TECHNO TRENDS
THE BIG IDEAS THAT ARE CHANGING EVERYTHING

ANTICIPATE VERSUS REACTING AND CRISIS MANAGEMENT

BY DANIEL BURRUS, CEO OF BURRUS RESEARCH

In my new book Flash Foresight, I share seven principles that can make invisible opportunities visible. Becoming anticipatory is a crucial one.

Agility has been a reasonable survival strategy during times of rapid change, like the 1980s, 1990s, and even the 2000s. Today, however, the pace of technological change is beyond rapid. Change is too fast for even the best reaction time to be fast enough. These days, it's not about agility; it's also about anticipation.

Being proactive has been another popular technique; it looks like this: "Don't wait, do something now—take action!" But do what? How do you know the action you're taking is the right action? Being proactive is the attempt to solve today's problems before they grow worse. That's not good enough: we need to solve tomorrow's predictable problems…before they happen. We don't just need to take positive action: we need to take positive action that anticipates future known events. We need to be preactive.

Being proactive is agile; being preactive is agile and anticipatory. *continued on page 2*

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The shift from proactive to preactive also creates a shift in the nature of our relationship to change. We tend to think of change as disruptive, but this is generally true only when change comes from the outside in. For example, when a new technology comes out that changes customer behavior, or when the boss changes strategy, or when a competing marketplace opens up overseas, we scramble to adapt.

Being preactive means putting yourself into opportunity mode, looking at problems before they occur, and then preventing them from happening in the first place. It means, instead of always reacting to change that happens from the outside in, creating change from the inside out.

Change from the outside in is disruptive. Change from the inside out is purposeful and constructive. This is the kind of change that allows you to direct your future and seize your destiny. The only possible way to operate in that kind of change is by becoming anticipatory. One way to do that is with a tactic I call future benchmarking.

Benchmarking is a popular technique of strategic management that involves tracking and imitating the best practices of the leader in your field. But there is an inherent problem here: you're benchmarking the best practices of the present. By the time you reverse-engineer it, copy it, and implement it, it will be obsolete. Because change is moving forward so rapidly, you'll always be playing catch-up.

What you really want to do is jump ahead. How? By skipping over today's best practices and benchmarking what the best practices will be in the visible future, based on hard trends and future certainties.

Let's say you're a manufacturer. You decide that Toyota's "lean manufacturing" approach is the best model around right now, so you say, "Let's copy that." But it may take you four or five years to successfully copy what Toyota is doing. So what do you do?

Instead of looking at what Toyota is doing today, ask yourself, "Based on the hard trends we know will happen, and the strategic path Toyota is on, what is our best projection of what Toyota will be doing four or five years from now?"

Then you can base your strategy on emulating those best practices so you can become the leader of your field, instead of staying in a perpetual game of follow-the-leader.

How are you supposed to figure out what Toyota, or anyone else, is going to be doing five years from now? By taking the time to fine-tune your knowledge of the hard trends. That's the best way to figure out what to look for—to uncover what, specifically, to anticipate. Try it. The results will amaze you.

TECHNOLOGY NEWS HIGHLIGHTS

MELANOMA SCANNER

A new handheld device is designed to aid in the early detection of skin cancer. Using a technique called Raman spectroscopy, it can identify the molecular makeup of a mole by illuminating it with a specific wavelength of light and then measuring the type of light that is reflected back. Known as the Verisante Aura, the device scans for 21 different cancer biomarkers in less than one second, and compares the spectral signature of the sample to a database of various skin diseases. Preliminary results of a six-year clinical study involving approximately 1,000 lesions indicate that the instrument correctly identified every case of melanoma in a total of 274 lesions that had been flagged for biopsy. Commercial units are expected to be available in September 2011.

For information: Verisante Technology, Inc., 309-2309 W. 41st Avenue, Vancouver, British Columbia, Canada V6M 2A3; phone: 604-605-0507; fax: 604-605-0508; Web site: www.verisante.com

HIGH EFFICIENCY SPLIT-CYCLE ENGINE

Traditionally, split-cycle engines have not been able to match the function and efficiency of standard four-cycle internal combustion engines. But a new design could surpass the performance of today's engines and improve fuel economy by as much as 50 percent. The new engine features a unique valve design that reduces clearance between the cylinder head and the piston. This allows nearly 100 percent of the compressed air to be pushed into the crossover passage. In addition, a

combination of high pressure air entering the power cylinder and a fast combustion rate results in better thermal efficiency. Finally, a compressed air tank captures air that is not used for combustion, which can later be used to drive the engine. In computer simulations on a 2004 Chevy Cavalier, the split-cycle engine reduced fuel consumption by 25 to 36 percent.

For information: Scuderi Group Corporation Headquarters, 1111 Elm Street, Suite 33, West Springfield, MA 01089; phone: 413-439-0343; fax: 413-439-0266; Web site: www.scuderigroup.com

BIOTECH CROPS

According to the International Service for the Acquisition of Agri-biotech Applications (ISAAA) genetically-modified (GM) crops now account for 10 percent of the world's farmland, and their use is continuing to grow at a steady pace, especially in countries that export large quantities of soy and grain. Globally, in 2010, 81 percent of soybeans, 64 percent of cotton, 29 percent of corn and 23 percent of canola came from genetically engineered seeds. Herbicide tolerance is the most common genetic modification. This allows farmers to spray crops with the weed killer glyphosate (aka Roundup) without harming them, and is present in 61 percent of biotech crops. Another commonly used gene comes from a bacteria called Bacillus thuringiensis, which enables plants to produce their own insecticide and appears in about 17 percent of biotech crops. One downside to the widespread use of GM crops has been the emergence of glyphosate-tolerant weeds. The addition of new allergens and toxins to food is also a concern. However, the higher yields of biotech varieties will undoubtedly play an important role in feeding the growing world population, which is expected to peak at 9 billion by 2050.

For information: ISAAA AmeriCenter, 417 Bradfield Hall, Cornell University, Ithaca, NY 14853; phone: 607-255-1724; fax: 607-255-1215; email: americenter@isaaa.org; Web site: www.isaaa.org

WORLD'S FIRST ANTI-LASER

Yale University scientists recently unveiled the world's first anti-laser – a device that absorbs light at specific frequencies rather than emitting it. Known as a coherent specific absorber (CPA) it uses a silicon wafer as a "loss medium." The wafer is encapsulated in a cavity and aligned with incoming light waves in such a way that they become trapped and bounce back and forth until they are eventually absorbed and their energy is released as heat. The current proof-of-concept device absorbs 99.4 percent of the light that enters it, although the theoretical limit is 99.999 percent. According to computer simulations, the size should also be able to be reduced from the current 1 centimeter to as small as 6 microns (about one-twentieth the diameter of a human hair). Applications for such devices may one day include switches and detectors for optical computers as well as therapeutic imaging and fiber optic communications.

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PRINTED AIRCRAFT WING

"Rapid prototyping" using 3D printing was a great phase one innovation, but now it is entering phase two using 3D printers for manufacturing finished products. In fact, it has been estimated that 20 percent of current output are final parts rather than prototypes, and that number is expected to rise to 50 percent by 2020. The idea of using 3D printing to produce finished parts is so attractive because it creates dramatically less waste than machining, saving on production costs. It can be used for a wide variety of materials from high grade titanium alloys to plastic, glass or concrete, and allows designs to be fine-tuned without costly retooling. The latest (and largest) undertaking for 3D printing is to create an entire airplane wing. If it's successful, it could change the entire face of manufacturing, allowing an entire aircraft to be built in one location and eliminating supply-chain issues that can slow production.

For information: Airbus (An Eads Company), 1, Rond Point Maurice Bellonte, 31707 Blagnac Cedex, France; phone: +33-5-61-93-33-33; Web site: www.airbus.com or www.eads.com

MINI CELL PHONE TOWER

Today's wireless industry relies on large antenna networks with wide areas of coverage. But a new technology that reduces cell tower base stations to a box the size of a Rubik's cube could start replacing those unsightly towers as early

as next year. Called the lightRadio™ cube, the device uses less power, yet handles 30 percent more capacity. It will be compatible with all carriers and cell phone technologies – 2G, 3G, 4G and LTE – and can be located virtually anywhere. They can also be arranged in grids in areas where signal demands are higher.

For information: Alcatel-Lucent, 3 av. Octave Greard, 75005 Paris, France; phone: +33-(0)1-40-76-10-10; Web site: www.alcatel-lucent.com

UBIQUITOUS IRIS SCANS

As numerous patents on iris scanning technology are set to expire, we can expect to see iris-detection capabilities on more and more devices. Iris patterns are complex and unique, making them as reliable as fingerprints for identifying individuals. But overuse may cause problems with identity theft if databases become compromised. While fingerprints are considered to be an "active" metric (you need to touch something to leave an imprint behind), iris scans are "passive" meaning that they can be detected in-motion and at a distance, simply by passing a security camera. In addition to traditional security applications, such as facility access, border control, financial services and counter-terrorism, a new handheld scanner for personal identity protection on portable electronic devices will likely be available in the near future.

For information: Hoyos Corporation, West Industrial Park, A14 Bay #3, Tolima Valley, Caguas, Puerto Rico 00725; phone: 787-961-2007; fax: 787-961-2020; Web site: www.hoyosgroup.com

POWER-GENERATING TEXTILES

Researchers at the University of Texas have found a way to harness the properties of nanotubes to create electrically and thermally conductive thread. Also known as biscrolled yarn, the threads are spun from carbon nanotubes that have been infused with superconducting particles such as boron and magnesium powder. In addition to fabricating garments that would charge a cell phone, for example, biscrolled yarns could be used to create any number of tangible product for everyday use, including sutures with antibiotic properties or self-cleaning clothes that destroy impurities and micro-organisms when exposed to sunlight.

For information: Ray Baughman, University of Texas at Dallas, Alan G. MacDiarmid NanoTech Institute, BE26, 800 West Campbell Road, Richardson, TX 75080; phone: 972-883-6538; fax: 972-883-6529; email: ray.baughman@utdallas.edu; Web site: www.utdallas.edu

THIN FILM SOLAR CELLS

A new substrate for organic thin film solar cells has been developed that is as efficient as silicon and converting light into electricity. The key to the design are arch-shaped protrusions that measure about 40 nanometers in diameter. Although they are less durable than silicon solar cells, organic thin film cells are lightweight and significantly less expensive. In addition, they are flexible and can generate power from fluorescent lighting making them ideal for mobile devices and wall outlets. The new devices are targeted for release in 2015.

For information: Beans Laboratory, MBR Building, 6th floor, 67 Kanda-Sahumagashi, Chiyoda-ku, Tokyo 101-0026, Japan; Web site: www.beanspj.org/lab/index.html (Japanese only)

INTELLIGENT PLASTIC WRAP

In the United Kingdom, it has been estimated that more than eight million tons of food is thrown away every year – much of which could have been eaten. Next-generation plastic packaging aims to reduce unnecessary food waste and improve food safety by providing consumers with a visual indicator of freshness. An indicator in the plastic changes color when food has expired, has been poorly refrigerated, or the packaging has been damaged. The plastic would be less expensive than inserting labels into a package, and could hit stores within two years.

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