



Advisory Report

The Remaining Divide: Converging the PC and TV

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■ Issue

Despite the resounding arrival of the digital media era, no convergent PC and TV solution has been able to inspire consumer adoption beyond a handful of brave mainstream users and a fraction of early adopters. Consumers' hunger for digital media has never been greater, with digital libraries being amassed at such an accelerated rate that storage has suddenly assumed a prominent position in the industry. Everything from digital photos, music files, TV programming, and online videos (homemade or public domain) is fair game and collectable. Since Apple started selling individual TV episodes a year ago, users have advanced to consuming digital video through their computers, iPods, alternative digital media players, and cell phones. The once-shy broadcast networks, afraid of sacrificing viewers and digital rights, now appear to be in a sprint to capitalize on potential revenue streams and advertising opportunities by populating various Internet sites such as Google, YouTube, Yahoo!, and their own Web sites with clips and, in some cases, full-length programs. Computers are often the chosen storage receptacle for digital media collections, but their centralized media server capabilities are rarely tapped directly by mainstream consumers. In addition, although viewing content on a large TV screen on a comfortable sofa would be a logical preference over diminutive computer screens at a desk, the progress in PC convergence is still marginal in today's marketplace. Convergent PCs acting as a home media center face a myriad of barriers regarding consumer awareness, price, performance, style, and technology, all of which must be addressed before further advancement is achieved in this field.

■ Current Perspective

Convergent PCs have experienced a massive transformation over the past four years since the first mainstream introduction materialized in the form of Sony's VAIO computer. Introduced

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in January 2002, Sony offered personal video recorder (PVR) functionality through proprietary software called GigaPocket. The VAIO systems were sold with the pre-loaded GigaPocket software, integrated TV tuners, and cavernous hard drive capacities, and they set out to revolutionize the way consumers watched TV. Alas, consumers were indifferent to Sony's convergent innovation, which was simply before its time and was priced out of the market, with systems selling for \$2,000 or more.

In November of that same year, HP released the first media center PC, laden with Microsoft's Windows XP Media Center Edition operating system, which was designed specifically to facilitate PC convergence with the TV. With a behemoth like Microsoft supporting the convergence front, there was a rush to market that resulted in a number of new media center brand names and stylish CE-like form factor PCs, all designed to take up residence in the living room alongside the family TV in order to initiate a content exchange between the PC and TV. Most of the systems deemed viable for convergent tasks were priced too high to reach beyond the niche of early adopters and tech enthusiasts, which resulted in their inability to capture more than a 10% share of the retail PC market in the first year and a half.

Eventually, vendors started stripping out expensive convergent-like components such as TV tuners, high-end graphics, and flagship processors to achieve more palatable price points and reach a much broader audience. Today, media center PCs dominate the consumer landscape, claiming an average 60% of desktops and 50% of notebooks sold through the U.S. retail channel. However, the vast majority of today's media center PCs are not practicing convergence as originally intended, but are instead managing and manipulating other digital media such as photos, music, and video clips. Less than 20% are sold with integrated TV tuner cards, and not all of those sold with tuners are utilized for synergistic content sharing between the PC and TV. The prohibiting factors facing convergent PCs are numerous, but have not changed a great deal in the past four years. Convergence is still largely an unknown phenomenon to a large percentage of consumers. Media center PCs are sold in the computer department without the benefit of being able to show-and-tell their convergent story to consumers that are down the aisle perusing large-screen digital TVs for their family room. In the computer department, the media center PC is simply taken at its face value as a PC rather than a convergence facilitator.

Complexity is another barring issue when it comes to convergence. The numerous different types of convergent solutions are almost as great as the number of media center PC vendors. The two most traditional are a hardwired solution, with the PC as the central device receiving televised input and distributing it through a TV screen, and a wireless solution where content, stored on a PC that resides in room other than the TV, is accessed via wireless network. The first solution essentially requires the consumer to give up control of their reliable TV, with the potential "blue screen of death" due to a computer glitch – should it appear – possibly foiling the fourth quarter of the Super Bowl. The second requires a wireless network with an intelligent access point, such as a digital media appliance (DMA), negotiating the transfer of content from PC to TV. Neither solution is for the faint of tech heart and, in fact, can often challenge even the most advanced PC enthusiast.

Form and functionality play a major role with a hardwired, central media center PC device. In terms of form, many consumers are not willing to hand over living room real estate to a PC. With few exceptions – such as extremely high-priced CE-like horizontal desktops – most media center PCs resemble ordinary vertical towers similar to those used in an office setting or that remain hidden under the desk in the home office. Unlike big-screen digital TVs, which naturally exude status, affordable media center PC designs are simply not appealing.

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In terms of function, centralized media center PCs are difficult for a mainstream consumer to implement, requiring a tremendous amount of re-wiring and an elevated understanding of PC technology in the event even one kernel suddenly becomes misaligned or the computer has to be rebooted for some inexplicable reason – just like in any office PC scenario. Once properly deployed, the TV content always streams through the media center to the TV screen, which means consumers either need to learn to leave the computer on at all times or wait for the media center computer to boot up every time they want to view televised content. In essence, the centralized media center device requires a modification of customary TV viewing habits, which today are as simple as pressing a button on the TV or remote control.

In contrast, the wireless DMA scenario is much less obtrusive to conventional TV viewing habits. The DMA, which has a very minute footprint and sits in the general vicinity of the family TV, facilitates access to the content stored on other devices throughout the house only when instructed, so consumers can bypass the unit and view televised content in the manner to which they are accustomed. Despite this significant advantage, however, the DMA scenario is not without pitfalls, too. First, there are no storage facilities for recording or time-shifting televised content. Instead, most DMA devices simply access content stored on other devices located on the home network. Second, there is the complexity of setting up a home network, which, despite improvements, is still not a plug-n-play solution for the mainstream consumer market. Third, there is the technological challenge of seamless streaming of content across a home network. The existing 802.11a/b/g platforms are simply not robust enough to facilitate seamless video streaming. The newer technologies, such as 802.11n and wideband networking technology, will likely be able to handle both standard video streaming and the emerging high-definition (HD) content, but this still remains to be seen. (The 802.11n standard will not officially be ratified until 2007.) Even if the next-generation of networking technology can accommodate bandwidth-hogging HD content, vendors will still have to further simplify home networking and invest in consumer education programs in order to increase mainstream adoption.

Another obstacle in making the PC the central device for home entertainment is the growing competition from the video service providers, including cable, satellite TV, and now the telcos with IPTV (such as Verizon FiOS TV). The service providers can provide a subscriber with a more advanced set-top box that not only delivers linear TV programming, but also a built-in digital video recorder (DVR) and a growing library of video on demand (VoD) content. In addition, these new set-top boxes are starting to be deployed with home networking capabilities to connect a TV to a home PC's hard drive full of personal photos and music. For example, the Verizon Home Media DVR provides FiOS TV customers with the added ability to watch recorded programs throughout the home using a media hub DVR to record programs and stream the content to multiple set-top boxes. The new service also includes free Verizon Media Manager software, which finds digital photos and music files on the PCs connected to the home network, organizes the photos for viewing on a TV screen, and plays MP3 music files on the home entertainment system connected to the Home Media DVR box. As previously mentioned, there is no shortage of diversity in the number of approaches to this facet of the market, but there is still no clear winning scenario. The accelerated consumer adoption rates for digital TVs, broadband, and digital content set the stage perfectly for convergence. However, for PCs to take the next evolutionary step forward in what appears to be a natural progression toward convergence, vendors will have to be more innovative in regards to technology and design.

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Recommended Vendor Actions

- First and foremost, the technology has to work. Initial media center PCs were often challenged with insufferable live TV lag times, inadequate picture quality, and the omission of dual-TV tuner support. All of these problems point to the fact that the technology barriers were not sufficiently addressed prior to the release of the product, and they could have a residual negative effect on the current and future adoption of convergent PCs. In the last four years, vast improvements have been made in the form of instant-on technology, HD tuner support, and content on-demand. These and forthcoming enhancements have to be touted publicly through reseller training and/or marketing and education programs.
- Hardware vendors literally need to think outside the box in order to create a media center PC that can easily be integrated into any consumer living room. These new age products need to be balanced with the proper pricing strategy and user-friendly technologies. PC vendors can learn a lot from CE vendors in creating a plug-n-play solution with all the bells and whistles – or LED lights – required to draw mainstream consumer interest.
- The hardwired media center PC makes TV viewing more complex, rather than giving consumers the flexibility to bypass the computer and watch live TV in the manner to which they are accustomed. This bypass solution is already prevalent in the VCR and DVD devices that reside in the majority of households, and the addition of this capability would perhaps placate PC non-believers. In addition, media center PCs are now competing with more sophisticated cable set-top boxes that have the popular DVR functionally built-in.
- PC vendors need to collaborate with and partner with TV vendors in order to create a more homogenized solution, one that is introduced in tandem with digital TV purchases. Digital TVs are currently marketed for their excellent picture quality, but now compatibility with PCs and portable devices is also becoming important to the consumer.

Recommended User Actions

- Consumers need a basic understanding of the potential benefits provided by a convergent PC solution. Beyond PVR functionalities, the future convergent device will open the door to viewing their library of digital media effortlessly on the family TV, including vacation photos and homegrown video.
- Consumers need to evaluate the entertainment and communication needs of the household before committing to a home media solution. Connecting a PC with a TV will increase the functionality of the main TV in the house. However, many of the popular features of a media center PC are starting to emerge from the service providers, with their single-cable-box solution offering DVR services, a vast library of VoD content, and home networking solutions to get personal digital content from the home PC to the living room TV.