



# DIGITAL DISRUPTIONS

## TECHNOLOGY INNOVATIONS POWERING 21st CENTURY BUSINESS

If you thought the Industrial Revolution was disruptive, “you ain’t seen nothin’ yet.”

The digital disruptions initiated by the Internet’s launch at the end of the 20th century, and responsible for a tremendous spike in global productivity, promise a second-round impact in the 21st century that we can only begin to imagine.

Digital disruptions are about information and communication technologies that change business models deeply, and often shockingly. These disruptions, on par with the telephone and automobile, transform the marketplace and society so completely that it can take decades for their full impact to be realized.

CSC has identified seven digital disruptions that are rapidly impacting today’s business models: new media, augmented reality, social power, information transparency, digital spectrum, new platforms and a smart(er) world.



### ***1. New Media - We have met the new media, and it is us.***

Old media was about stiff distribution channels, big-studio creators and power brokers. New Media is about flexible distribution channels, self-created content and broad participation. Content moves from isolation to interaction. Creators are you and me. Distribution channels vary and overlap, so that TV comes over the Internet and vice versa. Prime time and media-controlled broadcast and distribution are things of the past. When the Writers Guild of America went on strike to obtain royalties for digital viewings, the chaos ignited by the strike – TV shows were cancelled, reruns ran aplenty – showed that progress with new media will not necessarily move from business model A to business model B, but more likely from A to chaos to B. This is likely to be true for all the digital disruptions.

### ***2. Living in a New Reality - We will blend physical and virtual reality, improving both.***

We can break free of the physical world’s constraints by venturing into the virtual world. Augmented reality, a blending of the virtual and real, enables us to move effortlessly in time and space, interact in new ways, and experience things like never before. Participate in a real-world event like

a NASA spacecraft landing. Fly across a weather map of the country to see where it's raining. Host a town hall meeting for 100,000 employees without anyone having to travel. Control your data center remotely. Learn from life-size virtual guides at a historic tourist site. The ability to visualize data from numerous sources in 3D will enhance learning and productivity beyond what we can imagine today.

### ***3. Social Power – The power inherent in connected people surges.***

Leveraging the power inherent in connected people is disrupting how we locate and retain expertise, collaborate, advertise, lend money and even listen to music. New business strategies harnessing social power put a premium on relationships and what others say and do, and tap the viral capability of social networks as distribution channels for advertising, software applications and more. Enterprises need to “let people be people” and flex their social muscle at the office (with blog posts, social networks, etc.), but within corporate guidelines for acting responsibly. With social networks infiltrating the enterprise as well as becoming the hub of one's Internet experience, major disruptions are afoot.

### ***4. Information Transparency – What is observed by one will be known to all.***

Information that was once cloaked in darkness – inaccessible or nonexistent – is now available in droves, shedding light on previously opaque people, processes and things. This leads to more efficiency and fewer surprises, and can redefine activities such as criminal investigations, product comparisons, driving patterns and, thanks to ubiquitous cameras, overseas hiring. When enterprises know where their employees and assets are in real time, they can operate more safely and effectively. People are demanding access to more data, on their terms, and this force will be disruptive as enterprises and government agencies work to respond.

### ***5. New Wave of Waves – The sky is not the limit as spectrum goes digital.***

The communications infrastructure is undergoing a major overhaul as the Internet and new radio waves that are extending the Internet create platforms that challenge the old regime. A general purpose communications utility has formed that obliterates the limited products and services of telephony, TV and

radio that used to ride on 20th century infrastructures. As spectrum opens up, and spectrum allocation eventually falls by the wayside, the air waves become fertile ground – some say “beachfront property” – for a vast array of new services from new players, not just traditional operators. This sets up a perfect storm for innovation, where it is not clear who the ultimate winner will be except for the consumer.

### ***6. Platform Makeover – This is not your father's computing platform.***

Silicon has its limits, so it is only natural that new methods are being explored to provide next-generation computation power, in many more places, and with many more purposes than today's computers. As the new methods emerge – nanotechnology, molecular computing, quantum computing, optical computing – they will challenge silicon-based business models and markets. One key disruption will be in cryptography. Quantum computing blows apart current encryption techniques, which are effective because it takes a long time (hundreds of years) to factor a large number and break an encryption scheme. A quantum computer can do it in seconds. When that day comes, everything that depends on encryption, from credit card transactions to e-mail, will be wide open and unprotected until new security techniques are created.

### ***7. Smart(er) World – Smarter everything makes us smarter everywhere.***

It doesn't take long to point out what is “dumb” about our current technology landscape: applications that don't understand what we mean, rapidly-changing technologies that don't work well together, systems that crash for no known reason, computers that you “talk” to by typing. A smart(er) technology landscape that understands language and can reason is in the works. With that comes innovations in knowledge gathering, decision making and predicting. Smart virtual assistants are the future of online customer service, disrupting labor-intensive call centers. Semantics can be put to work to find expertise in the enterprise, solving problems faster and averting crises. Semantics at the IT infrastructure level make services more shareable and organizations more agile, since they can develop applications and manage change faster.

Many of the digital disruptions overlap, triggering new and more powerful disruptions. Virtual worlds are the next frontier for social networks. Social networks have a strong influence on new media. Information transparency is a prerequisite for a smart(er) world. New waves are a key enabler of information transparency. New platforms will turbocharge all the other disruptions.

### THRIVING ON DISRUPTION

The 21st century will be laden with digital disruptions. These disruptions are forming the foundation for a new economy, the Networked Information Economy. This economy, identified by Harvard professor Yochai Benkler in his book *The Wealth of Networks*, finds value predominantly in the production, enhancement and sharing of information (e.g., financial services, accounting, software, science, ideas, designs, opinions) and cultural content (e.g., movies, books, music). This speaks directly to New Media, Living in a New Reality, and Social Power, and indirectly to the other digital disruptions.

These digital disruptions are powering the Networked Information Economy and may be the biggest challenge to the status quo the world has ever seen.

Although the overall impact of the digital disruptions may take years to be felt, complementary infrastructure is already being built to make full use of these new digital technologies. In *New Wave of Waves*, a unified communications infrastructure powered by the Internet and joining TV, radio and telephony (traditional and mobile) is a case in point. Or, consider how the Platform Makeover trend towards cloud computing completely changes how we provision applications, data and other enterprise resources – a strong indicator that infrastructures are aiming at higher levels of service and interoperability. In *Living in a New Reality*, virtual worlds are providing a global, sensory-filled fabric for people to participate in regardless of time and place. This is an entirely new infrastructure for remote collaboration.

These new infrastructures are the basis for Information Transparency and its successor, a Smart(er) World. Both draw strength from unified communications – we know more about people, places and things and can

reason and predict better from these connections. Both benefit from more powerful, agile platforms that can analyze and make sense of enormous amounts of information rapidly. Platform Makeover will especially help a Smart(er) World as new materials beyond silicon provide enormous computational power that gets machines much closer to emulating the brain.

So put today's digital disruptions on your radar and realize they are a work in progress as supporting technologies and new behaviors take hold. Today's digital disruptions lay down important foundations and principles for the new economy to build and thrive on.

### ABOUT THE LEADING EDGE FORUM

As part of CSC's Office of Innovation, the Leading Edge Forum (LEF) is a global community whose programs help participants realize business benefits from the use of advanced IT more rapidly.

LEF members work to spot key emerging business and technology trends before others, and identify specific practices for exploiting these trends for business advantage. Members enjoy access to a global network of thought leaders and leading practitioners, and to a powerful body of research and field practices.

LEF programs give CTOs and senior technologists the opportunity to explore the most pressing technology issues, examine state-of-the-art practices, and leverage CSC's technology experts, alliance programs and events. LEF programs and reports are intended to provoke conversations in the marketplace about the potential for innovation when applying technology to help advance organizational performance. For more information about LEF programs, visit [www.csc.com/lef](http://www.csc.com/lef).

The LEF Executive Programme is a premium, fee-based program that helps CIOs and senior business executives develop into next-generation leaders by using technology for competitive advantage in wholly new ways. Members direct the research agenda, interact with a network of world-class experts, and access topical conferences, study tours, information exchanges and advisory services. For more information about the LEF Executive Programme, visit [lef.csc.com](http://lef.csc.com).