



Personalized Audio for Sports Broadcast: The Opportunity to Engage

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Introduction

As the next generation of sports broadcasting experiences is being defined, it is important to ensure that these new experiences line up with consumers' desires and preferences. Historically, sports broadcast experiences are, by their very nature, "one-size-fits-all" experiences. For example, although a viewer may be a fan of a particular team, the commentators and crowd sounds that are broadcast to them are based on the viewer's market and often biased against their favorite team.

With the rapid growth of broadband video services, consumers are increasingly offered opportunities to personalize their viewing and listening through the use of second-screen applications on mobile devices, and they can often satisfy their desire for personalized content from sources other than their local broadcaster.

Personalized audio provides the next wave of enhancement to the broadcast experience. Next-generation audio broadcast systems let content owners create and deliver more audio than can be sent through a traditional broadcast channel. Consumers can tailor their broadcast audio through interactive control of additional sound elements such as alternate dialogue, ambience, and effects.

Broadcasters, professional equipment manufacturers, and others are working with industry organizations like ATSC, DVB, and ITU to establish standards for broadcast TV audio—standards that will likely be deployed along with ultra high-definition (UHD) TV in the next few years. The ATSC, for example, is currently evaluating audio formats for its 3.0 standard and is evaluating proposals from companies such as Dolby Laboratories for next-generation audio standard.

Market factors—including the increasing array of display devices, shifting demographics, changing viewing habits, and increased access to an ever-growing variety of content—require that new TV audio systems be immersive, personal, and widely accessible. The viewing audience must have greater control of their TV audio experience, personalizing sound to their tastes by controlling dialogue, using alternate audio and commentary, mixing assistive audio services, and selecting various special effects. At the same time, these systems must enable multiple-language switching, dialogue enhancement, loudness management, and descriptive video services to continue to meet regulatory requirements.

In the end, by delivering these audio solutions, broadcasters, sports rights holders, and pay-TV operators will be given an opportunity to enhance their offerings and provide their customers the following benefits:

- **Engage viewers more deeply.**

Dolby® Personalized Audio offers viewers new ways to experience live event broadcasts, with options such as choice of announcers, crowd ambience, fan and player viewpoints, and more.

- **Drive profitability from personalization.**

Dolby Personalized Audio opens up new revenue streams by enabling operators the ability to create and package unique premium experiences, develop new sponsorship deals, and realize cost efficiencies.

- **Support agility.**

With Dolby Personalized Audio, operators can meet today's challenges while leveraging a platform that will help them deliver new services, meet new accessibility requirements, and evolve new ways to engage with and build their audience.

Market Opportunity

Globally, 90 percent of consumers watch video content over the Internet, including movies, TV programs, and videos on demand. And for sports viewing, these services are starting to offer more personalized viewing experiences. For example, MLB.TV has been offering live overlay audio technology to allow viewers to switch between TV and radio announcers, and the NBA League Pass has been offering home and away video and audio feeds.

To date, the functionality provided via the Internet has not been a significant threat to traditional sports broadcasting, as sports viewing as a category is only a small percentage of total broadband video viewing. This is due, in part, to the fact that early leaders in the broadband video space (such as Netflix®, Amazon®, and Hulu™) offer no sports content and have not focused on this area. However, as noted in Figure 1, this is likely to change as more and more sports content is consumed via online services.

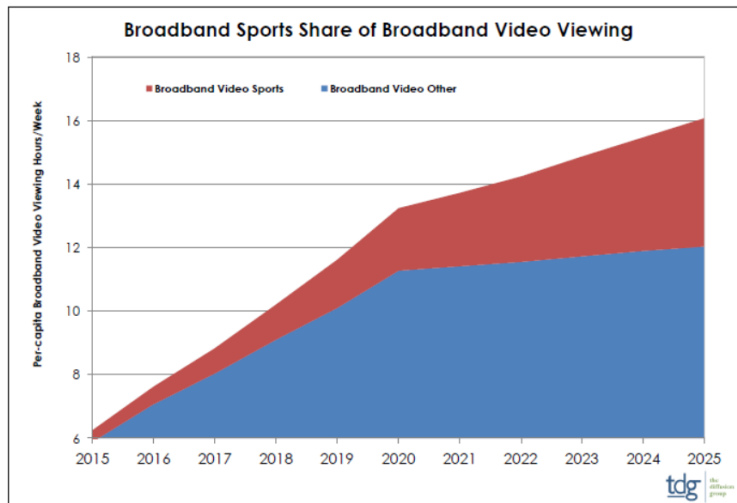


Figure 1. Broadband Sports Share of Broadband Video Viewing
Source: The Diffusion Group (December 2014)

Broadband sports pose a challenge to legacy TV providers. The TV industry will have to address the growing threat over the next decade regarding how to manage the rapid growth of broadband video and the rollout of new services. This threat will only grow, as new products such as the Chromecast™ device and the Amazon Fire™ TV Stick can be plugged into almost any TV sold today to easily stream content. In addition, these units have become relatively cheap and accessible and will only fuel the potential of broadband services.

One of the ways that broadcasters will be able to address the threat posed by online delivery of sports content will be through enhanced audio offerings, such as personalized audio. Audio personalization enables sound designers and mixers to deliver different presentations tailored to individual systems, needs, and preferences. It offers audiences a deeper level of control over the immersive experience and enables a more emotional connection to the action.

For example, football fans can personalize a match as if they were sitting with the home crowd in the stadium and can also listen to biased commentaries. Racing fans can listen in on team radio transmissions or place themselves in the driver's seat, where engine sounds are immediate and visceral. Producers can even deliver a scripted drama that tells a story from several different characters' points of view. Such audio personalization allows programmers to provide viewers with uncompromised, differentiated, and accessible audio.

Audio personalization is relevant to every playback device—with a differentiated experience available on headphones, stereo speakers, and home theater systems. Object-based audio makes it possible to deliver audio that can be optimally reproduced for each environment.

Focus-group testing done by the BBC has shown that consumer opinion differs in the desired balance and focus of an audio mix. Some consumers want to hear more of the action; some want more of the analytic commentary; and others want to hear a new viewpoint that more closely aligns with their interests and allegiance.

Our own market research has shown that audio control of commentator levels—as well as the ability to hear on-field player sounds and voices—was very well received by consumers. This result was in line with the BBC’s finding that sports fans enjoyed the ability to customize their audio solution and found value in controlling the audio levels of the commentary and crowd ambience levels independently.

One of the big benefits for broadcasters in the United States will be the ability to deliver a better experience when listening to the broadcast announcer. Networks pay these announcers significant amounts of money and are hesitant to do anything that would impact their reach. That being said, personalized audio offers a real opportunity to deliver clear dialogue and commentary. For example, one of the biggest viewer complaints is that they cannot hear the commentary. So, while there is a drive to do what you can for fans at home to put viewers in the middle of the action, there is a real need to make sure that the announcers, dialogue between player and coach, and other commentary be delivered in a clear and intelligible way.

One of the other areas to which broadcasters and, in particular, executive producers will have to pay attention is the rollout of UHD services for sports. Audio plays a large role in making UHD the type of premium, immersive viewing experience that the industry expects. Viewers have now become more distracted with broadcast content, and the increases in online multitasking while viewing reveals a decreasing level of user engagement with today’s broadcast TV. With personalization, TV viewers will have the opportunity to become more involved with their favorite sports teams and players, which will potentially drive increasing sport viewership and merchandise sales.

One example of the potential benefits of audio for UHD comes from the fact that the typically larger screen associated with UHD can enable mosaics for sports content, as well as enhance interactivity. Selecting camera angles has been a very popular feature online, and having the ability to switch the audio in conjunction with the camera angle is highly

desirable. Integration with video personalization creates holistic sports-viewing entertainment and will be essential for broadcasters who hope to create solutions that can compete with those services being offered by over-the-top (OTT) content operators. This is already happening in OTT services. For example, MLB.TV provides a mosaic view, where the user can watch games simultaneously. They have also patented live audio overlay, allowing users to switch between TV and radio announcers.

Excitement revolving around new products within the realm of technology naturally boosts profit potential. The hope is that creating the ability to deliver unique experiences will enable new sponsorship placements and additional advertisement revenue.

Meeting the Opportunity for Personalized Audio Delivery

In the long run, even as technology moves forward, it will come down to the producers of sports content to determine whether they see benefits to personalized audio. For these producers, the questions are simple:

- Will this increase my viewership or stem losses in my viewership?
- Am I missing an opportunity for engagement?
- How will this affect the setup of my show?
- How will this affect my show's overall production value?
- Will this increase the time needed to produce my show?
- Will this increase the complexity of producing my show?

These are all questions that need to be asked. And as with the introduction of 5.1 surround sound in the past, they will need to be addressed before the widespread adoption of personalized audio can occur.

The infrastructure that is currently in place will need to be augmented to support the extended requirements for next-generation personalized audio. In addition, the workflow will need to be enhanced. Key areas to be considered include the following:

- Audio-mixing facilities and sound design rooms may require upgrades to provide higher-quality audio. In order to create immersive and personalized audio, they must be outfitted with proper mixing and monitoring equipment.
- Uncompressed audio transport and bandwidth requirements need to be defined for moving audio in a production environment.

- New interfaces may be needed throughout the infrastructure, including production facilities, broadcast facilities, and possibly the home so as to handle immersive audio along with the higher bit-rate video that will be required for UHD TV.
- New audio playback solutions may be needed in the home to play immersive audio. Realistic rendering of immersive audio into a variety of playback systems is required.
- Audio mixers must be able to listen to the program in an immersive format as well as have the ability to spot-check the mix in stereo or 5.1 to ensure that viewers with only those capabilities will hear a good presentation.
- Broadcasts have to be adaptive and capable of handling transitions in TV programming from object-based audio, such as a sports event, to an advertisement or postgame show.

With these challenges in mind, the goal for next-generation audio is to limit (and, in some cases, potentially reduce) the operational and financial impact to existing workflows. It needs to drive cost efficiencies with an integrated end-to-end solution from capture to delivery and playback—a solution that will provide new tools to augment existing production practices and facilitate creation of personalized, immersive object-based audio without the need for a dedicated object-based audio mixing console.

The Solution

Dolby has developed and demonstrated an end-to-end system using object-based audio that gives content owners new ways of storytelling and enables consumers to personalize their audio experience. Object-based audio allows each sound element to be individually carried, described, positioned, and associated with other elements in the broadcast sound mix. This solution contains the necessary elements to address the questions asked in the previous section:

- New production tools provide easy creation of object-based audio from existing mixing consoles.
- Audio formats supporting object-based audio operate within existing contribution and distribution transports such as AES3, SDI, and transport streams. These formats carry advanced metadata to ensure that every personalized presentation provides an optimal sound experience.
- New audio engines enable playback devices to decode and render these new object-based audio presentations.

Dolby Personalized Audio can work for everyone, including broadcasters, OTT providers, sports leagues, and sports teams alike. It offers a turnkey suite of services and solutions that facilitates content creation and delivers the most engaging personalized experiences possible:

- End-to-end workflow and infrastructure integration support
- Support for integration in outside broadcast trucks for content creation
- Professional services for design, development, and deployment of immersive and personalized audio, from capture to playback
- Professional reference hardware for encoding, content creation, and monitoring
- User interface and experience design for service delivery
- A simple presentation layer and advanced constraints metadata to give you control over the viewer's audio experience
- Service monitoring and service assurance to ensure end-user quality of experience and quality of service
- Support for playback-device integration
- A proven ecosystem of professional partners for delivery support

Producers and audio engineers will be able to develop and deliver the experiences that viewers want. Content owners and broadcasters will have new ways to involve fans more deeply—and generate additional revenue with new features such as premium audio subscriptions, sponsorships, and endorsements.

In addition, the personalized experiences you create can do more than build audience engagement. They also help you meet growing accessibility requirements by providing features such as descriptive audio, dialogue enhancement, and multiple-language support.

At the heart of audio personalization is strong usability, because without intuitive controls, users will disregard next-generation features. A simple presentation layer and advanced constraints metadata gives broadcasters control over the user experience, so they can determine whether to offer viewers simple choices via the primary screen, a full set of personalization controls via the second screen, or a combination of both.

Personalization metadata is processed by the middleware in the playback device. This middleware presents the different personalization options to the user by an onscreen user interface or by communicating to a second-screen (for example, tablet) application. Either a remote control or touch device can be used to customize the audio program. This customization can be as simple as selecting from several different audio presentations or as

advanced as selecting the individual audio elements to be presented and configuring each audio element's position and level. The level and range of audio personalization available is ultimately defined by the metadata specified by the content creator.

Summary

Although sports will continue to be the foundation of legacy TV revenue for years to come, broadband delivery of sports content will offer significant opportunities for growth and innovation. Sports fans will have more choices as to which screen, which features, and which sports (and teams) they want to engage with. This will, in turn, challenge the TV industry to keep pace with these new innovative services.

Personalization can truly add value to content, and by delivering different audio choices, the likelihood of repeat viewing can be increased. Ultimately, a consumer who receives the experience he or she desires is a happier consumer and one who will see more value in the service that is being provided.

Delivering next-generation audio requires new technology and careful consideration at every point in the creation, delivery, and playback chain. The goal is to enable new experiences for the end consumer while minimizing cost and impact to existing production. New formats and tools will support next-generation audio, with a high emphasis on reliability and usability. Audio production mixers will have a new palette for delivering new artistic intent, and consumers will, in turn, have more control and more immersiveness in their listening experience.

Based on a history of innovation in audio and work with broadcasters worldwide, Dolby has created a solution for personalized audio with an end-to-end guarantee that the service will work and will offer the unique benefits that end users desire. By doing so, Dolby will provide broadcasters, sports rights holders, and pay-TV operators new opportunities to engage fans more deeply, drive profits via personalization, and support agility and innovation.

For more information on Dolby Personalized Audio, please see www.dolby.com or contact your Dolby representative.