



**THE FLAT SCREEN**

**ILLUMINATED**



## THE PANEL OF EXPERTS

**Jim Tessier**, *Business Line Manager,*  
*Visual Brand Marketing*

IBM Personal Systems Group

**Rob Enderle**, *Vice President,*  
*Desktop Service Information Group*

GIGA Information Group

**George Weller**, *Sr. Principal Engineer*  
Steelcase Inc.

**Joe Branc**, *Manager,*  
*Electrical/Mechanical Technologies*  
Steelcase Inc.,

**Steve Channer**, *Consultant/Int'l. Markets*  
Details, Inc. (the ergonomic  
worktools subsidiary of Steelcase Inc.)

## EXPERT THINKING

New flat computer panel displays feature big, flicker-free, LCD (Liquid Crystal Display) screens. They are streamlined and sleek.

All in all: thinner, lighter, more energy-efficient, offering more viewing space, less eye fatigue and easy adjustability. Now, even at early adoption price points, production supply can't keep up with demand.

What are the experts saying about this revolutionary new technology?

Will flat screens replace ubiquitous desktop monitors? Will they overtake the laptop trend? Will they change the way we use computers?

What will be the impact on workplace planning and design?

Details wanted to know. So we assembled a panel of experts for a roundtable discussion on the impact of flat screen technology on the workplace. Our panelists shared their knowledge and views from technology, information systems, as well as workplace perspectives.

## HOW WILL FLAT SCREENS AFFECT THE WORKPLACE ENVIRONMENT?

**Enderle (GIGA):** Well, it's one of those technologies that will certainly redefine how the desktop looks. The flat screen provides a great deal of flexibility as far as where it can be mounted, how it's mounted, where to position it, and also how many of them you can have.

**Channer (Details):** Flat screen technology affects current as well as future workspace design. We're talking about a huge installed base of workspaces with either beveled or radius corners. They're designed to support large monitors. You won't have to design workspaces with those gigantic corners in place, which effectively will deliver more usable work space in the same size office area.

**Weller (Steelcase):** It may simplify adjustability as well, because you don't have to deal with that 40-pound thing. Typically, a single piece of furniture is designed to hold the monitor and keyboard. By the time you've got something that's strong enough to hold the keyboard in one way and the display in another, it weighs as much as a sports car, and costs almost as much. You'll be able to do some more elegant things with flat displays.

**Tessier (IBM):** Heat generation is minimized. You've got probably 40-watts coming out of a 16-, 17-, 18-inch flat panel versus 100-plus watts on a large CRT (Cathode Ray Tube, the conventional monitor).

## WHAT ABOUT ITS EFFECTS, ESPECIALLY FROM AN ERGONOMICS STANDPOINT, ON THE PEOPLE WHO "LIVE" IN THOSE ENVIRONMENTS?

**Branc (Steelcase):** If you look at the average office worker demographics in the US today, we're starting to look through the lower part of our glasses (as we look at our screens). We're in the "geezerdom." So we have to view that display at a lower angle ergonomically. One of the big benefits of having a flat panel display is zero jitter and better physical support for you to work with during the day. You'll be less tired by looking at a flat panel display.

**Tessier (IBM):** Also, glare is reduced compared to the CRT for two reasons: the matte finish and its flat profile. You have less curvature to reflect the ambient light into the user's eyes.

**Channer (Details):** To best support the flat panel, we've developed a flat panel screen arm that allows you to bring the displays into more of an ergonomically correct viewpoint. You can readily adjust the height, adjust the focal length, adjust the tilt angle of the flat panel, and make better use of the flat panel or LCD technology.

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## WHAT OTHER TRENDS MAY DRIVE THE ADOPTION OF FLAT SCREENS?

**Branc** (Steelcase): If you go back probably three, four years ago, there was very little need for any display larger than 13 inches. That's because we were essentially working with one screen, and it was pretty much a command line — prompt text mode and syntax-based computing. Today we're in the windows arena and people are using more than one window open simultaneously. It's driving the need for a larger display and more of them. And I see that as a big change.

**Enderle** (GIGA): The two markets that really seem to like flat panels a lot and liked them early were medical and the financial trading floor. When it comes to new purchases, our financial trading floor clients have almost gone exclusively to flat panels. And they do arrange multiple ones across the desk of the broker. And you need to watch the brokers. They will change their focus from panel to panel as their calls come in or as activity occurs. It's worth trying. Once you do it, you will find you will not want to go back.

**Channer** (Details): When we sell into the securities market, we see trading floors, trading desks, with six to eight different windows all being open at the same time. But they're using six to eight different monitors at the same time. There's no way those are being ergonomically supported correctly in the office.

## IS THERE A DOWNSIDE TO FLAT SCREENS?

**Branc** (Steelcase): Everything we've said about the ergonomics and technology is all upside stuff. The downside is cost. In every other way, they're superior.

**Enderle** (GIGA): FEDs (Field Emission Displays) will be hitting the market towards the end of 2000; shipments in volume starting in first and second quarter in 2001. And they're substantially cheaper.

## HOW WILL PRICE AFFECT DEMAND?

**Channer** (Details): For products that support existing monitors, we're seeing interest beginning to wane. People are delaying their purchase decisions based on where the price of the flat screen is going.

**Enderle** (GIGA): Well...one of the advantages of the overall drop in system price is when budgets were set last year they were set for a system price in the \$2,000-\$2,5000 range. But with acceptable system prices dropping to the \$1,000 point, you can get a system with a flat panel and still hit that \$2,000-\$2,500 range. So even under existing budgets there have been ways to work in flat panels.



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**Weller** (Steelcase): The interesting price question is at what point the differential price of a flat screen will become unimportant. You may find that in view of all the ergonomic and technological benefits, when the differential drops to \$400 you can suddenly produce a sort of tidal wave effect.

#### ARE THERE ANY OTHER BARRIERS TO ENTRY BESIDES PRICE?

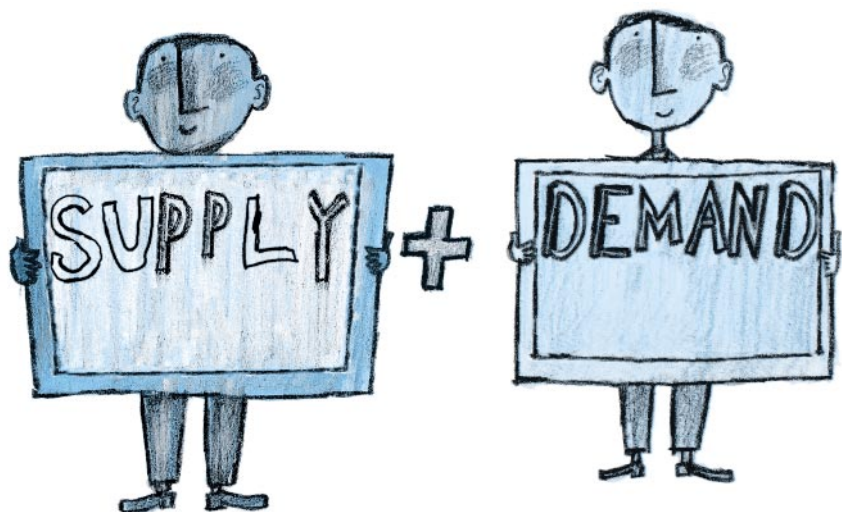
**Tessier** (IBM): Supply is going to be an issue until about halfway through 2000. So we expect the prices to help hold back the demand. Even after the new capacity comes on line in 2001, there still won't be near the capacity to take over the CRT market.

**Enderle** (GIGA): There's a good point here. The fact is, there is much more demand right now than supply, even at the current price points. People cannot get enough of them. The other thing that's a possible constraint is in transition from an analog technology to a digital technology. This could also have a lagging effect. Nonetheless, I expect that flat panels will predominate at the end of 2003.

**Tessier** (IBM): Another issue is if you're doing three-dimensional CAD designs, I don't think your flat panel can refresh as fast and you may lose some smoothness in transition as you rotate an image versus a CRT. So the CRT still has an edge on a very high-end, high graphics, something that takes 300 meg of memory to run the program.

#### ASSUMING THE PRICE BARRIER IS ADDRESSED, HOW QUICKLY COULD FLAT SCREENS BECOME A WORKPLACE STANDARD?

**Branc** (Steelcase): Three years is what I see.





### CAN YOU EXPLAIN THE CONCEPT OF “DISRUPTIVE TECHNOLOGIES” AND ASSESS THEIR LIKELIHOOD OVER THE NEXT FIVE YEARS?

**Enderle (GIGA):** Oh, they are things that seem kind of way out now that require one or two breakthroughs that could completely change the way we do things. As for the probability that it’s going to happen, oh it’s 100% in five years. Absolutely 100%. We will have at least one disruptive technology in the next five years.

**Weller (Steelcase):** I think the thing that has the most potential to be disruptive in the office would be large, cheap, low-powered, static reflective displays. Things that work like pieces of paper but are electronically loaded with information. They wouldn’t need to have the video type of response as far as refresh rate. But these would be things that you could paper walls with, use as surfaces on panels. That disruption probably will happen in five years. And that will have the potential to seriously change the way people use work space. Because all that vertical space that just has paint on it right now can have something more useful than a whiteboard, and maybe not much more expensive.

### CAN YOU COMMENT ON ALTERNATIVE APPROACHES TO COMPUTING AND USE OF SPACE?

**Enderle (GIGA):** Here’s the difficulty we’re dealing with right now: We’ve got competing technology trends. The move to laptops is certainly dramatic — between 25% and 30% of typical corporate buys and showing good growth. Yet companies are also discovering that people are leaving the things on their desk — aren’t making them mobile. So a combination of a high cost to purchase coupled with the fact that they are stationary is causing firms to look at other alternatives.

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higher resolution, and lower cost displays.*

**Tessier (IBM):** I have one thought about the whole (computer) desk system. It may not predominate. Some organizations are going to “thin clients” (generic term for an alternative to a PC, e.g., network computer or windows terminal). That way people always have the same level of applications because they’re pulling everything off a server.

**Enderle (GIGA):** We’ve actually forecast the thin client as a five-year trend and that the computer itself, in all cases, will become less intrusive in the office.

**Branc (Steelcase):** Part of the future is more displays, higher resolution and lower cost displays. We didn’t talk about the shape of the display. We talked about flat. And one of the reasons that flat was big is because it reduces reflection off the glass. But it still doesn’t accommodate the visual ergonomics. We have spherical vision and our eyes really do want to look at a concave surface. I think you’ll see that coming about probably within the next four to five years.

#### HOW ARE PEOPLE OUTSIDE THE INFORMATION TECHNOLOGY DEPARTMENT — DESIGNERS, FACILITIES MANAGERS, ERGONOMISTS — GOING TO BE AFFECTED BY FLAT SCREENS?

**Channer (Details):** We talk to folks at shows who have always considered the computer decision the default of somebody else, IT specifically. When they understand that some of these things are falling into their court and that the question has opened up, there’s almost a look of glee on their faces. Facilities managers are very interested in the power usage question. As Jim stated, the flat screen is not using nearly as much power and not generating as much heat from an HVAC perspective. As for the ergonomist, it’s the ability to change focal length easier and the fact that the LCD — or the flat panel — is easier on the eyes of the user. Designers see the possibility to design for the workspace in a different fashion if they don’t have to put those corners in place to support the monolithic monitors weighing 70 pounds.

**Enderle (GIGA):** A flat panel is more flexible. The folks who focus on ergonomics are favoring the flat panel if given a choice.

#### IT APPEARS THE SHRINKING WORKSTATION FOOTPRINT WILL HELP THE GROWTH POTENTIAL OF THE FLAT SCREEN. BUT DOES THE PRESSURE OF “SPACE WARS” HAVE TO STOP AT SOME POINT?

**Channer (Details):** We certainly hope so.

*A flat panel is more flexible.*

*The folks who focus on ergonomics are favoring the flat panel if given the choice.*



“I have traveled the length and breadth of this country and walked with the best people, and I can assure you that data processing is a fad that won't last out the year.”

– Editor in charge of business books for Prentice Hall, 1957.

Clearly it's impossible, even for the experts, to forecast the technological future with complete accuracy. Nonetheless, our Roundtable Forum panel suggests the following conclusions regarding the impact of the flat screen in the coming months and years:

**WHILE THE SALE AND USE OF CRTS ARE STILL PROCEEDING AT A FASTER PACE THAN THAT OF FLAT SCREENS, THE TIME IS RAPIDLY APPROACHING WHEN FLAT SCREENS WILL BEGIN TO DOMINATE.**

**THE ADVANTAGES OF USING THE FLAT SCREEN OUTWEIGH THE CRT'S ADVANTAGES.  
THE FLAT SCREEN:**

- takes up less space
- is lighter, usually between 8 and 15 pounds
- is more energy-efficient
- delivers more viewing space in the same screen size
- causes less eye fatigue

**PRICE REMAINS THE PRIMARY DRAWBACK TO GREATER IMPLEMENTATION OF THE FLAT SCREEN.**

**THE PRICE DIFFERENTIAL CAN BE ATTRIBUTED TO THREE MAIN FACTORS:**

- supply
- technology that is more expensive to produce than a CRT's
- premium pricing that can be commanded for new introductions

The supply issue is being corrected by the industry and the cost of the new technology will continue to decline as more units are produced and sold. Meanwhile, the price differential is likely to impede broader-based decisions to adopt the flat screen as standard throughout an entire organization. Yet in some industries, the future is now.

