Crossing the digital divide

I'm often asked – especially recently with repeated reports that DVD sales are declining and Blu-ray sales aren't making up the difference – if DVD is doomed. Is Blu-ray whistling past the graveyard? Will packaged media soon pack it in altogether? My short answer is "it depends on your context," says JIM TAYLOR, Senior VP and Chief Technologist at Sonic Solutions.

My long answer is that every technology is doomed in the long run, and that DVD and BD will eventually become nothing more than fondly remembered formats

Nevertheless, I take pains to point out that almost everyone seriously underestimates how long it takes for well-established formats to fade away. Take CDs, for example. MP3 technology and music downloading began around 1995, followed shortly by breathless predictions that CDs would shortly be added to the endangered technologies list as we all switched to Internet downloads.

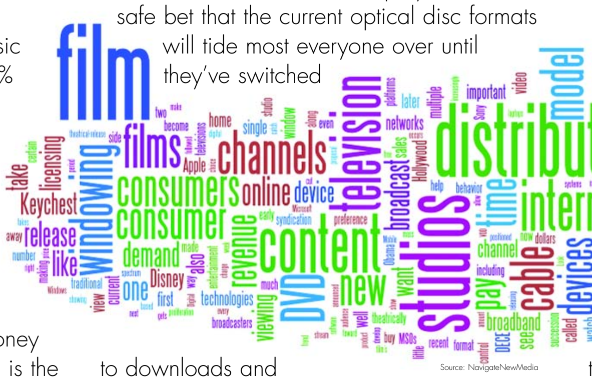
It's now 15 years later and by some measures online music delivery has only recently surpassed CDs, and by other measures it has yet to become dominant. According to the IFPI, digital sales accounted for 43% of the recorded music market in the US in 2009 and only 25% of worldwide trade revenues to record companies.

Six years ago, in 2004, Bill Gates said: "The entertainment of the future will definitely not be on a DVD player, that technology will be completely gone within 10 years at the most." Around the same time movie producer Mark Cuban also demonstrated that money can't buy prescience by asking "Which is the better way to deliver a movie or movies? On a DVD with a boring, lifeless future, or hard drives?" Unless Netflix and LoveFilm start shipping hard drives through the post, Mr. Cuban was way off the mark. Mr. Gates at least had the right idea, but not the right timeframe. When his worst-case milestone comes up in 2014, physical media will have declined, but will still be going strong.

DVD players peaked with worldwide sales of around 45 million in 2007. Worldwide sales of *Avatar* on DVD and BD, not including rental, hit 19.7 million after only three weeks. In the US, consumers rent about 40 million DVDs per week, 9 million of them from nearly 25,000 automated Redbox machines. Redbox estimates the overall nationwide potential for DVD kiosks to be about 60,000. According to The Diffusion Group, "most industry estimates predict 2014 US DVD rental revenue will exceed more than $8 billion." This does not in any way resemble a format on its deathbed.

However, the Diffusion Group also notes that by 2014 "over-the-top" video rentals delivered through the Internet will top $2 billion, accounting for 25% of home video rentals. What does this mean for the long-term future of video distribution? Will there be another physical mass-distribution format after Blu-ray? Something such as holographic storage or flash memory? In my opinion, no.

Blu-ray will be the last of its kind. Given the pace of broadband Internet penetration and the success of devices such as connected TVs and BD-Live players, it's a safe bet that the current optical disc formats will tide most everyone over until they've switched to downloads and streams. But in order to unseat the incumbents, downloads and streams have to offer a better experience.



Source: NavigateNewMedia

The critical link - Interoperability

This is where initiatives such as DECE and KeyChest come in. The goal of DECE (Digital Entertainment Content Ecosystem) is to recreate the DVD experience with digital delivery. Just as you can buy a DVD from any store and be confident that it will play in a DVD player or DVD PC or anything else that carries the DVD logo, DECE hopes to engender a similarly successful logo identifying dozens of new services and millions of devices that play content purchased from cooperating retailers.

DECE is only a working name — the group hasn't yet released the details of the final brand and logo. The fundamental feature of DECE will be a digital locker to store rights from various content purchases and make them available for download to DECE-compatible devices from various devices makers or for streaming to various DECE-compatible services, potentially including cable companies and online game systems.

DECE founding members include Alcatel Lucent, Best Buy, Cisco, Comcast, Deluxe Digital, Fox Entertainment, HP, Intel, Lionsgate, Microsoft, NBC Universal, Panasonic, Paramount Pictures, Philips Electronics, Samsung, Sony, Toshiba, VeriSign, and Warner Bros. Entertainment. The group has grown to over 50 members in two years, adding key members such as Adobe, BT, Dolby, DTS, Motorola, Nokia, Sonic Solutions, and Tesco.

The DECE group has invested a massive amount of work into structuring the ecosystem, defining file formats, integrating DRMs, standardising usage models (things such as number of users per household account, number of registered devices per household, and number of simultaneous streams), agreeing on content protection, and much more. The DECE common file format uses H.264 video compression and AAC video, with options for Dolby and DTS.

It supports multiple DRMs with a single AES encryption, which is a major step towards DRM interoperability and also promises to make the digital delivery model more like DVD, where content providers such as Hollywood studios will author, encode, and distribute "finished goods" in a widely-used digital format instead of charging each individual distribution service for master file access or for encoding as they do today. As an added advantage the DECE common file format is compatible with Microsoft's PIFF (Protected Interoperable File Format), based on the MPEG ISO container standard.

Disney has similar goals for its KeyChest

initiative, but Hollywood studio took a more straightforward approach by designing a less complex digital locker to store rights online while leaving usage models, content protection, and other details up to bilateral agreements between content providers their licensees such as retailers. Disney's related but independent file format, SingleFile, is similar to DECE's common file format.

Content ecosystem - a crowded field

The intent of all this specification and ecosystem creation work is to give consumers a single "DVD for digital." In one sense this can never fully succeed because there are formats and ecosystems already in place, and there will inevitably be more to come. For example, Apple iTunes quickly comes up in discussions about digital lockers and DECE. DECE would be happy for Apple to join, but Apple seems happy to play in its own sandbox with its own toys and its own rules. So, we may end up with something more like the "SACD and DVD-Audio for digital" with a few competing systems. Whatever the result, DECE has the potential to create the largest sandbox, probably co-existing with a few other significant sandboxes such as KeyChest and Apple iTunes.

There are also other existing entertainment content ecosystems such as video-on-demand (VOD) from various cable systems, content provider-supported systems such as BBC iPlayer and Hulu, retailer-specific systems such as Amazon VOD and Wal-Mart's Vudu, and third-party systems such as RoxioNow (formerly CinemaNow). Some of these systems were created to provide interoperability between formats and devices, but what about interoperability between systems? Meta-interoperability, if you will. It's actually possible to achieve, although somewhat complicated. And it requires content providers, such as Hollywood studios, to license content across multiple ecosystems.

Examples of potentially interoperable ecosystems are Comcast and Alcatel-Lucent, both DECE members, who could provide the ability to stream DECE content to set-top boxes. Or Sonic's RoxioNow digital locker system, used by Best Buy, Blockbuster, WBShop, and others, which can be extended to support DECE purchases and digital fulfillment of DECE content.

Some of the original support for DVD was garnered from studios who hoped to push back the tide of video rentals (where the studios only get paid once for multiple rentals) and create more sell-through purchases (where each buyer pays full price for the disc). This succeeded even better than anyone expected, with a resurgence in buying and collecting video.

But with the format change to Blu-ray and many other ways to access movies such as VOD, digital downloads, mail subscription services such as LoveFilm and Netflix, and inexpensive rental kiosks such as RedBox, the tide is shifting back toward rentals. Services such as RoxioNow, which make it easy to sit down in front of a connected TV or a BD-Live player and pick a movie to buy or rent and start watching within seconds, have seen that rentals outnumber purchases nine to one.

An expectation from some DECE members is that the added value of being able to purchase movies from different retailers and download them for use on a wide variety of devices will lead customers back towards higher margin purchases instead of rentals. How this plays out remains to be seen, but even though DECE will support only full purchases at launch, the system is designed to support rentals and other business models in the future.

Accessing the content, not the media

Other approaches to promoting sell-through of discs, such as DVD digital copy and AACS managed copy for Blu-ray, have had limited success but could take interesting new forms moving into the online distribution model. Making a digital copy to a single PC or hard drive from a DVD or BD is a nice feature, but is rather limiting. What if instead it were a locker load feature, where the disc served as a token to enter rights into a digital locker, allowing downloads and streaming to every device the buyer owned?

This is something that RoxioNow and others have experimented with, and it could become more widespread. There's also the option to include the rights to make a physical copy as part of a digital purchase. This has been supported by technologies such as FluxDVD and Sonic Qflix, and is currently part of the DECE usage model. In this case the yin/yang of physical/digital flips around, placing the digital purchase first but keeping the option to burn a DVD – perhaps at home, in the store, or by mail – to make the transition easier for consumers accustomed to the simplicity, reliability, and feeling of tangible ownership that discs provide. Other physical formats such as SD cards and USB sticks could also be supported as approved exports from a digital purchase.

The option for a familiar shiny disc should be comforting in the digital delivery frontier, which like the Wild West is still being explored and settled. Customers have plenty of questions. "What happens to my digital library if the company or ecosystem goes out of business?" (Of course most customers don't phrase it like that, since "digital library" and "ecosystem" are not yet household words, but this is the essence of their vague fears of intangible formats designed for indeterminate domains.) "Who gets what if my kids go off to college or if I get divorced, and how will I manage it?" "Will any of this stuff really work?" "Will features I'm used to, such as menus and extras and subtitles be available?"

And of course the "DRM is evil" crowd maintains that DRM for video is not necessary and should go away just as DRM for audio has, and thus that any system using DRM is doomed to fail. Not to mention the "just rip the disc" crowd. But all this can be worked out enough to give consumers the confidence to leap across the digital divide. Look at the success of iTunes, Xbox Live, PlayStation Network, CinemaNow, and others in proving out the model. And content protection – which simply must be in place before Hollywood studios will let loose their content – can be made mostly invisible for legitimate users, especially with systems that support multiple DRMs. When it works, it's a liberating experience to sit down at the couch with a bowl of popcorn and only a vague notion of what you want to watch, browse through an extensive list of movies and TV shows to find something, and start watching seconds after making your purchase.

So, does this mean discs will go the way of the dodo? It all depends on your timescale. Will DVD and BD players still be made five years from now? Absolutely! Will people still be buying CDs, DVDs, and BDs ten years from now? Indubitably! Will homes still have collections of discs and players to play them on in 15 years? Certainly.

But, as the world becomes more connected, as both fixed and portable devices become more reliably able to retrieve content from the Internet, there will be a slow, but inevitable shift from physical to online delivery. The significant amount of work going into making digital content as widely available and ubiquitously playable as DVD will build the bridge necessary to eventually bring the entire world across the digital divide.

BIOGRAPHY

JIM TAYLOR is SVP and Chief Technologist at Sonic Solutions. He wrote the best-selling book series *DVD Demystified* and *Blu-ray Disc Demystified*, and serves as Chairman of the International Digital Media Alliance. Jim has worked with interactive media for over 30 years, developing educational software, laserdiscs, CD-ROMs, Web sites, DVDs, BDs, and most recently working on online content delivery, including the DECE initiative. Contact: jim@sonic.com