



# DANIEL BURRUS' TECHNO TRENDS

THE BIG IDEAS THAT ARE  
CHANGING EVERYTHING

## How To Save The Manufacturing Sector

By Daniel Burrus, CEO of Burrus Research



Like most industries, the manufacturing sector is transforming rapidly. Because of recent technological advances and globalization, U.S. manufacturing is facing intense international competition, increasing market volatility and complexity, a declining workforce, and a host of other challenges. Yet we know that in order to have a strong economy, we need a strong manufacturing base. So what's the answer?

Today's manufacturers must transform along with the rest of the world by adopting six advanced Next Generation Manufacturing principles. They are:

1. **Anticipate customer needs:** Look at your customers' future and focus on what you do know rather than what you don't know. Ask, "What are the hard trends, the things that will happen, versus the things that might happen? What are the industries that are converging around our customers that our customers currently don't see?" Then you can start seeing both needs and opportunities before they happen.

2. **Innovate around the core:** What are your core competencies? Are you still using your core competencies? In the past, manufacturers could go decades between innovations. That strategy doesn't work anymore.

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## Save The Manufacturing Sector *(continued from page 1)*

Today you cannot just innovate now and then: to survive and thrive in a time of vertical change, you have to be innovating around your core competencies continuously. So what is your core, and are you using it?

**3. Focus on collaboration:** Collaboration is much different than cooperation. Cooperation is based on scarcity and it contains within it the assumption that your interests and mine are inherently in conflict; however, we will temporarily set aside those cross-purposes to find some cautious tactical common ground. In contrast, collaboration is when we co-create the future together. It's about working with everyone else, even your competitors, to make a bigger pie for all. It's based on abundance and requires working together under higher levels of trust and connectivity.

**4. Pre-solve problems:** The best way to avoid problems is to predict and pre-solve them. How? Use hard trends to look into the visible future and ask, "What are the problems that we can see based on anticipating customer needs?" Get that down to a short list that's aligned with your core competencies. Then that's where you focus because you can see which problems are coming. Additionally, look at your own company in the same manner to determine the problems you're about to face. Solve them before they happen so they don't occur in the midst of rapid change and transformation. That's the only way to stay ahead of the curve.

**5. Inform and communicate:** Informing is one-way. It's static and doesn't always cause action. Communicating is two-way. It's dynamic and usually causes action. Social media is a good example of engagement in communication, which is why it's spreading so rapidly and becoming a business tool. Next generation manufacturers understand that you don't just inform; you also communicate, develop that strategy, and move it out internally as well as externally.

**6. Do continuous de-commoditization:** The minute you come up with something new, a competitor will copy it. As they do so, your innovative product or service slowly becomes a commodity. The margins get thinner as time goes on. But instead of letting the margins get thinner and riding them down, you can wrap a service around a product or wrap a service around a service to add new value. You can think creatively about your product or service so you can repackage it, redefine it, revamp it, or somehow make it unique in the marketplace again. When you do continuous de-commoditization, you'll find yourself with good margins and a growing business.

In a competitive global economy that is becoming more tightly connected every day, U.S. manufacturers can no longer do things the way they've always been done. Adopting these next generation manufacturing principles is the only way to obtain the talents, capabilities, and resources necessary to build a highly effective enterprise that thrives in a global marketplace.

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### TECHNOLOGY NEWS HIGHLIGHTS

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## Sign Language Translator

U.K. researchers have developed a new portable sign language translator (PSLT) for laptops and other mobile devices. The application uses the devices' built-in cameras to capture hand movements and translates them directly into text, allowing people who are not fluent in signing to communicate with hearing-impaired individuals. The goal is to assist deaf students and workers in fulfilling their educational and workplace opportunities. An important feature of the system is the ability for users to personalize it with signs that express specific concepts and terms which may not be included in the vocabulary of conventional sign language, giving them the ability to express words that they previously could not. A version designed for use with British Sign Language and Makaton is planned for release in 2013.

*For information: Ernesto Compatangelo, University of Aberdeen, School of Natural and Computing Sciences; Meston Building, Meston Walk, Aberdeen AB24 3UE, United Kingdom; phone: +44-(0)1224-272910; fax: +44- (0)1224-273105; email: e.compatangelo@abdn.ac.uk; Web site: [www.abdn.ac.uk](http://www.abdn.ac.uk)*

## Personal Lab Mouse

Recent studies indicate that personalized mouse models may be an effective way to test an individualized treatment plan before administering it to a patient. In two independent tests, doctors transplanted bone marrow or tumor tissue from sick patients into mice whose immune systems had been suppressed. They then used the mice to determine the best combination of drugs or gene therapies to treat the disease. This approach could greatly reduce risk to the patient while giving them a much better chance of survival. It is also being used to study autoimmune diseases, such as type 1 diabetes, which is caused by uncontrolled T-cells attacking insulin-producing cells in the pancreas.

*For information: Megan Sykes, Columbia University, 650 West 168th Street, Black Building 1512, New York, NY 10032; phone: 212-304-5696; email: [megan.sykes@columbia.edu](mailto:megan.sykes@columbia.edu); Web site: [www.columbia.edu](http://www.columbia.edu)*

## Two-Minute Pothole Repair

A new “monster machine” has been developed that reduces the task of repairing potholes from one that requires multiple workers, multiple vehicles and several hours to a single-man, single-machine operation that takes about two minutes. Called the Python 5000, the self-propelled, five-ton capacity truck can be driven directly to the job site at highway speeds, eliminating the need to trailer equipment. A joystick controller allows the operator to clear out debris with compressed air, prep the patch with oil, apply hot or cold mix asphalt, and tamp it down with a hydraulic pressure controlled roller. It works equally well in sub-zero temperatures and pouring rain, and the patches are so strong that they may outlast the surrounding surface. Units are currently being evaluated in New York City.

*For information: Python Manufacturing, 1891 Albert Street N, Regina, Saskatchewan S4S 7K3, Canada; phone: 306-337-4440; fax: 306-337-4441; Web site: [www.pythonmfg.com](http://www.pythonmfg.com)*

## Camera Sees Around Corners

In another application of ultrafast computing, researchers recently reported developing an experimental camera that can “see” three-dimensional objects even when they’re obscured. It uses lasers that are pulsed at a rate of 50 femtoseconds (one femtosecond equals one quadrillionth of a second) onto an angled backing wall. When the pulses reflect off of the object and back onto the wall, the camera re-assembles them like a puzzle to create a somewhat rough, but recognizable picture. And all this occurs within about 15 millionths of a second. Since the prototype is still bulky and very expensive, initial uses will likely be limited to high-cost military or search-and-rescue operations, but the developers believe that the technology will be adaptable to mobile devices in the future.

*For information: Andreas Velten, Massachusetts Institute of Technology, Programming Media Arts and Sciences, E14-474G, 77 Massachusetts Avenue, Cambridge, MA 02139; phone: 617-253-0329; email: [velten@mit.edu](mailto:velten@mit.edu); Web site: [www.mit.edu](http://www.mit.edu)*

## Personal Fitness Monitoring

The latest design in personal monitoring technology requires no uncomfortable chest straps or armbands. The first disposable monitoring patch will be available by the end of the year, and it will track motion, skin temperature, sweat levels, and rate of heat flow from the body. The half-ounce, 3.5-inch long adhesive patch is designed to be worn on the upper arm for up to seven days. The data collected is then uploaded to a web site or app that charts activity levels, calories burned and sleep patterns.

*For information: BodyMedia, Inc., One Gateway Center, 420 Fort Duquesne Blvd. Suite 1900, Pittsburgh, PA 15222; phone: 412-288-9901; fax: 412-288-9902; Web site: [www.bodymedia.com](http://www.bodymedia.com)*

And soon, you may be able to monitor your vital signs without any contact at all. In the true spirit of Star Trek, a new device known as the Tricorder uses a digital camera to record chest movement and face color which is then analyzed to determine respiration and heart rate. With the addition of an infrared camera, it will also be able to sense body temperature. Other possible additions include sensors that could detect disease by analyzing the molecules in exhaled air. Still in the prototype phase, the Tricorder could be available as early as 2014.

*For information: Scanadu, NASA Ames Research Park, Building 20, 2nd Floor, Moffett Field, CA 94035; Web site: [www.scanadu.com](http://www.scanadu.com)*

## Bleeding Plastic

Scientists have investigated many approaches to self-healing materials that enable scratches to heal themselves when exposed to specific types of light or heat. But a new polymer, inspired by the properties of human skin, actually produces a visible color change – in this case a red splotch – when it’s scratched or torn. Made from water-based polymers, the new plastic is more environmentally friendly petroleum-based products. The color change also improves safety by drawing attention to potential structural defects. Finally, it can repair itself under a variety of conditions including sunlight, light from a bulb, changes in temperature or variations in pH. Applications for the new plastic include everything from nail polish to self-healing airplane parts.

*For information: Marek Urban, University of Southern Mississippi, Polymers and High Performance Materials, P. O. Box 05050, 118 College Drive, Hattiesburg, MS 39406; phone: 601-266-4868; email: marek.urban@usm.edu; Web site: [www.usm.edu](http://www.usm.edu)*

## Molecular Pillbox

A group of researchers has discovered a way to trap selected molecules in larger molecular nanoboxes until they are released on demand. The technology could someday be used to create “smart” medicines that are capable of transporting sensitive therapeutic drugs through the bloodstream to the site of the disease before being opened chemically. The work is based on the concept of “molecular recognition” which uses Fourier Transform Mass Spectrometry (FTMS) to distinguish compounds based on their molecular weight in samples less than one-billionth of a gram. The container molecules are designed to fit at an atomic level, ensuring that they react only with the target molecules.

*For information: David Dearden, Brigham Young University, Department of Chemistry and Biochemistry, Benson Science Building, Provo, UT 84602; phone: 801-422-2355; fax: 801-422-5383; email: david\_dearden@chem.byu.edu; Web site: [www.byu.edu](http://www.byu.edu)*

## Mobile Billing

More and more online businesses are offering customers the option of paying by phone, eliminating the need for credit cards. Although not as prevalent as it is in Asia and Europe, the services are currently being used by about 300 merchants in the U.S. and the number is growing. Buyers are given the option of billing purchases to their phone by typing in their phone number instead of a credit card number. Some provide an added level of security by requiring users to punch in a secret code that is immediately texted to the phone. The charges then show up on your monthly phone bill. Purchases in the U.S. are currently limited to things like online songs, videos, Facebook credits, and games, and most carriers set a maximum of \$100 per month to prevent “sticker shock” at billing time. But, as providers continue striving to ensure consumer security, someday you may be able to use the services to pay for just about anything.

*For information: BillToMobile, 2833 Junction Avenue, Suite 202, San Jose, CA 95134; phone: 408-232-3300; Web site: [www.billtomobile.com](http://www.billtomobile.com)  
 Boku, Inc. P.O. Box 190725, San Francisco, CA 94119; Web site: [www.boku.com](http://www.boku.com)*

## Fabric Batteries

Researchers have designed a new smart textile that’s essentially a woven battery. The new material could someday be made into garments that power your mobile electronics or even life-saving devices like defibrillators. It’s estimated that one garment could provide hundreds of volts of electricity. The fabric is constructed by sandwiching together layers of lithium iron phosphate cathodes, lithium titanium anodes and polyethylene oxide electrodes. The layers are exposed to heat, allowing them to be stretched into fibers which are woven into normal fabrics and assembled into clothing. The one remaining issue to be solved is making the technology waterproof, but otherwise, it’s perfectly safe for wear since it requires no liquid electrolytes.

*For information: Maksim Skorobogatiy, Polytechnic School of Montreal, Department of Engineering Physics, P.O. Box 6079; Station Centre-Ville, Montreal, Quebec H3C 3A7, Canada; phone: 514-340-4711; fax: 514-340-3218; email: maksim.skorobogatiy@polymtl.ca; Web site: [www.polymtl.ca/en/](http://www.polymtl.ca/en/) or [www.photonics.phys.polymtl.ca](http://www.photonics.phys.polymtl.ca)*

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