In our last issue, *IP Television* asked a number of leading industry players to share their thoughts on the Smart/Connected TV market. Here's the second part of our survey

Smart TV Survey 2012

IP Television: Will Smart TVs replace the set-top box?

Accedo: Smart TV can be seen as being about the big screen, computing power and connectivity together creating the living room experience. This can come about from a range of devices such as a set-top-box, a media box, a game console, a Blu-ray player or a Connected TV. These are all options for the consumer and it is up to consumers to choose what devices they want to get their favourite content on. The devices can provide complementary offerings, which may be provided by global providers, as well as local providers in local markets.

ActiveVideo: Maybe in 10 years or so. Operators have a rigorous set of standards to ensure that new STB entrants match or exceed the functionality, security and stability their traditional boxes provide. An inability of Smart TVs to meet those standards might result in dissatisfied consumers, increased loads on operators' call centres and even additional truck rolls. Operators recognise that Smart TVs can offer 'cool' experiences, but they also know it's in the best interest of subscribers and

themselves for Smart TVs to be proven in difficult field environments. Given that the useful life of a television is between seven and 10 years, it's also important that consumers have the confidence that the Smart TV they buy today will still be supported by the content and service providers for the next decade if it is to replace the STB.

Conax: Together with the Integrated CI+ module (making linear TV available), it is a clear trend that TV manufacturers put more and more STB functionality into the TV. However, multiroom, multi device platforms counter this trend. Conax Xtend series of solutions offer the same user interface and content on TV, PC, iOS, for example.

Connected TV Marketing Association (CTVMA): We believe there is room for both to co-exist over the next 5-7 year time period, with both going through a wide range of evolutions based on consumer and technological demand. There are strengths and weaknesses to both at present. Far off, we believe that more than likely the STB will be replaced by Smart TV, but I think there is a long way to go before this occurs.

httv: They will co-exist.

Inview: No matter how much the technology evolves, a STB is still

significantly cheaper than a TV.

Irdeto: Smart TVs will replace STBs in some segments of the market (particularly free-to-air viewers) however we expect we will still see STBs for two main reasons: In many markets, premium TV providers incorporate their own interface and special features in their boxes and see them as a key differentiator. Smart TVs are unlikely to provide this level of user experience and therefore the TV providers will still seek to market these features. TVs tends to have a far longer lifespan than 'Internet' technologies. Smart TVs from 2-3 years ago are already largely obsolete and we expect this lifespan to continue for a number of years. As a result, we will see a market in STBs providing features that Smart TVs are unable to support.

PacketVideo: Although the Smart TV offers similar services and is expected to outlive the STB it is a costly alternative. At the moment the STB is still an important tool that many users rely on. It would be expensive for people to move to Smart TVs straightaway but this will be the ultimate result as their living room TV experience transforms and people increasingly want to connect their media throughout the home. However, for now the STB will adapt instead to suit the changing needs of consumers. We're already seeing the integration of online content

and on demand TV players in services provided by Virgin and BT. As the devices in the home converge, the STB will become an increasingly important and complex connector where set top box manufacturers offer services to involve tablets, smartphones and PCs in the viewing experience too.

Rovi: We have not yet seen a device that will replace the STB. What we will likely see is that the set-top will become a connected device, where it will become a part of the many devices, tablets, phones and Smart TVs that consumers will use to access content.

Shazam: Smart TVs will definitely continue to develop and increase their presence in the market. However, given the lower cost of entry with mobile phones and tablets – as well as their current penetration level – it will take a significant amount of time for Smart TVs to reach the same levels. Additionally, as Smart TVs are an obtrusive experience that interrupts other people's viewing, it isn't necessarily ideal for family use.

smartclip: This is certainly a possibility, but the hardware requirement will be considerable and the device memory, processing etc. will need to improve substantially to accommodate such offerings.

Technicolor: In order to ensure the best quality of experience and promote their brands and service offerings, operators need to qualify the equipment they provide to their customers. There are CE devices and Smart TVs that will play the role of the IP client, but the service providers cannot bet that these devices will be there and remain trustable devices over time, in every home, so we will see a mixed bag of CE devices and operator-supplied clients.

Viaccess-Orca (VO): In some cases, if a TV in the future includes all technology needed. The VO perspective is the STB won't be replaced, but merged into another device.

IP Television: What impact will 'companion devices' have on Smart TV?

Accedo: Second screen applications running on mobile devices are increasingly popular. New applications are launched every month and the focus is to provide an enhanced TV experience by providing additional information about what you're watching on the big screen. The benefits with this approach is that you can create a stand-alone experience on the second screen and benefit from the more mature app technologies on mobile devices. The drawback is of course that everyone in the TV industry would like consumers to remain focused on the first screen, where all the

money is being generated. The real opportunity in this market is to offer a consumer experience, where consumers can use the tablet for an attractive interaction experience and the TV for community watching on a truly compelling video experience. The technology for this device pairing is available from Accedo and other vendors, and over the coming 2-3 years, we believe that this will be rapidly rolled out on the market.

Accedo see two types of true companion

applications. Firstly, and the first one to hit the market, is the service companion application. This is an application, which is supplied by a pay-TV operator or a VoD service provider. The application connects the TV device to the mobile device and allows for full control over the TV experience via the second screen application. Secondly, we have the content companion application. This application, which is normally offered by a TV channel or a content provider, will offer an enhanced experience to consumers watching the broadcast channel. It will provide contextual added value to loyal consumers instead of directing them from the first screen experience. Accedo also offers an efficient and simple tool to pair companion devices to the TV or STB and instant communication between them through our Accedo Connect solution.

ActiveVideo: Tablets and Smartphones got a lot of hype as standalone viewing devices during the Olympics, but they also bring more flexibility to the user experience when they're used in conjunction with Smart TVs. There's been a lot of work done on enabling companion devices to add navigation and interactivity to applications that normally can't benefit from an on-screen keyboard. ActiveVideo also

has demonstrated how the newer generation of smartphones can be used as voice-activated remote controls to any digital set-top boxes, CI Plus TVs or connected devices.

CTVMA: Companion devices will always allow for individualised experiences across entertainment content. Their greatest strength is that they will always allow for groups of watchers to have personalised companion experiences as well as longer term interaction-Such as loyalty initiatives, personalised companion content and discovery of personalised experiences. This means that Smart TV and Companion devices will also need to co-exist and can actually play off each other in robust ways. By integrating the two, it will also strengthen each other's individual offering. Moving forward, we see interactivity across screens, across apps, and across both groups and individuals requiring a true multi-screen ecosystem to not just flourish, but be necessary.

DTG: There is an opportunity to closely link the main screen to companion devices in order to deliver more engaging content and reflect current viewing habits. There is no industry standard for connections between two separate devices at present, so there are still many issues to iron out such as how to ensure interoperability between devices from two different manufacturers. The DTG is looking to standardise second screen technologies in the near future.

httv: They are complementary and will interact more and more. For example, our httv Box solution allows the Companion Device to access the broadcast TV Guide information (EIT) in order to manage a Guide with real-time data.

Irdeto The clue is in the question… Companion devices will provide an engaging tool for discovering and previewing content. With appropriate home networking technology they can act as a device for receiving and sharing content throughout the home across other approved devices, including Smart TVs and STBs. Overall they will have a positive impact in creating an immersive consumer experience.
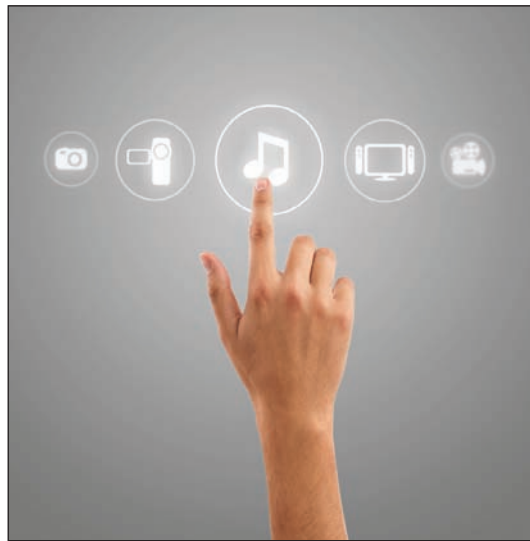
PacketVideo: As more people start to use Smart TVs as well as purchase more tablet devices and smartphones, the connected home will develop, which is a positive step for people who are joining up all of their media across devices. The Smart TV has the capabilities to work with companion devices and people will become accustomed to taking advantage of these services provided by their TV and will look for ways in which to connect their media content. Smart TV will enable devices to converge easily, providing a fully connected home where a smartphone or tablet device plays an equal role in the TV content discovery, interaction and viewing experience as your Smart TV.

Rovi: For many users, the device in their hands will become a primary and secondary screen at the same time. Users will want to be able to move content between those screens with great ease. As this happens, and as

discovery apps on hand-held devices get better and more personal, many users will find themselves using those second screens and apps more. But for the next decade at least, the remote control and TV UI will also have to exist.

Shazam: Currently, 88% of smartphone owners are engaged with their phones while they watch television – with nearly half of those people using their phones to find out more information about what they're watching. As smartphones and tablets continue to grow in popularity, this trend will continue to gain traction as more people will use mobile devices to engage with television and talk about what they are watching with their friends online through social networking sites. While Smart TV usage will grow, we believe that mobile devices are already at scale and will continue to dominate the way people interact with television for the foreseeable future.

smartclip: The rapid growth of companion apps, gaming, social networks, and supplementary information about live events as well as on demand viewing and the second screen, shows that the growth areas for Connected TV will lie outside traditional TV broadcasting in the future. The development of the second screen phenomenon is growing but

the full potential of companion apps remains mostly untapped. There are countless opportunities for broadcasters and advertisers with this media, creating deep engagement and interaction with viewers. Broadcasters are having to work harder and constantly innovate to pull in an audience for a live programming slot but, with interactive content provided by companion apps, advertisers can be assured that people are engaging with their content, not simply turning the TV on and leaving the room while the programme is

running on the screen unwatched.

Technicolor: Companion devices can nicely complement Smart TVs (as well as set-top-box based television services) and altogether they can change the way people watch TV in two ways. One is additional information the companion device can provide to the end user when watching a programme: quiz, games, enriched data, social interactions… and the second one is interactive advertising. It is now essential for content producers to create programmes that take these two considerations into account. With content applications, companion devices and social media, users can engage with a programme before, during and after it is aired. That is a fundamental change.

VO: They are a natural companion and will only enhance the total user experience.

IP Television: What are the challenges of ensuring content security and how are these overcome?

Accedo: OTT services are increasingly including both live and on-demand services, as well as premium content. This means that content security is a bigger issue, as the value of the content has increased. Internet delivery is often viewed as quite an open system with minimal security, however there are a number of companies with excellent systems to prevent unauthorised access of content, as well as ensuring that content is no re-distrib-

uted. We have developed a number of video-related apps and security is paramount for those services. Therefore, we have established partnerships with security providers, including Verimatrix and its Video Content Authority System (VCAS) and Irdeto's ActiveCloak.

ActiveVideo: When apps are downloaded to and stored in individual devices, 'hackers' have literally millions of opportunities to steal content or to compromise distribution networks. In addition, downloaded content and apps sometimes include the types of software bugs that already affect smartphone owners from time to time. Content that is based in the cloud is streamed, not downloaded, to the device; advanced security and stream encryption further minimise the risks of bugs, malware and content theft.

Conax: We offer high security solutions for linear TV into the Smart TV by using the Integrated CI+ module.

httv: HbbTV 1.5 could be implemented with multiple DRM solutions.

Irdeto: The biggest challenges are the range of security technologies which need to be used in a multi-device world and the different business rules which need to be enforced depending on device and content type. Irdeto solves this problem using its DRM-agnostic 'Control' centralised security platform. Control provides a central point of user and device authentication as well as content encryption. It allows rules to be defined to determine how content will be secured, on which devices it can be consumed and the viewing rules which govern its consumption. By providing a centralised tool for managing content across any device from STBs to Smart TVs to iOS and Android devices Irdeto removes one of OTT TV service operators' biggest operational headaches.

Packet Video: Different types of content protection schemes are used for different applications. We support popular digital rights management (DRM) technologies including Windows PlayReady, Digital Transmission Content Protection, or DTCP, and the new UltraViolet (UV) video standard.

Rovi: Really, the challenges of security seem to going away. We have a few DRM standards, but we also have content that only exists within apps (for example, Netflix and Spotify). We are not saying it's easy, but content licensing, for example, is a much bigger challenge for content aggregators than content security.

Shazam: There are many techniques used today to control the distribution of content online, technologies such as digital watermarking for version controls and minimising piracy, for example. Content security is an important issue for all forms of media. We'll

leave it to others like the content owners and the providers of the technology they use to ensure content security to comment on this.

smartclip: DRM across multiple platforms is a significant challenge today. This is an area where standardisation will clearly help all the stakeholders. As an ad network, we work largely with content that does not require DRM (although there are a few exceptions) but having this in place makes the ecosystem more attractive to everyone.

Technicolor: Smart TV will face two major challenges of security. As Smart TVs are connected to the Internet, they face all the current risks of computers. They will be attractive targets for hackers. And they will have to protect content against piracy. The new generation of STB faces the same risks but has some advantages. First, STB manufacturers have more than twenty years of experience to fight piracy, TV manufacturers are just at the beginning of the learning curve. Second, STBs use secure processors that provide mandatory root of trust.

VO: We have a professional services team responsible for managing the delivery and maintenance of the company core products and solutions. Using VO's open and flexible Service Delivery Platform with an additional strong team validation allows us to maintain an agile approach to this problem. However, fragmentation of the market is an issue and will continue to exist.

IP Television: Will standards emerge to optimise networks for Connected TV or will delivery become a free-for-all?

Accedo: In time, as the industry becomes more mature, standards will emerge, but it is difficult to predict exactly how and when this will happen. Accedo has, through its long experience, gained a lot of knowledge and is able to support all types of platforms and specific customer requirements through its flexible solutions.

ActiveVideo: Maybe in 10 years. The ecosystem needs to prove itself first and foster wide-ranging partnerships between Service Operators, Smart TV manufacturers, and Content Providers. Once there is 'partnership' of size, then standards will evolve.

Conax: This is about the conflict of interest between the manufacturers and operators. Some OTT content will be for free (YouTube etc), but the linear operators will emerge as (OTT) content aggregators offering OTT on top of their linear TV package.

DTG: HbbTV, OIPF and the DTG's D-Book all define standards for IP Delivery and the industry is converging on standards such as MPEG-DASH for the future.

httv: HbbTV provides such a standard solution.

Irdeto: We are seeing a range of standardisation efforts (e.g. YouView, HBB.TV etc.) and it appears that a range of standards will emerge that are broadly similar - but differ in details. We anticipate HTML5 (in the sense of HTML presentation delivery) will become the dominant delivery method with DRM and device integration varying between platforms. The biggest area of competition will be over the initial user experience where the device manufacturers (e.g. Samsung, Apple), traditional platform providers (e.g. DVB consortia such as YouView) and Internet operators (e.g. Amazon and Google) vie for control of the user's initial experience.

PacketVideo: We are currently in a free-for-all in this arena, but we believe that in the next 3-4 years, the winning standards will start to converge and become less confusing for the user. This is going to be a demand of the public. The industry is going to have to take the guess work out of this current equation and either agree on several standards in this arena, or begin to play well with all of the platforms currently available.

Rovi: Delivery will not quite be a free-for-all,

as the big players will continue to have a major share in the market. Comcast, Sky, and BBC have a heavy hand in the *de facto* technologies, because people will always want to access those content sources. Smaller players will have to conform to the technologies already brought to the devices by the bigger players. For example, Apple pushed H.264, so that you have to have that standard to play on their devices. Google followed suit. Similar moves will happen in content management, discovery, and security. The biggest players will set their requirements, and everyone will manipulate their services to match those requirements.

Shazam: We look forward to standards being developed that support the ecosystem. Until they arrive and become widespread in their adoption, we are in a stage where everyone is trying to figure out what works. We've have learned so much from the TV shows, live events and TV ad campaigns we've build second-screen interactive experiences around, and are applying those best practices with our network and advertising partners in what we're rolling out going forward, to the benefit of both our partners and people who use Shazam.

smartclip: The standard already exists – it is the web. The platforms cannot accommodate all aspects, but that will change and then it will be easier all round.

Technicolor: New solutions have been developed and are being proposed as standards, such as HbbTV and YouView in Europe, or ISDB-Tb in Brazil/Latin America. In parallel, we see that the toolbox of the industry further improving with:

- the emergence of HTML-5,
- the maturity of adaptive bit rate streaming techniques (HLS for Apple, Smooth Streaming for Microsoft, *etcetera*),
- the emergence of content protection and Digital Right Management solution(s) such UltraViolet, developed under the leadership of the DECE (Digital Entertainment Content Ecosystem) consortium, which manages the rights attached to, and licensing of, encrypted content (digital locker). However, the above only demonstrates that the industry is creating innovation and delivering solutions at a pace that makes older devices become obsolete in only a few years, much faster than in the past. Solutions to optimise networks for delivery of content to connected devices (and not just Connected TVs or Smart TVs) are already there or becoming available, but there will not be just one such set of standards.

VO: We don't believe standards are in conflict with free-for-all and we don't see any standards like DVB taking over. However, the

use of Internet technologies will help to standardise the market to some extent (HTML5, XML, IP, *etcetera*).

IP Television: Are we moving towards a marketplace where channels and apps become synonymous?

Accedo: Depending on applications, there are a number of different ways to use them, which is primarily up to the Application Owner and this is not limited to channels. For example, broadcasters and pay-TV operators have a range of different channels, and content owners have a large portfolio of content. We are seeing an increase in requests from individual channels as they are realising they have an opportunity to go directly to their consumer with an offering, maybe complimentary to what they offer through their traditional broadcast platform. In normal TV, consumers are stuck with the TV channels offered by their TV operator. Some operators might offer hundreds of TV channels, but packed into different bundles, which is less attractive for the consumer. Via Smart TV, consumers can interact directly with content providers, which supply attractive niche content. Since Smart TV platforms offer global distribution opportunities, content providers can find a market for their services outside the traditional TV distributors. The key to ensuring end-consumer usage, both now and in the future, is ensuring availability on different platforms, and focusing on both quality and usability when launching an application. Companies will also have to compete with price.

ActiveVideo: Yes. Once 'apps' moved to the TV they took on a different context – that of high quality entertainment. Users expect only the best in entertainment from TV, such as that provided by linear/on-demand. TV Apps need to tap into that side of entertainment and create an integrated viewing experience, but the ability to make apps compelling in a device-based environment is limited. That's why it's so important that the browser is moved to the cloud – so that content can be created quickly and efficiently, and be universally available.

Conax: Do not underestimate the revenue-generating strength of linear TV.

CTVMA: Yes. Brands will always be brands, and will be sought out due to their brand strength and familiarity of content. But the App environment allows for more than just simple surfing through channel Programming. It allows diverse modes of action, interactivity and diverse content. Due to this, it's a natural move forward that will hopefully serve to reduce content clutter and ease discovery. Channels will simply become Apps. We believe that the language of 'Channel,' will eventually be replaced by 'App'. The term

'channel' will go the way of the term 'LP', 'Record', 'Cassette', *etcetera*.

httv: Yes and No. With HbbTV, an App (like the weather app) could be accessed as a channel. Conversely, a channel could only exist online and not through broadcast. In the end, they are just items in a list with different ways to access them.

Inview: A channel could be seen as an App and *vice versa* already. They are simply tools that the user can use to access content. Currently, TV viewers are comfortable with channels. They understand how to navigate them and to find what they want. However, the growth of smartphone devices has introduced the Apps concept, and the Apps Store, which has been quickly taken up by consumers. The winning formula will be one where the tool used is the one that can deliver the most relevant content to the consumer in the fastest time.

Irdeto: App and channel fragmentation is an issue that all producers and end users are facing. Each piece of content and each channel have an app – thus channelling end user attention and creating more distraction. This is a serious issue that some app stores are trying to solve by adding groups of apps, for example. But sooner or later someone will have to solve or facilitate it. You can see Zeebox as the perfect example of a growth strategy using this fragmentation to get a better leverage on its platform.

PacketVideo: The TV may be the largest screen in the room but it's not necessarily commanding the attention of users who are also socialising with others on their smartphones and scouring YouTube for videos related to the programme on their TV screen. We're no stranger to the second screen with recent research from Deloitte showing that over 24% of people look to another device and half of 16-24 year olds use communication tools whilst watching TV. With so many competing screens and the smartphone becoming a key part of the TV experience, channels are losing their precedence to apps. Apps are becoming an increasingly important

tool for broadcasters and content providers because they offer a way to connect the TV with the second screen directly. When users are able to fully connect their video content, we will be able to control the TV from a smartphone so apps and channels will be extremely similar and fulfil similar tasks. When the home network is connected, the death of the remote is clear as apps control media on smartphones as well as the TV screen.

Shazam: That's an interesting concept. I think that we're moving rapidly toward a world that will enable people to engage with media across a number of different platforms. And, you'll be able to get your content via more channels, and even independent of those channels as we know them today, through a wider range of providers and devices. So, we're moving from the old days of leaning back and passively watching television in the living room to consuming even more outstanding programming through more ways, 'leaning forward' to engage more than ever before.

smartclip: They will both compete for the same amount of time on the same screen and the same user attention so in that sense they are moving closer.

Technicolor: Most probably yes, as we can imagine tuning in a specific channel where we will be presented a certain number of contextual actions which are going to enrich the live TV. Or channels with their own menu to access associated services. That is an interesting challenge for the industry in terms of user interface and new standards that have started to take place in Europe with HbbTV for instance. Studies still show that live TV is well alive (especially for sports and exclusive content) so proposing additional services directly when tuned to a specific channel rather than going through the device menus makes sense to improve the user experience.

VO: It's more important how these are consumed and how the marketplace will get organised to deliver a sea of such assets. This is the main question to us at VO.