TECHNO TRENDS
THE BIG IDEAS THAT ARE CHANGING EVERYTHING

KEEPING UP IS A FOOLS GAME

BY DANIEL BURRUS, CEO OF BURRUS RESEARCH

Keeping up—with technology, with competitors, with anything in business or life—is a fool's game. Think about it… When you're keeping up, what's the advantage? In reality, there is no advantage to keeping up, because all you're doing is making yourself just like everyone else. You're finding out who the best is and then you're copying the best. But by the time you get as good as the best, the best has already moved on to something better, and you're still far behind.

Realize that "benchmarking" is just a fancy way of saying "keeping up." When you benchmark you're simply identifying the best practices of what others do well and then striving to imitate them. Again, once you reach the benchmarked standards, the company or person that set the benchmark has already moved on to achieve higher standards.

So how do you gain advantage and truly stand out from the crowd? The key is to forget about keeping up and set a new standard for yourself and your company. Consider the following suggestions.

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KEEPING UP *(continued from page 1)*

LOOK TO THE FUTURE

Rather than keeping up, smart business people benchmark in a way that looks to the future. When they plan their future growth, they ask themselves three key questions: 1) Where are the successful companies evolving to? 2) What path are my competitors on right now? 3) What's the logical progression of the industry? Asking these questions enables you to go beyond your competition and get off the treadmill of keeping up. It opens your eyes to future possibilities—to stay ahead of the pack instead of side-by-side with them. Remember: Only when you go beyond your competition will you find advantage—and the financial rewards competitive advantage brings.

DO WHAT THE MASSES DON'T DO

Most businesses do exactly the same thing as their competitors and then wonder why they don't have the upper hand. For example, determine if there's a better customer you can go after—one that's better and different than what everyone else is going after. Can you customize your product or service for the better customer so that the better customer would want what you offer and not what the competitor offers? A process of constant innovation and differentiation provides you with new levels of advantage on an on-going basis. Perhaps there was a time when it made sense to play the one-upmanship game of keeping up with the competition. But the dramatic changes spawned by science and technology has made that a perilous game for the present and a formula for disaster for the future. Those who merely "keep up" are usually so caught up in meeting their day-to-day challenges that they can only worry about the future, while the real business innovators see the present as a stepping stone they can use to get to a bigger and better future. A new world is taking shape before our eyes, and no company can afford to hide out in the old familiar places. While it's important to stay abreast of changes and update your company as new technologies and developments unfold, it's just as crucial to distance yourself from the competition and embrace a forward thinking mindset that will enable you to turn tomorrow's opportunities into today's profits.

TECHNOLOGY NEWS HIGHLIGHTS

HIGH-ENERGY BIOFUEL

Researchers at the University of Wisconsin have developed a new process for converting biomass into a fuel that has a 40 percent higher energy density than ethanol. Called dimethylfuran or DMF, the renewable liquid fuel is also more stable in storage because it does not evaporate as readily as similar fuels and it is not contaminated by humidity from the atmosphere. The process starts with converting fructose (a biomass-derived sugar) to an intermediate chemical called hydroxymethyl furfural (HMF). The HMF is then extracted using a solvent and converted to DMF using a copper-ruthenium catalyst. The removal of oxygen molecules increases the volatility and energy density of the compound while decreasing water-solubility. The resulting fuel will allow for more efficient distribution, storage and combustion than ethanol.

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RFID "POWDER"

The world's smallest RFID chips yet were recently unveiled by Hitachi. Measuring only .05 mm square (smaller than the diameter of a human hair) the tiny chips resemble powder. They are 64 times smaller than mu-chips – which are currently being used in paper currency, gift certificates and admission tickets as an anti-counterfeit measure – yet have an equivalent 128-bit ROM that can store a unique 38-digit identification number. The company plans to begin marketing the device in two to three years.

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

RFID BOTTLE CAPS

Container manufacturers in Japan recently announced the development of a plastic bottle cap for soft drinks with an

embedded RFID chip. The passive 2.45GHz tag contains a chip and micro antenna with a communication range of 10 cm. The device is also impervious to any moisture that may be released from the beverage. The new tags should make it easier for manufacturers to comply with increasingly stricter standards for improving traceability within the food supply line. Production is scheduled to begin in 2008.

For information: Japan Crown Cork Company, Ltd., 1-3-1 Uchisaiwaicho, Chiyoda-ku, Tokyo 100-0011, Japan; phone: +81-3-3502-7731; fax: +81-3-3508-1308; Web site: www.toyo-seikan.co.jp/e/

SOFTWARE READS HAND GESTURES

A new system may soon be available as an add-on for video games and computers that allows users to control 3D images using hand gestures. Best of all, it requires no expensive input devices, such as special gloves. Instead, it uses an off-the-shelf Webcam and a software algorithm that selectively extracts hand movements from the background. With a twist of the hand, objects can be rotated; moving the hands closer to or further from the screen will zoom the image in and out. An audio input also allows the user to switch modes using sounds, for example, by snapping their fingers. The package is expected to become commercially available in as little as one year with a price tag of under $200.

For information: Visible Intelligence, Tsukuba Center, Inc., B5, 2-1-6 Sengen, Tsukuba City, Ibaraki Prefecture, Japan 305-0047; Web site: www.visiblei.com

SILICON LASERS

A new technology that combines the bandwidth of fiber optics with the efficiency of silicon may be a cost-effective solution to the challenge of transmitting large amounts of data within and around the high performance computers of the future. While fiber optics are excellent for carrying data at extremely high bandwidths, complex fabrication methods and costly raw materials make them too expensive for widespread use. So, in an effort to reduce cost without sacrificing performance, researchers developed the world's first hybrid silicon laser. It uses an indium-phosphide compound (commonly used in fiber optic telecommunications) to generate and amplify light, and more affordable silicon-based components to route, detect, and modulate the signals. The two materials are heated and fused together in to a single chip, where the silicon layer acts as a waveguide to contain and control the light generated by the indium-phosphide layer. The result is an inexpensive laser that bridges the gap between electron computing and photon transmission. Eventually, hundreds of hybrid silicon lasers could be integrated into silicon photonic chips to produce "data pipes" that carry terabits of data.

For information: John Bowers, University of California at Santa Barbara, Electrical and Computer Engineering, Santa Barbara, CA 93106; phone: 805-893-8447; email: bowers@ece.ucsb.edu; Web site: www.engineering.ucsb.edu

HIGHER DENSITY BLU-RAY

A new development in image compression will allow high definition image files to be squeezed down to 1/125th of their current size without sacrificing picture quality. While typical Blu-Ray compresses data down to about 1.5 Gigabits per second, the new technology, which conforms to the new MPEG4 standard, requires only 12 Megabits per second of information and one-third the processing time. With current MPEG2 technology, recording a two-hour movie requires a 50GB, double-layer disk. In comparison, the new high-density technology will allow a four-hour movie to be recorded on a single-layer, 25GB disk and still maintain its high resolution.

For information: Victor Company of Japan, Limited (JVC), 12, Moriya-cho 3-chome, Kanagawa-ku, Yokohama, 221-8528, Japan; Web site: www.jvc.co.jp/english/

REVERSIBLE HYDROGENATION

Canadian scientists have developed a non-metal compound called phosphonium borate that readily combines with hydrogen and releases it "on demand" when heated. The reversibility of the process could be an important key in overcoming many of the problems associated with storage of hydrogen for use as fuel. But the innovative new compound may have applications in other industries as well. Hydrogenation – a chemical process that is commonly used to add hydrogen molecules to foods, fertilizers, and pharmaceuticals – typically uses metals such as platinum, which are

expensive and can lead to low levels of metal contamination in the body and in the environment. Phosphonium borate, on the other hand, can be created in the lab inexpensively and is environmentally friendly.

For information: Douglas Stephan, University of Windsor, Department of Chemistry and Biochemistry, 273-1 Essex Hall, 401 Sunset Avenue, Windsor, ON N9B 3P4, Canada; phone: 519-253-3000 ext. 3521; fax: 519-973-7098; email: Stephan@uwindsor.ca; Web site: www.uwindsor.ca/

WORLD'S SMALLEST ULTRASONIC MOTOR

A prototype motor that measures less than 1 mm in diameter and 3.6 mm long is currently being evaluated for use in medical and industrial applications. The tiny device is powered by ultrasonic vibrations, which are generated by an external piezoelectric power source and transferred to a coil within the motor by a 50-micron diameter wire. When the coil vibrates, it drives a cylinder at rates of 2000 to 4000 rotations per minute with a torque force that is roughly equivalent to the hands on a quartz watch. Because it can operate in liquids, possible uses for the miniature motor include removing blood clots or manipulating the lens of an endoscope inside blood vessels. It could also be adapted to perform internal inspections of equipment.

For information: Seiko Instruments, Inc., 8, Nakase 1-chome, Mihama-ku, Chiba-shi, Chiba 261-8507, Japan; phone: +81-43-211-1111; Web site: www.sii.co.jp

ORGANIC "NANOLAMPS"

A group of experts in the fields of nanofabrication and organic materials has collaborated to produce light-emitting nanofibers that are smaller than the wavelengths of light they emit! Using a relatively simple fabrication method called electrospinning, a solution containing a metal/polymer mixture is ejected onto a rotating substrate of micro-patterned gold electrodes. As the solution stretches, it forms fibers only 200 nanometers wide – about the size of the smallest bacteria – which harden as the solvent evaporates. When a low voltage is applied through the electrode substrate, the fibers emit an orange light. Potential applications for the tiny "lightbulbs" include illuminating nanosized objects under a microscope and developing small, flexible displays.

For information: George Malliaras, Cornell University, Materials Science and Engineering, 327 Bard Hall, Ithaca, NY 14853; phone: 607-255-1956; fax: 607-255-2365; email: ggml@cornell.edu; Web site: www.mse.cornell.edu

"REWIRING" THE BRAIN

An implantable electronic chip may someday help reshape neural connections in the brains of patients who suffer from impaired movement due to injury or stroke. Called Neurochip, the brain-computer interface is designed to record activity in one part of the brain and then feed a signal back into a different part of the brain to stimulate muscle movement.In studies on monkeys, the researchers found that the brain learned to use the artificial pathways created by Neurochip to compensate for impaired pathways. With only one day of conditioning, the new connections appeared to remain active for more than a week after the circuit was turned off, suggesting that the brain can actually harness signals to produce changes in itself.

For information: Eberhard Fetz, University of Washington, Washington National Primate Research Center, Box 357330, Seattle, WA 98195-7330; phone: 206-685-2486; fax: 206-685-8606; email: fetz@u.washington.edu; Web site: www.washington.edu

SEARCHABLE PATENT DATABASE

The Japanese Patent Office recently announced plans to provide open access to its patent search system by 2014. The goal is to reduce the number of patents received for review each year by giving inventors the ability to determine for themselves whether similar patents already exist, before they submit. The current system allows public access only to titles and outlines, whereas the new system will include related research and drawings as well. The office hopes to reduce the average review time from more than the current two years to eleven months.

For information: Japan Patent Office, International Affairs Division, General Affairs Department, 3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan; fax: +81-33-3581-0762; Web site: www.jpo.go.jp

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