

ACTIVITY CREATIVITY RISING

*Creative Thinking and
Creative Problem Solving
in the 21st Century*

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Welcome to the World of Change: Life in the 21st Century

American author and satirist Mark Twain was credited with saying, “Everyone grumbles about the weather—but nothing is *done* about it.”

This strikes us as analogous to the way in which many people approach change. Everyone grumbles about change—“change is inevitable,” “change is accelerating”—but no one does anything about it. Or, more to the point, few seem to know what, if anything, they can do about change. Just deal with it, we are told. Put up an umbrella. Wear a heavy coat.

Whatever your attitude is about change, there is no denying the force it has on our lives. Consider:

- *If you are older than 20:* when you were growing up, if you were going to be late coming home, you had to go and find a telephone, and maybe have change in your pocket to make a call. Today, you reach into your pocket and pull out a phone instead of a quarter.
- *If you are older than 30:* you grew up going to the library to get answers and do research, with a pocketful of dimes for the photocopy machine. Today, you stay at home and open a web browser.
- *If you are older than 40:* you wrote college papers longhand and then carefully typed them. The arrival of white-out was a kind of miracle. Today, you press the delete key.
- *If you are older than 50:* you grew up with a black-and-white television (if you had a television), and you had to walk over to the set to change the channel, of which there were only three. You watched programs when they were broadcast. Today, you choose from a hundred channels, and you watch whenever you want. And you may watch on something that’s not a TV.
- *If you are older than 60:* you heard the world’s news on the radio, or when the newspaper hit your porch the next morning. Today, you can get the news instantly through your computer, or even on your telephone, the one that’s in your pocket.

Change, like the weather, is a natural part of life. In fact, we would argue that change is not just inevitable, it is essential to us as humans. The current thinking is that the primary reason the Cro-Magnon species survived, while the Neanderthals did not, was their superior ability to adapt to change.¹ And it remains true today.

Just as we can prepare for the weather—wear the right clothes, erect a tent for that outdoor wedding, install central air conditioning—so too can we prepare for change. Preparation requires awareness, which suggests that we need to recognize the distinctive feature of change in the 21st century: the increased rate of change.

Change, Accelerating

Here are some recent trends that highlight the accelerating nature of change.

FROM INDUSTRIAL AGE, TO KNOWLEDGE AGE, TO INNOVATION AGE

According to business writer Daniel Pink, the affluence of the developed nations, combined with the movement of much analytical work to automated methods and low-cost global workers, means that we have arrived in an age where we must become “a society of creators.”² Economist Richard Florida, who coined the name “Creative Class” for the workers “whose economic function is to create new ideas, new technology and/or creative content,” provides the numbers: today, more than 30% of the U.S. population works in creative jobs; from 1900 through the 1950s, it was less than 10%.³

This is not a new or temporary phenomenon. As early as 1991, U.S. expenditures related to information and communications technologies—the tools of the innovation age—surpassed those for the industrial economy, \$112 billion to \$107 billion.⁴

MORE FREQUENT JOB CHANGES

Children who are in school today can expect to have more than 11 different jobs between the ages of 18 and 42.⁵ What kinds of jobs? How’s this for an indication of change: no one knows.

When Forbes looked at jobs of the future, the magazine proclaimed that in two decades, “your job probably won’t exist, at least not in the same form.”⁶ Trend-analyzer Faith Popcorn predicted in 2001 that, in the foreseeable future, more than half of us will work in jobs that do not exist yet.⁷

SHORTER AND SHORTER PRODUCT LIFE-CYCLES

Product obsolescence comes in many forms, including planned (“it died”), perceived (“my interest died”), or practical (“if it goes any slower, I’m going to die”). Whatever the cause, products today are replaced more rapidly than ever, and industrial redesign, whether for competitive advantage or because of rapidly changing technologies, occurs at a much faster pace. According to two studies, products go through fundamental redesign every 5 to 10 years, while in the technology realm the rate of change is much faster, with products undergoing redesign every 6 to 12 months.⁸

Consider the difference between the first digital cameras released in 1991 and today’s models—1.3 megapixels and few features, versus more than 10 megapixels and loaded. Not to mention that before 1990 all cameras used film. Twenty years later, film cameras have all but disappeared. And in the future, phones might replace the standard amateur camera altogether.

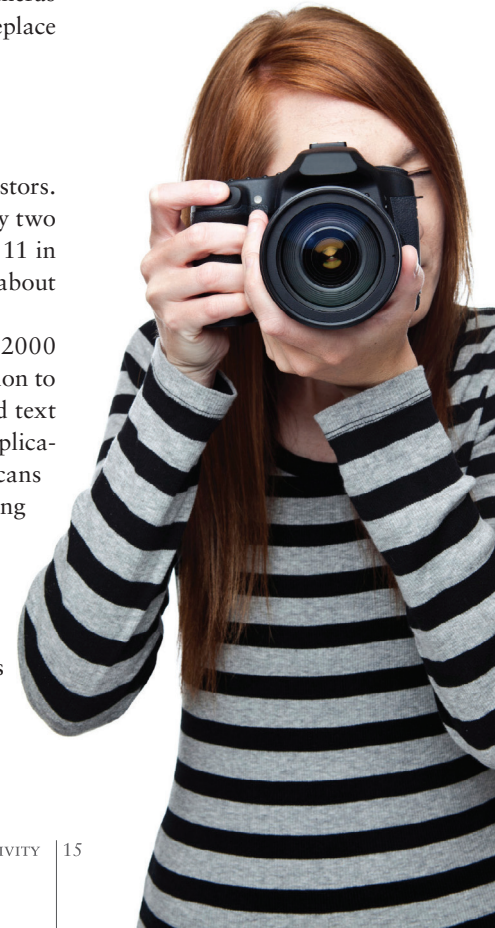
GREATER TECHNOLOGICAL POWER, SMALLER SIZE

In 1964, the year in which the last Baby Boomers were born, a computer chip could hold five transistors. As Gordon Moore predicted (in what is now known as “Moore’s Law”), this capacity doubles about every two years. Today, a chip can hold more than a billion transistors.⁹ The guidance computer onboard Apollo 11 in 1969 weighed 70 pounds¹⁰ and had less computing power than your current mobile phone, which weighs about four ounces.

Small size leads to ubiquity. Mobile telephone subscriptions in the U.S. increased from 109 million in 2000 to 279 million ten years later—or 90 phones per 100 people. Worldwide, the increase was from 738 million to 5.3 billion.¹¹ And mobile telephones are no longer just telephones. Most can take photographs and send text messages; many can send and receive email; and a rapidly growing number are “smartphones” that run applications from GPS tracking to games, from e-book readers to restaurant reviews. (As of 2011, more Americans own smartphones than have a bachelor’s degree.¹² We’re not sure what this says, but it might have something to do with how we’re outsourcing some of our memory to the Internet.)¹³

ENTERTAINMENT PRODUCTION AND CONSUMPTION ARE MORE DEMOCRATIC

In the entertainment industry, control is shifting. Previously, large corporations determined what was created, how it was distributed, and where and how it could be consumed. For instance, consider



movies. For the most part, the same corporations that decided which films to fund also carefully controlled the movement of the film, from first run in a theater, then onward to the rental market, home sales, and television. Rare was the independent film that could thrive in that environment. Today, digital technology allows low-cost production, and the Internet (e.g., YouTube and Hulu) provides the ability to immediately distribute.

The same applies to music, where once the large labels controlled everything, including the copyrights to the recordings. Today, an independent artist can have an inexpensive home recording studio, and, without the hand of a record label, have her work available on iTunes, right next to Beyoncé and Bruce Springsteen—and while retaining all rights to her work.

In book publishing, where the industry gatekeepers had a monopoly on what was published, print-on-demand technology allows anyone to produce a high-quality book in just a few days.

These and similar technological and societal changes are not impressive curiosities (such as space travel) that do not seem to affect us individually. These changes have great impact on our day-to-day lives. (And pretty soon, you'll be able to go into space as well. Virgin Galactic is now booking seats for sub-orbital space flights.)¹⁴

In the face of change we have these options: ignore it, grow with it, or drive it. We certainly do not recommend you stick your head in the sand; the weather is changing, and you're bound to get wet, wind-blown, possibly struck by lightning. So, no: ignoring is not really an option. That leaves the choice to grow with change or to drive change—and the good news is, it's both of those. In some arenas, you will roll with the changes, and in others, you will be the driving force.

Here's an example. Climate change (our weather metaphor writ large) is not something that most of us have the power to address on a global scale, but we can choose to get involved by, for instance, voting for candidates who see things our way. But on a personal and local level, we can take initiative, perhaps by forming an organization that takes action in our community, and by changing our own habits.

To live a healthy, productive life in the 21st century requires an attitude and skill set that opens us up to change. We believe that creativity and creative thinking, specifically, are the adaptive skills that will enable us to grow with change, as well as to drive it.

Problems and Approaches to Problems

The 21st century calls on us to *participate*. To get a feel for the participation level required, let's look through a particular lens: the types of problems we might be called on to address, and the ways in which we might respond.

Problems can be sorted into two basic categories:

- *algorithmic*: problems with a known solution, or an established process that leads to a single right answer
- *heuristic*: problems without a known solution

We can approach these problems in two ways:

- *proactive*: before a problem arises
- *reactive*: after a problem occurs

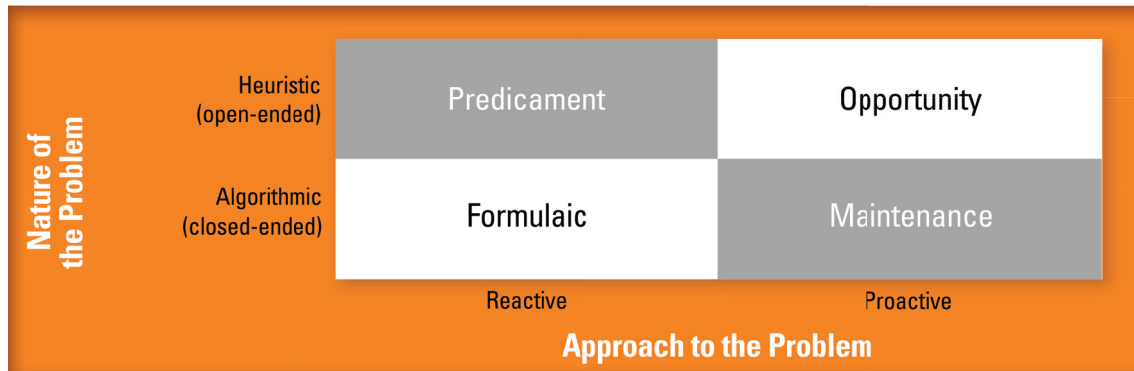


Figure 1:
Types of Problems

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permission.

By crossing the nature of the problem (algorithmic or heuristic) with the approach to the problem (proactive or reactive), we end up with four different situations: formulaic problems, maintenance issues, predicaments, and opportunities (see Figure 1). Two of these situations can be resolved through known solutions, and therefore might be considered straightforward, while two are more complex, and therefore calling for creative thinking.

FORMULAIC PROBLEMS (ALGORITHMIC, REACTIVE)

When reacting to a change that has a known solution, we simply implement it; there is no need for creative thinking. If you get a flat tire, you replace it with your spare or call your automobile club. If you are on the golf course and it begins to rain, you pull out the umbrella and waterproof pullover you keep in your bag. In an operating room, a surgeon uses a known method for removing a gall bladder, and if a problem arises, there is a known method for responding to it.



For formulaic problems, there is no need to invent a solution, especially when the existing approach works perfectly well. (Which, perhaps, explains the popularity of duct tape.)

MAINTENANCE ISSUES (ALGORITHMIC, PROACTIVE)

There are changes we can anticipate, and we respond proactively to prevent them. The solution is known, and we need only to implement it. To protect the engine in your car, you change the oil every 5,000 miles. To keep your feet dry when it rains on the golf course, you apply waterproofing spray to your shoes at the beginning of the season. Relationships deteriorate if we do not tend to them, but we don't need to re-imagine the rules: we buy gifts for our significant others, listen to them, and share meaningful time—all well-known approaches.

For maintenance issues we merely need to stay alert and anticipate the appropriate time to implement known procedures that have proven effective in the past. And if we do not know the proactive steps we can take, we have only to seek out the answers from a reliable source. (Which, perhaps, explains the popularity of Dr. Phil.)

PREDICAMENTS (HEURISTIC, REACTIVE)

Change sometimes occurs for which we do not have a ready answer, and known solutions do not seem to fit. Your competitor introduces a breakthrough product that makes yours obsolete. Your child's performance in school suddenly falls, but you're not sure why. You lose your job without warning. The newness of the situation and its unique conditions render any known approaches ineffective.

What is the solution when there is no solution? We're glad you asked: you apply creative thinking, which helps you to create a new solution path.

OPPORTUNITIES (HEURISTIC, PROACTIVE)

With change comes opportunity. Not all problems are negative; we consider a problem to be any puzzle in search of a solution. The "problem" in this instance is to identify a future opportunity, and to find a way to get there.

Opportunities sometimes present themselves to us. "*Look! Here I am! Now what?*" We can take this stimulus and imagine what might be—or not. An adhesive that wouldn't adhere led to an opportunity known as the Post-it note. A chocolate bar that melted in a scientist's pocket led to the microwave oven. Boredom while playing Scrabble led to the invention of a new, fast-paced word game called Bananagrams that has sold millions.¹⁵



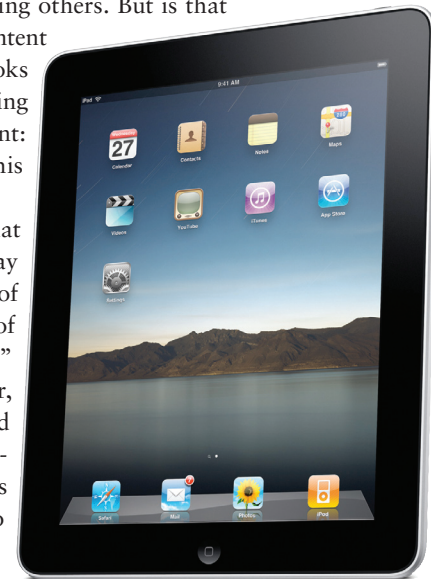
(Don't get us wrong, we love Scrabble. But imagine how many snail-paced Scrabble sessions did *not* lead to the invention of an award-winning word game.)

Other opportunities are not so forthcoming. They require that an individual or organization *seek*: understanding the present situation and trends as a launching point for new opportunities. The existence of cassette tapes—music in a small format—led to the creation of the Sony Walkman. Same industry, years later, the existence of digital data—music in an electronic format—led to the creation of MP3 players such as the Apple iPod.

All creative-thinking efforts start as a response to a situation. In some cases, you are reacting to a predicament that has presented itself, such as the newspaper companies that are trying to survive in a world in which people are increasingly getting their news through the Internet. In other cases, you see an opportunity emerging, such as when Amazon.com recognized a future in digital books and released the Kindle e-book reader. Note that Amazon did not release the first e-book reader, nor did they choose to simply sell e-books; instead, they did something unprecedented for the company: they created their own product.

We intentionally chose to look at how the digital world is impacting newspapers and booksellers to make this point: that the same general circumstances can serve as a predicament for some, an opportunity for others. In this instance, the movement to digital sources seems to be helping some while harming others. But is that a matter of fact or a matter of perception? Consider: people are reading more digital content and less printed content. In the book world, that translates to people buying more e-books and fewer printed books. In the newspaper world, it means that more people are reading the news online, and fewer are paying to subscribe to the printed paper. Here's the point: Amazon chose to see this as an opportunity, while the newspaper industry chose to see this as a predicament. Is it not good news that more people are reading the news?

When facing a predicament or an opportunity, it is an awareness of the situation that serves as a catalyst to creative thinking. In the case of predicaments, lack of awareness may result in a catastrophic situation; eventually the problem cannot be ignored. In the case of opportunities, lack of awareness means missing out. How many times have the leaders of one company, after seeing what another had done, said, "Why didn't we think of that!" Amazon's primary bookselling competitor, Barnes & Noble, now has its own e-book reader, but they were reactive, not proactive, and they are now far behind in that race. (But hold on: if you need another example of the pace of change, consider that the Kindle's near-monopoly was short-lived: the dedicated e-book reader was quickly challenged by tablets such as the Apple iPad, which are e-book readers and much more.) What did Amazon do next? It released its own tablet. And this time, Barnes & Noble was right behind them.



Creating change is proactively looking for places to bring about new solutions and approaches. For example, climate change (since we can't seem to resist talking about the weather) is an unknown realm—we don't know enough about what's coming to provide an algorithmic response—but that means it is an extraordinary creative opportunity. And there are many more. Face the fronts that are approaching—an aging population, a future oil shortage, ubiquitous high-speed live video streaming, an always-connected society, and others—and ask: what opportunities do they create? Again, creative thinking is the way to exploit these opportunities.

Moving Forward

When we consider the rapidly changing 21st century, we find ourselves on the border between two worlds: one we recognize, and one we do not. Certainly, much of what is to come is within our experience. For those issues, we know the correct responses; we know what will work. But there is much ahead that is new and unknowable. For those many situations, there is one common denominator: human creativity.

Change originates in creative thought. Creativity is a unique human characteristic that allows us to better respond to external changes, such as technological advances and social developments. Further, creativity allows us to imagine and then to create the kind of world we will live and work in—that is, to initiate change. To make our own weather.

¹ <http://pagingdrgupta.blogs.cnn.com/2010/11/08/neanderthals-less-creative-than-humans>

² Pink, D. H. (2006). *A whole new mind*. New York: Riverhead Books, p. 50.

³ Florida, R. L. (2002). *The rise of the creative class*. New York: Basic Books, p. 8, p. 74.

⁴ Trilling, B. & Fadel, C. (2009). 21st century skills: *Learning for life in our times*. San Francisco: Jossey-Bass, p. 3.

⁵ Trilling & Fadel, p. 10.

⁶ Clark, H. (2006). "Jobs of the future." *Forbes.com*, http://www.forbes.com/2006/05/20/jobs-future-work_cx_hc_06work_0523jobs.html, para. 4.

⁷ Popcorn, F. & Hanft, A. (2001). *Dictionary of the future*. New York: Hyperion.

⁸ Hunter, J. E., & Schmidt, F. L. (1996). Intelligence and job performance:

Economic and social implications. *Psychology, Public Policy, and Law*, 2, 447-472; Williams, W. M., & Yang, L. T. (1999). Organizational creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 226-250). Cambridge, UK: Cambridge University Press.

⁹ <http://www.intel.com/content/www/us/en/silicon-innovations/moores-law-technology.html>

¹⁰ http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19750004273_1975004273.pdf

¹¹ <http://www.itu.int/itu-d/icteye/indicators/indicators.aspx>

¹² <http://mashable.com/2011/07/11/one-third-of-us-adults-owns-a-smartphone>

¹³ <http://www.sciencemag.org/content/333/6040/277.summary>

¹⁴ <http://www.virgingalactic.com>

¹⁵ <http://www.nytimes.com/2010/06/10/business/10nathanson.html>