TECHNO TRENDS
THE BIG IDEAS THAT ARE CHANGING EVERYTHING

DON'T GET STUCK; MOVE FORWARD

BY DANIEL BURRUS, CEO OF BURRUS RESEARCH

A difficult problem can easily become a roadblock so large that it seems impossible to get around it. The result is often procrastination. The longer the problem is in place, the more you become convinced there are no solutions. Here are a few simple steps you can use to skip your problem, a concept I introduced in my article last month.

1. YOUR PROBLEM ISN'T THE REAL PROBLEM

Often, you can't see the real problem because you're blinded by what you perceive is the problem. By skipping what you perceive as the problem, you are free to discover the real problem. For example, the pharmaceutical company mentioned last month thought their problem was not having the budget to hire a large number of scientific and technical researchers. But when they skipped that problem they saw that their real problem was being able to find molecular solutions. Therefore, forget about what you think is the problem. If that problem simply didn't exist, what would be the real problem? Often the real problem (and solutions) will surface once you eliminate the perceived problem. *continued on page 2*

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2. THINK IN TERMS OF OPPOSITES

Often, the opposite of what you perceive is the problem is really your solution. For example, if your problem is "saving money," what's the opposite of that? Spending money. So instead of focusing on how you can save money, try focusing on your company's spending. When you focus on the spending and alter your company's spending habits, the "saving money" solution becomes evident.

3. LOOK AT TECHNOLOGY FOR HELP

Today's technology offers a wealth of options for solving numerous problems. Can't find a good typist for your company? How about using dictation software? Need a way to get more ideas for your products or services? Use the Internet to connect to customers via online surveys. Look at what you need done and find a technology solution to automate it for you.

4. PEEL THE ONION

Think of your problem as the top layer of an onion. To find the problem, you need to peel it back by listing the components of the problem to see if you are working on the correct issue. Often you'll find that the core issue you're focusing on isn't the one that's causing the most pain, but that a sub-issue is truly at the heart of your problem.

5. FOCUS ON ONE ISSUE AT A TIME

Sometimes a problem is complex and has many components working against you all at once. In fact, many problems are made up of multiple problems. You'll be better able to see the real problem (the one you should focus on) when you separate the other problems.

SKIP TO THE FINISH

Every problem has a solution – some better than others. By asking yourself if you can skip the problem completely, you free your mind to look beyond the roadblock. That is usually where the solution lies.

TECHNOLOGY NEWS HIGHLIGHTS

POCKET-SIZED BIOSENSOR

A new biosensor that is small enough to fit in a pocket may give clinicians a quick, easy, and inexpensive means for diagnosing diseases. Called a Hall device, it can detect even a single molecule of a target protein in a blood sample. The device contains antibodies for a specific protein along with tiny grains of iron, which are also mixed into a blood sample. If the sample contains the disease marker, it will bind to the antibodies. When current is passed through the device while it is exposed to a magnetic field, the presence of the protein is signaled by a change in electrical properties. The entire test takes only tens of seconds to complete.

For information: Tokyo Institute of Technology, Tokyo 152-8550, Japan; phone: +81-3-5734-2975; Web site: www.titech.ac.jp

ETHANOL FROM SWITCHGRASS

Researchers at the U.S. Department of Agriculture recently published the results of a five-year study on the feasibility of using switchgrass as an alternative to corn for producing ethanol. Cultivars were grown on marginal cropland throughout the mid-continental U.S. in varying temperature and precipitation conditions, using typical farming practices. Several factors were measured including energy input costs and energy yield. They found that switchgrass could produce 540 percent more energy than would be consumed to convert it, as compared to corn, which produces only 25 percent more energy. In addition, switchgrass is a perennial, making it far less expensive to grow and maintain.

For information: Kenneth P. Vogel, U.S. Department of Agriculture, Agriculture Research Service, University of Nebraska, 314 Biochemistry Hall, P.O. Box 830737, Lincoln, NE 68583; phone: 402-472-1564; email: kvogel1@unl.edu; Web site: www.unl.edu

FOUNTAIN OF YOUTH?

A new substance isolated from a lily plant that is native to India was recently shown to be sixteen times more effective than current anti-aging compounds at reducing the production of enzymes associated with wrinkles. The compound – a type of bibenzyl glycoside – works to inhibit tyrosinase, which is involved in synthesizing a skin pigment called melanin. The new chemical is inexpensive to manufacture and is water soluble, so it can easily be

added to cosmetics. Safety tests will soon be underway, but because the compound is plant-derived, safety is not expected to be an issue.

For information: Utsunomiya University, Japan; phone: +81-028-649-8649; Web site: www.utsunomiya-u.ac.jp/en/index.html

SYNTHETIC JET FUEL

As oil costs soar, the aviation industry is looking more and more to alternative sources for jet fuel. Petrochemical researchers in South Africa recently received approval from authorities, airlines, and engine manufacturers to use a new synthetic fuel derived from coal in commercial jets. The coal-to-liquids technology is expected to reduce cost and help stabilize prices in an otherwise volatile market.

For information: Sasol Synfuels, 1 Sturdee Avenue, Rosebank 2196, South Africa, P.O. Box 5486, Johannesburg, South Africa; phone: +27-27-610-1111; fax: +27-17-610-4149; Web site: www.sasol.com

FLEXIBLE DISPLAYS

A new semiconductor containing sulfur and carbon nanotubes could pave the way for paper-thin, bendable organic electroluminescent (OEL) displays. Unlike present OELs, which contain a silicon-based substrate, the new material would be totally malleable. And because the new technology drastically reduces production costs (by up to 90 percent) it may find applications in electronic paper and wireless smart tags as well.

For information: Toray industries Inc., Nihonbashi Mitsui Tower, 1-1, Nihonbashi-Muromachi 2-chome, Chuo-0ku, Tokyo 103-8666, Japan; phone: +81-3-3245-5115; fax: +81-3-3245-5344; Web site: www.toray.com

NO MORE TRANSISTORS?

A new electronic component has been developed that could mark the beginning of the end for transistors as the basis for computer chips. Called memristors, the new circuits can act as a conductor or an insulator, depending on the voltage applied. They also allow the amount of current flowing through the device to be controlled so that they operate more like a dial than a switch. They can not only be set for "1" (on) or "0" (off), but also for anything in between, making them act like digital or analog devices. The new components are faster, more powerful, consume less energy, and retain information even when they are shut down. They are also extremely space efficient; up to 100 times more memristors could fit on a chip than typical transistors.

For information: Stanley Williams, Director of Quantum Science Research, Hewlett Packard Labs, 3000 Hanover Street, Palo Alto, CA 94304; phone: 650-857-1501; fax: 650-857-5518; Web site: www.hpl.hp.com

BAMBOO WARDROBE

Bamboo fabric is gaining in popularity as a sustainable and eco-friendly alternative to traditional materials. One of the world's fastest growing plants, it matures in three to four years and requires no pesticides or fertilizers. Plus, its fibers can be woven into strong silky fabrics that are widely used in Asian countries. However, it has been shown that damaging ultraviolet (UV) rays can readily penetrate bamboo fabrics, providing little protection from the sun. In addition, the cellulose fibers wick moisture away from the body, providing a haven for bacteria and unpleasant odors. Recently researchers developed a special bacteriocide containing UV absorbing molecules that alleviates both problems. In fabrics treated with the solution, bacterial concentrations were reduced by up to 80 percent and the ultraviolet protection factor (UPF) was boosted to 56.

For information: Subhash Appidi, Colorado State University, Ft. Collins, CO 80523; email: subhash.appidi@colostate.edu; Web site: www.colostate.edu

WASH AWAY CATARACTS

Surgery is no longer the only option for people suffering from cataracts. A new eye drop solution called C-KAD, now in the final stages of clinical testing, is designed to dissolve the age-related accumulation of protein in the lens of the eye that is the leading cause of blindness throughout the world. A permeation enhancer, which allows the solution to pen-

etrate all parts of the eye, including the cornea and the retina, also makes it effective for treating other eye diseases such as glaucoma and diabetic retinopathy. The new eye drops may be available in as little as two years.

For information: Rajiv Bhushan, Chakshu Research, 130 Knowles Drive, Suite A, Los Gatos, CA 95032; phone: 408-871-1002; Web site: www.chakshu.com

500GB OPTICAL DISC

Storage capacities continue to increase geometrically as companies find more and more efficient ways to read and write data. The latest breakthrough is a reflective type of phase change material that fills in the nano-sized pits on an optical disc. When heated with a laser, it changes from a crystalline state to an amorphous state. This decreases its reflectivity, which can be read as a bit. The result is a fourfold increase in density per layer. However, data can also be read from five layers instead of just two, yielding storage densities ten times that of Blu-ray technology.

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

AFFORDABLE SOLAR

A new solar technology is due to be released in mid-2009 that will generate electricity for about 7 cents per kilowatt-hour. That's comparable to the cost of cheap coal-fired power. The key is a "concentrated photovoltaic" system that reduces the number of cells needed by magnifying the sunlight two thousand times. The company has also developed a proprietary heat removal technology that extends the useful life of the cells. The system is designed to be modular and upgradeable. It can be deployed in small configurations and distributed over multiple sites. Plans call for marketing to large industrial and commercial customers initially, but the product should be available to homeowners within three years.

For information: SUNRGI, 6430 Sunset Blvd., Suite 500, Hollywood, CA 90028; phone: 323-469-3210; fax: 323-957-0842; Web site: www.sunrgi.com

DISEASE-FIGHTING ALLIGATORS

Intrigued by the fact that alligators can heal rapidly after serious injury, and almost never suffer from an infection in spite of the fact that they often live in stagnant water, chemists are now looking to these animals for clues on treating antibiotic resistant superbugs. In one study, researchers have successfully isolated several disease-fighting peptides that are capable of protecting alligators from just about any microbes, even those for which they have developed no antibodies. In tests on twenty-three different strains of bacteria, all were wiped out when exposed to the alligator proteins. The next step is to determine which one work best and why.

For information: Mark Merchant, McNeese State University, 4205 Ryan Street, Lake Charles, LA 70609; phone: 337-475-5000; email: mmerchant@mcneese.edu; Web site: www.mcneese.edu

PUTTING AN END TO STOWAWAY ORGANISMS

In an effort to curb the proliferation of invasive species of marine life – such as zebra mussels in the Great Lakes – engineers are investigating a new ballast system for ships aimed at preventing the spread of unwanted organisms. Currently, water is pumped into sealed ballast tanks so that ships can maintain an optimum height in the water. When they arrive at their destination, the water is discharged, along with the organisms it contains. The new system employs hollow tubes, which allow the water to pass through from bow to stern. By adjusting the number of open tubes, the buoyancy can be controlled, but contaminants are never carried from one port to the next. Scale model studies also suggest that the new design could cut energy usage by about 7 percent.

For information: University of Michigan, Department of Naval Architecture and Marine Engineering, 2600 Draper Drive, Ann Arbor, MI 48109; phone: 734-764-6470; fax: 743-936-8820; Web site: www.engin.umich.edu

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