WHITE PAPER

Driving Productivity with Multiple Monitors

Sponsored by: AMD

Tom Mainelli
April 2010

IDC OPINION

Today's PC end users are inundated with data. The average office worker often finds himself or herself sorting through a dozen windows, with information from his or her main application competing for space with data from the Web, email, and instant messages. And the problem is even more dramatic for power users such as digital content creators, CAD workers, and desktop publishers, who typically work in multiple applications at once, with each one generating multiple windows each. In recent years, many PC end users' productivity actually began declining under the weight of too many open windows and not enough screen real estate.

Then the dual-monitor evolution arrived. A rapid decline in the price of LCD monitors, coupled with the proliferation of well-priced graphics cards with dual-monitor support, allowed more companies to outfit their most-valued workers with a second monitor. The result: Dramatic increases in productivity. Better still, many of these dual-monitors users say they actually enjoy their work more. Freed from the frustrating task of tiling through windows, they find themselves spending more time actually getting things done.

Dual-monitor workstations were a boon to a small but very vocal crowd. However, over time it has become increasingly clear that for some end users, two is not enough. Unfortunately, moving from two monitors to three, four, or more has traditionally been a more difficult task than moving from one to two. From the cost of buying and installing a second graphics card, to the complexity of configuring the workstation's operating system and applications to work with the new card and monitors, it's not been a job for the non-technically inclined. And that's why multiple-monitor setups have traditionally only appeared in mission-critical situations at well-financed, IT-supported firms such as financial services.

Of course, not every company that could benefit from multiple-monitor workstations has deep pockets and a team of tech experts on staff. As an increasing number of businesses look to outfit their key producers with more onscreen workspace, IDC sees real market potential for vendors that can provide simple and cost-effective solutions to driving multiple-monitor workstations. Specifically, ID believes that:

☑ Many single and dual-monitor users today could derive real productivity benefits from using three or more monitors. Additional workspace and the ability to view multiple windows without constantly moving other windows from front to back can lead to faster project completion and much less user frustration.

☑ Today's existing two-card multiple-monitor solutions are often too complex for the average company to support. To move multiple-monitor solutions beyond a niche market, PC and monitor vendors must offer hardware and software packages that make multiple-monitor workstations easier to set up and manage for everyday users.

☑ Cost is a key factor. Most businesses today find themselves with large IT needs but small IT budgets. If they're going to embrace multiple monitors, the costs have to be reasonable and the return on investment needs to occur in the very near term.

IN THIS WHITE PAPER

This white paper discusses the increasing need for a cost-effective, easy-to-use multiple-monitor solution. It explores the impact adding multiple-monitor workstations had on three tech-driven companies. And it explores AMD's new multiple-monitor technology solution.

SITUATION OVERVIEW

Dual-monitor workstations may not be on every desktop in every company, but the productivity benefits of running two displays in front of those workers most deeply immersed in graphical data are widely accepted. In fact, a growing number of end users and companies are now wondering aloud if they might be able to achieve even greater productivity gains by adding additional monitors.

Unfortunately, many of these companies have found that moving their employees to a multiple-monitor setup using today's technology is just too much trouble. The way a typical scenario plays out is described as follows.

End user gets approval to add a third monitor, and he (or an intrepid member of IT) opens the workstation to look at his existing graphics card. If he finds the necessary slot for a second card accessible, he continues. If not, his upgrade adventure is already at an end.

Next he goes online to see about buying a graphics card that matches his existing one. He finds his nearly two-year-old card is no longer widely available, but that he can buy it from an online specialty store for close to what the company paid for the original card several years prior. This option ensures a good match between cards, but it also means he has to deal with aging technology (and slower performance compared with newer cards) well into the future. Or he can buy a more recent vintage graphics card for less, but then he's forced to deal with potential GPU speed and resolution incompatibilities between the two cards. He buys a card.

Once he receives the card, he goes to install it and finds it very difficult to fit the card into the space he has available in his PC. After struggling for a bit, he gets the card installed, and he plugs in the cable from his new monitor into the card and reboots the system. Minutes later, he's up and running, but for reasons unknown his operating system isn't handling the card correctly, resulting in a poor image appearing on his new monitor.

After sorting through the operating system monitor-control issues and achieving an acceptable but less than perfect solution, the end user finally boots up his most-used applications, only to find that they don't work well under a dual-card system. After consulting pages of support documents, he finds a workaround. Or, he doesn't.

Eight hours and a great deal of frustration later, he's finished. What he's created is a serviceable solution that creates three usable displays when situated in a straight line left to right. However, without specialized apps and drivers, he has no easy way to deal with issues such as mismatched monitor sizes and resolutions or unique physical deployments. There's no simple way for him to ensure that dialog boxes and windows title bars don't appear awkwardly across displays. And if he wants any visual compensation for bad screen splits across bezels, he's got to figure it out for himself.

Asked if he'd be willing to help his coworker move to a multiple-monitor setup, he politely declines.

What if a company could enjoy a multiple-monitor workstation without all the hassles involved? IDC believes multiple-monitor workstations can be a boon to all users, presuming the technical issues are easily addressed. To explore the numerous potential benefits multiple-monitor workstations can offer, IDC talked to employees at three different companies that recently made the move to multiple monitors using a new technology from AMD called ATI Eyefinity.

CASE STUDIES

Cosworth, Kirkham Motorsports, and Slappy Studios all saw notable improvements in productivity and creativity from those employees who received a multiple-monitor upgrade.

Cosworth

Known for its world-class engine designs used in Formula One racers, UK-based engineering firm Cosworth also designs and manufactures components for applications such as marine, rail, aerospace, and power generation. Yusuf Islam is the company's brand, communications and design specialist, and it is his job to help clients visualize and understand the complex components his company creates. At any given moment, he's using three, four, or more applications to do his work. Long an advocate of his dual-screen setup, he recently upgraded to a three-monitor configuration using the AMD solution. His feelings about the improvement were quite clear.

"Two screens are essential for getting anything done at a sensible speed," he says. "Three screens are the holy grail for artists like me."

Whether he's using CAD applications such as NX or 3ds Max to work with complex models, or creating brochures in a range of desktop publishing apps, Islam says the extra screen real estate that three monitors provide makes it possible for him to do his job better.

Islam uses his three 24in. monitors in an H configuration, with the outer monitors in portrait mode and the center monitor in landscape mode. When doing 3D

visualization work, he typically works in 3ds Max on the center screen, with the app's tools and pallets on the adjacent screens. More often than not, he's concurrently viewing CAD drawing and working in Photoshop at the same time.

"When I'm in 3ds Max, I'm often also in Photoshop creating textures to wrap around models," he says. "If you can save yourself from battling between overlapping windows, you can save significant amounts of time. And not just time, but frustration, too. Saving your sanity is a big deal."

When it comes time to publish the visuals he's created, Islam often finds himself working in at least three publishing applications at once. "Using Adobe InDesign, Adobe Photoshop, and Adobe Illustrator, I constantly find myself opening files, editing them, and importing them," he says. With three screens, he can do that without moving open windows out of the way. Islam notes that this leads to noticeable productivity improvements, and better work.

"If I can do jobs quicker, that leaves me more time to polish the work at the end. And that makes for a better final product, and happier customers."

Kirkham Motorsports

Kirkham Motorsports made its name designing and building full-scale, functioning replicas of the Shelby Cobra automobile. Most of that original design work was done on paper, with the parts machined by hand. Today the US-based company continues to innovate around its Shelby replicas, but it is also designing a new car from the ground up. All design and manufacturing staff use CAD applications, and the company creates parts using programmable Computer Numerical Control (CNC) tools including mills, lathes, a tube bender, and a waterjet.

"The best CAD guys have to be artists," says Steve Kirkham, manager. "Multiple screens mean a larger canvas. The less work they need to do to get where they want to be, the better."

Kirkham recently added a third monitor to the company's primary CAD workstation. In the center, there's now a 23in. monitor, flanked on both sides by 19in. displays.

Kirkham notes that multiple monitors are the perfect setup for running CAD The designer uses SolidWorks software for model creation on the main monitor. Then he runs Surfcam software (which turns the model into usable code) on one of the outer monitors. And on the third monitor, the designer is typically working in another application to manually clean up the code created by Surfcam.

"When we were using just two monitors, we were constantly moving windows front to back and from side to side," Kirkham says. "This is a huge time saver, and when a CAD designer is saving time, we're making money."

Kirkham estimates the increased productivity of his CAD designer will cover the cost of the new monitor itself within a few weeks of purchase. In fact, he's so happy with what he's seen so far, he expects to add a fourth monitor to the workstation in the very near future.

He envisions the designer using the fourth monitor to open and display photos, files, and other supporting documents without impacting his view of existing windows. "The reason I'm going to add a fourth monitor is I know he's going to use it. The more tools he has, the more he creates."

Slappy Studios

Creating post-production visual effects for movies, commercials, trailers, and other projects means the designers at Slappy Studios spend a great deal of time in front of their PC displays. Given the opportunity to add two more monitors to their primary dual-monitor workstation, they company jumped at the chance.

"The more monitors we have on a workstation, the more we can see at once," says company owner David Scandlyn. "The more we can see without moving windows, the faster we can work."

Scandlyn added two 20in. monitors to his workstation's existing complement of two 21in. monitors. After dealing with the expected issues of organizing four monitors on a single desktop, he was able to get right back to work.

His work consists primarily of photo editing, 3D visual effects, and graphic design. Scandlyn says he's typically running applications such as Adobe Flash, Adobe PhotoShop, Adobe After Affects, and Adobe Illustrator all at once. The additional two monitors made doing so much simpler. By assigning certain apps to certain monitors, he experienced an almost instant improvement in workflow.

Based on his hands-on testing, Scandlyn estimates the new four-monitor workstation could help save him a tremendous amount of time and effort, while allowing him to do better work at the same time. The result for clients could be faster turnarounds at lower prices.

For example, he says, a typical project for the company costs about $100,000 and takes four employees about two weeks to complete. By adding two additional monitors to three of those four employees' workstations, he estimates he could cut the time by 25%. And the final cost: down from $100,000 to closer to $80,000.

Why not add four monitors to all four employee's workstations in this scenario? "Four monitors don't scale everywhere, and not everybody needs four monitors," he says. "But for certain employees, it's about screen real estate; the more of it the better."

"This type of upgrade is well worth the effort and cost. Productivity gets a great boost, and that makes it a very profitable thing to do."

ATI EYEFINITY

Initially introduced in 2009 for tech-savvy consumers looking to run multiple monitors to fully immerse themselves in game play, ATI Eyefinity is now appearing in AMD's FirePro products. Built around the DisplayPort connectivity standard, ATI Eyefinity will appear in everything from entry-level graphics cards to high-end products.

Entry- and mid-level cards will typically support up to three monitors (see Figure 1), with at least one utilizing a DisplayPort-enabled monitor (or using a DisplayPort adapter to convert a legacy-input monitor to DisplayPort compatibility). Future high-end cards will offer support for four to six monitors, with the six-monitor products utilizing the new Mini DisplayPort standard.

ATI Eyefinity will have the horsepower to drive monitors in just about any configuration an end user can imagine — from a standard 3x1 landscape orientation to more complex arrangements such as 3x1 portrait with a stack of 3 extended landscape monitors on the end.

FIGURE 1

Three Monitors: Oil and Gas Exploration

Source: AMD, 2010

ATI Eyefinity addresses each of the previously described pain points around the setup and use of multiple monitors:

☐ **One graphics card.** A single GPU and single card drive from three to six monitors. There's no need to deal with the technical issues involved with installing a second card.

☐ **Cost effective.** Instead of paying to buy an older graphics card to match the one already in their system, users can purchase a current-generation ATI Eyefinity-enabled card and swap out their outdated one.

- ⊡ **Simple setup.** AMD says the included Desktop and Displays Manager software will make it easy to set up and control multiple monitors, regardless of their size, resolution, and placement on the desktop.

In addition to handling the basic control elements of multiple monitors, the ATI Eyefinity software package will include more advanced features to help workstation users better tune their display space to their own workflow. HydraVision technology will help users efficiently organize multiple applications across display groups, dealing with usability issues by automatically moving windows title bars away from bezel areas. HydraGrid will ensure that applications and dialog boxes never populate bezel areas by placing them in a predetermined location on a grid. And single large screen (SLS) technology will let users treat their multiple monitors as a single large screen, with the ability to adjust the image to compensate for bezels.

A key benefit of ATI Eyefinity is the fact that it's not reserved for high-end cards only. AMD will be introducing cards at every price point. That means that every business, small or large, will have the opportunity to try multiple monitors.

FUTURE OUTLOOK

Multiple-monitor workstations will remain a niche market, with the only question being how large a niche market? While IDC does not envision a future in which all workers in an office use three or more monitors, it's not hard to imagine savvy firms happily outfitting their top producers with multiple-monitor rigs. A low cost of entry, clear potential for productivity gains, and the added benefit of happier employees make it worthwhile for even the most skeptical companies to at least try the multiple-monitor solution. And once most people begin using such a combination, few are going to be happy going back to using a mere two monitors.

CHALLENGES/OPPORTUNITIES

One of the major challenges to widespread adoption of multiple-monitor workstations is the continued tightness in IT budgets of companies big and small. At a time when employees are making due with aging PCs, it can be hard to advocate for adding another display to someone's desktop. However, in many cases, you can argue that it may cost less — and be a bigger productivity boost — to upgrade a PC's graphics card and add another monitor rather than to buy a new PC. Better still, when it does come time to swap out the user's PC, the investment need not be squandered, as the video card and monitor can be used with the incoming PC.

Another challenge facing the growth of the multiple-monitor segment is the simple fact that when you move beyond two monitors, most people quickly begin to run out of real estate on the physical desktop. While three monitors set up left to right is usually possible, things get more complicated when it comes time to stack multiple monitors in 2x configurations. At this point, aftermarket stands are required, and, unfortunately, they do not come cheap. When you're buying four 20in. monitors for $120 each, it can be hard to justify spending $300 for the required stand. Companies willing to sell stands with lower margins could find a great deal of pent-up demand in this space.

Finally, perhaps the greatest challenge the multiple-monitor segment faces is the rapid and ongoing end-user shift from desktops to notebooks. Most current notebooks can drive only a single standalone monitor out of the box; with the right docking station, some can drive two. As a result, at upgrade time, many multiple-monitor converts have been forced to choose between the mobility of a notebook and the enhanced productivity of a multiple-monitor desktop. That difficult choice will become less necessary as more vendors bring to market notebooks capable of driving multiple monitors. For example, HP recently launched several new ATI Eyefinity-enabled notebooks capable of driving three monitors out of the box, and five monitors using a docking station. And next year, many expect the first notebooks with the new DisplayPort 1.2 specification to ship, offering users the ability to easily daisy-chain multiple monitors together through a single port on their notebook.

CONCLUSION

The benefits of multiple-monitor computing can be hard to quantify, but ask those who have used three or more monitors to work within a complex workflow environment, and you're likely to hear just how much they liked it. From increasing productivity to lowering frustration, in the right scenarios, a multiple-monitor workstation is simply the best way to work. As LCD monitor prices continue to decline, and technologies such as ATI Eyefinity continue to evolve to make it easier to set up and use multiple-monitor workstations, more end users will have the opportunity to experience the true benefits of running with three or more monitors.