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LEAN THOUGHTS

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10 Tech Concepts You Need to Know for 2007

From concrete that can flex to sensors that you swallow, here are the technologies you'll be talking about.

BY Alex Hutchinson
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Bendable Concrete

The nickname for Engineered Cementitious Composites (ECC) is self-explanatory: bendable concrete. Specially coated microscopic polymer fibers slide past each other instead of snapping under stress, so ECC bends without breaking. The material has been used to create stretchable expansion joints for a Michigan bridge, and to allow the coupling beams in a 41-story tower in Yokohama to flex during Japan's frequent earthquakes.
SHORT-TERM IMPACT: LOW It could take years for ECC to be commonly used in construction, unless a major earthquake puts it in the spotlight.

PRAM (Phase-Change Random Access Memory)

Flash memory, with no moving parts to break or wear down, is the data storage technology of choice for devices such as iPods and digital cameras. But phase-change RAM is set to overtake flash entirely—it uses a chemical found in rewritable discs, which is alternately heated and cooled to store data. The result is memory that's 30 times faster than flash, with more than 10 times the life span.
SHORT-TERM IMPACT: HIGH Samsung demonstrated a PRAM prototype in September and expects PRAM-enabled devices to be available in 2008.

Printed Solar Panels

Tomorrow's solar panels may not need to be produced in high-vacuum conditions in billion-dollar fabrication facilities. If California-based Nanosolar has its way, plants will use a nanostructured "ink" to form semiconductors, which would be printed on flexible sheets. Nanosolar is currently building a plant that will print 430 megawatts' worth of solar cells annually—more than triple the current solar output of the entire country.
SHORT-TERM IMPACT: LOW Solar power still isn't in wide use, so even a tech breakthrough will take time to have an effect. But the long-term outlook is brighter.

Passport Hacking

Starting this year, all new U.S. passports will include a radio-frequency identification (RFID) chip that stores a digital photo of the owner, as well as biographic data (name, date of birth and so on). The goal is to prevent passport counterfeiting, but hackers already have flexed their muscles: A German security researcher publicly cloned an e-passport at a Las Vegas conference last summer. The State Department promises additional encryption, which hackers will no doubt put to the test.
SHORT-TERM IMPACT: LOW Most people won't need a new passport for years. And even if counterfeiters are able to swipe data to make forged documents, these RFID chips won't hold financial information or Social Security numbers.

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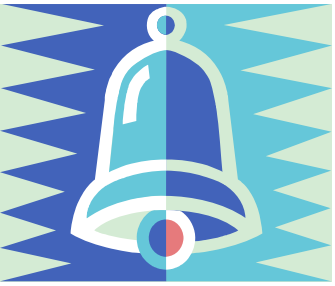
Where "Lean Thoughts" Become Reality

Vehicle Infrastructure Integration

Your car may have GPS navigation and radar blind-spot monitoring, but it still doesn't stand a chance against traffic. The Department of Transportation's Vehicle Infrastructure Integration program, which faces its final testing in 2007, might even the odds. The program involves installing a 5.9-GHz short-range wireless link in your car that can talk with other cars, as well as with control units at intersections and along the side of the road. Pool all the information being beamed from cars—speed, location, whether the wipers are on—and you have a map of traffic and weather conditions, so that drivers can be directed away from trouble spots. **SHORT-TERM IMPACT: LOWThis is only the latest — albeit the smartest — in a long history of federal initiatives to win the war on traffic. Next year, lawmakers will decide whether to wire up hundreds of thousands of intersections and roads, but getting automakers to install standardized transmitters might prove even trickier.**

Body Area Network

Picture this: The cellphone in your pocket sends a tiny electrical current—a fraction of an amp—along your skin, so your car door springs open at your touch and your PC logs in when you grab the mouse. That's what German startup ImCoSys says its new smartphone will be capable of, thanks to body area network (BAN) technology. Of course, proving those claims would require partner companies to build BAN-compatible devices, and no such deals have been announced since the phone was released last summer. **SHORT-TERM IMPACT: LOWUsing your body as a secure network is smarter than sticking finger- print scanners everywhere, but there's no guarantee that BAN products will ever materialize.**



Plasma Arc Gasification

Garbage can be a gold mine—when it's heated to 10,000 F. A plant being built in Florida will use a plasma arc jet (like the one shown at left) to turn 3000 tons of garbage a day into steam for nearby factories, sludge for road construction and 120 megawatts of electricity—all with promise of minimal emissions. **SHORT-TERM IMPACT: LOWThe Florida plant will go on line in 2009, at the earliest.**

VoN (Video on the Net)

The first Video on the Net (VoN) conference was in 1998, but the concept of watching videos on your PC is only now reaching maturity. Products like Apple's iTV video-streaming box, due to launch this year, promise to simplify the sometimes geeky process of finding and playing video files. And Google's $1.65 billion acquisition of YouTube last fall is evidence that VoN is big business, though exactly what kind of business is anyone's guess. **SHORT-TERM IMPACT: HIGHTiVo, DVRs and iTunes have already changed the way many people watch TV, and VoN is likely to make shows and movies more accessible than ever.**

Smart Pills

These swallowable, vitamin-size sensors won't make you smarter, but anything that lets you avoid an endoscopy is a pretty good idea. The FDA-approved sensor (right), from Buffalo-based SmartPill, transmits data about pressure, acidity and temperature to a 5 x 4-in. receiver that patients carry around with them during the pill's trip through their gastrointestinal tract. SmartPill already has competition—the Israeli company Given Imaging has developed a similar sensor called PillCam. **SHORT-TERM IMPACT: HIGHWhile you won't be popping them on a daily basis, these sensors — which at press time were on the verge of being shipped—could make a wide range of invasive procedures obsolete.**

Data Cloud

Ferrying data from one hard drive to another via e-mail, flash memory thumb drives or rewritable discs is no way to live. What if every one of your files, from skimpy documents to gigabyte-hogging music collections, were accessible from any Internet connection, forming a vast data cloud that follows you wherever you go? A host of products and services let you create a data cloud right now, from Maxtor's networked hard drives to Google's rumored Gdrive, with "unlimited" storage on the search giant's servers. Add a synchronization service such as Microsoft's FolderShare, which applies a change you've made on your PDA to that same file on your laptop and PC, and you're one step closer to retiring the original data storage device—the one in your head. **SHORT-TERM IMPACT: HIGHFor better or worse, data clouds are here to stay. With improved file sharing as well as new security concerns, they're already changing the face of computing.**

Consortium Event Schedule

Tour Workshop Conference

January	February	March	April	May	June
T **Wednesday 24** **Eaton Electrical,** contact Joe Fisher, JoeRFisher@eaton.com **W** **La-Z-Boy Corporate Monroe MI** **February 14 & 15** **Enterprise Value Stream Mapping** **How to use the VSM tools to map admin processes.** Contact Richard Kunst for info. Richard.kunst@la-z-boy.com Register at www.ame.org	**T** **Wednesday 14,** **CFN Precision,** contact Paul Kaulback, pkaulback@cfn-inc.com	**T** **Wednesday 21,** **Nestle Waters,** contact Mariela Castano mcastano@perriergroup.com	**T** **Wednesday 18,** **CTS Corp.,** contact Bob Garces, Bob.Garces@ac.ctscorp.com **C** **Lean Design & Development Conference** **Wed 18 to Fri 20** Chicago Contact www.iirusa.com/lean	**T** **Wednesday 16,** **Stackpole CSD,** contact Don Barber Don.Barber@stackpole.ca **Consortium Shareshowcase** **Saturday 05** **CGL Guelph.** Contact Cindy Grolleman Grolleman@canada.com or Dave Deskur daved@cglmfg.com	**T** **Wednesday 20,** **Morrison LaMothe,** contact Tony Vita tvita@morrisonlamthe.com **C** **AME Regional Conference** **Mon 18 to Thur 21** Edmonton, Alberta Contact www.measureupforsuccess.com
July	**August**	**September**	**October**	**November**	**December**
		T **Wednesday 26,** **Kraft Foods,** contact Hanif Jivraj hjivraj@Kraft.com	**T** **Wednesday 10,** **CGL Manufacturing** contact Dave Deskur daved@cglmfg.com **C** **AME National Conference** **Mon 29 to Friday Nov 2** Chicago Contact www.ame.org	**T** **Wednesday 14,** **Messier-Dowty,** contact Mike Smith Mike.Smith@Messier-dowty.on.ca	**T** **Wednesday 12,** **Orenda,** contact Brenda McIntosh brendamcintosh@orenda.com