

# TECHNOTRENDS®

## Newsletter

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### **Leveraging Intellectual Capital By Daniel Burrus**

Several years ago, I attended a meeting with executives and managers from one of the largest automobile manufacturers in the world. One of the top executives stood before the large crowd and said that the most valuable asset they have is their brand recognition. At that point, I knew this company was heading for trouble, and as I look at the headlines in the paper today, this icon of American manufacturing is struggling to survive. Don't get me wrong. Brand recognition is very important. However, there are other things that have even more value.

Over the past twenty-five years, I have observed that the most valuable assets of an organization tend to be the knowledge, talent, experience, capabilities, and vision of the people within the organization. These, coupled with the value of their patents, customer bases, and good will, equal what is called their intellectual assets. When leaders understand how to formalize, capture, and leverage their intellectual capital to produce higher-valued assets, profits tend to soar.

In the early '90s, I asked executives of the Mayo Clinic to do something that I am asking you to consider doing today – that is, to look at what I call the “visible future.” The visible future is the part that you *can* see. Of course, the people at the Mayo Clinic said, “We don't like to do that.” And when I asked why, they answered, “Because it depresses us.” Indeed, their visible future included decreasing reimbursements for Medicare and Medicaid and increasing losses in their emergency rooms. To the executives of the Mayo Clinic, the future looked bleak. They were puzzled when I suggested, “Why don't you sell your knowledge?” Further thinking led them to put Mayo Clinic knowledge on CD (the Clinic's first knowledge-based product). Any time, day or night, people who purchased the CD could put it in their PC and determine if, for example, their child's rash and fever required just aspirin or a trip to the emergency room.

The Mayo Clinic put a \$100 price tag on their CD product when it first came out about 15 years ago, and in the first year I was told they sold 670,000 copies. A light went on for the Clinic executives: leveraging internal knowledge creates value. A side benefit they discovered was that by expanding to offer a knowledge-based product, they began to develop a new and powerful 21st-century brand in the marketplace. In the past, in order to get help from the Mayo Clinic (and give them revenue), you had to go to their location. Now, with a CD in French, German, Spanish, or Japanese, the Clinic could help people anywhere around the world at any time, long before 24/7 became a popular phrase. And why have just one CD? Why not customize the product for elementary schools, high schools, medical schools, and nursing homes?

As you might guess, after the Internet and the Web took off, customers could also tap into the Mayo Clinic online. The result was to create new value and new revenue; they open their customer base up not to people who are geographically close, but to the world. And in the case of the Mayo Clinic, the name recognition isn't regional or national anymore; it became international. Are you leveraging the most valuable assets in your organization?

## TECHNOLOGY NEWS HIGHLIGHTS

### **UNLEASHING THE POTENTIAL OF BIOGAS**

Some people may believe that the widespread utilization of biogas as an alternative fuel source is still a pipedream, but in Linköping, Sweden it's already in the pipeline. As the result of a cooperative effort between municipal officials and farmers, the city now runs 67 buses, 80 taxis, and a passenger train exclusively on biogas produced from slaughterhouse waste. The methane-based fuel is extracted by placing waste – such as manure, blood, intestines and other organs – into a digestion tank where it is maintained at a temperature of 95° F for 18 to 30 days while bacteria transform it into biogas. The gas is then filtered to remove carbon dioxide, water vapor, and hydrogen sulfide, and piped to a depot where vehicles (up to 45 at one time) are slow-filled overnight to be ready for service the next day. In general, a bus can carry enough methane fuel to travel 300-400 kilometers. Automobiles, such as those currently being manufactured by Volvo for distribution in Europe, are typically equipped with two tanks – one for diesel and one for biogas – and can travel up to 200 kilometers on either of them. The price for biogas is comparable to that of diesel fuel; however, the potential payoff for the environment is substantial. It is estimated that for each bus running on biogas, nitrous oxide emissions are reduced annually by 1.2 metric tons and carbon dioxide emissions by 90 metric tons per vehicle.

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### **HIGH PERFORMANCE, HIGHLY FLEXIBLE FIBER OPTICS**

Traditional fiber optic cables have a high capacity for transmitting data, but because they are made from glass, they are not suitable for use in tight spaces since they break if bent too sharply. A new high-performance plastic fiber called LUMISTAR-X may change all that. The acrylic resin fiber is not only bendable (to a radius of 10mm), it is also capable of carrying data at rates of up to 10 Gigabits per second. The new fibers will make it possible to extend optical capabilities right into the home and even into devices themselves. Because the fibers are easier to handle, installation costs may also be reduced.

For information: Fuji Photo Film Co., Ltd., 26-30, Nishiazabu 2-chome, Minato-ku, Tokyo 106-8620, Japan; Web site: [www.fujifilm.com](http://www.fujifilm.com)

### **PAINT REPAIRS SCRATCHES ON ITS OWN**

Nissan will soon be releasing a revolutionary new paint coating that automatically repairs minor scratches from things like car washes, off-road driving, and fingernails. Called "Scratch Guard Coat," the highly elastic resin becomes fluid on a molecular level, filling in any grooves that appear. It can return a scratched surface to its original luster in anywhere from one day to one week, depending on the ambient temperature and the depth of the scratch. The scratch can also be repaired more quickly by applying heat directly to the area. The coating is totally clear, so it can be used on any vehicle body color, and will maintain its scratch-resistance for about three years. It will first be introduced on a line of SUVs.

For information: Nissan Motor Co., Ltd., 17-1, Ginza 6-chome, Chuo-ku, Tokyo, 104-8023, Japan; phone: +81-03-3543-5523; Web site: [www.nissan-global.com](http://www.nissan-global.com)

## **BOOSTING BATTERY POWER**

Thanks to nanotechnology, a whole new generation of batteries is poised to hit the market this summer. A new and improved version of lithium-ion technology will enable the new batteries to carry five times as much power as their existing counterparts. The batteries are made by “doping” poorly conductive materials with trace amounts of lithium. The particles are then shrunk in size to make it easier for ion exchange to take place. The resulting batteries are powerful enough to provide the needed torque for applications such as professional tools, lawn mowers and vacuums, and will be capable of recharging to 90 percent capacity in five minutes. They will also withstand up to ten times more discharge/recharge cycles than current lithium-ion batteries. An added advantage of the new design is safety. In nail-puncture tests, which normally cause lithium-ion batteries to burn, the nanotech batteries produced only a small amount of vapor.

For information: A123 Systems, The Arsenal on the Charles, One Kingsbury Avenue, Watertown, MA 02472; phone: 617-778-5700; fax: 617-778-5794; Web site: [www.a123systems.com](http://www.a123systems.com)

## **BETTER DIGITAL CAMERAS**

A team of researchers at the University of Rochester has designed a prototype chip that could revolutionize digital photography. The chip is based on two newly patented technologies that not only serve to dramatically reduce power drain but also improve image quality. The net result may someday be a camera the size of a button that can run for years without changing batteries. The first technological advancement enables an image to be digitized at the site of each pixel. It also enables more light to be sampled so that the dynamic range is increased from 1:1,000 (typical of today’s cameras) to 1:100,000. This translates into higher resolution chips that are faster and less power hungry than existing CMOS detectors. The second advance deals with more efficient compression of the image. Called Focal Plane Image Compression, it arranges the photodiodes on the chip so that as little as one percent of the computing power (and hence battery power) is required to compress the image. Initial applications for these new technologies will undoubtedly include security cameras to transmit high quality images in low light conditions while keeping battery consumption low. But devices such as these are also likely to revolutionize consumer products, bringing capabilities such as cell-phone video calls one step closer to reality.

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## **ELECTRONIC TASTE-TESTER**

Chemists at Keio University recently unveiled a taste analyzer that is capable of evaluating beverages in the same way that humans detect flavors. The device consists of eight electrodes, each of which carries a compound corresponding to the eight sensations of flavor on the tongue, including ions (sodium, potassium, hydrogen and chlorine) and molecules (sucrose, glucose, glutamate and caffeine). The concentrations of each substance in a liquid sample are measured and compared to a database of human taste sensations. The system then outputs a graph depicting the overall flavor characteristics of the beverage. The device will be a useful tool for helping beverage manufacturers manage quality control and may be commercially available in as little as two years.

For information: Koji Suzuki, Keio University, Graduate School of Science and Technology, 3-14-1 Hiyoshi Kohoku-ku, Yokohama-shi, Kanagawa-ken, 223-8522, Japan; email: [suzuki@applc.keio.ac.jp](mailto:suzuki@applc.keio.ac.jp); Web site: [www.applc.keio.ac.jp](http://www.applc.keio.ac.jp)

## **FILTER REMOVES DEADLY VIRUSES FROM BLOOD**

A new device that is capable of filtering smallpox, Ebola, and other viruses from human blood may enter clinical trials in the U.S. by the end of the year. Called Hemopurifier™, the filter, which resembles a dialysis cartridge, may provide an effective means for treating drug- and vaccine-resistant bio threats, pandemic viruses, or other infectious diseases. The Hemopurifier uses plant-derived antibodies to bind to a variety of viruses and remove them from the bloodstream. Depending on the strain to be targeted, the plant solution can be modified to be selective for specific diseases. In addition to a hospital version of the device (which is about one foot long and an inch in diameter), the company has designed a pen-sized version for field use. Instead of requiring a pump to operate, it uses the pumping action of the patient's heart to force blood through the filter.

For information: Aethlon Medical, Inc., 3030 Bunker Hill Street, Suite 4000, San Diego, CA 92109; phone: 858-459-7800; Web site: [www.aethlonmedical.com](http://www.aethlonmedical.com)

## **NANOSCOPIC VIDEO**

Atomic force microscopes (AFMs) have provided scientists with incredibly detailed pictures of the nanoworld, but they operate relatively slowly, so the images are limited to still photographs. Recently, however, engineers at Georgia Institute of Technology developed a new version of an AFM that operates at 100 times the speed of conventional devices, making it possible to produce real-time video of molecular interactions as they are occurring. Traditional AFMs map out the topographical detail of a sample by dragging a tiny cantilevered tip over the surface. Mechanically raising and lowering the tip is time-consuming in comparison to reactions that take microseconds to complete. The new design uses a circular membrane to support the tip. Rather than moving the entire assembly up and down, the membrane flexes in response to electrical signals, making it more responsive. In addition to measuring the external structure of an object, the new device also reveals information on elasticity, stiffness, stickiness and other properties.

For information: F. Levent Degertekin, Georgia Institute of Technology, School of Mechanical Engineering, 801 Ferst Drive NW, Atlanta, GA 30332-0405; phone: 404-894-3200; fax: 404-894-8336; email: [levent@degertekin@me.gatech.edu](mailto:levent@degertekin@me.gatech.edu); Web site: [www.me.gatech.edu](http://www.me.gatech.edu)

## **MULTI-USER INTERACTIVE DISPLAYS**

Today's touch-sensitive displays are practical for single points of contact, but researchers at New York University's Media Research Lab are taking touch screens beyond "press" and "poke" functionality to create what may be the next big step in computer interfaces. Using a technique called frustrated total internal reflection (FTIR), they have developed a touch-sensitive screen that is capable of distinguishing between multiple fingers or multiple users simultaneously. It also enables users to grab, expand, shrink, and merge objects within a 3D space, offering an unparalleled level of sophistication, usability, and flexibility. The technology will be especially useful for large-scale display applications such as interactive walls and tabletops.

For information: Jefferson Han, New York University, Media Research Lab, 719 Broadway, 12<sup>th</sup> Floor, New York, NY 10003; phone: 212-998-3390; fax: 212-995-4122; email: [jhan@mrl.nyu.edu](mailto:jhan@mrl.nyu.edu); Web site: [www.mrl.nyu.edu](http://www.mrl.nyu.edu)





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## About Daniel Burrus

Daniel Burrus is one of the world's leading technology forecasters and business strategists, and is the author of six books, including the highly acclaimed *Technotrends*, which has been translated into over a dozen languages. He is the founder and CEO of Burrus Research Associates, Inc., a research and consulting firm that specializes in global innovations in science and technology, their creative application, and future impact.



In 1983, Burrus became the first and only futurist to accurately identify the twenty technology categories that would drive two decades of revolutionary change. Since then, he has established a worldwide reputation for his exceptional record of predicting the future of technological change and its direct impact on the business world. He has helped hundreds of clients identify new opportunities and develop successful competitive strategies based on the creative application of leading-edge technologies, and has delivered over 2,200 keynote speeches to corporations, associations, and professional organizations worldwide.



In his presentations, Mr. Burrus blends timely and provocative knowledge with just the right amount of humor and motivation. He is a master at tailoring his presentations to his audiences as he addresses relevant trends and offers powerful, practical guidance for turning rapid change into a competitive advantage.



Burrus' client list encompasses a wide range of industries, and includes many Fortune 500 companies such as GE, IBM, Oracle, Microsoft, DuPont, Yahoo!, Toshiba, American Express, Northwestern Mutual, ExxonMobil, and Sara Lee. He has been the featured subject of a *PBS Special*, has appeared on programs such as *Larry King*, *CNN*, and *Bloomberg*, and is quoted in a variety of publications, including *USA Today*, *Fortune* and *Industry Week*.

*"From all of us at Yahoo!, a very BIG thanks for your insight, candor, ideas, inspiration, enthusiasm and sheer presence at our annual conference. You made a real contribution to our program and helped elevate our thinking."*

**-- Wenda Millard, Chief Sales Officer, Yahoo!**