TECHNO TRENDS
THE BIG IDEAS THAT ARE CHANGING EVERYTHING

BUSINESS APPS FOR SMART DEVICES

BY DANIEL BURRUS, CEO OF BURRUS RESEARCH

Today we're in the midst of a computing hardware and software paradigm shift that is spreading faster than anything we've seen before.

Previously, you could only use a computer by accessing a mainframe using a terminal. Then came desktops. Mainframes did not go away; we simply changed our primary interface device. Next came laptops. Mainframes and desktops still didn't go away, but the laptop became the interface device of choice. Now, the power of a laptop is being put in the palm of our hand with Smartphones and Smartpads. And because they are a phone, multi-media computer, video conferencing platform, still and video camera, locator and navigator, and game and entertainment center that is with us 24/7, they are transforming all areas of life.

The second shift is in software and software distribution. We went from enterprise level software for mainframes to personal and business packages for our desktops and laptops. Now we have the app software revolution. Again, the old doesn't go away, but the main tool we're using is changing.

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BUSINESS APPS FOR SMART DEVICES *(continued from page 1)*

With apps becoming more popular, it's now time to explore a new level of apps – what I've coined Enterprise Level Apps. These are apps customized for such wide-scale applications as purchasing, logistics, supply chain management, sales, and military security, just to name a few.

Combine this with the real time data revolution that's also taking place, and you can see how groundbreaking these enterprise apps are. Never before have people been able to get information and data in their hand right as it's happening. So when something occurs, is produced, or a need arises, that information is immediately visible to anyone authorized to see it. To have that visibility – and have it with you 24/7 in the form of an app – is both powerful and amazing. Instead of just having real time data, companies are transitioning into real time enterprises, which means they are using real time data to make better decisions faster. Following are some examples of this new app technology:

PURCHASING APP

Suppose you work at a hospital and want to purchase an item. The moment you discover the need, you can pull up the hospital's purchasing app on your Smartphone. You can see all the pre-approved items that fit your need and select what you want. When you click on the item, you can get an instant approval or denial. If there's a denial because your request doesn't meet pre-defined purchase parameters established by the hospital's head of purchasing or CFO, you can get a reason and access steps to move forward to make that purchase happen. At the same time, everyone involved in the purchase can have instant access to that request and its status.

MILITARY AND SECURITY APPS

With a security app for a military base, if an incident occurs on base, such as a fire, everyone on base can know exactly what happened and where the incident is – all from your phone and the minute it occurs. Depending on your role on base, you can know where to go and what to do. You can see the location of the fire extinguishers and other emergency tools. If there is an explosion and you need to go to a secure place, you can see where to go and how to get there. You can locate different emergency assets quickly from the palm of your hand.

Amazing? Yes! But don't look for apps like this yet. They're currently in development. When they do hit the market, however, they'll empower organizations with real time tools and data that will streamline operations and ultimately increase both productivity and profits.

TECHNOLOGY NEWS HIGHLIGHTS

FAST-CHARGE FOR CARS

One of the barriers to widespread acceptance of electric vehicles is the time it takes to charge them, but a new system will soon be available that is capable of charging car batteries up to 50 percent capacity in as little as three minutes – about as long as it takes to pump a tank of gas. The new charging station is similar in size to a typical gas pump and costs about 40 percent less to install than current chargers. It will operate on a standard power source using specially designed lithium batteries, which store power at night (when demand is low) and deliver up to five times more current. The manufacturer estimates that the device will save about 900,000 yen (nearly $10,000US) in electricity costs each year as compared with currently available high-speed chargers. The system will be marketed to gas stations and convenience stores in Japan beginning later this year.

For information: JFE Engineering Corporation, First Floor, Nihon Building, 2-6-2 Otemachi, Chiyoda-ku, Tokyo 100-0004, Japan; Web site: www.jfe-eng.co.jp/en/

MAN-MADE BACTERIA

Researchers recently announced development of the first bacteria strain that is totally man-made. Known as Mycoplasma mycoides, the non-infectious microbe was designed by assembling chemicals into a gene chromosome inside yeast cells. It was then transplanted into a different species of bacteria where it "booted up" and began to reproduce. The fourteen genes that would allow the organism to become infectious were eliminated from the gene map as a failsafe, however, the researchers

warn that it would be possible to engineer a dangerous organism using the same techniques. For that reason, steps are already being taken to control the chemicals needed to synthesize genomes. This development represents an important advancement in the future use of designer microbes for manufacturing fuels, chemicals and other materials.

For information: Craig Venter, J. Craig Venter Institute, 9704 Medical Center Drive, Rockville, MD 20850; phone: 301-795-7000; Web site: www.jcvi.org

HYDROGEN CELL LOCOMOTIVE

The Burlington Northern Santa Fe Railway recently unveiled a fully hydrogen-powered locomotive – believed to be the first of its kind in the world. Designed through a partnership with the United States Department of Defense, it is intended to be used as a backup power source for disaster relief efforts in the event oil and fuel is not available. The technology is also being explored as a "green" alternative for transporting freight.

For information: Burlington Northern Santa Fe Railway Company, 2650 Lou Menk Drive, Second Floor, P.O. Box 961057, Fort Worth, TX 76161-0057; phone: 817-352-1000; Web site: www.bnsf.com

FASTER MEMORY STICK

The Memory Stick Pro-HG Duo has a read speed of 30 megabytes per second – 50 percent faster than its predecessors – thanks to improved flash memory and a new controller chip. The 32-gigabyte model, which went on sale this month, retails for about $250. Memory Stick-Pro HG Duo is also available in 16 gigabyte and 8 gigabyte versions.

For information: Sony Corporation, 1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan; phone: +81-3-6748-2111; Web site: www.sony.net

GREEN BATTERIES

A protein structure found in pea plants could revolutionize solar cells or form the basis for "green" batteries. Known as Photosystem I (PSI) complex, it acts as a nano-machine that turns light into chemical energy during the process of photosynthesis with 100 percent efficiency. Recently, researchers isolated crystals of PSI and used them to convert sunlight into electricity. When they were placed on gold-covered plates, illuminating them generated a voltage of 10 volts. This ability to harness the power of sunlight could readily be put to use to meet small-scale power needs even in areas where current solar technologies are impractical.

For information: Nathan Nelson, Tel Aviv University, Department of Biochemistry, George S. Wise Faculty of Life Sciences, Tel Aviv 69978, Israel; phone: +972-3-640-6017; fax: +972-3-640-6018; email: nelson@post.tau.ac.il; Web site: www.tau.ac.il/index-eng.html

MICROBIAL FUEL CELL

Have you ever dug down into mucky slime and smelled the odor of rotten eggs? That's the smell of bacteria – and it could be a reliable source of power in the future. Bacteria in mud eat carbon material to fuel their metabolic activity, which, in turn, creates electrons. Now, U.S. naval scientists have developed a technology that can harness the energy from those bacteria by dumping the excess electrons onto an electrode, creating a microbial fuel cell. As a point of comparison, a D-cell battery will supply one watt of power for about one hour. But a fuel cell powered by microbes could provide an equivalent amount of energy for nine months or longer. The navy intends to use the devices to power sensors that can operate sustainably under water, such as the ones currently being used to study pacific green sea turtles.

For information: Linda Chrisey, Office of Naval Research, One Liberty Center, 875 North Randolph Street, Arlington, VA 22203; phone: 703-696-4504; email: Linda.chrisey@navy.mil; Web site: www.onr.navy.mil

WORLD'S SMALLEST PUMP

Although glass is generally known for not being able to conduct electric current, it behaves very differently at the nano level due to a phenomenon known as "dielectric breakdown." Now, engineers at the University of Michigan have taken advantage of that property to create the world's smallest pump. First, they used ultra-fast laser pulses to cut tunnels (0.6 micrometers wide) through glass rods that are thinner than a human hair (about 4 micrometers in diameter). The thin glass walls act like electrodes to conduct electricity, so by switching the current on and off they were able to create a pumping action that they

described as "liquid wire." One important application for such devices is in the medical industry, where they could be used to inject tiny amounts of drugs directly into cells, or to sample miniscule amounts of fluid from diseased cells.

For information: Alan Hunt, University of Michigan, Associate Professor of Biomedical Engineering, 2170 Lurie Biomedical Engineering Building, 1101 Beal Avenue, Ann Arbor, MI 48109; phone: 734-615-0331; fax: 734-936-1905; email: ajhunt@umich.edu; Web site: www.engin.umich.edu or www.umich.edu

AUTOMATED MANNEQUIN

A new line of robotic mannequins uses sensors and cameras to respond to people as they approach. Dubbed "Palette" mannequins, they can strike a variety of poses by rotating their head and neck around four separate axes. A built-in neural network also records shopper reactions – such as how long they remain engaged – and learns over time which poses are most effective at keeping their attention. An upper torso Palette can be purchased for about 700,000 yen ($7,550US) or leased for 134,000 yen ($1,450US) per month. The full-body version retails for 5,000,000 yen ($54,000US) or about 300,000 yen ($3,250US) per month on rental.

For information: Flower Robotics, Inc., #201 H Building, Hillside Terrace, 18-17 Sarugaku-cho, Shibiya-ku, Tokyo 150-0033, Japan; Web site: www.flower-robotics.com/english.htm/

IS MICROWAVED FOOD MAKING YOU SICK?

Research on the effect of microwave radiation on human tissue has centered mainly on the environmental effects of cell phone towers and other high-frequency devices. But there may be evidence that using microwaves to heat our food has similar detrimental effects on our health. In addition to nutrient loss that occurs through heating, microwaves can actually alter the molecular structure of nutrients, affecting how the body absorbs them. The food itself can even become a passive carrier of radiation. So the next time you spend more to buy organic, consider the fact that how you cook your food could have a big impact on how beneficial it is to eat.

For information: Dr. Joseph Mercola, Dr. Mercola's Natural Health Center, 3200 W. Higgins Road, Hoffman Estates, IL 60169; phone: 877-985-2695 or 847-252-4355; Web site: www.mercola.com

FLYING SAUCERS

A Russian manufacturer has designed a helium-filled airship with a carrying capacity of 600 metric tons. Shaped like a flying saucer to minimize drag, a smaller version of the Locomoskayner is already being used for geographical prospecting, but a super-sized cargo-passenger version is planned that can transport up to 11,000 people at one time. The Locomoskayner-600 will have the cargo-carrying capacity of an entire train, without limitations on where it can travel (i.e. no need for tracks). That means it can travel to remote and inaccessible areas, for example, to evacuate people in the event of natural disasters. It can land on open ground without the need for special equipment, or it can load and unload without landing at all using customized lift mechanisms.

For information: Locomo Sky, Lublin Street 42, Moscow, Russia; phone: +7-495-748-1595; Web site: www.locomosky.ru/en/

TACTILE FEEDBACK FOR ROBOTIC SURGEONS

A new device has been developed that will greatly improve dexterity and control during robotic surgery. The system uses pneumatically actuated drives to create the same feel that a surgeon would get during traditional surgery, and is sensitive enough to distinguish between a balloon filled with air and one filled with water. This tactile feedback should minimize damage to tissues and organs by making it more intuitive for doctors when manipulating forceps through tiny incisions.

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