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How to prepare for the Connected Generation's transformation of the consumer and business landscape.

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AND ALEX KOSTER

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Colin is a 20-year-old computer science student living in London with two other students in the year 2020. He enjoys backpacking, sports, music, and gaming. He has a primary digital device (PDD) that keeps him connected 24 hours a day — at home, in transit, at school. He uses it to download and record music, video, and other content, and to keep in touch with his family, friends, and an ever-widening circle of acquaintances. His apartment is equipped with the latest wireless home technology, giving him superfast download speeds of up to 100 Mbps.

Colin's parents are divorced and live in different cities, and he has one sister, who lives abroad. He is close to his family, but his physical contact with them is minimal. Instead, he prefers to stay in touch virtually through his PDD, which allows him to communicate

through multiple channels via voice, text, video, data — either separately or all at once. His parents would prefer that he visit more often, of course, but they are finally beginning to get used to being a part of his digital life. Still, sometimes Colin feels he is too digitally connected. A recent surprise visit to his mother was ruined because she knew he was in town — he had forgotten to disable the location feature on his PDD. Colin's social life is also arranged via his PDD. He always knows the location of his friends — even what they are doing — and can communicate with them instantly.

Much of Colin's experience at school is mediated by his PDD. He can attend lectures, browse reading material, do research, compare notes with classmates, and take exams — all from the comfort of his apartment. When he goes to campus, his PDD automati-

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cally connects to the school's network and downloads relevant content, notices, and bills for fees, for which he can authorize payment later, at his leisure. Although he prefers to shop online, when he visits a retail store, his PDD automatically connects to the store's network, guiding him through product choices, offering peer reviews, and automatically checking out and paying for items he purchases.

Colin's real passion is traveling, preferably with a backpack. On his recent trip to Australia, his PDD kept him occupied throughout the long plane ride with music, video, and Internet access, and helped him through customs by automatically connecting to the Australian government's network. Then he used it to pinpoint the location of the Australian friends he was planning to travel with (he had met them online through one of several social networks he uses). Once they met up, they used their PDDs to plan their route, a relatively easy task, given that with all of Australia (and most of the civilized world) mapped and modeled on the Web in 3-D, they could see every twist and turn on their path.

What Makes Gen C Special

Who is Colin? He is a member of a new generation that will be coming into its own over the next decade. Its members are typically realists and materialists. They are culturally liberal, though not necessarily politically progressive. They are upwardly mobile, yet they live with their parents longer than earlier generations ever did. Many of their social interactions take place on the Internet, where they feel free to express their opinions and attitudes. They've grown up under the influence of Harry Potter, Barack Obama, and iEverything — iPods, iTunes, iPhones. Technology is so intimately wo-

ven into their lives that the baby boom-era concept of "early adopters" is essentially meaningless.

We call them Generation C — connected, communicating, content-centric, computerized, community-oriented, always clicking. As a rule, they were born after 1990 and lived their adolescent years after 2000. In the developed world, Generation C encompasses everyone in this age group; in the BRIC countries (Brazil, Russia, India, and China), they are primarily urban and suburban. By 2020, they will make up 40 percent of the population in the U.S., Europe, and the BRIC countries, and 10 percent of the rest of the world — and by then, they will constitute the largest single cohort of consumers worldwide.

This is the first generation that has never known any reality other than that defined and enabled by the Internet, mobile devices, and social networking. They have owned various handheld devices all their lives, so they are intimately familiar with them and use them for as much as six hours a day. They all have mobile phones, yet they prefer sending text messages to talking with people. More than 95 percent of them have computers, and more than half use instant messaging to communicate, have Facebook pages, and watch videos on YouTube. Their familiarity with technology; reliance on mobile communications; and desire to remain in contact with large networks of family members, friends, business contacts, and people with common interests will transform how we work and how we consume.

We expect that, in keeping with expectations for long-term economic development, the world that Generation C will make theirs in 2020 will be a better place, with a brighter future for a much larger proportion of the population in both the developed and the develop-

ing world. Following the lull that has taken place during the recent, persistent, worldwide recession, there is reason to believe the world will revert to the economic mean of steady growth, with globalization picking up speed again.

As populations in Western countries age, powerful new consumer segments will be created, including a relatively wealthy retirement segment and a rising young middle class. The pace of innovation will accelerate, creating an ever more digital world, even as wireless devices become the dominant tool for trade, entrepreneurship, and Internet access. Indeed, the very rise of Generation C will help create a virtuous circle that will help stimulate economic growth, which in turn will encourage both the public and private sectors to continue to invest in faster and more widespread communications infrastructure, thus enabling even greater growth.

Although climate change and energy security will remain major concerns, stable electric power will likely be available to a substantially larger part of society, and energy inefficiency will no longer represent a hurdle to progress. High-speed broadband, whether fixed or mobile, will be pervasive and affordable. Secure online identity systems will allow reliable user authentication. It is likely that increasingly rational regulatory schemes will open up commercial activity worldwide, and that companies and individuals will be able to profit fairly from the intellectual property they generate.

Connected Consumers

The trends outlined above will have a wide range of effects on how members of Generation C — and, by extension, other generations as well — use communications technology, how they access and consume information and entertainment, and how they interact. These effects will be determined in part by the progress of technologies over the course of the next decade.

On the grid 24/7. Being connected around the clock will be the norm in 2020 — indeed, it will be a prerequisite for participation in society. Currently, there are 4.6 billion mobile users (67 percent of the world population) and 1.7 billion Internet users globally. By 2020, the number of people using mobile phones will reach 6 billion (nearly 80 percent of the world population) and 4.7 billion people will access the Internet, primarily through their mobile devices. Among younger Europeans, 52 percent already say they feel disconnected from the world if they don't have their mobile phones with them, and 91 percent of all mobile users keep their

phones within arm's reach, waking or sleeping.

The Internet's power will develop not just through its online economic might, but also offline, as a result of its cultural and political influence. At the same time, personal and business activities will mingle seamlessly, as the day fragments into a flexible mix of personal and business activities — work, commuting, shopping, socializing, and entertainment. The inevitable corollary: As “off-grid” time becomes rarer, it will become more valued.

Social animal 2.0. Thanks to the popularity and performance of social collaboration technologies and mechanisms, including social networks, voice channels, online groups, blogs, and other electronic messaging systems, the size and diversity of networks of personal relationships will continue to grow. These networks will include acquaintances ranging far beyond the traditional groups of family, friends, and work colleagues to include friends of friends, online acquaintances, and anonymous members of interest groups. Already, 49 percent of 16- to 24-year-olds in Europe are savvy users of social networks.

One result will be the rapid creation of fast-moving political and business pressures — such as the tidal wave of electronic interest created by Barack Obama's 2008 presidential campaign. The average person in 2020 will live within a web of 200 to 300 contacts, maintained daily through a variety of channels. Even within the family, the need for physical proximity will be reduced through increased digital interaction. Just as Facebook's “Connect” buttons are already distributed across 80,000 websites and devices, social networks will accompany people throughout their daily activities.

Digital information osmosis. People will dramatically increase their consumption of digital information, much of which will be unverified. The vast pool of information available will allow consumers to pick and choose the information they want, as well as how they want to consume it. “Nonlinear” information consumption will become the norm. And the supply of digital information itself will explode. Walmart already handles more than 1 million sales transactions every hour, feeding databases estimated at more than 2.5 petabytes (2.5 million gigabytes), according to a recent study by the *Economist*. Cisco has estimated in a much-cited study that it expects Internet traffic to increase 10-fold by 2013, to 667 exabytes (that's 716 billion gigabytes). Right now, much of this information is pure exhaust — unanalyzed and unanalyzable — but it will soon be put to material economic use.

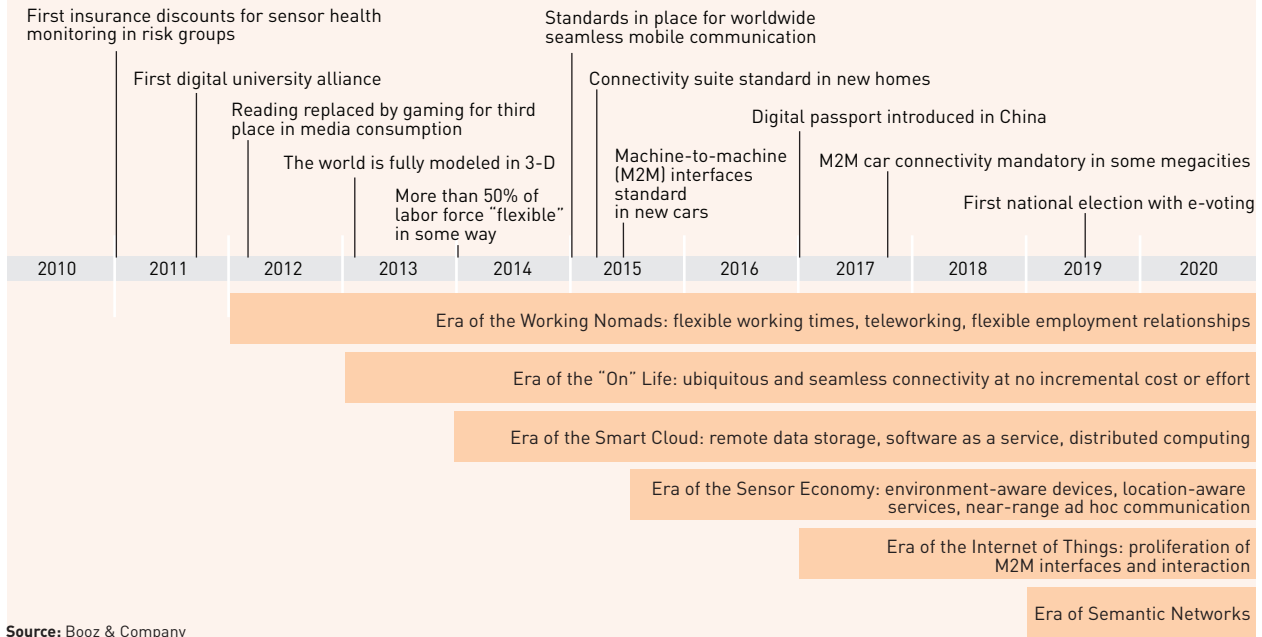
How the Tech Future May Unfold

It is notoriously difficult to project the future; still, the exhibit be-

low presents a plausible chronology of the next 10 years. We see a series of “eras” triggered by the sequential rise of critical new technologies. The Era of the Smart Cloud, for instance, will enable significant portions of the Generation C lifestyle in the coming years, to be succeeded by the Era of the Sensor Economy,

which the cloud will help trigger. Above the time line is a series of specific events keyed to and dependent on the arrival of the various eras; thus the Era of the Internet of Things will enable motor vehicle manufacturers to build cars with full machine-to-machine (M2M) connectivity.

Time Line of Events for the Coming Decade



Broadcast privacy. Concerns about privacy and the security of personal data will decline as consumers come to perceive the benefits of transparency as outweighing the risks, and as mechanisms to secure and process personal information become more sophisticated. The result: The availability of an abundance of real-time, personalized information on people’s presence, online status, physical location, preferred communication channels, friend networks, interests, passions, and shopping habits. Facebook, for instance, already hosts 40 billion photos of its members. The use of social networking increasingly will determine consumption patterns. Viral marketing and positive peer reviews will become essential to commercial success, which will in turn erode the value of traditional marketing and of bricks-and-mortar outlets, and ultimately the concept of brand value itself.

iEverywhere. As privacy concerns dwindle, people’s personal data, such as identity, payment details, shopping preferences, interests, and membership in social communities, will become widely available. Members of Generation C will be able to access their digital life from a multitude of digital interfaces and devices, because they will live in a fully interconnected world in which services and data reside online — in what’s known as cloud computing — rather than on those devices themselves. Today’s consumer electronics already show the way: smartphones, iPads, iPods, netbooks, laptops, PCs, and watches, and the list is sure to grow in the next decade. At the same time, prices for such devices will continue to fall. Netbooks subsidized by telecom operators go for as little as a penny, and they are approaching the US\$200 mark in retail outlets. Wireless broadband services, however, will still cost

more than \$50 per month.

Continuing generation gap. The upper age limit of the digitally literate will rise, as the 50-plus age bracket broadly migrates online. At present, the average 65-year-old spends just two to three hours online in a typical week; in 2020, 65-year-olds will spend closer to eight hours online weekly — though they will remain far below the 16- to 24-year-old group, which already spends 13 hours online weekly. Older people will also continue to lag in the intensity of their digital behavior. Generation C will distance itself further, particularly in the development of its own pervasive culture of communication. That culture has led some observers to dub this group “the silent generation,” as digital communication channels have replaced much of the physical interaction typical of prior generations.

Generation C at Work

The digitization of everything will have an equally profound effect on how businesses operate, and on how work gets done. Among the changes that will be wrought by the arrival of Generation C in the workplace will be the continuing consumerization of corporate IT. More than half of the CIOs in a recent Booz & Company survey said that in the next three to five years, most employees will bring their personal computers to work rather than using corporate resources. The trend of redefining employees as resident consumers will be led by Generation C, given its familiarity with technology and its expectation of always-on communications.

This trend will, in turn, encourage the increasing virtualization of the organization. As 24/7 connectivity, social networking, and increased demands for personal freedom further penetrate the walls of the corporation, corporate life will continue to move away from traditional hierarchical structures. Instead, workers, mixing business and personal matters over the course of the day, will self-organize into agile communities of interest. By 2020, more than half of all employees at large corporations will work in virtual project groups. These virtual communities will make it easier for non-Western knowledge workers to join global teams, and to migrate to the developed world. As they do, they will bring with them the innovative ideas and working behavior developed in their home territories.

Moreover, the proliferation and increasing sophistication of communication, interaction, and collaboration technologies and tools, and the economics of travel itself, will result in knowledge workers’ traveling much

less frequently. The opportunity to meet face-to-face will be accorded primarily to top management, and business travel will become a valued luxury.

The Developing World

The trends that are already transforming life and work in the developed world are beginning to be felt in emerging economies as well, although the path such countries take to digitization will be significantly shortened. As the developing world increases in connectivity and sophistication, a huge new audience of people who have not yet been exposed to the consumer economy will develop outside the already connected urban centers. Between 1990 and 2005, more than 1 billion people worldwide entered the middle class, and the rate of entry is rising quickly. Their consumption of media and other kinds of content will transform the media industry. As with prior technology adoptions, these new audiences will leapfrog years of technological development and quickly emulate the behavior of Generation C in developed economies. The experience of the rapidly developing middle class in China will become typical: A member of the Chinese urban middle class spends almost 30 hours per week online but watches TV for just 12 hours. Three out of four regularly download music, two out of three watch online videos, and almost half play games online.

This increasing technological sophistication will promote the emergence of skilled and innovative digital entrepreneurs in massive numbers throughout the developing world. The rise of these entrepreneurs has the potential to significantly disrupt traditional Western business models. And they will have the attention of a large, newly connected audience that can benefit from their new ideas. In urban China, for instance, 76 percent of people are already online, and 61 percent have broadband at home. Western countries currently lead the world in just two critical online services, e-commerce (Germany) and online advertising (the U.K.), whereas non-Western countries are ahead in several others: broadband (South Korea), social networking (Brazil), online gaming (China), mobile payments (Japan), and microtransactions via SMS (the Philippines).

Industry Effects

As Generation C enters the workforce over the next decade, the manner in which it consumes information, communicates at work and play, and uses technology will transform many major industries. The most affected sector will be telecommunications, which is at the

In 2020, drivers will have better information on the roadside environment, sensors that check for sleepiness, and simplified car maintenance based on remote diagnostics.

very center of how this new generation will live their lives; other sectors apt to greatly change include health-care, retail, and travel. How will these industries evolve over the next decade?

Telecommunications. Just as the telecom industry is heading toward a strict separation between infrastructure and services and applications, customers are shifting their consumption patterns, and their loyalties, away from the traditional telecom operators and toward application and service providers such as Google, Apple, and Facebook, as well as any number of smaller players. In this world, telecom players that remain vertically integrated will come under substantial pressure. Indeed, it is likely that the industry will evolve to include two types of players: The efficient utility, driven by fiber-optic and wireless access technology, and the fast-moving, customer-centric software innovation provider.

At the same time, the information and communications on which the world of 2020 will depend, and the intelligence needed to manage that information, are moving quickly into the online computing cloud. The convergence of these technologies in the cloud will only be the start, however. As more and more services migrate online, telecom, IT, technology, and Internet service companies themselves will begin to encroach on one another's territory, as they all move toward higher-margin and differentiating applications.

The general outlines of the future created by the arrival of Generation C are clear. The question is whether telecom operators are ready for the changes already on the way and are planning now to create the strategies and business models they will need to keep growing in this more competitive future. Too many telecom operators appear to be focused on preserving sources

of revenue, such as voice telephony, that are likely to decline in the future, rather than on developing new sources of revenue and opening up new markets. As a whole, telecom industry players need to rapidly change their operational and business models, the ways they interact with customers, the access and price points they establish to generate revenues, and the way they manage innovation.

We see three primary new revenue opportunities arising from the changes that the emergence of Generation C will bring about. First, the demand for ubiquitous connectivity will ultimately create the need for universal broadband access in developed economies. As a result, operators that hope to grow by offering services dependent on broadband must support national efforts to build out this next-generation infrastructure. Second, vast segments of the world's population in emerging markets are still unconnected, and operators looking to grow their customer bases thus need to expand in those markets. Third, the ways that Generation C behaves and collaborates, and the technologies it prefers, will create opportunities in other industries; telecommunications operators should be considering how to promote the use of their services to capture some of the new value created. (See "The Thought Leader Interview: Didier Lombard," by Art Kleiner and Pierre Péladeau, *s+b*, Spring 2011.)

Healthcare. As information about doctors and hospitals, medical treatments, and costs floods the Internet, consumers will gain real power, performing their own research; writing reviews of physicians, hospitals, and drugs; and forcing the players to compete more actively. Online services, some featuring user-generated content, will become a primary channel for medical advice, sub-

stituting in part for traditional support channels.

Widespread connectivity will boost electronic diagnosis, helping to reduce costs; digital health monitoring will become accepted practice; medical R&D will come to rely on social media such as crowdsourcing. The personalization of medicine will lead to new insurance models, and electronic medical records and national e-health infrastructures will connect with online identity and digital passport technologies.

Retail. Ubiquitous connectivity will continue to transform the retail industry, seamlessly integrating the online and offline worlds, and ultimately leading to a form of augmented reality that allows a more elaborate presentation of retail goods. Peer reviews will become a real-time decision-making tool in physical stores as well as online, and social networks will become critical for brand awareness and customer preferences. This will lead to a winner-take-all dynamic among retailers, already typical of commerce on the Internet. Electronics retailers will lose ground as consumers purchase software and services from the cloud rather than in their current shrink-wrapped store format. Social media techniques such as crowdsourcing will be used to further product innovation, and increased connectivity will generate new monetization models driven by new partnerships among retailers and manufacturers.

Travel. By 2020, business travel will decline in the face of costs and alternative meeting technologies. In the leisure segment, traditional intermediaries such as travel agents have already been largely cut out, and peer reviews have become a dominant form of deciding on vacation destinations. This will lead to increasingly individualized travel, online advice and information dictating travel plans in real time. The distinction between travel and home will blur (as the distinction between the office and home already has), and the off-the-grid getaway will become a luxury.

Even the concept of distance will be transformed, as the world becomes fully modeled in 3-D, and open for inspection by prospective visitors. The digital world will also further invade the car. For the driver, this will lead to better information on the roadside environment — another instance of augmented reality — along with improved safety through the presence of sensors that check for drivers' sleepiness or drunkenness, and simplified car maintenance based on remote diagnostics. It will also improve the efficiency of the street network, allowing for instant data on traffic and providing the ability to determine traffic flow.

Is Your Company Ready?

There is already evidence of some of the changes that will be brought about by the coming generation of workers and consumers, and increasing speculation about the path of future change. Few businesspeople, however, have fully grasped the implications for every industry. The arrival of Generation C will have an impact comparable to that of the Industrial Revolution, but it will take place much more quickly. For managers, it is no longer sufficient to plan for the next few quarters, or even the next few years. Companies that aren't willing to determine their strategies for the longer term — 10 to 15 years out — are putting their business models and value chains at risk. Executives must begin now to develop an agenda that includes an analysis of the capabilities and workforces they will need in the next decade and beyond. A critical step will be to make sure that the organization as a whole understands the coming changes, and that there are already people within the organization who are living these changes now, who don't perceive them as a threat, and who can help integrate them into the organization's business plan.

The world of 2020 will be set and governed by the members of Generation C, as they mature and grow in numbers and power. How businesses choose to cater to this coterie will determine their success — and even their ability to survive — in the coming decades. +

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Resources

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