going on is going to end. There are a few reasons for it. The first is that the cloud is close to 4-6 times more expensive, and there's no clear advantage to it. It just feels like it's a trend, but in the broadcast world, it does not sit right. There are issues with security, latency, etc., and for a broadcaster who already has a support team on-site, having an on-premises system is not an issue. Also, with virtualization, you basically have all the benefits that the cloud has without any of the drawbacks. You can always upgrade, and the upgrading is much easier. You can scale it, and it's much better than a cloud system. That's pretty much it for the cloud.

Something that will change is the increasing popularity of NDI because NDI is way bet-

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Gustavo Robles, AEQ: Most projects are related to cloud, internet, virtualization and AI

Gustavo Robles, Sales Director at AEQ, Spain

1. The broadcast industry is constantly evolving, and sometimes I feel very fast. As an engineer, I am very happy about this. Not long ago, all talk in the industry moved from the analog world to the digital transformation. After a while, the whole broadcast sector started talking about IP technologies, and now most projects are related to the cloud, the Internet, virtualization and artificial intelligence. So in a few years, for sure, broadcast operations will be heavily dependent on cloud technologies, with many remote processes being carried out using virtualization tools, and obviously, artificial intelligence will be there too.

2. If we model the world of broadcasting

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Evgeny Almazov, Stream Labs: Many routine operations will be replaced by AI

Evgeny Almazov, Head of Product at Stream Labs

1. AI will find its place, become an assistant in production and improve the efficiency of content use. A balance will be achieved between the participation of AI and humans in production. There will be more AI-generated content in cinema and broadcasting, but then, I believe, we will want real content created by human mind, genius, and talent again. Many routine operations will be replaced by AI, but humans (actors, presenters, journalists, cameramen, archivists, etc.) will remain or even return when it becomes clear that content is not only a flow of information or entertainment, but also energy that can be created only by humans... But it is obvious that AI

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Mikhail Dvornikov, ALFAPRO–M: AI can really change the balance in social networks and blogs

Mikhail Dvornikov, General Director of ALFAPRO-M

1. As for the broadcasting itself, the introduction of 5G technology will play a major role, and it is unlikely that something new will come after it. The theoretical limit of bandwidth in the radio range has been reached within 5G. Frequencies will be used by television and mobile operators in accordance with the capabilities of this standard, but the main decisions on how the resource will be distributed will be made by regulatory authorities in each country. This is a matter of legislation, relevant ministries and industry associations. There is also the option of inertia, in which nothing changes at all — an analogue is still being used somewhere.

2. The hype around AI is growing, but it's

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Pavel PotuZAk, Aveco: We see a changing landscape

Pavel Potužák, Aveco's CEO.

1. First we have to think about the foundation of this industry. It is rock solid, and there actually are two strong foundations. One – people want to be entertained. This applied thousands of years ago, even more it applies today, and will do in the future, too. Second foundation is rather unspoken, but as strong, if not stronger: the rulers of the world absolutely need this industry to influence, manipulate, lead the masses. This industry is destined to boom forever.

Yet, we all see the changing landscape. New technologies support new habits of the consumers (or vice versa). Small mobile screens teach viewers not to care about technical quality, thus the pride of broadcast engineers is fading away. Viewers also are not able and not willing to concentrate on long form artistic programs, they consume an ava-

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Alexey Ermishin: We will see a significant increase in low–budget content

Alexey Ermishin, Director of JoyMechanix

1. Over the next five years, the broadcasting industry will continue to follow trends that have already begun in recent years. The main changes include:

Decrease in cost and improvement in broadcast quality:

Access to better technologies will become more widespread due to reduced costs for equipment and software. This will lead to an overall improvement in broadcast quality and expansion of its capabilities.

Increased automation:

Automation of processes will become more significant, leading to fewer jobs at large events. However, this will also improve efficiency and reduce production costs.

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Paul Richards, PTZOptics: One of the biggest changes is not AI, but cloud connectivity

Paul Richards, Chief Revenue Officer (CRO), PTZOptics

1. One of the biggest changes isn't AI, it's simply cloud connectivity which opens up a variety of workflows including remote production. Remote Production is one of the top ways for broadcasts to reduce costs while maintaining quality and adding new flexibility. Cloud-connected broadcast equipment will be the next big innovation in this market.

2. AI will likely make its way into most content production areas of broadcast. Content creation is obviously an emerging area of AI that effects productions but Computer Vision is a newer area of interest. Computer vision can be used to operate PTZ cameras and switch video based on training data.

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Sergey Lakham, Telestrider: We will see more implementation of artificial intelligence

Sergey Lakham, President of Telestrider, USA

1. In my opinion, the broadcast industry mostly revolves around either state funding or advertising revenue. If we look at the commercial aspects of the broadcast industry, then we see that the pool of advertising dollars in absolute value is growing year over year. The broadcast medium whether cable, DTH etc; is changing to internet technologies and IP platforms. There is a tectonic shift in how content is being delivered, but at the end of the day, everyone still wants to watch the Super Bowl final. All advertisers want to get in on the action and tell the world about their products. In essence, the broadcast medium is shifting to different platforms, but the industry remains alive and well and even

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Jacob Zuo, Kiloview: The broadcasting industry will inevitably merge deeply with IT and the Internet

Jacob Zuo, Founder and CTO of Kiloview

1. Predicting the future of technology is always bold and challenging. However, by examining the current state of technology in the broadcasting industry and its related IT-driven sector, we can identify clues and make imaginative forecasts.

Our primary prediction is that within the next five years, the broadcasting industry and broadcast technologies will inevitably merge deeply with IT and internet industries. This outcome is beyond doubt.

The integration of broadcasting with IT

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David Ross, Ross Video: We are working on creating new products

David Ross, Chairman of the Board, CEO and majority owner of Ross Video

I wish I knew the answers to those questions! In this particular case, I'd prefer not to go out and speculate on the record. If I do have ideas, I think I'd prefer to keep them to myself and my team as we work to create new products that meet future needs. Sorry that I'm ducking this one! :-)

Sergey Pribyl: Everything will move to VR and AR

Sergey Pribyl, strategy consultant

1. Most likely, viewers' preferences for viewing (consumption) of news will change and the concept of "prime time news" will disappear from the usual. On the other hand, there will be a merging of purely TV channels and radio stations with news in their broadcast grid into something new, united; news can be listened to and watched "from every pot". It is obvious, that public channels will become completely subsidized and non-competitive with entertainment channels. There will be no larger studios with physical sets, it will all move to VR & AR.

2. AI should be considered as a tool for increasing the efficiency of a company, everything that can be done faster, better, for less money. Therefore, wherever AI can be applied, it will be applied, otherwise opera-

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Alexander Nuzhny: The Future of Broadcasting: The Rise of IP Systems, Streaming, and the Gradual Integration of AI

Alexander Nuzhny, founder and owner of Artparovoz, Kazakhstan

1. The development and expansion of IP systems, the movement towards 4K quality. Terrestrial data transmission via the Internet will replace satellite systems. The number of online broadcasts and TV channels in general will increase. Streaming technology will become even simpler and cheaper.

2. I don't think that AI will drastically change the «world of broadcasting» within five years; most likely, some individual AI services will be used in broadcasting as

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Archil Mikadze: Traditional television will be watched less.

Archil Mikadze, Technical Director of Euronews Georgia, Georgia

1. I think that in the next five years, the film and broadcasting industries will face significant changes. Streaming services will become even more popular, while traditional TV viewing will decrease.

There is no doubt that 5G will improve streaming quality. Artificial intelligence will help develop visual effects and personalize content. Perhaps virtual reality will open up new interesting ways to watch movies and TV shows. User-generated content on social media will become more influential, and television broadcasters will integrate this content into their programs. For example, Euronews has already started moving in this direction. More interactivity and con-

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Bagila Isakova: By 2030, broadcasting will "revolve" around personalized content

Bagila Isakova, broadcasting technology expert, Kazakhstan

1. Traditional SDI infrastructures will continue to be upgraded to infrastructures utilizing IP technologies. The rapid development of digital technologies such as 5G and 6G, generative AI, cloud computing, and virtual and augmented reality (VR and AR) will enable the creation of more personalized interactive user experiences and the delivery of content quickly without quality loss. This, in turn, will lead to the widespread adoption of more advanced viewing devices using 3D imaging technologies and VR and AR, ranging from gesture-controlled 3D screens or mobile

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Denis Vyhodcev: Equipment and technologies will become automated, stamped and templated

Denis Vyhodcev, Director of VTV Broadcast & Production, Kazakhstan

1. Even more streams of conferences, summits, and other interest-based gatherings. Equipment and technologies will become more automated, standardized, and templated. Less creativity, just ordinary routine.

2. First of all, we need to live to see it. Secondly, it's better to ask the younger generation, who will be dealing with broadcasting issues in 2030. Modern technical solutions and products are increasingly replacing humans. For now, this is built on compromis-

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Ernar Baimoldayev: We will see a strengthening trend towards personalized content

Ernar Baimoldayev, Technical Director of Channel 31, Kazakhstan

1. In the next five years, the broadcasting industry will continue to adapt to new technologies and changes in consumer preferences. We will see an increase in the trend toward personalized content based on viewer data and preferences. Streaming platforms will become even more popular, while traditional television will be forced to integrate new technologies to retain its audience. The development of 5G will also play a key role, providing faster and more reliable data transmission, which will enhance broadcast quality and accelerate the content delivery process.

2. By 2030, AI will become an integral part of the broadcasting industry. AI will

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Oleg Berezin: We are facing a total shift to IP

Oleg Berezin, Chairman of the SMPTE Section, Member of the Board of Directors of the European Digital Cinema Forum

1. We are heading towards a complete shift to IP, the development of cloud media services, and the transition from hardware solutions to software-based ones. However, hardware solutions for energy-intensive processes and those requiring high-precision synchronization will undoubtedly remain. It is evident that the technologies of professional TV, film production, and the broader AV services market will merge into generalized technologies for the production, transmission, playback, and consumption of media. Towards the end of this five-year period, an interesting transition to object-based media will begin, where content consists of digital objects. The essence of reproducing such

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Oleg Ogloblya: We have not found any attempts to use AI in engineering

Oleg Ogloblya, chief engineer of the system integrator Comtel Broadcast Solutions, Ukraine

1. I don't see any prerequisites for significant changes in the production segment. As of 2024, the 24G SDI standard has been established. Based on this standard, work is underway to create equipment with 8K and 16K resolution. It is worth noting the commitment of Japanese manufacturers to SDI technology. Ten years after the announcement of the 2022 and 2110 standards, companies like Sony, Ikegami, Hitachi, and JVC remain very cautious about IP solutions, mainly at the level of experimental models. SDI and

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Isa Mutaliev, PTF Lab: We expect wider adoption of VR and AR

Isa Mutaliev, CEO and co-founder of PTF Lab

1. In the next five years, the broadcasting industry and broadcast technologies will undergo significant changes driven by digital innovations and the implementation of new technologies. We expect wider adoption of virtual and augmented reality (VR and AR), which will create more immersive viewer experiences. AI and computer vision will play a key role in content personalization and the development of more interactive broadcasts. Additionally, automation and cloud solutions will optimize content production and distribution processes, making them more flexible and efficient.

2. Looking further into the future, by

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Oleg Krasin: We see confident movement of film camera manufacturers towards the broadcast segment

Oleg Krasin, Head of Production at PTF Lab

1. In the next five years, I don't expect any groundbreaking technological breakthroughs. Instead, I believe progress will be gradual. One day, you might open an old recording of a TV show from the early to mid-2020s that you want to rewatch on YouTube, and your eyes and brain will react the same way they would if you were shown a 720*576 interlaced video today. Recently, I had the opportunity to work with the Panasonic 500. A camera that was used to shoot TV series 15 years ago and was still a workhorse for

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Yernur Kasabekov: The development of VR and AR technologies attracts special attention

Yernur Kasabekov, TV and Radio Broadcasting Expert, Kazakhstan

1. Undoubtedly, the industry has changed significantly and continues to evolve constantly. We are witnessing many production processes, such as studio filming, set design, video and audio editing, and program broadcasting, being carried out with minimal human involvement. Content delivery to the viewer is now achieved through various methods and services, with streaming platforms becoming more targeted and personalized, providing content that best suits the specific viewer's preferences and needs. The development of virtual and augmented reality technologies is particularly noteworthy, as

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Umid Malikov: Pandora's Box is Open

Umid Malikov, Uzbek Director, Director of Photography

Based on my work experience, I can note the following. Over the past two years, I have been shooting projects for online cinemas. In Uzbekistan, this is an entirely new format of web series, with each episode lasting 20-30 minutes. Considering the collapse of the traditional distribution system, many filmmakers who previously produced decent independent film projects have fully transitioned into producing low-quality soap operas for TV.

The emergence of online platforms can be compared to a new renaissance.

The high standards and control during the production stage by producers regarding the creative aspects of web series significantly elevate the quality of the final product.

The majority of viewers, follow-

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Davit Trapaidze: Nothing will fundamentally change in the industry in the next five years

Davit Trapaidze, Head of Public Broadcasting Radio Adjara, Georgia

1. In the next five years, nothing fundamentally will change in the industry. There will only be minor additions to highlight that these capabilities exist, but it is still too early.

2. AI will be a good assistant and a lifesaver for small commercial projects with limited budgets, such as creating short advertising videos.

3. Artificial intelligence will not significantly impact my business sector, as AI is minimally used in radio broadcasting.

4. The future of professionals in the visual sector is mostly in question. Illustrators, color correctors, editors, and specialists at the sketching stage may be replaced by artificial intelligence. The main phases of work are still beyond AI's current capabilities.

Cesar Garcia: 5G private networks could be a game changer

César García, Broadcast Engineer at Radiotelevisión Española ,Spain

1. Regarding OB production, I believe 5G private networks could be a game changer, significantly reducing the need for long and heavy cabling.

2. I believe that by 2030, AI will have a profound impact on archive management and search functions. As a former student of Digital Signal Processing, I hope it will enable the curation of video and audio in every recorded material with significantly reduced processing times...

3. As far as MCRs are concerned, this is not a good niche for ROI in AI. On the other hand, the cloud, 4/5G feeds, and SRT point to point transmissions are overwhelmingly replacing SAT and fiber feeds.

4. Archive managers, journalists.

Nazim Baratov: In the 5G era, 4K video will become the most popular content

Nazym Baratov, chief engineer of Eurasia + ORT LLP, Kazakhstan

1. Just 25 years ago, learning to operate a computer was a necessity. Today, users of smartphones and tablets simply pick them up and start working intuitively. Virtual and augmented reality technologies will once again transform the way we interact with computers, making the process even more intuitive. Commands will be given through gestures and graphics, and images will no longer be confined to the size of a display.

The widespread adoption of smartphones and mobile internet is a key driver behind the development of augmented reality technologies. A prime example is the success of Pokémon Go, which topped the app charts on iOS and Android just hours

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Dmitry Kaminsky: Increase in content personalization is expected

Dmitry Kaminsky, Head of the Technical Support and Control Department of the Technical Support Department of JSC «RTRK «Kazakhstan»

1. Over the next five years, the broadcast industry and broadcast technologies will undergo significant changes driven by the adoption of advanced technologies. We can expect an increase in content personalization, where viewers receive content tailored to their interests through AI algorithms. The integration of virtual and augmented reality (VR/AR) technologies will also intensify, leading to more immersive and interactive programming. The adoption of high-definition formats, such

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Alexey Ugrinovich: AI at the service of man, not man as an object for AI

Alexey Ugrinovich, Independent Expert in the Field of Audio-Visual Technologies

1. The primary drivers of the entertainment industry in the coming years will be video and online gaming platforms, supported by home equipment manufacturers (TVs, receivers, audio systems, gaming consoles, etc.). This is made possible by their technological capabilities in implementing the latest technologies and their financial resources. The «big» cinema industry and broadcast television, due to significant revenue declines and technological limitations in adopting new technologies, will be forced to collaborate with online platforms through co-productions. Overall, the unification of efforts between online platforms, cinema, and broadcast television will have a positive im-

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Alexander Kostylev: Development of VR and AR will lead to the emergence of new cinema formats

Alexander Kostylev, Cameraman, Director of Photography, Senior Lecturer of the Cinematography Department of Turan University, Kazakhstan

1. We are living in a unique era of rapid digital technology advancements. The film industry is set to undergo significant changes influenced by various factors such as technological innovations, shifts in viewer behavior, and global economic and social trends. Streaming services will continue to rise in popularity, increasingly displacing traditional cinemas. The number of original films and series created specifically for these platforms is expected to grow. Competition among streaming platforms will intensify, leading to increased investment in exclusive content. This will create new opportunities for inde-

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Mikhail Akimov: In the near future we will see a significant acceleration of the transition to IP

Mikhail Akimov, Technical Director of SMIT, Central Asia LLP, Kazakhstan

1. In my view, we will soon see a significant acceleration in the transition to IP technologies. Streaming will continue to gain popularity, while traditional television will increasingly integrate with digital platforms, gradually losing ground in its classic form. Hybrid technologies that combine linear television with internet services will play an important role. Additionally, cloud solutions and process virtualization will lead to cost reductions and increased production efficiency.

2. By 2030, AI will become an integral part of content creation and broadcasting. AI will also be used to automate complex

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Igor Yudakov: All broadcasting will go online

Igor Yudakov, Chief Engineer of the Kostanay Regional Branch of JSC «RTRK «Kazakhstan», Kazakhstan

1. No.

2. Replacement of designers. The designer or director only sets the task for AI.

3. Considering the second response, almost not at all. Advertising has moved to the internet. All broadcasting will move online. However, there will be two options:
- Full program broadcasting.
- Internet broadcasting similar to social media for younger audiences, with a question and summary lasting no more than a minute. After that, the younger audience disconnects. There will need to be a link for the full content.

4. Designers and coordinators. The engineering and technical staff are unlikely to be replaced, as AI won't help with installation and training of the creative team.

Dudu Kurdgelia: By 2030, AI will be deeply embedded in all aspects of broadcasting

Dudu Kurdgelia, Deputy General Director of Rustavi 2 TV Channel, Georgia

1. Technological advancements that are being integrated into various fields on a daily basis will more broadly impact the broadcasting industry in the next five years. I believe one of the most noticeable changes will be the increased convergence of traditional broadcasting with digital platforms. Linear television will certainly remain relevant, but it will transition to hybrid models that combine over-the-air broadcasting with on-demand streaming services. This shift will allow broadcasters to reach a wider audience and offer more personalized content.

Additionally, the deployment of 5G networks will revolutionize live broadcasts by providing higher-quality video streams with

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Artem Zhilin: The transition to minimizing infrastructure will continue

Artem Zhilin, Technical Director of TV Channel Pryamiy LLC, Ukraine

1. Looking back over the past five years, we can see that there haven't been any radical changes. Although much new and interesting work has been done in many areas related to media content production and broadcasting, the pace of change has been steady rather than revolutionary. I notice a trend toward the unification of technologies like IP. It hasn't completely taken over as many predicted when it first appeared, but its use is increasing each year. I believe the shift toward minimizing infrastructure and enhancing mobility will continue. Consumer devices are increasingly approaching professional quality, and it's become perfectly normal for people to watch reports filmed on an iPhone.

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Oleg Kungurov: I hope for a breakthrough in AI in the field of graphic design of broadcasts

Oleg Kungurov, technical director of the Sport+Qazaqstan TV channel, Kazakhstan

1. Solutions for IP signal delivery will become more popular compared to traditional options like satellite communication and dedicated lines. Video editing will be partially, or even halfway, entrusted to artificial intelligence. Cloud solutions will become cheaper and more accessible due to advancements in technology and high market competition.

2. It is quite possible that artificial intelligence will make some professions redundant, but it will not completely replace all people in television production.

3. I am hopeful for a breakthrough in artificial intelligence in the field of broadcast

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Anatoly Goronesko: In the next five years we will see a trend towards simplification, automation and miniaturization of broadcasting equipment

Anatoly Goronesko, Founder of VR Sphera and VR Cast

Overall, I don't expect any drastic changes. However, I believe IP solutions will continue to develop and become fully reliable for broadcasting.

Currently, AI isn't widely used in television, but it's definitely a matter of time. With the pace of technological advancements, by 2030, we can expect many interesting and surprising developments involving AI.

AI is already being used in cameras to improve focus and other functions. These technologies will continue to evolve and get even

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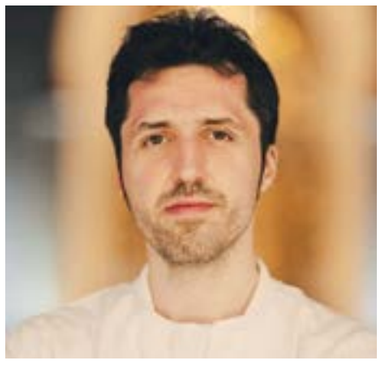

Dmitry Bunevich: Overall, I don't expect any major changes

Dmitry Bunevich, Senior Manager, Sony Electronics

1. Solutions for IP signal delivery will become more popular compared to traditional options like satellite communication and dedicated lines. Video editing will be partially, or even halfway, entrusted to artificial intelligence. Cloud solutions will become cheaper and more accessible due to advancements in technology and high market competition.

2. It is quite possible that artificial intelligence will make some professions redundant, but it will not completely replace all people in television production.

3. I am hopeful for a breakthrough in artificial intelligence in the field of broadcast graphics, which will make sports broadcasts more dynamic, vibrant, and engaging.

4. In my opinion, the role of an ingest engineer could be replaced by artificial intelligence. Video editors (not in all areas, but I admit in news production) could also be replaced.

Gocha Kumsiashvili: Traditional TV broadcasting is rapidly losing its audience

Gocha Kumsiashvili, Director of Production and Technical Support at Georgian Public Broadcasting

1. In my opinion, the film, television broadcasting, and broadcast technology industries will undergo significant changes over the next five years. These changes will be driven by technological advancements, evolving consumer behavior, and the corresponding shift in the landscape of content creation and distribution.

The key trends and changes that may shape these industries are as follows:

1. Further Expansion of Streaming Platforms

- Continued Growth and Dominance of Streaming Services: Traditional broadcasting

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Anar Safarov, AzTV: AI will be integrated into all aspects of the broadcasting industry in 2030

Anar Safarov, Deputy Director of the Technical Production Department of the Azerbaijan Television and Radio Broadcasting Company

1. Over the next five years, significant changes are expected in the broadcasting and broadcasting technology sectors. These changes will occur across various areas:

- Growth of Streaming Services: Streaming platforms will continue to gain popularity, attracting more viewers than traditional television. The number of streaming services will increase, with specialized platforms being developed for different types of content, such as sports, news, and entertainment. Over-the-top (OTT) services will expand, delivering content directly to users via the internet and becoming more widespread.

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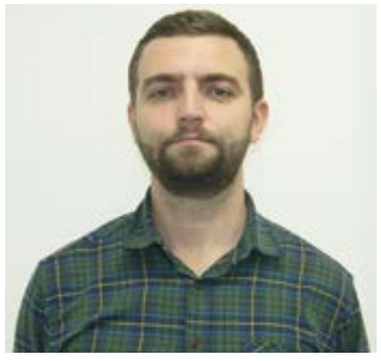

Ajdar Maniyev: Viewers will have more opportunities to customize content to their interests

Ajdar Maniyev, DevOps Eng at Baku TV, Azerbaijan

1. I believe that in the next five years, the broadcasting industry will become even more digital and interactive. Viewers will have more opportunities to choose and customize content according to their interests.

2. By 2030, artificial intelligence will likely become an integral part of broadcasting. It will be able to predict audience preferences and even generate new ideas for shows and programs.

3. In our business, AI will help automate many routine tasks, freeing up time for cre-

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Yolcu Aliyev: AI and Machine Learning Will Play a Big Role in 2030

Yolcu Aliyev, Chief Engineer, Az TV, Azerbaijan

1. In the next 5 years, streaming, live streaming, and the convergence of broadcasting with social media will play a significant role in the broadcasting industry.

2. By 2030, AI and machine learning will have a major impact on the industry.

3. Our business segment will become more in demand and profitable.

4. I believe that AI will displace some technical professions, though it's difficult to pinpoint exactly which ones at this time.

Emad Askar: AI will be a good assistant, but it won't change much in our industry

Emad Askar, SNG Engineer at AlamiyaMedia, Saudi Arabia https://www.linkedin.com/in/emad-askar-b23368ab/

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THE BROADCAST INDUSTRY DOESN'T LIKE BIG CHANGES

Philip Grossman, editor of TFT 1957

I believe that over the next 5 years, the broadcast industry typically does not favor a lot of change, as the system needs to remain stable… Broadcast engineers must know that they can count…

There have been many changes over the past 5 to 8 years, (IP, HDR, UHD, 8k, OTT, etc.) and I believe that over the next 5 to 10 years, we will see less "industry-changing" technology.

The number of "eyeballs" has not changed over the past 10 years, however, the amount of time those "eyeballs" can be reached has increased due to smart phones, tablets, OTT, etc. I believe over the next decade the broadcast industry will be working to figure out which

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CASSIDY PHILLIPS: WE'RE ABOUT TO SEE A VIRTUALIZED BROADCAST INDUSTRY

Cassidy Phillips, Lead Solutions Architect, swXtch.io

1. Cassidy: Media is a bit behind other industries in the race to virtualization. The evolution of CPU and GPU, as well as creative changes to workload distribution and software, are enabling more every day. This means we could see a mostly virtualized broadcast industry soon.

2. Cassidy: Rules-based workflows are low-hanging fruit for AI (think file-transfer+-conversion+archive). Any mechanically repeatable action should be consumed by AI over the next few years. If the capabilities of AI push beyond the kind of "memorization and compression of data" we see today, who knows what else AI could do.

3. Cassidy: For the cloud, AI could help

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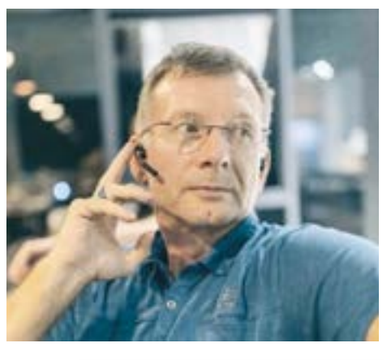


Max Popov: 1/4 of all companies will go to the cloud based production

Max Popov: 1/4 of all companies will go to the cloud based production

1. ST2110 will become easier and safer standard to move too. 1/4 of all companies will go to the cloud based production. New Media companies (Amazon, Apple...) will pick up more tier one Sports rights and will introduce new ways of production.

2. AI will be used for some editing tasks, closed capturing, translations... Some small productions will even use AI for automated live switching. By 2030 we will see some AI content.

3. Already using AI for automating service requests.. Will utilize more of it in this area.. Already utilizing AI in creating quick Playlists in sports based on Metadata recorded to Dreamcatchers.

4. None. It will empore different professions to do more with less time and effort...

PETER VINOGRADOV: TRADITIONAL TV CHANNELS WILL BECOME MORE THEMATIC

Peter Vinogradov, Technical Director of System Solutions

1. VOD services will continue to develop, but more in the style of YouTube. Traditional TV channels will become even more thematic. There will be an even greater disparity in the quality of programs.

2. Subtitles and translation on budget services will definitely be handled by artificial intelligence (AI). Standard studio filming will be automated and controlled by AI. It's very likely that AI's involvement in filming sports events will increase. AI's role in reviewing and analyzing video footage will also grow.

3. Almost no change. System integration will remain system integration. AI still needs to be implemented by someone.

4. It will reduce the number of editors, translators, camera operators, and various standby personnel.

CLOUD PLAYOUT: SUCCESS OR MISSED EXPECTATIONS?

By Peter Hajittofi, CEO, coralbay.tv

Over the last decade or so, many linear TV channels have been migrated to the cloud. But has this move been successful? Have expectations been fulfilled? What lessons have been learned?

Unfortunately the answers to the first two questions are not a simple yes or no. It really depends on what we mean by "cloud", what we mean by "successful" and what the expectations were in the first place.

Public vs Private Clouds: Choosing the Right Infrastructure for Broadcasting

For some, the cloud means public clouds such as AWS, Microsoft Azure or Google Cloud, whilst for others it means private clouds or private data centers. Many broadcasters moved channels to the cloud to save costs and to reduce the risk of new channel launches by avoiding large capital spending at the beginning of the project. There were also perceived operational advantages, such as being able to control channels from a web browser, being able to launch channels quickly and easily as well as being able to easily shut down channels which are no longer needed. There is also the additional redundancy and resilience that the cloud offers.

But to properly assess whether a move to the cloud has been successful, you have to look at what the objectives were. If it was only to save costs, then unfortunately not all broadcasters have achieved that goal. In some cases, the failure to meet goals was affected by what playout system was chosen, where it was hosted and what channel types were migrated to the cloud.

To get the maximum advantage of hosting in the cloud, the playout solution has to be cloud native. An older product designed as a real time system for on premises dedicated hardware might run in the cloud, but it won't utilize its full power. Also, it will be inefficient in resource usage and expensive to operate. A modern cloud-native product is designed using microservices, containers, and orchestration. Rather than one large monolithic application, there are a large number of smaller services that run in containers and are deployed and orchestrated by an orchestration layer, such as Kubernetes. The advantage is that you get the resilience and elasticity that the orchestration provides.

The Benefits of Microservices and Incremental Upgrades in Cloud Playout

There are other benefits too – software upgrades are much easier and less risky. Using microservices has changed the way software releases are managed. Rather than one or two large software releases per year, it is possible to release software incrementally, which greatly reduces the risk of doing upgrades and customers receive the software sooner. It is now possible to upgrade only the services that are affected by any software changes made and most upgrades can be done whilst the software is running. It's also possible to roll back easily if any issues are encountered with the new version.

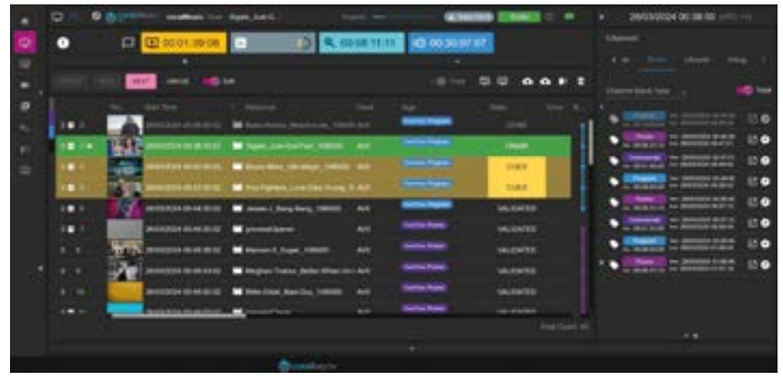
Running playout in public Cloud does offer potential cost savings. You don't need to invest in expensive on-premises hardware or budget for its maintenance. You also don't need the equipment rooms, the air-conditioning, lighting and the personnel to manage all the infrastructure. Instead, the software is spun up in the cloud and configured to meet the needs of the channel. This includes setting up the bit rates, frame rates, formats, graphics, subtitling, I/O and so on.

It is very easy to launch new channels. Some systems can actually deploy new channels in minutes. Compare that to several weeks, if not months of planning, rack layouts, wiring, commissioning and so on as it used to be done with older on-premises systems. It's also just as easy to decommission channels when they are no longer required. This means you only have to pay for infrastructure that you use and not what you don't use. This greatly reduces the risk of new channel launches.

The Flexibility of Pay-As-You-Go Licensing for Broadcasters

Some vendors offer both Pay-As-You-Go (PAYG) pricing and perpetual licensing to provide the optimum cost saving. Customers can choose the best licensing model for each channel; PAYG for channels which may have a short life or perpetual licensing for those channels that are expected to be more permanent. PAYG licensing is ideal for Pop up channels and for Disaster recovery (or business continuity).

However, established broadcasters may have long building leases and are already committed to space and on-premises equipment for several years. So when a cost comparison is done, it doesn't always stack up if you don't factor in all the space savings and associated costs. That is one of the reasons why coralbay.tv has designed its products to operate both on premises and in the cloud. In fact hybrid solutions are also possible, where some channels can be hosted in the cloud and others on premises, all with the same user interface and workflows. Edge solutionsare also possible and can offer savings in distribution costs.



Ensuring Resilience in Cloud Playout: From Redundancy to Multi-Region Deployment

Although the cloud offers many benefits, you still need a well-architected product to provide the feature range and the high reliability expected by today's broadcasters. A good product will be architected to provide additional resilience over and above what the orchestration provides. All mission critical components, such as the database, message bus, core automation services and video pipelines need to be replicated for redundancy. The outputs from the video pipelines can be fed to a downstream product, which monitors the output of the main and backup pipeline and can switch automatically if one was to fail. For added resilience, also possible to deploy the system across multiple availability zones, so if one cloud zone was to fail, playout would continue from the other zone. And for those that want even greater resilience, it is also possible to go one step further and deploy systems across multiple regions.

How to Handle Live Event Broadcasting in the Cloud: Challenges and Solutions

One other important factor when selecting a cloud playout system is live event handling. In traditional SDI on-premises playout systems, handling live inputs is quite straightforward. An automation system only needs to control a router or master control switcher and switch to a live source when a live event is scheduled. These events typically have undefined durations as it is impossible to predict exactly when a live event will end. Commercials or other events can be played during the live event and when the live event ends the operator presses the "next" button and the playlist moves on to play the next video event in the schedule. There are no delays to be concerned about and the operator can view the output in real time and make decisions on when to move on in the schedule easily. In the cloud, things are different. The inputs and outputs are normally compressed transport streams and there are encoding delays. Switching isn't that easy either — you can't just switch instantly to a new IP address and make a frame accurate transition between transport streams. So how then can live events be handled reliably in the cloud?

Any serious playout system needs to be able to switch between multiple sources as there is often a need to switch from one live feed to another. To handle multiple inputs in the cloud, it is possible to decode multiple sources at the same time and the video sources for these to be fed to the input of the video pipeline's internal software router. If a switch from one live source to another is required the video source(s) is already decoded and a frame accurate switch can then be made.

To make life easier for the operator, the live input feeds (as well as the channel output) can be monitored. Rather than make the decision on when to switch out of live events by monitoring the delayed output, it is possible to view the input and make the decision based on that. The output encoding delay is then not a significant factor.

To reduce delays and make things even easier, low latency monitoring can be used, such as webRTC. And for those wanting high quality video with minimal delays, formats such as JPEX-XS, NDI or 2110 can be used, although 2110 could be prohibitively expensive in the cloud. AWS's CDI is a more realistic alternative when working in the cloud.

But there is more to managing live events. It is also a requirement to be able to manually control events during a live event. This could be to trigger commercial breaks or it may be to control a logo or other graphic manually. coralPlay enables users to set up and control these functions using manual control panels in the UI. So during a live event, such as a cricket match, it is easy to bring up a graphic manually or to play a commercial.

Conclusion

For many broadcasters, the move to the cloud has been successful. The cloud has offered cost savings and has reduced the risk of new channel launches by moving to an Opex rather than Capex cost model. It has also offered greater elasticity, allowing for systems to scale up and down to match demand. Broadcasters have also benefited from the additional resilience and self healing that cloud offers. However, not all who have moved to the cloud have benefited from the advantages the cloud offers. One lesson to be learned is that to run efficiently in the cloud, the playout system has to be cloud native and it has to have the features you need, especially around live event handling. It is also important to carefully considerwhat you need from your cloud hosting, as costs and features differ between cloud service providers.

360 Seconds. Broadcast News & Commentary is a weekly program on Youtube about the latest equipment for broadcasting and film. Explained by experts — practitioners directly working in the field of cinema and television. Hosts: Philip Grossman, host and co-producer at Visionaries. Production — TFT1957 LLC.

- Telos Alliance: VX Duo VoIP Broadcast Phone System
- Atomos Ninja Phone: 10-Bit Video Recording for Smartphones
- Haivision Systems Inc.: Live Video Contribution Solutions at IBC2024
- TAG Video Systems: new capabilities at IBC2024
- Shotoku Broadcast Systems: the future of robotic camera systems at IBC2024
- Blue Lucy: launch of the BOLT media asset portal at IBC2024

Telos Alliance has launched its new VoIP broadcast phone system, the Telos VX Duo

Philip: Most people don't realize that getting a phone call on air is more complicated than it seems. It's not as simple as everybody thinks. I think Telos has done a wonderful job building a system that simplifies this process, especially for newer people in the industry, such as YouTubers and small production companies who are starting to do more live production. This technology integrates with their Voice over IP (VoIP) phone system, making it easier to get someone on air. What I like about it is that it starts small with two lines and can grow to accommodate up to eight lines at once. It's a great product, and I'm excited to learn more about it when I get to IBC next month.

In April, Atomos announced the Ninja Phone, and it is now available for purchase along with its app

Philip: What's really interesting about this is that they're not the first to develop a co-processor for the iPhone, but they have so much experience as a recorder. The other system, I believe it's Axun, turns your screen or your phone into a screen for your camera, whether it be a 35mm or a mirrorless, and gives you professional tools for focusing. This just takes it to the next level by turning your phone into a recorder, utilizing the software on the phone—particularly on iPhones—using machine learning to enable 10-bit recording. I would assume eventually it will support ProRes RAW and other formats. So, it's really transforming what was just a phone for making calls into a much more complete solution.

Of course, Atomos makes recorders and screens on their own, but this gives small production companies the ability to record high-quality material off their cameras in a format that isn't overly compressed. That's usually a big issue with a lot of this tech—on your camera, you get very compressed video. This just opens up a world of capabilities for the average filmmaker. It's exciting to see. I don't suspect they'll be the last to do this, but they have a lot of experience in recorders, and merging that with the capabilities of the iPhone is exciting. I'm looking forward to seeing what this entails and what the capabilities of the technology will be when it rolls out to market.

Haivision Systems Inc is set to present its advanced live video contribution solutions at IBC2024

Philip: Well, especially since the pandemic, which accelerated the adoption of REMI (Remote Integration Model) remote productions, a lot of the challenges revolved around how to get the signal from a location back to the control room, or whether to deploy OB (Outside Broadcast) trucks, which presents a significant cost issue. Haivision has really taken what appears to be lessons learned over the last four or five years on how people are doing things and has started to build out what amounts to an ecosystem that simplifies high-quality video contribution.

The biggest issue with remote production is the latency involved in compressing the content and then sending it to the location, where it needs to be switched in real-time. They've really worked on reducing the latency footprint on the contribution side. Obviously, on the distribution side, latency is not as critical since it goes out when it's ready. If it's two or three seconds behind, no big deal. But if I'm working with multiple cameras at a remote location and trying to synchronize everything, that latency can be challenging. Haivision seems to have addressed this across their entire product line, which is a significant development for production companies, especially considering the potential cost savings.

TAG Video Systems is set to introduce several new capabilities at IBC2024

Philip: TAG is one of the first multiviewer companies to produce a product that's entirely software-driven. In the past, they were very hardware-driven and limited by the number of I/Os. They've set the standard for software-driven multiviewers, which I think is fantastic. Their technology is providing a lot of end-to-end solutions for customers, from the studio environment all the way to production, output master control, and distribution.

Two of the things in their announcement that are interesting: one is a role-based security model. They're increasing security, which is crucial because multiviewer solutions were typically managed by a few engineers with everyone seeing the same thing. With larger broadcasts and people spread globally, a roles-based solution is necessary. I think this is a fantastic addition to their solution.

The second interesting feature is a heat mapping functionality. Multiviewers help monitor signal status, such as close captioning, color accuracy, and black frames. The new heat mapping feature assists users in root cause analysis to determine signal issues more quickly. Because TAG is software-based, they can continually add features like this. I'm excited about these additions and will definitely visit their booth at IBC.

TAG: Thank you for this amazing overview! We can't wait to showcase all these new capabilities in person at IBC, helping our customers to simplify their workflows and achieve amazing quality at scale.

Shotoku Broadcast Systems will showcase its latest advancements in robotic camera systems at IBC2024

Philip: The one thing I really liked about their press announcement is the way they presented their advancements without heavily relying on the term "AI". Technically, some features in their solutions could be considered AI, but they didn't market them as such. Many organizations use robotic systems because it's impossible to have camera operators for every angle, especially as studios get smaller. Investing in robotic camera pedestals is a smart move for these organizations.

One of the new features is facial tracking, which they refer to as "centering". It ensures that if someone is walking back and forth in the studio, the camera remains centered on their face. This technology is similar to what we see in devices like Apple and Android phones, but it's great to see it integrated into a professional system.

Another feature, also falling under the realm of artificial intelligence, is a pedestal that not only keeps subjects centered left to right but also adjusts up and down, maintaining the shot's center. This allows for more dynamic studio setups, enabling hosts to move around freely. While this might not be as common in news studios, it's a fantastic addition for the sports market.

Blue Lucy Announces Plans to Debut BOLT at IBC2024

Philip: Over the last 10-15 years in the content management arena, we've seen numerous systems adopted by various organizations and sub-organizations. Consequently, within a single organization, you might find two or three different content solutions. The Blue Lucy BOLT appears to be a solution that, as the name implies, bolts on top of your existing systems and provides the connectors to integrate all these different systems. This creates a single pane of glass across various systems, facilitating workflow.

It will be interesting to see how it eventually rolls out. While I couldn't get many details, I assume this is a cloud-based offering. It would be great if they also offered an on-premises version because some organizations prefer not to have certain content in the cloud. If BOLT can provide both cloud and on-prem solutions, that would be wonderful. Content management and asset management are areas I'm passionate about, having started my career in this field. I'm excited to see how these solutions can speed up processes as we continue to create more content within our organizations. BOLT looks very promising, and I'm excited to see what they have to offer at IBC.

PHOTO ESSAY

ONE DAY AT **EVERTZ UK, LTD**

Andrew Smart, Sales Manager, Broadcast EMEA, Studer-Evertz Audio Solutions at Evertz, UK

EVERTZ UK was founded 27 years ago in Wokingham, Berkshire, UK. Controlled by Evertz Tecnologies Ltd. Specializes in the design, manufacture and sale of video and audio infrastructure solutions for television, telecommunications and new media

PHOTO ESSAY

PTF LAB: TRANSFORMING LIVE BROADCASTS WITH AI–POWERED VIRTUAL ADVERTISING

In broadcasting, keeping viewers engaged while maximizing ad revenue is crucial. Traditional ads, like static in-stadium placements or pre-recorded commercials, often don't fit the dynamic nature of live sports and events, leading to a poor viewer experience and missed revenue.

The Challenge:

Dynamic Advertising Demands

Viewers now expect immersive experiences, even during ads. Static ads often disrupt fast-paced broadcasts, reducing their impact. Managing diverse ads across regions and demographics also poses challenges, limiting broadcasters' ability to grow revenue and engage audiences effectively.

PTF Lab's Solution:

AI-Driven Virtual Advertising

PTF Lab's AI-powered technology offers a solution by integrating dynamic, real-time ads into live broadcasts. This approach enhances the viewer experience and opens new revenue streams.

Real-Time Ad Integration: Our technology uses AI to find optimal ad placement moments, seamlessly inserting digital ads that feel like part of the live environment, boosting viewer engagement.

Adaptability Across Formats: Unlike traditional methods, PTF Lab's technology adapts to various live events and integrates with handheld and moving cameras, ensuring ads remain visible and relevant.

Multi-Regional Capabilities: PTF Lab enables broadcasters to customize ads by region and demographics in real-time, enhancing engagement and ad effectiveness, and revolutionizing revenue generation.

Beyond Sports:

Expanding Virtual Product Placement

Beyond sports, PTF Lab's technology suits live broadcasts from concerts to TV shows, seamlessly integrating branded content and offering fresh opportunities for advertisers and broadcasters.

Key Technical Advantages

Cloud-Based Tracking: Processes video feeds in real-time without costly on-site equipment, reducing costs and enabling quick scalability.

AI and Neural Networks: Ensures precise ad placement even in complex environments, enhancing visibility and effectiveness.

Scalability and Easy Integration: Integrates easily with existing systems, scaling from small streams to major broadcasts, providing a versatile tool for broadcasters.

Future Outlook:

Personalized Virtual Advertising

PTF Lab is at the forefront of advancing virtual advertising. Technology customizes ads for various groups, like tailoring streams for different regions. The future lies in greater personalization, delivering ads based on individual viewer interests. Using AI and data analytics, PTF Lab aims for uniquely personalized advertising, enhancing relevance and engagement and offering brands more effective ways to connect with audiences.

Conclusion

PTF Lab provides broadcasters with innovative tools to enhance viewer engagement and unlock new revenue. Integrating AI-driven virtual advertising into live broadcasts helps broadcasters stay ahead, driving success through advanced technology.

Canon

ELEVATE YOUR CREATIVITY

The EOS C80 and C400 are designed to excel in professional video and live productions, where cinematic high quality, compact, familiar design and flexible ergonomics are key to single operator or small team productions.

EOS C80

- Full frame 6K BSI sensor, triple base ISO, 13 customisable buttons and tack-sharp autofocus
- Compact powerhouse with professional connectivity, in a familiar, robust body ideal for your video and live productions.

EOS C400

- Full frame 6K BSI sensor, triple base ISO, and 18 customisable buttons into a compact, robust body
- Building on Canon's colour science to deliver warm skin tones and a naturally pleasing image, your ally in cinema, live broadcast, and virtual production with professional connectivity.