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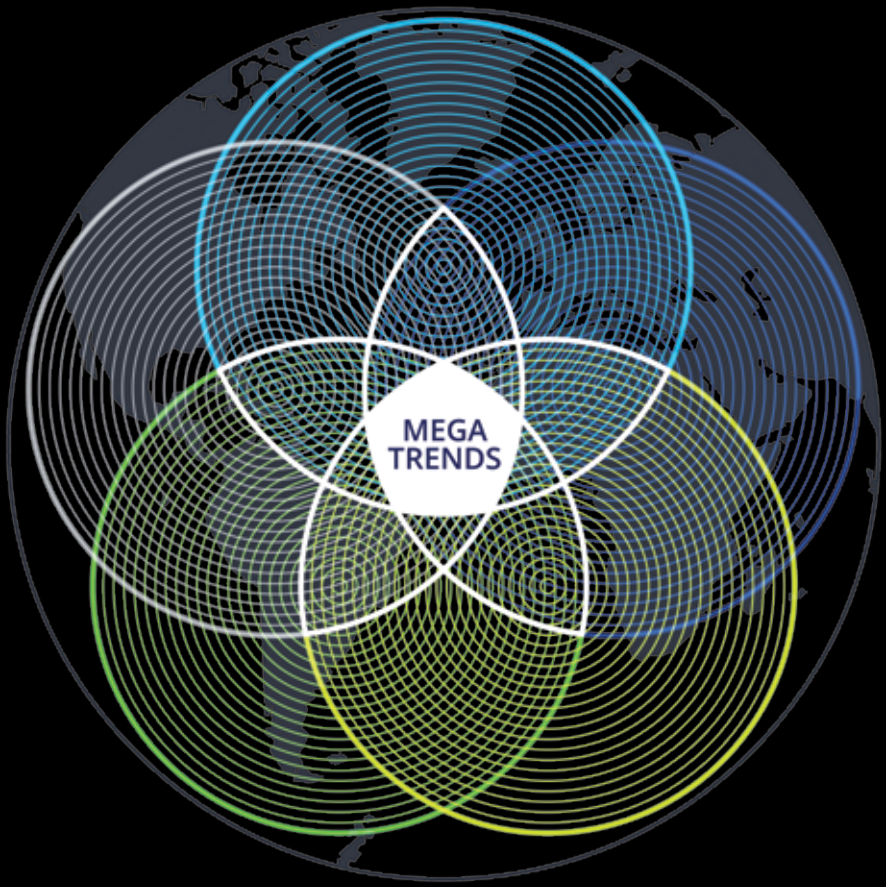

Beyond the Noise

The Megatrends of Tomorrow's World

center
for the long view

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Content

We all have to make decisions in spite of an uncertain future. Imagining the future through scenarios enables us to identify robust strategic choices that would fit to any plausible future, and to keep strategies flexible in case the future surprises us.

Take a step back and consider this: is it easier to make assumptions about the future today, or some years back in the last millennium? Most people would agree that it is harder to make sense of "it all" today, compared to the more clear-cut and bipolar world in which we grew up.

We live in a world of ever faster technology cycles, hyperconnected and nervously flickering financial markets, and post-factual politics. No wonder that the gentle art of perceiving, as scenario-pioneer Pierre Wack once famously described it, has become an increasingly critical skill when far-ranging decisions are to be taken.

With this book, we would like to draw your attention to a number of trends that, in our current view, might well drive the future. To do this, we will describe a selection of the social, technology-related, environment-related, economic, and political drivers of change that we encounter again and again in our daily work at the Center for the Long View.

There is one striking insight from years of scenario work: the set of drivers that form the general background to the scenarios we draw is surprisingly stable. It changes only slowly over time, and varies surprisingly little across industries, geographies and sectors. However, the ways in which these drivers link up and interact with each other is never the same, and is extremely specific to the focus of the scenario at hand.

In other words, drawing up a sensible list of factors that can explain the proverbial first 80 percent of our future is the easy bit of scenario thinking. Selecting the relevant drivers for your specific focal question, country or industry, and combining the overall set into plausible, balanced and challenging stories, on the other hand, is an art.

The objective of this book is two-fold. We would like to give you a sense of structure when thinking about drivers of the future. By clustering drivers into buckets such as societal, technology-related, environment-related, economic, and political (which is often referred to as the STEEP categorization), you are off to a good start.

We would also like to open your eyes to the fact that the future is already here, you just need to perceive it. After absorbing the list of drivers, you might start to read or watch the news differently. If you start to feel that most of the news we are bombarded with on a daily basis actually tie in neatly with one or several of the trends described in this book, you have started to think like a futurist.

As you embark on your personal journey to imagine the future, please keep in mind two more points. First, this book can be read from front to back, but you don't have to stick to convention. Feel free to jump from driver to driver, go back and forth and explore the points that capture your imagination.

Second, there are two parts to this book, and that structure needs a bit of explanation. The first section describes 35 drivers of the future, which are social or political tendencies, economic or environment-related processes, or technological developments we often rank as relevant when compiling our trend analyses. These drivers certainly make an interesting read on their own, but they are still rather discrete and unrelated observations between themselves.

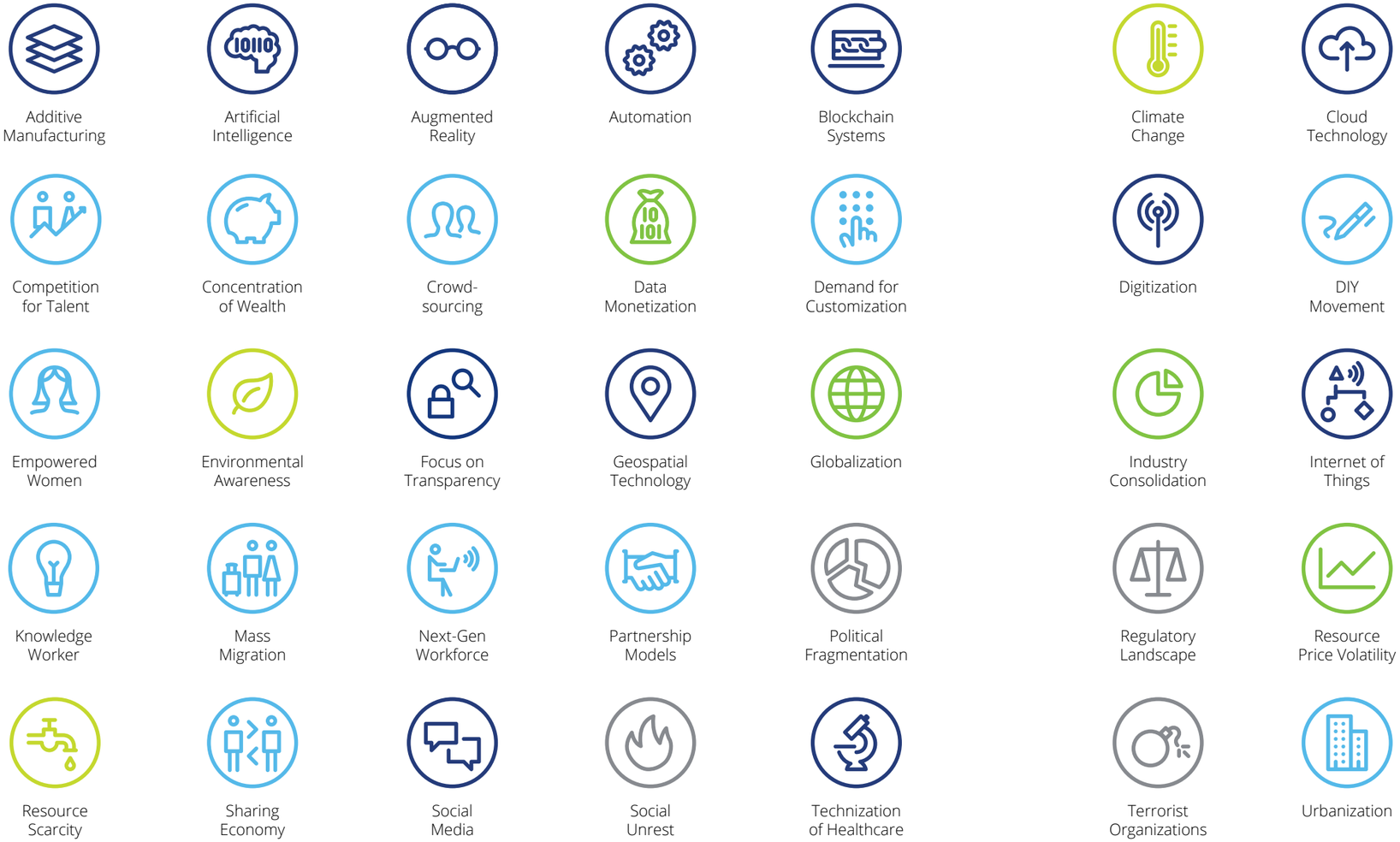
By contrast, the second section highlights megatrends, which is a more abstract concept. Megatrends emerge at the intersection of two or three STEEP categories. For example, hyperconnectivity is a phenomenon that stems from both technology and society, and therefore qualifies as a megatrend. Yet, even more importantly, megatrends will have an impact on all aspects of our life in the future. To stick with our example, that megatrend hyperconnectivity not only determines further future technologies and trigger new social trends, but also leaves its mark in politics, the environmental debate, and of course the economy. To illustrate this, we provide five "stories of the future" for each megatrend, to give you examples of how the megatrend might impact the future across STEEP categories.

Enjoy the ride.

Florian Klein
Head of the Center for the Long View

This century is best described as the era of uncertainty.

Underpinning the future of our world are 35 drivers of change.



- Society
- Technology
- Environment
- Economy
- Politics

The Megatrends of Tomorrow's World | Drivers

Additive Manufacturing

Additive manufacturing (AM) or 3D printing refers to a production method whereby three-dimensional products are created by successively layering material using a computerized or digital process.

Importance

- AM already affects an enormous number of industries including automotive, industrial products, medical devices, aerospace and defense, consumer goods, and architecture.
- From 2013 to 2018, the market volume for AM systems and support products/services is expected to rise from US $3.1 billion to US $12.5 billion.
- The fastest growing segment within AM, metals, is expected to reach a market volume of US $3.9 billion by 2025.
- AM is currently already used in some form in 24% of manufacturing firms and in up to 50% of supply chain leaders.
- By 2017, an additional 21% of manufacturing firms plan to use AM.

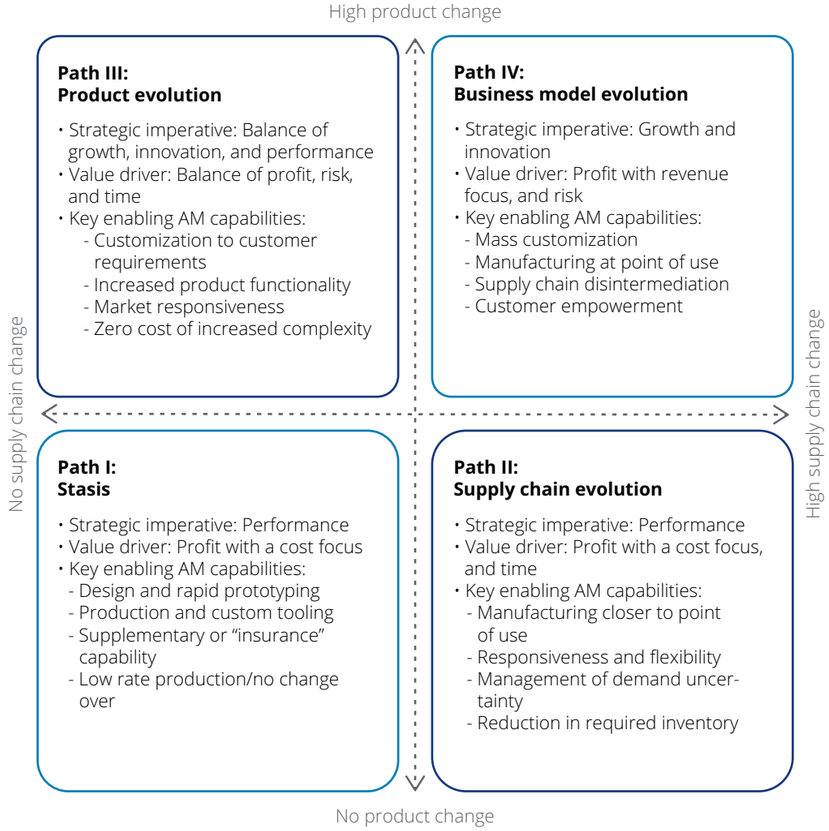
Impact

- AM can improve a product's value by increasing the efficiency and effectiveness of the design process. The main benefits are reduced process time and cost reduction in the development cycle, as well as quality and design improvement of the final product.
- AM's impact on supply chains includes material waste reduction, increased production flexibility, and the possibility of further decentralizing production. However, companies have to overcome quality assurance barriers to employ AM for purposes beyond rapid prototyping or tooling.
- Some experts estimate that consumers might save approximately 80-90% of purchase costs by purchasing the right to manufacture a product at home rather than through traditional retail channels.

Sources: Statista 2013, IDTechEx 2015, Deloitte University 2014, Deloitte University 2017

The Megatrends of Tomorrow's World | Drivers

Framework for understanding AM paths and potential value



Sources: Deloitte University 2017

Artificial Intelligence

New technologies are focused on augmenting the processing capabilities of machines for human-like intelligence (e.g., robotics, natural-language processing, speech recognition).

Importance

- Due to the increased use of robotics and artificial intelligence (AI), it is expected that about 50% of US occupations will experience some degree of automation in the next 10 years (2014–2024).
- A study conducted by researchers from the University of Oxford predicts that almost half of total US employment (47%) will transform or vanish because of automation.
- There are three general categories into which applications dealing with artificial intelligence can be divided. These are "product applications", "process applications" (such as automation), and "insight applications" (such as machine learning).

Impact

- Through suggestions that specifically refer to a context, cognitive analytics can enhance the accuracy of forecasts and the performance of tasks in terms of their efficiency and degree of automation. Cognitive analytics can support and add to human cognition by providing suggestions that a human mind may not have taken into consideration.
- Cognitive analytics are especially valuable for companies that are eager to enhance their capabilities to predict, sense, and react since they combine the analysis of big data with practical decision-making support.

Sources: Deloitte University 2015, Deloitte 2014, Deloitte University 2014

The Megatrends of Tomorrow's World | Drivers

The Three Vs framework for assessing applications for cognitive technologies

Screen	Cognitive technology indicators	Application examples
Viable	• All or part of a task, job, or workflow requires low or moderate level of skill plus human perception • Large data sets • Expertise can be expressed as rules	• Forms processing, first-tier customer service, warehouse operation • Investment advice, medical diagnosis, oil exploration • Scheduling maintenance operations
Valuable	• Workers' cognitive abilities or training are underutilized • Business process has high labor costs • Expertise is scarce; value of improved performance is high	• Writing company earnings reports; e-discovery; driving/piloting • Health insurance utilization management • Medical diagnosis; aerial surveillance
Vital	• Industry-standard performance requires use of cognitive technologies • A service cannot scale relying on human labor alone	• Online retail product recommendations • Fraud detection • Media sentiment analytics

Sources: Deloitte 2014

Augmented Reality

Augmented reality (AR) is a form of technology used to provide a digitally enhanced view of the real world. This technology layers digital information (e.g., graphics, sound, or feedback) on top of the physical environment for the user to manipulate.

Importance

- In 2017, there will be more than 2.5 billion downloads of mobile AR applications. By 2020, there could be about 1 billion people using AR.
- It is predicted that the annual revenues of mobile AR in the enterprise and general entertainment application sectors will each exceed US $1 billion in 2018.
- Copenhagen Airport has introduced a pilot project in which an application guides users through the airport. By 2020, users could be navigated with a 3D tool embedded in either a mobile or a wearable AR device. This device will map passengers by means of the triangulation of Wi-Fi access spots at terminals and navigate them through the airport.

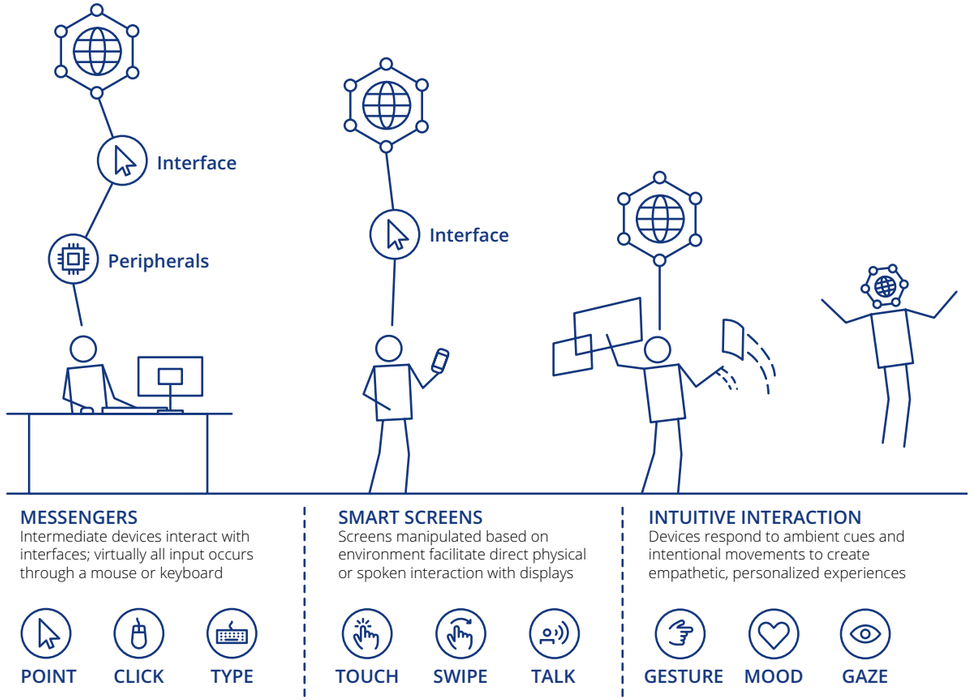
Impact

- By using AR devices, users can experience their physical surroundings through computer-generated inputs (e.g., video, sound and GPS data). These sensory inputs augment items from the real world in such a way that people think their environment is real, even though they may find themselves in a totally different surrounding.
- During the past 12-18 months, retailers and brands have been strongly engaged with advertising their AR applications via mobile channels to influence consumer behavior and drive consumer adoption of AR devices.
- At a time when customer focus is becoming increasingly important, mobile is considered the leading technology driving omni-channel marketing.

Sources: Deloitte 2016, Deloitte University 2015

The evolution of interaction – shortened chains of command

Augmented and virtual reality help accelerate the coalescence of users with their device-powered experience of the world, improving the fidelity of intention, increasing efficiency, and driving innovation.



Sources: Deloitte University 2016

Automation

Physical objects are becoming more and more frequently interconnected with digital technology (e.g., advanced robotics and sensing) and able to communicate without human intervention.

Importance

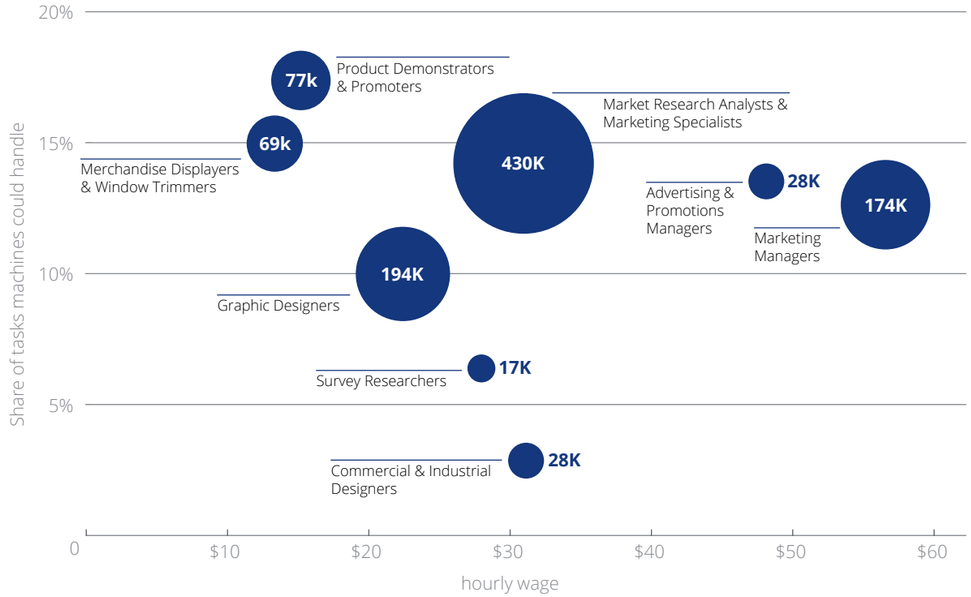
- By 2020, the robotics industry could reach a market volume of US $100 billion.
- During 2014–2024, half of the work carried out by today's US workers could be automated to some extent.
- In that period, the robotics industry may create 3 million additional jobs, especially in consumer electronics and the electric vehicle industry.
- By 2020, the rehabilitation robot market may grow 40-fold compared to 2014 due to advancements in rehab/therapy robots, exoskeletons, wearable robotics, and active prostheses.

Impact

- Automation reduces errors significantly and supports product improvements. Companies in all sectors have to decide whether to understand and adopt intelligent automation or take the risk of falling behind.
- Industry example: in the life sciences and healthcare industry, robots sterilize surgical tools without human intervention, thus incidents of infection are reduced and hospital staff resources are freed up.
- Robotic systems in pharmacies could hand out drugs with zero errors while in automated kiosk, patients are able to enter medical symptoms and receive customized recommendations.

Sources: Deloitte University 2015, Deloitte University 2015, Deloitte University 2014, Deloitte 2015, Deloitte 2015

Time spent on tasks machines could handle



Sources: Harvard Business Review 2016

Blockchain Systems

Blockchain systems use a distributed ledger technology to promote transparency, trust, and decentralized validation among members of the digital network.

Importance

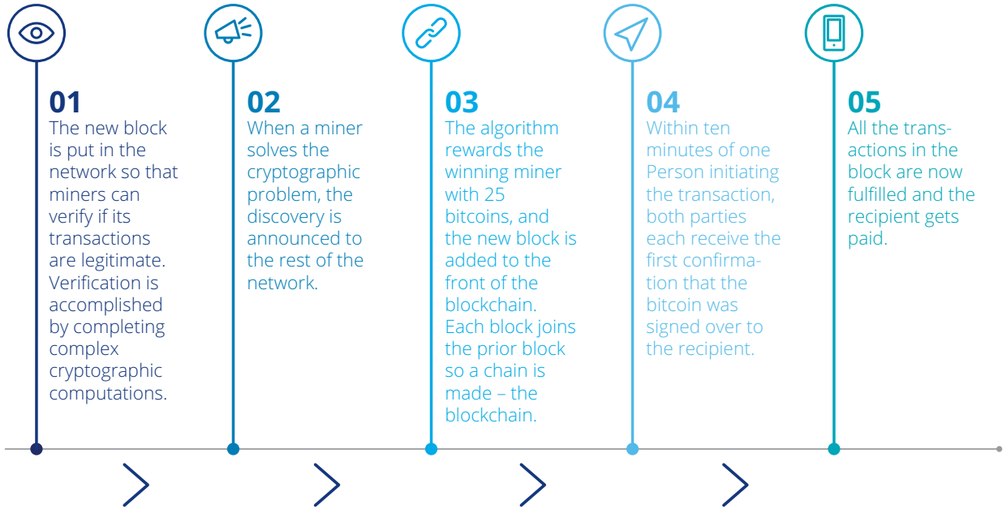
- Venture capitalists are fueling this development with the investment of approximately US $1 billion in 120 blockchain-related start-ups – half of that investment already took place in 2015.
- With the representation of more than 50 of the world's largest banks, the blockchain consortium R3 CEV is creating a distributed ledger platform to power the financial services industry's foray into blockchain.
- Linq, a blockchain-based platform and ledger system that manages the trading of shares, was rolled out by NASDAQ (MX Group Inc.) in October 2015.

Impact

- Due to their similarity to the Internet, which increased communication dramatically by reducing cost and friction to near zero, cryptocurrencies have the potential for a sharp increase in transactions.
- Analysts at one investment bank commented on this trend recently, saying that venture capital flow accelerated in 2016 and is leading to further the development of the foundational and infrastructure services necessary to create a fertile "plug and play" ecosystem for entrepreneurs and innovation. This may ultimately escalate enterprise adoption from a trickle in 2016 to a multi-year boom starting in 2017.

Sources: Deloitte University 2016

The Megatrends of Tomorrow's World | Drivers



Sources: Deloitte 2016

Climate Change

As climate change continues, natural disasters and abnormal weather patterns will increasingly have effects on our socio-economics, demographics, crop production, food security, migration, and political landscape in unprecedented ways.

Importance

- According to the UN Food and Agricultural Organization, 1.8 billion people are exposed to absolute water scarcity and more than 5.2 billion are expected to face water stress by 2025.
- By 2020, an increase of 13% in food production is needed to meet the demand of 890 million tons for 7.8 billion people.
- By 2025, water withdrawals will increase by 50% in developing countries and by 18% in developed countries. This will foster local competition for water.

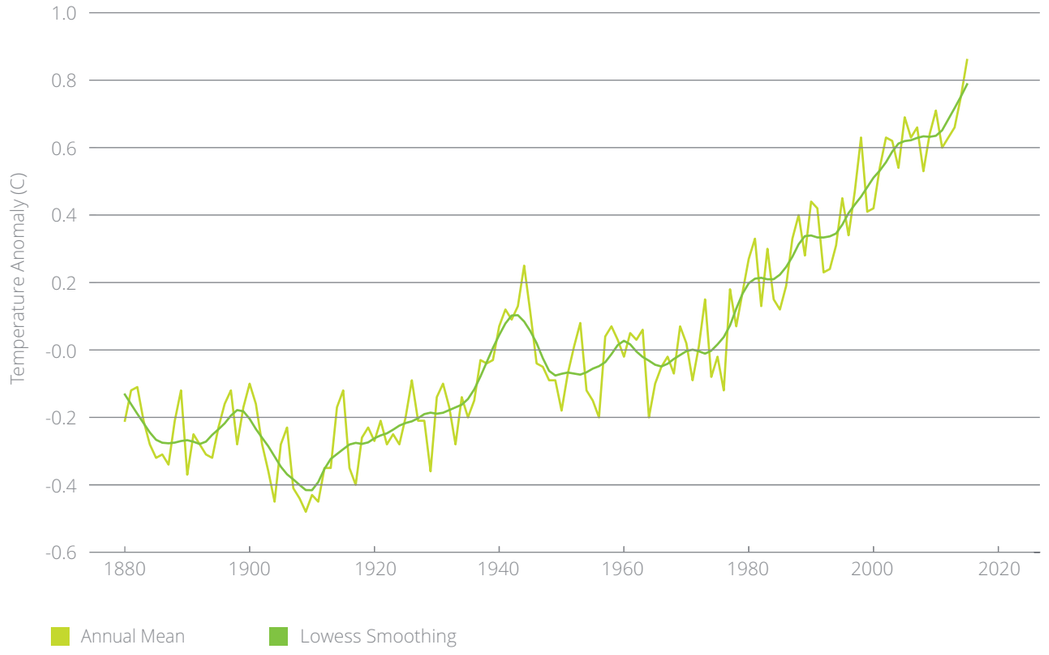
Impact

- 2016 was ranked as the warmest year since 1884 according to a study published by the NASA Goddard Institute for Space Studies (GISS). Similar findings were also published in studies by the UK Climatic Research Unit (CRU) and the US National Oceanic and Atmospheric Administration (NOAA).
- The need for innovation in food production is increasing, fueled by climate change and natural calamities.
- Aware consumers push for healthy and organic food, reduced food footprints, and sustainability. This results in food waste, recycling, and the redistribution of unused food emerging as the main concerns for burgeoning ecosystems.

Sources: Gartner 2016, The Guardian 2016, Deloitte University 2015, Deloitte University 2015

The Megatrends of Tomorrow's World | Drivers

Global Land-Ocean Temperature Index



Sources: NASA Goddard Institute for Space Studies 2015

Cloud Technology

Cloud technology allows users to access scalable technology services immediately via the Internet's existing network, promoting lower infrastructure, inventory, and overhead costs, and creating leaps in computing power and speed, data storage, and bandwidth.

Importance

- On average, small to medium-sized businesses (SMBs) that use an above-average number of cloud services grow 26% faster and are more profitable by 21% than those SMBs that use no cloud tools.
- Compared to in-house, cloud-based file storage is more cost efficient. For an enterprise, it costs US $955,000 per year to deploy and operate 100TB of file sharing space, but only US $141,180 per year to use Amazon S3.
- In a survey carried out by Deloitte, 55% of SMBs used cloud technology in some aspect of their business, seeking one or more of the six types of benefit which are scalability, flexibility, cost, innovation, maintenance, and security.
- 95% of IT professionals surveyed in 2016 are making use of cloud technology.

Impact

- With cloud computing and scalable computing power delivered as a service using a pay-by-use model, retailers, for example, are able to meet hurried, on-the-go, and digitally connected consumers during various phases of their shopping experience.
- The emergence of cloud technologies is enabling new and innovative customer-facing services and products. For example, 77% of retailers deployed or piloted cloud computing to enable them-selves to provide:
  - Seamless retailing
  - Single view of consumer
  - Real time personalization and cross-channel visibility

Sources: Deloitte 2014, RightScale 2016

The Megatrends of Tomorrow's World | Drivers

Benefits of using Cloud Technology

Scalability	• Ability to rapidly scale capacity up and down • Standardization across locations (including globally)
Flexibility	• Frees up resources for other capabilities • Enables mobility – employees can work in any location • Improves collaboration and sharing
Cost	• No up-front investment in technology (hardware, software) • SMBs can get economies of scale benefits • Access to technical expertise without paying for full time staff
Innovation	• Ability to test and trial new products • Upgrades/new products immediately feasible
Maintenance	• Lower maintenance requirements • Deploying and integrating technologies (including using APIs) is typically simpler
Security	• Software is updated automatically to fix bugs • Disaster recovery – content is stored remotely • Data is not held on transportable hardware

Sources: Deloitte 2014

Competition for Talent

The mismatch in skills available and capabilities needed in the workforce given today's technologically-focused world has resulted in fierce competition for talent.

Importance

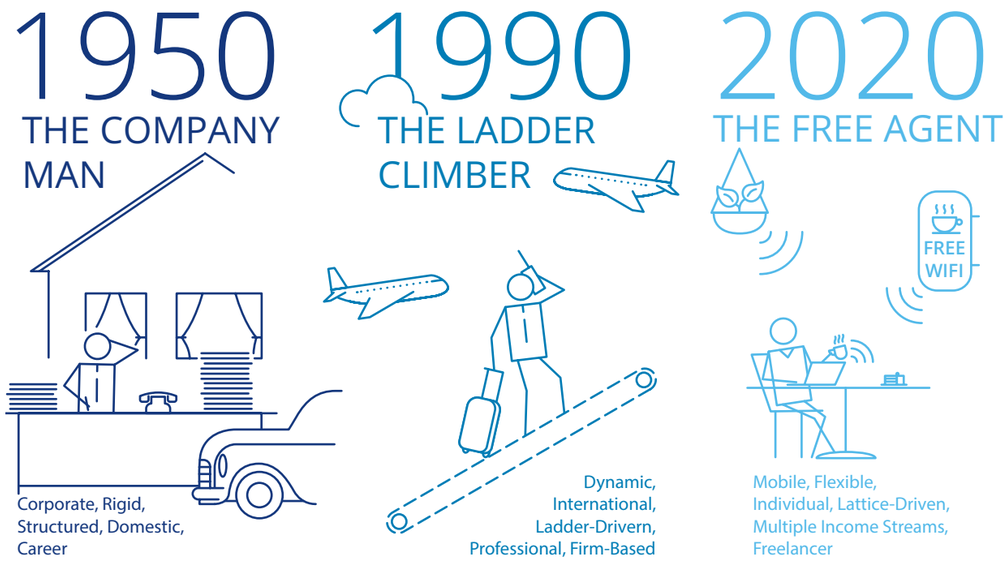
- According to an EIU survey, more than 60% of respondents answered that "talent shortages are likely to affect their bottom line in the next five years" – especially in the highly-skilled talent pool.
- 54% of employers state that they are unable to find qualified applicants for open positions.
- Next to demographic change, competition or the war for talent was ranked as the second most important factor for recruiting.
- Since global demand for skilled workers is increasing and the creative class is becoming more selective, virtual mobility, reverse transfers, and short assignments are part of new global mobility forms.
- By 2017, 58% of firms expect to hire more part-time, temporary, or contract employees.

Impact

- Personal identities are shaped through terms like "global citizen" and "global community" since innovators travel to distant shores to solve problems.
- Individuals must deal with much greater professional flexibility. Highly-skilled generalists who have graduated from the nation's top universities need to adapt very quickly to changing markets with specialized skillsets.

Sources: Deloitte 2016, US Chamber of Commerce 2014, Monster.de 2015

The changing composition of the corporate worker



Sources: Deloitte University 2012

Concentration of Wealth

As global wealth inequities grow, the divide between the rich and the poor gets greater, coupled with stagnating middle class incomes and the rise of the luxury consumer.

Importance

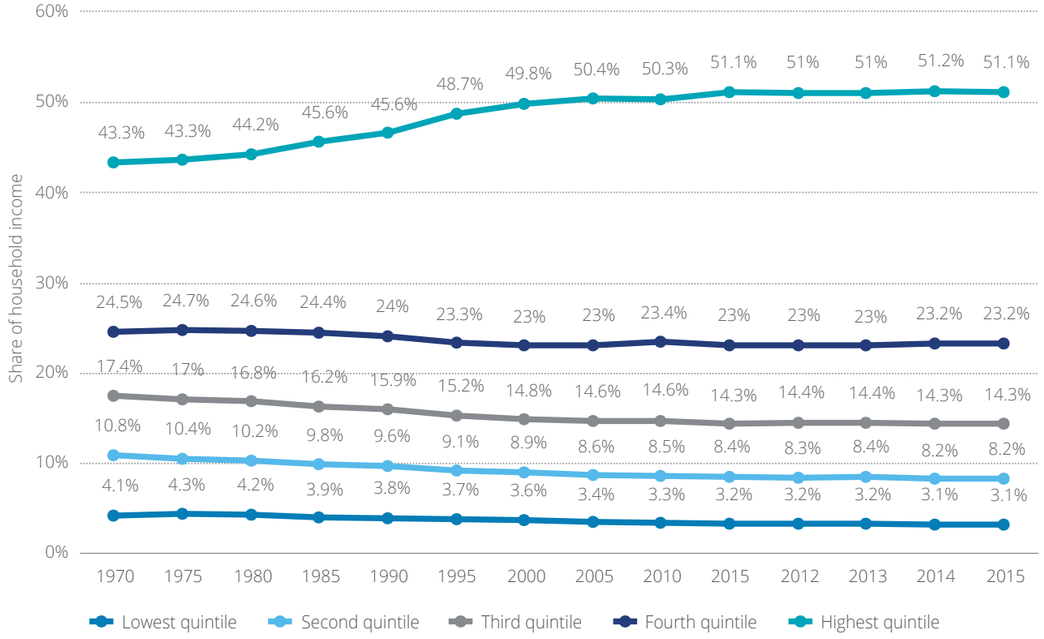
- In 2016, more than 3.5 billion adults worldwide had wealth of less than US $10,000, while the wealthiest 0.7% held 46% of the world's wealth.
- In 2015, more than 51% of the household income of private households in the US was earned by the top 20%. In the same year, only 3.1% of household income was earned by the lowest-earning 20% of households.
- Factors including the aging population, rising unemployment, and skill gaps in developing countries foster global income inequality.
- Trends suggest the upper class will be able to spend more while the rest of the population may be seriously constrained about home values.

Impact

- The ever-increasing income gap implies that companies will target the upper class and the less wealthy population through distinct strategies.
- While the differentiation approach will entail focusing on branding, customer experience, lifestyles, and consumer aspirations, the cost leadership approach will mostly concentrate on low prices and a strong sense of value. The market in-between is expected to disappear increasingly.
- Stagnation of incomes and the limited ability to take on debt will lead to slower growing consumer spending in the next decade.

Sources: Deloitte University 2015, Credit Suisse 2016, Deloitte University 2011

Shares of household income of quintiles in the United States from 1970 to 2015



Sources: US Census Bureau, Statista 2016

Crowdsourcing

As consumers are increasingly interconnected through social media platforms and with the rise of digitalization, collective intelligence gathering is being leveraged to elicit perspectives and insights from a wide variety of individuals.

Importance

- To identify 2,880 suspects during the riots in 2011, the London Metropolitan Police used a crowdsourcing smartphone application.
- An open-source talent acquisition via crowdsourcing is a spreading alternative staffing model – growing in scale, sophistication, and importance.
- Leading Fast Moving Consumer Goods (FMCG) enterprises increased their usage of crowdsourcing by 27% in 2015 compared to 2014.
- The world's most valuable global brands increased their crowdsourcing of creativity over 30% from 2014 to 2015.

Impact

- The current, linear product development and innovation process from an initial idea to an item available on retail shelves can take years for large companies.
- The start-up Quirky is challenging current wisdom by crowdsourcing the development process, shortening the invention timeline from years to weeks.
- A future organization's distributed workforce strategy will contain a crowdsourced labor pool as a legitimate component.

Sources: Deloitte University 2015, Forbes 2015, Deloitte University 2014, eYeka 2016

The Megatrends of Tomorrow's World | Drivers

A sampling of crowdsourcing platforms

Gigwalk
A mobile, flexible workforce for job in the field
Founded 2011

oDesk
A tool for hiring and managing remote freelancers
Founded 2005

Kaggle
Competitions for predictive modeling and analytics
Founded 2010

Tongal
Collaborative contests for video production
Founded 2008

Quirky
A product design incubator and marketplace
Founded 2009

Kickstarter
A global funding platform for creative projects
Founded 2009

User Numbers of contributors in the community

Sources: Deloitte University 2014

Data Monetization

Consumers increasingly collect, track, barter, or sell their personal data for savings, convenience, or customization; companies increasingly value sources of data direct from the consumer as a way of gaining a competitive advantage (e.g., Facebook, Uber).

Importance

- Before companies start to monetize their data, they have to assess whether they have the legal, statutory, and/or ethical right to market consumer data – and move no further without the proper rights and protections in place.
- In the near future, there will be three major trends:
  - Consolidation within the data economy
  - Further expansion into different ecosystems
  - A shift to customized fulfillment models in response to greater customer centricity

Impact

- An increased mobile penetration in the emerging countries of Asia and Africa fosters further growth of the demand for mobile data services and increases the potential for data monetization.
- Researchers believe that more than 80% of consumers will barter, track, or sell their private data for savings, customization, or convenience in the year 2020.

Sources: Global Information 2015, Deloitte 2015, Forbes 2016

The Megatrends of Tomorrow's World | Drivers

8 Data Monetization Opportunities

Digital advertising:
Right content, right audience, right time

Financial services:
Cross and upsell & detect fraud

Managing traffic:
Alleviate congestion, optimize delivery routes

Optimized billboard ads:
Understand the traffic, tailor the message

Public transportation:
Passenger satisfaction, operational efficiency, revenue opportunities

Retail:
Optimize store placements and staffing, monitor competitors

Entertainment and events:
Manage traffic, target promotions

IoT:
Add value – location data and more

Sources: TM Forum 2016

Demand for Customization

Control is shifting away from the manufacturer, giving the consumer a greater say in what, when, and how they receive their goods and services (e.g., customized goods, precision medicine) due to the interaction between Web 2.0 and advanced manufacturing trends.

Importance

- The healthcare sector is increasingly making use of so-called bioinformatics, with numbers growing exponentially. With the help of such analytics, which support sequencing genomes and body composition, medical treatment can be customized for each patient specifically.
- Due to the rise of 3D printing, consumer goods can be personalized more easily and mass customization of consumer goods is being introduced by an increasing number of companies who offer "print at home" options to their customers (e.g., 3D printed toys, shoes, cosmetics, and food products).
- Retailers collect and analyze big data to adapt product offerings to their customers' preferences. Amazon is only one outstanding example, building a large part of its success on this approach.

Impact

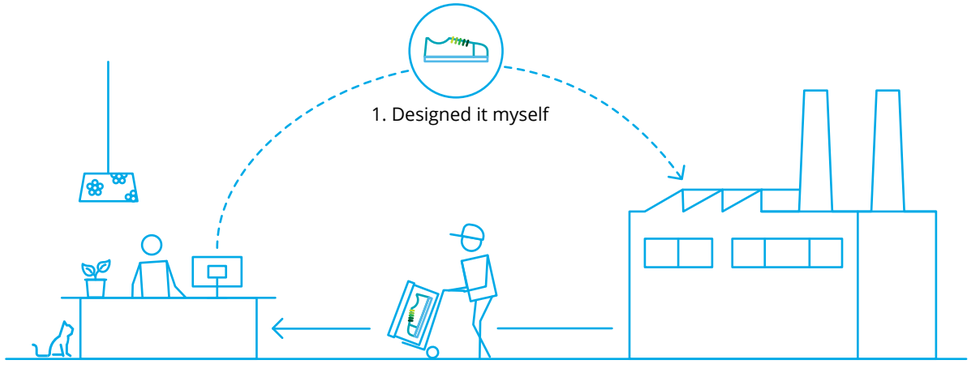
- By offering customized products to customers, companies can increase sales online as well as in-store. Therefore, brands are increasingly engaging with customization:
  - Pepperidge Farm allows its customers to decide on the shape of their Goldfish crackers
  - Jawbone offers its customers the ability to create their own speakers
  - Trek customers can build their own bike from scratch
  - Men can design their own suits at Brooks Brothers
- Through customization, companies can gain a competitive advantage over their competitors as they receive insights from customized designs. This creates a virtuous feedback loop which may help them to adapt small aspects of their business and differentiate their products for consumers.

Sources: Deloitte University 2015, Deloitte University 2015, Forbes 2013

The Megatrends of Tomorrow's World | Drivers

Mass customization interjects buyer participation into product design

Mass customization allows customers to participate meaningfully in the design of products they will buy.



Sources: Forrester Research 2011

Digitization

The proliferation of new mobile technologies, the rise of the Internet of Things, reliance on sensor and wearable technologies, and increased reliance on digital interaction has shifted the world from an analog to a digital one.

Importance

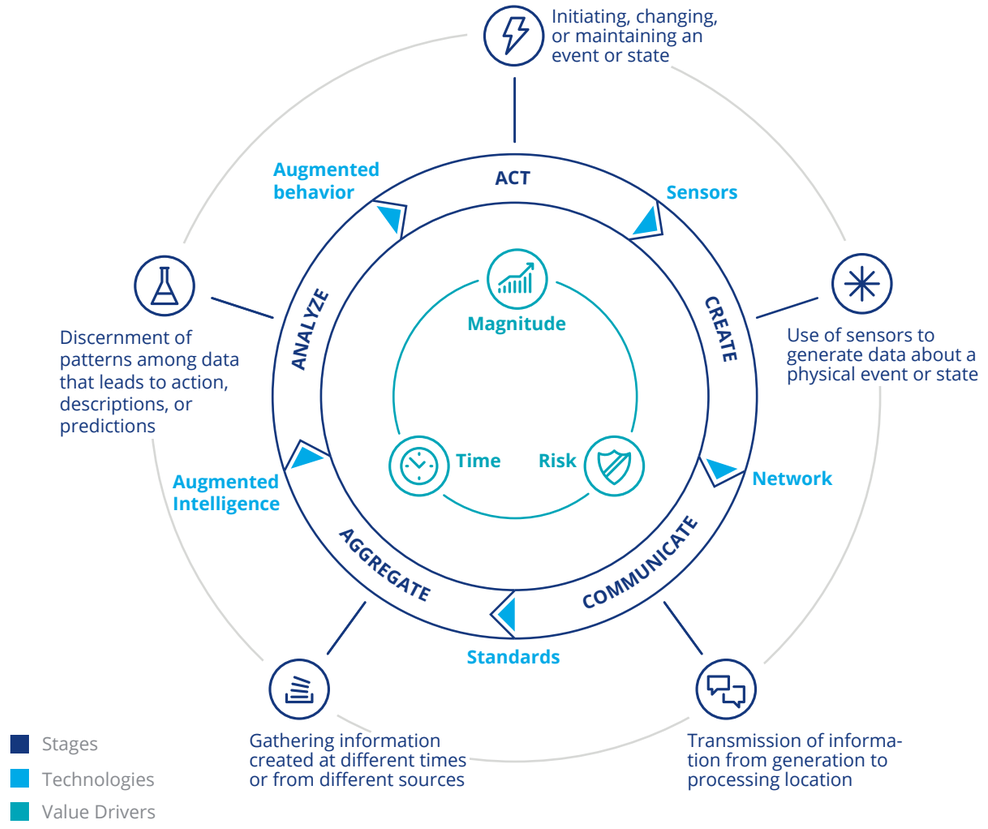
- It is predicted that about 30 billion devices with unique IP addresses will be connected to the Internet by 2020.
- In 2019, the market of devices that are connected to the so-called "Internet of Things" (IoT) is expected to be twice as big as the market for computers, smartphones, tablets, connected cars, and wearables combined.
- Examples from different industries show how applications with sensors and wireless communication can be used to track the location and condition of high-value equipment such as construction and mining machinery, or vending machines and ATMs. In addition, digital applications can support the management and control of commercial trucking fleets, electric power distribution networks, and manufacturing operations and processes.

Impact

- By 2020, the economic impact of the "Internet of Everything" could account for more than US $14 trillion.
- The IoT can lead to the emergence of new organizations and services. One example is the automotive industry: through the introduction of telematics services, car manufacturers that had formerly concentrated on manufacturing goods are now offering subscription-based services, turning them into service providers.
- According to Gartner, in 2016, companies will have invested around US $5 billion on consulting support and implementation services that deal with cellular machine-to-machine (M2M) communications. Industries such as manufacturing, transportation, utilities, healthcare, retail, banking, and also the government are expected to have invested the most.

Sources: Deloitte University 2015, Deloitte University 2013

The Information Value Loop



Sources: Deloitte University 2015

Do-It-Yourself (DIY) Movement

Driven by the ubiquitous adoption of the Internet and smartphones, individuals are increasingly engaging with the digital world to make purchasing decisions and perform tasks without professional assistance.

Importance

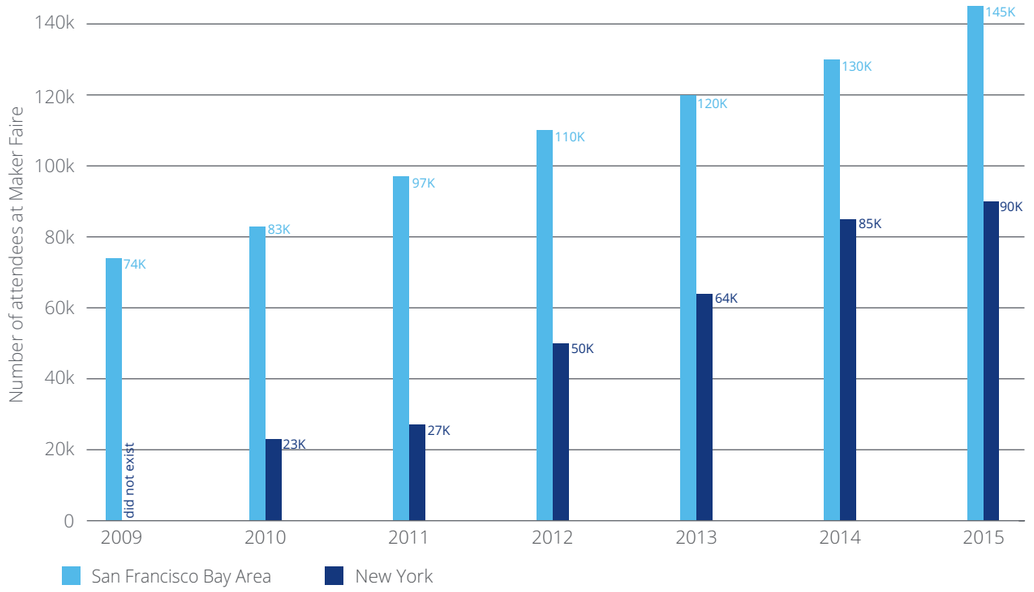
- In 2016, there were more than 191 Maker Faires worldwide in 38 countries with 1.4 million attendees and flagship events in the Bay Area, New York, or Chicago alone attracted more than 260,000 visitors.
- By launching a program called Live Customs, the shoe brand TOMS which is highly popular amongst millennials, lets its customers design their own pair of shoes.
- According to estimates by Make Media, the market for DIY products and components that is used by makers had a turnover of more than US $1 billion in 2015.
- Every day, around 1,600 people sign up for the online platform Craftsy which has provided DIY tutorials to its users since 2012. By January 2013, Craftsy already had 840,000 enrollments and currently has approximately 6.7 million registered members.

Impact

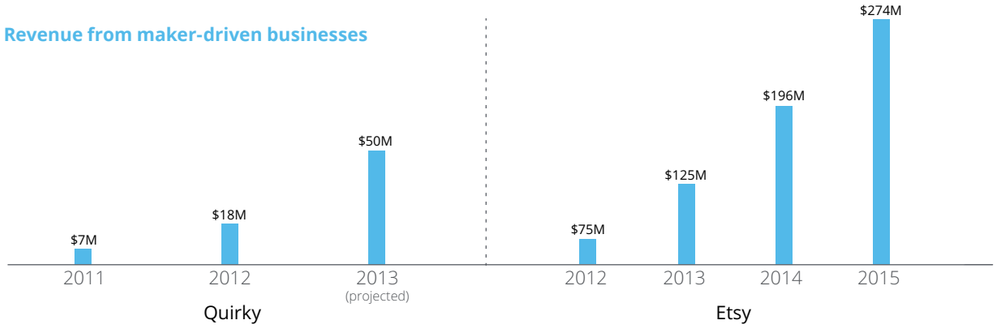
- As customers increasingly look for possibilities to buy customized products and create products of their own, niche markets will proliferate. These offer consumers the opportunity to create their own products according to their needs.
- Manufacturers who concentrate solely on mass production with little variety must rethink their business model and their place in the production landscape, as the demand for customization increases and consumers turn to smaller or more personalized producers.

Sources: Deloitte University 2015, Deloitte University 2014, The Denver Post 2016, Maker Faire 2017

Maker movement overview and drivers



Revenue from maker-driven businesses



Sources: Deloitte University 2015, Statista 2016

Empowered Women

Women are making significant inroads into top leadership positions across the public and private sectors, as well as emerging as an important economic sub-group in developing countries who can serve as an engine for growth.

Importance

- Between 2003 and 2016, the global share of women in national parliaments rose from 15% to 23%.
- Women's Empowerment Principles (WEPs) have already been rolled out in various enterprises worldwide, hence more than 1,368 business leaders are demonstrating leadership on gender equality, based on these principles.
- According to the World Economic Forum, there is a strong correlation between countries that are successfully closing the gender gap and their economic competitiveness. Thus companies with a high percentage of female employees, particularly in board positions, perform better than competitors.
- By narrowing the gender gap in employment, the global income per person will increase by at least 20% by 2030.

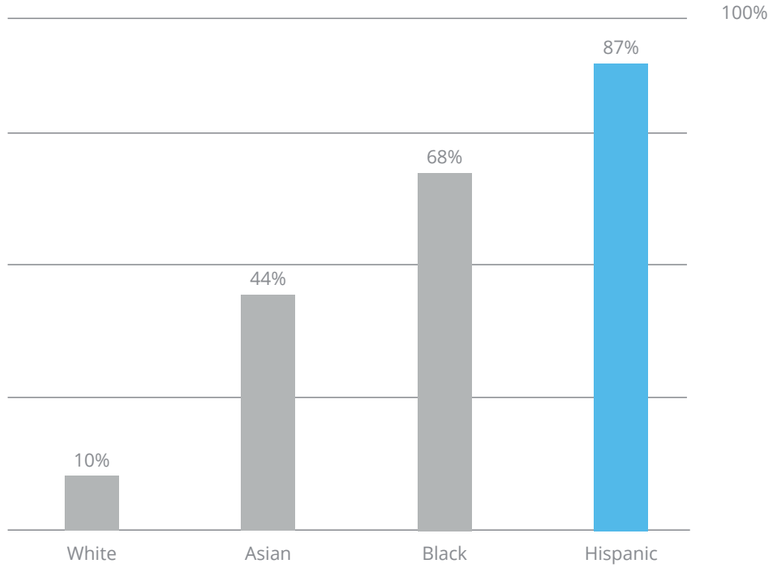
Impact

- The number of enterprises that have discovered women as powerful yet overlooked consumers with specific needs regarding products and services is increasing exponentially.
- While emerging markets such as China and India, with growing technology and engineering industries, are expecting a faster elimination of gender inequality in the STEM sectors, markets with aging populations are seeing an increase in male employees in traditionally female-dominated caring professions.

Sources: Deloitte University 2014, The Wall Street Journal 2015, The Wall Street Journal 2015, The Economist 2013, Inter-Parliamentary Union 2016

The Megatrends of Tomorrow's World | Drivers

Increase in Women-Owned Business between 2007 and 2017 in the US clustered by race



Sources: CNN 2015

Environmental Awareness

The influence of social activism has continued to rise as consumers have become more empowered, demanding environmentally sustainable products, increased corporate social responsibility efforts, and other commitments to society.

Importance

- According to a survey in 2016, 63% of all consumers are positive influencers and encourage others to buy from environmentally and socially responsible companies.
- 65% of consumers can be classified as responsible consumers and are willing to pay extra for products produced in a environmentally and socially responsible way.
- Independently of whether it is based on obligation or desire, more than 2 billion aspirational consumers prefer sustainable consumption.
- In China, about 60% of the population require the prioritizing of environmental protection when fostering economic growth.

Impact

- Not only "green" buildings as seen in the first decade of the 21st century, but entirely "green" cities will become the norm and will reshape the construction industry. They are not only sustainable, but resilient. Zero-energy home building, rooftop farming, and permeable pavements are just a few of the advances.
- In addition to sustainability, cities will be "smart", increasingly using sensors and wireless networks.
- By 2020, a sustainable marketplace with new industry leaders will have been established. This development is driven by consumers with knowledge of corporate practices and an interest in environmentally sustainable products. These consumers will likely buy products only from companies with a "green" reputation.

Sources: Deloitte University 2015, Deloitte University 2015, Deloitte University 2015, BBMG 2016

Sources: Deloitte University 2015

Focus on Transparency

Expectations of government transparency are growing while personal data is becoming more ubiquitous, creating new implications for privacy, cybersecurity, and accountability.

Importance

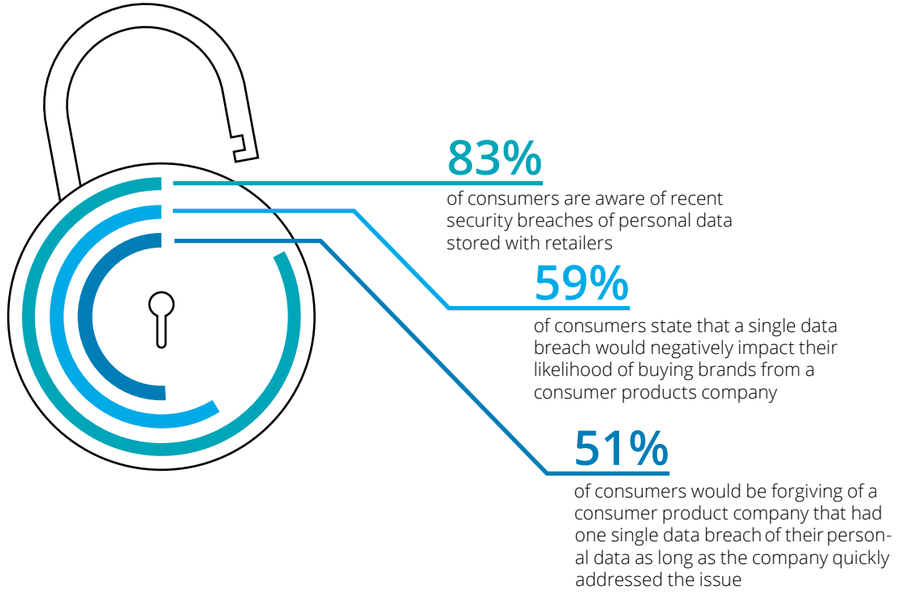
- A recent survey interviewing more than 1,000 business journalists from over 35 countries found that more than 90% of journalists source news from social media.
- Citizens eager to expose government and corporate secrets have given millions of documents to WikiLeaks.

Impact

- Citizen innovators have been encouraged by the production and use of troves of data to transform open data into solutions and applications.
- Today's progressive HR departments particularly value the treasure trove of data available through outside sources such as social networks. It can help monitor and build employment brand, identify and recruit valuable talent, enhance the understanding of compensation strategies, recognize flight risk, and monitor employee satisfaction and their engagement.

Sources: Deloitte University 2015, Deloitte University 2015, Deloitte University 2011, Deloitte University 2015, Deloitte University 2015, Deloitte University 2015

Consumer opinion on data privacy



Sources: Deloitte University 2014

Geospatial Technology

The process of gathering and analyzing geographical data to understand the locational patterns of a subject has become prevalent.

Importance

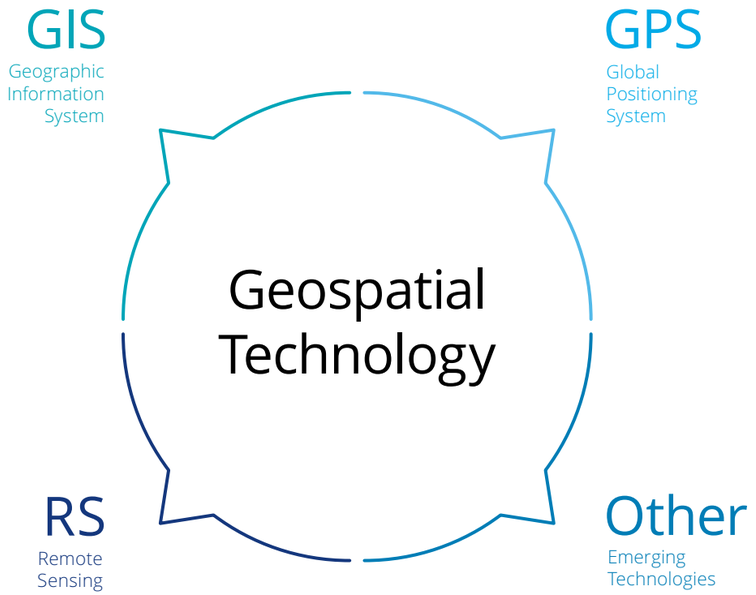
- The Geographic Information System (GIS) market is being disrupted by innovations that focus on consumers as these commoditize geospatial data.
- Oxera, an economic consultancy company, suggests in its recent study that the value of the geo-services industry ranges between US $150 and US $270 billion per year, while accounting for about US $90 billion in wages.
- Half of new investment in geospatial applications had been devoted to consumer-focused technologies by 2016, displacing the revenues of firms that provide traditional GIS solutions.
- Companies analyze social data to map location-specific trends based on consumer behavior patterns while consumers demand geospatial data for mobile technologies.

Impact

- The ways in which locational data is collected, analyzed, and stored is critical for achieving sustainable advantages when the concept of "liquid data" comes into play.
- It is important for firms to know to what extent geospatial data services which are cloud-based and also crowdsourced through mobile applications can contribute to enhanced performance.
- Geospatial data which is available for each project or initiative implemented by international development organizations or institutions such as the World Bank can depict the actual impact of these projects and initiatives within the context of urbanization, public health, land use, and climate change. The data will especially support further resilience with respect to climate change.

Sources: Gartner 2012, The World Bank 2016, Deloitte 2012

The Megatrends of Tomorrow's World | Drivers



Sources: Deloitte 2012

Globalization

The liberalization of global economic policy has opened borders, supply chains, and trade patterns, creating impacts in one country or region that affect or cascade to others, based on market activity.

Importance

- Reduced poverty, increased development, and economic growth have been shown to result from a country's integration into the world economy. Annual world trade growth has averaged 6% over the past 20 years and is thus growing twice as fast as world output.
- Nowadays, flows of data across countries are 45 times higher compared to one decade ago and have a higher impact on the economy than flows of manufactured goods.
- By using e-commerce platforms such as Amazon, Alibaba, or eBay, millions of small companies are now able to export goods globally.

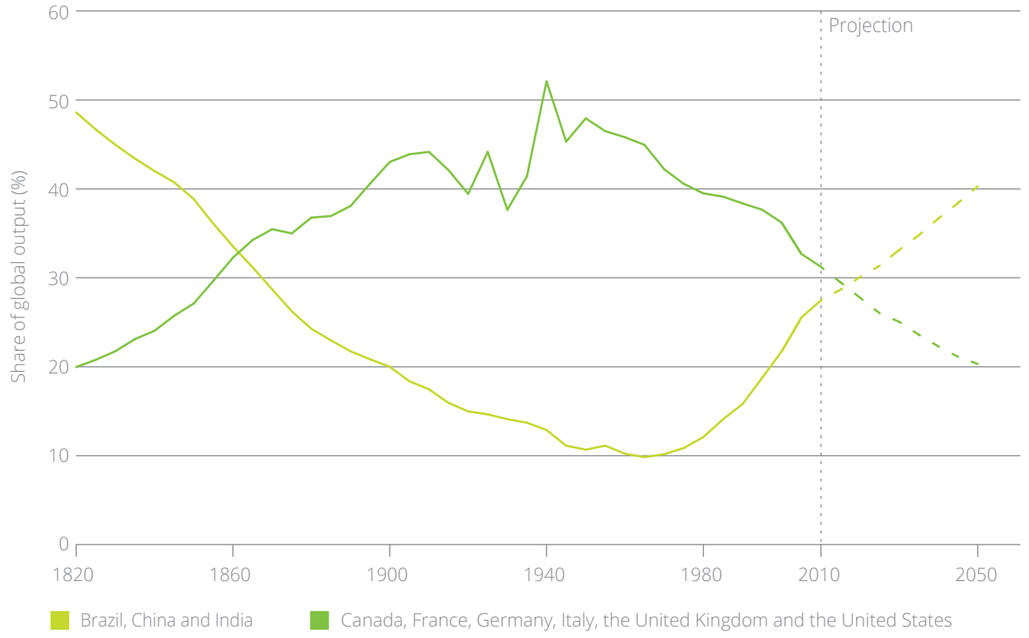
Impact

- People who are employed in shrinking industries will presumably need to learn new skills in order to find occupations in different industries, and may have to move from home with their families to find new job opportunities.
- Due to globalization, economies throughout the world have become more competitive and interdependent regarding trade in goods and services and also capital flows.
- Major research universities should focus on attracting the best talents in order to stay competitive and should thus be seeking international partners.

Sources: Brookings Institution 2016, Deloitte University 2014, Forbes 2010

The Megatrends of Tomorrow's World | Drivers

Brazil, China and India combined are projected to account for 40 percent of global output by 2050, up from 10 percent in 1950



Note: Output is measured in 1990 purchasing power parity dollars.

Sources: UNDP 2014

Industry Consolidation

After a minor decline in 2016, merger and acquisition activity – particularly across borders – is expected to increase, especially with the return of private equity buyers to the transaction market.

Importance

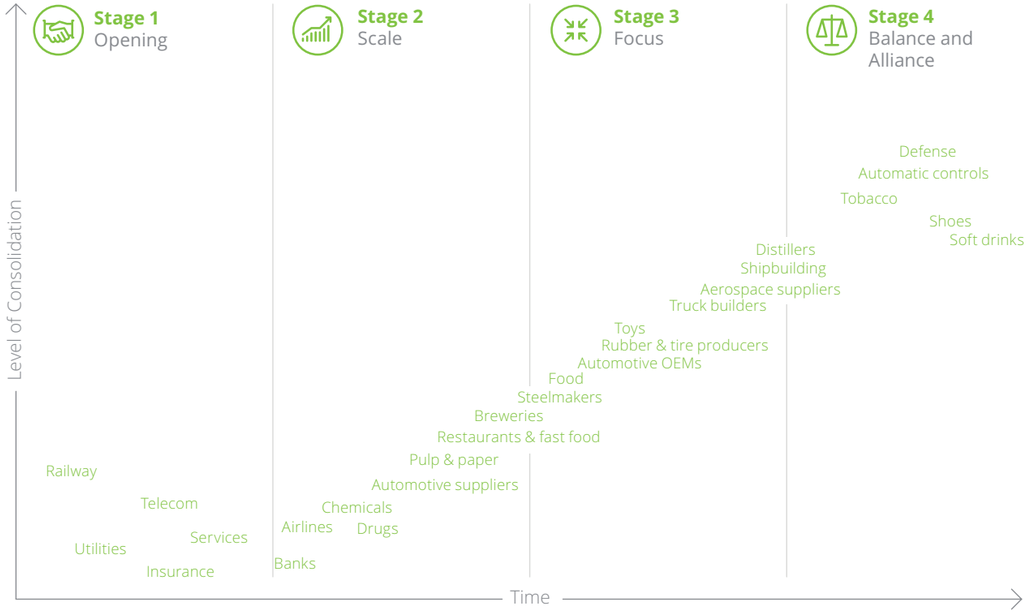
- Diversifying sources of supply across different countries (35%), re-shoring production to domestic vendors (33%), and consolidating vendors (28%) represent the top three strategies applied by retailers nowadays.
- Due to the strong last quarter in 2016 and poor organic growth prospects, experts believe the M&A boom will carry on in 2017. In particular, a flow of capital from Asia to Europe and from Europe to the USA is expected.
- The travel industry, which accounts for US $7.6 trillion, faces a small upward trend in consolidations as well.

Impact

- The order situation for aerospace suppliers is as high as never before, because manufacturers are speeding up their production in response to the increased demand for commercial airplanes.
- Gartner predicts that one fourth of the top 100 providers of IT infrastructure will disappear within the next two years.

Sources: The Wall Street Journal 2015, The Wall Street Journal 2012, Financial Times 2016

Stage of consolidation by industry



Sources: Harvard Business Review 2002

Internet of Things

The ecosystem of electronic devices connected to the Internet that can be accessed remotely continues to grow (e.g., sensor technology, wearable technologies, connected vehicles).

Importance

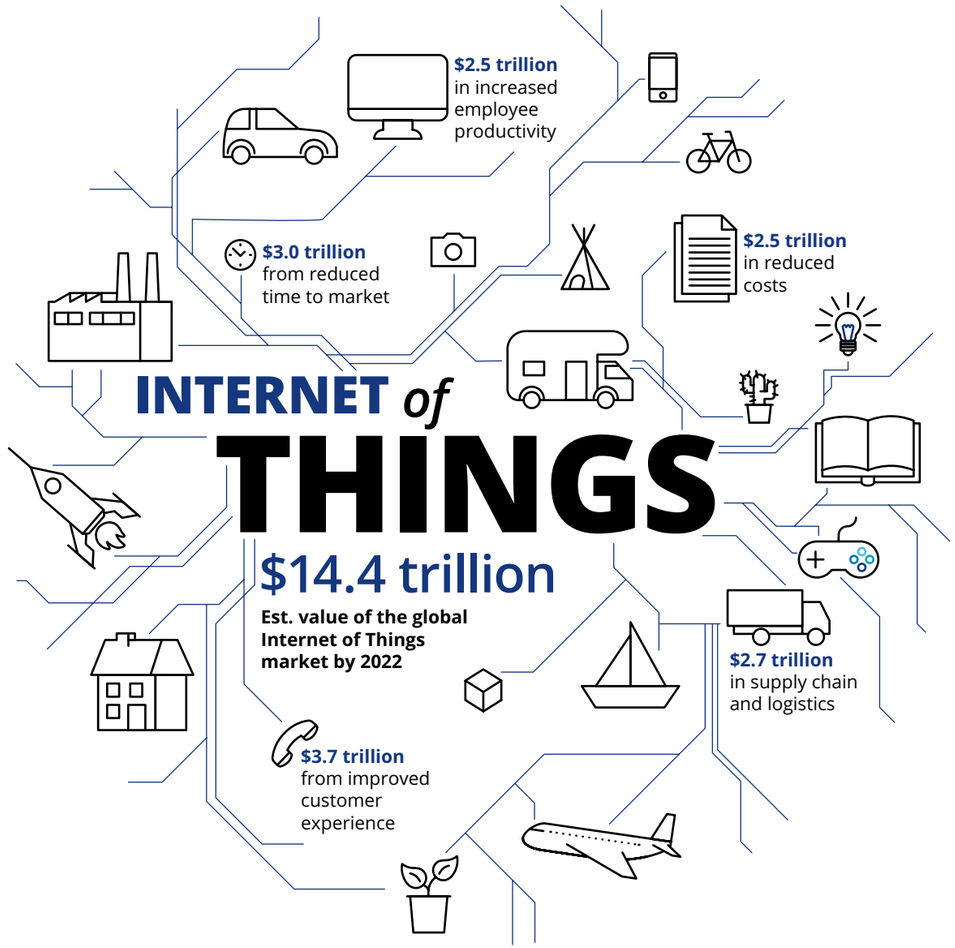
- In 2016, global spending on security for the Internet of Things (IoT) accounted for US $348 million, according to a prediction by Gartner. This would represent an increase of 23.7% compared to spending of US $281.5 million in 2015.
- According to Gartner, the number of connected things in use globally will, at 6.4 billion, represent an increase of 30% compared to 2015. By 2020, the number is expected to increase to 20.8 billion overall.
- It is thought that 5.5 million things have been connected every day in 2016.
- Gartner predicts that IoT-related services spending will be up by 22% (US $235 billion) in 2016 compared to 2015.

Impact

- The Internet of Things is increasingly considered as "purposefully bounded for deliberate intent and outcomes" by companies. They see the IoT as being focused on particular business processes, functions, and domains.
- Many companies, ranging from small- through medium-sized to large companies, design software and develop online services that coordinate smart devices to leverage the IoT.
- The large amount of data emerging from IoT applications will be one of the biggest benefits of this new trend, according to industry executives. In particular, the data can be used to gain more insights into products' use and operations which can result in enhanced product design.

Sources: Gartner 2016, Deloitte 2016, The Wall Street Journal 2015

The Megatrends of Tomorrow's World | Drivers



Sources: Deloitte 2016

Knowledge Worker

Intellectual capital has risen in value compared to physical labor and financial capital, placing a premium on the creation, acquisition, management, and application of knowledge to gain a competitive advantage.

Importance

- As a result of the rapid increase in information and communication technologies (ICT), knowledge is nowadays generated and disseminated in quantities that have never been achieved before.
- Since the 1980s, knowledge-intensive occupations have led to approximately 2 million new jobs every year, even though an increasing number of jobs are affected by the rise of automation.
- Telecommunications, finance, insurance, business services, health, and education represent examples of knowledge-intensive industries.

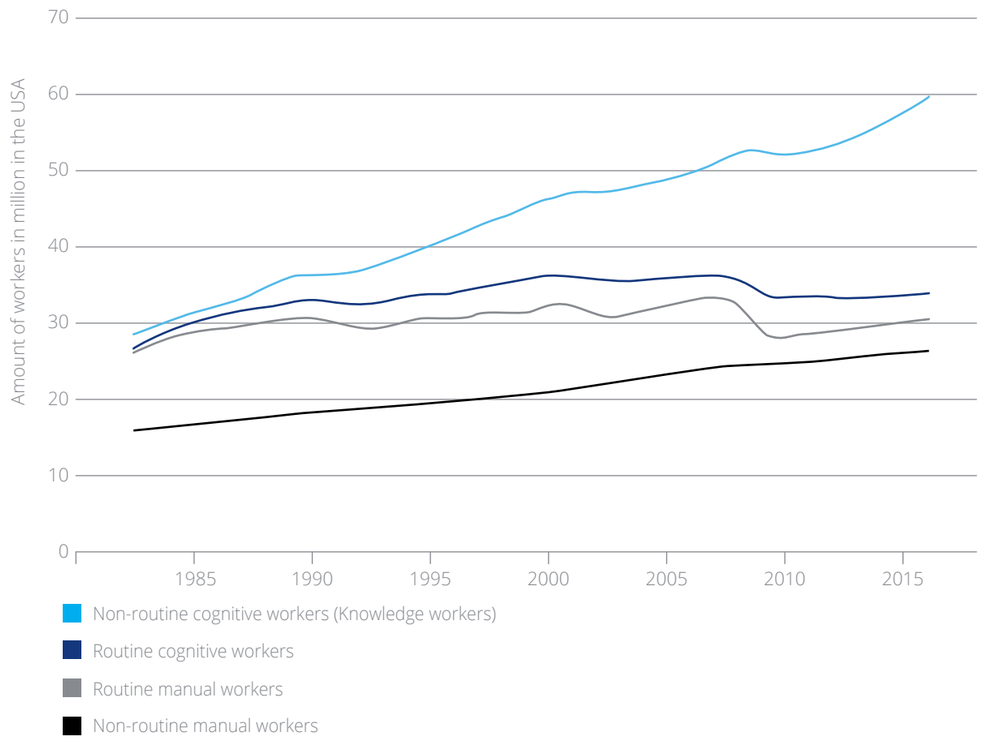
Impact

- While the rise of automation reduces the number of jobs that require little know-how or critical thinking, firms should be seeking novel ways of attracting highly skilled people and retaining them in the company in the long term.
- Different business models are necessary to attract and retain skillful personnel. Google's 80/20 Program was once considered a pioneer in introducing the concept of passion projects at work; now several organizations have introduced programs to promote creative thinking and employee autonomy.
- As knowledge-intensive jobs increase in importance, companies' employment costs for these positions rise accordingly. Companies should thus focus on enhanced productivity in order to achieve positive returns.

Sources: The Wall Street Journal 2016, Financial Times 2011, Harvard Business Review 2006

The Rise of Knowledge Worker

Workers are classified by whether their occupation is primarily cognitive or manual work, and whether or not the tasks are routine. Knowledge work is non-routine cognitive work.



Sources: Federal Reserve Bank of St. Louis 2016

Mass Migration

Immigration, border migration, demographic changes, and increases in the number of refugees are causing massive demographic shifts, affecting cultural assimilation, integration, and economic development.

Importance

- Overall, 200 million people could be displaced due to climate change by 2050.
- Nowadays, a total number of 60 million people are displaced or have fled their countries, representing the highest number ever recorded.
- According to the United Nations High Commissioner for Refugees (UNHCR), the global number of refugees was 16.1 million at the end of 2015. This represents the highest level in the past two decades and an increase of approx. 1.7 million compared to one year ago. The total number has constantly increased over the past four years by more than 50% (from 10.4 million in 2011). Most of the refugees in 2015 (more than 50%) came from Syria, followed by Afghanistan, Burundi, and South Sudan.

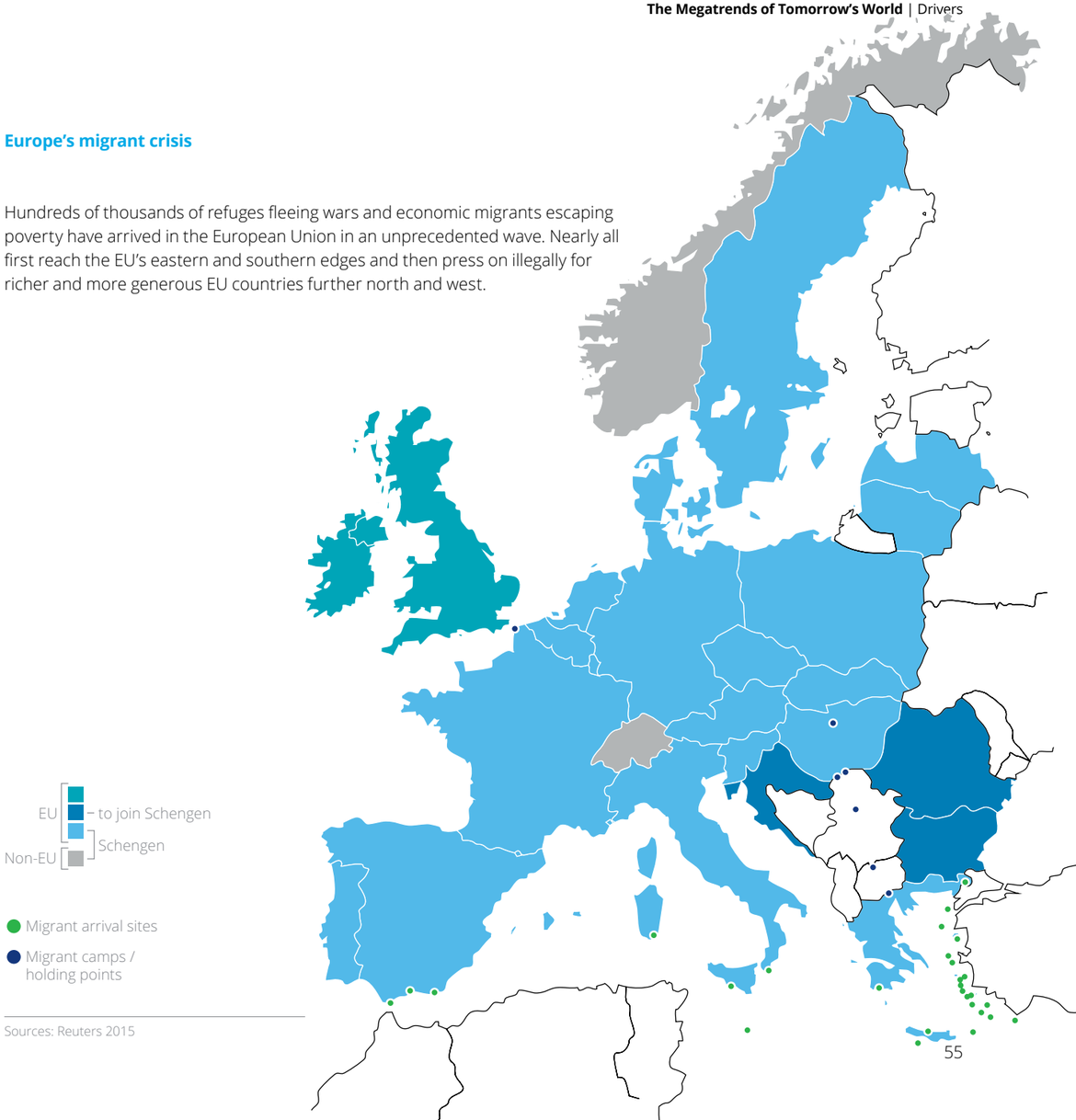
Impact

- Regulatory and societal structures as well as politics are challenged by mass immigration, which is also likely to increase conflicts between states. A prominent example for this are the diplomatic tensions which followed the travel ban by the Trump administration in January 2017.
- The rising number of immigrants also led to the breakup of local labor and company monopolies.
- New perspectives and contradictory attitudes are disrupting some production techniques.
- According to the World Bank, evidence suggests that immigrants will contribute more in taxes through their hard work than they will consume in social services.

Sources: The Guardian 2016, Eurostat 2016, Financial Times 2016, Forbes 2015, BBC 2013, The New York Times 2017, UNHCR 2016

Europe's migrant crisis

Hundreds of thousands of refuges fleeing wars and economic migrants escaping poverty have arrived in the European Union in an unprecedented wave. Nearly all first reach the EU's eastern and southern edges and then press on illegally for richer and more generous EU countries further north and west.



Sources: Reuters 2015

Next-Gen Workforce

The retirement of baby boomers and the growth in the millennial workforce requires organizations to create new incentives to attract, develop, and retain a more competitive and flexible labor pool.

Importance

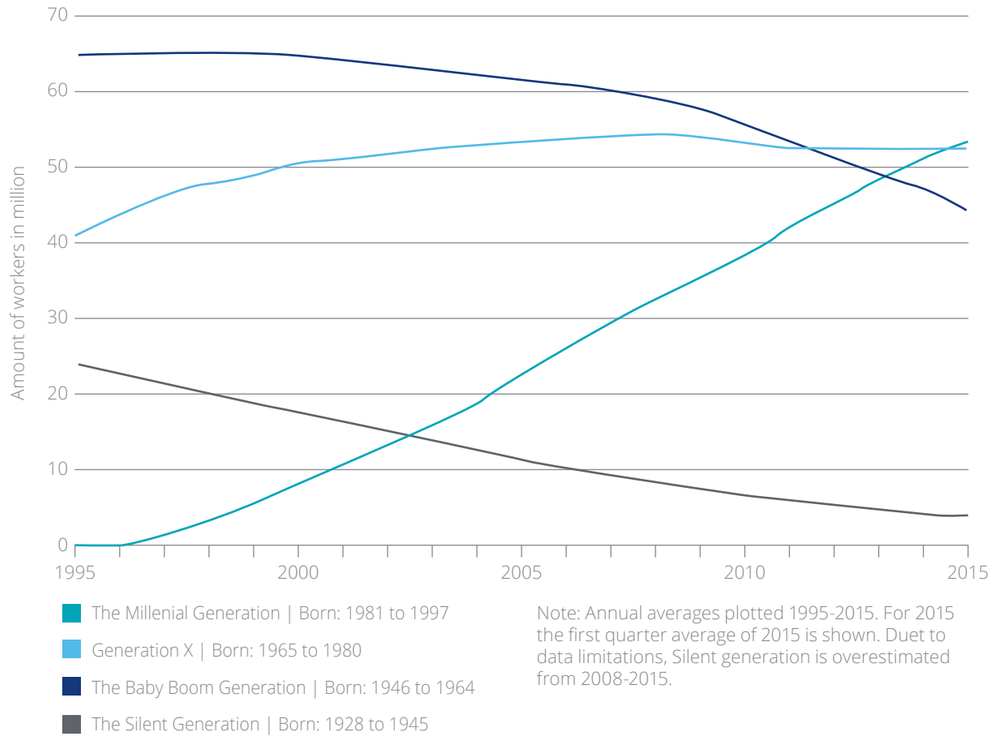
- A report by the Kauffman Foundation revealed that the proportion of people starting their own business between the ages of 20 and 34 dropped to 23%, whereas in 1996, new entrepreneurs aged from 20 to 34 years accounted for 35% of startups.
- The workforce in 2025 will likely consist of two-thirds millennials relative to the current proportions.
- According to consultants, people who were born between 1946 and 1964 (the so-called Baby Boomers) act rather competitively and are convinced that employees need to pay their dues.

Impact

- According to Baby Boomers, successful careers require long workinghours and a 60-hour work week is considered as a prerequisite for success. Unlike them, a large number of millennials prefer a greater balance between work and private life. They demand less overall working hours, occasional overtime, and weekends without work.
- Some researchers and industry analysts suggest that non-secure consumer technology has been introduced by Gen Y, that wikis and social networks must be further adapted to hire graduates, and that the email medium may diminish as the younger generation would not use it.

Sources: Deloitte 2016, The Wall Street Journal 2015, The Wall Street Journal 2015, Gartner 2015

US Labor Force by Generation, 1995-2015



Note: Annual averages plotted 1995-2015. For 2015 the first quarter average of 2015 is shown. Duet to data limitations, Silent generation is overestimated from 2008-2015.

Sources: PewResearch Center 2015

Partnership Models

There has been an increase in partnerships of all forms, between public and private sectors, consumers and producers, and even competitors in order to combine capabilities in new and innovative ways.

Importance

- Automotive manufacturers in the US have entered into strategic alliances and/or merged with other automotive manufacturers from Europe and Japan.
- Several emerging countries have seen the consolidation of large national private water operators: Philippines (Manila Water, Maynilad), Brazil, Malaysia, and Russia but also Africa (e.g., SDE in Senegal which became independent of Saur).

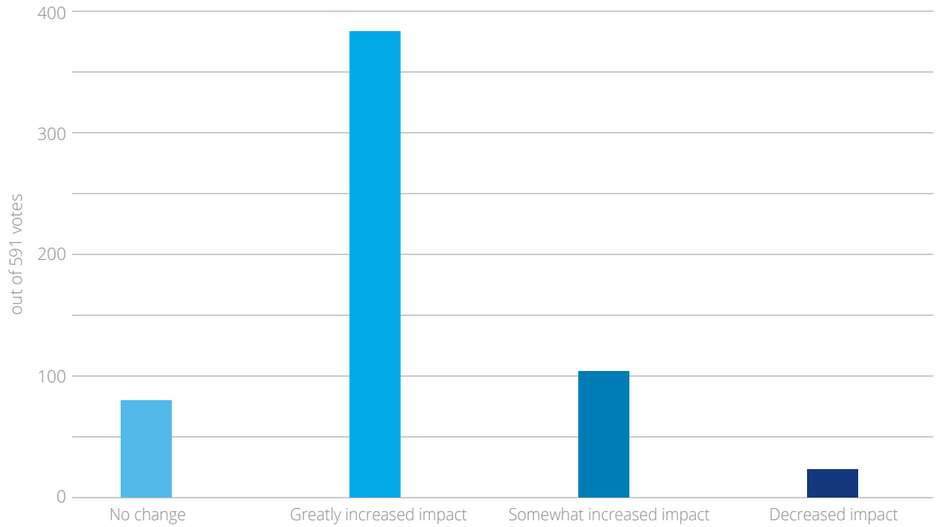
Impact

- In 2015, more than half of traditional consumer products had native digital extensions and by 2017, 50% of consumer product investments will be redirected to customer experience innovations.
- In 2018, the total cost of ownership for business operations will be reduced by 30% through smart machines and industrialized services.
- The new forces of social structuring and the so-called digital natives (Gen Y and younger) will soon disrupt the traditional transaction model for doing business, as well as the current partnering model.
- Partnering will begin to happen across great distances, include reciprocity thinking, and even intellectual property will shift from a closed to a more open system.

Sources: The World Bank 2015, Forbes 2015, Forbes 2014, Forbes 2014, Forbes 2013

Perceived government impact on business (LinkedIn survey results)

How has the government impact on your business changed in recent years?



Sources: Deloitte University 2013

Political Fragmentation

Political and economic instability and catastrophic global disasters are reshaping the global stage in terms of trade relations, fiscal policy, regional economic health, the price of key commodities, and supply chain risk.

Importance

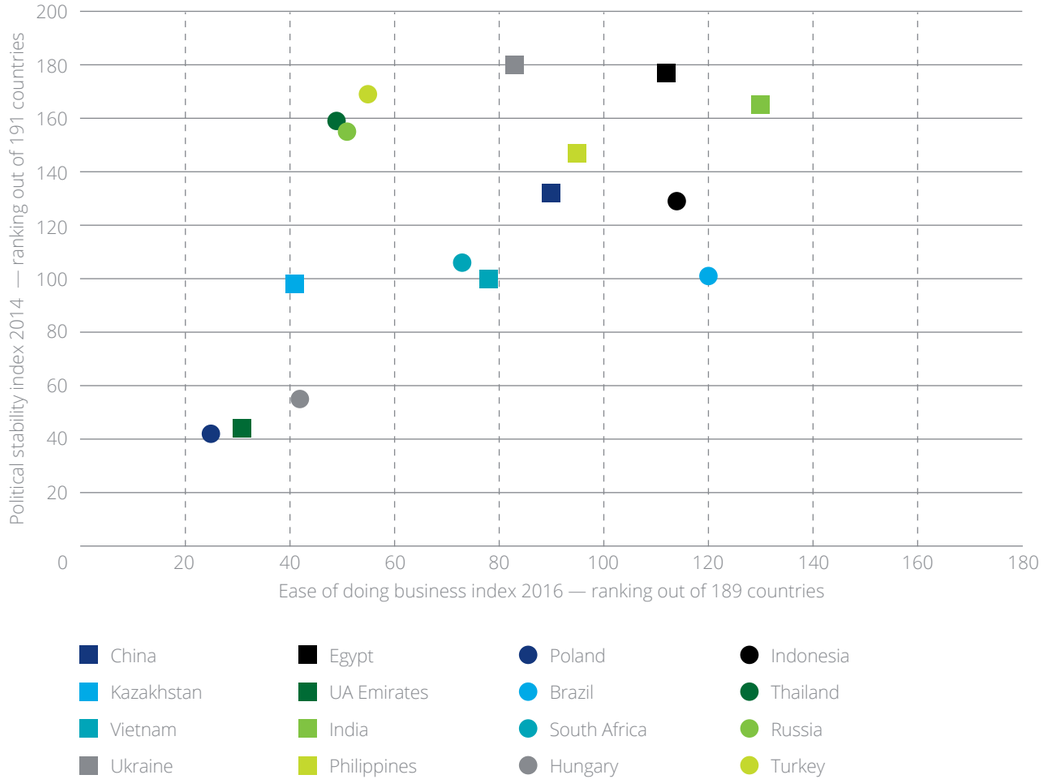
- In a report provided by the World Bank, it is empirically proved that economic growth is hindered by political instability emerging from regional political conflicts, military suppression, violence, and the lack of resource access, and free movement.
- In the area of North Africa and the Middle East, political violence has increased in more than 60% of the countries' regions within three years following the Arab Spring.
- Populist parties in Europe and the US are receiving more and more support as a result of an increasing discontent amongst voters which leads overall to polarized and more fragmented political landscapes. The movements behind Donald Trump in US, the Front National in France, or the AfD in Germany are just a few of many examples.

Impact

- The changing political stability in Europe and the Middle East affects investments, consumption, and economic growth.
- On the one side, Indonesia experienced an increase in inflows of foreign direct investment (FDI) by 66.5% (in real terms) between 2008 and 2013 due to its enhanced political stability and reformed business environment.
- On the other side, due to its political conflicts following the Euromaidan movement, the GDP of Ukraine declined by almost 50% between 2013 and 2016.
- For emerging markets such as Egypt, increased political instability additionally impedes their economic growth. In Egypt, the annual growth rate of real GDP dropped from 5.1% in 2010 to 2.1% in 2013.

Sources: The World Bank 2014, CNN 2013, International Monetary Fund 2016

Ease of doing business and political stability per country



Sources: The World Bank 2015, The World Bank 2015, Euromonitor 2014

Regulatory Landscape

Recent regulations across industries (e.g., financial and healthcare) have affected business models, increased costs, and come with a number of global considerations regarding legal implications.

Importance

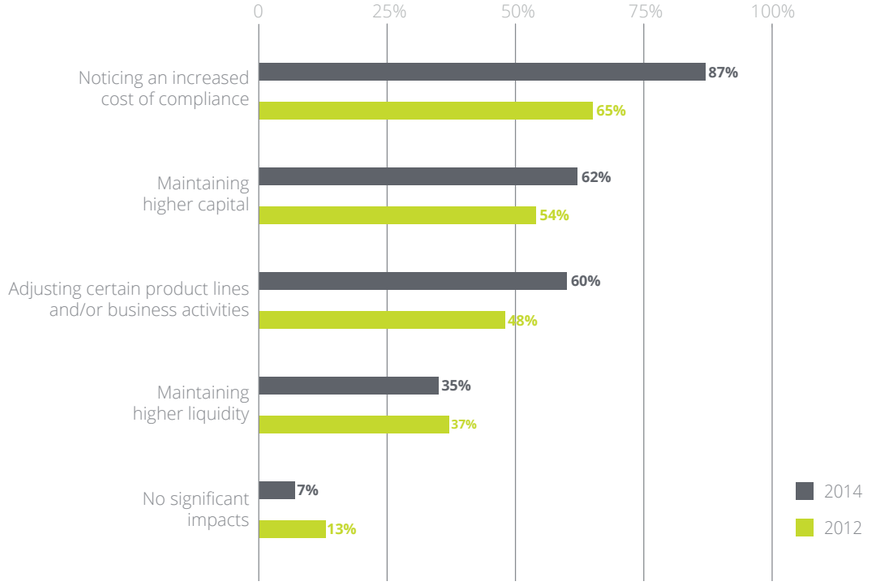
- Increased regulations led to a fast-changing market of healthcare players in the US. In 2020, the value of the market is expected to reach US $21.1 billion, which means a CAGR 0f 12.2% over five years.
- In a study conducted by Forbes Insights, 400 CEOs in the US consider the overall regulatory system to be a major issue which is likely to have a significant impact on their companies. Regulatory/compliance risks have been named as being among the top three risks that are expected to increase most in importance for their companies in the next two years. Furthermore, 79% of respondents replied that increased regulations represented the greatest challenge for them.

Impact

- As a result of the Affordable Care Act and an increased Medicaid eligibility in the US, millions of Americans will receive health insurance while drug coverage is likely to grow as well. However, after the changes under the administration of the US president Donald Trump at the beginning in 2017, it is difficult to predict how the situation will develop.
- Increased regulatory requirements in the US are currently having the greatest impact on the healthcare and financial sectors, the latter mainly because of the obligation to provide transparency and minimize overall market risks.

Sources: Deloitte University 2014, Gartner 2014, Forbes 2014, Markets and Markets 2015

Which of the following Impacts on your organization have resulted from regulatory reforms in the major jurisdictions where it operates?



Sources: Deloitte University 2015

Resource Price Volatility

Market volatility is causing unexpected shifts in the prices of futures and commodities, affecting investment decisions (e.g., the rise in US oil production and key issues around pipelines raises questions about the future volatility of energy markets).

Importance

- Research shows that the global population is currently depleting 150% of the renewable resources that the earth can produce during one year ('1.5 Earths'). The figure is expected to increase to 300% ('3 Earths') by 2050.
- Based on the fact that about 60% of trade with global gas is linked to the price of oil, the price of gas fell significantly.
- From 2008 to 2012, the price of coal in the US dropped by 40%, as demand declined as a result of an increased supply of gas.
- Although the global population increased by almost 4 times and the economy is expanding worldwide, prices have dropped by almost 50% during the past century. However, rises in global commodity prices have erased these declines in the last 10 years.

Impact

- Due to the fall in oil prices, alternative sources of energy (e.g., biofuel) have become less competitive.
- Major oil and gas companies have extensively cut down their planned coal investments. Coal investments are likely to decrease further due to the US government's plans for its power sector by 2030 and the fact that coal usage in China is likely to reach its peak before 2020.
- Industries characterized by an intensive use of energy and a high sensitivity toward the price of natural gas benefit from low gas prices which are expected to remain relatively stable for the near future. Examples of such industries are the food industry, the paper industry, or power production.

Sources: Deloitte 2016, Deloitte 2015, BBC 2012

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Examples of extreme price spikes in commodities over the past 20 years

Commodity	Est. global annual consumption		# of extreme price increases from 1992-2012	Avg. duration of price increase[4] (days)	Avg. price increase	Avg. annual price volatility[5]
	Volume	**Billion $[1]**				
Corn	836 MM tons	231	4	425	65%	28%
Cotton	24 MM tons	77	2	353	80%	28%
Copper	20 MM tons	174	3	279	41%	26%
Coffee	8 MM tons	47	3	609	94%	35%
Crude Oil	28,000 MM barrels	2,800	4	550	128%	36%
Heating Oil	11,000[2] MM barrels	1,386	5	451	113%	34%
Natural Gas	0.7[3] trillion cubic m	88	5	157	139%	68%

(1) Calculated using annual consumption and recent commodity prices
(2) Number denotes consumption of all distillates (heating oil, diesel, fuel oil, etc.)
(3) Number denotes US consumption
(4) Duration includes rise and subsequent drop in price
(5) Average of annualized standard deviation of change in daily commodity from 1992 to 2012

Sources:
1 International Grains Council
2 International Cotton Advisory Committee
3 Union Bank of Switzerland
4 US Department of Agriculture
5 US Energy Information Administration

Resource Scarcity

As the world's population continues to grow, there is increased demand for and pressure to conserve natural resources that have huge implications for poverty, inequality, demographics, and public health.

Importance

- Water is jointly responsible for about 90% of all disasters, the UN assumes. Nevertheless, water scarcity will become a severe problem in the future, as only 60% of the water needed will be available by 2050.
- About one-fifth of the global population inhabit areas with great physical scarcity and the number is expected to increase by 500 million people. About one quarter of the global population must deal with severe economic water scarcity, meaning that these people live in areas without an infrastructure required to extract water from rivers or aquifers.

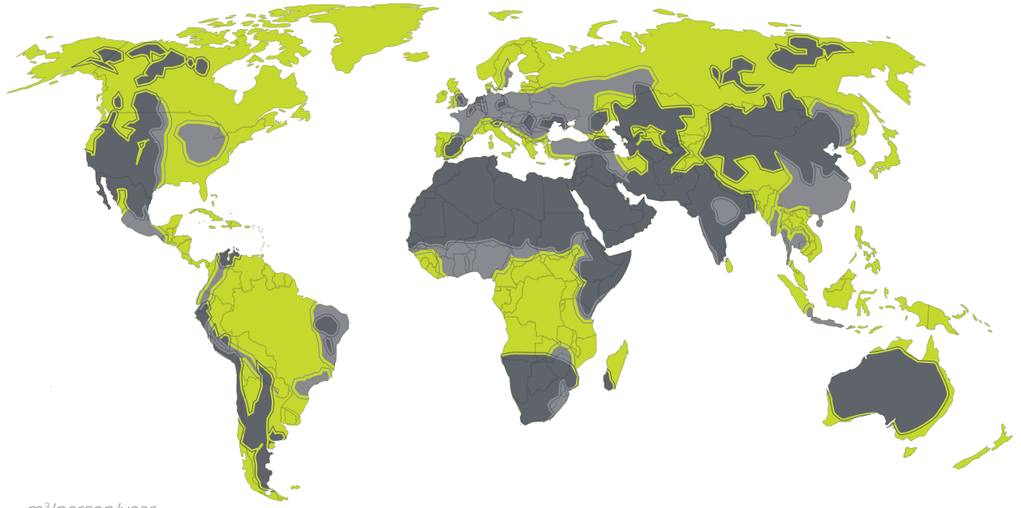
Impact

- Companies must deal with resource scarcity such as water shortage, an increased demand for energy, and possible supply shortfalls in countries with water shortage.
- Scholars at the University of California stressed the loss of approximately 17,000 jobs in California's agricultural sector in 2014 and predicted the loss of about 20,000 jobs for the following year. According to these scholars, 500,000 acres overall constituted fallow land in 2014 while this number increased by 30% to 40% in 2015. Compared to 2013, acreage in California declined by 11% in 2014 according to the United States Department of Agriculture (USDA), with the production of crops (e.g., rice, corn, or cotton) suffering the greatest declines.

Sources: The Guardian 2016, Deloitte University 2015, Deloitte 2015, United Nations 2014

The Megatrends of Tomorrow's World | Drivers

Projected water scarcity in 2025



Sources: Center for Environmental Systems Research 2016

Sharing Economy

The collaborative nature of the online environment has led to the rise of the sharing economy, in which technology is leveraged to unlock idle capacity and provide access to products through renting or borrowing.

Importance

- The value of the rental market in peer-to-peer (P2P) business alone in the US is $26 billion, according to several studies.
- The sharing economy is driven by different societal trends:
  - Due to the increasing number of people living in cities, sharing and local services gain greater value. Thus, people tend to share products and reuse them instead of buying new ones.
  - A rising concern for environmental sustainability and the motivation to prevent ecological devastation further promotes the sharing economy.
- Another driver for collaborative activities is the fact that renters can increase their monthly income by offering accommodation to peers. The P2P rental market is also likely to offer lower prices and thus less costs for tenants.

Impact

- The costs and complexity of matching supply and demand have been reduced significantly since the introduction of the internet. Through smart-phones and global positioning systems (GPS), people can nowadays easily search for leasable rooms or make use of car-sharing models.
- Collaborative consumption is considered a new business model under which consumers earn money through selling the idle capacity of underutilized assets to peers for a specific time period.
- A study conducted by the European Added Value Unit of the European Parliament predicts that the better use of capacities (which would otherwise be under-used) constitutes a maximum potential economic gain of € 572 billion in annual consumption across all 28 Member States.

Sources: Deloitte University 2014, Deloitte 2014, The Economist 2013, European Parliamentary Research Service 2016

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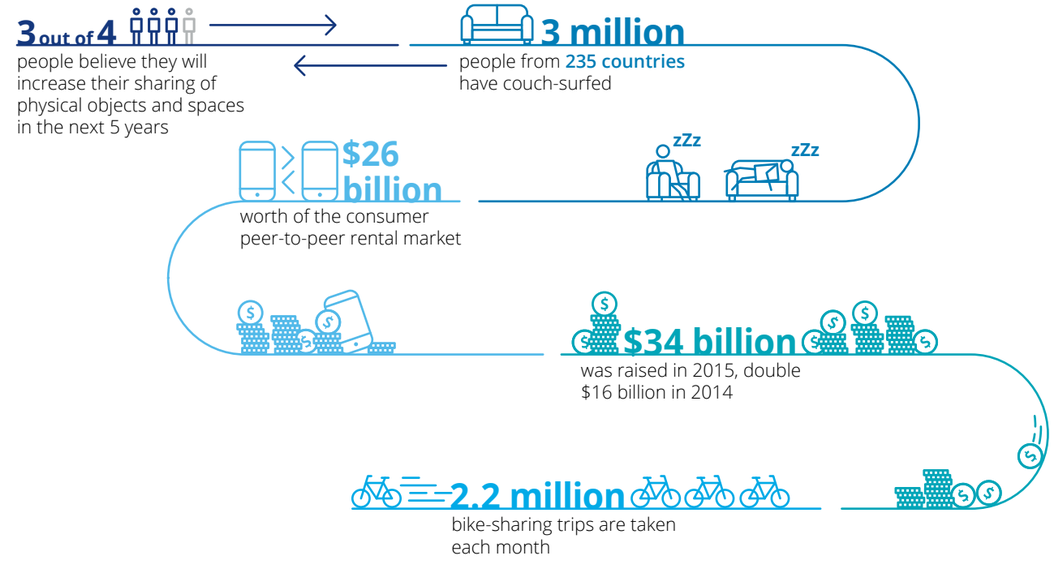
What is the Sharing Economy?

The sharing economy refers to the growing marketplace of economic agreements between two parties, usually enabled by a digital platform, which enables use or consumption of a product, service, or activity without full ownership.



Sources: Forbes 2015, Crowdinvesting.org 2015, Fast Company 2011

Social Media

The rise of social media as a dominant channel/platform for communication has led to new forms of rapid connectivity and interaction across the global landscape (e.g., Arab Spring, the 2016 US presidential election, Facebook groups for Syrian refugees).

Importance

- The number of social network users rose by 18% in urban China and by 11% in Europe as well as Australia.
- According to a survey, TV (28%) and social media (26%) are used almost equally as a news platform by young people between the ages of 14 and 25 in the United States. If social media continue to receive high attention in future, it is expected that they will replace TV as the prevalent cultural medium very soon.
- Scholars conducted studies which show that the government in China is likely to place censorship on information that triggers collective actions such as protests against the government.

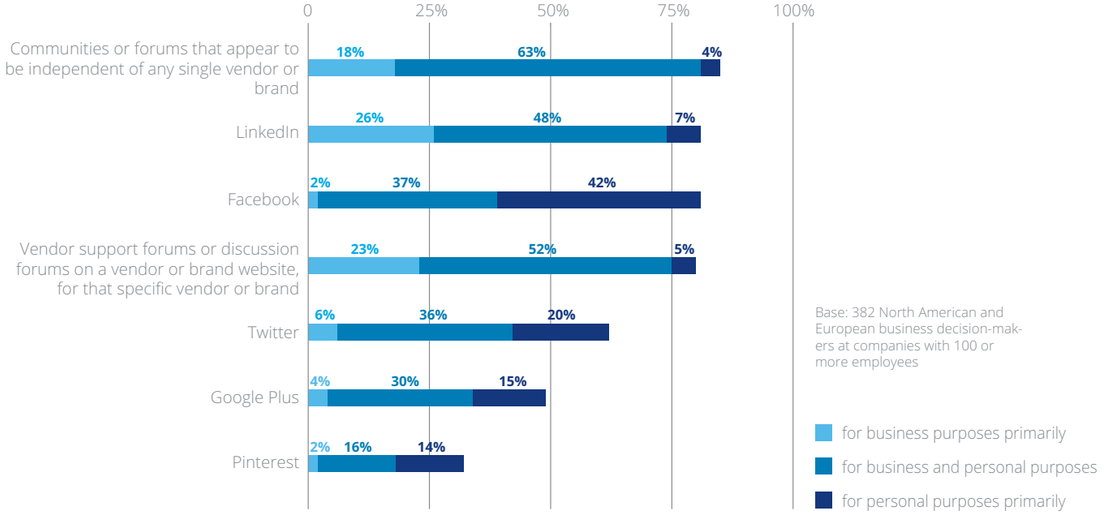
Impact

- A survey on the types of social media that are used by companies for investigative reasons found that LinkedIn and Facebook are the two most popular websites with 90% of respondents using both sites. However, LinkedIn is considered to be more valuable than Facebook (51% and 43%, respectively). The reason could be LinkedIn's focus on professionals. Although 55% of the surveyed companies use Twitter, only one-fourth considers the social media platform as highly valuable.
- By 2019, advertisers will spend US $103 billion on interactive marketing – as much as they do on television to-day. Search marketing, display advertising, mobile marketing, email marketing, and social media will grow to 26% of all advertising spending within the next five years.

Sources: The World Bank 2016, The Wall Street Journal 2016, Forrester Research 2014, Forrester Research 2013

Business Decision-Makers Rely On Communities

"For what purposes do you visit or participate in the following places?" (Respondents who replied, "at least monthly")



Sources: Forrester Research 2013

Social Unrest

As political and ethnic groups have become more empowered, there has been a resurgence of civil and social rights issues calling for change or reform (e.g., Pegida, student protests in Mexico, the Occupy Wall Street movement, the anti-GMO movement, Black Lives Matter, gender pay discrimination, LGBT rights and Planned Parenthood).

Importance

- A sample of protests in Europe between 1980 and 1995 shows that an average of 700,000 people took part in demonstrations that dealt with austerity programs whereas less than 15,000 people participated in demonstrations against war.
- A study found that the expected amount of protests per year decreases by approximately 0.4 events due to a 1% rise in GDP. This is about half the effect of a similar rise in the governmental budget.
- Dissatisfaction among people results from the lack of growth and the prevalence of high unemployment.
- According to the International Labour Organization, the average social unrest index increased between 2015 and 2016 above the long-term average of the last four decades. Social discontent increased in 8 out of 11 regions, particularly in the Arab States.

Impact

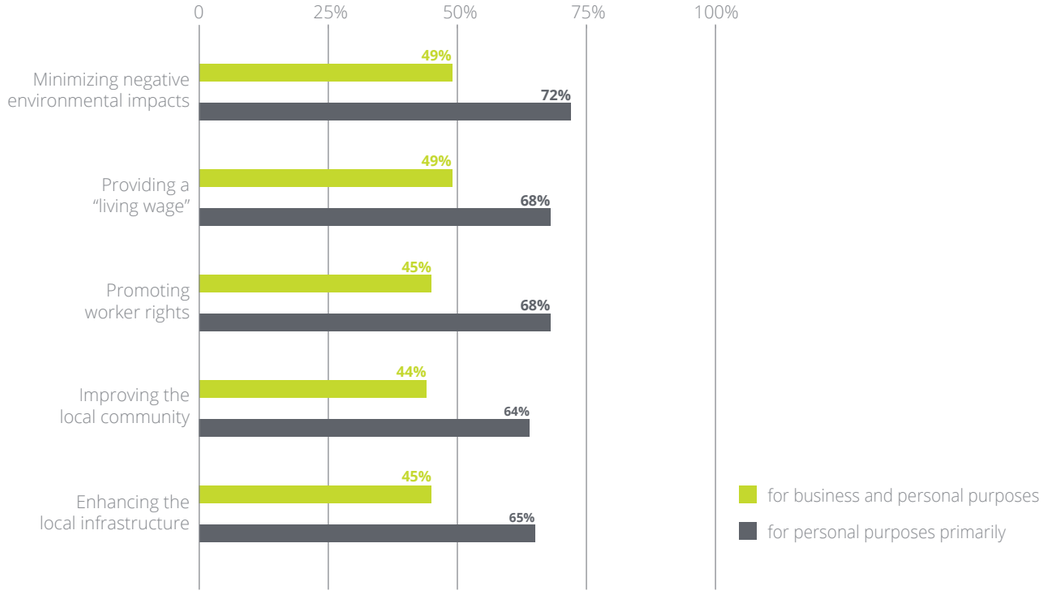
- In an alert in 2010, the International Labour Organization reported that high rates of unemployment, especially among the young, provoke increased social unrest.
- In a study in 2011, the International Monetary Fund (IMF) analyzed the relation between food prices and anti-government demonstrations in 120 countries between 1970 and 2007. Results show that the number of anti-government protests in low-income countries doubled in the event of a 10% rise in food prices.

Sources: Deloitte University 2014, The Economist 2011, International Labour Organisation 2017

The Megatrends of Tomorrow's World | Drivers

Importance of social issues in emerging markets

When operating in emerging markets, how important is each of the following considerations when your company makes business decisions?



Sources: Deloitte 2013

Technization of Healthcare

Advances in technology have enabled digital medicine and bioinformatics, advanced genomics, digital manufacturing, and nanotechnology, and the widespread development of genetically modified products.

Importance

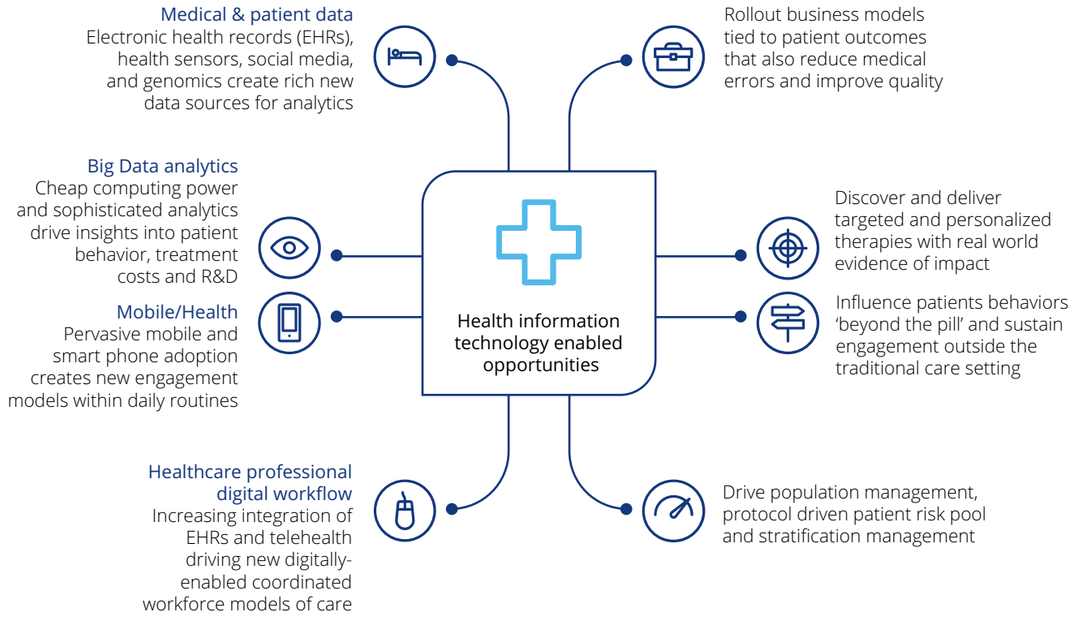
- Physicians and other caregivers obtain vital patient biometrics in real time through the transmission of med-tech industry sensor-enabled remote monitoring devices.
- By 2020, ingestible "smart pills" with sensors could be in use to wirelessly relay information on health indicators within the body to a smartphone. This would permit health indicators to be tracked more closely and enable doctors to receive precise information on which medications their patients actually took, and when.

Impact

- Telemedicine enabled e-visits, mHealth, and tele-mentoring – where a robot surgeon on site can be guided by a remote surgeon – may take pressure off the health-care system, while creating opportunities to improve the quality of care.
- The convergence of biomedicine, wireless and mobile devices, IT ,and health data initiated the transformation of medicine from an art to a data-driven science, providing the right care in the right place at the right time and at manageable costs.
- Life science companies are increasing their focus on patient and healthcare outcomes and expanding the use of social media to reach patients and caregivers.

Sources: Gartner 2015, Deloitte University 2015, Deloitte 2014

New business models: 'beyond the pill', outcomes and real data are providing health data and transforming what is possible



Sources: Deloitte 2014

Terrorist Organizations

Political uprisings, instability, or other social unrest has led to a rise in terrorist organizations around the globe (e.g., an increasing number of organizations publicly affiliated with ISIS or the rise of Boko Haram).

Importance

- 82% of people who died in terrorist attacks were living in one out of only five countries.
- The number of deaths caused by terrorist attacks is nowadays five times higher compared to 2000.
- Between 2012 and 2013, there was a significant rise in terrorist activities: the overall number of people killed during terrorist attacks increased by about 60% (from 11,133 in 2012 to 17,958 in 2013) as did the number of countries that count more than 50 deaths (increased from 15 in 2012 to 24 in 2013).
- Between 2007 and 2016, about 1% of people worldwide (approximately 60 million people) fled from their homes due to political or regional conflicts.

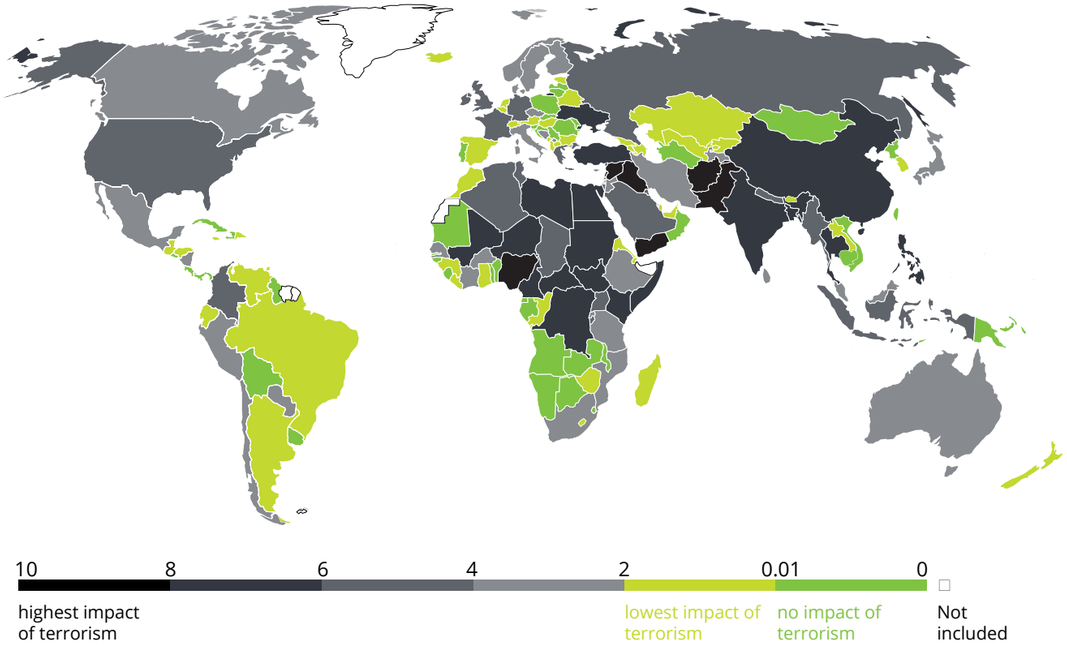
Impact

- Terrorism can have a strong negative effect on per capita income. In the Basque Country, while there was a major threat of terrorist attacks, per capita income fell to 10% below the actual amount budgeted.
- In the United States, financial markets and flights slowed down and came to a halt after the 9/11 attack.
- The financial impact of terrorism in recent years has been estimated at US $13.6 trillion, which represents about 13.3% of global economic activity.

Sources: Forbes 2016, Institute for Economics & Peace 2016

The Megatrends of Tomorrow's World | Drivers

New Global Terrorism Index from 2016



Sources: Institute for Economics & Peace 2016

Urbanization

Cities are growing more quickly than suburban and rural areas, and are simultaneously witnessing an increasing concentration of wealth. As a result, the quality of life continues to improve in urban centers relative to suburban communities, and demand for services is increasing.

Importance

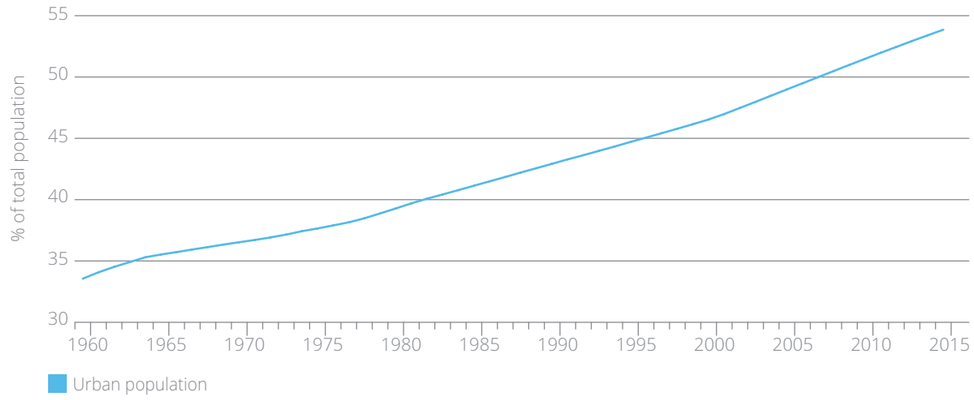
- Nowadays, more than half the global population (54%) already lives in cities and the number of city dwellers is assumed to rise continuously in future.
- It is expected that by 2030 two-thirds of the world population will live in cities. This would mean an increase from 3.5 billion to 5 billion in under 20 years.

Impact

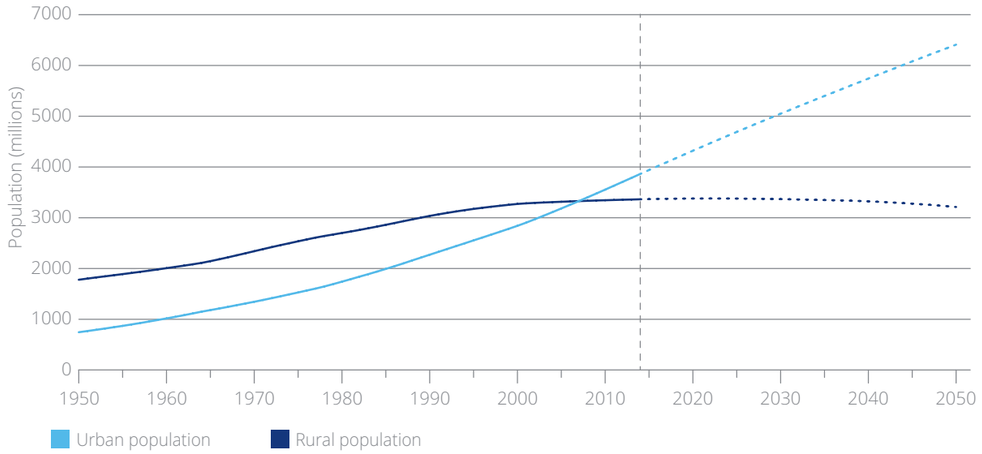
- As cities account for more than 80% of the global GDP, the increase in urban population can promote sustainable growth. Therefore, urbanization requires good management, which can then lead to higher productivity, new ideas, and innovations.
- Cities account for more than 70% of global greenhouse gas emissions and use two-thirds of the world's energy. While cities are constantly growing, the risk of disasters or climate catastrophes is augmenting as well.

Sources: The World Bank 2016

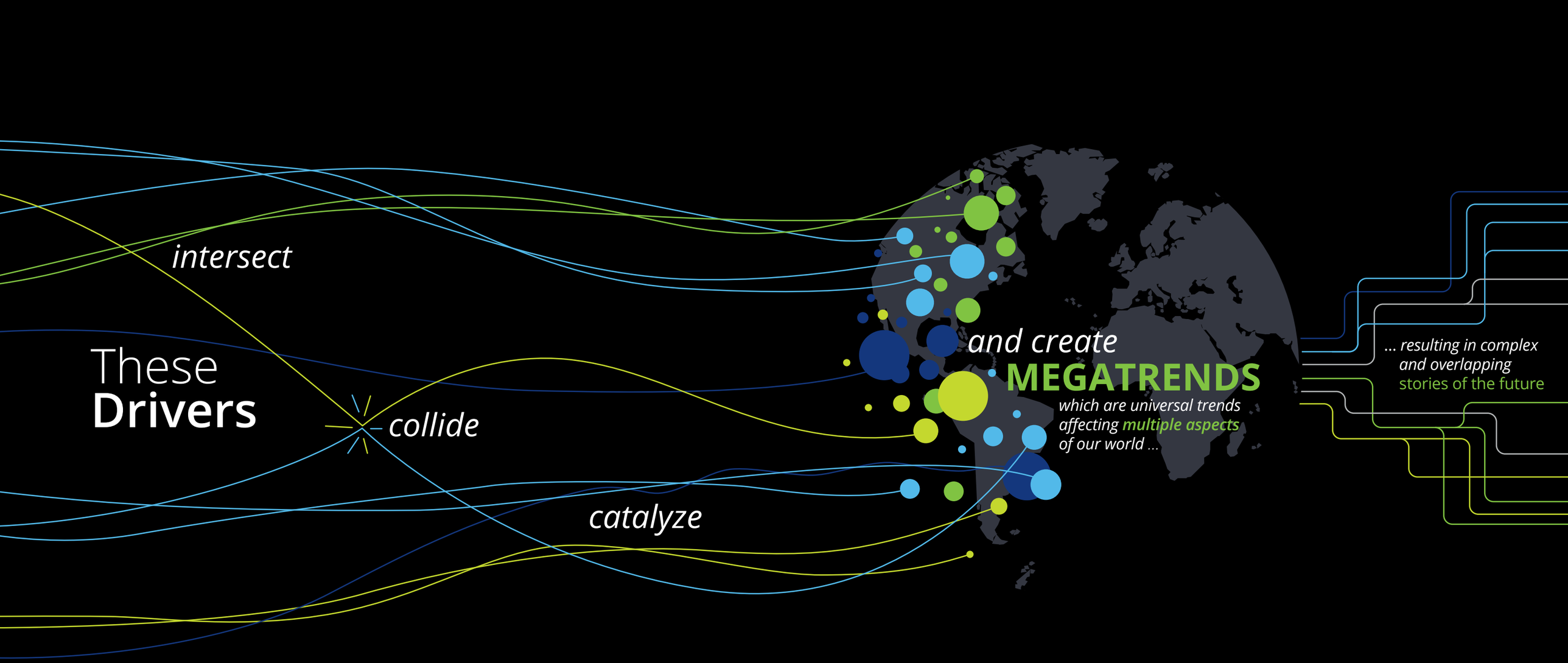
Share of urban population



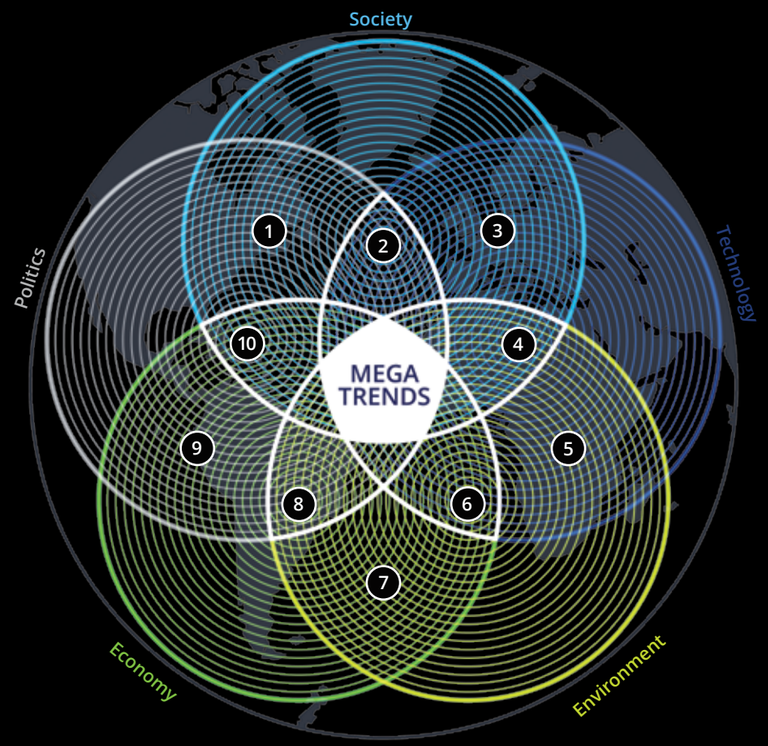
Development of urban and rural population



Sources: The World Bank 2016


These
Drivers
intersect
collide
catalyze
and create
MEGATRENDS
which are universal trends
affecting multiple aspects
of our world ...
... resulting in complex
and overlapping
stories of the future

Stories of the future



The overlap of the five circles reveals ten groups of stories. Some them are new and surprising, while others are more obvious and have been visible in plain sight to many of us.

Megatrends of Tomorrow's World | Megatrends

1 **Empowerment**
the growth and re-invigoration of ideas and self-worth

- Rise of the individual
- Collaborative consumption
- Triple bottom line
- New markets
- Unconventional regimes

2 **Polarization**
the rise of divisiveness and divergence

- Rise of ideology
- Bursting digital bubble
- Politicism of science
- Skillset divide
- Institutionalized radicalism

3 **Hyperconnectivity**
the emphasis on interconnectedness and collective behavior

- Transparent lives
- Integrated systems
- Conflict minerals
- Hyper-sensitive markets
- Global regimes

4 **Disengagement**
the evolution of ways in which we communicate and interact

- Interpersonal divergence
- Digital personification
- NIMBY
- Fragmented workforce
- Political defiance

5 **Aging**
the changes in values, cultures, and priorities across generations

- Intra-generational fairness
- Digital rift
- Resource footprint
- Silver agers
- Gerontocracy

6 **Dematerialization**
the shift in the value structure from physical to intellectual

- Knowledge society
- Digitalization
- Scientification of agriculture
- Post-industrialism
- Shifting power bases

7 **Scarcity**
the unsustainable consumption of our natural resources

- Middle class angst
- Innovation
- Sustainability
- Qualitative growth
- Wealth distribution

8 **Blurring Boundaries**
the emergence of business ecosystems across traditional silos

- Melting pots
- Co-development
- Mass epidemics
- Shadow markets
- Nation state 2.0

9 **Erosion of Governance**
the decline of the traditional world order Direct democracy

- Direct democracy
- Decentralization
- Resource disputes
- Free markets
- Alternative governments

10 **Displacement**
the movement of people, ideas and challenges across the globe

- Mass migration
- Infrastructure shift
- Ecological pressure
- Global supply chains
- Allocation conflicts

Empowerment the growth and re-invigoration of ideas and self-worth

Empowerment: Social Implications

Rise of the individual

In today's society, it's all about the individual over the collective. A culture of "me" has risen over a culture of "we" as individuals become empowered to demand specific outcomes, resulting in the decline of social cohesion and the mass market. Individual empowerment comes from significant advances in education, technology, and healthcare, and as the global extreme poverty rate goes down, the middle class has risen in importance. This demographic places importance on different value structures, resulting in a number of significant examples today:

- Rise of civil liberties movements in the United States (e.g., Black Lives Matter, Occupy Wall Street).
- The 2016 Brexit Referendum in which the United Kingdom voted to leave the European Union in favor of independence.
- The rise in focus on women's rights and issues (e.g., equal pay, women's health).

Sources: Deloitte 2016

Change will not come if we wait for some other person or some other time. We are the ones we've been waiting for. We are the change that we seek.

-Barack Obama, 44th President of the United States of America

Empowerment: Technological Implications

Collaborative consumption

The emergence of collaborative consumption models has led to the rise of the sharing economy, which allows consumers to make use of their idle assets to contribute in existing markets. Collaborative consumption models are augmented by technological platforms that connect discrete players through the use of networks and geo-located devices. Consider the car owner who can provide rides to users in need through the use of a mobile app allowing them to access a nearby driver at their convenience. Or consider the homeowner who is able to rent out his flat to eager families on holiday for a portion of the profits. Collaborative consumption models touch upon key aspects of user experience, including desire for convenience, more affordable prices, and network connectivity. Technology is used as the platform that connects individuals in this new economy, making use of underused assets and creating new opportunities for value creation and value capture.

Sources: The Economist 2013

There is a book yearning to come out of me: about how we can build the new collaboration economy, and the role of 'openness' in our quest for efficient use of resources and as a driver of innovation.

-Robin Chase, CEO of Zipcar

Empowerment: Environmental Implications

Triple bottom line

As consumers' expectations evolve, an increasing importance is placed on measuring not only a company's profits, but its impact on people and the planet as well. This focus on what's referred to as a triple bottom line emphasizes business models and metrics that touch upon key elements of society (e.g., diversity and equal opportunity) as well as environment (e.g., sustainability and carbon dioxide emissions), in addition to the standard measures of economic health like profitability and growth. What has resulted is an emergence of new business models (e.g., the buy-one, give-one model of TOMS and Warby Parker) and the rise of disruptive players who capitalize on this consumer preference to capture key segments of the market (e.g., The Honest Company's organic, eco-friendly product line as direct competition to traditional CPG providers). As consumers grow in importance, their opinions now begin to dictate the growth models and profitability of companies in unprecedented ways.

Sources: University of Pennsylvania 2015, Stanford University 2014

Businesses need to go beyond the interests of their companies to the communities they serve.

-Ratan Tata, Former chairman of the Tata Group

Empowerment: Economic Implications

New markets

The advent of globalization and technology have led to what's referred to as a "Maker's Movement", a growth in the creative class of people (e.g., craftspeople, app developers) who derive their identity through creation. Often this is spurred on by technological advances that have democratized means of production and enabled a more open and collaborative production environment. A resulting economic impact of this movement will be the growth of players in this fragmented part of the economy, leading to organizational and structural shifts within traditional enterprises. Consider Etsy, a global e-commerce market that connects over 29 million users with over 40 million artisanal, handicraft products from all over the world. Or consider the UK-based start-up MakieLab which allows customers to create one-of-a-kind dolls using its FabLab app. The growth of individualized products will result in a resurgence of entrepreneurship as individual makers connect with the larger, global market.

Sources: Etsy 2016, Deloitte University 2015, Deloitte University 2014

You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.

-R. Buckminster Fuller, 20th century American inventor and visionary

Empowerment: Political Implications

Unconventional regimes

As the age of empowerment grows, often this is not accompanied by the commensurate and required rise in education which can lead to the rise of unconventional regimes. In some cases, this occurs through the advent of terrorist organizations such as ISIS and Boko Haram, who take advantage of weak societal integration and an impoverished community to wreak havoc on world order. In other cases, we see the rise of new political parties (e.g., the Tea Party in the United States, the Five Star Movement in Italy, AfD in Germany) that seek to revolt against traditional political structures. And in still other cases, we see the rise of singular dictatorships who rail against the Western way of life. The emergence of these regimes is often the outcome of dissatisfaction with existing policies, which are thought to benefit an elite minority over the welfare of the majority. Therefore these groups, empowered by the masses, often hide behind the guise of broad societal revolution, while promoting self-interest and chaos instead.

Sources: Deloitte 2016

The world will not be destroyed by those who do evil, but by those who watch them without doing anything.

-Albert Einstein, 20th century German physicist

Polarization
the rise of
divisiveness
and divergence

Polarization: Social Implications

Rise of ideology

Fueled by individual empowerment, access to information and communication technologies, and growing wealth inequalities, the world is seeing a rise in ideology as people and communities seek dramatic change from the status quo. As individuals engage increasingly over social networks due to the proliferation of ICT technologies, networks of ideological thinkers are no longer constrained by proximity and are able to grow exponentially with new followers who seek sources of insight online. In one particular example, we have seen the rise of Islam as a powerful influence shaping the political and economic regimes of the Middle East, as well as the rise of extremists who sully the name of the religion in order to convey dominance over tradition. Furthermore, driven by values and religion, we see a world that lives divided along social dimensions. Debates about gay and lesbian rights, women's health, and racial equality dominate the stage as groups become more and more divided along ideological lines.

Sources: Deloitte 2016

Religion doesn't make people bigots. People are bigots and they use religion to justify their ideology.

-Reza Aslan, Iranian-American author, public intellectual, religious studies scholar

Polarization: Technological Implications

Bursting digital bubble

Driven by the increase of mobile technologies that have enabled constant connectivity, the world around us has fundamentally changed. What has resulted is a pervasive dependence on technology for everything from social interaction to transactions to health monitoring. However, venture capitalists are predicting the burst of the tech bubble as the democratization of knowledge has led to an oversaturation and overvaluation of players in the market. Concerns about data privacy have called into question whether digital technologies will continue to grow at this rate. Social media hinges upon the willingness of people to share and the cultivation of an intimate environment, but the concern over privacy and focus on expansion have sometimes resulted in a decline in usage. Consider Facebook's 21% decline in "original sharing" from its 1.6 billion monthly active users. With such division about the trade-offs about technology, the bubble that has emerged comes dangerously close to popping.

Sources: CNBC 2016, The Wall Street Journal 2016, Fortune 2016

Startup investment has cooled. Valuations are falling. But many investors and entrepreneurs haven't grasped the new reality.

-Keith Rabois, American entrepreneur, investor and former EVP at PayPal and Linkedin

Polarization: Environmental Implications

Politicism of science

As people become more entrenched in their individual value systems and as environmental outcomes are increasingly tied to political and financial motivations, a politicism in scientific reasoning has emerged in today's world. This skepticism is an example of one of the negative consequences of an increasingly polarized world, a "kick the can" mentality about issues which affect the long-term viability of our planet. Several examples demonstrate the divide:

- The constant dispute over climate change and the extent to which global warming and greenhouse gas emissions affect our planet.
- The debate over the Keystone XL Canada-US oil pipeline project which pits energy independence against environmental costs.
- The divide between parties who support hydraulic fracking as a means of natural resource extraction and parties who oppose it due to the threat of contamination of toxic chemicals.

Sources: Bloomberg 2016, Voice of America 2014

The most important thing about global warming is this. Whether humans are responsible for the bulk of climate change is going to be left to the scientists, but it's all of our responsibility to leave this planet in better shape for the future generations than we found it.

-Mike Huckabee, American politician, 44th Governor of Arkansas from 1996 to 2007

Polarization: Economic Implications

Skillset divide

Following the Great Recession, the workforce particularly in the United States realized more significant employment declines in middle-skilled white- and blue-collar jobs (e.g., construction, manufacturing, mining) than in the high-skill or low-skill sectors. While those losses have stabilized somewhat in the US, the polarization in skillsets valued in today's global market still exists. As the world changes to a more digital landscape and a more millennial next-gen workforce, the skillsets needed for competitive advantage have shifted. Emphasis is placed on careers in the science, technology, engineering, and math (STEM) spaces, and coding has risen in importance. The focus on the digital economy highlights an estimated 900,000 ICT jobs in Europe that would be unfilled by 2020 if investments in education are not made. This change in what the market values highlights significant disparities between today's workforce and what will be required in the future.

Sources: Forbes 2014, MIT 2010

Innovation has nothing to do with how many R&D dollars you have. When Apple came up with the Mac, IBM was spending at least 100 times more on R&D. It's not about money. It's about the people you have, how you're led, and how much you get it.

-Steve Jobs, American entrepreneur, inventor, and co-founder of Apple Inc.

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Polarization: Political Implications

Institutionalized radicalism

While the term "radicals" once meant one-off individual extremists as part of a certain religion or political group, the world has evolved to a place where radicalism has become the norm. In one example, we have the rise of ISIS as a pervasive threat in the Middle East that has now infiltrated global corridors with their terrorism. We also see a different kind of radicalism emerge in the United States, the rise of untraditional political players who capitalize on general dissatisfaction with the status quo to galvanize a new tier of supporters with more money, influence, and power. Boko Haram in Nigeria and Nicolás Maduro in Venezuela demonstrate that radicalism is not just a religious or ideological concern, but a truly political challenge. As societies become increasingly conflicted and value systems increasingly distinct, radicalism has evolved as a new norm, making its way into formal political structures and creating a dangerous dynamic for collaboration and cooperation.

Sources: Deloitte 2016

Our enemy is not Islam. Islam is not the enemy of America; Americans are not the enemy of Islam. Our real enemy is extremism and radicalism.

-Feisal Abdul Rauf, Kuwaiti American Sufi imam, author and activist

Hyperconnectivity
the emphasis on interconnectedness and collective behavior

Hyperconnectivity: Social Implications

Transparent lives

With the rise in ICT technologies, the proliferation of data has exploded leading to the rise of big data analytics and trend sensing. In today's world, data is easy to search for, manipulate, and extract insights from. Our Facebook and Instagram pages convey the stories of our lives, our Yelp and Four Square check-ins geo-tag where we are at any given point, and our LinkedIn and Xing profiles share with the world where we have worked and studied. The more a user engages with the digital technologies and social media of today, the more public and transparent their life becomes. This opens new doors of connectivity, networks, and markets as head-hunters are now able to find us online, collaborators are able to access our credentials, and new partnerships are able to be created. The catch-22 of technology demonstrates that in order to fully benefit from technology, we must fully embrace it and understand the trade-offs with privacy that accompany that decision.

Sources: Deloitte 2016

In a digital era, privacy must be a priority. Is it just me, or is secret blanket surveillance obscenely outrageous?

-Al Gore, American politician and environmentalist

Hyperconnectivity: Technological Implications

Integrated systems

In a more digital world, we are able to create beautiful "smart cities" which integrate ICT networks and leverage the Internet of Things to create a positive, interconnected, and hyperconnected world for its inhabitants. While hyper-connectivity such as this boasts many benefits, it can also lead to greater risks from the integration from physical and cyber infrastructures as hackers increasingly exploit our reliance on digital technologies. A country's financial systems, electrical grid, nuclear power structures, and other critical infrastructures are all tied to digital networks and attacks against this infrastructure are increasing in number. In 2015, hackers blacked out a region of Western Ukraine by accessing its power grid's connected control system. In 2016, hackers demanded US $17,000 in bitcoins after hacking into and holding ransom a US hospital's data records. Furthermore, beginning in 2013, Russian hackers managed to infiltrate the bank's internal computer systems using malware for two years. For stealing around £650 million, they infected networks of more than 100 financial institutions worldwide - the largest cybercrime ever uncovered. While hyperconnectivity has created massive positive social and economic change, the technological consequences will become increasingly important to safeguard against.

Sources: Reuters 2016, The Telegraph 2015, Tripwire 2015

We are vulnerable in the military and in our governments, but I think we're most vulnerable to cyber attacks commercially. This challenge is going to significantly increase. It's not going to go away.

-Michael Mullen, retired United States Navy admiral and 17th Chairman of the Joint Chiefs of Staff

Hyperconnectivity: Environmental Implications

Conflict minerals

As our dependence on smartphones, computers, and technologies has grown, our consumption of the precious metals and minerals required to produce such products has also grown significantly. Smartphones each contain approximately 40 different minerals including tantalum, tungsten, tin, and gold – referred to as the 3TG. However, the mining procedures required to extract these resources are often quite controversial. Pollution, dangerous working conditions, human rights violations, and poor wages are all the by-product of an emphasis on these minerals to produce smartphones. Furthermore, key players in the tech space recently revealed that proceeds from some of the mines in conflict zones such as the Democratic Republic of the Congo are sometimes used to fund the ongoing conflict. This emphasizes a critical supply chain issue that needs to be brought to light as our dependence on smartphones and the minerals required to produce them increases.

Sources: Time 2014, Michigan State University 2014

We require all of our suppliers to certify in writing that they use conflict-free materials. But honestly there is no way for them to be sure. Until someone invents a way to chemically trace minerals from the source mine, it's a very difficult problem.

-Steve Jobs, American entrepreneur, inventor, and co-founder of Apple Inc.

Hyperconnectivity: Economic Implications

Hyper-sensitive markets

As the world becomes increasingly intertwined, significant political and economic structural changes in one region have huge impacts on major financial markets leading to increased volatility. The 2008 subprime mortgage crisis in the United States sent the entire globe into catastrophe as markets were shorted and a Great Recession emerged. As Greece plunged into economic darkness in 2015 and closed its banks, restructurings and bailouts became the central topic of discussion for members of the European Union. And as the world woke up to the news of the United Kingdom voting to leave the European Union in June 2016, Brexit resulted in the Japanese yen jumping 13% against the British pound and the Dow closing down 600. Globalization and the liberalization of trade hugely drove the interconnectedness of today's markets, and as volatility grows in social and political spheres, the impact of wealth inequality and political apathy on our macroeconomics has risen in significance.

Sources: The New York Times 2016, Forbes 2015

Markets love volatility.

-Christine Lagarde, Managing Director (MD) of the International Monetary Fund

Hyperconnectivity: Political Implications

Global regimes

From the Roman Empire to the British Empire to Attila the Hun, the story of global regimes is not new. However, today the rise of and reach of global forces is catapulted forward by the ubiquity of social media and ICT technologies which create the possibility of connecting beyond physical borders on ideological platforms. The rise of the Islamic State of Iraq and the Levant (ISIL) represents one of the most serious and deadly by-products of our increased focus on hyperconnectivity, as they actively use social media and digital networks to recruit, radicalize, plan, and orchestrate violent acts of terror. Furthermore, ISIL is able to spread its propaganda in more far-reaching ways by conquering digital distance in ways previous global regimes never could. Hyperconnectivity has created the platform for a bully pulpit, and made the possibility to galvanize global regimes easier. By using informal methods of connectivity, groups gain access to the formal political sphere to create radical implications.

Sources: Deloitte 2016

ISIL's widespread reach through the Internet and social media is most concerning, as the group has proven dangerously competent at employing such tools for its nefarious strategy. ISIL uses high-quality, traditional media platforms as well as widespread social media campaigns to propagate its extremist ideology.

-James Comey, current Director of the Federal Bureau of Investigation

Disengagement the evolution of ways in which we communicate and interact

Disengagement: Social Implications

Interpersonal divergence

The advent of digital has created incredible impacts in connecting people across the globe, but often at the expense of face-to-face interpersonal interaction. On the one hand, new friendships and relationships are explored through the rise of networking and social platforms. Connections are made where previously serendipity was the medium of choice. On the other hand, interpersonal disintegration seems to prevail. Instead of discourse at a dinner table, the glow of smartphones illuminates diners' faces as they sit down to eat. The headphone industry grew 32% in 2012. Furthermore, the reliance on platform-based technology has generated interesting implications on developmental psychology. Attention spans are shorter, retention has diminished, and creativity has gone down because the imagination has become obsolete. The effects are unknown because we are still in the preliminary phases, but the divergence in our interpersonal interactions is a future worth exploring.

Sources: The New Yorker 2016

You're talking about a younger generation, Generation Y, whose interpersonal communication skills are different from Generation X. The younger generation is more comfortable saying something through a digital mechanism than even face to face.

-Erik Qualman, author and keynote speaker

Disengagement: Technological Implications

Digital personification

The confluence of artificial intelligence and augmented reality has resulted in a new mode of interaction with the digital world: the space of digital personification where "things" become humanized in a way. One of perhaps the most mainstream and foreshadowing examples of this occurred back in the mid-90's, where Tamagotchi digital pets from Japan rose in prominence with children. Today, stories of digital personification and its potential applications are plentiful:

- Creation of online avatars that gamers use to connect across virtual reality platforms.
- The 2013 American science-fiction film, "Her", which portrays the development of a relationship between a man and a smart computer operating system.
- In 2017, a Japanese insurance company replaced 34 of their employees with an artificial intelligence system. The system is based on IBM Watson which IBM calls a "cognitive technology that can think like a human".

Sources: BBC 2017, Forbes 2016

The rise of powerful artificial intelligence will be either the best or the worst thing ever to happen to humanity. We do not know which.

-Stephen Hawking, English theoretical physicist

Disengagement: Environmental Implications

NIMBY

For years, the NIMBY ("Not in my backyard") phenomenon has been described in economics textbooks as the classic example of how people's attitudes and behaviors often don't match up. NIMBY represents the disengagement of society with outcomes that do not affect them at face value. Take the example of the great big trash in the North Pacific Ocean. Despite consumers' emphasis on being eco-friendly, the spinning vortex of garbage was first detected in the 1990s, formed partially as a result of consumer waste from a materialistic product-driven culture and loose incentives for proper waste disposal and recycling. Now as a result, marine life faces severe threats from the patch, which some estimates guess is roughly the size of Texas. Toxins from the plastic waste also threaten both marine and human life. Another example is the atomic waste problem – perhaps the mother of all NIMBY problems. Most proposals for dealing with radioactive waste involve burying it in underground sites. However, there is no guarantee whether the storage will offer sufficient protection. The Yucca Mountain in Nevada is an exemplary case where industry plans have been disclosed as flawed. As a result, since the 1980s due to billions of dollars of investment, not even one gram of waste has been stored there. Ultimately, the dissonance between people's attitudes and behaviors leads to ramifications that, while seemingly disconnected, will have impacts on our way of life unless properly mitigated.

Sources: Greenpeace 2006, Nuclear Energy Institute 2015, National Ocean Service 2014

It's a national concern, I mean how we dispose of nuclear waste in a safe way, how we deal with this incredible amount of nuclear waste we have created over the years.

-Tom Udall, Senator from New Mexico

Disengagement: Economic Implications

Fragmented workforce

Mobile technologies have fundamentally changed the way we work today. As virtual connectivity grows, physical co-location diminishes. Gallup data suggests that 37% of the workforce in the US have telecommuted and companies have begun to roll out alternative work schedules (e.g., 4-day weeks). What has resulted is a fragmentation of the workforce. While this enables flexibility and agility, questions of employee engagement and productivity have inevitably risen. Disengagement in the workforce has also taken another form. Exacerbated by the recession, the younger generation is facing challenges engaging with the traditional labor market, so much so that the acronym NEETs ("not in education, employment, or training") has taken foothold. Some have termed this "The Disengagement Economy" with estimates suggesting that this could cost our society US $4.7 trillion in the long-term. Daunting as this figure may seem, it remains to be seen whether this future will prevail.

Sources: Fast Company 2015, The Wall Street Journal 2013

We like to give people the freedom to work where they want, safe in the knowledge that they have the drive and expertise to perform excellently, whether they [are] at their desk or in their kitchen. Yours truly has never worked out of an office, and never will.

-Richard Branson, founder of Virgin Group

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Disengagement: Political Implications

Political defiance

While heralded as the hallmark of democracy, political disengagement has become a new normal, where individuals don't feel as if their voice is heard over the din of mass opinion. Voter apathy is high and campaigns to increase voter turnout in critical election years abound. Even in the case of relatively high voter turnout, such as in the 2016 Brexit Referendum, disengagement and defiance is reinforced by the untruths promised by politicians to gain favor in minds of young voters. While promising freedom from the European Union, extra surplus for public services, and the ending of free movement of labor, the Leave party's campaign promises quickly unraveled. What remained was a concentrated anger at and mistrust of the lies told to gain favorable votes. While Brexit started as a story of trying to re-engage a disgruntled populace, what has now surfaced is a frustrated group of young British who have lost their old system, do not trust the new system, and feel lost in the sea of political decisions being made.

Sources: The Guardian 2016

I always believe that ultimately, if people are paying attention, then we get good government and good leadership. And when we get lazy, as a democracy and civically start taking shortcuts, then it results in bad government and politics.

-Barack Obama, 44th President of the United States of America

Aging
the changes in values, cultures, and priorities across generations

Aging: Social Implications

Intra-generational fairness

Striking the balance between the present and future has always had its challenges, but as demographics, political structures, and technological advances collide, the intra-generational equity issues are gaining a front and center seat. Demographic trends suggest that our population is aging dramatically and at a faster pace than the regular population. Among many things, this trend can be attributed to advances in medical technology and healthcare, changes in diet, and an overall lower fertility rate. However, as we continue to live at an unsustainable pace of life, the challenge of ensuring equity for our children remains at bay. Social services are strapped as the elderly require more long-term care, the ratio of dependents to workers in a society rises, and retirement ages are pushed back. Coupled with the volatility in the economy, the pressure on the younger generation is therefore mounting, as they pay into a system of social services and politics that are not necessarily designed with their interests in mind.

Sources: Census 2016, Forbes 2016, Ledevoir 2014

The aging and decreasing population is a serious problem in many developed countries today. In Japan's case, these demographic changes are taking place at a more rapid pace than any other country has ever experienced.

-Toshihiko Fukui, Japanese economist and 29th Governor of the Bank of Japan (BOJ)

Aging: Technological Implications

Digital rift

The rapid flux of technology and digitalization of the world have fundamentally shifted the ways in which we operate. For example, as mobile technology has grown exponentially in the past decade, it has given a distinct advantage to the millennials and generations X, Y, and Z who more quickly adopt the change. For example, a Pew Research Study found that seniors continued to lag behind all Americans when it came to cell phone ownership, broadband access, and even using the Internet at all. While this has created a digital rift between the young and the old, it has also opened a "silver market" to design innovative products for the elderly. Furthermore, the connectivity of technology has addressed feelings of social isolation and loneliness, and created a sense of freedom. The digital rift that has emerged places technological constraints on senior citizens who cannot keep up with the pace of change, but with proper support, could be the key to enabling happier and more connected lifestyles into the golden years.

Sources: PewResearch Center 2015, PewResearch Center 2014

I think there's a gigantic generation gap in terms of how people understand the Internet and how much they think technology is an important factor in social change.

-Alex Steffen, futurist, speaker, and author

Aging: Environmental Implications

Resource footprint

While not wholly attributable to an aging population, the behaviors and tendencies of this demographic may point to indirect effects on the environment and our planet. For example, data has suggested that as older people retire, particularly in developed and Western countries, their level of leisure consumption and travel rises creating impacts on CO_2 and greenhouse emissions. Other data has suggested that the elderly occupy a greater residential square footage than their younger counterparts, and therefore consume more energy in their households through heating and cooling. Another consideration is the amount of waste generated by hospitals per patient, 15% of which is considered infectious, toxic, or radioactive, that without proper disposal poses significant environmental problems. It is safe to say the data is not conclusive or causal, but as societies continue to age, monitoring and mitigating the potential environmental implications will be of utmost importance.

Sources: WHO 2015, European Commission 2008

We are in the midst of a silent revolution. It is a revolution that extends beyond demographics, with major economics, social, cultural, psychological and spiritual implications.

-Kofi Annan, seventh Secretary-General of the United Nations

Aging: Economic Implications

Silver agers

As the Baby Boomer generation prepares to retire, economists are predicting "a silver tsunami" in the workforce, a massive simultaneous exiting in the workforce of the population aged 65 and older. This creates a fundamental change in the way our labor market will operate as employers compete for talent and seek to replace the loyalty, skillsets, and networks lost. This impending future has many implications for our world. For example:

- Social service strain: as retirement rises, the cost of pensions, social security, and healthcare will rise.
- Tax slowdown: as silver agers retire, tax bases will shift based on changes in income levels.
- Next-gen workforce: as Baby Boomers retire, organizations will have to shift their business models and strategies to recruit and retain a digital native millennial workforce.

Sources: Forbes 2015, Deloitte 2013, The Economist 2010

Europe is one of the continents with the oldest population worldwide. This offers opportunities but also poses massive societal challenges to sustain our care and pension systems, and to maintain our quality of life. While seizing the opportunities of the Silver Economy, we must not deepen inequalities. Innovation for Active and Healthy Aging must benefit our citizens – all of them.

-Günther Oettinger, European Commissioner for Digital Economy and Society in the EU Commission

Aging: Political Implications

Gerontocracy

As societies age, so too does the age of our electorates. Coupled with political apathy and under-representation of the younger generation in governing bodies, this points to an interesting future for our political systems as the value structures and desires of the young and the old diverge. In the 2016 Brexit Referendum, the generation gap was incredibly stark. The older generation was about three times more likely to want to leave the European Union, resulting in a 52% vote to leave versus a 48% vote to stay. This brings other issues into the limelight, such as voter turnout. The highest turnout was in areas where British pensioners made up more than 25% of the population, for example. The challenge with an aging of our electorate thus results in long-term political decisions made by a generation who will probably not have to face the consequences in full. Thus, this potential rise in gerontocracy due to the aging of our societies has massive implications for the future of our world.

Sources: Time 2016, Intergenerational Foundation 2012

An important antidote to American democracy is American gerontocracy. The positions of eminence and authority in Congress are allotted in accordance with length of service, regardless of quality.

-John Kenneth Galbraith, one of the most influential economist in the 20th century

Dematerialization the shift in the value structure from physical to intellectual

Dematerialization: Social Implications

Knowledge society

The emergence of a knowledge society is fundamentally transforming the way we create and capture value in today's world. Rather than land, labor, or financial assets, intellectual property and human capital have risen in importance, creating huge implications for the way we employ, educate, and communicate. For example, the rise of knowledge societies is partially driven by the proliferation of digital technology, which creates rapid exchange of information relative to the "old world." However, knowledge societies differ from information societies. Information is a commodity, and true knowledge generation is derived from open networks and a culture of knowledge transfer. While generally a positive implication, the rise of the knowledge society must be monitored so that a societal knowledge divide doesn't lead to further fragmentation or to the perpetuation of a system in which only those who can afford the education required for knowledge capture will benefit.

Sources: The Wall Street Journal 2016, Unesco 2005

Knowledge is power. Information is liberating. Education is the premise of progress, in every society, in every family.

-Kofi Annan, seventh Secretary-General of the United Nations

Dematerialization: Technological Implications

Digitalization

As the digital world rises in prominence, consumers find themselves at a fork in the road facing both analog and digital options. For example, telecommunications providers still offer landline connections, but consumers choose smartphones and wireless connectivity, seeing minimal value in the additional cost. As Amazon offers both hardcopy books and Kindle applications on tablets on their e-commerce site, the convenience and ease of the digital book option often prevails. Grocery shopping, browsing for clothes, banking, automotive, even dating have all taken a digital form. Internet users have surpassed 40% of the world's population, emerging countries are leapfrogging to mobile connectivity, and phenomena such as the Internet of Things are creating new ways of connecting disparate industries for the good of the macro environment. Fundamentally, what we are seeing is a full digitalization of our formerly analog world, as physical products and processes fall prey to the world of digital.

Sources: Deloitte 2016

Everything has gotten less expensive. Digitalization has made content, whether it's print or music, less costly. Today, anyone can read the news for free online.

-Hubert Burda, German art historian and publisher

Dematerialization: Environmental Implications

Scientification of agriculture

As advances in biotechnology and nanotechnology grow, the future of agriculture is evolving. Genomics are rising in importance as agricultural companies begin to invest heavily in R&D efforts to replicate a crop's DNA sequence, selectively breed animals through genetic engineering, or use stem cells to produce meat-based products. The Internet of Things also offers significant opportunity as sensor-based technologies become more common — a breakthrough that supports "precision agriculture". For example, sensors are used to conduct multi-spectral analysis to understand levels of nitrogen based on how plants absorb or reflect different wavelengths of sunlight. This emphasis on advanced science that incorporates digital technologies represents a trend towards more advanced production processes, but threats to bio-diversity must be increasingly managed with this shift so that new crops or species of animals do not succumb to some unknown threat and further endanger our world's food security.

Sources: The Economist 2016, Stratfor 2015

I have seen first-hand that agricultural science has enormous potential to increase the yields of small farmers and lift them out of hunger and poverty.

-Bill Gates, CEO Microsoft, entrepreneur

Dematerialization: Economic Implications

Post-industrialism

While the world was once pre-occupied with an Industrial Revolution and emphasis on a manufacturing-based economy, our world is now characterized by the rise of a service economy. In post-industrial societies, the production of goods has given way to the production of services; knowledge becomes a form of capital (e.g., the emergence of a knowledge society), and information and ideas are commoditized. The pursuit of education has risen in importance as the labor force becomes polarized between technical and professional workers (e.g., bankers, doctors, engineers) and blue-collar professions (e.g., construction). Furthermore, the world's focus on technology and digitization has placed a high premium on fields in these spaces, such as information technology, cybersecurity, and artificial intelligence. As the world shifts towards a post-industrial society, the stratification along socioeconomic lines increases, exacerbating wealth inequities and turmoil, creating new complexities in our society.

Sources: The Wall Street Journal 2016

We must deal quickly with the fusion of the online world and the world of industrial production. In Germany, we call it Industrie 4.0.

-Angela Merkel, 8th Chancellor of Germany

Dematerialization: Political Implications

Shifting power bases

As the world shifts away from an emphasis on physical strength and towards digital prowess, strength is becoming synonymous with countries which display greater technological infrastructure and capabilities. This is in contrast to the days when power was exhibited by those with a strong militia, defense systems, and weaponry. While Russia was once a force to be reckoned with because of its emphasis on artillery and tanks, its focus now is on establishing dominance in a new war field: the Internet. The US Intelligence Community's 2015 "Worldwide Threat Assessment" report named Russia and China as the "most sophisticated nation-state actors" with regard to cyber-warfare, with a particular emphasis on the Kremlin's technical proficiency, sophistication, and inventiveness. These examples suggest that today, power doesn't necessarily reside with the physically brawny but more likely with the digitally nimble. The implications of this for our political world order will therefore be massive.

Sources: Newsweek 2015, The Diplomat 2014

Cyber warfare is the new warfare of the asymmetrical enemies we face in this country.

-Mike Pence, incoming Vice President-elect of the Unites States of America

Scarcity
the unsustainable consumption of our natural resources

Scarcity: Social Implications

Middle class angst

Propelled by growth, urbanization, and a concentration of wealth, a global middle class has emerged with varying sets of values and needs. This group still faces significant barriers in the way of economic resources and a result of wealth inequities, and a pervasive frustration has emerged with the social status quo. In the US, rising tensions with Wall Street culminated in the Occupy Wall Street movement in 2011 and continue to dominate the 2016 election discourse. In Venezuela, food scarcity and running water have become critical emergencies as the middle class faces suppression from political dictatorship. And in China, a new term has emerged to describe the middle class, "zhongchanjieji", which translates roughly to "tragic middle class." Across the world, as the middle class swells due to changes in wealth structures, a new set of challenges around the tensions that come with socioeconomic disparity have emerged. The question that remains is how these will be managed in the future to ensure the viability of the middle class.

Sources: The New York Times 2016, PewResearch Center 2015

Our goal is to upgrade the life of China's middle class. We all want to live better.

-Guo Guangchang, Chinese billionaire, business magnate and investor

Scarcity: Technological Implications

Innovation

Scarcity is a tale often told which results in negative consequences but in the case of technology, the scarcity of resources is prompting new and innovative ways of managing, saving, and in some cases creating new resources to mitigate growing challenges. Innovation prizes are offered to teams who can come up with unique solutions to societal challenges (e.g., Water XPRIZE). New ways of design thinking are incorporated into engineering to develop products and services that fit the populations in need (e.g., Spring Health's safe water kiosk system in India). Stem cells are being used to manufacture meat products in laboratories without endangering the lives of animals. And in Germany, Wendelstein 7-X experienced recent breakthroughs in nuclear fusion as a way of addressing the world's energy crisis. As natural resources become more scarce, our world faces significant constraints. However, the limitations force us to think more creatively about how to collectively address the resource constraints we face.

Sources: Phys.org 2016, Tech Times 2015

Above all, it is important to point out that we can only maintain our prosperity in Europe if we belong to the most innovative regions in the world.

-Angela Merkel, 8th Chancellor of Germany

Scarcity: Environmental Implications

Sustainability

The limitation of natural resources has led to a significant focus on environmental sustainability, resulting in the rise of new markets, an active lobbyist and political base, and renewed efforts in social responsibility. "Going green" has become a business strategy, and new players specifically targeting environmental concerns have risen in prominence. Consumer watchdog groups such as Greenpeace continue to lobby for change. And businesses have begun to take a more active role. As drought threatens the State of California, companies such as Mattel, a global toy maker, have banded together to purchase recycled water, cut utility bills by 40%, and save 2 million gallons of drinking water per year. Furthermore, Starbucks Corporation recently announced a plan to sell 10-year bonds to pay for sustainability projects, such as programs to support coffee growers. Sustainability has become a global focus, and a goal towards which government, consumers, businesses, and universities work towards collectively to secure a better future.

Sources: The Wall Street Journal 2016,
The Environmental Leader 2016

In the 21st century, I think the heroes will be the people who will improve the quality of life, fight poverty, and introduce more sustainability.

-Bertrand Piccard, Swiss psychiatrist and balloonist

Scarcity: Economic Implications

Qualitative growth

In a market-driven economy, growth is often synonymous with progress and high performance. However, unbridled growth over the past several decades has placed a high toll on our resources and capacity, necessitating more efficient and quality-oriented means of production in order to sustain current levels of consumption. Inextricably linked to the knowledge economy and systems thinking, the need for qualitative growth has spurred greater investments in R&D and innovations in collaborative consumption as our society looks to produce in smarter and more efficient ways. A classic example can be seen in the automotive industry today, where the focus is not necessarily on producing more cars, but on identifying consumer desires, technological advances, innovations in materials, and partnership models that can lead to a more efficient production function for the sector. The focus on qualitative growth emphasizes the importance of the development and evolution of industry, instead of just growth.

Sources: Audi 2015, Automotive World 2014, Automotive World 2014, Institute if Chartered Accountants 2010

Quality means doing it right when no one is looking.

-Henry Ford, American industrialist and founder of the Ford Motor Company

Scarcity: Political Implications

Wealth distribution

As families continue to pull themselves out of the global recession, the stark truth remains that the socioeconomic order has tilted further towards inequity as 1% of the population is now as rich as the rest of the world combined. As the rich have grown richer and the poor have grown poorer, a new global middle class has emerged with a new set of values and priorities which now dictate political discourse. Politicians' platforms globally contain policies and proposals to affect the inequities in wealth. Countries such as Finland, Namibia, and Kenya are now experimenting with a concept called universal basic income, to provide a flatrate income to every citizen, in part to remedy the growing wealth inequities that have emerged as a result of the Great Recession. Results from these pilot schemes have yet to be seen, but the mere fact that socioeconomic programs such as this are taking a front seat on the political scene speaks volumes to the injustices for all that were created as a result of the behavior of few.

Sources: Independent 2016, Independent 2016, BBC 2016

We can't leave people in abject poverty, so we need to raise the standard of living for 80% of the world's people, while bringing it down considerably for the 20% who are destroying our natural resources.

-Jane Goodall, British primatologist, ethologist, anthropologist and UN Messenger of Peace

Blurring Boundaries
the emergence of business eco-systems across traditional silos

Blurring Boundaries: Social Implications

Melting pots

As ICT technologies have permeated the fabric of our lives, we have entered an age of inundation with data and stories which have made decision-making a more challenging feat. While perhaps traditionally, individuals would fall in line with traditional societal expectations with regard to careers, interpersonal relationships, and political beliefs, today there is much more fluidity between one choice and another, leading to a culture of increased autonomy and thoughtful ambivalence. Several examples emerge across the social aspects of our lives:

- The rise of the global workforce, who live in one country, work in another, and consider mobility a critical hallmark of employment.
- The increase in intermarriage across ethnic, religious, and cultural lines.
- The walk between the left wing and the right wing in the political sphere as conviction becomes predicated on candidate trustworthiness and personal emotion.

Sources: Telegraph 2014, HRO 2012

America's a melting pot, all races, cultures, religious choices.

-Tiger Woods, American professional golfer

Blurring Boundaries: Technological Implications

Co-development

As business ecosystems have formed, convening players across traditional silos, a swath of new opportunity in co-development and collaboration has emerged. In part this has emerged because of a blurring of the producer-consumer boundary, as consumer usage data and metrics feed into the design of new products and services versus in the past, when consumers were merely the recipient. Co-creation and open innovation are a critical focus for today's companies, as firms seek to capitalize on both internal and external knowledge to gain an advantage in the market. Consider Airbus Helicopters' new website for its Open Innovation initiative, which is targeted at external organizations for partnerships, or the new collaboration between Fiat Chrysler and Google focused on self-driving vehicles. Regardless of the size of company, co-development represents a powerful opportunity for companies to combine knowledge areas to address complex problems.

Sources: Deloitte University 2015, Deloitte University 2015

Open source isn't about saving money, it's about doing more stuff, and getting incremental innovation with the finite budget you have.

-Jim Whiteburst, CEO at Red Hat

Blurring Boundaries: Environmental Implications

Mass epidemics

An unintended consequence of open borders, free movement, and climate change, mass public health epidemics have begun to increase in outbreak frequency and impact. Blurring boundaries between species create new forms of antibody-resistant bacteria which affect animals and humans in significant ways. Mosquito-borne infections such as Dengue fever, West Nile virus, and malaria are transmitted across borders, often from affected countries in Africa and Asia. The 2009 H1N1 swine flu epidemic, aptly nicknamed for a similar strain of virus found in pigs, resulted in thousands of deaths globally. In 2014, the world faced a severe outbreak of Ebola in West African countries which resulted in the occurrence of the disease on both UK and US soil. Finally, the 2016 Zika crisis in Central and South America has posed significant implications for pregnant women in the region. Mass epidemics have always existed but with increased travel, globalization, and converging trade routes, the risks of outbreak seem to be at an all time high.

Sources: Deloitte 2016

It is a tragedy, at rate at which EBOLA VIRUS is spreading in West Africa. It is a fatal disease in the history of the world. Intensive education (formal and informal approaches) of the citizens of African can help prevent the spread. International cooperation is urgently needed to combat the EBOLA virus.

-Lailah Gifty Akita, Ghanaian

Blurring Boundaries: Economic Implications

Shadow markets

As boundaries have blurred, the line between the traditional sectors and shadow markets has emerged, creating market complexity. A major contributor to the 2008 financial crisis was the emergence of a shadow market in financial services, in which risky loans were repackaged and sold as triple-A bonds. The opacity of these transactions was a critical contributor to the downfall of the big banks. Today, this shadow market has reappeared as new intermediaries provide similar bank-like services (e.g., peer-to-peer lending, mobile payments).

Another example exists in healthcare. With the blurring of boundaries between physical and digital, a range of self-service websites have become popular where consumers can enter symptoms and be diagnosed online for a nominal fee as against participating in the formalized healthcare sector. While these shadow markets facilitate access to sectors otherwise difficult to break into, the limited regulation will be an important factor as to whether they become the new norm.

Sources: The Economist 2016

We need to increase the transparency of shadow banking markets so that authorities can monitor for signs of excessive leverage and unstable maturity transformation outside regulated banks.

-Janet Yellen, Chair of the Board of Governors of the Federal Reserve System (FED)

Blurring Boundaries: Political Implications

Nation state 2.0

In recent years, there have been several political conflicts in which regions are demanding sovereignty as they protest against the political structures and physical borders within which they exist. Some conflicts have been in existence for many years, such as the political disputes between Hong Kong and the People's Republic of China. Some states have succeeded in their political disputes to form new nation states, such as the 2011 creation of the Republic of South Sudan. Others have been a part of formal organization and now seek independence such as Scotland and Great Britain. And still others have fought for independence but cling to a partial state recognition status, such as Kosovo. Finally, there are those disputed regions that hang in the balance, such as Kashmir whose administration is in the hands of three separate nations. As borders overlap and converge, the chaos that ensues in establishing political order remains one of the most pressing international governance issues of our day.

Sources: Deloitte 2016

An independent Scotland—like all countries—will face challenges, and we will have our ups and downs. But the decisions about how we use our wealth will be ours.

-Nicola Sturgeon, fifth First Minister of Scotland

Erosion of Governance
the decline of the traditional world order

Erosion of Governance: Social Implications

Direct democracy

As power is shifting more into the hands of individuals, direct democracy has the potential to severely affect the trajectory of several political and economic debates. Consider the 2016 Brexit Referendum in the United Kingdom, which resulted in a 52% to 48% vote to leave the European Union. Direct democracy played a major role in this referendum as every vote mattered in a race with such tight margins. Voter turnout, education, and age seemed to play large roles in the outcome of the vote. For example, polls showed that across the UK, only 19% of people aged 18 to 24 supported the Brexit compared to 59% of pensioners, leading to a margin of approximately 1.3 million votes. In Switzerland, 50.3% of people voted for a limitation of immigration. The results of the poll vary widely between urban and rural areas. For example, in cities such as Zurich, Genf, and Basel with higher portion of migrants, the iniative to limit immigration was less supported than in rural areas such as Tessin. While in some cases direct democracy mitigates some challenges seen in a representative democracy (e.g., campaign contributions influencing election outcomes), it also creates other concerns about the danger of a majority populace with different priorities and values driving the political and economic outcomes for our societies.

Sources: NewEurope 2016, Time 2016, The Diplomat 2016, Spiegel 2014

Direct democracy can pose risks if people vote on complex topics.

-Joachim Gauck, 11th President of Germany

Erosion of Governance: Technological Implications

Decentralization

Historically, transactions were managed with the use of handwritten accounting ledgers in which the type, amount, and parties of a transaction were captured. Over the years, this private ledger has evolved with the advent of computing. Today, we see the emergence of a decentralized form of governance aided by technology: the blockchain. The blockchain is an open-source distributed ledger system to which an infinite number of parties can contribute, promoting accountability and trust in a system previously managed by a few. While Bitcoin is the obvious example that comes to mind, blockchain technologies have massive opportunities in government, insurance, music, and other industries which involve transactions or digital claims. While the future of blockchain remains unclear, it cannot be refuted that technology is enabling new, decentralized methodologies that will have massive possibilities for the fundamental ways through which our world operates.

Sources: UCL CBT 2016

I do think Bitcoin is the first [encrypted money] that has the potential to do something like change the world.

-Peter Thiel, Co-Founder of PayPal

Erosion of Governance: Environmental Implications

Resource disputes

Land and sea disputes have always existed but as governance models shift and resource scarcity rises, territorial disputes have started to have significant environmental undertones. For example, recently an international tribunal voted that China's claim to territorial rights to the oil and gas reserves in the South China Sea had no legal basis, and that its actions (such as the construction of artificial islands) had endangered the marine environment and interfered with the Philippine's fishing and oil industries. Consider another example on the other side of the world, as Denmark, Russia, Canada, and the United States all lay claim to the North Pole because of the potential for untapped gas and oil reserves. It is unclear how this dispute will play out. What is clear however, is that in regions where territorial boundaries are ambiguous, major world superpowers have taken up infighting to gain access to precious environmental resources, suggesting that control of environmental resources is the indicator of power in today's world.

Sources: The New York Times 2016, The Guardian 2015, BBC 2014

The emergence and development of the new regime of the law of the sea has given rise to dispute between China and the Philippines over maritime delimitation in certain areas of the South China Sea which needs to be resolved through negotiation.

-Liu Zhenmin, Vice Foreign Minister of the People's Republic of China

Erosion of Governance: Economic Implications

Free markets

Support for free market ideologies has started to grow as societies begin to get tired of a series of public policies that are thought to benefit only the rich. With socioeconomic inequities widening, the clamor for a reduction in government intervention is at an all-time high and the desire to return to a free market economy in which the "invisible hand" directs outcomes is gaining traction. Consider the Movimento Brasil Livre (MBL). Driven largely by a younger demographic fighting against Brazil's tradition as a social welfare state, this movement recently walked 600 miles to promote free markets, lower taxes, and privatization, and organized massive demonstrations in São Paulo. Citing Margaret Thatcher as an inspiration, MBL's platform stands in strict opposition to former President Dilma Rousseff's administration and the Workers' Party, and the movement is gaining traction. As socioeconomic tensions continue to grow and led to the impeachment of Dilma Roussef, the story of if and how a return to free market society unfolds in Brazil will be an interesting tale to follow.

Sources: The New York Times 2017, The Guardian 2015, The Economist 2015, Bloomberg 2012

I want completing the single market to be our driving mission. I want us to be at the forefront of transformative trade deals with the US, Japan and India as part of the drive towards global free trade. And I want us to be pushing to exempt Europe's smallest entrepreneurial companies from more EU directives.

-David Cameron, Prime Minister of the United Kingdom from 2010 to 2016

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Erosion of Governance: Political Implications

Alternative governments

As political tensions increase, countries become more nationalistic, and socioeconomic inequities continue to divide nation states, the old models of global governance are being tested and challenged. New, alternative governments are rising to power, capitalizing on the pervasive frustration felt by the middle class and the lack of consensus about collaborative governance. These new governments are primarily non-state actors — regional institutions, activist movements, coalitions, transnational professional networks — which are calling into question whether the global governance bodies of today (e.g., the World Bank and the International Monetary Fund) are in need of reform. The implications of this shift are massive, suggesting a potential new world order not grounded in the shared values and principles that once bound powerful countries together. The erosion of the global governance structures paves the way for a more shaky and unstable future for the world.

Sources: The Economist 2015, Ethic International Affairs 2015

It has been said that democracy is the worst form of government except all the others that have been tried.

-Winston Churchill, Prime Minister of the United Kingdom from 1940 to 1945 and from 1951 to 1955

Displacement
the movement of people, ideas, and challenges across the globe

Displacement: Social Implications

Mass migration

As terrorism and violence in the Middle East and surrounding nations grow, the world is facing a massive international refugee crisis. Half of Syria's pre-war population has been killed or forced to flee their homes and at least 4.7 million Syrian refugees have fled to neighboring countries, with at least 1 million applying for asylum within Europe. The refugee crisis places immense pressure on the social support and political systems of European countries, and in some cases (e.g., Hungary and some Balkan countries), we see nations beginning to consider closing their borders as the pressure mounts. While mass migration due to terrorism is a major social issue, urbanization is also a leading factor affecting the displacement of particular socioeconomic groups. As cities grow in size, gentrification pushes out key sectors of the economy and a massive suburbanization of poverty results. Today's migration issues are thus a critical social challenge that must be addressed to prevent further disintegration of our society.

Sources: MercyCorps 2016, Brookings 2010

Europe and Africa share proximity and history, ideas and ideals, trade and technology. You are tied together by the ebb and flow of people. Migration presents policy challenges—but also represents an opportunity to enhance human development, promote decent work, and strengthen collaboration.

-Ban Ki-moon, Former Secretary-General of the United Nations

Displacement: Technological Implications

Infrastructure shift

The world is becoming more mobile and as a result, the infrastructure needed for our daily lives is shifting from roads and pathways to cell towers and digital networks. Our increasingly technological lifestyles demand constant connectivity, and as a result, bandwidth, reception, megahertz, and signal become more ubiquitous concepts. Internet-based economic activity was expected to reach US $4.2 trillion in the G-20 nations by 2016 and the digital economy was growing at about 10% per year (12-25% in emerging markets) to serve the more than 2.5 billion people connected to the Internet. As investments in digital infrastructure grow, cell phone real estate investment trusts (REITs) have risen in prominence. As a trade-off, investments in physical infrastructure may fall behind because of the priorities placed on the digital world and the returns investors expect to see. As a result, displacement not only affects the type of technologies we use, but where we see investment going as well.

Sources: World Economic Forum 2014

Digital infrastructure is the base for everything — everyone should enjoy adequate connectivity to fully benefit from digital opportunities and from Digital Single Market. For me the adequate level of connectivity is a Gigabit society by 2025.

-Günther Oettinger, European Commissioner for Digital Economy and Society in the EU Commission

Displacement: Environmental Implications

Ecological pressure

Typically climate change and other environmental disasters are viewed as the drivers of displacement, but can also be affected quite significantly by migration patterns. As the world faces massive displacement due to political conflicts, for example, the pressure placed on our environmental ecosystems has risen. Refugee crises concentrate large numbers of people, resulting in strain on natural resources. For example, refugee camps have resulted in major deforestation in order to meet survival needs as trees are cut down for firewood and habitat formation. Land degradation and soil erosion occurs due to overpopulation. Food scarcity also abounds as wild game, fruit, herbs, and other plants are rapidly consumed, and often unsustainable groundwater extraction and water pollution occurs. While migration is typically thought of as a social or political issue, the long-term effects on our environment will be important as the challenges grow in magnitude.

Sources: Population Reference Bureau 2014, United Nations Environment Programme 2007

Some global hazards are insidious. They stem from pressure on energy supplies, food, water and other natural resources. And they will be aggravated as the population rises to a projected nine billion by mid-century, and by the effects of climate change. An 'ecological shock' could irreversibly degrade our environment.

-Martin Rees, British cosmologist and astrophysicist

Displacement: Economic Implications

Global supply chains

The liberalization of economic policies over the past several decades has contributed to a relaxing of trade barriers and free movement of labor and capital across boundaries, leading to a more rapid diffusion of ideas and cultures across political and geographic borders. As supply chains become increasingly international, countries have started to locate different stages of the production process in different locations. This shift has introduced new risks into ensuring quality and standardization in the production process. Human trafficking, black markets, and labor cost play a more significant role as companies make their supply chains increasingly cross-border. For example, in 2014, 36% of the fastest-growing exporters were based in countries rated as high or severe risk for human rights or environmental violations. The globalization of today's supply chains emphasizes the importance of prediction and forecast models as the impact of external trade shocks, input price variations, and natural disasters is magnified.

Sources: Deloitte 2016, International Monetary Fund 2014, World Economic Forum 2012

In Globalization 1.0, which began around 1492, the world went from size large to size medium. In Globalization 2.0, the era that introduced us to multinational companies, it went from size medium to size small. And then around 2000 came Globalization 3.0, in which the world went from being small to tiny.

-Thomas Friedman, American journalist

Displacement: Political Implications

Allocation conflicts

As international wars and political conflict dominate the scene in many developing countries, resource fighting has led to the displacement of millions of residents. Consider the Eastern Congo, which has been undergoing a massive political conflict since the early 1990s, facing two international wars and multiple militia invasions. The value placed on its untapped raw mineral ores is around US $24 trillion and the political infighting to gain access to these resources has displaced millions of Congolese over the last several decades, who seek asylum in neighboring countries. The pressure placed by displacement on political relationships therefore mounts as refugees seek access to social services, state institutions, land ownership, and/or employment opportunities. The cycles of war and violence that are perpetuated by corrupt political constructs is thus exacerbated by further displacement of residents who seek asylum and peace in neighboring conflict countries.

Sources: UN Refugee Agency 2016, United Nations 2016, Los Angeles Times 2014, BBC 2013

We don't know if the diamonds are coming from the Central African Republic where there is a war, or from artisanal mines in Sierra Leone where people are paid next to nothing.

-Ian Smillie, Chair, Diamond Development Initiative

Concluding Words

As you reflect on the drivers, mega-trends, and stories of the future, let's recall the purpose of this book. We present these ideas with one purpose in mind. That is, we hope these points help you to start thinking about the factors which will shape the future of your organization, or your future as an individual. They are examples, and should not be confused with predictions. You will need to refine and update this list according to yourspecific circumstances.

Please keep in mind that the drivers presented here will interact in many unpredictable ways in the future. This interaction will produce distinct scenarios. And it is precisely these scenarios which will determine your position in the future – how the future feels to you and which strategic options you will have. Hence, the ideas presented in this book are only the starting point of your particular story.

Now that you have made the first step, you should explore how your journey might play out. To do this, may we recommend scenario design?

What stories of the future are top of mind for you?

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About the authors

Florian Klein is an advisor, corporate strategist, and future thinker with extensive experience in providing strategic counsel to senior decision-makers at leading multi-national corporations and governments across Europe and globally. He is an expert in facilitating the creation of robust strategies today, in the light of an uncertain tomorrow. Florian founded the Center for the Long View, which is Monitor Deloitte's global center of excellence for scenario design.

Megha Bansal is a former senior consultant with Deloitte's Strategy practice with over five years of experience working with public sector, not-for-profit, and commercial clients on strategy projects, assessing emerging trends to understand market disruptions and business model innovation. Megha also supported Deloitte's US CEO Program on research initiatives relating to CEO-led strategic transformations. Currently, she is pursuing an MBA at The Wharton School at the University of Pennsylvania.

Julian Wohlers is a former senior consultant with Deloitte's Strategy & Operations practice. Before joining Deloitte, Julian worked in the consulting department of a major German investor. During his professional life, Julian supported and led several projects in different European countries and industries. The projects included procurement initiatives, process optimization/ digitalization, and business transformation programs. Furthermore, Julian was part of Deloitte's Center for the Long View where he was developing long term strategies for international clients based on the scenario design approach.

The CLV focuses on topics of strategic relevance that often transcend specific industries. Building on our rich heritage and world-class reputation in this field, we have adapted the methodology to the client needs and the technical possibilities of the 21st century. We have developed customized artificial intelligence and online collaboration tools to dramatically increase the quality of scenario planning.

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Contact

Florian Klein
Head of Scenario Design | Center for the Long View | fklein@deloitte.de

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