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The Dangers of Legacy Thinking

By Daniel Burrus, CEO of Burrus Research

Every successful company and organization inevitably must confront a powerful question:

Is *what got us to where we are* helping us to continue to move forward, or just holding us back?

Your current position may be enviable. Your company or organization may be thriving. You may have years of success and achievement under your belt—the envy of your industry or field.

Yet, despite all that, perhaps there's a thought rummaging through your mind. Is this record of success sustainable? Can we keep going the way we have been?

Or, by the same token, maybe you're noticing chinks in your armor. Perhaps you've had a drop-off in your sales or other means by which you measure success. You're thinking and acting as usual, but something is misfiring.

" *Left unchecked "legacy thinking" can pose enormous obstacles to your success*

You may be dealing with what I refer to as "legacy thinking." And, left unchecked, legacy thinking can pose enormous obstacles to your continued success—or worse.

Legacy Technology—Dangerous But Also Diverting
Legacy thinking has a better-known cousin—legacy technology. For many companies and organizations, the issue of legacy technology is old news—in more ways than one.

As you probably know, legacy technology refers to old forms of technology that are simply no longer current. This can include everything from software to operating systems to most any type of technology that once may have been perfectly adequate but now is well past its prime.

It's more than a question of being outdated. For one thing, trying to continue to get by with legacy technology can be very expensive, from the cost of operating the systems themselves to the cost of paying people to monitor things to make certain nothing serious goes wrong.

But, with legacy technology, things often do go wrong—and rather spectacularly. In late January, Delta Airlines' entire fleet in the United States was temporarily grounded because of computer problems—the second such shutdown over a period of six months. The glitch also shut down the carrier's website and all its mobile apps.

Nor are airlines the only ones dealing with legacy software. Last year the British bank Tesco shut down online banking in early November after 40,000 accounts were compromised.

Those are certainly major headaches. But legacy technology isn't just a problem in and of itself—it

TECHNOLOGY NEWS HIGHLIGHTS

Smart Jacket

It has been reported that pneumonia is the leading cause of death for children under the age of five.

A major contributing factor is that many cases are misdiagnosed in the early stages. This is especially true in underdeveloped countries where access to laboratory testing forces healthcare workers to base diagnoses on simple clinical exams. But a team of Ugandan engineers has developed a "smart jacket" that offers hope in fighting the disease, which claims the lives of 900,000 children worldwide every year.

The "Mama-Ope" (Mother's Hope) kit includes the jacket and a mobile phone app that analyzes the information to provide a diagnosis up to three times faster than a doctor, with a higher degree of accuracy.

Sensors in the jacket record sound patterns from the lungs to detect crackling or bubbling sounds that are characteristic symptoms of pneumonia.

It also tracks temperature and respiratory rate. By comparing the results to a database of known cases, the system can provide an estimate of the severity of the disease to better inform the course of treatment. Capturing the data on cloud storage also enables doctors to manage their patients remotely.

The team plans to roll out the pilot product first in Ugandan hospitals and later in more remote health centers and other countries — primarily in Africa and south Asia, where the need is greatest.

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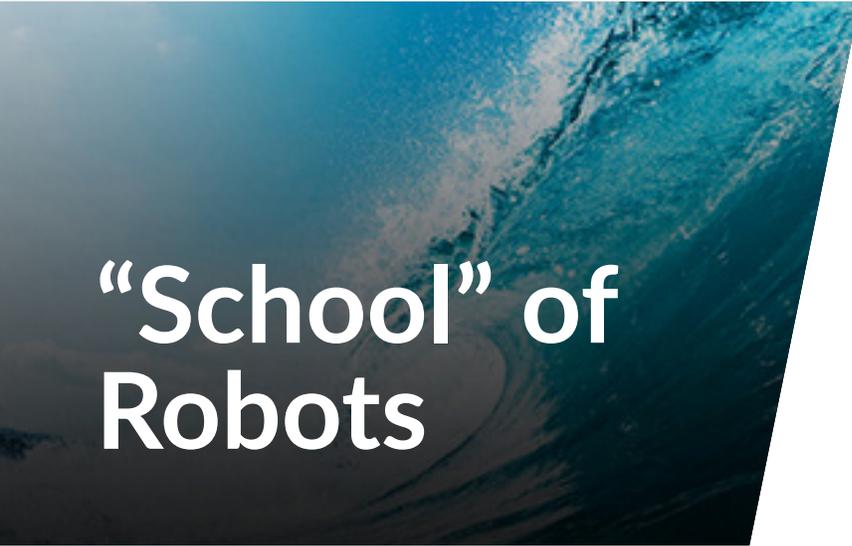
"School" of Robots

Current methods of capturing reliable three-dimensional data on ocean currents and marine life are limited — not to mention expensive. But oceanographers at UC San Diego have designed a swarm of low-cost, underwater robots to study small-scale environmental processes and answer important questions about the most abundant form of ocean life — plankton.

Dubbed miniature autonomous underwater explorers (M-AUEs), the grapefruit-sized robots are equipped with a variety of sensors to monitor surrounding conditions while they swim up and down by adjusting their buoyancy. In a recent experiment, 16 M-AUEs were programmed to study how plankton form dense patches, which often surface as harmful red tide blooms. It has been theorized that the free-floating organisms increase their concentrations to better protect themselves from predators, as well as aid feeding and reproduction, by utilizing the giant, slow-moving internal waves below the surface of the ocean.

The M-AUEs were deployed over a 300-meter (nearly 1,000-foot) diameter area, collecting three-dimensional location data every 12 seconds. Over the course of five hours, the swarm formed a tightly packed patch in the internal wave troughs, which dispersed over the crests of waves, similar to the way red tides are observed. This confirms that plankton use the physical dynamics of the ocean to increase their concentrations, and opens up a whole new field of exploration for studying marine life, as well as monitoring oil spills, sewage outlets and small-scale circulation in rivers or coastal areas.

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Food from Methane

Some major food companies in the United States and in Europe are looking to fossil fuels to produce animal feed — an idea that's understandably being viewed as somewhat controversial. Although the feed has already been approved by the European Union (EU) for livestock and farmed fish, approval is still underway in the United States and could potentially be expanded to include dogs, cats and even humans.

The process being exploited is not new. In fact, it first evolved billions of years ago, even before photosynthesis, as methanotrophs (microbes that feed on methane) began feasting on the methane that seeps through cracks in the sea floor into ponds and marshes. These organisms

basically burn methane for energy and combine with other complex organic molecules to produce a high-protein food product that can be dried and turned into pellets. But along the way, one of the by-products is carbon dioxide, which, on a large scale, could actually exacerbate global warming.

Proponents of the technology claim that the reduced need for land to grow livestock feed and lower demand for wild fish to feed farmed fish would counteract the effect of increased CO_2 emissions. They also propose that the process will reduce hazardous gas flares, which currently release nearly 140 billion cubic meters (5.3 trillion cubic feet) of natural gas into the atmosphere every year. But opponents argue that using non-renewable fossil fuels in lieu of sunlight is an environmentally unsound approach to long-term food production.

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Fountain of Youth?

The results of a study recently presented at the annual meeting of the Society for Neuroscience indicate that blood plasma from teenagers may have the power to keep you young. Although the test was only conducted on mice, the researchers believe that it also has potential benefits for humans.

In earlier experiments, it had been found that when old mice were injected with plasma from young mice, their brain and muscle function improved. So the team decided to see if plasma from young humans had the same benefits. Plasma from 18-year-old teenagers was injected into 12-month-old mice (the age equivalent of a 50-year-old human).

This is the age at which mice begin to show signs of aging, including slower movements and poorer performance on memory tests.

The mice received two plasma injections per week for three weeks. At the end of that time, they were running around like young mice and were able to navigate a maze from memory much better than untreated mice.

The lead researcher believes she has isolated certain factors in young blood that could be responsible for the changes but did not reveal what those factors were.

The goal is to translate the findings into an anti-ageing treatment for humans who are feeling the effects of aging on their brain function and/or cognition. A trial is already underway to test the effects of teenage plasma on Alzheimer's patients.

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Biometrics vs. Passports

Diagnostic Nose

Australia's international airports have started implementing the "Seamless Traveler" project, a system aimed at automating up to 90 percent of air traveler processing by 2020. Utilizing biometric identification technologies — including face recognition, iris scanning and fingerprints — instead of passports, manual processes will be greatly reduced, enabling fast, seamless self-processing for the vast majority of travelers while allowing border control to focus on passengers of interest.

The program will be piloted in July in Canberra, a relatively small airport that receives a limited number of international flights from New Zealand and Singapore. By November, the Department of Immigration and Border Protection hopes to roll out the technology to at least one major airport, with nationwide implementation scheduled for March 2019.

Australia is not unique in its attempt to meet national security challenges through the novel use of technology. Similar systems have been introduced in the United States at John F. Kennedy International Airport and Dulles International Airport with an unspecified timeline for expanding to other areas of the country.
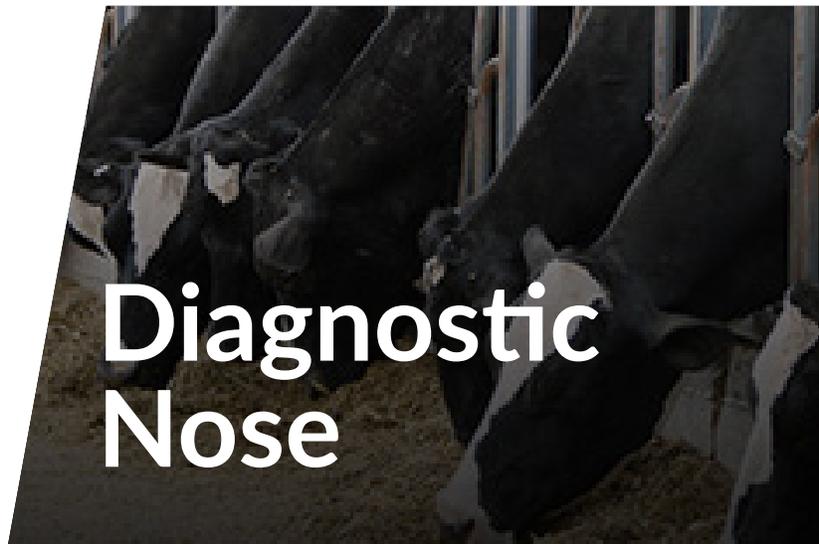
Doctors and other healthcare providers rely heavily on their sense of smell when assessing a patient's condition. For example, diabetes presents as a fruity smell on the breath, while foul odors are indicative of respiratory infections. But many compounds that are associated with diseases cannot be detected by the human nose, so Israeli chemical engineers have come up with a device that can do it automatically. Unlike other diagnostic "breathalyzers" that are disease-specific, the new device is capable of detecting multiple compounds in varying concentrations to identify a variety of disorders.

The prototype consists of an array of carbon nanotubes and gold particles, each covered with one of twenty organic films. Each film is sensitive to one of several compounds known to be present in the breath of people suffering from a range of illnesses including Parkinson's disease, multiple sclerosis, bladder cancer and Crohn's disease. When exposed to its specific compound, the electrical resistance of each film changes in a predictable manner, and the

combined changes generate an electrical fingerprint that can be mapped to one of many different diseases.

The device was tested on 1,404 patients known to be suffering from at least one of the diseases being studied. A total of 2,808 samples were taken, and the results were varied but promising with an overall accuracy of 86 percent — more than adequate to warrant further refinement and additional studies.

Look Mom, No Cavities!

Fillings may one day become a thing of the past as scientists have discovered a drug that can stimulate stem cells in tooth pulp and repair cavities. The drug, known as Tideglusib, could be fast-tracked into dental applications, since it has already been demonstrated to be safe for human use in clinical trials for treatment of Alzheimer's disease.

Although teeth already possess the capability to regenerate dentine when the pulp is damaged due to trauma or infection, they can only

produce a very thin layer. In the case of tooth decay, where the damage is deep, cements are needed to fill the holes and protect the underlying portions of the tooth.

The new drug works by turning off an enzyme (called GSK-3), which inhibits dentine growth. Small, biodegradable, collagen sponges are soaked with the drug and inserted into the cavity to trigger the body's natural systems and restore the dentine.

Over time, the sponge melts away, leaving only the tooth. In experiments on mice, the entire injury site was repaired within six weeks.

This new approach offers a less invasive treatment option for patients who suffer from dental phobia and could alleviate the long-term problems associated with traditional fillings.

Portable Centrifuge

Sometimes the solution to a problem comes not from "new tech" but from "old toys" that are repurposed in new ways. Here's one great

example.

Envision a cardboard disk with two holes — one on either side of the center point. Thread a piece of string through each hole, pull on the ends, and voila! You have a whirligig, versions of which have been found in archaeological digs dating as early as 3000 BC. But it turns out that, with a few modifications, this simple child's toy can be turned into an inexpensive, portable medical centrifuge that can be used by healthcare workers in underdeveloped areas to carry out diagnostic tests.

Short lengths of drinking straw are used as receptacles for the blood to be centrifuged, two of which are glued to opposing radii and sandwiched between two cardboard disks. The string is replaced with fishing line attached to two wooden or plastic handles. The resulting device (dubbed a "paperfuge") spins at more than 300 revolutions per second, generating a centrifugal force 10,000 times that of gravity. That's enough to separate plasma from corpuscles in less than two minutes. Spinning for longer periods (about 15 minutes) will even separate red corpuscles from white corpuscles to enable testing for diseases like malaria.

In 2014, the same inventor unveiled a microscope made from a piece of paper and a small spherical lens. Known as the "foldscope," more than 50,000 have already been distributed in 135 countries, and he plans to ship a million more by the end of the year. In combination, the two devices will make it possible to separate biological samples and analyze them under a microscope for less than a couple of dollars.

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The Risks of Sticking with Legacy Technology

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can also divert leaders' attention from the perils of legacy thinking.

From where I sit, that's an even more dangerous concern.

Legacy Thinking Defined
Like legacy technology, legacy thinking refers to thinking, strategies and other actions that, in their own way, are outdated. By that, I mean they're no longer serving you to the extent that they may once have.

That can be all the more problematic if legacy thinking accounted for much of the success you've been able to achieve.

Let's break that down a bit. Many organizations can point to certain types of business principles, strategies and other ways of thinking that underscored success. One example is agility—the ability to respond quickly to changing events and market conditions.

In stressing the capacity to react as quickly as possible, many organizations have, in fact, climbed to the top of their industry or fields. Being agile—and, at the same time, stressing an agile approach and mindset internally—seemed like a bulletproof way to approach things.

The key term there is "seemed." We are now in a period of transformational change. Whether products, services or the marketplace, change is coming faster and faster, and it's not slowing down.

From a technology standpoint, that means legacy technology is becoming outdated faster and faster as well.

The same can be said for legacy thinking. Take agility. As change happens at an increasingly faster pace, even the most agile of organizations will be hard pressed to keep up—let alone leap ahead with new ideas and innovations. Over time, agility will likely prove to be less and less effective.

Now, take that reasoning and apply it to other forms of thinking and strategies that may have served you well in the past. Are they helping you to move forward or are they, in effect, holding you back? If they're more a hindrance than help, that's legacy thinking.

Legacy Thinking—Changing Your Thinking Changes Your Results
The first thing to understand about legacy thinking is that it isn't necessarily all bad. Overcoming legacy thinking doesn't mandate a complete whitewash of every strategy, idea or other leadership concept you may have used in the past.

Instead, peel the onion a bit. Identify those ideas and strategies that continue to serve you well. By the same token, pinpoint others that may have worn out their value.

Let's look at agility again. Is agility, in and of itself, something to be completely discarded? Of course not! There will always be fires and other immediate issues that warrant an agile response. Agility can handle that very nicely. But, as I mentioned earlier, it's no longer the silver bullet it once might have been.

Consider other forms of legacy thinking. For instance, maybe you or some others in your organization have been hesitant to embrace certain forms of new technology that may be critical to your future growth and success. From your point of view, what's the point? The good old days of our industry are well behind us.

I saw that firsthand when I worked with a major retail organization. Many key figures in their leadership team didn't embrace the company's commitment to technology and other elements of the future. For them, the good times were gone. Mobile apps, Internet shopping and other innovations made their future rather bleak.

What to do? In some cases, management shifted certain people into different roles—not a demotion by any means, but a sideways move so their attitude wouldn't hinder the company's vision.

Others, on the other hand, were tasked with identifying those strategies, ideas and tools that would, in fact, serve the company well as it moved forward. The result was twofold—not only did the company effectively separate those elements of harmful legacy thinking from other concepts that were much more beneficial, but those once hesitant executives saw firsthand for themselves how powerful those tools and ideas could be. They, in effect, were walked into the future—and they liked what they saw.

The next time you're thinking about the dangers of legacy technology, broaden the picture a bit to include the pitfalls of legacy thinking. Just like old software that can shut down an entire airline, so, too, can legacy thinking cripple your organization.

On the other hand, like software, there's always the opportunity for an upgrade in the way you think and act. And, if you can change the way you think, you can dramatically change your results for the better.

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