Drivers of Change:
Summaries and Forecasts

Aging World

SUMMARY: Most of the world's societies are aging, with the shares of elderly poised to rise steeply in both the advanced economies and most emerging economies. This could reshape political, financial, and social priorities as countries grapple with issues related to aging populations, such as rising dependency ratios, retirement and the workforce, and costs of caring for older citizens. These issues will play out for associations in areas such as workforce and benefits.

Forecasts

- Workforces will be older—not just because of aging populations but also because older workers will delay retirement, whether due to a preference for working, lack of retirement resources, or the need for insurance benefits.

- The aging global population could slow GDP growth in countries where aging is most advanced. In some economies this slowing might be offset by automation-fueled productivity increases.

- From geriatric communities that don't want to pay taxes to support schools they will not use, to shifting funding priorities for healthcare and medical research, demographic aging will likely spark debates over the allocation of money and other resources.

- Beyond spending concerns, aging may intensify other kinds of societal stress, arising from issues such as middle-aged people squeezed between caring for elderly parents and their own kids, or to younger workers frustrated because career advancement is being blocked by older workers not retiring.

Key Uncertainties

Financial health of potential retirees

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Levels of immigration and the fertility effects

·

State of retirement benefits and systems

·

What retirees do with their time and money

·

Role of automation in replacing workers

·

Effectiveness of medical interventions in aging

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Anticipatory Intelligence

SUMMARY: Big data, data analytics, and artificial intelligence are enabling predictive analytics used to anticipate needs, opportunities, and threats in an organization's environment. The market for predictive analytics is growing rapidly, and major computing companies are key players. Organizations view predictive analytics as one of the most important ways to leverage big data.

Forecasts

- Organizations will employ machine learning (which occurs without explicit programming) and predictive analytics to predict demand, optimize pricing, and adjust sales and marketing campaigns. They will use sensor data to anticipate maintenance requirements of physical assets and patient data streams to improve healthcare. Other applications will include banking, threat analysis and security, and agriculture.

- Prescriptive analytics, which anticipate the effects of future decisions, will be adopted by a growing number of companies and organizations.

- For individuals, an online digital assistant available on any connected device will know as much about you and your friends as you do and will make individualized anticipatory recommendations and even decisions.

- Futurist and *Wired* magazine founder Kevin Kelly forecasts that digital intelligence will be viewed as a utility—"IQ as a service."

Key Uncertainties

Development of user-friendly applications accessible to non-experts

Rate of development of supporting technologies, such as artificial intelligence, and components such as machine learning

Impact of regulations that enable or impede development and deployment

Concerns about privacy, intrusiveness of the technology, and surrendering decision-making to machines

Risk that incorrect or corrupt data lead to poor forecasts or decisions

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Virtualized Meetings

SUMMARY: Ubiquitous broadband, the mainstreaming of virtual reality, and robotics are accelerating the capabilities of telepresence technologies. These technologies could enable the telepresence of both speakers and participants at meetings. Or meetings could take place entirely in a shared digital reality. While these technologies can broaden participation and generate novel experiences, the social and experiential benefits of "real life" may prove challenging to replicate.

Forecasts

- A growing bifurcation between real-world and virtual meetings may occur. Information delivery may migrate to virtual reality (VR) meetings, while socializing and networking become the primary goals of real-world meetings.

- Augmented reality (AR) shows signs of developing quickly as a meeting technology.

- Meeting participants may rapidly acclimate to interacting with non-local participants. Video chat interactions have already become normalized, making it less daunting to interact with a Facetime-equipped telepresence robot.

- The post-Millennial generation will include "VR natives" who find hybrid and virtual forms of person-to-person interactions more natural.

Key Uncertainties

Ability of telepresence technology to deliver the networking and social interaction components of meetings

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Ability of virtual reality to replace live product demonstrations

·

New capabilities of telepresence technology that traditional meetings cannot match

·

Generational preferences for online versus face-to-face socializing

·

Ability of Facebook, the owner of VR firm Oculus Rift, to mainstream virtual reality socializing

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21st-Century Guilds

SUMMARY: Deep structural changes in the world of work—automation, the gig economy, and broader economic trends—are shifting the balance of power between employers and workers in ways that favor employers. Millions of people are finding their livelihoods put at risk by 30-hour workweeks, smart machines, and the erosion of middle-class occupations, among other trends. New kinds of entities are arising to support workers' rights and protections in the face of inexorable change.

Forecasts

- For the next generation, work will mutate in ways that challenge workers, requiring repeated reskilling and demanding continual adaptation to new technologies and work structures. With traditional unions a diminished force, independent workers' abilities to contest employer—or government—policies that harm their interests will be weakened.

- Forward-looking organizations, including associations as well as new kinds of entities, could assume more of the functions once provided by unions and guilds. In this expanded form "21st-century guilds" could support workers with rights, protections, collective negotiations, and safety-net benefits, in addition to their traditional functions.

- Twenty-first century guilds could leverage the power of the collective to pressure employers and policymakers to respect workers' interests.

Key Uncertainties

How many associations choose to expand their services in new directions

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Traditional unions' reactions to new entities' potential encroachment on their turf

·

Governments' continued provision of safety-net benefits versus private entities needing to step in

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Millennials' interest in organizing to navigate workforce changes

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Algorithmic Politics

SUMMARY: The power of algorithms to influence politics—shaping the way information flows, manipulating individuals, and even participating as bots— is increasing. There is growing public concern that the same internet algorithms that customize content and personalize online interactions enable tech companies to imperceptibly filter information, alter and focus attention, and provide conduits for messaging micro-demographic niches.

Forecasts

• Concerns about algorithmic persuasion will combine with the growing concerns about the political impacts of information bubbles and "fake news." Ultimately, these issues revolve around a struggle for who will control the information context for society.

• Wider access to algorithmic tools could cause them to be used beyond marketing and politics to persuade the public on a variety of non-partisan social issues.

• People disconnected from social media tracking—through either non-use or cookie blocking—will become an increasingly important variable in politics and elections.

• Widespread use of algorithmic targeting will increase public interest in online privacy and drive adoption of anti-tracking technologies.

Key Uncertainties

Consumer willingness to trade privacy for free online services and content

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Balance of free speech rights versus the preservation of democratic discourse

•

Continuing dominance of Google and Facebook in internet media and advertising

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Potential for government regulation of search and social media algorithms

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American Inequality

SUMMARY: Inequality in America is growing worse, though there are scattered signs of progress. Since the 1970s, income inequality and the share of wealth in the hands of the most advantaged 1 percent of Americans have been rising, though poverty has declined. Americans face a widening opportunity gap as a function of socioeconomic status, as well as significant racial, ethnic, and socioeconomic gaps in primary, secondary, and postsecondary education—though some of these gaps are shrinking.

Forecasts

- In the absence of any discontinuous change, inequality will widen. Already, workers' share of national income has fallen and the middle class is shrinking.

- Workplace automation could exacerbate inequality issues.

- Failure to invest in the education and development of children and youth will have a negative impact on healthcare costs, criminal justice costs, and the quality of the future U.S. workforce.

- Shrinking of the middle class could leave many young Americans overeducated and underemployed as job opportunities dry up.

- Grim economic experiences, and prospects, may significantly shape the worldviews of many millennials as they move into new life stages.

Key Uncertainties

Global and national economic conditions

Political conditions and responses

Point at which growing inequality reaches a tipping point beyond which it leads to social unrest, rising crime, young people giving up on the economic system, or large-scale emigration

Changing conceptions of success as the economic reality becomes increasingly difficult for many

Automating Work

SUMMARY: Machine learning, innovative robotics, data analytics, and affective computing mean that growing swaths of work are potentially automatable. The impacts of automation on work and workers will vary substantially by industry, occupation, and even workplace—but they could transform most kinds of work and affect workers at every level, including senior management. Associations' members and their own workforces will increasingly be affected by automation.

Forecasts

- Work automation is under way and will grow substantially, eventually displacing millions of workers, disrupting work structures, and pushing a broad societal and organizational rethink of how work is performed and managed. For the foreseeable future, automation will be an increasingly pressing issue for workers, employers, and governments.

- In the near to medium term, automation will tend to take over tasks within jobs rather than displacing entire occupations. Both automated and human work will become more taskified as a result, with humans often handling the more creative, interpersonal, or higher-value roles.

- Automation will move up the value chain. As it starts to affect knowledge workers and executives, their jobs will become more taskified, too.

- How automation affects a given industry or occupation will depend on a mix of factors including technical feasibility, business case, labor supply and demand, and regulatory and social acceptance.

Key Uncertainties

How rapidly automation technologies are adopted by industries

Whether there will be a tipping point in many industries beyond which automation becomes a competitive necessity

Progress of affective computing, which includes emotion detection and psychological sensitivity

Progress in robotics

How soon machines can understand and use natural language

Level of pushback from regulators and the public

The implications of automation for privacy, safety, and the quality of products and services

Bifurcated Workforce

SUMMARY: Trends may create two classes of American workers: mission-critical players who move the organization forward, and foot-soldiers who do the basic work. The latter are regarded by employers as relatively disposable, with lower prestige and pay. Such a two-tiered workforce is not assured, but it is being driven by deep structural forces including the expansion of gig and freelance work and the rising inequality of opportunity for workers.

Forecasts

- The rise of a global gig, freelance, and contract work economy will produce a vast pool of workers for whom work is a piecemeal—and, in many cases, insecure—affair. Besides lacking salaries and benefits, contingent workers risk finding themselves treated by employers as second-class or disposable, with lower pay and professional standing.

- Lower-tier workers could represent all skill levels, and indeed may be as educated and skilled as their full-time counterparts. For instance, adjunct professors may be as capable as their tenured peers but typically work for little, with weak upward prospects.

- Automation will not be a determinant of whether a worker is considered crucial or disposable. Either tier of workers could serve as skilled counterparts to machine intelligence. But because automation will drive taskification, more work will be modularized and farmed out to contingent workers, potentially pushing a bifurcated workforce.

Key Uncertainties

Labor supply and demand in any given industry (which shapes treatment of all workers in that industry)

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Regulatory and policy protections for gig and contract workers

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Overall economic conditions (which shape business decisions about investment and hiring)

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Social insurance policies

·

Risk of lower-quality products and services from less-invested contract and gig workers

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Blockchain Platforms

SUMMARY: Blockchain technology uses a distributed digital ledger to record data, contracts, and transactions, financial and otherwise, without the need for third-party validation. While bitcoin was the first proof-of-concept for the efficacy of blockchains, blockchains have applications beyond virtual currencies. By embedding trust in the algorithms of the blockchain, blockchains can enable trustless transactions and data exchanges, eliminating the need for supervision by intermediaries or government authorities.

Forecasts

- The financial services sector is working to mainstream blockchain. Stable and secure blockchain platforms could drive decentralization of global finance by embedding trust and transparency into blockchain platforms.

- Blockchain is likely to be a disruptive technology. While incumbent firms are introducing the technology, blockchain platforms are likely to create opportunities for new entrants and entirely new types of services.

- Blockchain platforms will be developed for a wide variety of non-financial applications, such as education credentialing, worker-reputation systems, and supply chain management.

Key Uncertainties

Ability of incumbents to capture the emerging blockchain market

·

Scalability of blockchain to handle millions of simultaneous transactions

·

Security of blockchain and ability to resist hacking and subversion

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Willingness of HR and credentialing institutions to adopt blockchain technologies

Cartel Capitalism

SUMMARY: Mergers and acquisitions have caused a growing number of industries to be dominated by a smaller number of companies, while in the tech industry, network effects have led to the dominance of firms like Apple, Amazon, and Google. While these firms benefit from economies of scale that cut costs, their dominance can reduce competitiveness and economic dynamism. Additionally, by attracting the best talent, these world-beating firms capture a disproportionate share of productivity growth, contributing to stagnation in the rest of the economy.

Forecasts

- Enthusiasm for antitrust enforcement has ebbed in the last two decades in the United States. However, accelerating industry consolidation may bring about renewed interest in this form of regulation. Action against prominent tech or health insurance firms could trigger renewed public enthusiasm for antitrust interventions.

- Industries where consolidation has occurred include beverages, household appliances, mobile phone carriers, air travel, grocery stores, health insurance, and pharmaceuticals. These are likely to be primary targets if antitrust sentiment grows.

- Even without regulatory intervention, technology innovation will eventually disrupt some heavily concentrated industries.

Key Uncertainties

Willingness of regulators to pursue antitrust investigations

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Effects of changes in the American political landscape

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Effects of potential EU action against U.S. tech firms

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Inevitability of internet firm monopolies

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Relative priority of internationally competitive firms versus nationally competitive markets

Dark Data Comes to Light

SUMMARY: The drive to leverage big data will lead to more data-gathering and better use of existing data. According to Gartner, dark data are "information assets that organizations collect, process, and store in the course of their regular business activity but fail to use for other purposes." A significant fraction of sharing on the internet is "dark social," sharing links via instant messaging, email, and text—communication that often is not recorded or studied. New approaches will allow better gathering, management, and exploitation of ever-expanding data.

Forecasts

- Industries that will leverage dark data to innovate and improve productivity include travel, manufacturing, and publishing.

- Dark data will be used to gain deeper insight into individual consumers and consumer cohorts.

- Because dark data are generally unstructured, the growth of advanced analytical tools will provide new access to insights hidden in dark data.

- The "data lake" approach—capturing all data that flow into the organization while imposing a bare minimum of upfront shaping and processing—may offer a cost-effective way to manage expanding volumes of structured and unstructured data.

Key Uncertainties

Return on investment from dark data exploration and mining

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Extent to which the explosion of data overwhelms the ability to store and process it

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Shifting views of privacy, data transparency, and data ownership

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Extent to which information remains separated in multiple silos

·

Evolution of standards for data structures and interfacing

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Shifts in regulations on data use

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Declining Trust

SUMMARY: In the United States, trust in institutions—including government, media, science, and medicine—is falling, with important social, political, and economic implications. This decline in trust could fuel deeper political polarization and further erode social cohesion.

Forecasts

- Growing trust deficits in many areas of American life are creating a need for a rebuilding of trust systems. Fact-checkers—Snopes, PolitiFact, etc.—are early examples of this. Efforts to enhance reproducibility in science are another example.

- As the understanding of filter bubbles, targeted marketing, and "fake news" grows, more people could begin seeking out better information. This response is likely to vary by socio-political segment, however.

- Low trust in institutions of all kinds feeds political populism. If trust continues to decline, more populist political movements could find traction.

- New technologies—realistic fake video and audio and AI—will have further corrosive effects on trust.

Key Uncertainties

Evolution of trust in institutions within various political and cultural groups

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Societal capacity and methods for rebuilding trust

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The role of filter bubbles and misinformation

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Potential rise of new trusted institutions and knowledge sources

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Evolution of technical means to obscure or fake reality and manipulate people's perceptions

Diversity and Inclusion

SUMMARY: American society and workplaces will continue to grow more diverse and inclusive as values evolve and younger generations increase their share in the demographic mix. This will occur against a backdrop of social, political, and racial polarization—and the workplace will be a primary arena in which contending views collide and issues are worked out. To meet these challenges, inclusion efforts can be treated as a systemic priority, supported by a new generation of tools and processes.

Forecasts

- Given ongoing trends—immigration, rising racial and ethnic diversity, contention around LGBTQ rights, and changing values—diversity and inclusion will be a primary social and human resources issue for decades.

- New diversity and inclusion issues (such as cognitive diversity, genetic discrimination, etc.) will arise continuously. Some will be novel; some may pit the rights of different groups against each other.

- The workplace is one of the few places where people from diverse backgrounds are thrown together by circumstance, rather than choice. Increasingly, businesses and organizations may be the primary location in which issues of diversity and inclusion are worked out.

- Millennial demography and values will push organizations to make diversity and inclusion a strategic priority.

Key Uncertainties

Directions in American politics and their effects on society

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The pace, nature, and demography of immigration

•

Evolution and effects of social and political polarization

•

The speed at which millennial attitudes shift American culture, and how those attitudes evolve

•

The changing nature of identity and its effects on social fragmentation

Empowered Women

SUMMARY: In many countries, changing workplace needs, women's educational advances, and the reduction of discrimination are resulting in more women at the top of their professions. Associations have a unique and important role to play in promoting women in the workplace and making their presence visible. Gender equity discussions are important considerations in policy decisions and external communication.

Forecasts

- Women are positioned to excel in the workplace based on their academic accomplishments and their fit for a complex, knowledge-based work environment.

- As women advance into higher levels of management, they will bring different values and approaches to the workplace. As leaders, women are perceived as being both more willing to compromise and more ethical and honest.

- Younger people in wealthy countries show signs that they will downplay gender as a defining characteristic, preferring gender-neutral clothing and being open to workplace gender equality.

- Issues of reproductive rights, equal pay, and workplace harassment will continue to keep gender equity in the political and social discourse.

- Women's status in both political and boardroom hierarchies will remain unevenly distributed on the global stage, amplifying philosophical and values clashes between countries and cultures.

Key Uncertainties

The strength of pushback or backlash against women's rights, especially in the areas of reproduction, pay, and recognition

Whether advanced education will be devalued as women take a majority of degrees at all levels

Results as women compete for more political positions

The degree to which women are willing to fight within established organizational bureaucracies or choose instead to create their own structures and companies

Ethical Consumption

SUMMARY: Younger U.S. consumers are engaging in more "ethical" and values-driven spending on products and services, and investing in companies seen as doing good. The values and demographic weight of the millennial generation suggest that this trend will grow.

Forecasts

- As tools—apps, sensors, data analytics—to guide consumer behaviors along ethical lines proliferate, ethical consumption will be a primary screen or filter for more purchasing and spending decisions.

- From Tesla to renewable energy generation to ethical supply chains, the ethical economy will drive innovation in consumer-facing products and services as companies seek to capture ethical dollars.

- Who or what is ethical will remain highly debated in an increasingly polarized society.

- Publicly trumpeting ethical positions can make ethical issues go viral faster, and organizations and companies will run a higher risk of being publicly called out, shamed, or boycotted when consumers perceive a breach of stated ethics.

Key Uncertainties

*Evolution of consumer values
over life stages*

Evolution of environmental issues

Size of ethical market

*Effects of political polarization
on consumer values and choices*

Economic conditions

Consumer choice fatigue

Related standards and certifications

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Ethical Edge of Innovation

SUMMARY: Fast-moving technological innovation is outpacing the legal and regulatory structures designed to protect public safety, promote business and trade, and foster ethical practices. While new technologies often roll out ahead of laws, in the coming decade the public pressure to curb unintended consequences will intensify.

Forecasts

- Differing views on the role of technology and regulation in society will lead to a spectrum of laws and regulations in different regions of the world, with variations governed by factors such as views of privacy, bioethics, and free speech. Some countries may surge ahead of others due to looser regulatory environments—for instance, China and CRISPR-based genetic modification.

- There could be resurgent consumer interest in government regulation in the face of transformative but alarming technologies, such as self-driving vehicles and pervasive user tracking and profiling.

- Wider adoption of artificial intelligence—and the black-box algorithms that often power it—will make questions around tech adoption and control relevant to many organizations.

- The nature of free speech online will be worked out in the 2020s: what is allowable, who controls speech, and whether social media and its platforms constitute public forums.

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Key Uncertainties

Speed of adoption of these technologies, including AI systems

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Attitudes toward online vs. "real-life" actions and goods (e.g., cyber-bullying, theft of online goods)

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Definitions of algorithmic bias

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Tolerance for "black-box" algorithms

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Nature of regulation of technology platforms, for instance as utilities

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Harmonization of international rules governing technology

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Consumer desire for technological innovation vs. demand for regulation

Fast Data

SUMMARY: "Fast data" emphasizes real-time decision making, based on the idea that the greatest value from data comes when the analytics can be used immediately. Examples include fraud detection, recommendation engines, personalization, and real-time demand forecasting. In all of these cases, the value comes from quickly processing and acting on the data—and this value can diminish quickly as the data get stale.

Forecasts

- While the trend toward big data represented a change in the scale and structure of static data, fast data will impose new challenges because the analysis and recommended actions must occur nearly instantaneously.

- Artificial intelligence and expert systems may be required to monitor and respond to data at sufficient speed. The role of human analysts may shift toward training fast data systems to do analysis in real time.

- The trustworthiness of fast data analytics will be a growing concern. The speed and continuous nature of fast data mean that the underlying assumptions of the data model can change faster than conventional analytics. Even if a fast data system is working well, analysts will need to routinely test their fast data models to verify that they are accurately reflecting current reality.

Key Uncertainties

Who has access to what information

•

Whether analytics insights can be verified or are "black box" systems

•

Whether data are public and shared or private and proprietary

•

Ability to extract the signal from the noise in real time

•

Tradeoffs of being an innovator versus a fast follower

Fraying Cybersecurity

SUMMARY: Risks to digital infrastructures are growing, even as dependence on them rises. Employees are both worried and harried—concerned about digital privacy and security in the workplace, and tired of the difficulty and complexity of maintaining system security. Associations face the same internal risks as other organizations but also have opportunities to support their members in new ways.

Forecasts

- Risks to cybersecurity will continue to mount in both numbers and potential for harm, driven by the rise in cyberwarfare activities by governments, expansion of the internet of things (IoT), and the growing sophistication of a global criminal marketplace of data theft.

- The IoT will create billions of new vectors of attack, from traffic systems to toys to medical implants to door locks. The Economist Intelligence Unit has called the IoT "a quantum leap in cyber-risk."

- Cybersecurity will increasingly be unmanageable by humans. An emerging genre of software will apply AI to automate cyber-defense, automatically detecting and self-healing systemic risks.

- Spearheaded by the EU, more governments are likely to pay increasing attention to public cybersecurity—potentially even treating it as a "public health" issue, with new regulations for consumer-facing companies and IoT products.

Key Uncertainties

The scale and scope of future digital disasters

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Risks from the internet of things and how effectively they are addressed

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Whether courts will extend existing liability protections for non-tech products (e.g., cars, large appliances) to the IoT

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Whether autonomous cybersecurity systems will be as effective as hoped

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Shifts in balance between cyber offense and defense

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Global Power Shifts

SUMMARY: Existing global power structures are breaking down, as new centers arise and power diffuses. Power is shifting among nation-states and flowing to several kinds of transnational and sub-national organizations and groups. This will change the operating environment for associations, especially those with cross-border reach.

Forecasts

- The United States and Europe are both on a trajectory for a relative decline in world power, with Europe falling faster than the United States due to its economic stagnation and demographic aging.

- The institutional priorities and practices of international bodies such as the World Trade Organization and ICAAN, the internet supervisor, will shift as emerging markets come to the fore.

- The informal rules of international systems will change as different cultures assert their perspectives in the world.

- Some forecast not new leadership but less, as old powers decline before new powers step up to fill their positions.

- In a high-inequality, globalized era, more one-man powers will arise, in the style of Bill Gates and Elon Musk. They will have the power to change global agendas and shift the course of technologies.

Key Uncertainties

Level of cooperation versus conflict in the international system

•

Trajectory of economic growth by China, India, Brazil, and other rising powers

•

Durability and stability of the socio-political system of China and some other rising powers

•

The state of globalization

•

Evolving power of multinational companies, which increasingly include companies from emerging markets

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Higher Education 3.0

SUMMARY: Traditional educational models are under tremendous pressure as changes in work, technology, and student expectations demand both new curricula and new modes of instruction. Higher education is facing new threats of disintermediation by online education and alternative credentialing systems. While the knowledge economy places a premium on analysis and thinking, it is also creating new alternatives to the university that threaten to transform how students receive postsecondary instruction.

Forecasts

- While top-tier educational programs are relatively unthreatened, online education and alternatives like massive open online courses (MOOCs) could pose a significant challenge to lower- and mid-tier colleges. Private sector acceptance of alternative credentials could amplify the challenge.

- Bifurcation among fields of study—between those degrees requiring access to campus facilities and those that are earnable from anywhere—may grow.

- The meaning of college is in flux, with traditional college models increasingly out of step with a lifelong learning orientation. Additionally, debate about the value of college as a social institution versus college as an arena for professional training will grow.

Key Uncertainties

Levels of public funding for research

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The role of MOOCs and microlearning in higher education

·

The affordability of higher education

·

Who holds the power to credential

·

Role and influence of tech philanthropists

·

Financial return on college educations

Human–Machine Cooperation

SUMMARY: Though many forecasts include substantial job losses due to automation—and such losses are indeed already occurring—many jobs will rely on cooperation between humans and machines. While less disruptive than total automation, human–machine cooperation will be a massive shift, with entire work processes becoming machine-oriented and humans learning to complement automation's role.

Forecasts

- Work automation will proceed for the foreseeable future, mostly by taking over tasks within a job rather than by taking over entire jobs. Humans will handle the remaining tasks in ways that complement what automation can do.

- The ratio of automated work to human work will vary substantially by industry, job, and workplace. Employers will embrace automation to the extent that they can, attracted not only by lower labor costs but also by higher quality and greater output.

- The human side will often be about planning and decision making, managing and developing people, or creative work—tasks that are all hard to automate with current technologies.

- Working alongside computers will frequently require humans to have higher levels of education and skills. Even many factory jobs will require a technical degree.
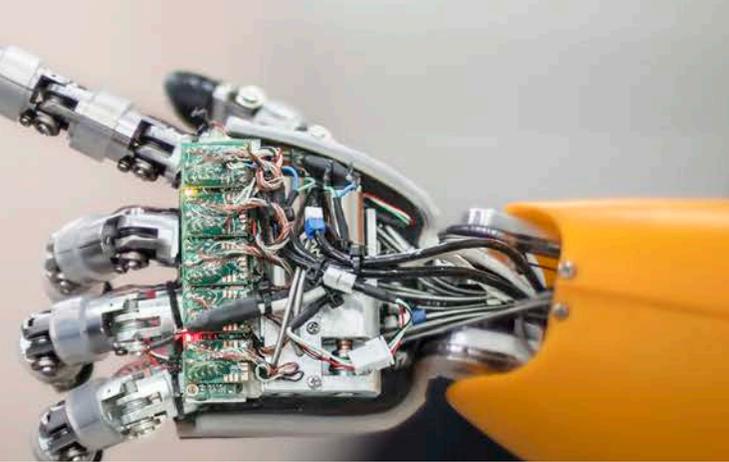
Key Uncertainties

The speed of development and adoption of automation technologies

The speed at which organizational leaders learn to redefine roles and processes

The ratio of automatable tasks versus human tasks in a given work process

Regulatory and societal reaction to automation

People's tolerance for working with machines, including as managers

Rates of progress in machine learning, affective computing, and natural-language capabilities—each of which will significantly extend the kinds of work machines can do

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Immigration-Driven Demography

SUMMARY: Immigration has become the central driver of American population growth—and will reshape not only demographics but also values and attitudes in the decades ahead. For associations, this will result in a more diverse membership with new ideas, expectations, and needs.

Forecasts

- Immigration could bring cultural and political shifts as new citizens add their cultural diversity to American society. This could lead to new cultural influencers as immigrants move into U.S. media.

- The fluctuating intensity of immigration could affect all levels of the workforce, from unskilled labor (farms, factories) to highly skilled medical and technology workers.

- Polarization around immigration and resulting diversity issues will continue, though this will likely shift over time as younger generations with a more accepting view of immigration become more influential.

- The nature of the immigration debate could shift as people grasp that immigrants to the United States are increasingly from Asia.

Key Uncertainties

Immigration policy on numbers of immigrants and how they qualify for admission

Organic levels of immigration, as the demography of countries of origin changes

Immigrant fertility changes

How fast millennial influence drives changing attitudes about immigration

Immigrants' values and how they are expressed

Marketing and Advertising Transformation

SUMMARY: Advertisers and marketers are exploring innovative ways to connect with the public. Online advertising is growing, but concern is rising about vulnerabilities to abuse for other purposes, including fraud, as well as whether the model is even effective. Meanwhile, innovations in marketing and advertising are reshaping practices and assumptions by blurring the lines between marketing, entertainment, advertising, and content.

Forecasts

- Advertising will shift from traditional formats toward greater reliance on embedded marketing and product placement as means to influence brand perceptions. Brands looking to attract younger audiences will become more dependent on social media "influencers" to reach mass audiences.

- Artificial intelligence interfaces like Alexa and Siri will be critical gatekeepers in a growing proportion of consumer transactions. AI platforms will be locations of experiments with new advertising approaches, such as paid search placement or discount microtargeting.

- Decentralized internet technologies such as blockchain will play an important role in supporting new advertising technologies. These technologies offer new ways to prevent fraud and protect privacy, and potentially they will provide a means for consumers to monetize their attention.

Key Uncertainties

U.S. adoption of EU-style data protection practices

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Shifting consumer attitudes toward privacy protection

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Effectiveness of traditional online advertising

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Ability and willingness to curb "fake clicks" and fraudulent web traffic

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Willingness of consumers to pay for online news and entertainment

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Integration of advertising into new personal-assistance platforms

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Extent of regulatory controls imposed on "big tech" companies

Mentoring 2.0

SUMMARY: Mentoring, even as it takes new forms, remains a central way to share organizational knowledge. Millennials are especially enthusiastic about using mentoring as a path to learning. Increasingly, technical advances are affording the opportunity to make more informed mentoring assignments and to use mentoring to capture institutional wisdom.

Forecasts

- Many millennials are eager to learn from and engage with the more experienced members of an organization. Studies also show that formal mentoring programs are one way to keep millennials connected with an organization and help bridge leadership gaps.

- HR analytics can provide ideal matchmaking services for mentoring relationships. Advanced data insights can support matching the mentor and the mentee according to their knowledge, work styles, personalities, and schedules.

- Co-mentoring, group mentoring, reverse mentoring, and e-mentoring are new ways to provide guidance and skills, and will all have a role in mentoring programs.

- Building both informal and formal processes that facilitate intergenerational dialogue and create opportunities for knowledge transfer will become more important as generational ratios continue to shift toward millennials and Gen Z.

Key Uncertainties

Willingness of experienced people to take time to train potential job competitors

•

How generational cultural differences make sharing information a communication challenge

•

The parameters for best mentors for an individual —peers, elders, formal coaches, associations

•

Ways to mentor gig, flexible, and remote workers

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Balancing mentoring to retain and grow key individuals versus "training employees to leave"

Microlearning

SUMMARY: Workers will need to continually learn, but many want small, specific bursts of information tied to immediate job demands, available at a time of their choosing. New media forms will enable modules that are small, timely, and focused. Certification will need to change to allow microlearning modules to be assembled in innovative combinations for new forms of certification.

Forecasts

- Content delivery will increasingly be interactive, online, and mobile. This will require tools that make it easy for non-traditional content providers to create engaging modules on any topic.

- Classroom time, if desired or appropriate, will be devoted not to traditional lectures but to engaging in discussions or problem-solving using knowledge from microlearning modules.

- Microlearning encourages flexible learning: different times, variable locations, and a range of platforms. It may be able to support non-traditional learners and different styles of learning.

- Systems will be needed to identify the needed micro-modules in a field of study, highlight prerequisites, track completion, and incorporate the modules into sequences of certification. Sophisticated systems for learners to find and retrieve modules will also be required.

Key Uncertainties

How to compensate providers of microlearning modules

•

How to assess and validate skill levels

•

How to avoid poor teaching and make sure that information provided is credible and accurate

•

Whether universities, associations, and other traditional learning institutions support and engage in microlearning or push back

•

Degree of reciprocity and compatibility between different systems of microlearning

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More Human Humans

SUMMARY: Automation will steadily increase the relative value of certain human qualities in work, including social skills and creativity. In the age of artificial intelligence, humans will remain relevant not by knowing but by thinking, listening, relating, and collaborating at the highest level.

Forecasts

- Economist Tyler Cowen forecasts that the human abilities that will remain important are "empathy, interpersonal skills, and who we are rather than what we do." According to author Edward Hess, a human will remain relevant by defining herself "as the quality of [her] thinking, listening, relating, and collaborating."

- Digital technology, by enabling collaboration, transparency, and flexibility, has the potential to democratize and humanize work, match it to individual strengths, and make it more meaningful.

- As valued characteristics in the workplace shift, women may have comparative advantages. Women tend to be comparatively stronger in emotional intelligence, empathy, storytelling, collaboration, and teamwork; some of these are "mission-critical skills for innovation and critical thinking."

- As automation takes over the production of a service, the human interaction offered by the service provider and the quality of the experience created will become more differentiating.

Key Uncertainties

Progress in "humanizing" technology through affective computing and machine learning

•

Positive or negative impact of social media on interpersonal skills and the quality of social interactions

•

Extent to which organizations adopt structures and leadership models designed to leverage uniquely human strengths

•

Relative priority placed on human development versus economic growth, in society in general and political systems in particular

New Journal Models

SUMMARY: The traditional model of academic publishing is facing disintermediation by new, technology-enabled forms of scholarly communication. Open-access journals, preprint archives, and research data aggregators make it increasingly easy for researchers to bypass traditional publishing. Both traditional and non-traditional journals need to develop sustainable business models and rethink how to maintain editorial quality standards in a changing publishing environment.

Forecasts

- Journals provide multiple functions: selection, promotion, reputation, and communication. A growing number of platforms and mechanisms will be available online to replace and disaggregate these functions.

- The internet has created a general public perception that information should be free. "Digital native" millennials are likely to reinforce this attitude, and they will push journals to reduce or shift their access costs.

- Scientific fields may grow more divided, with conflicting camps of scientists gravitating to different platforms, giving new form to rivalries among journals.

Key Uncertainties

Sustainable business models for journals

Impact of open access on research quality

Reforms in peer review process and new replication standards

Potential for university cutbacks in journal subscriptions as higher-education structures and economics evolve

Influence of emerging-market science programs

Public perceptions of scientists and experts

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New Forms of Work

SUMMARY: Freelance, gig, contract, and temporary work and the infrastructure to support them (e.g., online platforms and reputation systems) are growing. The number of independent professionals is expanding, and networked organizations rely on them. Associations will have new opportunities to serve these workers and advocate for their interests.

Forecasts

- While the gig economy (as measured in the ground transport and lodging industries) does not seem to be affecting payroll employment in most places, cannibalization is a future possibility.

- Online talent platforms, including gig-economy digital marketplaces, could improve productivity, grow some kinds of employment, and boost labor force participation globally.

- According to Freelancers Union and Elance-oDesk (now Upwork), new forms of work will "have major impacts on how Americans conceive of and organize their lives [e.g., how time is structured], their communities, and their economic power."

- Decisions about the future of the social safety net, and especially about access to health insurance and retirement benefits, will significantly affect the viability of new work forms.

- Work restructuring will be driven in part by automation as humans share work with machines.

Key Uncertainties

Changing regulatory climate for new work patterns

•

Economic conditions affecting hiring and employer confidence

•

Societal tolerance for potential adverse impacts of new work forms— e.g., less certain employment and reduced access to the social safety net

•

Evolution of millennial attitudes toward the freelance and gig work lifestyle as the millennial cohort enters new life stages

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Nichification: Big-Data Segmentation

SUMMARY: The big data revolution makes it feasible to define new niche demographic segments that share common motivations and interests and to target them with tailored and tested appeals. Associations will be able to communicate to and even predict the interests of very specific segments but will run the risk of limiting broader audience awareness of content and messaging.

Forecasts

- Nichification will enable real-time, contextualized targeting, including location-based marketing, need-based marketing, and marketing informed by past purchases.

- Nichification will be based on attitudes, values, and identity in addition to demographic and lifestage segmentation.

- Big data will make it possible to continuously update the characteristics of a segment and forecast how its needs may evolve.

- Traditional marketing segmentation may ultimately give way to individualized customer communication based on predictive analytics. Big data nichification ("extreme segmentation") is a step along this journey.

- Nichification could lead to algorithmic consumption and lifestyle guidance, resulting in greater separation between groups and gradual "algorithmic tribalization."

- Nichification risks intensifying the isolation of groups of people into self-contained "bubbles" and perpetuating unintentional discrimination.

Key Uncertainties

Attitudes about privacy and control of personal data, exemplified by the recent backlash against corporate access to individual online history

•

Extent of desire to escape targeting

•

Resistance to being algorithmically shaped and guided

•

Ability to effectively reach identified niches and deliver on identified needs

•

Potential backlash against real or perceived discrimination

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The Next-Gen Professionals

SUMMARY: Millennials are now the largest generational cohort in the workforce, and generation Z is right behind them. These next-gen professionals are the future of associations and, contrary to some conventional wisdom, they are willing to both join and stay with organizations that meet their career development needs. Organizations will need to provide the kinds of training, mentoring, content, and other services that next-gen professionals value most, encouraging engagement that leads to loyalty.

Forecasts

- Millennials will join organizations in larger numbers as three trends unfold: their share of the U.S. workforce continues to increase, their financial status improves, and more organizations reshape their offerings around what many millennials value most. These highly-valued offerings include mentoring and training; personalization; state-of-the-art tech platforms; curated content; real job leads; plenty of networking with other millennials and with leaders in their field; and, often, a sense of meaning.

- Next-gen professionals will motivate more organizations to step up their training and education—and in formats younger generations prefer: just-in-time microlearning, multiscreen events, co-mentoring, and smaller, more focused face-to-face meetings.

- Many next-gen professionals will continue to push for merit-based leadership positions, seeking to bypass the traditional promotion ladder.

- Next-gen professionals could form their own organizations if they are unable to get what they want from baby boomer- and gen X-led organizations.

Key Uncertainties

How the youngest millennials will differ from their generation's elders

·

Whether certain key characteristics (slowness in purchasing cars and homes, starting families late, etc.) are lifestage-based or are lifelong traits of this generational cohort

·

Whether a more robust labor market and rising wages will continue— and whether this will change next-gen professionals' consumer and lifestyle behaviors

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Personalized Artificial Intelligence

SUMMARY: Rapidly advancing machine learning is combining with data analysis to enable software equipped with increasingly accurate pictures of consumers' lives and likes. This technology can support personalized microtargeting and allow organizations to offload customer service work to chatbots and other interfaces. Individuals may interact more and more with software that seems to know and understand them, sometimes better than their friends.

Forecasts

- Machine learning and data proliferation make the spread of personalized artificial intelligence, or AI, inevitable; only its ubiquity and capacities are in question.

- AI will offer increasingly personalized decision support in a range of activities. People will look to AI for advice on purchases, solutions, and even questions of social life. Some will grow dependent on their artificial support systems.

- Personalized AI tools will interact not only with their "owners" but also with each other and with other humans—e.g., to set up appointments.

- AI systems may be oversold or misused and become associated with ineffectiveness. This perception could persist even after the technology has further matured. The notorious inaccuracy of voice recognition systems offers a lesson.

Key Uncertainties

Speed of development of AI technologies and methods

·

Speed of change in computing power, especially as advances in raw computing power slow down

·

Acceptance of AI and how people react as they simulate intelligence more closely

·

Effects of privacy concerns and norms

·

Data regulation around privacy

·

Interoperability and the compatibility of systems

·

Data access and control and whether it is siloed or open

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Philanthropy Reshaped

SUMMARY: Demographic and political changes, loss of trust in institutions, and the growth of donor-advised funds and impact investing will drive shifts in the channels, targets, and geographic focus of American philanthropy. These shifts will offer opportunities for associations to access new resources, engage new members, and create new partnerships.

Forecasts

- Charitable giving will continue to grow, although big donors will contribute an increasing percentage and will often prefer to fund their own foundations and direct philanthropy.

- A growing share of givers will be women and people of color.

- Donor-advised funds, venture philanthropy, and impact investing will grow, potentially blurring lines between sectors.

- Growing distrust of institutions will affect philanthropy; a 2015 *New York Times* op-ed described it as a sector with too much secrecy and too little oversight and outside accountability.

- Millennials—who often seek to integrate values, investment, entrepreneurialism, and careers—will want to go beyond donation to engagement and launching social enterprises.

- Social media and data analysis will continue to affect charitable giving, enabling transparency, donor engagement, and peer-to-peer fundraising.

Key Uncertainties

Performance of the economy

·

Political climate and potential legal and regulatory changes—e.g., to the charitable giving deduction, rules for donor-advised funds, or rules for political contributions

·

Evolving role of government at all levels in addressing educational, social, and environmental issues

·

Evolving relationship among philanthropic institutions and endeavors, corporations, and government entities

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Rejection of Expertise

SUMMARY: Public skepticism toward well-credentialed experts is growing, in part because of a perception that they have failed to recognize or address persistent sociopolitical problems. Expert pronouncements are having less impact on public perception, with the public turning instead to non-credentialed and "unofficial" sources for guidance and information. At the same time, information is increasingly able to route around gatekeepers, diminishing their influence and ability to shape discussion and debate.

Forecasts

- Rejection of expertise could exacerbate polarization and make governing large structures (such as nations) and small organizations difficult due to lack of shared consensus about reality.

- There will be new "experts" whose credentials won't come from experience or academia but rather from new skills—media training, networking, etc.—that afford them the appearance of expertise.

- A bifurcation will emerge between people who respect traditional expertise and those who don't.

- People's overconfidence in their own expertise has been growing for years. A shock to society—pandemic, political crisis, etc.—could be one path to reestablish the worthiness of "traditional" experts.

Key Uncertainties

Evolution of the media and its role

Need for information management or filtering

Success of pro-expert and pro-fact countermovements

Evolution of new kinds of consensus

Impact of populist politics

Changing role of credentials and education

Impact of the evolving economy

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Reputation by the Numbers

SUMMARY: Vast amounts of data will support reputation systems, and reputation will increasingly eclipse credentials for landing a job. As worker reputation systems and human resources analytics grow, assessment of an individual's suitability for a job will be driven by a person's algorithmic match to needs.

Forecasts

- The evaluation of reputation data by new analytics could change what personal attributes or abilities are valued. For instance, a system may reward popularity, or it may effectively ignore it.

- New reputation analytics may erode current credentials, both educational and professional. For example, degrees from Ivy League schools may carry no more weight than degrees earned via massive open online courses (MOOCs) or other alternatives.

- A move to a more objective measurement of talent could vastly expand the talent pool of workers, facilitating a more global workforce. Workers previously overlooked due to subjective human hiring biases could also find more opportunities.

- For those without an established reputation, there will be challenges to entering the workforce. Reputation systems will have to include effective "on-ramps."

Key Uncertainties

Efficacy and reliability of reputation systems, especially black-box, algorithmic systems

•

Privacy concerns

•

Role of algorithmic and human discrimination

•

The effects of rating fatigue on users

•

Effects of gaming the system and reputation-polishing

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Re-Working Career Pathways

SUMMARY: The idea that the course of people's professional lives is settled in their twenties is long-outmoded, but employers and life structures have been slow to adapt to this fact. However, organizations are increasingly assisting workers with midlife transitions, such as going back to school, enhancing skills for new career directions, or allowing for reduced hours so that employees can pursue other interests. Such steps create a need to rethink work, education, and social safety nets to accommodate new approaches.

Forecasts

- "Careers for life" may begin to give way to "careers for life stage" as workers and employers realize that time in a job or industry is a finite thing due to changing skills, interests, technologies, and market needs.

- New resources and structures will be needed to support a workforce that retrains or shifts careers regularly. These could range from mid-career use of social safety net funds to rethinking the roles of universities, community colleges, and technical schools.

- Mid-career shifts could help combat workplace ageism as workers retrain and move to jobs where they have interests, rather than lingering in jobs where their skills become obsolete.

- While this change is emerging slowly, it could become supercharged in the medium term by a workforce with generally looser ties or allegiances to organizations than in the past.

Key Uncertainties

Whether evolving views are tied to generation, life stage, or some combination thereof

·

Evolution of institutions to support midlife shifts

·

Older millennials and their approach to midlife

·

In the United States, whether health insurance continues to be tightly coupled to work

·

Shifting gender roles vis-à-vis work and family

·

Whether midlife career transitions are primarily for elite workers

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The Sharing Economy

SUMMARY: The sharing economy—a peer-to-peer exchange of goods or services—will continue to grow globally and expand into new areas of commerce, although regulatory issues constitute a key uncertainty. The sharing economy portends a shift in the balance between access and ownership, from ownership of resources to access to goods and services. Organizations that broker exchanges between owners and users play a pivotal role in this economy.

Forecasts

- The sharing economy will grow. eMarketer forecasts that sharing economy use among U.S. adults will rise from 10.8 percent in 2016 to 15.3 percent in 2020.

- Consumers who choose sharing over ownership will have a lower level of control over these shared resources, and they may need to accept, as examples, uncertainty in the timing or availability of rides or lodging.

- Retirement and household downsizing in developed economies could boost demand for the sharing economy; sharing their resources could also supplement the income of retirees.

- The sharing economy will enable those with modest (or even substantial) means to sample more affluent lifestyles.

Key Uncertainties

Changing regulatory climate for sharing platforms, a potential barrier to or enabler of growth

·

Economic conditions driving demand for and availability of shared resources

·

Changes in demand for sharing as generations, especially millennials, enter new life stages

·

Changing expectations about cost of and control over shared goods and services

·

Extent of mutual reinforcement between the sharing and experience economies

·

New economic opportunities for vulnerable populations who gain as-needed access to new resources

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A Shifting Environment for Content

SUMMARY: Content producers face an increasingly challenging environment. Audiences are fragmented and distracted, and they expect to be entertained and informed for free. Delivery channels are shifting rapidly for both economic and technological reasons, a trend likely to accelerate over the medium-term future.

Forecasts

- Content personalization will steadily increase as pervasive data feeds are further filtered through automated content selection and creation.

- Innovations in micropayments and paywalls may make it easier to sell content, but charging for content will divide audiences more firmly into those ready to pay and those satisfied with free content.

- The consumption of media will increasingly be seen as a political act. Different sources will be tagged—accurately or not—as favoring one side of various political and social divides. Reading, subscribing to, or advertising in media will increasingly be perceived as political acts.

- More content creation will be automated. Automated production may take on basic information-update articles, as well as listicle-style entertainment pieces.

- Automated content-filtering systems will increasingly reveal the discrepancies between consumers' stated, actual, aspirational, and demonstrated content preferences, which are often at odds.

Key Uncertainties

The changing role of social media

Feasibility of widespread paywalls

Spread and nature of content personalization

How the media habits of millennials and post-millennials evolve

How quickly automated content-creation capabilities grow

The changing nature of attention

Attitudes about privacy and data gathering and use

Prevalence of filter bubbles and efforts to combat them

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Shifting Terrain for Advocacy

SUMMARY: In the United States, single-party control of the executive and legislative branches, shifting power between Congress and regulators, and conflicts among federal, state, and local governments will change the nature of policymaking. National-level gridlock will drive more efforts at policy change toward state and city governments. All of this will change the arena in which advocacy occurs.

Forecasts

- Sharp political disagreements over the locus and nature of regulation mean that American regulatory policy could whipsaw in the 2017–2021 period and beyond, as party control of Congress, the executive branch, and state legislatures changes.

- To the extent that national government is gridlocked, more efforts at policy change will devolve to states and cities.

- Devolution will also create new power centers, accentuating the role of certain states or even cities, or groupings of such. These centers will lead or shape certain issues, as California, Texas, or New York City have in the past.

- Cities will attempt to enact policies, sometimes in concert with each other, but will often be thwarted by preemption from their more conservative state legislatures.

Key Uncertainties

Political direction of the United States 2018–2020

·

Evolution of the U.S. political system over the medium term

·

Changes to rules for lobbying, advocacy, and political contributions

·

Nature and course of the political struggles between different levels of American government

·

Ability of states to make policy at odds with federal policy, and of cities to defy their home states

·

Success of efforts to combat political gerrymandering

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Socializing Reshaped

SUMMARY: Social media, telecommuting, digital entertainment, and shifting social norms are reshaping patterns of socializing, both online and in person. A growing percentage of social interaction is now digitally mediated. Work life and social life are increasingly occurring in the context of online social tribes and communities. The need to change one's physical location to socialize and work with others is declining.

Forecasts

- The line between work and personal life will continue to blur as technological mediation allows activities associated with either sphere to be accomplished from anywhere.

- With most work and social activities partially mediated by online tools, the providers of these tools will have tremendous amounts of user data and information, giving them influence over what users see and do and how they perceive the world.

- As digital interactions reshape social behaviors, these new patterns will be adopted by workers—increasingly changing how work is done and how offices are managed. The "I'll text if I'm coming" ethos could play havoc with scheduling freelancers, while sick days could be supplanted by "ghosting." Managers will need to be ready for this new flavor of blurred work and social lives.

- As new ideas about socializing and social networks take hold and work and leisure forums blur, co-workers could be seen as just another social cohort. This could lead to headaches for HR as workers begin to forget or ignore the fact that there are special behavioral rules governing office interactions.

Key Uncertainties

Effects of privacy concerns

•

Rising backlash against working from home or remotely

•

Level of integration of physical and online social lives

•

People's need or desire for physical company

•

Role of automation in reshaping work life

•

Degree of resistance to expanding role of algorithms in all facets of life

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The Splintered Society

SUMMARY: Americans are self-segregating along multiple divides, both online and offline: politics, economic status, educational attainment, social life, consumer spending, media choices, and geography. This is being fueled as much by political polarization as by economic and social inequality.

Forecasts

- Political polarization could be exacerbated as more issues are labeled partisan or assigned to a particular divide. This could strengthen segregation and filter bubbles and increase their effects—shaping even more whom people socialize with and where they live, among other factors.

- A splintered society will drive social instability and insecurity, as it is the result of corrosive processes that undermine existing institutions and social structures.

- As people self-segregate into like-minded communities, or around shared ideas, it could spark the rise of new social, commercial, and civic institutions that partially duplicate existing institutions but better mirror the ideas and values of their supporters and users.

- As splintering spreads, the danger of people further disengaging from political and social institutions is rising due to lack of trust or a failure to believe in efficacy.

Key Uncertainties

Whether some kind of breaking point will occur

The potential for restoration of trust in media

Varying levels of trust decline across different institutions and social groups

Potential for re-engagement in shared civic discourse

The speed at which polarization grows

Effects of a potential external unifying event, such as war or terror attack

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The Stagnation Economy

SUMMARY: U.S. economic growth is slowing—the recovery since 2007 has been steady, but it is the slowest recovery since WWII. Productivity growth is also slowing, and there are concerns that innovation may be decelerating as well. The result is a contracting middle class, with weak job and wage growth and no clear solutions in sight. Lackluster economic growth may linger throughout the rest of the decade, despite an economic environment that seems generally stable and healthy.

Forecasts

- Tech firms are innovating at a rapid pace in internet technology and services, but their growth likely will fuel only modest job creation. New tech-enabled, platform-based services can be a disruptive force in a given industry. However, they will continue to fall short of becoming the transformational innovators that give rise to entirely new spinoff industries.

- Many markets are dominated by a handful of leading firms, which can impede disruptive innovation. These firms may capture an inordinate share of future growth until new technologies or regulatory interventions destabilize their market dominance.

- Technology innovation can drop the price of goods while increasing their capabilities (e.g., HDTVs). Consumers may perceive an improving quality of life, even if economic growth is weak.

Key Uncertainties

Ability of financial institutions to maintain status quo

·

Future funding levels for scientific research

·

Whether R&D spending comes from the public sector or the private sector

·

Ability to preserve political stability given continued economic stagnation

·

Impact of artificial intelligence and automation on productivity growth

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Taming Big Tech Dependency

SUMMARY: A handful of global consumer-technology platforms—Facebook, Google, Apple, Amazon, and their subsidiaries—increasingly shape entertainment, news, commerce, and even personal interaction. The unprecedented (and still growing) power and influence of these companies create a variety of challenges for both governments and civil society, prompting governments to step up their oversight.

Forecasts

- All stakeholders, including the big tech companies, their advertisers, and their users, face a period of tumult as governments shift their approaches to big tech.

- New approaches to regulating big tech will arise outside the United States. The EU's 2018 law, the General Data Protection Regulation (GDPR), could serve as a global model of stringency. Any U.S. regulation will be influenced by the GDPR but will tend toward piecemeal guidelines rather than rules.

- China's tech champions (especially Alibaba, Tencent, and Baidu) will be a growing force in this area, creating both new competitive issues and new voices in the global regulatory debate.

- Tech platforms will self-regulate to avoid legal clampdowns. This could generate useful innovations, such as the application of AI to weed out offensive content or ensure adherence to rules.

- Beyond 2020, decentralized internet-style networks could gain usership alongside—or in place of—today's internet.

Key Uncertainties

Whether the recurrent crises afflicting the big tech platforms (data misuse, electoral influence, fake news, etc.) will trigger significant oversight

•

Influence of the EU's stringent privacy laws on other governments' treatment of big tech

•

How Chinese multinationals choose to engage with regulators in the rest of the world

•

Effects of tech companies' own attempts at self-regulation

•

Millennials' attitudes as they move into positions of authority

•

The possibility of a "digital 9/11" event that changes people's views of cybersecurity

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Trade in Transition

SUMMARY: The rules of global trade are up in the air, with growing uncertainty about whether the trend toward global trade harmonization will be maintained. The United Kingdom and the United States have begun renegotiation of once-settled trade policies that supported economic globalization, pushing the world trade system toward economic nationalism.

Forecasts

- Trade policy for the United States and the European Union will have a high degree of uncertainty through at least 2020. Trump administration tariffs on targeted industries, Brexit, and E.U. financial challenges all have the potential to destabilize established trade policies.

- Uncertainty also originates outside the trade arena as secondary effects of geopolitical conflict and domestic politics. Territorial disputes in the South China Sea, conflict in the Middle East, and the E.U.'s refugee crisis all add to global trade instability.

- With Brexit and the U.S. withdrawal from the Trans-Pacific Partnership, and the renegotiation of the NAFTA agreement, the world is likely entering a period that shifts trade agreements away from multilateral pacts and toward narrower bilateral trade agreements.

- China, India, and other rising economies will have greater influence and more rulemaking power in the future global trade system.

Key Uncertainties

Stability of the European Union

Electoral outcomes in the United States and Europe

Potential for bilateral trade wars

Strength of populism and nationalism

Impacts of tariffs

Linkage of trade to strategic , environmental, or human rights issues

Spillover effects from geopolitical conflict

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Transparent Organizational Ethics

SUMMARY: Organizations will face new kinds of scrutiny as drivers of transparency proliferate. Ubiquitous connectivity and information-capture, new sensing capabilities, and pervasive social media all enable hyper-transparency of organizations' actions, necessitating actively managing reputation in a world increasingly concerned about ethical behavior.

Forecasts

- Growing amounts of deliberately released and emergent data will create an environment where organizations have declining control over their transparency.

- Ethical decisions in a very dynamic and polarized environment will require difficult balancing of considerations and an understanding of longer-term implications.

- Automated ethics-ratings apps, tailored to users' personal ethical beliefs and interests, will inform where individuals buy, invest, or do business.

- Consumers will show a wide range of interest in punishing and rewarding organizations for their behavior; new tools may help boost the percentage of people who engage in this behavior.

Key Uncertainties

Overall societal status of trust

·

Effects of competing and contradictory views of "ethical" in a polarized political climate

·

The nature of future activism

·

Evolution of regulation

·

Level of active consumer interest in corporate and organizational ethics

·

Role of fake and misleading news and information

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Who Owns The Data?

SUMMARY: In the United States, there is a growing movement among technologists and consumers to give individuals more control over data about themselves (their identifying information, online communications, purchasing histories, social media habits, etc.). This idea may prove a challenge to existing industry models, as free consumer data is the lifeblood of many popular online services and programs, particularly mobile applications.

Forecasts

- The battle for control of personal data could involve consumers less and less. As government regulations on use of consumer data are relaxed, it will be corporations challenging other corporations for access to consumer databases, with users having little say.

- Current methods for enabling consumers to control their data are incomplete and cumbersome. As this idea grows, new ways of data sharing and control could arise. These may include differential controls, allowing the release of some data (consumer preferences) but restriction of other data.

- User concerns about data privacy could drive behavior changes and product innovations, including interest in products in which user data capture is ephemeral. Users may also begin to purposely create public-facing consumer personas that are similar to, but not exactly like, their actual selves.

- The issue of who owns consumer data could escalate as connected devices spread (the internet of things) and collect more consumer data, often surreptitiously.

Key Uncertainties

Convenience of data ownership systems

The role of regulation

Discontinuous data disasters

Evolving privacy concerns

Availability of non-data models of funding consumer access

Tech industry views of security

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Work Redefined

SUMMARY: A variety of driving forces are redefining the boundaries and nature of work and jobs in fundamental ways. New employment and workplace systems, educational systems, and social safety net systems will need to rise to meet emerging needs.

Forecasts

- Automation, temporary work, and new economic realities will endanger the traditional 40-hour job.

- Work will be less confined to traditional working hours and workplaces.

- Education, work, and leisure will no longer be sequential life events, but will be pursued continuously throughout the lifespan.

- Automation will drive workers to designing, marketing, and selling rather than producing.

- Organizations will continue to flatten, shifting from ladder to lattice structures, enabling collaboration.

- More work will shift from jobs with titles to getting a project done and moving on.

- In some locales, the loss of traditional jobs will harm cultural cohesion and civic spirit.

- More workers will retire later, and gradually.

Key Uncertainties

Extent to which automation creates jobs, destroys jobs, and enhances existing jobs

State of the economy

Societal recognition of traditionally unpaid work, e.g., childcare and elder care

Methods for delivering the non-monetary benefits of work to individuals who don't have a job

Future of the social safety net and retirement structures

Future of migration