



TECHNO TRENDS

THE BIG IDEAS THAT ARE CHANGING EVERYTHING

PLUG INTO YOUR FUTURE BY UNPLUGGING FROM THE PRESENT

BY DANIEL BURRUS, CEO OF BURRUS RESEARCH



What if there were a way to predict the challenges your organization will face and stop them from ever happening? Short of having a reliable crystal ball, most people believe such a concept is impossible. In reality, you can solve tomorrow's problems today – you simply need to give yourself time to do so.

The fact is that in today's marketplace, change is coming at us fast...and it's only getting faster. That means organizations will be facing more problems than ever before. One thing we know for sure is that most problems or changes come from the outside in – external factors impact the organization. This causes people to react, crisis manage, and continually put out fires.

Therefore, the only way to gain control of your future and avoid the increasing number of problems is to ensure that some of the changes come from the inside out – that both you and the organization make a change before the marketplace dictates a major shift or change in direction.

Changes that come from the inside out are far more controllable. Changes that come from the outside in are often out of our control. As such, crisis managers live in an uncontrollable world, while opportunity managers have a handle on their future. *continued on page 2*

SEPTEMBER 2009

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

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. It's about taking an hour and not looking at the economy, the stock market, the balance sheet, the sales numbers, and all the things that are part of today's world. Rather, it's a time to plug into the future, because that's where you're going to spend the rest of your life...it's where you're going to make all your money from this moment forward...and it's also where you can lose everything in an instant. Since you'll be living in the future, doesn't it make sense to give the future some thought every now and then?

If you're ready to solve tomorrow's problems before they occur and see the new opportunities change brings, take the following steps.

MARK THE OPPORTUNITY HOUR IN YOUR CALENDAR

In order to make sure you take the time to plan, you need to put the time in your calendar. Make an appointment with yourself just as you would for any other important business meeting. If you don't put it in your calendar, you'll never take time to plan. You'll be so busy putting out fires that you'll never get to it. And if you think you don't have time to do this, that's because you're in a habitual crisis management mode. The only way to get time back is to spend the time to stop those problems from happening.

KNOW WHETHER YOU'RE DEALING WITH A CYCLE OR PERMANENT CHANGE

The good news is that most changes are cyclical rather than permanent. For example, home values will always rise and fall, the stock market will always fluctuate between bull and bear, and a company's sales will continually ebb and flow with the seasons. Those are all cyclical changes that are a bit easier to deal with – provided you know how long the cycle will last.

Sometimes, though, changes are permanent. For example, someone gets an iPod and starts listening to music on that device rather than buying CDs. That person now has all her music with her at all times. That's a permanent change, because she's not going back to music on CDs. Permanent changes, even those that are small, can have devastating effects on a business.

Here's another example to consider: Today, cable and satellite companies need to take a look at what the young college graduates are doing when they get an apartment. Many of them are opting not to get cable or satellite and instead watch their favorite TV programs on their computer. If you're a cable or satellite company just dealing with changes as they happen, you're going to be in big trouble in the future. While it's a new trend that is primarily in the younger demographic, those "kids" are going to grow up and be the main demographic in the country very soon. Therefore, it's a potentially permanent change that needs to be on the cable and satellite companies' radar.

What permanent marketplace changes are on your organization's radar? Next month, I will share two additional steps that you can use to solve tomorrow's problems before they occur.

TECHNOLOGY NEWS HIGHLIGHTS

WORLD'S FIRST GREEN LASER

In the quest for reliable, efficient light sources for display applications (such as pocket projectors and wide-screen TVs) lasers are undoubtedly the best candidates. But they are currently only commercially available in red and blue. This means that in order to display full-spectrum color, green light must be generated by passing infrared light (at a wavelength of 1064 nanometers) through special optical filters, which convert it into green light (at a wavelength of 532 nanometers). Recently, a green laser crystal was developed that will eliminate the need for intermediate filters. The key component is a gallium nitride (GaN) crystal that is cut in a special way to eliminate distortion. This allows the device to be tuned to any wavelength in the green region.

For information: Sumitomo Electric Industries, Ltd., 5-33, Kitahama 4-chome, Chuo-ku, Osaka 541-0041, Japan; phone: +81-06-6220-41411; fax: +81-06-6222-3380; Web site: <http://global-sei.com>

DNA COMPUTER

Moore's Law states that computing power doubles every 18 months. Historically, those gains have been obtained by shrinking components, but many of them have already reached microscopic levels, leaving developers few options for further reductions in size. Now, scientists have found that DNA nanostructures (about one-thousandth the diameter of a human hair) can serve as scaffolds for the assembly of computer chips. Dubbed "DNA origami," the breakthrough could maintain Moore's Law well into the future. The process involves placing a long, single strand of viral DNA in a solution with short, synthetic strands. The large molecule self-assembles into various configurations, folding itself into a square, triangle or other two-dimensional shape, with the short segments acting as "staples". The structures are positioned precisely on a silicon wafer using electron-beam lithography and oxygen plasma etching. Carbon nanotubes, nanowires, and other microscopic components can then be assembled on the scaffold to create complex circuits that are much smaller than any conventional semiconductors.

For information: Spike Narayan, IBM Almaden Research Center, 650 Harry Road, San Jose, CA 95120; phone: 408-927-1080; Web site: www.almaden.ibm.com

INVISIBILITY CLOAK

Optical camouflage is well on its way to becoming a reality, thanks to some innovative research being done at Keio University, where scientists have developed a special jacket that can render the wearer "invisible." The jacket is made up of tiny (50 micron diameter) glass beads that reflect images captured by a video camera mounted on the back of the wearer's head. For example, if a person is standing in front of a picture, the device would project an image of that picture on the jacket, making it appear as if you were looking through him. The refractive index of the beads is also adjusted to only reflect light back in the direction it came from, so the image of the background changes as the viewer moves. Applications for the device (in addition to fulfilling childhood fantasies about prowling around undetected) include car-mounted cameras that would give drivers a wider field of view, or camouflaged pillars that would provide unobstructed views of a stage.

For information: Masahiko Inami, Keio University, Kyosei-Kan, 6th floor, 4-1-1 Hiyoshi, Kohoku-ku, Yokohama, Kanagawa 223-8526, Japan; phone: +81-045-564-24; Web site: <http://inami-lab.kmd.keio.ac.jp/inami/index.en.html>

BRAIN-MACHINE INTERFACE

Several research groups have succeeded in developing thought-controlled devices for wheelchairs, but the robotics team at Toyota has taken a giant step forward in the area of brain-machine interfaces (BMI). The new system can translate thought patterns into movements in as little as one-thousandth of a second as compared to previous systems which take up to several seconds to complete a command. It doesn't require any bulky equipment either – just a laptop mounted right on the wheelchair. They've even added an emergency brake sensor that's activated when the user puffs out their cheek. Accuracy has also been increased to about 95 percent and training requires only about three hours per day for one week.

For information: Toyota Motor Corporation, 1 Toyota-cho, Toyota City, Aichi Prefecture 471-8571, Japan; phone: +81-0565-28-2121; Web site: www.toyota.co.jp/en/index.html

SMART HOMES

A number of companies are offering iPhone applications that allow users to control their home energy usage remotely. A variety of in-home devices enable you to turn your thermostat up or down, turn lights on or off, and control other appliances. Some apps also provide a way to view your home energy consumption in real time.

For information: Vantage Mobile, Tendril Networks, Inc. 5395 Pearl Parkway, Suite 100, Boulder, CO 80301; phone: 303-951-4360; Web site: www.tendrilinc.com / Energy UFO, Visible Energy, Inc., 2666 East Bayshore Road, Suite A, Palo Alto, CA 94303; phone: 650-353-7812; Web site: www.visibleenergy.com / Smart Thermostat, Ecobee, 333 Adelaide Street W, 6th floor, Toronto, Ontario M5V1R5, Canada; phone: 877-932-6233; Web site: www.ecobee.ca / My House UI, Control 4, 11734 S. Election Road, Salt Lake City, UT 84020; phone: 801-523-3100; Web site: www.control4.com

CELL-SIZED RFID

The next generation of radio frequency identification (RFID) chips will only be slightly larger than a human cell, which will

greatly increase affordability and functionality. At a mere .075 x .075 millimeters (one-twentieth the size of the smallest existing chips) the tiny transmitters are too small to be distorted or bent, so they could be applied directly to clothing or other pliable surfaces. The new devices are mass-produced by floating the chips in liquid. They are transferred individually to substrates using pipettes, a process similar to that used in the medical field when working on a cellular level.

For information: Hitachi, Ltd., 6-6, Marunouchi 1-chome, Chiyoda-ku, Tokyo 100-8280, Japan; phone: +81-3-3258-1111; Web site: www.hitachi.com

SELF-ERASING FILM

A new technology may make it possible to create documents that “self-destruct” after reading. It takes advantage of the fact that nanoparticles change color depending on how close they are to each other. To create the film, researchers coated gold nanoparticles with a compound called 4-(11-mercaptoundecanoxy) azobenzene (MUA), which causes the particles to congregate together when exposed to ultraviolet (UV) light. The particles were suspended in a gel sandwiched between sheets of plastic to create a red film. Using a UV pen, words or images could be drawn in the film and would appear purple or blue in a few seconds. But once the light source was taken away, the MUA reverted back to its original color. By varying the concentration of MUA, the researchers could control how long the images remained visible, but exposure to heat or intense visible light erases the image in seconds.

For information: Bartosz Grzybowski, Northwestern University, Chemical and Biological Engineering, TECH 2145 Sheridan Road, Evanston, IL 60208; phone: 847-491-3024; email: grzybor@northwestern.edu; Web site: www.northwestern.edu

OPTICAL TRANSISTOR

For years, scientists have been trying to produce circuits that operate on the basis of photons rather than electrons. Such an advance would catapult computing beyond the limits of today’s central processing units by enabling higher data transfer rates while generating much less heat. Researchers at the Swiss Federal Institute of Technology recently made a huge breakthrough with the development of an optical transistor in a single molecule. A hydrocarbon dye molecule was suspended in a crystalline matrix and cooled to -272 degrees Celsius (-457 degrees Fahrenheit) – one degree above absolute zero – using liquid helium. When the molecule was irradiated with an orange laser, the molecule absorbed the energy. They found that it could then be released by zapping the molecule with a lower intensity green laser, effectively creating a device that switches light with light.

For information: Vahid Sandoghdar, Swiss Federal Institute of Technology, Laboratory of Physical Chemistry, HCI, F 205, CH-8093 Zurich, Switzerland; phone: +41-44-633-4621; fax: +41-44-633-1316; email: vahid.sandoghdar@ethz.ch; Web site: www.nano-optics.ethz.ch

CHEMICAL “CAGE”

White phosphorus is a highly reactive ingredient used in many explosive devices. Recently researchers at the University of Cambridge came up with a novel approach to neutralize the effects of this unstable substance and clean up war zones or other areas contaminated by industrial waste. They happened upon the “container molecules” as they were researching ways to make complex, self-assembling molecular structures. What resulted was a “cage” of four iron atoms held together by rigid organic molecules to form a large pyramid-shaped compound with a central cavity. As it turns out, that cavity is precisely the size of a single molecule of white phosphorus, and the fit is so snug that there is no room for oxygen atoms to react with the otherwise unstable substance. In fact, the “caged” white phosphorus could be left open to the air for months with no reaction. The researchers intend to use the same approach for other larger molecules, including pharmaceuticals that are too big to fit into the current “cage.”

For information: Jonathan Nitschke, University of Cambridge, Department of Chemistry, Lensfield Road, Cambridge CB2 1EW, United Kingdom; phone: +44-01223-336324; email: jm34@cam.ac.uk; Web site: www.ch.cam.ac.uk

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