



TECHNO

THE BIG IDEAS THAT
ARE CHANGING EVERYTHING

TRENDS

WEB 3.0

BY DANIEL BURRUS, CEO OF BURRUS RESEARCH



To date, the Web has gone through two basic iterations. The first generation, Web 1.0, ran from 1995 to 1999 and can best be described as a flat, one-dimensional way of displaying information that could be accessed by keyword searches. Hyperlinking text was a key feature of the first generation Web and pop-up ads were seen as a way of revenue generation. Google's current project, digitizing all of the world's books and making the contents available via search, is basically using an advanced form of Web 1.0.

The second iteration of the Web, Web 2.0, started in 2000, and its hallmark trait is all about users sharing with other users. Peer-to-peer networking was the application used by Napster to take the Web to the next level by offering music file sharing to the masses. Since then we have seen enthusiastic amateurs from around the world work together to classify and post massive amounts of new content on the collective encyclopedia project Wikipedia.

Idea sharing tools such as Blogs, personality-sharing sites such as MySpace, photo-sharing sites such as Flickr, and video sharing sites such as YouTube are all great examples of the sharing nature of Web 2.0 *Continued on page 2*

APRIL 2007

VOL. XXIII, NO. 4

- Test Kit Identifies Multiple Viruses
- Satellite-Tracking Antenna
- Top Speed For 4G Wireless
- Brain Simulator
- Nanotech Goes Flat
- Portable Water Treatment Plant
- Wireless HDTV
- World Rail Speed Record
- Live TV On The Web
- Giant Cargo Ship
- Cancer-Killing Filter

VISIT TECHNOTRENDS.COM

For an easy solution to keep up on the rapidly changing world of science and technology, visit our new updated web site Technotrends.com

SIGN UP FOR OUR FREE VIDEO E-BRIEFING

Visit our web site www.Burrus.com and sign up on our home page to receive our free Video e-Briefing featuring highlights of our monthly Consumer Intentions and Actions Survey.

PUBLISHED BY: **burrus**
research

800-827-6770

www.burrus.com

WEB 3.0 *(continued from page 1)*

Thanks to the underlying technology of XML, which allows machines to talk to other machines over the Web, applications can also connect to and share data with each other. A good example would be connecting corporate or personal location-based data to Google Maps. The next generation of the Web, Web 3.0, is already beginning as we bring artificial intelligence to the Web making our searches more relevant, useful and accurate. These searches will have a level of guidance to them.

Today, when you enter a word or phrase into a search engine such as Google or Yahoo!, you get thousands of responses, most of which are not useful. With Web 3.0 technology, you can type in a question about managing your 401K account, and you will get relevant advice based on all of your previous searches. The search function will become more of an automated advisor. Web 3.0 will also have the option of using a 3-D Web browser providing an inner spatial world to interact with. An early version is Linden Lab's Second Life where 2.1 million registered players select an avatar of themselves. They can interact with others, purchase land, build homes and conduct business.

In my keynote speeches, I have been showing off an early prototype of a 3D Web browser since 2000. It's easy to predict the future when you are already there. Business audiences always respond positively to the demonstration of the 3-D eCommerce engine that will let potential customers interact with an electronic sales agent, or if you wish, a real human sales person. Computers finally have enough power, and there are enough high-speed Internet connections, both wired and wireless, to enable the transition to Web 3.0 applications over the next few years.

TECHNOLOGY NEWS HIGHLIGHTS

TEST KIT IDENTIFIES MULTIPLE VIRUSES

A new biochip that is capable of identifying more than ten strains of influenza (including bird flu) at one time is currently being tested at Singapore's National University Hospital. Called Vereflu, the new test requires only a tiny sample of infectious material swabbed from a patient's mouth or nose. The sample is magnified and analyzed by a portable optical reader that can be installed on any PC. It is then compared to a database of known viruses to determine what diseases are present as well as whether or not they have mutated or become drug-resistant. Unlike current tests that look for only one specific strain, Vereflu can potentially detect up to 400 different viruses, tropical diseases, cancer markers, and genetic diseases. In laboratory tests, the new technique has been shown to be 99 percent accurate. Because it needs only a small sample, it is capable of detecting influenza even before the patient becomes symptomatic. The developers envision using the system at immigration checkpoints, farms and clinics for simple, early detection of possible flu outbreaks.

For information: Dr. Rosemary Tan, CEO, Veredus Laboratories Pte, Ltd.; phone: +65-6776-3633; fax +65-6776-6636; email: rosemary@vereduslabs.com; Web site: www.vereduslabs.com

SATELLITE-TRACKING ANTENNA

A new antenna has been developed that automatically adjusts its position to maximize signal reception, even when located in a moving vehicle. The device, which is not affected by noise, will enable high-speed connectivity for multi-media applications while on trains, buses, and other modes of transportation. The prototype is a one-meter diameter dish, the surface of which is covered with small radio receivers. The direction of a satellite is calculated by monitoring the phase difference between groups of receivers. The antenna then rotates and adjusts its angle of elevation, moving at up to ten degrees per second, to track the signal. Even when mounted on a bullet train, the system is capable of maintaining a high-speed Internet connection of 30Mbps.

For information: Nippon Telegraph and Telephone Corporation, 3-1, Otemachi 2-chome, Chiyoda-ku, Tokyo 100-8116, Japan; Web site: www.ntt.co.jp

TOP SPEED FOR 4G WIRELESS

The technology for fourth generation (4G) mobile communications recently reached another milestone with the first successful wireless data transmission at a rate of 5Gbps. The field test used 12 multiple-input multiple-output (MIMO) antennas at a frequency bandwidth of 100 MHz and proprietary signal processing technology to break the previous record of 3.5Gbps posted last year. A handset using 4G-technology at 5Gbps would be 1,300 times faster than currently available

wireless technologies.. In other words, a two-hour movie could be downloaded in about six seconds.

For information: NTT DoCoMo, Inc., 2-11-1, Nagata-cho, Chiyoda-ku, Tokyo 100-6150, Japan; phone: +81-3-5156-1111; fax: +81-3-5156-0271; Web site: www.nttdocomo.com

BRAIN SIMULATOR

Computer science is coming closer to modeling brain function. On the Blue Gene L supercomputer, researchers recently reported creating a "virtual" mouse brain that exhibited dynamic properties of actual thought patterns, including synapses firing in coordinated patterns and neurons forming spontaneously. But they are still a long way from simulating true brain function. Even with 8 million virtual neurons, each having 6,300 virtual synapses, this test represented only half of a typical mouse brain, and the simulation was so complex that it could only run for a period of ten seconds at one-tenth the speed of a real-life brain. The next step will be to speed up the simulation and add structure to more closely mimic nature.

For information: James Frye, Rajagopal Ananthanarayanan, or Dharmendra Modha, IBM Almaden Research Center, 650 Harry Road, San Jose, CA 95120-6099; phone: 408-927-1080; Web site: www.almaden.ibm.com

NANOTECH GOES FLAT

Graphene – sheets of carbon that are one atom thick – is the latest craze in materials science. The thinnest material known to man, physicists are hoping that it will help them explore certain quantum effects more easily. Many of these phenomena occur in other substances, but only at extreme temperatures. With graphene, the same effects can be observed at room temperature. Unlike nanotubes and buckyballs, graphene can be produced easily and inexpensively using a very low-tech tool – cellophane tape. By placing graphite flakes on the adhesive and repeatedly folding and unfolding it, it is possible to produce flakes that are the thickness of a single carbon atom. In addition, researchers can easily determine whether the flakes are a single layer thick by viewing their color under a simple light microscope.

For information: Andre Geim, University of Manchester, School of Physics and Astronomy, Oxford Road, Manchester M13 9PL, United Kingdom; phone: +44-161-275-40-70; fax: +44-161-275-40-56; Web site: www.manchester.ac.uk

PORTABLE WATER TREATMENT PLANT

An innovative system called Solar Cube can produce enough fresh drinking water to sustain hundreds of families in the event of a disaster. It uses photovoltaic solar panels and a wind generator to power its unique systems for water purification and/or desalinization, providing up to 3,500 gallons of drinking water per day with minimal maintenance. Polluted water is first pumped through a series of filters, removing large particles. A reverse osmosis membrane then eliminates bacteria, viruses, and dangerous chemicals. The easy-to-operate system also incorporates a proprietary, automatic backwashing system and an AC inverter to power refrigeration or communication equipment. The price of the Solar Cube ranges from \$38,000 to \$80,000.

For information: Spectra Watermakers, Inc., 20 Mariposa Road, San Rafael, CA 94901; phone: 415-526-2780; fax: 415-526-2787; Web site: www.spectrawatermakers.com

WIRELESS HDTV

Get rid of those cumbersome cables! Later this year, it will be easier than ever to set up your high definition video theater. With the new wireless HDMI (high definition multimedia interface), simply attach a transmitter to the back of your cable box, DVD or Blu Ray Disc player, and a receiver to your high definition television. The system transmits 1080p high definition uncompressed video up to 25 feet away. The system is expected to retail for about \$400. A similar technology, scheduled to appear in Sanyo projectors, uses specially tuned WiFi to send 1080p video a distance of 100 feet or more.

For information: Tzero Technologies, Inc., 4545 West Maude Ave., Suite 100, Sunnyvale, CA 94085; phone: 408-328-5000; fax: 408-774-1784; Web site: www.tzerotech.com

Sanyo North America Corporation, 2055 Sanyo Avenue, San Diego, CA 92154; phone: 619-661-1134; fax: 619-661-6795; Web site: www.sanyo.com

WORLD RAIL SPEED RECORD

The V150 trainset made history earlier this month, reaching a speed of 574.8 kilometers (about 357 miles) per hour, a new world record on rails. The trainset consists of two power cars, two double-decker coaches and two high-speed motorized bogies. The total power output of the system is 25,000 horsepower or 19.6 megawatts. An onboard measurement laboratory incorporated 600 sensors to verify and analyze the aerodynamic, acoustic, and vibration data as well as the integrity of the materials at such high speeds.

For information: Alstom Transport, 48 rue Albert Dhalenne, Saint Ouen 93482 France; phone: +33-1-41-66-88-43; Web site: www.transport.alstom.com

LIVE TV ON THE WEB

Watching television on the Web is fine for on-demand programming, which allows content to be downloaded by different people at different times. But bandwidth limitations make transmitting live broadcasts over the Internet a problem. Now, a new system called Live Delivery Network makes it possible to distribute time-sensitive video feeds – such as news and sports – to millions of users without overloading the central server. It uses a peer-to-peer distribution tool called Pastry to make every user an active link in the broadcast chain. The server sends content to only a fraction of the recipients who, in turn, pass it on to other nearby nodes in the network. When a new subscriber comes online, its peers are updated so that data can be pushed to every user in the system automatically. The new system could eliminate the need for costly antenna systems such as those currently used to broadcast live content.

For information: Skinkers, 28-20 Kirby Street, London EC1N 8TE, United Kingdom; phone: +44-20-7579-8350; fax: +44-20-7579-8351; Web site: www.skinkers.com

CANCER-KILLING FILTER

Biomedical researchers at the University of Rochester are looking at an innovative new method to halt the spread of cancer. It is based on the fact that cancer cells grab onto adhesive proteins called selectins. When cancer cells break free of a primary tumor, they enter the blood stream and get carried to remote areas of the body where they can form a secondary tumor. But when a slender plastic tube coated with selectins that have been specifically designed to target cancer is placed in the blood stream, it captures the cells. Another molecule called TRAIL then delivers a biochemical signal that triggers apoptosis (cell death) within two days. Normal cells are left unharmed. The same technique for trapping cells has also been shown to be an effective and non-controversial method for harvesting stem cells. The researchers envision a device that could someday be implanted into the body, or be used outside the body in conjunction with a pump, to simultaneously kill cancer cells and harvest stem cells.

For information: Mike King, University of Rochester, Dept. of Biomedical Engineering, Rochester, NY 14627; phone: 585-275-3285; email: mike_king@urmc.rochester.edu; Web site: www.urmc.rochester.edu

GIANT CARGO SHIP

The world's largest cargo ship, measuring 1,303 feet long and with a deck that stands 251 feet above the water line, is now at sea. Its official cargo capacity is 11,000 20-foot containers, and its 2,300-ton engine cranks out 110,000 horsepower. But in spite of its size, the Emma Maersk is still environmentally friendly. A waste heat recovery system that feeds exhaust back into the engine reduces emissions and boosts efficiency by 12 percent. Instead of biocides that can leach into the oceans, the hull is coated with a silicon-based paint that reduces drag by keeping barnacles from attaching themselves. And although it will accommodate 30 people, an advanced, fully integrated computer control system allows the Emma Maersk to run smoothly with a 13-person crew.

For information: A.O. Moller-Maersk A/S, Esplanen 50, 1098 Copenhagen K, Denmark; phone: +45-3363-3363; fax: +45-3363-4108; Web site: www.maersk.com

Technotrends is published 12 times a year by Burrus Research, Inc., a research and consulting firm that monitors global advancements in science and technology and their direct impact on business and consumers. Patti Thomsen, Editor P.O. Box 47, Hartland, WI 53029-0047. To subscribe, call 800-827-6770, or email office@burrus.com. © 2007 Burrus Research, Inc.