OMG: The Accelerating Pace Of Change
Implications - Are You Ready?

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The Problem / Abstract

"There is nothing permanent except change" - Heraclitus, Greek philosopher 5th century BC.

Change is nothing new... It is incessant... Change is natural... it is growth, maturation, deterioration, decay... Nothing stays the same... Everything is always undergoing change...

As Management evolved as a post industrial age profession, we developed a model of change which has helped business and society understand and manage / cope with change. The model that is still predominantly used directly or forms the foundation of Change methodologies today is the Unfreeze ⇒ Change/Transition ⇒ Refreeze model first expressed by the psychologist Kurt Lewin.

Figure 1.0 Kurt Lewin Change Model

This is often stated using such terms as Present state (Equilibrium / stability / prepare for change) ⇒ Change state (Disruption / Transition / instability) ⇒ Future state (Equilibrium / Stability / re-enforcing change).


It's not the changes themselves that we are concerned about in this paper but rather the new reality that The accelerating pace of change no longer gives us as a society, an individual or business enterprise time to re-stabilize after a change, before another change is disrupting the environment. We are dealing with a new change or more likely multiple new changes - all the time.

Big Changes (new paradigms) are now occurring more often and at a demonstrably faster pace. The pace of change is accelerating exponentially. Each new paradigm results in much disruption... both threats and opportunities for society, community, individuals and business.
We need to build a **new model** / paradigm for coping with, embracing change which helps us thrive in this new environment of multiple simultaneous, exponentially increasing, change events.

The velocity and proliferation of change has reached a tipping point. The new reality of constant change / constant disruption will prove fatal for any organizations which do not learn how to embrace it. The problem we need to be addressing now that it is no longer realistic to expect the future state to be stable, to be in equilibrium is **"How do we address this new constantly changing reality effectively?"** Reference white paper **"Supporting the Emerging Culture of Embracing Change"** by the same author.

### The Evidence

John Hagel III describes the time we are currently challenged by as the "Big Shift". This big shift is driven by two current paradigm shifts - **Globalization** and the rapid improvement in performance and proliferation of **IT infrastructure**. We have experienced dramatic improvements in infrastructure before in the modern era - railroads, electricity, and telephones. The central difference with IT infrastructure paradigm is that the capability is increasing constantly and exponentially. This paradigm shift does not settle to a new equilibrium before the next change needs to be addressed. Hagel & Brown in their 2009 HBR article **"The New Reality: Constant Disruption"** point out that the we can no longer expect a stabilization period after a change... The new reality is constant disruption.

Ray Kurzweil cofounded the Singularity Summit in 2006 with Peter Thiel and the Singularity Institute to encourage meaningful dialog on Singularity issues: including technological convergence, accelerating change, and the impact these dramatic advances will have on society. He argues that the exponential performance and capacity trends of technology will continue to accelerate. In his **Law of Accelerating Returns**, he generalizes Moore's law that the number of transistors that can be placed on an integrated circuit board doubles every 2 years.

In his book **"THE SINGULARITY IS NEAR: When humans transcend biology"**, Kurzweil presents compelling evidence to support the hypothesis that within the next 2 decades the artificial intelligence software running on a $1000 computer will exceed the collective intelligence of the human population. This has been the subject of much science fiction - To actually contemplate the possibility of it happening, in our lifetime, is scary and at the same time exhilarating.

In essence, Technology is the next evolution of humanity. How will the biology / technology symbiosis develop? We will not try to answer that question here, but... it IS clear that we need to admit/acknowledge to ourselves that the rapidly changing environment we are currently living in, requires a change in our behaviours if we are successfully cope/thrive in this new reality.

The chart, Figure 2.0, illustrates with historical reference that the pace of change is dramatically different today than it was 50, 100, 1,000 or 10,000 years ago. There was more change in the 20th century than in the previous 19 centuries and it is speculated by some that there will be 1000 times more change in the 21st century than in the 20th century.
Brief descriptions for each of the points on the chart and hyperlinks to more information are located in the Appendix.

It's no surprise, to any of us, that there is a lot of change happening all around us -- After all we're living it every day.

Figure 2.0 The Accelerating Pace of Change

There's a short (5min) video clip on YouTube titled "Did you know" that presents some interesting statistics highlighting the pace of change - check it out!

What's next?
What will be the next paradigm shift that we will experience? If we buy into Kurzweil's thesis - it will happen soon. Will it be triggered by dramatic advances in nanotechnology, human brain scanning, computing with molecules, effective analysis of "Big Data", cloud computing pervasiveness or something our propensity for linear/extrapolative thinking cannot even contemplate?

What might this new reality of constant and disruptive change mean to your organization? your leadership style? your customers?
The Implications

The pattern of disruption followed by stabilization has itself been disrupted. The logical future is a world without equilibrium - one of continuous and rapid change.

The problem we need to be addressing today is that it is no longer realistic to expect the future state of a change to be stable, to be in equilibrium. How do we address this new reality effectively?

Every individual, every corporation, every government, every non-profit is unique in their aspirations and are subject to different external and internal change influences. There can be no one right answer on how best to deal with pervasive change, but . . . . Below are some generalizations that may be helpful as you interact / respond to change in your specific environment.

1) The accelerating pace of change requires a new change model

Lewin's model is no longer adequate.

- **There is no longer time for equilibrium to re-establish.** Before the change can settle in and establish a new norm, the environment that was just changed is likely to be undergoing other significant changes concurrently.

- Most change initiatives spend significant periods of time in Lewin's "change phase" developing new processes, tools, skills, and beliefs to support the change. Often other change initiatives are being made in parallel. Each Change must be sensitive and take actions to maintain awareness of the changing context within which their Change initiative is operating and act accordingly.

- While it is still conceptually valid to have Lewin's unfreeze and freeze phases, it is no longer practical to count on the luxury of being able to control those phases directly. They must be "controlled" indirectly through the corporate value/belief system. They still need to be planned, but the plan needs to be flexible to external influences.

Lewin's model works best for a single change being made in relative isolation. What we are faced with today is a network of interrelated changes being made concurrently. The most likely / natural consequence of this situation is chaos and failure. The trick / challenge is to find ways to have multiple concurrent changes work together in harmony and not conflict.

The new model: (Lewin's model must become non-linear and fluid)

"All models are wrong, but some are more useful than others". George E.P. Box Center of Quality and Productivity Improvement.

Think of your organization as being under the influence of many changes simultaneously (both internally and externally generated) and more being added into the hopper regularly. At the individual change level,

- Lewin’s unfreeze phase is often happening spontaneously in response to external changes,

- The scope and requirements of the change phase are fluid in response to other changes occurring in the same time frame, and
• The Freeze phase rarely happens in the way it was originally conceived

The key's to successfully optimizing the value of this plethora of constant changes is to ensure that all change initiatives share two common attributes:

1. **Are aligned with corporate goals.** Corporate Vision / Goals / Strategies must exist and be reviewed and updated regularly.

2. **Are self aligning.** Every stakeholder must understand the corporate goals and believe them to be important. All stakeholders must be empowered to make decisions within their domain of competence. i.e. change projects must be able to re-align dynamically when the context of their Change changes.

**General actions:**

1. Goal / strategy development, refresh, and a constant communication ethos
2. Empowerment belief and bias for action ethos.
3. Use Organization Consultants to leverage External research and experience
4. Establish a corporate Change Management function or office (CMO)
5. PMO (Project Management Office)
   - Limit # and scope of initiatives
   - Regular reviews to ensure scope and objectives of projects remain relevant in dynamically changing environment
   - Use an Agile Development Methodology which is integrated with your Change Management Methodology

2) **Leadership must be proactive, adaptive and flexible**

To try to keep ahead of the competition in interpreting what threats and opportunities are presented by incessant Change. Jim Collins in his book "Good to Great" talks about level 5 leadership - WHO before WHAT. Once you have the right people on the bus, then you can figure out the best path to greatness. To thrive in the constant Change environment, it's more about having the right people who can respond to external Change and develop new visions/strategies, rather than in having a rigid pre-defined vision of where you want to drive the bus (business).

**Cynefin** is a model which classifies the problem / solution space in 5 ways. The Complex space is where we find more and more of our situations today. This is partly driven by the accelerating Pace of change.

Simon French in his article (Manchester Business School) titled Cynefin: Repeatability, science and values states "In the complex space, often called the Realm of Social Systems, though such complexity can arise in environmental, biological and other contexts, decision making situations involve many interacting causes and effects. Knowledge is at best qualitative: there are simply..."
too many potential interactions to disentangle particular causes and effects. There are no precise quantitative models to predict system behaviours such as in the known (Simple) and knowable (complicated) spaces. Decision analysis is still possible, but its style will be broader, with less emphasis on details. Decision support will be more focused on exploring judgement and issues, and on developing broad strategies that are flexible enough to accommodate changes as the situation evolves. Analysis may begin and, perhaps, end with much more informal qualitative models, sometimes known under the general heading of soft modelling, soft OR, or problem structuring methods (Franco et al. 2006; 2007; Mingers and Rosenhead 2004; Pidd 2004; Rosenhead and Mingers 2001). If quantitative models are used, then they are simple, perhaps linear multi-attribute value models (Belton and Stewart 2002). Snowden suggests that in these circumstances decision making will be more of the form: PROBE, SENSE, AND RESPOND”

In this new world of constant change, we will not have time to figure it all out. We will have to try something and see how the environment responds. The environmental response will give us guidance on which direction to proceed. We are living more and more in the Cynefin Complex (emergent) and Chaotic (Novel) domains.

"An ounce of action is worth a ton of theory" - Freidrich Engels - social scientist / philosopher

General Actions:
1. Developing, regularly reviewing and updating corporate vision, mission, strategy and tactics to ensure sustained relevance in the dynamically changing environment must become standard operating procedure with higher frequency than is currently practiced by Corporate America.
2. Consider formally using the Cynefin model to provide insights and new strategic planning frameworks.
3. Choose leaders who have a positive attitude for change, have good judgement and are not afraid to take risks and succeed. Get the "right" people on the bus.
4. Change is advancing exponentially, yet the thinking of most executives is linear - stuck in the old disruption/equilibrium model. Successful leaders in the future will be very open minded and innovative. They will be proactively looking at the constantly changing business and social environment for opportunities to evolve their business. The challenge is to be able to distinguish what is at the core of the business that must remain stable vs. what can/needs to be changed.

3) Work and life culture must shift to one that embraces change
Resistance to change is the nemesis of successful change. Fostering a continuous improvement culture throughout the organization will help people be responsive and resilient to the constantly changing environment. In conjunction with an empowerment ethos, stakeholders will be able to self re-align change initiatives when the external context of a Change initiative dynamically changes because they are corporate goal aligned and driven. Reference White Paper "Supporting the Emergence of a Culture of Embracing Change" by the same author.

General Actions:
1. The rewards and recognition model needs to be aligned with the continuous improvement desired work culture. "What gets measured, gets done" - Peter Drucker.
2. Staff should be trained in continuous improvement **tools**

3. **Leadership must walk the talk.** Even the slightest unexplained deviation in leadership expected behaviour will generate scepticism and change resistance.

**4) Current business models are threatened**

Every business has a business model. Each model has different characteristics. Some examples are manufacturer, inventor, financial trader, wholesaler/retailer, lenders/insurers, landlords, contractor, brokers. Some businesses use multiple business models aligned with different revenue streams. Some of the changes that will seem to appear out of nowhere may accelerate processes and create the opportunity to eliminate "middle men".

**General actions:**

1. The origins of advantage are shifting. This will necessitate businesses to be constantly looking at their business models both defensively and offensively to take advantage of new opportunities afforded by the constant Changes occurring in the business and societal environment.

**5) New organization structures are required.**

The current predominant hierarchical functional organization model is not likely to be the best in most future cases because of its inherent slowness in responding to and defining needed Change. There are several approaches to restructuring based on the anticipated structure model that will best support your organization's goals. Organizations can be function based, product/service based, process based, matrix based, and network based. Reference "Organizational Change Interventions: A practitioners guide for Change Leaders and Consultants", Michael Beitler PhD, 2005. Within these options, teams/groups can be creative teams, tactical teams or decision making teams.

**General Actions:**

1. As part of the frequent re-look at vision / goals / strategy, assess if the current structure is an enabler or an impediment to effectively achieving corporate goals.

2. Initiate a facilitated organization restructure initiative as appropriate

**6) Learning needs to be fostered as a lifelong process.**

Lifelong learning is an important value to be fostered in our youth by parents, mentors and educational institutions. With constant change, new roles will be created overnight which will require new skills. This means training / education cannot happen in advance but rather will have to be done concurrently with the Change. The pace of Change renders the educational system just one small part of the "Just in Time" or continual learning challenge.

"The half life of the average job skill is now about five years, so if we are not continually refreshing our skills, we rapidly become marginalized and irrelevant" - John Seely Brown

**General Actions:**

1. Learning institutions should make the point to their students to prepare them for the need for continual learning and "Coping with Change" - Reference White Paper "Supporting the Emergence of a Culture of Embracing Change" by the same author.
2. This should become a key element of all mentorship encounters.

7) Institutionalizing Change Management

The new reality is that expectations have shifted from seeing change as an extraordinary event to seeing change as a permanent condition of business and societal life. Change Management is increasingly perceived as a business function rather than a focused response to the occasional need for re-organization.

General Actions:

1. Consider institutionalizing Change Management as a dedicated change management function, a Change Management Office (CMO) within an organization (Typically HR or IT):
   - dedicated and committed to developing standards/methodologies/tools for planning and implementation of change
   - focused communication efforts directed at facilitating change
   - ensuring reorientation of corporate culture toward flexibility and nimbleness with regard to change

8) Increasing risk of project failure

"We can do anything we want, but we cannot do everything we want" - age-old saying.

The oft quoted, now decades old, Standish Group Chaos Report cited that 70% of all IT projects fail to fully achieve their original objectives. Prosci® research has confirmed similar findings. With more change occurring simultaneously, this statistic can only get worse unless something is done. Some would say there is currently a high degree of complacency surrounding this dismal statistic. "Most projects fail anyway - Why try to raise the bar?" This attitude guarantees your organization will not be one that is able to cope/thrive in the New Reality of constant Change.

The causes of most project failures are not the technical challenges but rather failing to pay attention to the people aspects of change. Because there are so many technical tasks and technical specialists involved in projects, there is always a risk that projects get easily focused on the technical side of a change project (the new tool and new processes) and short shift the people side of change in the initiative.

"I wasn't smart enough about people. I was reflecting my engineering background and was insufficiently appreciative of human dimensions. I've learned that's critical." Michael Hammer, author, Reengineering the corporation: A manifesto for business Revolution.

General Actions

1. No enterprise has infinite resources, so choosing the optimum portfolio of Change initiatives from the "wish" list requires a disciplined approach. A mature and empowered PMO (Project Management Office) is important to ensure that the best portfolio of investments is selected and managed. Whatever selection/management method is chosen, it should be reviewed and enhanced regularly.
2. **Chartering**, focused on desired Business Outcome, must be done well. This is a critical element of change management that is historically done very poorly. Management often feel chartering is done adequately because they have insisted on a solid business case and committed the funding. These are important elements of chartering, but the real value of good chartering is in aligning, and empowering the team to achieve the objectives. Without the team understanding the objective and being committed, all too often, team members gravitate to a comfort zone at the task level without any personal commitment or accountability for the overall Change objectives. This is a major root cause of project failure. When everyone understands the goal and believes it is important, the ultimate success of the Change initiative is almost assured. **Building the Desire for change cannot happen without active and committed involvement of Senior Leaders, Managers and Supervisors.** Prosci® research confirms that weak executive sponsorship has the strongest correlation to project failure.

3. **Proactive Risk/Scope Management** at the portfolio level needs to be in place to ensure that the Change initiatives underway and planned are being constantly re-aligned to the dynamic ever changing environment. This can be a PMO function.

4. Recent research by Lechler & Byrne has concluded that if a **Project Manager has a mindset of optimizing the Value** of the project instead of the more typical Project Manager mindset of minimizing the variance in Scope, Schedule, and Budget - the triple constraint mind set upon which traditional project management methodologies is built. With a mindset of driving value to the client, the results are greatly enhanced and the customer is very happy i.e. a successful project results. The key distinction is risk (known unknown) vs. uncertainty (unknown unknown). In the triple constraint mindset, you try to minimize variation by avoiding risk. In the value mindset, you embrace uncertainty and when an unforeseen event/new piece of data presents itself you try to figure out how it can be exploited to add value to the customer. This is a much more useful paradigm to adopt in an environment of constant Change.

5. **Smaller scope initiatives** are better to limit the window of opportunity for exposure to external changes. Agile development methodologies do this within a project or program by continually delivering small pieces of functionality to enhance continual feedback from the client so scope and approach can be dynamically adjusted.

6. **Change Management:** Change Management (The people side of change) has always been important, but never more so than in a constant change environment. Formal methodologies have appeared on the scene and consultants who have the benefit of experiential success are also available. Taking advantage of Organizational Change Management (OCM) methods and Organizational Leadership Consultants will dramatically improve the likelihood of Change project success. Reference paper "*Change Leadership / Management: A Business Outcomes Biased Perspective*" and "*Supporting the Emergence of a Culture of Embracing Change*" by the same author.
Summary

- **Don't fight it, constant change is here to stay.** Figure out how to **embrace it.** "Get on the bus and enjoy the journey. Maybe you'll even get to steer a little". It is a natural human trait to fear change. Only those who develop a nimbleness in facing change will thrive in constantly changing environment.

- **Foster a Continuous Improvement culture** in your organization. If everyone is empowered, many of the conflicts resulting from Change will be resolved seamlessly.

- "**Heed the context**". Beware of letting one Change initiative team isolate themselves from what is going on around them. They must stay connected to the dynamically changing environment and adjust accordingly. Gone are the days where you could nail down the requirements and lock the team away for a year while they developed a new tool or new way of operating. A business PMO helps here.

- When managing a Change implementation, adopt the **mindset of optimizing value** to the customer and look for Changes in scope presented by the changing context, driven by the reality of constant Change instead of letting the project be constrained by the triple constraints on scope, schedule and budget - the customer needs to be involved in these decisions -- an enlightened customer will thank you for it -- indeed, they are likely expecting it - they are not expecting project managers to perform as automatons.

- **Be reflective.** What could constant change mean to your business?? You need to figure your specific situation out for yourself. As Oscar Wilde once said, "Nothing worth knowing, can be taught". What is the relevance of this new reality to your organization and to you personally?

- You cannot control all the external change being presented to your organization, but you can control how you respond. Focus on leadership, structure and culture to ensure your organization is as prepared as it can be to cope and thrive in this new reality. "**There should be no attempt to Manage/Control** Change. Managing change will often discourage Real Change - The effort should be focused on encouraging a positive attitude towards change so that Change will happen organically" Russ Paddington. John P. Kotter's step 5 "Empowering Employees for Broad Based Action" from his book **Leading Change** makes the point as well.

- **Ensure Change Management expertise** is made available to all your Change initiatives.

- **Utilize Organizational Consultants** to facilitate workshops with senior leaders to set new visions and strategies.

*Hold on tight, flex your mind and make it fun.*
Appendix : Brief Descriptions of Historical Paradigm Shifts

Below are brief descriptions of historical paradigm shifts which illustrate that the pace of change is dramatically increasing. The list below is not complete but rather representative.

**Tools 1,500,000 BC**
Early man did not have strong claws to help them fight. They could not outrun tigers or cave lions. The Homo habilis man is credited with inventing stone tools to help live more comfortably, and to better protect themselves against the many carnivore (meat eating) animals of the time.

**Fire 400,000 BC**
The control of fire by early humans was a turning point in the cultural aspect of human evolution that allowed humans to cook food and obtain warmth and protection. Making fire also allowed the expansion of human activity into the colder hours of the night, and provided protection from predators and insects.

**Agricultural Revolution 8,000 BC**
The Neolithic Revolution was the first agricultural revolution. It was the transition from hunting and gathering to agriculture and settlement. Archaeological data indicates that various forms of plant and animal domestication evolved independently in 6 separate locations worldwide circa 8,000–5,000 BC. The earliest known evidence exists in the tropical and subtropical areas of south-western/southern Asia, northern/central Africa and Central America.

**The Wheel 3,500 BC**
The wheel is everywhere on all our cars, trains, planes, machines, wagons, and most factory and farm equipment. What could we move without wheels? But as important as the wheel is as an invention, we don't know who exactly made the first wheel. The oldest wheel found in archaeological excavations was discovered in what was Mesopotamia and is believed to be over fifty-five hundred years old.

**City States 3,000 BC**
A city-state (what the Greeks called a polis, which is where our word politics comes from) is like a very small country, with just one city in it. There are still some city-states in the world today, like Monaco or Luxembourg. But in antiquity and the Middle Ages, city-states were very common.

**Zero-Decimal system - 458 AD**
The oldest known text to use a decimal place-value system, including a zero, is the Jain text from India entitled the Lokavibhâga, dated 458 AD. This text uses Sanskrit numeral words for the digits, with words for zero such as the Sanskrit word for "void" or "empty", shunya. The first known use of special glyphs for the decimal digits that includes the indubitable appearance of a symbol for the digit zero, a small circle, appears on a stone inscription found at the Chaturbhuj Temple at Gwalior in India, dated 876 AD. There are many documents on copper plates, with the same small o in them, dated back as far as the sixth century AD, but their authenticity may be doubted.
**Printing Press** 1440 AD
The printing press was invented in the Holy Roman Empire by the German Johannes Gutenberg around 1440, based on existing screw presses. Gutenberg, a goldsmith by profession, developed a complete printing system, which perfected the printing process through all its stages by adapting existing technologies to printing purposes, as well as making groundbreaking inventions of his own. His newly devised hand mould made for the first time possible the precise and rapid creation of metal movable type in large quantities, a key element in the profitability of the whole printing enterprise.

**Scientific Method** 1600 AD - Galileo & Kepler
Scientific method refers to a body of techniques for investigating phenomena, acquiring new knowledge, or correcting and integrating previous knowledge. To be termed scientific, a method of inquiry must be based on gathering empirical and measurable evidence subject to specific principles of reasoning. The Oxford English Dictionary says that scientific method is: "a method of procedure that has characterized natural science since the 17th century, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses.

**Industrial Revolution** 1800 AD
The Industrial Revolution was a period from the 18th to the 19th century where major changes in agriculture, manufacturing, mining, transportation, and technology had a profound effect on the social, economic and cultural conditions of the times. It began in Britain, then subsequently spread throughout Western Europe, North America, Japan, and eventually the world.

The Industrial Revolution marks a major turning point in human history; almost every aspect of daily life was influenced in some way. Most notably, average income and population began to exhibit unprecedented sustained growth. In the two centuries following 1800, the world's average per capita income increased over 10-fold, while the world's population increased over 6-fold. In the words of Nobel Prize winner Robert E. Lucas, Jr., "For the first time in history, the living standards of the masses of ordinary people have begun to undergo sustained growth. Nothing remotely like this economic behavior has happened before".

**Quantum Physics** 1900 AD
In the realm of quantum physics, observing something actually influences the physical processes taking place. Light waves act like particles and particles act like waves (called wave particle duality). Matter can go from one spot to another without moving through the intervening space (called quantum tunnelling). Information moves instantly across vast distances. In fact, in quantum mechanics we discover that the entire universe is actually a series of probabilities. Fortunately, it breaks down when dealing with large objects, as demonstrated by the Schrödinger's Cat thought experiment.

**Digital Revolution** 1947 AD
In 1947, Shockley was director of transistor research at Bell Telephone Labs. Brattain was an authority on solid-state physics as well as expert on nature of atomic structure of solids and
Bardeen was an electrical engineer and physicist. Within a year, Bardeen and Brittain used the element germanium to create an amplifying circuit, also called a point-contact transistor. Soon afterward, Shockley improved on their idea by developing a junction transistor.

It's no exaggeration that transistors have enabled some of humankind's biggest leaps in technology.

**Systems Thinking 1954 AD**

Systems thinking is the process of understanding how things influence one another within a whole. In nature, systems thinking examples include ecosystems in which various elements such as air, water, movement, plants, and animals work together to survive or perish. In organizations, systems consist of people, structures, and processes that work together to make an organization healthy or unhealthy.

Systems Thinking has been defined as an approach to problem solving, by viewing "problems" as parts of an overall system, rather than reacting to specific part, outcomes or events and potentially contributing to further development of **unintended consequences**. Systems thinking is not one thing but a set of habits or practices within a framework that is based on the belief that the component parts of a system can best be understood in the context of relationships with each other and with other systems, rather than in isolation. Systems thinking focuses on cyclical rather than linear cause and effect.

In science systems, it is argued that the only way to fully understand why a problem or element occurs and persists is to understand the parts in relation to the whole. Standing in contrast to Descartes' **scientific reductionism** and **philosophical analysis**, it proposes to view systems in a holistic manner. Consistent with **systems philosophy**, systems thinking concerns an understanding of a system by examining the linkages and interactions between the elements that compose the entirety of the system.

**Personal Computing 1975**

The first personal computers, introduced in 1975, came as kits: The MITS Altair 8800, followed by the IMSAI 8080, an Altair clone. (Yes, cloning has been around that long!) Both used the Intel 8080 CPU. That was also the year Zilog created the Z-80 processor and MOS Technology produced the 6502. Bill Gates and Paul Allen wrote a BASIC compiler for the Altair and formed Micro-soft.

In 1976, Apple's two Steves (Jobs and Wozniak) designed the Apple I, Apple's only "kit" computer (you had to add a keyboard, power supply, and enclosure to the assembled motherboard), around the 6502 processor. That was also the year the first word processing program (**Electric Pencil**) and the first text adventure for microcomputers (**Adventure**) were released. Shugart introduced the 5.25" floppy drive; it would become a key component in the personal computing revolution.

**Globalization - Late 1980's**

Globalization refers to the increasing unification of the world's economic order through reduction of such barriers to international trade as tariffs, export fees, and import quotas. The goal is to
increase material wealth, goods, and services through an international division of labor by efficiencies catalyzed by international relations, specialization and competition. It describes the process by which regional economies, societies, and cultures have become integrated through communication, transportation, and trade. The term is most closely associated with the term economic globalization: the integration of national economies into the international economy through trade, foreign direct investment, capital flows, migration, the spread of technology, and military presence. However, globalization is usually recognized as being driven by a combination of economic, technological, socio-cultural, political, and biological factors. The term can also refer to the transnational circulation of ideas, languages, or popular culture through acculturation. An aspect of the world which has gone through the process can be said to be globalized. Against this view, an alternative approach stresses how globalization has actually decreased inter-cultural contacts while increasing the possibility of international and intra-national conflict.

Globalization, particularly instant global communications, accelerates the pace of change and raises possibilities for new business models.

**Public internet Proliferation 1990's**
The origins of the Internet reach back to research of the 1960s, commissioned by the United States government in collaboration with private commercial interests to build robust, fault-tolerant, and distributed computer networks. The funding of a new U.S. backbone by the National Science Foundation in the 1980s, as well as private funding for other commercial backbones, led to worldwide participation in the development of new networking technologies, and the merger of many networks. The commercialization of what was by the 1990s an international network resulted in its popularization and incorporation into virtually every aspect of modern human life. As of 2011, more than 2.1 billion people – nearly a third of Earth's population – use the services of the Internet.

**Social Media Pervasiveness 2004**
The term Social Media refers to the use of web-based and mobile technologies to turn communication into an interactive dialogue. Social media are media for social interaction, as a superset beyond social communication. Enabled by ubiquitously accessible and scalable communication techniques, social media substantially change the way of communication between organizations, communities, as well as individuals. Facebook and Twitter are the most pervasive examples.

**Smartphone proliferation and function 2007**
A smartphone is a high-end mobile phone that combines the functions of a personal digital assistant (PDA) and a mobile phone. Today's models typically also serve as portable media players and camera phones with high-resolution touch screens, web browsers that can access, and properly display, standard web pages rather than just mobile-optimized sites, GPS navigation, Wi-Fi and mobile broadband access. The term smartphone is usually used to describe phones with more advanced computing ability and connectivity than a contemporary feature phone, although the distinction can be vague and there is no official definition for what constitutes the difference between them. The definitions also shift over time since many phones
that are considered feature phones today can have capabilities that exceed those of phones that had been promoted as smartphones in the past.

The most popular function robust smart phones today are the iPhone, the Blackberry and a variety of other hardware manufacturers running the Google Android operating system.

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About the author

Richard's formal education is in applied mathematics and computer science from the University of Waterloo in Ontario, Canada. His practical education is derived from his work experience in IT Project / program management and organizational leadership (Oil & Gas & IT Services Industries). He is certified in Prosci’s® Change management methodology (2011) and IMA’s AIM© Change Management Methodology (2012).

Richard is passionate about helping business enterprises, teams, and individuals succeed in introducing sustained positive change - The Critical Success Factors of actualizing effective change are fundamentally the same whether the change is the introduction of a new business culture, a new business function, a new business system or a new technology.

Richard's consulting clients include fortune 500 companies and mid-size companies in Oil & Gas, Transportation, Telecommunications, Insurance and Professional Services.

Richard’s early career focused on the project management arena where he quickly became known for his ability to lead complex programs and rescue dysfunctional projects and organizations. The common thread throughout his career is his success in introducing sustainable change, both as an organization leader and a project/program manager. He has worked for several of the world’s largest companies, including Imperial Oil, Exxon and HP, where his projects have taken him from Canada to the US, Malaysia, Qatar and New Zealand. His ability to diagnose and remediate difficult business problems and to communicate effectively has made him a strong leader and efficient team builder, an innovative, an energetic and versatile consultant.

In 2009, Richard left corporate America as an employee to focus his passion for "Helping Clients Succeed" by launching an organizational change consulting business. In 2017, Richard wound up his consulting company and is now semi-retired.

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