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## **FEATURE STORY**

### **The (r)evolution of sports broadcasting**

[OPEN PRECEDE]

Escalating viewer demand for televised sport continues to drive many of the technological advances in the broadcast industry. This is changing the way sport is both delivered and watched.

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Sport on television has captured the imagination of the viewing public since its inception nearly 70 years ago. Arguably the purest form of 'live' television, modern sports broadcasts offer viewers a virtual front-row seat at the world's premier sporting events. The first televised broadcast of a college baseball game between Columbia and Princeton Universities in 1939 laid the foundation for what now forms the backbone of modern sports broadcasting.

Guaranteed—almost always—to produce an unrehearsed outcome, sport on television was instrumental in promoting the uptake of television sets and generating a new mass audience in the technology's infancy. From humble beginnings, where a single camera was used to capture the action, sports broadcasting has developed into a business-driven multi-billion dollar viewing spectacular, where broadcast rights and sponsorship contracts share equal importance with on-field umpiring decisions.

Sport's inherent appeal to a wide cross-section of the community continues to drive the commercial viability of television today, with sporting events occupying more television time than any other viewable content. With major sporting events, such as the Olympic Games, World Cup Football, and Formula 1 racing, attracting massive television audiences worldwide, delivering premium-quality sports broadcasts has never been more important.

### **Olympic origins**

Over the past decade in particular, television broadcasting has experienced a fast-track evolution with developments in digital technology. Improvements in content acquisition, production and

delivery technologies have enabled television networks to provide an unprecedented volume of premium-quality content that ensures the viewer is kept right in amongst the action.

While sports broadcasting has been a major beneficiary of such changes, it can be argued that it has actually driven a number of the more significant broadcast advancements. On-field cameras, multi-view broadcasting and super-slow-motion replays all have their origins in sports broadcasting. It seems that each sporting event is accompanied by a new camera angle or broadcast feature. Providing the driving force for this rapid evolution of sports broadcasting is the world's premier sporting event—the Olympic Games.

Historically, the broadcasting of the Olympics was typically overseen by the host country's national broadcaster. This presented a potential risk—that often became a reality—of the broadcaster's coverage predominantly focussing on the host nation's athletes. Consequently, this 'biased' coverage resulted in a lack of interest from both viewers and sponsors from other countries.

This all changed in the mid 1980's when the International Olympic Committee (IOC), recognising this coverage bias, took more active control of the broadcast rights to ensure that the successful broadcaster provided unbiased coverage. It was during this time that the concept of a 'host broadcaster' with specific responsibility to produce unbiased coverage was developed. The unbiased coverage was provided to Rights Holding Broadcasters (RHB) who could then supplement the unbiased feeds with their own country/athlete specific coverage.

RHBs were awarded geographical coverage rights for the Olympic Games through a bidding process. This strategy was immediately successful, as the unbiased coverage rated extremely highly and attracted unprecedented levels of sponsorship and advertising dollars. Broadcasters now bid for the Olympic Games television rights and the rating benefits and commercial revenues that accompany them.

This influx of fresh capital from advertising and sponsorship meant broadcasters were able to revolutionise the production and delivery of sports content. Producing slick multi-featured broadcasts—each telecast seemingly more detailed than the last—television networks have 'raised the bar' with respect to what comprises a 'standard' sports broadcast. Consequently, viewers have become accustomed to such high-quality programming and have increased their expectations dramatically.

## **A new era**

The sports broadcasting industry has come a long way since the first live terrestrial sports broadcasts and 'pay-per-view' cable TV. New digital platforms, such as digital terrestrial television (DTT) (including datacasting and multi-channelling), digital cable, IP/Internet technologies and mobile TV, have brought significant change to the way sport is both delivered and watched—heralding a new era in sports broadcasting.

Sports fans now have the luxury of viewing sport in high-definition widescreen and Dolby Digital 5.1 surround sound, with multiple camera angles and super-slow-motion replays—all on multiple viewing platforms. The recent broadcasting history of the Olympic Games provides a valuable insight into just how much the provision and delivery of sports content has changed over the past decade.

The sophistication of sports broadcasting has grown dramatically since the analogue coverage provided at the 1996 Atlanta Olympic Games. At the Sydney Olympics in 2000, high-definition television (HDTV) began to make its mark. While standard definition (SD) coverage was provided, some 'marque events' were telecast in HDTV—perfect for the action-packed spectacle of the Olympic Games. These developments coincided with the initial implementation stage of Australia's Digital Video Broadcasting - Terrestrial (DVB-T) system—one of the first in the world.

By the Athens Olympics in 2004, increasing amounts of the terrestrial broadcast infrastructure in Australia was digital and new viewing platforms were beginning to emerge. IP/Internet streaming was well developed with the RHBs offering large volumes of streaming material. Some mobile services were available, but consisted mostly of data, with mobile TV yet to make its mark on the Olympic field of play.

Since 2004, mobile TV has become a major focus in all aspects of sports broadcasting. At the 2006 Commonwealth Games held in Melbourne, Australia, Broadcast Australia showcased digital video broadcasting – handheld (DVB-H) mobile television technology. The demonstration revealed the strength of DVB-H mobile television at large sporting events, with up to seven channels of live Commonwealth Games television broadcast to select handheld devices. An information channel was also broadcast, providing event-related data, such as starting lists, medal tallies and weather reports.

Mobile TV will continue its development at the Beijing Olympics in 2008, with the increased provision of mobile TV and digital radio services. In addition, the Beijing Games will be the first

Olympic Games to be captured entirely with HDTV technology, and the RHBs will also stream IP/Internet content from the Games' 302 events.

### **'Lean back' to 'lean forward'**

The emergence of DTV has reaffirmed the extent to which television has pervaded our lives. Viewers are increasingly expecting more choice—more programs in more locations, via an ever-increasing selection of viewing platforms on demand. Moreover, we are seeing the convergence of these viewing technologies, with television services increasingly incorporating an interactive component. With these developments comes a significant change in viewing habits.

Traditionally, television viewing has been essentially a passive experience, with content fed to the viewer. This could be considered a 'lean back' or 'sitting on couch' technology, as the only interaction required is changing the channel. Conversely, PC-based Internet has an active component and requires significant involvement from the user, and could be termed a 'lean forward' technology.

The high degree of selectivity available with modern interactive broadcasts is having a dramatic effect on consumer viewing habits, allowing viewers to effectively customise their television experience. 'Lean back' television is evolving into a new 'lean forward' technology, as viewers demand sports content tailored to their specific tastes. As content providers produce a record number of programs in an attempt to satisfy sports fans' appetites, new viewing mediums are being embraced at a rapid rate.

At the Beijing Olympics there will be over 3,800 hours of content created over a 16-day period. Even if viewers were to watch the broadcast 24 hours a day for the 16-day duration, they would still only see approximately 10 per cent of all the available content.

At a glance, these new viewing platforms appear to provide broadcasters with the ability to deliver more content to viewers. However, on closer inspection it is actually not quite so straightforward. In reality, the rapid emergence of multi-platform technology presents a range of challenges to both the content provider and the broadcast services provider.

In principle, digital broadcasting presents a number of advantages when compared with its analogue forerunner. Multiple digital services can be provided within the same amount of spectrum that a single analogue channel occupies. However, digital broadcast technology allows broadcasters to provide a range of new services and features that can potentially consume vast amounts of spectrum. Advanced digital pre-broadcast production techniques, such as signal

compression, multiplexing and content 'repurposing', allow broadcasters to maximise and tailor both the quality and volume of content. While these broadcast advancements provide viewers with increased broadcast features, this can lead to new challenges.

### **Bandwidth burden**

The issue is that sports broadcasts—by their very nature—tend to be extremely data-intensive. Detailed and rapid movement, coupled with additional broadcast features such as replays and multi-camera perspectives, inherent to sporting events, mean that sports broadcasts often demand significant bandwidth. Only so much data can be transmitted within a given bandwidth, and bandwidth remains a finite resource.

The burden on broadcast spectrum can be alleviated to some degree by transmitting the signal at a lower bit-rate. This can be achieved in some applications by compressing the signal to bit-rates as low as 8Mbps (an uncompressed digital broadcast signal is typically 270Mbps). However, this is not always ideal; it stands to reason that content providers are hesitant to compromise the quality of the sports broadcast. As a result, broadcasters are often presented with the challenge of disseminating all this information via a conduit with limited capacity.

Multiplexing technology enables broadcasters to combine multiple digital data streams into one signal, and has paved the way for exciting multi-view features, common to many sports broadcasts. Generally, the more signals that are combined, the greater the bandwidth required. However, statistical multiplexing alleviates this to some extent by monitoring the instantaneous traffic demands of the incoming channel data streams. Here, the multiplex (mux) effectively allocates spare capacity from 'lightly loaded' incoming channels to more data-intensive services, thus maximising content throughput. It minimises the burden on bandwidth and takes full advantage of the available broadcast spectrum.

Another requirement unique to digital broadcasting is that the signal must be made suitable for viewing on different viewing platforms. For example, the signal sent to high-definition terrestrial widescreen DTV is vastly different from that sent to a handheld device, which has a lower resolution small screen. Further signal processing is carried out to 'repurpose' the content in order to make this multi-platform delivery possible.

Traditionally, broadcasters have often played the dual role of content provider and deliverer, primarily through investment in terrestrial broadcast infrastructure. But now, with so many delivery options available, it is no longer sufficient to rely on just one delivery vehicle. This is paving the way for broadcast transmission specialists to relieve the delivery burden from content providers,

allowing them to focus on content development as a primary differentiator.

In many parts of Asia, digital terrestrial broadcast infrastructure sharing is already in place, allowing multiple channels to be broadcast through a single antenna system using RF combining technology. Moreover, as infrastructure sharing expands its context to include the mux, neutral service providers present a particularly cost-effective and efficient option. This is likely to promote a trend towards outsourcing of delivery.

Potentially, a single broadcast transmission site could broadcast many tens of services on behalf of multiple content providers and stakeholders. The benefits of this type of 'neutral host' scenario include not only the minimisation of capital costs, but also minimisation of the ongoing operational expenses of network management and maintenance.

### **'Game, set, match' sports fans**

Mobile TV looks set to be one of the primary drivers of further developments in terrestrial broadcasting in the near future. While there are many sports fans happy enough to view sport on their home television, an increasing number of consumers are embracing the option of viewing their favourite sports programs on their handheld device. It is expected that mobile TV will reflect the fast-track uptake of mobile telephony.

For instance, the rapid uptake of mobile TV has resulted in yet another sporting milestone. The IOC recently announced that at the 2012 Olympic Games in London, it will award mobile TV rights in addition to the traditional free-to-air television rights. This is arguably the clearest indication of the enormous interest and immediate market potential of mobile TV.

Consumer interest in mobile TV is matched only by the 'buzz' of what many are describing as the future of television—three-dimensional television (3DTV). Developments in acquisition, broadcast and viewing technology promise to make 3DTV a reality in the not-too-distant future. The mere thought of watching a major sports event in 3D is enough to inspire intense public interest. As we have seen previously, such consumer enthusiasm provides the ultimate driving force for broadcasting advances.

This collective desire has seen viewers reap the rewards, enjoying access to an unprecedented choice of premium-quality sports programs and viewing media—all with a range of features and interactive functionality. As long as viewers demand it, and technical 'wizards' can dream it up, it seems the broadcast industry can deliver it. Perhaps one day broadcasters will develop virtual-reality viewing that puts the viewer on the field of play. Can it be done? Sure, if you want.

*\* Peter Kepreotes is Business Development Manager for Digital Broadcast Systems for leading broadcast transmission provider, Broadcast Australia. Peter has previously worked as Venue Technology Manager for the IBC International for the Sydney 2000 Olympics and the 2004 Athens Olympics.*



Peter Kepreotes, Business Development Manager for Digital Broadcast Systems, Broadcast Australia: “Technological advances in the broadcast industry are changing the way sport is both delivered and watched.”

#### **Company background**

As the owner and operator of one of the most extensive terrestrial broadcast transmission networks in the world, Broadcast Australia provides transmission services for radio and television (analogue and digital) broadcasters and offers site sharing and infrastructure services.

With over 70 years broadcast transmission experience, Broadcast Australia plays a strategic role in developing new and emerging technologies—including Infocasting, Digital Radio and Mobile TV. The company’s aim is to provide world-class broadcasting solutions throughout the Asia Pacific region by working with strategic partners, including wholly owned subsidiary, The Bridge Networks.

Broadcast Australia is a 100% owned subsidiary of Macquarie Communications Infrastructure Group, an entity listed on the Australian Stock Exchange (ASX code: MCG). Its sister company, the UK-based Arqiva, specialises in providing broadcast transmission solutions for fixed and mobile media applications.

**Web site** <http://www.broadcastaustralia.com.au/>

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