When Chaos Rules, Only the Fittest Survive:

The Impact of Disruptive Technologies on Organizational Survival

By Deepak Sarup, CISA, FCA

But if variations useful to any organic being ever do occur, assuredly individuals thus characterized will have the best chance of being preserved in the struggle for life. This principle of preservation, or the survival of the fittest, I have called Natural Selection.
—Charles Darwin, *The Origin of Species* (1859)

Sailing around the Galapagos Islands on board the H.M.S. Beagle in the early 1830s, Charles Darwin was "much struck with certain facts in the distribution of the organic beings inhabiting South America."[1] Mulling over these facts led him to formulate and publish, some 25 years later, the new and hugely controversial, at least for that time, theory of evolution. The two central tenets of this theory were, first, that all current species have evolved, through a process of mutation, from some generally extinct species. Hitherto, the conventional wisdom had been that all species were immutable and had been separately created. Second, he postulated that the species that have endured over time are the ones that have best mutated to fit their surrounding habitat. This latter phenomenon he classed as the principle of natural selection or, as it is better known, the survival of the fittest.

The broad principles of evolution espoused by Darwin resonate with the history of commercial enterprise over the last three centuries. At the start of the industrial age, the commercial world was transformed by the introduction of new sources of energy and types of transportation. The immediate impact was a shift from small-scale local workshops to mills that were built for mass production, in turn leading to major demographic shifts in society. Later, around the early part of the 20th century, businesses had to contend with even more dramatic change as accelerated advances in a cluster of new technologies took place.

The mass entertainment industry over the last century is a classic case in point. For centuries, mass entertainment was largely based on local or touring theatrical companies. By the start of the 20th century, the demand for this type of entertainment was gradually eclipsed by the success of silent movies, and only a few of the touring companies were able to transition to this new medium. The early Hollywood moguls were so convinced of the longevity of the silent movie format that they largely ignored the first "talkie" in 1927—*The Jazz Singer*. Indeed, the great icon of the silent movie era, Charlie Chaplin, was quoted as having said some five years after the release of the first talkie, "I give the talkies six months more." It seems that the "people who succeeded with one business model often can't acknowledge its impending collapse."[2]

Some 70 years later, another major shift is taking place in the movie business. DVD sales and rental revenues have overtaken the box office revenue from cinema tickets by more than two times in the US. Yet most studios today still conceive new productions with a strong bias on the return from box office proceeds, as they have little or no knowledge of the preferences of the end consumer with respect to DVD tastes and the even newer video-on-demand channel. The latter, though small, is growing rapidly and may soon overtake both the box office and DVD revenues. Not surprisingly, a major shakeout is likely in the near future, and the studios that are unable to adapt to the new delivery technologies will probably face the same end as the weaker species so laboriously catalogued by our paleontologists.

The Push to New Business Models

Darwin's theories spanned millions of years of geological change. Changes in the core business models of the industrial age—railways, electricity, *et al*—were, at best, generational. What has changed in the information age is the rate of change. Advances in the Internet and other enabling technologies not only hold the promise of fundamental change to the business model, but for change at a significantly accelerated rate—measured in years or, in some extreme cases, even months.

Consider the computing industry as an example. In the mid-1970s, the only business computers were the monolithic mainframes that were launched a decade or so earlier. These computers were kept in "glass houses" and connected to the real world by paper-based batches. Most employees never went near a dumb terminal, let alone accessed the glass house. This era was overtaken in the early 1980s by online minicomputers, which ushered in the age of departmental computing and caused the demise of many of the mainframe manufacturers that were unable to shift to the new technology in time. Just a decade or so later, facilitated by the PC revolution, cheap servers started to come of age, followed closely by web-based connectivity. Many of the champions of the minicomputer revolution were unable to adapt to this new computing model, and most of the leading minicomputer vendors are all but extinct now—all this change in a single industry in just 30 years.

In the hype leading up to the dot-com bubble in 1999, almost everyone, from the Wall Street analyst down, believed that the traditional business models were dead and the new-age Internet businesses would obliterate the "brick and mortar" businesses. Even Jack Welch was prompted to start his famous *destroyyourbusiness.com* initiative at General Electric. Sure,

this fad was hyped out of all proportion and, post-bubble, everyone was wiser—but, perhaps, a tad complacent. The warning may have been premature, but the threat posed by new technologies is very real for the commercial ecosystems.

One should examine two radically different business models enabled by the new disruptive technologies that have recently emerged through the World Wide Web. It is important to clarify that disruptive technologies do not mean just clever new technologies, but those that dislodge existing technologies. In that sense, they make life very uncomfortable for businesses that rely on the *status quo*.

Will the Internet Kill the Phone Company?

The question posed above may be a bit kind. A leader in *The Economist*[3] in September 2005 was titled "How the Internet Killed the Phone Business." The much-hyped disruptive technology behind this threat is Voice-over Internet Protocol (VoIP). Broadly, VoIP service providers enable registered users to make free telephone calls to each other using free downloaded software and, for a very small fee, to any other telephone anytime and anywhere in the world. As *The Economist* noted, "All of this spells trouble for the incumbent operators."[4]

Hype about VoIP reached a crescendo when **eBay** announced its takeover in September 2005 of two-year-old **Skype**, a market leader in VoIP-based phone services. This acquisition—for an eye-popping US $2.6 billion with a potential additional US $1.5 billion in downstream earn-outs—was shocking because Skype has annual revenues of only about US $60 million, and it has yet to show any profits!

Yes, at 43 times Skype's current revenue, eBay may have grossly overpaid on the acquisition. Yet, the fact remains that Skype and its ilk represent an irresistible new business model for the century-old phone industry. The basic premise of the new model is that voice calls are free or almost free provided that a user pays for a high-speed broadband connection. If this model proves economically sustainable, as many like eBay are betting it will, it could spell the beginning of the end for the distance- and time-based pricing model used by the US trillion-dollar voice telephone industry. Further, the new model is premised on the largest number of users that pay a fixed connection fee rather than the highest revenue per user that has been the key driver for the traditional phone industry. In that sense, with 50 million users in just over two years, Skype appears to have a headstart on the competition.

The *coup de grace* for traditional phone companies is that VoIP does not just provide voice services. A veritable plethora of value-added services, including voice mail, video conferencing and (Internet-delivered) television, could provide major new revenue streams. Also, the user can get much more flexibility by selecting a traditional telephone number or, alternatively, multiple traditional telephone numbers spanning different parts of the world. The latter would allow a user to assign a local number in Chicago for a call center that is a continent away in, say, Calcutta.

Skype and other VoIP service providers do have some limitations. First, calls are probably not as trouble-free as they are from a traditional land-based line. However, considering that the calls are free, most users do not seem to have a problem redialing if occasionally required. Next, there are also some hardware issues with using VoIP, such as the use of microphones with a PC. Improvements are underway as equipment manufacturers jump on the bandwagon and design sleek new VoIP devices that can simply be plugged into a PC. Finally, there are issues on calls to and from unregistered users. Again, services such as Skype Out and Skype In, which are almost free, are quickly plugging this gap. In short, the technology will soon move from being "cool but geeky" to "cool and mainstream." As Wharton professor **Barbara Kahn** noted, "Skype has gone from 100,000 users to 47 million users in less than two years, largely because of viral marketing."[5] It would seem that its best advocates are its growing band of existing users—a hallmark of a successful Internet company.

With the voice telephone business model under attack, there is a level of panic, somewhat belatedly, among the traditional phone companies. Predictably, the first knee-jerk reaction is to protect the voice-based revenue stream through some form of blocking, where possible, of the VoIP service providers. At best, this seems to be a delay tactic as the public pressure for cheap or free services will increase, and regulators will move to ensure that VoIP is not barred. Some of the phone companies have decided to continue to invest in a new generation of networks (3G). Ultimately, this defensive approach may only deepen the carrying cost burden because such networks will enable mobile VoIP, thus placing even the mobile voice revenue at risk. Finally, some of the traditional phone companies have decided that if you cannot beat them, join them. They are investing in new networks based on Internet technology that could position them to best benefit from VoIP-based business model changes.

The other threat that the traditional phone companies face is the arrival of bigger and savvier competitiors than the current lot of relative upstarts. Other than eBay, other major Internet services suppliers such as **Yahoo**! (which has acquired **Dialpad Communications Inc.**), **Google** (which recently launched Google Talk), and **Microsoft** (which just bought **Teleo Inc.**) have entered the fray.[6] As the proverbial saying goes, "Let the games begin."

The only remaining question is not if VoIP will truly come of age, but when. Many analysts expect that as early as 2010, all voice services will essentially be free but packaged with broadband or pay-TV. If this is correct, it appears that the hype over Skype is not misplaced, as it "symbolizes a massive shift for a trillion-dollar industry" and "the death of the traditional pricing model." Either the incumbent giants adapt or they will likely perish.

Will Google Kill the Fourth Estate?

It says a lot about Google when the disruptive technology unleashed by a single company represents a powerful threat to the media empires of our times. So what does Google represent?

To begin with, Google is different, as was dramatically illustrated by its peculiar approach to going public. The company was launched by two Stanford University (California, USA) computer science graduates only seven years ago to

market a new search engine service using an algorithm they had developed. The company's lofty goal, as stated by its cofounder **Larry Page**, is to provide "the perfect search engine" that "would understand exactly what you mean and give you back exactly what you want."[7] Over the last few years, its search engine has achieved near-mythical status among millions of Internet users.

Next, Google is quick. It has rapidly moved beyond pure search and blogging capabilities. It has already latched on to the VoIP opportunity by positioning **Google Talk** as a major challenger. **Google Print** aims to provide an electronic repository of every book ever written—searchable in less than a second. Assuming it can successfully win the ensuing copyright battle, this offering is poised to emerge as the mother of all libraries and bookshops! **Google Earth** was launched to provide online satellite maps of almost every location in the world with value-added overlays, such as the location of schools and shopping areas. It is now set to launch **Google Video** with content drawn from a number of third parties. Clearly, Google encourages innovative, even wild, thinking, and it will mutate endlessly to maintain a competitive edge. (For example, on a recent day at the Google campus a bulletin board invited workers to a session about the dream of erecting a 200-mile-high elevator into space.[8])

Finally, Google is astonishing. The financial markets clearly believe that there is something extraordinary about this company. With a dizzying market capitalization of nearly US $130 billion, and a gravity-defying share price uplift of more than 100 percent in the last calendar year alone, it now has awesome financial muscle to match its technical edge. At nearly 100 times earnings, its market valuation is either mania or merit—in the latter case, a leap of faith on its future worth.

The only true creed at Google is data. The ethos of the company is that the more data you collect, the more you know before you make a decision. It is this zeal that is a threat to the traditional media companies. Two Californian bloggers, **Robin Sloan** and **Matt Thompson**, have painted a fascinating scenario under the title "**EPIC 2014**."[9] In this scenario, the Internet is projected to overtake the traditional media companies by 2014. The scenario hypothesizes that Google will lead this charge, leveraging a string of takeovers, including Amazon, which will lead to the formation of the giant **Googlezon** by 2008. It suggests that by combining Google's unmatched search-related capabilities with the outstanding personal recommendation engine of Amazon, Googlezon will be able to provide the ultimate electronic newspaper—one that is customized to the tastes and sociodemographic profile of each individual reader. The scenario concludes with the prediction that by developing the Evolving Personalized Information Construct (EPIC) for each and every person in the world, Googlezon will outmaneuver and vanquish the challenge from **Microsoft** and the likes of the *New York Times*. EPIC will filter the mediascape, drawing contributions from bloggers, freelance editors and just about everyone who stores data online to create the ultimate personalized newspaper—killing, once and for all, the 400-year-old traditional business model of the Fourth Estate.

While EPIC 2014 is, no doubt, the product of a fertile imagination, the threat to traditional newspapers, journalists and editors has been taken very seriously. Some editors, including Frank Kane of the London-based *Observer*, are frightened by it. Kane notes that all this could lead to "a future of chaos, frivolity and lowest-common-denominator news."[10] On the other hand, **Rupert Murdoch**, chairman and CEO of News Corporation, has responded in kind to the potential threat from Google and other Internet companies. He notes, "Google is as much an advertising company as a technology company, and they're very brilliant."[11] Speaking at a convention of the American Society of Newspaper Editors, he cautioned that newspapers risk being "relegated to the status of also-rans"[12] if they don't make use of the Internet. Murdoch is deadly serious—he just paid US $580 million to acquire the operator of *MySpace.com*, a leading web site for teenagers and young adults. At the start of 2006, he has indicated that "News Corp could spend as much as US $2 billion on Internet assets, and is particularly interested in acquiring an Internet search engine or forming a partnership with one."[13]

Yet, the somewhat subliminal message in EPIC 2014 is, perhaps, not really about Google. It is directed more at the pervasive footprint of the Internet and its intrusion on business models that date back to an analog past. In the digital future, almost every business model is under threat, to a lesser or greater degree. Indeed, the Internet is at the epicenter of a seismic-like shift to a new age with new possibilities and grand challenges. Only the species that can adapt to this new digital ecosystem will survive this transition. The traditional business model of the Fourth Estate may just be the first of many casualties.

The Twin Fallacies of Size and Success

A common fallacy that abounds is that the size and/or success of an organization immunizes it to the forces of disruptive change, either from technologies or markets. This is patently untrue. Time and time again, a powerful and mighty corporation that virtually dominates the current market has been felled with inordinate ease by a disruptive change. Let's consider a few examples.

Digital Equipment Company (DEC), **Prime Computers** and **Data General** were among the dominant players in the minicomputer revolution of the 1980s. DEC even redefined the potential of technology with its PDP 11 and VAX range of computers. Sadly, as the shift to PC-based servers occurred, they were overwhelmed with the wrong model and either perished or were quietly absorbed on the cheap.

Kodak has dominated and excelled in the photographic film market for so many decades that its name is almost synonymous with photographic film. Yet, it may have miscalculated the impact of the new digital medium—and when it did recognize the new trend, it may have moved too far too quickly, perhaps even in the wrong direction. It now appears to have ceded marketshare in digital photography to the likes of **HP** and **Canon**.

Sony, another great market leader, has been the *de facto* brand leader in the global audio-video product market for the last three decades and has consistently proved its ability to

innovate with category-defining products such as the Walkman and Playstation. Yet, it too appears to have missed the recent shift to flatscreen televisions and digital music storage devices such as the iPod. It is no doubt trying hard to recover with new offerings, but, in the meantime, **Samsung** and **Apple** have established a dominating presence in some of its key product areas.

Microsoft, one of the titans of the times, dominates the software industry with its Windows and Office products. Yet, possibly because of this domination and the assured revenue stream therefrom, it seems to have missed some of the major developments on the Internet—despite having one of the largest research and development budgets in the world. While it remains a formidable market leader, it now appears more vulnerable to the likes of Google, as conceptualized in EPIC 2014, than could have even been conceived only a few years ago.

Kodak, Sony and Microsoft are still giants in the commercial world and the game is not over for them by any means. Yet, these apparent missteps may turn out to be very costly and, in any event, they illustrate the great paradox of our times. Current success or existing market share is no proxy to future success. On the contrary, current success and giant market share can result in an ambivalence within an organization to disruptive technologies and, thus, can be an impediment to the continued evolution of a business.

Meeting the Challenge of Disruptive Technologies

One of the hardest things for businesses is to stay focused on the competitive pressures of the near term as well as the challenge posed by the changing technologies of the future. So what does an organization do to respond to the looming threat of disruptive technologies? How does it get fit enough to survive such threats?

**An Agenda for Developing Corporate
Fitness to Face the Future**

So much of our current management thinking concentrates on the here and now that organizations need a whole new way of addressing the very real challenge of the new disruptive technologies. While every industry will have its peculiarities, a few general rules apply to all:

• **Map** emerging technolgies that will have an impact on a business model, and differentiate between the ones that are sustaining (supportive of incremental change) and the ones that are disruptive (like VoIP).

• Assess the probable **impact** of disruptive technologies, bearing in mind that existing customers can rarely provide meaningful guidance (for instance, in the early stages of the shift to digital photography).

• Selectively **pilot** the more significant disruptive technology to foster learning within the organization and better evaluate the new business model (as Apple has done so many times with its consumer products).

• If viable, **roll out** the new technology either to replace existing technologies (for example, the iPod Nano replacing the iPod Mini) or to complement them (as Samsung did initially with its flatscreen televisions due to the price gap with traditional television models).

While this framework is a broad guide, there is no substitute for top management being cognizant of the future and taking measured bets, from time to time, to ensure the organization's survival.

Creating the Ambidextrous Organization

Perhaps the biggest challenge for companies lies in developing an organizational structure to address the needs of the future while, at the same time, delivering expected short-term improvements. Research conducted by Harvard professors **Charles O'Rilley** and **Michael Tushman** on companies that have been successful at exploiting the present and exploring the future indicates that they share important characteristics. In particular, they believe that these organizations "separate their new, exploratory units from their traditional exploitive ones, allowing for different processes, structures and cultures; at the same time they maintain tight links across units at the senior executive level."[14] They call these companies ambidextrous organizations, and they believe that this type of structure can provide a business with the ability to address the challenges of today and the impact of new and disruptive technologies. This organizational model was used by *USA Today* to develop its succesful Internet foray *USAToday.com*. It was also used by **Ciba Vision**, a unit of Swiss pharmaceutical giant Novartis, to develop and launch a range of breakthough contact lens-related products that led to a tripling of revenues from a nearly stagnant revenue base.

Learning to Operate at the Edge

In their brilliant new book, two of the leading thinkers of our times, John Hagel and John Seely Brown, provide a thought-provoking new strategy for an organization to sustain its competive edge.[15] They suggest that an organization must learn to operate at its periphery to survive. They contend that it is at the edge, and distant from its core, that an organization can harvest opportunities for value creation and best fortify against value destruction. They argue compellingly that at the edge of an enterprise—be it the edge of a market, geography or consumer demography—an organization will be able to look ahead and discern the distant contours of the future landscape. They note that "even if we cannot predict the future, we can certainly anticipate and, in some cases, even shape broad patterns of evolution."[16]

Hagel and Brown suggest that, to survive in the future, organizations must take a dynamic view of building capabilities; it is no longer a zero-sum equilibrium model but a positive-sum process model that can grow infinitely in new commercial ecosystems. Specifically, they identify three broad strategic thrusts for building capabilities that are required to maintain a sustainable edge. First, through **dynamic specialization**, an organization should eliminate activities or resources that provide it with no distinction, and concentrate on accelerating growth from capabilities that truly distinguish it in the marketplace. Next, as an organization specializes, there will be the increasing need for it to **connect and coordinate** with other companies on which it must rely—and it must learn to do this effectively to add even more value to its customers. Finally, through collaborating with others, an

organization will experience productive friction and, through this process, will be able to **leverage its capability building**, as each party will push the other to become faster and better. According to the authors, these three elements (for accelerated capability building) "must converge on a global scale in a pragmatic, evolutionary way if a company is to create and capture value as competition intensifies."[17]

Conclusion

The early lessons of the disruptive technologies are that it is not enough to be successsful today to survive. An organization must learn to evolve continuously or it risks being overtaken by exogenous forces. A telling end note is provided by McKinsey consultant Eric Beinhocker:

> *Unlike creatures in nature, we are not blind, passive players in the evolutionary game. Through the sciences of complexity, we can come to understand how evolution works, the tricks it has up its sleeve, and the skills needed to survive in a complex world. If we do so, we may be able to harness one of the most powerful forces of all: evolution will then be the wave we ride to new levels of creativity and innovation rather than the tide that washes us over.*[18]

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