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NEWSLETTER

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THE
ANTICIPATORY
ORGANIZATION

Turn Disruption and Change Into Opportunity and Advantage

By The New York Times and Wall Street Journal Best-Selling Author
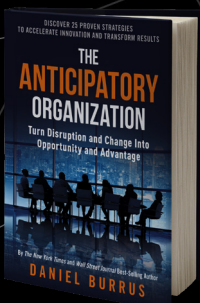
DANIEL BURRUS

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Career Competencies Where Humans Win Hands Down

By Daniel Burrus, CEO of Burrus Research

The robots are coming! That well-worn phrase, used both in fiction and serious journalism, encapsulates a fear that many share—that machines of all sorts are poised to take over every function and responsibility formerly performed by mere mortals.

I have only one response: Relax. In my new book, The Anticipatory Organization, I repeatedly stress the point that, no matter the level of technological advances we will witness in the future, there are a number of career attributes and competencies that machines simply cannot do better than human beings.

> " *Only a human being can accurately capture and interpret the subtlety and varied meanings that communication can carry.*

To that end, I've identified 10 career competencies that even the most sophisticated machine can't do better than a human counterpart. Here they are:

1. Communication—When you consider the varied ways we communicate—be it verbally, in written form and even in body language—it's easy to see how only a human being can accurately capture and interpret the subtlety and varied meanings that communication can carry.

Can you think of a time when you sent an email—a mode of communication that's as technologically based as it gets—was somehow misinterpreted or misconstrued?

That's because the subjective elements of

communication were absent—components of communication that only humans have access to.

2. Collaboration—My Anticipatory Organization Model stresses the value of collaboration. That, as opposed to cooperation—which is something that someone needs to do—is something that someone chooses to do, based on the idea that working together builds something better for us all. Whether through physical or virtual collaboration, that's a valuable nuance and mindset that technology can't grasp.

3. Customer Service—A machine can certainly fulfill a customer's order quickly and efficiently. And there are some tools, such as customer relationship management software (CRM), that help identify consumer interests and preferences. But these tools cannot replicate the human capacity to not only fully interpret that sort of information but also to develop, after working with a customer over time, an anticipatory sense of what a customer may want or need—often before the customer him or herself is aware of it. Here, an understanding of both Hard and Soft Trends can be exceedingly valuable.

4. Adaptability—Another core idea of an anticipatory organization and mindset is a willingness to accept mistakes and missteps. As I routinely point out, innovation at all levels—particularly those that fall into the game-changing category—simply isn't possible with an attitude that not only is critical of mistakes but, in effect, makes people afraid to experiment and pursue innovation out of fear of failure. That sort of adaptability requires someone to be open-minded

TECHNOLOGY NEWS HIGHLIGHTS

More Precise DNA Editing

A new version of the CRISPR gene-editing tool has been developed that is capable of repairing smaller segments of a genome without breaking the DNA structure.

The method – known as base editing – will make it possible to treat a wide variety of inherited conditions for which there are currently no treatments.

Standard CRISPR techniques remove and replace entire sections of the DNA strand. But more than 60 percent of genetic diseases are caused by point mutations, where a single base pair gets swapped, inserted or deleted.

In these situations it's more efficient to use base editing, which essentially rewrites the genetic code by rearranging atoms in a chemical base (designated by A, C, G and T) so that it resembles a different chemical base.

For example, about 15 percent of point mutations that are responsible for genetic diseases are caused by the substitution of a G for an A at specific points along the DNA strand.

Correcting these point mutations by swapping bases has been shown to cure disorders like anemia and hemochromatosis (a disorder in which the body absorbs too much iron).

The researchers will also be looking at using base editing to correct mutations that cause neurologic disorders as well as hereditary blindness and deafness.
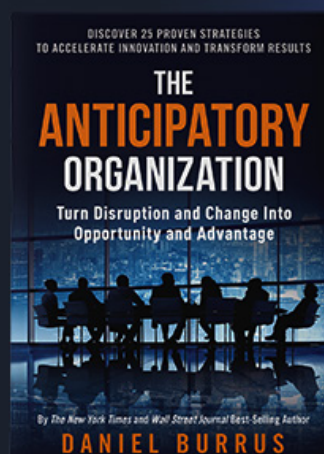
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Greener Aircraft

A revolutionary new airplane, designed for improved fuel efficiency and lower emissions, is on the drawing table. Called the "double-bubble" D8, the new jet has a fuselage that's wider than a conventional aircraft in order to generate additional lift. Combined with a more aerodynamic nose design, this allows the tail and wings to be smaller and lighter, decreasing overall weight. However, the most notable design change is the engine position, which is moved from the traditional spot underneath the wings to an area on top of the body back by the tail.

On a conventional plane, one of the major forces creating drag comes from the effect of air slowing down as it moves across the top of the body. The D8 reduces this effect by drawing in and reaccelerating the slow air layer. As a result, the new aircraft would use an estimated 37 percent less fuel. With airlines accounting for a larger and larger share of total greenhouse gas emissions, and the demand for air travel increasing steadily, meaningful progress toward lowering pollutants will likely require some fundamental redesigns.

A 1:11 scale concept model has been built and tested in a wind tunnel. The developers are now planning to construct a half-scale prototype. But don't expect to see the "double-bubble" flying the friendly skies anytime soon. Even if all goes well,

it's estimated that passengers won't be boarding a D8 until 2035.

Colon Cancer Blood Test

Colorectal cancer (CRC) is the second most common form of cancer worldwide. While screening programs have been shown to reduce mortality by up to 30 percent, many individuals don't follow through with testing because of the pain and expense associated with colonoscopy. Now, a less invasive, data-driven screening tool could one day replace colonoscopies for standard CRC screening. Called ColonFlag, the system uses machine learning to analyze a blood sample, and has been demonstrated to be twice as accurate as a fecal exam.

ColonFlag compares current samples to a patient's historical profile as well as a database of 20 million anonymized tests. The algorithms can automatically detect subtle changes and correlations to predict the likelihood of developing CRC earlier than traditional methods.

A blind study is currently underway to quantify the efficacy of the new method. The developer is

also working with two major U.S. hospitals to find other potential applications for their predictive analytic technique, including diabetes, heart failure, kidney injury and sepsis.

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Killing Superbugs

As scientists all over the world work to find ways to combat today's antibiotic-resistant superbugs, one team of researchers is literally digging for new solutions...in dirt. One shovelful of soil contains tens of thousands of organisms – many of which have never been studied until now – and some of them are already showing promise.

Researchers recently discovered an organism that produces a new class of antibiotics, dubbed malacidins. In laboratory testing, these drugs were shown to be effective against several superbugs, including methicillin-resistant Staphylococcus aureus (MRSA). Furthermore, the new drug did not stimulate resistance due to a calcium-dependent gene that acts as an on-off switch, making it harder for bacteria to evolve.

Although many of the antibiotics used today are actually produced by bacteria (which have been fighting each other for millions of years) they are difficult to reproduce in a laboratory petri dish. In recent years, the development of metagenomics

has allowed researchers to sample molecules directly from the environment and reproduce them through cloning.

It may take years for these new drugs to hit the market, but this study illustrates that there is still much to be learned and derived from the world around us.

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Look Into My Eyes

In another application of machine learning, an algorithm has been developed that can assess cardiovascular (CV) risk by analyzing retinal scans. The method is based on the fact that the plethora of blood vessels at the back of the eye (known as the fundus) can provide information related to blood pressure, age, and smoking history – all of which are predictors of CV health.

The algorithm was "trained" on a database of almost 300,000 patients, which included eye scans as well as general medical data. In limited testing, upon analyzing data from patients with and without a history of CV disease, it was shown to correctly identify those at high risk about 70 percent of the time. In comparison,

the commonly used SCORE method is successful about 72 percent of the time.

An important aspect of this research is that it illustrates how artificial intelligence (AI) can be used to analyze existing medical data. Instead of simply replicating existing diagnostic tools, AI could become a paradigm for scientific discovery by cross-referencing huge volumes of information. Although longitudinal studies (like Google's Project Baseline) are already underway for developing an exhaustive database to study the gamut of medical diagnoses, it will take years (possibly decades) for tools such as this to become mainstream.

For information: Verily Life Sciences LLC (formerly Google Life Sciences); website: https://verily.com/

Lithium Ion Alternative

About a year ago, a polymer was discovered that had the potential to store up to 10,000 times more energy than conventional lithium-ion batteries. Now researchers have used the novel material to construct a supercapacitor that could replace lithium-ion batteries in electric vehicles.

While supercapacitors are useful as power sources in certain applications, a major drawback has been their inability to store large amounts of power. Because of this, their use is limited to situations where they can be recharged

often. But the new polymer changes all of that, while bringing with it some real benefits. For example, in the transportation industry, the new supercapacitors would give electric vehicles a range similar to their non-electric counterparts, but could potentially charge much more quickly than lithium-ion batteries. Although supercapacitors in general do not hold a charge as long as a battery, they would also provide an alternative power storage solution for renewable energy.

While further testing is needed before the technology is ready for commercialization, consumers will realize several benefits to the use of supercapacitors over lithium-ion batteries in the future, including lower cost, increased robustness and safer operation.

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Cryptocurrency's Downside

Digital currencies were originally conceived to decentralize control of money and give users the power to authenticate transactions. But a closer look reveals that they may not be as different from traditional institutions as they claim – and could be worse.

Monitoring of two well-established networks over a period of two years, from 2015 to 2017, revealed that their computational power is actually controlled by a very small number of "miners." For example, more than half of bitcoin's computational power is controlled by the top four "miners," while over 60 percent of ethereum's is controlled by only three. Whether these "miners" are individuals or groups of individuals who share processing power doesn't really matter. The danger is that any person or group who controls more than 51 percent could potentially prevent other users from spending or receiving currency, or give themselves more purchasing power by double-spending their own.

As a result, instead of a government-regulated bank you now have a currency system controlled by a small yet anonymous group of strangers. This may be one of the reasons cryptocurrencies are seeing a decline in value in recent weeks.

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Cloned Monkeys

The recent news about Zhong Zhong and Hua Hua, the world's first cloned monkeys, has generated mixed reactions within the science community. On the one hand, the ability to create a population of genetically identical monkeys could greatly aid in the development of treatments for diseases like cancer, Alzheimer's and Parkinson's by enabling scientists to make genetic alterations in an experimental group and then comparing the results to an identical control group. This is the only way to truly ascertain the effects of gene therapy and fine-tune it for optimal results. On the other hand, some fear that this will bring the technology one step closer to humans.

Since the cloning of Dolly the sheep in 1996, at least 23 species of mammals have been cloned, including pigs, cats, dogs, rats and cattle. But when the same techniques were used on monkeys, none of them survived long enough to be implanted in a surrogate. In this most recent research, it was discovered that two new ingredients – messenger RNA and trichostatin A – when added to the mix of nutrients and growth factors, triggered an additional 2,000 genes needed for development and helped the embryos begin growing before implantation. Out of 79 embryos implanted into 21 surrogates, six pregnancies resulted, of which Zhong Zhong and Hua Hua were the only live births; however, this is a huge improvement over the 277 implanted embryos of which only Dolly survived.

While China appears to be expanding the use of monkeys for medical research, many other countries have greatly limited research on primates to clearly defined problems of high significance, with no other means to address them.

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Career Competencies Where Humans Win Hands Down

and nonjudgmental—emotional and mental attitudes that only humans can possess and leverage.

5. Relationship Building—Through the use of the concept of Hard Trends, my Anticipatory Organization Model pinpoints a number of future certainties. One in particular stands out among all the others: The number one certainty in this world is that the future is all about relationships. That only makes sense. Certainly, technology is advancing at an exponentially faster rate, increasing its varied capabilities at an astonishing speed. But all the technology in the world is secondary to interaction between people—constructive, trust-based interaction that comes from people actively working to improve their people skills and promote true collaboration. Not only are those attributes that machines can't replicate, but without positive relationships, even the most amazing technology can become irrelevant or even useless.

6. Creative Problem-solving—We're all familiar with the capacity of computers and other tools to evaluate data and information and, from there, offer empirical recommendations and solutions. Further, most everyone knows about IBM's Watson and other computers that can effectively learn as they work. But one thing that technology can't address is more subtle nuances and impressions that allow humans to approach problems from a very special perspective. For instance, let's say you're a salesperson working with a particular client. For one thing, you can see your client's facial reaction and hear the tone of her voice as you make purchase recommendations. That unto itself allows you to be flexible and, from there, creative in how you can best help the client. Additionally, an ability to be creative fosters an equally flexible approach in adjusting suggested

solutions and problems based on what your client is telling you, both with the spoken word and in other ways.

7. Sales—The example presented in the prior section offers a natural segue to another area in which human beings will always outperform technology—sales. A person's capacity to "read" a client and, from there, make appropriate purchase recommendations and suggestions, is critical to building a successful and longstanding relationship. Granted, a machine can make somewhat similar recommendations—such as when you visit a website and the system suggests new purchases based on prior shopping activity—but, once again, the nuances and subjective understanding of a customer's needs, priorities and values are competencies that only a human salesperson can possess.

8. Career Mastery—Simply put, no machine or computer, no matter how advanced or sophisticated, has what we call ambition. Again, they can learn—and learn enormous amounts of information with remarkable speed—but there's no driving force that underscores that activity. It's what they're built to do, and they do it.

Ambition is a powerful motivator that only humans possess. It's particularly important when it comes to improving functional and technical expertise with art, science and other disciplines. Like computers, we learn and build our skill set in all sorts of areas, but there's generally a goal or objective in mind. For instance, in working to further our careers, we may go back to school or obtain additional training. Those are career-driven choices that are very potent sources of energy and focus, characteristics that machines cannot leverage.

Career motivation is particularly central when it comes to various types of art. There's a fair amount of debate going on as to whether machines can truly "create" art—this article in the MIT Technology Review examines this particular question—but few would dispute the fact that art requires passion and imagination. A computer may be capable of

producing a painting that's technically sound, but there's no fire in the belly behind its creation. Passion is a human trait and always will be.

9. Learning Agility—Human learning is rarely a linear process, prearranged and consistent from beginning to end. That's not true with those computers and other forms of technology that are capable of learning. In so many words, they're fed information, they absorb and process it, and they wait for the next feeding.

Humans don't usually learn that way, and that's a very good thing. One ideal example is the Socratic method of learning, which basically employs a series of ongoing questions and answers through which people obtain information. The process is designed to stimulate different types of thought and ideas and to move people's thinking in varied, different directions. One illustration of human beings' learning agility is our capacity to pursue concepts and ideas that suddenly strike us as intriguing.

Nor does the process have to be as formal as the Socratic system. Merely daydreaming for a few moments is another example of learning agility, an experience characterized by a capacity to follow thoughts in whatever direction they may lead us. Moreover, that's not just a pointless waste of time. As this article points out, many large companies have embraced the value of daydreaming by specifically earmarking time during the day in which employees can pretty much do anything they wish—even if that's nothing at all—to foster creativity.

10. Comfort with Technology—It's no great revelation to point out that many people aren't all that comfortable with technology. In fact, if everyone embraced technology with utter comfort, articles about people's fear of tech (such as this one!) would be utterly irrelevant.

But, as we all know, that's not the case. A great many people are unnerved by technology, whether due to fear that machines will "replace" them or a simple hesitancy to take the time to learn how to best use
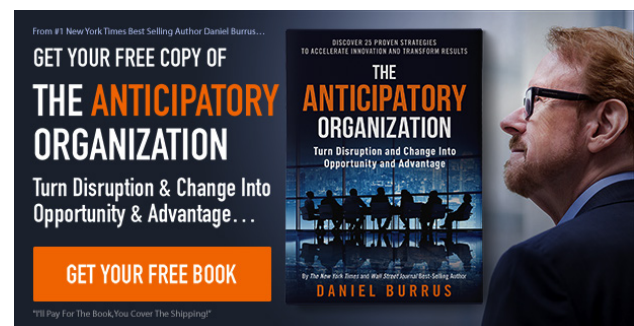
technology.

Happily, that attitude isn't cast in stone. No matter what level of discomfort we may experience with technology, we all have the capacity to, at the very least, become more comfortable with it. By contrast, machines aren't comfortable with technology in even a remotely similar manner. They just perform along the lines of what they were created to do.

On the one hand, particularly for younger people, a comfort level will be an essential element in career success, as this piece in Forbes discusses. But becoming comfortable with technology doesn't have to derive from an adapt-or-die mentality. Here, what I refer to as a time travel audit can be a gentle, yet effective, way to increase a person's comfort with technology.

The process is simple. First, determine just where a person happens to be in terms of their comfort level with technology. From there, simply point out to them just what technology may be able to do for them—effectively "walking" them into a future in which they can see and appreciate the potential of technology.

Understanding the many ways that humans have and will continue to outperform technology circles back to what amounts to a "bonus" competency—the ability to anticipate. By knowing that our future will continue to be largely defined by our relationships—including that with technology—we can effectively anticipate how to best use our human abilities as well as those of technology to craft the best future possible. And that's something we can all look forward to with excitement and optimism.

Burrus Research®