



Video's future becomes clearer

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Continued improvements in video display technology highlighted the 2008 Consumer Electronics Show. Several manufacturers showed 100-plus-inch displays, with Panasonic's 150-inch prototype (more than 6 feet high and almost 11 feet wide) winning the prize.

The most surprising difference between this and last year's CES, though, was not the increased size, but rather the enhanced image quality. Improvements in resolution, color gamut, contrast, refresh rate and other factors are dramatic, resulting in deeper blacks, more vibrant colors and smoother motion.

Larger, higher-quality displays will drive continued demand for more superior video sources, particularly in higher average-revenue-per-user (ARPU) households. They also create increased opportunity for service providers to differentiate on quality — as well as greater pressure for providers to upgrade their networks to support higher-quality video. At CES, a typical 1080i ESPN live video feed from a cable operator was truly disappointing on displays larger than 60 inches.

CES also featured many demonstrations of simultaneous, integrated video applications. Microsoft previewed a NASCAR application with multiple feeds (track video, overlaid statistics and selectable cockpit views) shown concurrently on one display. While compelling, the application and others like it would be more powerful on multiple screens. Imagine football with one display devoted to the field view, another showing player statistics and others with alternate camera views. Unlike audio, where we can perceive only one stream and technology has tapped out our perceptual ability, video has opportunity for expansion. Humans can scan multiple video images at the same time and perceive quality substantially greater than that available today.

With prices for similar models declining by more than 40% annually — 42-inch high-definition (HD) displays are well under \$1000 — there will be rising demand for multiple HD sets throughout the home, and even within the same room. Valuable customers will, therefore, demand a steadily growing number of high-quality, simultaneous HD streams from service providers.

Several years out, 1080p physical media will be widely available, and broadcast eventually may move in that direction too. Looking further ahead, some large-screen displays will have 4096 x 2160 resolution (the same as Panasonic's 150-inch CES prototype), four times that of today's 1080p "full HD." 4K x 2K is the standard for digital cinema, so movies likely will be available to feed those displays. On the distant horizon, Japan plans to develop and launch an ultra-high-quality 7680 x 4320 (33.2 million pixel) broadcast standard by 2015, requiring bandwidth of 180 to 600 Mb/s. Video display technology and consumer demand for higher-quality video sources have the potential to escalate for years.

Implications for video service providers are increasingly becoming clear:

- For the foreseeable future, providers will have the opportunity to differentiate based on video quality and number of simultaneous HD feeds.
- Providers that over-compress video streams will lose high-value customers. Cable operators must migrate systems off analog to free capacity for more and higher-quality HD channels.
- Public Internet and terrestrial wireless networks won't have the bandwidth to keep pace with growing demand for higher-quality HD video to feed new displays. Landline and satellite video service providers will continue to be the most significant competitors for high-value customers.
- Opportunities to partner with content owners to transform the customer experience, particularly for sports programming, appear almost limitless.
- Video service providers will require a program of ongoing network upgrades to remain competitive in high-ARPU households. Along the way, providers will win by targeting investment to regions where customer demand, competitive environment and deployment costs maximize return on investment.

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