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Daniel Burrus'

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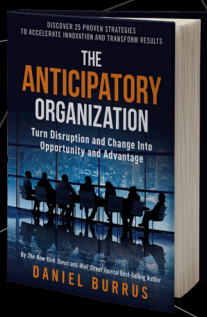
TECHNOTRENDS® NEWSLETTER

The biggest ideas that are changing everything

IN THIS ISSUE

MY NEW BOOK



Innovation leads to disruption, not being disrupted.

Learn more with my new book, The Anticipatory Organization, now available at www.TheAOBook.com

www.DanielBurrus.com

The Anticipatory Entrepreneur

By Daniel Burrus, CEO of Burrus Research

Ice hockey great Wayne Gretzky once said that the secret to his extraordinary career was skating to where the puck was going to be, not to where it had been.

That's a great way to think about the opportunity you can uncover by being anticipatory. Adopting an anticipatory mindset is enormously powerful, no matter what you do or the organization you happen to be a part of. But anticipation can prove particularly critical to entrepreneurs.

In his own way, Gretzky was very much an entrepreneur as he "created" a new form of hockey play that didn't depend on size or brute strength. Moreover, he didn't just dream of different ways of excelling at the sport—he acted on it, and brilliantly so.

Granted, saying you'll be the next Gretzky in the world of entrepreneurs if you develop an anticipatory mindset will take focus and discipline. But learning to be anticipatory versus being agile and reactionary will prove to be far more effective in helping you to innovate with low risk and envision amazing new ideas that you can bring to life with the confidence that certainty provides.

> *Entrepreneurs can go from evolution to revolution by using Hard Trends*

Don't React, Anticipate

At first glance, it's understandable to assume that every entrepreneur is anticipatory. Since their "job" is to create new things, that must obviously involve a degree of anticipatory thinking.

That's true to a certain extent, but it's not always the case. In many instances, some very successful entrepreneurial ideas were logical improvements upon existing products or services. By using anticipatory skills, entrepreneurs can go to the next level by learning to see the evolution of a product such as the evolution from vinyl records to eight-track tapes to cassettes to CDs while the evolution is occurring and use that knowledge to innovate with low risk. Better yet, entrepreneurs can go from evolution to revolution by using the Hard Trends that are shaping the future to create positive disruption. The evolution from vinyl records to CDs addressed many of the problems that prior products experienced—skipping and scratches, to name just two—but it was still a tangible means of delivering music.

Having your music stored on your smartphone or streaming from the cloud allowed you to break away from the necessity of fumbling with records and discs. It wasn't just a variation on a theme—rather, it was a completely new way of storing, accessing and listening to music. As I often tell my audiences about my love of music, "It didn't change how I listen to music, it transformed it, and today, I have no idea where my CD collection is, and I don't care!"

An anticipatory entrepreneur can go beyond simply improving upon something that already exists or react to a perceived need or void. Instead, she can clearly envision something utterly different—something that has the power to disrupt an entire landscape and opens people's eyes to something completely new.

As I also point out during my presentations, don't just

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TECHNOLOGY NEWS HIGHLIGHTS

Getting Back in Touch

For victims of spinal cord injury, loss of mobility is only half the story. In many cases, the impairment extends to their sense of touch as well as their sense of proprioception – a complex interaction of sensory neurons, stretch receptors and muscles that enables us to perform physical tasks like standing upright or walking without really thinking about them. Proprioception is controlled by special neurons in the spinal cord called sensory interneurons, which relay sensory information to the brain regarding the position of your body in three-dimensional space so you don't tip over sideways or trip over your own feet. When these neurons are damaged, any movement requires intense concentration and conscious effort. These same types of neurons are also largely responsible for fast reflexes such as pulling your hand away from heat.

In a recently published study, researchers have discovered a way to potentially restore damaged sensory interneurons using stem cells. Although the technique has been used successfully for other types of nerve cells (such as motor neurons), differentiating stem cells into sensory interneurons required an understanding of the signaling compounds that enable the process. Using chicken and mouse models, they determined that a molecule known as BMP4 produced the most robust results.

They further uncovered the fact that by carefully controlling the time at which the differentiation molecule was added, they could create different types of sensory neurons – type 1, which sense spatial location, and type 3, which sense pressure and touch. The next step is to make the process more efficient; currently, only about 35 percent of the cells matured into sensory neurons.

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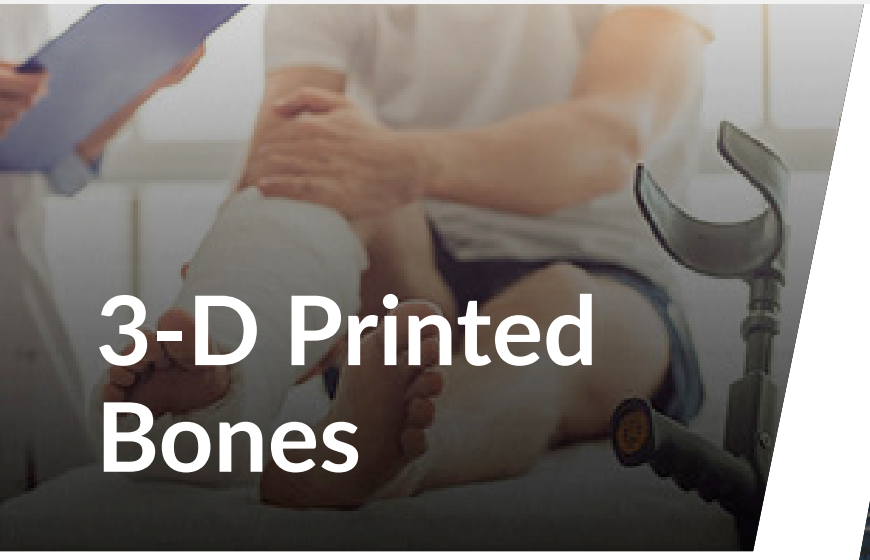

3-D Printed Bones

A new ceramic implant could eliminate the need for metal plates and screws in repairing broken bones. Using a mixture of minerals that closely matches the composition of natural bone, the new technique uses 3-D printing to create a scaffold, which eventually turns to real bone as the fracture heals.

Initial testing on rabbits showed complete healing of broken leg bones. In a subsequent study on sheep, the method has also been successful at repairing large leg fractures. After three months, 25 percent of fractures were completely healed, and within one year, 88 percent saw complete healing.

This is in spite of the fact that the sheep were walking on the implants immediately following surgery, with stabilizing casts for only four weeks.

X-rays confirmed that the scaffold gradually dissolved as the new bone grew back. There were no toxic side effects, as is often the case with bone grafts.

The team is planning to begin human clinical trials with repair of spinal defects and jawbones before moving on to larger fractures such as leg and hip bones. Their hope is to see the new material in clinical use within 10 years.

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The New Voice of Google

In the quest for the best voice synthesizer, Google claims to have built a system that rivals those using professional voice artists.

Called Tacotron 2, this latest text-to-speech system "learns" aspects of speech simply from recordings and transcripts. It can then generate sounds from text entirely from scratch, even if it has never encountered some of the words before.

The neural network algorithm considers several characteristics of human speech, including punctuation, intonation and a feature called prosody, which can best be described as the "tune" of the voice. Unlike purely mechanical qualities, prosody reflects qualities like emotion, sarcasm, emphasis and contrast.

Although it's a big improvement over the artificial-sounding robotic voices we've come to know (if not love), the developers admit that it still has its drawbacks, stumbling over complex words and periodically producing strange random noises.

It also cannot yet be used to generate real-time audio or be programmed to sound happy or sad. Regardless, it's safe to say that we're entering a new realm of speech synthesis where the quality may soon be indistinguishable from human speech.

For information: Google Research; Web site: https://research.googleblog.com/2017/12/tacotron-2-generating-human-like-speech.html

Reinventing Ultrasound

For more than a century, ultrasound bas been employed in a wide range of technological applications, including medical imaging. In more recent years, it was found that the contrast in grainy images could be improved by passing ultrasound waves through microbubbles.

In the last two decades, it was further discovered that those bubbles could penetrate the blood-brain barrier – a junction that makes it difficult to treat many neurological conditions because it's impassable by 98 percent of drugs.

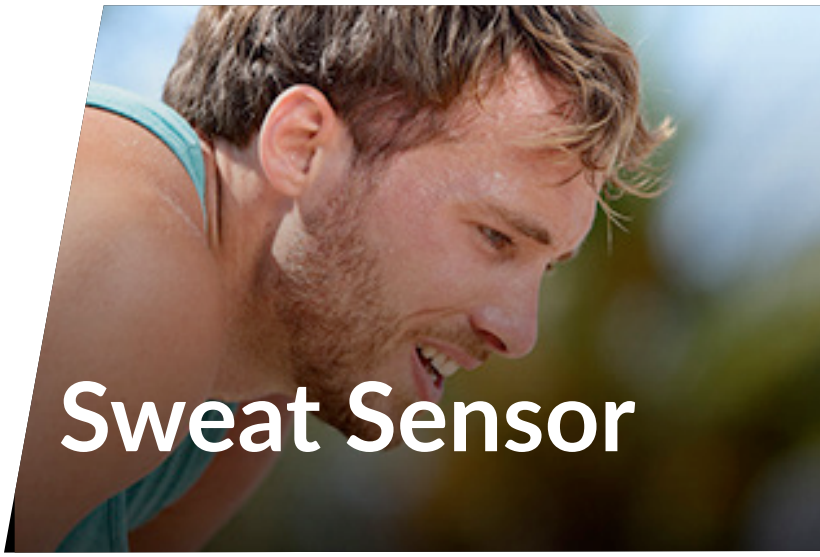
It turns out that when microbubbles at the blood-brain barrier are excited by a focused beam of ultrasound, the barrier opens up, allowing drugs like chemotherapy or anti-seizure medications to enter the brain.

The problem is that if the pressure becomes too great and the bubbles implode, they can cause irreversible damage.

Now, with the help of a special ultrasound listening helmet to detect the stability of the bubbles, and magnetic resonance imaging (MRI) to precisely focus the beams, it's possible to control the bubbles to deliver more precise therapy.

The technique could also have application for treatment of the colon to improve absorption of drugs for inflammatory bowel disease like Crohn's disease and ulcerative colitis. The company hopes to submit for FDA approval to begin human clinical trials later this year.

For information: Suono Bio, c/o Lab Central, 700 Main Street North, Cambridge, MA 02139; Web site: https://www.suonobio.com/



Sweat Sensor

A lightweight, wearable sweat sensor could be used to detect and monitor a variety of biochemical parameters for more precise diagnosis and treatment of a range of diseases.

The device includes a flexible sensor array that continuously measures skin temperature along with four key constituents of perspiration: sodium ions, potassium ions, glucose and lactate.

A wireless circuit board amplifies, filters, calibrates and transmits the signals to a smartphone or other device for further analysis and storage.

When used during exercise, the wearable system could alert the user of overheating, dehydration or fatigue. But the device can also be used diagnostically, for example, to monitor high chloride levels in cystic fibrosis patients or high glucose levels in pre-diabetics.

As the trend toward personalized medicine continues, devices such as this will play an increasingly important role.

For information: Ronald Davis, Stanford University, Genome Technology Center, 3165 Porter Drive, Palo Alto, CA 94304; phone: 650-721-5614; fax: 650-721-5651; email: ron.davis@stanford.edu; Web site: https://med.stanford.edu/news/all-news/2016/01/wearable-device-detects-real-time-changes-in-composition-of-sweat.html

Drone Warship

A new class of anti-submarine warfare vessel known as a Medium Displacement Unmanned Surface Vehicle (MDUSV) was recently transferred to the United States Navy, where it could be deployed for active operations as early as this year.

The first totally autonomous ship capable of transoceanic travel, the vessel carries no weapons but is designed for submarine surveillance and mine countermeasures. This represents a change in strategy for the Navy, which is moving away from the use of small numbers of large, high-value assets toward larger numbers of smaller platforms.

Known as Sea Hunter, the MDUSV is relatively inexpensive to build (around $20 million) and less costly to operate than manned vessels, and should be able to stay at sea for months at a time without a crew. The 127-foot-long craft has a maximum speed of 27 knots and a range of 10,000 nautical miles, and carries a full complement of cameras and radar.

The vision is to have flotillas of these ships operating in the Persian Gulf and western Pacific Ocean in about five years.

For information: Defense Advanced Research Projects Agency, 67 North Randolph Street, Arlington, VA 22303; phone: 703-26-6630; Web site: https://www.darpa.mil/news-events/2018-01-30a

Collaborative Robot

A multidisciplinary, collaborative project known as SecondHands is focused on advancing robotics for the industrial market.

They recently presented their first robot prototype – a collaborative robot (cobot) called ARMAR-6, whose job it will be to support maintenance technicians at a highly automated

customer fulfillment center.

The ultimate goal is for ARMAR-6 to supplement human capabilities by handling tasks that require a higher degree of strength or precision than their human counterparts are capable of doing.

The cobot will observe and learn through interaction, using advanced perception and an evolving knowledge base to function autonomously in a dynamic environment.

As robots evolve from performing repetitive tasks to more complex, interactive systems, the field of collaborative robotics is expected to become the fastest-growing market segment in industrial robotics.

According to the International Federation of Robotics, installations are expected to increase by 15 percent in 2018 alone.

For information: Ocado Technology, Buildings One and Two, Trident Place, Hatfield Business Park, Mosquito Way, Hatfield AL10 9UL, United Kingdom; Web site: https://ocadotechnology.com/blog/secondhands-project-first-robot-prototype/

Keeping Organs Viable for Transplant

Clinical trials of a new organ preservation system indicate that it's possible to double the length of time that a liver can be stored for transplant. Known as Metra, the device would not only increase the supply of viable organs, but also enable surgeons to more thoroughly evaluate the health of the liver prior to transplantation.

Typically, organs can be stored on ice for up to 12 hours to slow the metabolic processes and preserve the tissues. Unfortunately, there is no way to know whether it will work properly once it is placed into a patient and reaches body temperature.

Metra, on the other hand, is designed to keep a liver for up to 24 hours at body temperature while supplying it with blood and nutrients so that the organ is fully functioning at the time of transplant. Metra also continuously monitors the health of the organ by measuring variables such as blood flow, bile production and acidity. In some cases, it can even improve function of an organ that has been in cold storage, and eventually it may be used to heal damaged livers that would otherwise be unusable.

About 25 systems are currently in use around the world, and the United States Food and Drug Administration recently approved it for human clinical trials. The developers plan to move forward on applying the same principles to other organs, a move that could revolutionize the field of organ transplantation.

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The Anticipatory Entrepreneur

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ask people what they want, go to the next level by giving people the ability to do what they currently can't do but would want to do if they only knew they could.

That, as much as anything, will keep you as an entrepreneur far ahead of the competition.

To Anticipate, Use Hard Trends

Anticipation can open enormous opportunities for entrepreneurs of all sorts by showing you a way to innovate with much lower risk. That said, how can you build your anticipatory skills?

Two cornerstones of my Anticipatory Organization Model are what I refer to as Hard Trends and Soft Trends. Hard Trends are based on future facts that represent future certainties—things that are inevitably going to happen. These can include such things as greater use of mobile technology across a variety of applications as well as the demographic certainty of the impact on healthcare from an aging population. Hard Trends are coming, and you can't stop them. The good news is that you can see them coming ahead of time and use that knowledge to innovate and create positive disruptions with lower risk.

Soft Trends, on the other hand, are based on assumptions about the future and represent future possibilities. By that, I mean they may or may not occur. As you can imagine, that takes in a broad array of issues and topics, from political outcomes to which team will win the next Super Bowl or World Series. However, unlike Hard Trends, Soft Trends are not only future maybes, but they're open to influence, allowing you to impact their outcome, such as a team trading for a key player to help them win a championship.

Knowing the distinction between Hard and Soft Trends can be enormously valuable for an entrepreneur. For instance, by recognizing a Hard Trend—a future certainty—an entrepreneur can see previously invisible opportunities such as developing a wearable medical device like a smartwatch for seniors to predict and prevent injuries and other problems.

Additionally, in recognizing key Soft Trends, entrepreneurs will see invisible opportunities to influence the direction and outcome of future possibilities. For instance, if retail sales are declining in your category, an anticipatory entrepreneur can find powerful ways to increase sales by positively influencing the negative trend. Many are doing this by using people and technology to redefine the customer experience.

Certainty and Pre-Mortems

The use of Hard Trends boils down to an enormously important advantage for entrepreneurs: certainty. By identifying Hard Trends that represent future facts, entrepreneurs can greatly reduce the risk that is often inherent in most every project or idea they pursue. Strategy based on certainty has low risk compared to strategy based on uncertainty. Additionally, pinpointing Soft Trends that others might mistake for future facts is another way to identify new opportunities and drive innovation. For example, rising healthcare costs in the U.S. is a Soft Trend that can be influenced (reduced). If, however, you think increasing costs are unstoppable, you won't even try.

Another strategy that can be exceedingly helpful for an anticipatory entrepreneur is what I refer to as a Pre-Mortem. To explain what a Pre-Mortem is, let me first point out a term that most people are familiar with: a postmortem. Most every business and organization conducts a postmortem. To varying degrees, these are reviews of product or service launches, projects, campaigns and other activities after they have been in place for a while or completed, whether successfully or otherwise. The goal is straightforward: identify what went right, what went wrong and what adjustments, if any, should be implemented moving forward.

Postmortems are undeniably valuable, but they have a significant downside: they happen after the fact. That means if a mistake or other misstep harmed a particular idea or project, the damage is already

done. It can be corrected in the future, but the snafu has already occurred.

On the other hand, a Pre-Mortem is very similar to a postmortem in that its objective is to identify both the good and bad associated with most any sort of project or campaign. But unlike a postmortem, a Pre-Mortem is used before a new product, service or change is implemented. That allows an entrepreneur to identify problems in advance and, from there, to pre-solve them. That, like Hard and Soft Trends, can greatly minimize the level of risk attached to any new project, service or other idea and accelerate its success.

Got a Problem? Skip It!

No matter how adept or experienced an entrepreneur might be, inevitably there will be problems and challenges that go along with any new concept or idea. Some of the hurdles seem so great that it's tempting to abandon an idea altogether rather than waste time trying to solve something that seems unsolvable. My advice boils down to two simple words: Skip It.

At first glance, that may seem like avoiding a problem altogether. On the one hand, it sounds wonderful—like finally getting rid of a nagging headache—but it doesn't seem to be particularly constructive. Rather, we're all ingrained with the ethic of continuing to work on a problem until we come upon some sort of resolution.

But problem skipping can be exceedingly helpful in several ways. For one thing, in many cases what we identify as the problem is, in fact, not the real problem at all. In my new book, The Anticipatory Organization, I share a story about a furniture manufacturer who, faced with inventory overload during the majority of the year because most of the sales were during the fourth-quarter Christmas timeframe, considered building additional storage facilities.

Instead of storing the inventory until the retainers needed it in the fourth quarter, the manufacturer skipped the problem by using financial incentives for the retailers to store the inventory in their locations. It not only worked like a charm, but also uncovered the common problem of taking a problem at face value rather than using the Skip It Principle to identify the genuine issue.

Another Skip It strategy is to skip the problem completely. In another story from my book, undeveloped countries commonly struggle with getting medication and supplies to far-flung villages. The issue is that roads are often in very bad shape and can be prohibitively expensive to fix or build. The answer: skip the problem entirely by using drones that don't require a road for transportation.

For anticipatory entrepreneurs, problem skipping allows them to not only "solve" what may seem to be unanswerable questions, but also, in so doing, to accelerate their progress toward innovation and success. And those are two goals that every entrepreneur would happily achieve.

Embrace Change

One of the overriding topics in my anticipatory model is the prevalence of change—more specifically, how it is constant and increasing in speed at an exponential rate. Consider the computer as a prime example. You may assume you don't have access to a powerful supercomputer, yet by asking Alexa, Siri or Google Home a question, you're as close to a supercomputer as you would be if it were in your own home.

That sort of daily experience was unheard of less than a decade ago. That's what I mean by anticipatory entrepreneurs using exponential change and Hard Trends to see future opportunities long before the competition, allowing you to turn change and disruption into opportunity and advantage.

That may be unnerving to some, but it's welcome news for most entrepreneurs. By looking to create something new, they're naturally at the heart of change.

By incorporating the anticipatory strategies outlined in this article—and in much greater detail in my new bestselling book, The Anticipatory Organization—you can position yourself to create positive disruption and actively shape a better future for yourself and others.

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