

1-1-2017

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Recommended Citation

Stern, Tziporah; Wieser Friedman, Linda; and Friedman, Hershey H. (2017) "How We Got Here: Connectivity, Creativity, Confluence and Internet Culture," *Journal of International Technology and Information Management*: Vol. 26 : Iss. 1 , Article 3.

Available at: <https://scholarworks.lib.csusb.edu/jitim/vol26/iss1/3>

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How We Got Here: Connectivity, Creativity, Confluence and Internet Culture

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ABSTRACT

There are more innovations today than at any time in human history. The companies that value creativity and diversity of ideas in their hires are the ones most likely to thrive. Indeed, the key asset of a corporation is the abilities, innovativeness, and creativity of its employees. The authors construct a timeline of critical events leading up to today's highly networked and interconnected world with its ubiquitous social media technologies. The current state has been influenced by advances in media, technology, military defense, and commerce. One trend that stands out in this timeline is the increasing rate of change. It also becomes apparent that the companies that will survive are the ones that are nimble, sensitive to changes in the competitive environment, and can quickly adapt.

KEYWORDS: convergence, expert predictions, history of technology, Internet, social media, web 2.0

INTRODUCTION

The companies that value creativity and diversity, including diversity of ideas, in their hires are the ones most likely to thrive. After all, we live in the “age of creativity, innovation, and sustainability” (Hoque & Baer, 2014). This is evidenced by the number of patents issued in recent years. According to Frohlich (2015), more patents were issued by the United States Patent and Trademark Office (USPTO) in 2014 than any other time in history. IBM was number one for the 22nd year in a row with 7,534 patents; the total number of patents issued by the USPTO was 300,678 (Frohlich, 2015).

Change and innovation is critical in today's business environment. Admiral Grace Murray Hopper, the technology pioneer sometimes known as “Grandma COBOL,” said "Humans are allergic to change. They love to say, 'We've always

done it this way.' I try to fight that." (Schieber, 1987). That kind of thinking is deadly today. Even firms once known as being innovative eventually become slow to adapt to changing business conditions. Think of what has happened to such companies as A&P, AOL, Blackberry, Blockbuster, Borders, Kodak, MySpace, Netscape, Pan American, Radio Shack, Sears, and Wang Laboratories. Many of these companies were iconic, but failed to sustain their dominance in the face of new technology. When comparing these defunct companies to companies around for a decade, such as, General Electric and DuPont, the common denominator of success is management innovation (Hamel, 2006). Management innovation is different than product and technology innovation since it is a systemic and long-term process that helps sustain long-lasting competitive advantage in the market. It allows for a culture open to change that permits employees to be creative (Hamel, 2006). Some examples of management innovation include: business process re-engineering, *total quality management*, learning organization, team-work, quality management, building an employee community, and out-sourcing (Birkinshaw, Hamel, & Mol, 2008; Damanpour, 2014; Hamel, 2006; Pavitt, 1990), all of which are necessary components for companies to, "maintain performance outcomes and enable an organization to adapt, transform, grow, and survive" (Damanpour, 2014). On the flip side, when companies fail, it is often because of management failure and/or a culture resistant to change (i.e. Kodak and Blockbuster) (Gershon, 2013). Thus, it is critical for companies to remain innovative (Pavitt, 1990), and it is a key job of a corporate leader is to create an organizational climate that fosters innovation and creativity. Today's CEOs have to transform their organizations' into ones that are nimble, resilient, quick, and willing to adapt to changing conditions. To sustain competitive advantage, employees should also share knowledge and help each other in order to maximize creativity (Friedman & Lewis, 2014; Raphan & Friedman, 2014). This promotion of intellectual capital has been found to directly affect e-service innovation (Tsou, Chen, & Liao, 2016).

Innovation is crucial in order to increase performance (Damanpour, 2014; López-Nicolás & Meroño-Cerdán, 2011). While the effects of management innovations are sometimes difficult to measure, research suggests organizations adopt multiple innovations (i.e. technological, organizational) simultaneously in order to have a greater and more positive effect (Damanpour, 2014). In fact, management innovation enables companies to successfully translate their technological breakthroughs to tangible financial performance (Černe, Jaklič, & Škerlavaj, 2015). While it is true that many factors can affect the success of an innovation (Campbell-Kelly & Garcia-Swartz, 2013; Garcia & Calantone, 2002), research has found that there is a "reciprocal relationship" between management practices and technological innovation (Yoo, 2013). Technology in the firm must be

managed appropriately (Leonard-Barton & Kraus, 1985; Pavitt, 1990), especially since technology changes at a faster rate than management (Damanpour, 2014; Yoo, 2013). In fact, firm effectiveness has been linked to how well they use information technology. Thus, technology is an important aspect of maintain a competitive advantage (Ravichandran & Lertwongsatien, 2014).

Technological innovation in today's world has fundamentally changed much of our society, from the way we shop, socialize, bank, job search, exercise, and converse. The fact that communication, collaboration, and creativity are accessible at the slightest touch of a button or swipe on a screen is taken for granted. The Internet, in particular, has touched many aspects of society, with its plethora of online tools. Wikipedia, online social networking, selfies, streaming entertainment, online learning, and other types of media, all of which have replaced or exist alongside of their old-world counterparts. The paradigm of convergence covers everything. For example, while the toy carried in pockets and purses may be called a telephone, it is used for everything but –to text, shop, take photos, network, check the weather, follow a map, read books and newspapers, watch movies and (what passes for) TV, listen to music, etc... In fact, technology is used in ways that even the inventors didn't intend (Yoo, 2013). Rather than being satisfied with communications handed down by self-important experts, information is searched and aggregated from multiple sources and commentary is broadcast using Web 2.0 technologies. Thus, the status and control of information has changed (Tredinnick, 2006) as individuals become the producers, distributors, aggregators and creative artists. Since many of the most active contributors to the Internet culture such as, e.g., the Wikipedians and Creative Commons enthusiasts, are altruists; everyone is the beneficiary of such altruism.

One of the most interesting and introspective questions any culture can ask is the one humans have been asking themselves since the earliest creation stories: Where are we now, and how did we get here? This paper leaves the first part of this question to the many books and articles that continue to appear on the subject of Internet culture (see, e.g., Friedman & Friedman 2008; van Dijck 2013).

The purpose of the current paper is to look back in time and examine how we got to where we are today. A timeline is constructed of critical events leading up to today's interconnected world. Since there are so many technological, social, and cultural effects of the Internet and the communications technologies that make up its' infrastructure (Kleinrock, 2010), the 'high level' groundbreaking technologies that most 'layman' and average users would be familiar with are the ones focused on. Since it is, "possible to narrow Internet history down to specific technologies with which we are most familiar" (Kleinrock, 2010; p. 26). Therefore, the events

presented here are selected for their critical importance, but are also inspired by our experiences. As the communication platform for today's connected culture is based on computer technology, it seems appropriate to view the critical historical events noted here through the prism of whimsy. Since the advent of the computer age, people have reveled in humor and playfulness that is somehow encouraged by this seemingly self-important technology (Friedman & Friedman, 2003). Finally, the factors influencing and converging in today's world are also examined. Figure 1 is a self-developed model depicting the various influences on Internet culture that are incorporated in the timeline: computer technology; telephony (communication networks); military; commerce; and media.

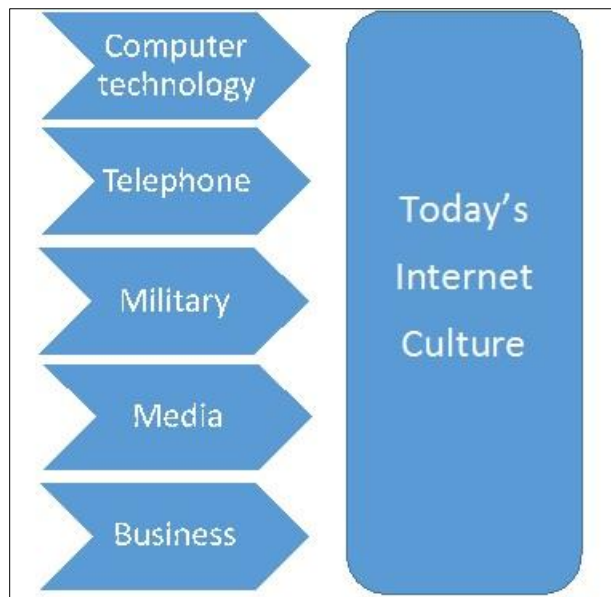


Figure 1. Influences on Today's Culture of Connectivity

This timeline is a valuable teaching tool since it makes it very apparent that the companies that will survive are the ones that are sensitive to changes in the competitive environment and can adapt. The companies that value creativity and diversity, including diversity of ideas, in their hires are the ones most likely to thrive. Companies that are reluctant to change the way they conduct business will become obsolete. At the same time, the phenomenon that has had virtually no influence on our Internet culture and associated social media technologies, namely, expert predictions are highlighted.

THE TIMELINE

In this section, some important milestones – in technology, defense, communication, media, and commerce – without which we would not be where we are today are presented. Most of the events listed here are indeed critical; some are interesting bits of arcana, not as critical as the others but it would be a shame to lose them. This timeline is clearly subjective, reflecting the authors' interests and, to some degree, a slightly idiosyncratic, somewhat whimsical approach to the subject.

Prehistory – or, at least before we start the timeline.

- In the beginning there were... cave paintings, songs, verbal lore passed down across generations.
- All knowledge was local. Communities and cultures were not really aware of any others except for those geographically closest to them. (Not much need for a GPS.)
- No patents, no copyright.
- All creative works were freely shared and reworked.
- Authorship was not important. In fact, writers would often attribute their own works to important individuals rather than take “ownership” of them.

1440

- Johannes Gutenberg invents the printing press, making possible such innovations as newspapers, universal education, and censorship.

1605

- The first newspaper is published in Strasbourg.

1650s

- Early social networking is imported along with coffee from the Arab world when the first coffee house opens in England. Within a few years coffee houses have become where one goes to argue politics and economics, read newsletters, waste time and, yes, check one's mail (Standage 2013).

1834

- The first known "computer," Charles Babbage's Analytic Engine, is the design of a computing device not actually built at this time. It had all the important elements of a modern computer.

- Lady Augusta Ada, Countess of Lovelace (daughter of the poet Lord Byron), is considered the first computer programmer. She develops the instructions for the Analytic Engine, including the loop (Friedman 1992).

1843

- The idea for a facsimile machine is patented, for image transfer line by line.

1844

- Samuel Morse sends message by telegraph to a colleague, "What hath God wrought!"

1865

- From an editorial in the *Boston Post*:
 - Well informed people know it is impossible to transmit the voice over wires and that were it possible to do so, the thing would be of no practical value.

1876

- Alexander Graham Bell transmits speech. Well, in actuality, he yells: "Mr. Watson, come here, I want to see you."
- A Western Union executive says:
 - The telephone has too many shortcomings to be seriously considered as a means of communication.

1878

- The first telephone switchboard – manual, of course.

1895

- The first public screening of a projected motion picture. And then, less than a year later, the first pornographic movie was released, *Le Coucher de la Marlée*.

1899

- Charles H. Duell, the U.S. Commissioner of Patents states:
 - Everything that can be invented has been invented.

1915

- The first coast-to-coast telephone line from New York to San Francisco.

1920

- Radio broadcasting begins.

1926 – 1939

- Over this time period we see the evolution of television as we know it. At first, it is an experimental undertaking only, not expected to become a commercial enterprise. By 1939, RCA televisions are released in the New York City area, promoted as a business opportunity with a great deal of potential.

1939

- Irving Thalberg warns Louis B. Mayer, regarding the movie *Gone With the Wind*:
 - Forget it, Louis, no Civil War picture ever made a nickel.

1941

- The first television commercial airs before a game between the Brooklyn Dodgers and the Philadelphia Phillies. This ten-second commercial for Bulova clocks and watches ("America runs on Bulova time.") costs less than ten dollars.

1943

- Thomas Watson, the first president of IBM, states:
 - I think there is a world market for maybe five computers.

1944

- IBM's Automatic Sequence Controlled Calculator (ASCC), is called the Mark I computer at Harvard, used for some of the calculations needed for the Manhattan Project.

1946

- ENIAC the first electronic computer, developed at U. Penn, with 17,468 vacuum tubes, 70,000 resistors, 10,000 capacitors, 1,500 relays, 6,000 manual switches, it takes up 1800 square feet and weighs 30 tons.
- In a possibly related story, when the computer is first powered on, Philadelphia experiences a blackout.
- Darryl Zanuck, movie producer, co-founder of 20th Century Fox, asserts:
 - People will soon get tired of staring at a plywood box every night.

1947

- Grace Murray Hopper, working for the U.S. Navy, “debugs” the Mark II computer. She removes an actual bug – a moth – from the machinery. Forever afterward, programmers are known to blame debugging for time overruns.

1948

- UNIVAC I – the first commercial computer. Used on some TV game shows.
- 30,000,000 telephones in service
- The first TV commercial jingle, for Ajax Cleanser (Classic Vintage TV Commercials, 2011).

1949

- Popular Mechanics predicts:
 - Computers in the future may weigh no more than 1.5 tons.
- John von Neumann, who created the theory that underlies modern computers, states:
 - It would appear that we have reached the limits of what is possible to achieve with computer technology, although one should be careful with such statements, as they tend to sound pretty silly in five years.

1950

- Alan Turing’s “Turing Test” or, as Turing actually called it, “The Imitation Game” (Turing 1950).

1954

- IBM introduces Remote Job Entry (RJE).

1957

- From a Prentice-Hall editor:
 - I have traveled the length and breadth of the country, and have talked with the best people in business administration. I can assure you on the highest authority that data processing is a fad and won’t last out the year.

1959

- *IBM executives, speaking to the eventual founders of Xerox, predict that:*
 - *The world potential market for copying machines is 5,000 at most.*

1961

- According to FCC Commissioner Tunis A.M. Craven:
 - There is practically no chance communications space satellites will be used to provide better telephone, telegraph, television, or radio service inside the United States.

1962

- Work on ARPANET is started at the Defense Advanced Research Projects Agency (DARPA). Some folks in the early 1960s wanted to enable computers in science and the military to share R&D information
- The first computer game *Spacewar!* is built at MIT (Graetz, 1981).
- Decca Recording Company explains why they are turning down the Beatles:
 - We don't like their sound. Groups of guitars are on their way out.

1963

- The ASCII (American Standard Code for Information Interchange) code is standardized, 128 7-bit strings.

1964

- The SABRE airline reservation system is completed. This first remote automated electronic reservation and booking system uses remote teletype machines.

1965

- Dartmouth Time Sharing System (DTSS) is operational on and off campus. When it first went operational in January 1964, the system failed on average once every five minutes (Heffernan 2008).

1968

- ARPANET tidbit: Senator Ted Kennedy hears that the pioneering Massachusetts company BBN won the ARPA contract for an Interface Message Processor (IMP). He sends a congratulatory telegram to BBN applauding them for their ecumenical spirit in winning the "interfaith message processor" contract.
- HAL, the evil sentient computer is introduced in the film *2001: A Space Odyssey*. The name HAL is not, most definitely, absolutely not, a character-by-character decrement of IBM, according to both Arthur C. Clarke and Stanley Kubrik the film's creators.

- First demo of the mouse. It is actually called the “X-Y position indicator for a display system” (Kennedy 2013). Better, right?

1969

- ARPANET, the original Internet, begins operation (Madrigal, 2013).
- The Neiman Marcus catalog showcases the very first home pc, called the Honeywell Kitchen Computer, offered at the price of \$10,600. The accompanying photograph shows a housewife, complete in apron, next to the free-standing computer, with the caption "If she can only cook as well as Honeywell can compute." Yes, this was 1969. It may have been a fantasy offering, a stunt by the well-known retailer; at any rate, the computer was not a commercial success.

1971

- Over 100 million telephones are in use.

1972

- The Intel microprocessor.
- Email begins, on the ARPANET system.

1973

- The release of the Xerox Alto personal computer (really, a desktop mini-computer) with a “desktop” – the first graphical user interface (GUI).
- The File Transfer Protocol (FTP) is born.

1974

- Ethernet, a protocol for many local networks, is an outgrowth of Harvard student Bob Metcalfe's dissertation on "Packet Networks." The dissertation was initially rejected by the University for not being analytical enough; it later was approved after Metcalfe added some more equations to it.

1975

- The first true pc – Altair 8800.

1977

- The first Apple computer
- Ken Olson, President of Digital Equipment Corporation, a now-defunct computer manufacturer, says:
 - There is no reason anyone would want a computer in their home.

1978

- Radio Shack's (Tandy) TRS-80

1979

- Steve Jobs visits Xerox PARC (Sen, 2002). Xerox executives, used to dealing with productivity measures like “pages copied,” not understanding how important the GUI desktop will become, and against the advice of their own design team, allow Jobs in.
- Comuserve goes online

1981

- Bill Gates declares:
 - 640,000 bytes of memory ought to be enough for anybody.

1982

- TCP/IP, the basic communications protocol of the Internet, is introduced. It was developed by the U.S. Defense Advanced Research Projects Agency (DARPA) for ARPANET.
- Carnegie Mellon Professor Scott Fahlman invents the smiley emoticon in a message to an online electronic bulletin board: "I propose the following character sequence for joke markers: :-) Read it sideways."

1982

- Jack Valenti, MPAA president, in testimony to the U.S. House of Representatives:
 - I say to you that the VCR is to the American film producer and the American public as the Boston Strangler is to the woman home alone.

1983

- Divestiture of Ma Bell – the Justice Department breaks up AT&T because of its telephone monopoly.

1984

- The Domain Name System (DNS) is introduced. The first domain names are registered in 1985.
- The first Macintosh computer is released. Inside the plastic case inscribed the signatures of the design team.



Figure 2. Inside the back case of the 1984 Mac (Tweedie, 2004)

1985

- The first massively multiplayer online role-playing game (MMORPG) was probably *Island of Kesmai* available in 1985 via the CompuServe online service for \$12/hour; it supported up to one hundred players so, basically, it was only “massive” for its time.

1988

- Internet Relay Chat (IRC) developed in Finland.
- A joke breaks the Internet or, at least, temporarily takes down rec.humor.funny (Glendenning n.d.)

1991

- Gopher.
- The World Wide Web (WWW).

1992

- Delphi is the first national commercial online service to offer Internet access to its subscribers.

1993

- Mosaic, the first web browser.

1994

- Pizza Hut introduces online ordering.
- Netscape is released.
- The first banner ads on hotwired.com
- WebCrawler, first web search engine

1995

- Amazon goes online.
- Sun launches Java.
- AOL, Prodigy, and CompuServe come online.
- RealAudio is released.

1996

- Voice Over Internet Protocol (VoIP).
- ICQ free instant messaging.
- Palm Pilot, the first commercially successful PDA.

1997

- Tivo

1998

- AoL acquires ICQ.
- Hampster Dance, generally acknowledged as the first successful internet meme. (Ever since, cats all over the world shiver in fear.)
- Open Source
- U.S. Attorney General Janet Reno, on hackers (Kornblum 1998):
 - They have computers, and many have other weapons of mass destruction.

1999

- Craigslist is incorporated (it was founded in 1995).
- Napster is released.
- Google passes beta testing.
- Blogger
- Urban Dictionary, the crowdsourced online dictionary of modern slang, is started by Aaron Peckham, then a computer science major at CalPoly. He kept the server under his dormitory bed.

2000

- Pandora Radio is launched.
- Jennifer Lopez's Grammys dress inspires the development of Google image search (Weisman 2015).

2001

- iPod
- iTunes

- Wikipedia
- Creative Commons
- Napster shuts down.

2002

- Friendster
- The first public demonstration of Second Life
- The Nielsen/NetRatings firm estimates that the Internet population increased from 2,000 or so privileged researchers in 1973 to over 428 million people worldwide.
- On February 4, the CIA uses an unmanned Predator drone in a targeted killing.

2003

- Myspace
- Skype
- Technorati blog search engine
- LinkedIn
- Google acquires Blogger.
- This is a good year for expert predictions from Steve Jobs:
 - There are no plans to make a tablet. It turns out people want keyboards.
 - I'm not convinced people want to watch movies on a tiny little screen.

2004

- Flickr.
- Facebook.
- Mozilla Firefox.
- Podcasting - internet audio programming.
- Google acquires Picasa.
- Bill Gates at the World Economic Forum
 - Two years from now, spam will be solved.

2005

- Google acquires Android.
- YouTube is invented because some tech folks had a hard time locating video of Janet Jackson's notorious Super Bowl 2004 wardrobe malfunction. Once again, necessity is the mother of invention (McIntyre, 2015)

- Steve Chen, co-founder of YouTube, worrying about the success of his start-up:
 - There's just not that many videos I want to watch.

2006

- Twitter.
- Google acquires YouTube.

2007

- iPhone.
- Google acquires DoubleClick.
- Steve Ballmer on the introduction of the first iPhone:
 - 500 dollars? Fully subsidized? With a plan? I said that is the most expensive phone in the world. And it doesn't appeal to business customers because it doesn't have a keyboard. Which makes it not a very good email machine.

2008

- Waze
- Massive Open Online Courses (MOOCs)

2009

- WhatsApp
- Bitcoin is introduced.

2010

- Instagram
- Apple iPad

2013

- Google Glass is released.
- Google acquires Waze.

2014

- Google presents fully-functioning prototype of self-driving car.
- WhatsApp is sold to Facebook for \$16 billion. Co-founder Jan Koum insists on a deadline for finalizing the deal that would not require him to change his travel plans. After all, he had purchased his plane ticket with reward points (Campbell-Dollaghan, 2014).

2015

- Apple Watch.

DISCUSSION

In traversing this timeline, several important trends become apparent. First of all, while it seems to be focused on, and perhaps even a bit obsessed with, technology, by stepping back for a moment, it becomes clear that once the basic infrastructure was realized, it is human need that drives the innovation train (Leiner et al., 1997). It is astonishing to think about the fact that the Internet was designed as a military experiment, but has become the basis of a world-wide information infrastructure that has become part of everything (Haigh, Russell, & Dutton, 2015). Thus, it becomes apparent that technology will bring about change and is a driver of change (Vega-González, 2005, 2006). Models have found that technology actually affects the rate of change (Vega-González, 2006). Thus, it is of utmost importance to understand this change and how to manage it, as there is a constant reciprocal effect where change brings about more change (Leiner et al., 1997). In fact, technology can actually be used to characterize different time periods in history (Vega-González, 2005, 2006). Naisbitt and Aburdene (1990) correctly predicted, “The most exciting breakthroughs of the 21st century will not occur because of technology but because of an expanding concept of what it means to be human.” This trend becomes even more important when focus is shifted from what has already happened to considering where to go from here.

Furthermore, it becomes apparent from the timeline that as connectivity increases the world becomes much smaller place. From the first exploratory telephone and telegraph messages, to today’s online social communities, MMORPGs, MOOCs, and navigation systems, we have become a closely interconnected culture and there is no going back. Interestingly, this uptick of connectivity took place over just ten years, and it must be noted that it has become a valuable resource leading to profitability for large and small businesses (van Dijck, 2013). This interconnectivity is as a result of the diffusion of both computing and communication technologies. In fact, the most recent communication devices of the 1970’s and 1980’s (i.e. the PC and mobile phone) only took 16 years and 13 years respectively until ¼ of the US population used them (Kurzweil, 2006). It is astounding to compare this to the diffusion of web, which only took 7 years for ¼ of the US population to be used (Kurzweil, 2006)!

The format of the timeline, with year-by-year bullet items and very brief descriptions, naturally highlights rate of change. This rate of change within different more specific subsets has been statistically proven (Kurzweil, 2006; Vega-González, 2005, 2006). For example, models have found that technology increase the rate of change (Vega-González, 2006), and there has been an exponential growth in computing (Kurzweil, 2006). Thus, it is clear from past

research and from even the briefest glance at this timeline, that there is an exponentially increasing rate of change. In the early years, we had one innovation at a time, developed and then used over many years before the next new thing appeared. The rate of diffusion of innovations was also much slower (Kurzweil, 2006). At the end of the timeline – in our time period today – each year sees multiple innovations ratcheted out one after another after another; indeed towards the end there are so many innovations that we could not even attempt a truly comprehensive listing. It is important to understand how quickly technology moves and to be prepared for it. As Stewart Brand, writer and activist, once said: “Once a new technology rolls over you, if you’re not part of the steamroller, you’re part of the road.” This idea is highlighted when considering what happened to Borders versus Amazon; Kodak versus Shutterfly, Snapfish, and Flickr; and Blockbuster versus Netflix (Andressen, 2011). Today, competition is more volatile than ever. As technologies continue to converge, competition can come from anywhere at any time. Safian (2012) is right that the defining feature of business today is chaos – a rapidly changing landscape, where threats can come from anywhere. According to Safian (2012), “size and brand awareness no longer provide a competitive moat.” Note how many once powerful companies are now in trouble because they were slow to adapt.

It is difficult to believe now, but Apple came extremely close to bankruptcy back in 1997. Fortunately, Steve Jobs understood that the company had to be innovative, even change some rules, if the company was going to survive (Shontell, 2011). Today, Apple is the most valuable company in the history of the world; it has a market cap of about \$748 billion. Apple is not the only one. Companies that managed to maintain competitive advantage over their competitors are all able to use software and technology to their advantage to transform their business model (Andressen, 2011). Examining this paper’s timeline can help us understand how quickly technology is changing the world. There are more innovations today than at any time in human history. Some of them will “stick to the wall” and become entrenched in our universal connected culture.

WHAT’S NEXT?

So, what’s next? Elbert Hubbard, American writer, publisher, and philosopher, said: “The world is moving so fast these days that the man who says it can’t be done is generally interrupted by someone doing it.” Apparently, not all the experts are getting it wrong. Or, perhaps we should say, the experts do not get it wrong all the time. What we also see is how ridiculous it is to make predictions

about technology. And yet, a paper with an embedded timeline still seems to beg for a prediction: Now that we know where we've been where are we going from here?

While it may seem from the timeline, and also from Figure 1, that the profit motive has been driving the train over the last couple of decades, that is not strictly true. Take the example of wikis and blogs. Since Web 2.0 technologies became available, anyone, anywhere can (and often does) become a blogger, photographer, videographer, commentator, promoter, and broadcaster. In fact, much has been written about the opposite effect, namely, the effect of social media technologies on business (Edosomwan, Prakasan, Kouame, Watson, & Seymour 2011; Tredinnick, 2006).

It is hoped that by examining the above timeline, it will become obvious that the job of corporate leaders today is to foster creativity. It should not come as a surprise that the average life of a public firm is about 10 years (Walsh, 2015). The firms that will disappear are the ones that focus on such obsolete ideas as maximizing shareholder value. CEOs today have to focus on maximizing innovation and creativity. This means creating a climate that encourages collaboration and diversity. Diversity is important if a firm focuses on ideas.

The old hierarchical structure consisting of layers upon layers of corporate bureaucracy does not work if the goal is creativity. The organization that will prosper is one that is filled with employees who can adapt to the competitive threats that can appear from anywhere in the world. Diversity among employees and management, including diversity of ideas, is an essential element. Research has that ideas produced by ethnically diverse groups were of higher quality than those produced by homogenous groups (McLeod, Lobel, & Cox, 1996). Additionally, groups of diverse employees has been credited with creative outputs that have a direct effect on organizational success (Egan, 2005). Jack Ma, founder of the huge Chinese e-commerce firm, Alibaba, boasts that 34% of the leadership positions in his company are women; 40% of the total workforce is female. Note by contrast that only 21% of Google's leadership consists of women; 30% of its employees are female. Ma believes that, "Women think about others more" and that, "Women balance the logic and the instinct." He considers women the "secret sauce" that makes his company so successful (Kokalitcheva, 2015). It is not only about gender diversity; it is about hiring employees regardless of their religion, ethnicity, sexual preference, and way they dress. It is also about realizing that the old 9 to 5 workday is also obsolete (Duxbury, Towers, Higgins, & Thomas, 2006). Creative companies encourage employees to get things done and do not care about where or when they did the job. Shaking up the old

management notions and principles are the ingredients to drive innovation, imagination, and new ideas (Hamel, 2006).

CONCLUSION

In this paper, we have briefly noted, using a timeline, the history and development of today's Internet culture with its widespread interconnectivity, long geographic reach, and ubiquitous social media. We have seen that the current state has been influenced by advances in media, technology, including computing and telephony, military defense, and commerce. Some trends noted in the timeline include an increasing rate of change and a competitive landscape that resembles nothing so much as chaos – where it is increasingly difficult to see the next competitive threat on the horizon. And, in what appears to be a very human ironic twist, the experts responsible for many of these advances have consistently been the worst predictors of what is to come.

It is our fervent hope that a similar timeline in, say, mid-century, for students of culture one or two generations hence, will display a similarly dazzling array of innovations that are characterized by their creativity and inspired by a strong sense of what it means to be human.

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