CELEBRATING 25 YEARS TECHNOTRENDS NEWSLETTER

# TECHNO TRENDS

THE BIG IDEAS THAT ARE CHANGING EVERYTHING

## PLUG INTO YOUR FUTURE BY UNPLUGGING FROM THE PRESENT (PART II)

*BY DANIEL BURRUS, CEO OF BURRUS RESEARCH*

The key to becoming an opportunity manager is to have the discipline to unplug from the present at least once per week and instead plug into the future. Last month, I shared two steps on how to solve tomorrow's problems before they occur and see the new opportunities change can bring.

This month, I have two additional steps you can take to move the ball forward and watch your success grow.

### SOLVE PREDICTABLE PROBLEMS BEFORE THEY HAPPEN

During your opportunity hour ask yourself, "Based on the direction I see things going, the trends I see happening, and the market cycles I'm aware of, what are the problems I'm about to have? And, equally important, what are my customers' predictable future problems?" Then determine a strategy to solve those problems before they occur. Keep in mind that a future problem represents a future opportunity.

For example, if you're implementing a new strategic plan, predict the problems the plan will create and solve them before they start. If you're launching a new product, figure out the problems associated with that product and solve them before the launch.

*continued on page 2*

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# PLUG INTO YOUR FUTURE *(continued from page 1)*

If you're implementing a company-wide change, identify those who are likely to fight the change and why, and then develop solutions for their concerns beforehand. It's about becoming more anticipatory. If you don't take an hour a week to look at what's about to occur, you're going to keep doing what you've always done until you inadvertently go off a cliff. Rather than be a crisis manager and only react to problems as they occur, you want to be anticipatory, identify opportunities, and capitalize on them.

### LOOK AT THE FUTURE OF YOUR PROFESSION

In addition to looking at your industry and organization's future, whatever profession you're in or whatever your career happens to be, you also need to look at the future of your employment. Based on all the things you're seeing with your organization and all the technological changes out there, how are you going to be doing your job or career in the next few years? If you can start to see the future of your career, you can chart your own course, identify problems before they occur, and solve them proactively so you end up ahead rather than behind the curve.

### YOUR FUTURE AWAITS

No matter who you are or what you do, an hour a week is doable. Before long, you'll become addicted to that hour and will expand it. And when that happens, you open yourself up to a whole new world of possibilities. So don't wait for your future to unfold randomly, only to end up in a place you don't want to be. Instead, invest an hour a week into your company and/or yourself and watch your success grow.

## *TECHNOLOGY NEWS HIGHLIGHTS*

# GOLD-TIPPED NANOCRYSTALS

Solar cells made from nanocrystals are viewed by many to be key components in developing solar electricity and solar fuel technology, but improving their efficiency is essential to making them cost-effective. Now scientists at Berkeley Labs have discovered a technique that increases the conductivity of semiconductor nanocrystals 100,000 times! Current methods for improving the performance of thin film nanocrystals involve chemical treatments, such as etching, to remove surfactants that hinder conductivity. However, these techniques often alter the electrical properties of the semiconductor itself. The new process grows the contacts in a solution of gold salts and takes advantage of the self-assembly characteristics of the nanorods to apply gold selectively to the tips of the tiny structures. When a semiconductor chip is immersed in the nanorod solution, its chemical composition is preserved. This will make it easier to control the quality and performance of semiconductors in the manufacturing process.

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# HANDHELD ULTRASOUND

GE recently unveiled a handheld ultrasound machine called the Vscan. The device opens similar to a flip phone revealing a small screen on the top half and a circular button pad on the bottom half. An attached wand is used to generate an internal organ or fetal scan. The unit is targeted for primary care doctors to use onsite instead of referring a patient to a specialist. In addition, it can be used in remote regions without access to sophisticated equipment to improve patient care by enhancing the doctor's ability to quickly and accurately make a diagnosis. The device will be available sometime next year and is said to be "very digitally capable."

*For information: GE Healthcare, phone: 888-202-5528; Web site: www.gehealthcare.com*

## FACE RECOGNITION

A new sensor has been developed that allows face recognition systems to operate in dark settings or overly bright conditions. It can even capture a person's image when they are behind a reflective glass surface. Current systems that are used, for example, in parking garages, are unable to recognize a driver if a reflection in the windshield obscures his face. However, the new system utilizes an LED modulated, near-infrared light source to filter out sunlight and other sources of interference. The result is a clear, QVGA-quality image that contains only the light reflected back from the subject. With a shutter speed of .002 seconds, images can be captured in cars traveling up to 30 miles per hour and at distances of up to 10 feet away. Additional LEDs would enable the distance to be increased to around 30 feet. The technology can also be used to enhance the accuracy of other biometric systems, such as those used to identify hand vein patterns. The sensor system may be commercialized as early as Spring 2010 for building control and security systems.

*For information: Panasonic Electric Works Co. Ltd., 1048 Kadoma, Kadoma-shi, Osaka 571-8686, Japan; phone: +81-6-6908-1050; fax: +81-6-6908-5781; Web site: www.pewa.panasonic.com*

## CLOAKING DEVICES

Although there are many practical details to be worked out, scientists at Hong Kong University maintain that transformation optics have the potential to create doorways which are invisible to the human eye. The technology – called a "superscatterer" – would be based on an extreme version of the light-bending effect you see when looking at fish in a glass tank. The materials, however, would be made from photonic crystals that have the ability to push the laws of refraction and reflection to new limits. Unlike previous materials used in such experiments, these "metamaterials" would be engineered to operate over a wider range of frequencies, and would be capable of forcing light and other forms of electromagnetic radiation into complicated patterns. The developers have even come up with a means to switch the system on and off remotely. An obvious application for this technology would be for use in military cloaking devices. Similar research is also underway to apply these principles to sound waves for creating an "acoustic cloak."

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## HOUSEKEEPING ROBOT

A new robot called DiGORO has been designed to help around the house with simple, everyday tasks. Unlike existing robots, which can only perform preprogrammed tasks, DiGORO can be customized for ten different movements and make dynamic adjustments based on room layout or furniture placement. The android is about 150 centimeters (60 inches) tall and weighs around 120 kilograms (265 pounds). A camera in its head allows DiGORO to observe its environment and detect human movements while a microphone and voice recognition software translate human commands. To train it, a user simply moves DiGORO around the room to familiarize it with its surroundings, and demonstrates the task to be performed. DiGORO will then be able to repeat the movement on command.

*For information: Honda Research Institute Japan Co, Ltd., 8-1 Honcho, Wako-shi, Saitama 351-0188, Japan; fax: +81-48-462-5221; Web site: www.jp.honda-ri.com*

## GROWING PLASTIC

The idea of making plastics from plant starch and soy proteins is not new, but the research underway at the University of Missouri is putting a new spin on environmentally-friendly plastic. That's because instead of simply using plants to manufacture non-polluting, renewable plastics, they are actually using them to grow plastics. When three bacterial enzymes were introduced into an engineered plant (arabidopsis thaliana), they combined with two additional enzymes to produce an organic polymer called polyhydroxybutyrate-co-polyhydroxyvalerate (PHBV), a flexible and moldable plastic that degrades into water and carbon dioxide when exposed to the bacteria in soil. It can be used to produce a wide range of products, including soda bottles, grocery bags, and plastic flatware. As an agricultural commodity, PHBV could create a double crop in one plant. For example, soy beans could be engineered to produce PHBV in the leaves, while the seeds remain unchanged. Additional research will determine whether the same technique can also be applied to naturally occurring plants such as switchgrass.

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## FIGHT THE FLU WITH WATER

Recent research has shown that electrolyzed water may be effective in fighting flu viruses – including the H1N1 strain that reached pandemic proportions earlier this year. The tests were conducted by exposing H1N1 virus to electrolyzed water that had a free chlorine concentration of 2 milligrams per liter. Results indicate that the infectivity of the virus was reduced by 99 percent after ten minutes. Although the mechanism has not been fully confirmed, it is thought that two types of oxygen present in the electrolyzed water neutralize a protein on the surface of the virus so it cannot attach itself to human cells. When used in air purifiers, it could effectively render the airborne organisms non-contagious. The technology is already being used to suppress various viruses including seasonal influenza.

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## MICROCHIP SABOTAGE

The latest concern among chip manufacturers is the possibility of "hardware trojans" – malicious, remotely controlled circuits that can render electronic circuits (or entire systems) inoperable without warning. Undetectable by firewalls, antivirus software, or ordinary quality control testing, this extra circuitry, which can be introduced in the manufacturing process, could effectively turn microchips into time bombs according to researchers. In fact, this very possibility has been of growing concern as manufacturing continues to migrate overseas. In an effort to combat the potentially devastating effects of such industrial sabotage, engineers are looking at ways to detect compromised circuits. One proposal is to limit critical applications to processors with multiple cores, and run each task on two cores simultaneously. If one is compromised, the outputs will be different, and the one with the trojan can be effectively shut off.

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## WEIGHT-LOSS ENZYME

Researchers have identified a chemical in the brain that could ultimately help dieters keep the weight off for good. Reducing caloric intake automatically activates a mechanism that makes metabolism more efficient, so the body can get by with less. This is why, when a dieter returns to normal eating habits, they often gain the weight right back. But an enzyme called CPE blocks this mechanism. In tests on mice, when levels of the compound were low, they ate more and burned less energy. However, when levels were elevated, they ate less and burned energy at the normal rate. In the future, CPE-elevating drugs (similar to those currently available to treat diabetes and infectious diseases) could become available that will combat this age-old problem.

*For information: Domenico Accili, Columbia University, Diabetes and Endocrinology Research Center, Russ Berrie Medical Sciences Pavilion, 1150 Nicholas Avenue, Suite 238, New York, NY 10032; phone: 212-851-5332; fax: 212-304-7390; email: da230@columbia.edu; Web site: www.columbia.edu*

## USER-ANNOTATED WEB SITES

Google recently introduced a new service, called Sidewiki, which allows users to post comments on Web sites. For example, you could annotate a Web page on Hawaii with your own travel recommendations, and other visitors to that page would be able to click on your comments to read them. Sidewiki also includes a complex algorithm to rank the quality of the comments. It will even post notes across multiple sites that have published the same content.

*For information: Google Inc., 1600 Amphitheatre Parkway, Mountain View, CA 94043; phone: 650-253-0000; fax: 650-253-0001; Web site: www.google.com/about.html*

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