

April 2017
VOL. XXXIII, NO. 4

Daniel Burrus'

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TECHNOTRENDS[®]

NEWSLETTER

*The biggest ideas that are
changing everything*

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Agility and Anticipation—A Powerful Combination

By Daniel Burrus, CEO of Burrus Research

If you've been with a company or organization for a while, take a moment to consider the relatively slow evolutionary progression of the tools that you use every day, and how long it took to move to a more revolutionary set of tools:

- Manual typewriters took a long time to be replaced by electronic typewriters. Once electronic typewriters were replaced by mainframes and desktop computers, the pace of change quickened as we shifted to laptops, tablets and smartphones.
- In a very similar pattern, the shift from a rotary phone, once a fixture on every person's desk, to a pushbutton phone took a very long time. Once we could cut the cord with practical wireless phones, we moved at an accelerating pace to integrate our contacts and email features into a mobile phone (BlackBerry) and then to the revolution of smartphones.
- Video conferencing is another good example of a slow evolutionary progression of devices that were so expensive only the largest organizations and top executives used them. Live video has now moved to a revolutionary stage with today's free Skype, FaceTime and social applications we can use from almost any connected device with a screen.

For those of you who have read my books, including my last bestseller, *Flash Foresight*, and the hundreds of articles I have written over the decades, the escalating exponential pace of disruption and change have not caught you by surprise. The drivers of exponential change I first wrote about way

back in 1983, processing power, digital storage and bandwidth (the Three Digital Accelerators), have been creating a predictable path that has taken us from a period of change to today's transformation.

Given the relatively slow pace of the early stages of exponential change over the decades, it makes sense that agility has been the established tool of many organizations—the practiced ability to react to problems, shifting market conditions and events as quickly, efficiently and effectively as possible. Moreover, agility isn't just a “nice” thing to have—in many organizations' eyes, agility is the single most important strategy to use when dealing with change and disruption.

“ *Exponential change has reached a tipping point that creates problems and disruptions* ”

Why Agility Is No Longer Enough

The problem is, exponential change has reached a tipping point that creates problems and disruptions in both number and magnitude faster than agile organizations can handle—and many organizations have been struggling to address this present and future fact. Organizations being disrupted by digital technology clearly indicates that agility is simply no longer as useful as they key strategy to protect and defend against change it once might have been. Given the ever-increasing speed with which technology is driving change of all sorts, agility in

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TECHNOLOGY NEWS HIGHLIGHTS

Solar “Sun”flower

A new concept in solar collector design could improve overall efficiency by up to 40 percent. Known as SmartFlower, the free-standing system is based on the shape and behavior of a flower, using individual panels shaped like petals to capture energy.

Several intelligent features have been incorporated to improve efficiency.

First, the system automatically opens in the morning as the sun rises, then moves throughout the day to maximize the amount of solar energy absorbed.

Second, the individual petals are rear-ventilated to reduce heat build-up, resulting in an increase in power output of up to 10 percent compared to traditional rooftop installations.

Finally, brushes on the back of each petal clean the panels underneath each time the system opens, eliminating the accumulation of dust and debris to further boost efficiency by up to 5 percent.

SmartFlower is available as an on-grid system or with an off-grid option that includes battery storage. Depending on location, it will generate between 3400 and 6200 kilowatt hours per year – enough to power an average household. And if you move, you can take it with you!

Complete systems start at about \$20,000 and are available in eight colors.

For information: SmartFlower North America, 20 Park Plaza, Suite 320, Boston, MA 02116; phone: 617-918-7000; Web site: <http://smartflowersolar.com/>

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Transport of the Future

The dream of traveling around through pneumatic tubes has been around for decades. There are lots of advantages to such a system including low power consumption, immunity to weather conditions, and the ability to run collision-free at very high speeds. Analysis of a preliminary proposed route from Los Angeles to San Francisco calculated the travel time to be as little as 35 minutes at an average speed of 600 miles per hour.

But the futuristic idea never really got off the ground until 2012 when Elon Musk (CEO of SpaceX) introduced a concept dubbed Hyperloop and later announced a competition to outsource the pod design. Less than five years later, in January of this year, the concept took a giant step toward becoming a reality as Hyperloop One demonstrated its technology on a test track. And now the race is on...


Recently, Hyperloop Transportation Technologies (HTT) announced plans to begin building a full-size hyperloop passenger capsule in France. Designed to seat between 28 and 40 passengers, the pod will be about 100 feet in length and 9 feet in diameter and weigh about 20 tons. Another startup company called Arrivo has reportedly started seeking funding for test sites in the United States.

A system connecting Abu Dhabi and Dubai

appears to be a popular choice for the first commercial installation, although several other sites are being proposed.

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Hyperloop Transportation Technologies (HTT), 11844 Jefferson Blvd., Culver City, CA 90230; Web site: <http://hyperloop.global/Arrivo>; email: info@arrivo-loop.com; Web site: <http://www.arrivo-loop.com/>



Redesigning the Grid

When it comes to designing the energy grid of the future, China has taken a clear lead with the deployment of “new” technology that can transmit power over very long distances more efficiently. While most electricity is currently transmitted as alternating current (AC), State Grid Corporation of China – the largest of its two utilities – has turned to ultra-high-voltage direct current (UHVDC) to expand distribution of renewable energy.

DC transmission offers a number of advantages over AC cables. Transmission losses are 30 to 40 percent lower, and the cables themselves are also much less costly. Most importantly, DC is well-suited to transmitting power over long distances. Whether it's wind, solar, or wave power, the best sources of renewable energy are often far removed from consumers, so more efficient transmission is highly desirable. In addition, DC

links make it easier to balance supply, and can even run in reverse when output is not needed.

The technology itself is not really new. DC transmission was developed extensively as far back as the 1930s, and commercial installations include systems in Russia, Sweden, and Brazil. DC is also widely used for underwater power cables. But the grid being developed in China is massive by comparison; an \$88 billion project to construct 23 separate UHVDC lines by 2030, the largest of which will span more than 3000 kilometers (nearly 1900 miles) and carry three times the capacity needed to power the city of London.

For information: State Grid Corporation of China, No. 86, West Chang'an Street, Xicheng District, Beijing City, 100031 China; email: sgcc-info@sgcc.com.cn; Web site: <http://www.sgcc.com.cn/ywlm/gsgk-e/gsgk-e/gsgk-e1.shtml> or <http://cleanandsecuregrid.org/2017/01/02/a-new-energy-network-hvdc-development-in-china/>

silencing viral genes within tobacco plants for up to 20 days using a technique called RNA interference (RNAi). RNA strands from specific-disease causing organisms are mixed with clay nanoparticles to produce a substance dubbed BioClay. When sprayed on the plants, the clay particles react with carbon dioxide to release the RNA slowly over time, triggering a protective response that blocks the virus from replicating.

The research could have a profound effect on the future of farming by enabling farmers to make crops more drought-resistant, boost yields, and trigger ripening simply by spraying them. The biggest current obstacle is that RNA is very expensive to replicate; however, companies are already working on getting the cost for a gram of RNA (enough to treat a small field) down from more than \$100,000 a few years ago to under \$2. If successful, BioClay could be the answer to residue-free, sustainable farming.


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Gene-Inhibiting Sprays

Plant viruses have been the target of genetic research for decades due to the tremendous threat that they pose to global food security. Genetic modification has allowed for the development of many crops that are resistant to disease. But creating new crop varieties by altering their DNA takes years, so recent research has focused on achieving the same goal using sprays.

In the first study of its kind to be published, Australian scientists have reported successfully



Healing Without Scars

A recently published study indicates that scar tissue can effectively be transformed into nearly normal looking skin by converting the cells into fat cells, a technique that could lead to new anti-scarring therapies.

Scar tissue is primarily made up of cells known as myofibroblasts. Normal skin, on the other hand, contains fat cells – called adipocytes – as well as hair follicles. What the research revealed is that, although fat and hair develop separately, they are not independent of each other. In fact, a key aspect of the work includes the discovery that the hair follicles form first, and they are responsible for sending the signals to myofibroblasts to regenerate as adipocytes via a factor called Bone Morphogenetic Protein (BMP). The conversion process was successfully completed in mice as well as in human keloid cells grown in a culture.

The study illustrates for the first time that myofibroblasts are capable of becoming totally different types of cells, and that there is a window of opportunity after a skin wound occurs to influence the healing and eliminate scarring. The findings may also lead to more effective anti-aging strategies by regenerating adipocytes in wrinkled skin.

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Subconscious Learning

A technique known as “passive haptic learning” could help you master complex manual skills without even trying. By combining wearable

computers with the sensory power of touch, researchers have demonstrated that users can learn Morse code (for example) almost subconsciously as they go about their normal daily routines.

Twelve participants engaged in multiple hour-long sessions of online gaming, during which they wore a pair of Google Glasses programmed to deliver audio signals of words spelled out in Morse code.

For half of the participants, the glasses were also equipped with a built-in, bone-conduction transducer that simultaneously delivered tactile “taps” behind the right ear. After each session, the subjects were asked to use Morse code to tap out letters on the smart glasses’ touch pad. At the end of four sessions, they were asked to tap out a sentence that used the entire alphabet.

The group that received “audio only” cues achieved only about 47 percent accuracy in typing out the panagram, while those who received both audio and tactile cues demonstrated a proficiency of 94 percent.

In prior studies, the group has also used tactile gloves, which deliver vibrations to the fingertips, to teach piano and Braille with similar results. This suggests that mobile, wearable devices could eventually become important tools for mastering new tasks and skills.

For information: Thad Starner, Georgia Institute of Technology, Technology Square Research Building, 85 Fifth Street NW, Atlanta, GA 30332; phone: 404-385-0816; email: thad.starner@cc.gatech.edu; Web site: <http://www.gatech.edu/>



Robot Companion

A new home robot was recently unveiled that's designed to help keep aging adults active and engaged. Dubbed ElliQ, the desktop device consists of a stylized "body" and a separate, detachable screen. Cameras and face recognition enable it to detect when the user is nearby and direct its attention to them when they speak. ElliQ can proactively recommend activities, such as watching a video or taking a walk, as well as remind the user of scheduled events, including when it's time to take their medication. Machine learning helps tailor the suggestions to individual preferences and prevent the robot from becoming annoying.

A key feature of ElliQ is the ability to overcome the complexity of the digital world by interfacing easily with existing services like social media, messaging, and audio/video streaming. For example, it can alert the user of new Facebook posts and allow them to reply using speech recognition and speech-to-text technology. To alleviate concerns about privacy, the system is designed to only send audio to the cloud when it hears its name, and any information captured by the camera remains on the local device.

Although nothing can (or should) replace human-to-human interaction, devices like ElliQ can make life easier and more interactive as physical and cognitive health declines. As the population ages, and the technology becomes more affordable, robots and home assistants will undoubtedly play a larger role in our everyday lives.

For information: Intuition Robotics, 18 Hayezira Street, Ramat-Gan, Israel; email: info@intuitionrobotics.com; Web site: <https://www.intuitionrobotics.com/>



3D Mapping

Contour is a new handheld, portable device that makes it possible to generate three-dimensional maps in real time. A built-in laser range finder scans over 43,000 data points per second at a range of 20 meters (about 60 feet) and an accuracy of +/- 3cm. Proprietary mapping and localization algorithms generate an image as the device is carried through the environment, which is instantly displayed on an integrated 7-inch touch screen. This gives the operator the ability to pause, rewind, and resume recording; streamlines workflow; and enables decisions to be made at the time of the scan.

A typical 10,000-square-meter (110,000-square-foot) area can be scanned in as little as 2.5 hours, and the data may be imported into a variety of CAD and 3D formats. Color camera images can also be taken to enhance the point cloud models.

In addition to the obvious applications for architecture, engineering, and construction, Contour technology could also enable robots and autonomous vehicles to navigate more safely without GPS. Production is slated to begin in the latter half of this year.

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Agility and Anticipation—A Powerful Combination

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many cases can only slow down the speed with which you fall behind. It's like being a tightrope walker who sees that the cable is about to break. You can be as agile as the day is long, but you're still headed for a fall!

Further, being agile doesn't lend itself to innovation, particularly the sort of game-changing innovation that every organization strives for. For example, one of Time magazine's choices for great innovations was an adaptive device that, once connected to a stethoscope, automatically transfers data to a smartphone for ready analysis. The device can identify health issues that a human ear often can't detect.

Did the developers of that innovation use agility to come up with their breakthrough idea? Being agile would not have helped. Agile innovation is good, but it will position you as a follower and keep you from jumping ahead.

The Place for Agility

So, given the stage of exponential change we are currently in, one that I have referred to as a profound tipping point in human history, does the reactive nature of agility provide enough value for organizations and individuals, or should we give it a decent burial?

Not at all! An ability to be agile is a key strategy in both an organization's and an individual's toolbox. After all, there are always going to be unpredictable problems that demand rapid solutions, unforeseen situations that mandate fast decisions, and other shifts and challenges that require quick analysis and response.

But, it's important to keep agility in a proper context. Agility is the ideal strategy for:

- 1) Unpredictable change.
- 2) Reacting quickly after a change occurs.
- 3) Solving problems quickly after they occur.
- 4) Creating a competitive advantage over slower rivals.

In other words, agility is a reactive strategy, and you should be using it as a key strategy, but don't treat it as the panacea to change and innovation that many organizations assume it still is. After all, reaction is all well and good, but reaction doesn't allow you to leap ahead in both your thinking and action. At the very least, it's just another step in the dance that protects the status quo.

Anticipation—Today's More Powerful Option

Let's be clear: I want you to be agile, and no methodology will allow you to accurately predict everything. But, agility needs to be balanced with a new key strategy—becoming anticipatory if you want to become the disruptor and turn change into game-changing opportunity.

It may seem the stuff of science fiction to some, but our Anticipatory Organization Model has proven itself over time and is geared to showing both organizations and individuals how to anticipate the future and make bold moves with the utmost confidence. It's the ideal strategy for:

- 1) Turning disruption and change into an opportunity.
- 2) Identifying and acting on change before it occurs.
- 3) Identifying and pre-solving problems before they occur.
- 4) Driving exponential innovation with reduced risk.
- 5) Jumping ahead of competitors with the confidence that comes from certainty.

One of the keys lies in the proven methodology

of identifying both Hard and Soft Trends. Hard Trends are based on future facts; they will happen, they are those future events we can all bank on, from the increasing number of retiring baby boomers to digital technology that is becoming more sophisticated and useful at a predictable, exponential rate. By contrast, Soft Trends are based on assumptions and represent future possibilities—things that may or may not occur but which are open to influence.

Leveraging those two concepts—those things we know are going to happen as well as those that carry less certainty—allows organizations of all sorts to plan and carry out strategy with a newfound level of confidence that fosters rapid growth and accelerated innovation.

By anticipating those Hard Trends that are certainties and pinpointing Soft Trends that can be influenced to your advantage, you have the opportunity to pursue innovation at every level. That means everything from everyday innovation that can make things run more smoothly to the sort of blockbuster form of disruptive exponential innovation that can upend an entire industry or field— smartphones, Uber, Airbnb, and other examples of products and services that are utter game changers.

Is There Still a Need for Agility?

After reading the discussion above about the power of becoming anticipatory, it might seem like you should skip being agile altogether.

Not in the least. The ability to be agile will continue to be an extremely important component in an organization's toolbox. After all, there are always going to be unforeseen events that are impossible to predict, and that is where your ability to be agile pays off in a big way.

The key is to keep agility in a proper context. I'm concerned about the number of organizations that have adopted what is called agile innovation.

Agile innovation is another way of saying reactive innovation. You can successfully innovate in a reactive way, but that will not let you jump ahead with the much lower risk of applying anticipatory Hard Trends to anticipate predictable game changers. By all means use agility when reacting and responding quickly requires it, but don't treat it as a no-fault panacea. After all, reaction is all well and good, but reaction doesn't allow you to leap ahead in both your thinking and action. At the very least, it's just another step in the dance that feeds the status quo.

There will always be a place for agility in the most successful and prosperous organizations—provided that a focus on agility doesn't preclude the far more proactive ability to be anticipatory whenever possible.

In fact, being anticipatory can actually serve to improve your organization's agility. If a particular Hard Trend identifies a future certainty, you can prep yourself and your organization with the ability to better respond to that sort of change when it inevitably arrives—or, even better, act before it has a chance to occur. By the same token, being aware of Soft Trends affords you the opportunity to influence them to your advantage—in effect, a far more proactive and effective form of agility.

The ideal would be to consider agile and anticipatory as synergistic strategies. When used together with strategic intent, they can accelerate innovation, growth and results. By adopting an anticipatory mindset and culture, change and disruption become your biggest competitive advantage.

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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. Mary Norby, Editor, 1860 Executive Drive, Suite E2, Oconomowoc, WI 53066. To subscribe, call 262-367-0949 or email office@burrus.com.

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