



## Content Convergence: The New Frontier for Digital TV



Vision Paper

ADB. Leader in hybrid set-top solutions

## Executive Summary

Consumers have changed and the television industry now recognizes the need to give people access to more of the content they want, where and when they want it.

Service providers have moved decisively to support on-demand and time-shifted viewing and to make television content – including programmes recorded on DVR – available in multiple rooms. The next big challenge is to give customers access to non-television content on the TV. This ADB White Paper looks at how this can be achieved and what true content convergence means for the Pay TV industry.



ADB-5812TWX Hybrid HD Digital Video Recorder.

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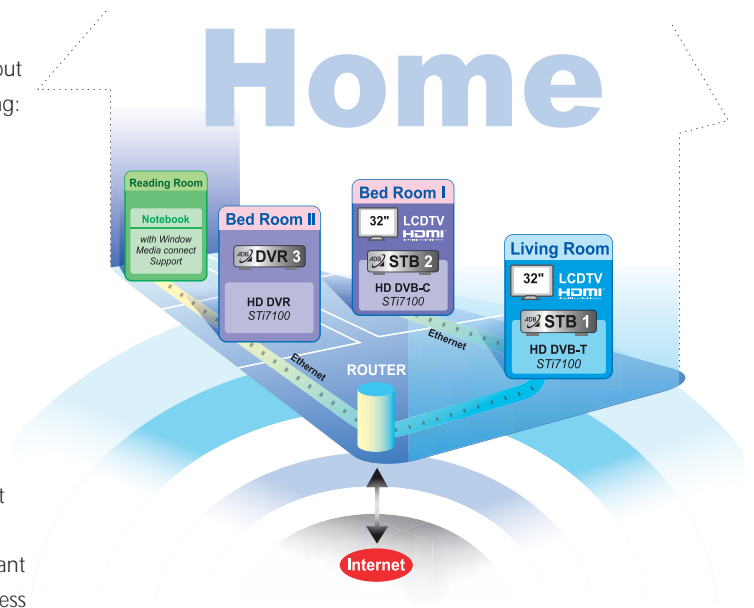
## Consumers want more from their service

Modern consumers have unprecedented choice about where they find the content they want to watch, from linear and time-shifted TV to Internet video, social networking sites and personal content stores.

They want access to their favourite content on their own schedules, wherever they are, on multiple devices around the home. Content is still king in the modern living room but consumers are interested in more types of content including:

- Personal video captured on cameras and often stored on PCs
- Special-interest video from the Internet including user-generated content
- Broadcaster-originated Internet video that is no longer available on TV
- Community-based opinion and recommendations about programming
- Photos and other content from friends and family via social networking sites

Television is no longer a standalone media and consumers want to enjoy some of their Internet and PC entertainment experiences on the big screen, sitting on the couch. They are not asking for device convergence but they do want content convergence, because that is what gives them access to their favourite movies, programmes, music, photos and videos at all times. There is a real business opportunity for service providers to meet this demand and deliver an enhanced consumer TV experience.



## Content convergence – the challenge and opportunity

The challenge for Pay TV operators is to give people access to more content from more places, making content and services easy to find, and presenting multimedia in new and exciting ways. It means converging television, Internet and personal content where consumers want it most – in the living room on their widescreen television. Increasingly, it means making VOD (Video on Demand) available on any platform, including satellite and digital terrestrial.

If Pay TV platforms do not enable content convergence as part of their television service, people will find the content anyway. Consumers will either watch more of their entertainment on the PC or mobile or, worse, they could introduce one of the various Consumer Electronics devices that enable the transfer of PC content, including video, to the television. These solutions bypass the TV service provider and diminish their value in the customer home.

Pay TV operators need to decide how they are going to handle the inevitable interaction between TV, CE devices like PCs and portable media players, and the Internet.

Service providers who give consumers the choice to enjoy linear and time-shifted TV, Internet video, social networking and personal content on the TV will be pioneering the next major trend in television. By enabling content convergence in the home they will open the way to brand new services that appeal to all generations but especially younger consumers.

Pay TV operators who deliver on this vision can expect to take a greater share of the time people spend entertaining themselves at home. There is a huge opportunity for operators to differentiate their services, increase customer loyalty and therefore grow market share and revenues.



## Enabling an enhanced consumer experience

To make this new consumer TV experience a reality, Pay TV operators need to connect their Wide Area Network with the Local Area Network in the customer premise. Then they must support the seamless movement of multimedia around the home and in particular to the TV and home theatre system. This requires hybrid set-top boxes (and Digital Video Recorders - DVRs) that are equally comfortable accessing content from different sources, notably:

- Broadcast TV and on-demand infrastructure using DVB or IP
- The broadband Internet (over IP)
- Local devices including PCs, games consoles and mobile phones.

We believe the hybrid set-top box, combining DVB broadcast reception and Ethernet IP, is the most important component in this next-generation TV experience. However, being able to physically connect a receive device to different networks is the easy part – the key to success is how you manage the different services and present them to consumers. In that respect, not all hybrid set-top boxes are equal and, increasingly, the level of software expertise among set-top box vendors is going to determine whether content convergence is an opportunity or a threat to TV operators.

The set-top box and Consumer Electronics devices need to complement each other. Set-top boxes and multi-room DVRs must enable content sharing around the home. Neither consumers or network operators are interested in complicated installations so for this concept to work in the mass-market, operators need to harness DLNA (Digital Living Network Alliance) and UPnP™ (Universal Plug and Play) home networking technologies.

To help viewers navigate the additional content, all services provided through the set-top box should be made available as channels. 3D graphics innovations in the user interface will also make navigation more pleasant and intuitive, encouraging mass-market participation. Consumers have become accustomed to the elegant user interfaces on popular media players and phones, and this has raised the bar for what digital TV services must look like. 3D could be the answer.

Advances in graphics engine technology means it is now possible to offer a user experience on set-top boxes to rival 3D games consoles. Interactive TV graphics, fluid motion and a full suite of animation effects can be supported even on platforms that were previously limited to the 2D world.

Pay TV operators need to achieve their content convergence goals while minimising capital and operating costs. When comparing solutions they should consider the total cost of ownership. Optimized software makes the best use of existing hardware platforms and will help to deliver the consumer TV experience at costs that support all business models – whether bundling the new capabilities into subscriptions or charging extra for new services and features.



## Hiding technical complexity from customers

To make the consumer TV experience work, all complexity must be hidden from the user. People want the simplicity and reliability of the TV and they want to be entertained immediately, not spend hours searching for content. So if Pay TV operators want to increase their appeal to all age groups they need to deliver content convergence in a stable, user-friendly environment.



ADB-3810TW Hybrid HD set-top device.

This represents a major challenge because hybrid technology is complex from a software management perspective and adding new applications must be achieved without compromising the overall service reliability. The IP software stack has to be implemented in parallel with other software such as MHP middleware, DRM and DLNA home networking.

In a converged content environment, it really matters how set-top box vendors implement and manage this software, ensuring the set-top-box is optimized for the growing range of tasks it has to perform. You cannot simply bolt on new applications and hope they interoperate – it is crucial that set-top box vendors keep control of the whole software stack and have a full understanding of it from top to bottom.

Set-top boxes also need to take account of environmental expectations: with more applications running simultaneously in consumer homes, the emphasis will be on minimizing power consumption and therefore consumer power bills and carbon footprint. This is a function of a highly optimized software/hardware implementation and innovative applications.





ADB-2810W Hybrid HD device.

## Your partner in delivering content convergence

ADB is well placed to deliver on these growing market requirements. The company is a leader in the design, development and supply of high-quality products to the world-wide digital television market and we are a trusted partner to television operators launching new services. Through our unique end-to-end understanding of set-top box software, we can design and supply highly efficient and optimized hardware platforms ahead of our competition, including for the cable, IPTV, satellite and digital terrestrial TV markets.

We have deployed over 13 million set-top boxes incorporating the industry's pioneering middleware, conditional access and hardware technologies. We were the first STB vendor in the world to deploy the MPEG-4 AVC video codec, in 2005, and we were the first set-top box company to be certified to use the DLNA home networking standards.

Subsequently we added the local area applications needed to support the consumer TV experience, thanks to our own implementation of the DLNA standards (supporting picture and music exchange and multi-room PVR) and provided access to Internet video and social networking with one of our partners' application. We have also developed our own implementation of the MHP standard, which we merged with the operator's IP stack. We continually harness the latest silicon technologies to enhance set-top box performance and features, including for powerful DVR and multi-room DVR solutions.

ADB is one of a few companies that can write the complete set of software needed to support content convergence through a hybrid device, from the lower level operating system to the high-end applications. We lead the industry in set-top box software integration and based on this experience, we believe that developing proprietary implementations of open standards, which lets us vertically integrate the software, is the key to delivering stability in the consumer TV experience.

Our proven software expertise delivers the combination of performance, stability and pleasant user interfaces that ensures content convergence is a consumer-friendly television experience.

## Next-generation checklist

### Consumer:

- A wide and expanding choice of video content
- Quality programming through pay or free-to-air television service
- Access to broadband and mobile video services on TV
- View personal content (self, friends and family) on the TV
- Access to all digital content from the couch – no need to move
- Increasing volumes of television on-demand and time-shifted TV
- Social networking features on the television
- Easy to use, television-like experience

### Pay TV Operator:

- Support content convergence
- Low total cost of ownership
- Hybrid set-top boxes with IP network interfaces (Ethernet/USB)
- Options for DVR, multi-room DVR or push-VOD
- Multiple codec and DRM support
- Highly stable platforms, including when accessing non-television content
- Standards-based support for content sharing
- Efficient proprietary implementation of open standards
- Fast and cost-effective software/applications development
- Meet environmental expectations

## Introducing convergence-friendly services – today

TV/Internet content convergence is not a vision but a reality. It is possible today to support DivX<sup>®</sup> encoded content on a hybrid set-top box, enabling consumers to access DivX files from their PC and play them on television, while ensuring a proper management of the digital rights. Pay TV operators can use this capability to enhance their VOD offering with DivX content, which includes old and niche movies that are not always available in other formats. Increasingly, set-top boxes will support more decoding options to enable Internet video and social networking sites to be accessed from the TV.

Web 2.0 services can also be brought to the TV screen.

In partnership with the Stream Group, ADB has been demonstrating how access to YouTube<sup>™</sup> and Twitter<sup>™</sup>, can be delivered to the TV through a hybrid set-top box. Consumers are given the opportunity to access FaceBook<sup>™</sup> and recommend TV programmes to friends, with all services running alongside live broadcast television content.

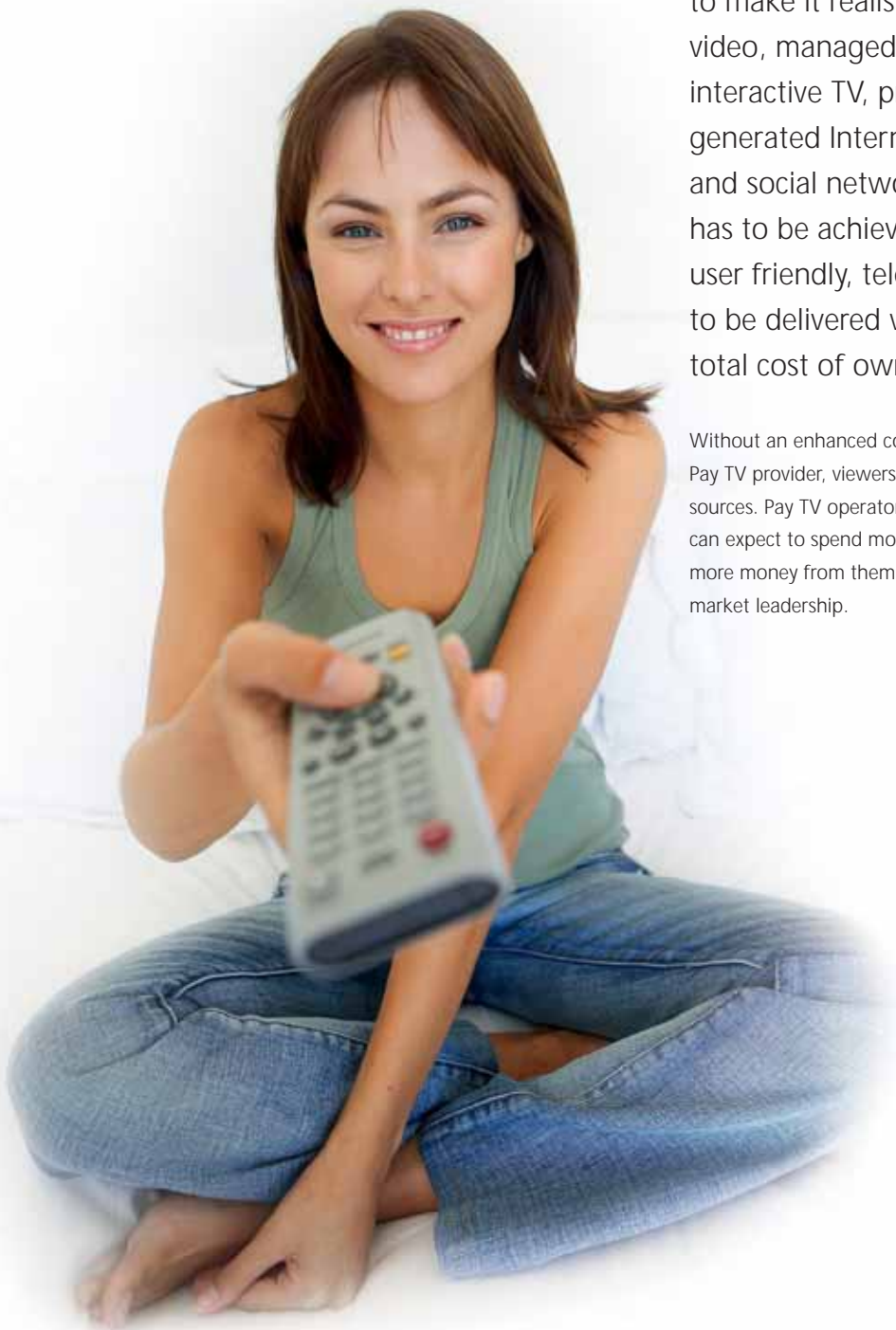
ADB has also been showing how its set-top boxes and multi-room DVRs enable content sharing around the customer home using DLNA and UPnP home networking. We provide push-VOD capabilities to support the vision of on-demand services on every television platform, even where there is no high-bandwidth return channel.



**Conclusion:**  
spend more time with your viewers

Content convergence will be a significant theme of the digital TV industry over the next ten years. Operators need to make it realistic to bring broadcast video, managed VOD and time-shifting, interactive TV, professional and user-generated Internet video, personal content and social networking onto the TV. This has to be achieved while maintaining a user friendly, television experience. It has to be delivered with the lowest possible total cost of ownership.

Without an enhanced consumer TV experience from their Pay TV provider, viewers will seek this content from alternative sources. Pay TV operators who do enable content convergence can expect to spend more time with consumers and earn more money from them – while laying the foundations for market leadership.





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