

## IDC FutureScape

# IDC FutureScape: Worldwide Utilities 2019 Predictions

Roberta Bigliani  
Gaia Gallotti

Jean-François Segalotto  
Emilie Ditton

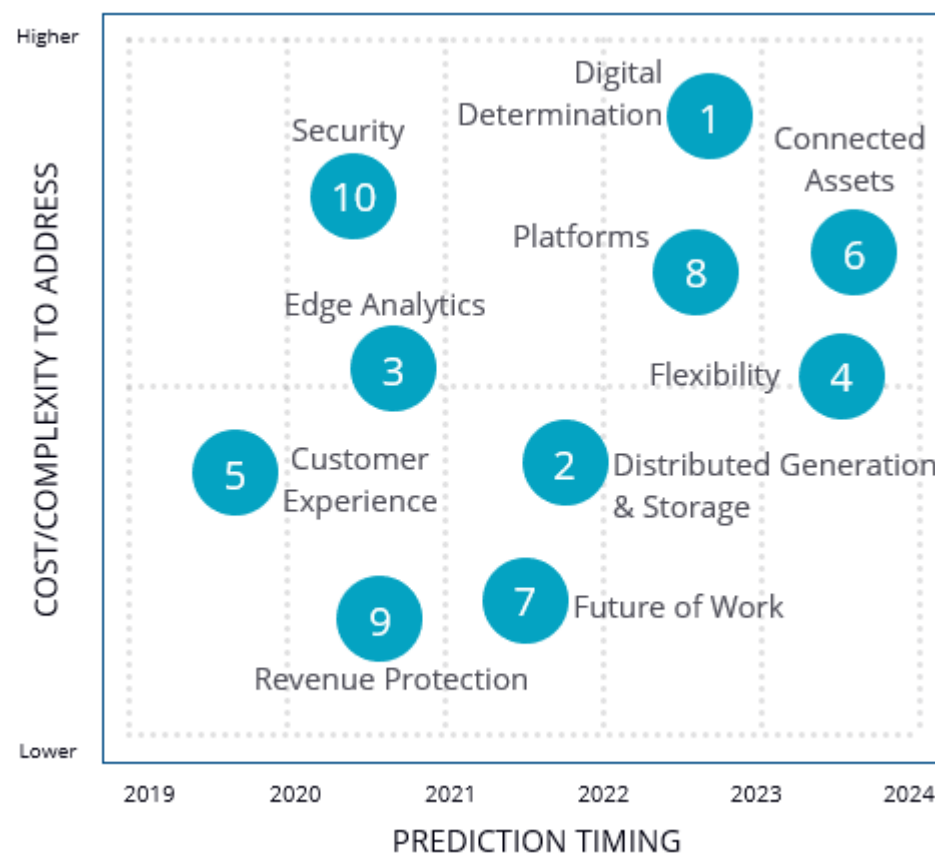
Phevos Skolidis  
Nigel Wallis

John Villali

## IDC FUTUREScape FIGURE

FIGURE 1

### IDC FutureScape: Worldwide Utilities 2019 Top 10 Predictions



Note: Marker number refers only to the order the prediction appears in the report and does not indicate rank or importance, unless otherwise noted in the Executive Summary.

Source: IDC, 2018

## EXECUTIVE SUMMARY

---

Utilities across the world are radically transforming their businesses. This is happening despite different regulatory regimes and across the diverse electricity, gas, water, and waste businesses. For instance, technology is changing how energy is produced, transported, consumed, and conserved. Customers are not just raising experience expectations – they are becoming prosumers with an active role in energy markets. New business models are emerging, thus requiring utilities to go beyond the traditional commodity business – packages combining distributed generation and energy storage at home is just one among the several examples of how utilities' mission is evolving. Digital disruptors are circumventing industry entry barriers, and utilities are being reborn in 3D: decentralized, divergent, and digital.

The outlook is presented through 10 predictions that make up, in IDC Energy Insights' view, the framework for IT and line-of-business (LOB) decision makers and influencers' technology-related initiatives in the year ahead (Figure 1). IDC Energy Insights' top 10 predictions for worldwide utilities for 2019 are:

- Prediction 1: Digital determination. By 2022, 20% of digitally determined utilities' revenues will come from new products and services.
- Prediction 2: Distributed generation and storage. By 2021, 55% of utilities will derive 20% of gross margin on average from combined distributed generation and storage packages for prosumers.
- Prediction 3: Edge analytics. By 2020, 65% of power, gas, and water companies will have invested in edge analytics/computing as they strive for operational excellence and the best optimization of their assets.
- Prediction 4: Flexibility. By 2023, 65% of electricity companies will have invested in digital technologies and platforms to support flexibility services, thereby activating a load potential of up to 35% of installed capacity.
- Prediction 5: Customer experience (CX). In 2019, utilities/energy retailers will double their investments in artificial intelligence (AI) to improve convenience, customization, and control for clients, thus enhancing customer experience.
- Prediction 6: Connected assets. By 2023, utilities will have digitally connected 75% of their critical assets to predict and prevent equipment failure and prescribe best maintenance options to optimize and extend asset life cycles.
- Prediction 7: Future of Work (FoW). By 2021, 35% of utility CEOs will have access to an intelligent personal assistant at work.
- Prediction 8: Platforms. By 2022, 55% of utilities will use a core digital platform to automate, optimize, and orchestrate assets, business processes, customers, and employees, thus improving efficiency and business outcomes.
- Prediction 9: Revenue protection. By 2020, artificial intelligence applied to revenue protection will enable water, gas, and electricity companies to reduce revenue losses by 70%.
- Prediction 10: Security. In 2020, managing the risk of operational technology/IT cyberattacks and data privacy compliance will cost utilities an average of 1% of annual turnover.

This IDC study provides the outlook of IDC Energy Insights' analyst team for the worldwide utility industry for 2019, as well as the planning horizon for the next five years.

"Utilities are facing challenges in their transformation journey. They need to overcome *siloed initiatives* by integrating and orchestrating change across the organization. They need to strengthen *weak road maps*, which are responsible for the transformation deadlock. They must close their *talent gap* and overcome their *inability to scale* up innovation. Finally, they need to introduce new sets of *key performance indicators (KPIs)*. This journey is neither easy nor painless, but if they will do it right, they will deliver value to customers, employees, shareholders, and society," said Roberta Bigliani, vice president, IDC Energy Insights.

## IDC FUTUREScape PREDICTIONS

---

### Summary of External Drivers

Many external factors have a direct or indirect impact on utilities' business. These factors come from the political, economic, social, technological, environmental, legal, and business realms. IDC Energy Insights has identified the main drivers that set the context and conditions for designing and executing utilities' IT and operational technology strategies, tactics, and operations. Collectively, these drivers lead to the 10 predictions discussed in the sections that follow:

- The Race to Innovate – Speed of Change, Delivery, and Operations Separates Thrivers and Survivors
- Platforms, Platforms, Platforms – Industry Competes for Innovation at Scale
- Sense, Compute, Actuate – Turning Data into Value
- New Nature of Risk – Innovation Requires New Thinking in Security and Risk Management
- Emerging Autonomy – Learning to Live With AI
- Rising Customer Expectations – More Convenience, Customization, and Control
- The Future of Work – Bridging the Digital Talent Gap

For more details, refer to the *External Drivers: Detail* section at the end of this document.

### Predictions: Impact on Technology Buyers

#### ***Prediction 1: By 2022, 20% of digitally determined utilities' revenues will come from new products and services***

Utilities across the world are radically transforming their businesses. This is happening despite different regulatory regimes across electricity, gas, water, and waste businesses. For instance, technology is changing how energy is produced, transported, consumed, and conserved. Customers are not just raising experience expectations – they have become prosumers, taking an active role in energy markets. New business models are emerging. *Digital* is a key constituent of the utility r/evolution.

IDC classifies organizations in two macro categories – *digitally distraught* and *digitally determined* – 41% of utilities now belongs to the latter. Digitally distraught utilities are either running digital as an impromptu effort, running multiple digital strategies initiated by the line of business, or operating with a short-term perspective. It's no surprise that these organizations are distraught. It is difficult to accomplish a major transformation when efforts are not well orchestrated. On the other hand, a digitally determined utility has digital embedded in its enterprise strategy. It does not have a separate digital strategy, since digital *is* the strategy.

Digitally determined utilities will be best positioned to evolve their businesses, adding new business models and revenue streams, as well as carving efficiencies out of their core operations, with *data* as the pillar of innovation. With the traditional commodity business becoming progressively unsustainable, utilities need to redefine their role to be "relevant."

### Associated Drivers

- The race to innovate – speed of change, delivery, and operations separates thrivers and survivors
- Rising customer expectations – more convenience, customization, and control

### IT Impact

- Data-driven innovation, agility, and speed of execution will be the new normal for new revenue streams' testing and deployment. IT will be challenged to integrate innovation and deliver projects with a three-to-four-month cycle.
- IT will be required to ground business digital transformation, actively contributing to remove roadblocks and providing the right set of digital skills.
- A new set of IT solutions need to be provided to manage new businesses. IT will have to consider whether to adapt what is already available and deployed for the traditional business or whether to adopt new solutions. Cloud will become mainstream.

### Guidance

- Encourage a cognitive-based culture in which decision-making is supported by facts and evidence. Adopt agile techniques, and develop an enterprise road map that is *modular* (i.e., breaks down effort into chunks delivering immediate business value), *scalable* (i.e., thinks through how the road map will evolve), and *extendable* (i.e., accommodates changes as they unfold).
- Develop a digital platform that integrates digital innovation and enterprisewide systems together in a single platform. The platform enables digital products, services, and experiences while modernizing and integrating the internal IT environment. Opt for non-traditional sourcing approaches, including gigs marketplaces, to close the digital skills gap.
- Consider cloud and as-a-service procurement models to quickly provide capabilities and facilitate the ability to scale.

### ***Prediction 2: By 2021, 55% of utilities will derive 20% of gross margin on average from combined distributed generation and storage packages for prosumers***

Utilities will increasingly need to be service providers, offering to manage a bidirectional flow, not only for consumers that want and can produce energy ("prosumers"), but also offering battery storage services for prosumers equipped with energy storage, also known as "prosumagers." This constitutes a shift away from utilities' traditional commodity provider role and inherent business model.

After all, utilities are in a unique position to offer additional distributed generation and storage products and services as a natural extension of their businesses – not doing so would push potential prosumagers to look for other providers and risk utilities' losing out on new revenue streams, and more dramatically, complete customer loss. Their position in the market also enables utilities to offer financial support mechanisms to customers wishing to invest in distributed generation and battery technologies but might not have the financial resources for the upfront cost. This not only opens up possibilities for cross-selling and driving revenue generation, but also enables utilities from an operational perspective to make significantly better use of storage for the purpose of grid stabilization.

The additional layer of complexity owed to the presence of physical infrastructure at the client's house (or premise in the case of non-residential customers) will inevitably have utilities expand emphasis on customer experience, lest they end up with backfire from early adopting, yet disappointed customers.

The continuous decrease in the price of photovoltaic panels and the even more marked fall of battery prices during the past years have not only paved the way for the emergence of prosumers, but also brought about an even more impactful change – the sector's decentralization. Prosumers will attract utilities' attention as the forerunners of a trend that is here to stay, and which constitutes a true paradigm shift.

### Associated Drivers

- The race to innovate – speed of change, delivery, and operations separates thrivers and survivors
- Rising customer expectations – more convenience, customization, and control
- Sense, compute, actuate – turning data into value

### IT Impact

- Additional IT capabilities along the entire energy value chain will be essential for maintaining the grid in balance at any given time. Smart meters' ability to perform net metering, Big Data used in grid management for short-term predictions of weather conditions, and predictive maintenance of power plants thanks to the use of IoT are prominent examples.
- To increase grid stability and contribute to improved customer segmentation for marketing purposes, it is of paramount importance to extract value from additional data streams generated from storage and distributed generation. This will impact utilities' strategies and infrastructure.
- IT departments' collaboration with LOBs will have to be further intensified, as part of an orchestrated attempt combining both digital and physical assets. A sophisticated use of data will only be made possible by an integrated approach covering the provision and maintenance of storage and generation assets.

### Guidance

- Consider a pricing policy meant to (partially) bear the burden of high upfront investments for distributed generation and/or storage capacity, particularly in the absence of subsidies or other forms of incentives.
- Design an end-to-end supply chain for new products and packaged offerings that consider implications on the customer journey. New products, services, and packaged offerings give utilities and energy retailers the opportunity to design internal processes to support the customer journey and not vice versa, which is usually the case for their commodity offerings.
- Create awareness on the benefits of a combined installation of small-scale generation and batteries to ensure a successful market outreach and related financial gains.

### ***Prediction 3: By 2020, 65% of power, gas, and water companies will have invested in edge analytics/computing as they strive for operational excellence and the best optimization of their assets***

Edge analytics and computing is becoming a higher priority for worldwide power, gas, and water utilities. The ability to monitor, analyze, and act on data from devices in the field will become the standard to react in a timely manner to operational events and inefficiencies. Using smart meters and sensors and applying cognitive computing and analytics at the edge, utilities will vastly improve their operational performance.

Edge analytics and computing will change traditional approaches to asset maintenance for utilities. The collection and analysis of real-time operational data will enable utilities to observe asset operation anomalies in advance of asset failures, which will increase asset performance while minimizing downtime. Additionally, edge computing and analytics can improve the productivity of utility field workers by providing data such as operational performance data, which will lead to operational excellence and utility customer satisfaction. Edge computing and analytics will help minimize service interruptions, improve outage restoration times, and provide timely information, communication, and interaction with utility customers.

### Associated Drivers

- Sense, compute, actuate – turning data into value
- Emerging autonomy – learning to live with AI

### IT Impact

- Increasingly vast amounts of data will be stored for processing at the edge.
- Integration of security tools for edge computing and analytics will be needed to mitigate security concerns around utility operational assets.
- Edge computing and analytics will require IT/OT integration, creating close collaboration between operations/line of business and IT departments to achieve desired business outcomes.

### Guidance

- Consider a hybrid on-premise/cloud approach when implementing edge computing capabilities, as cloud will provide the scale needed to handle the massive amounts of data generated by IoT devices.
- Ensure that your edge network gateway can differentiate between data best sent back upstream and critical operational data sets that can be computed and analyzed at the edge to make quicker decisions in real time.
- Integrate data tools as close as possible to sensors in the field to minimize latency issues, and introduce a security-by-design approach.
- Develop and adopt agile storage architectures as well as distributed and converged IT/OT computing technologies with IoT-specific networks.

### ***Prediction 4: By 2023, 65% of electricity companies will have invested in digital technologies and platforms to support flexibility services, thereby activating a load potential of up to 35% of installed capacity***

The energy transition is not only changing how we generate and use electricity, but crucially, also boosting our ability to conserve it, changing the way we operate networks and balance systems.

Non-dispatchable renewables (wind and solar) already represent a quarter of power generation capacity in Europe and more than 15% in China. By 2030, IDC Energy Insights expects them to generate 20% or more of all electricity in Europe, China, India, and parts of the U.S., soaring to almost 30% in Australia and 40% on the U.S. West Coast. While they have only played a minor role to date, "negawatts" and storage are becoming important elements of renewable systems. Two decades from now – with electric cars and heat pumps adding to the mix – flexibility will be a hard currency in most of the world's electrical systems, and it will be difficult to imagine power supply without it.

While the past decade was one of technology development, utilities have now started putting in place the building blocks of their flexibility plays, from demand-side management (DSM) and vehicle-to-grid (V2G) technology to full-fledged distributed energy resources management system (DERMS). Aggregation and virtual power plants (VPP) offer electricity companies a way to add grid services to the revenue mix, increase protection from price peaks, and offer distributed energy resource (DER) owners access to the market. System operators must oversee, use, and coordinate flexibility in their grids as part of their active management responsibilities and as a tool to operate cost efficiently. VPPs, for instance, can make DER and loads more predictable and dependable for the system.

Recent field work by IDC Energy Insights confirmed that over 80% of utilities have either launched or are planning to establish a flexibility services business within two years, and that over a third believe flexibility will be a critical value contributor to their retail operations by 2025.

### Associated Drivers

- Platforms, platforms, platforms – industry competes for innovation at scale
- Sense, compute, actuate – turning data into value
- Rising customer expectations – more convenience, customization, and control

### IT Impact

- Offering flexibility services require that utilities develop a mix of IT and OT capabilities that include, as a minimum, the ability to enroll prosumer and run orchestrated demand response programs as well as the ability to operate in both the wholesale and retail markets.
- Active demand aggregation and VPPs require that these capabilities are significantly expanded through IT-OT integration and IoT. Utilities will need to be able to run device-based energy programs, "seeing" and managing physical and data assets that belong to third parties, and operating ever smaller and more frequent transactions in near-real-time. Dedicated platforms provide the link between the markets and behind-the-meter resources.
- Ultimately, flexibility as a service will emerge as a commercial and technological construct where utilities manage and control energy assets for their customers (and in some cases, even supply and own them). Here, flexibility transactions are transparent for the end user and their proceeds are embedded in the service contract, while the asset is fully integrated in the utility's back-office, both physically and financially.

### Guidance

- Consider the entire vendor ecosystem to equip you with the required mix of IT and OT capabilities. Commercial software and hardware exist across all needed capabilities, but the range of functionalities vary widely across solutions and vendors. Most software is available in the cloud, which helps develop a road map in which capabilities are added incrementally.
- Select the right partners. Flexibility markets vary nationally and regionally, so localization is critical, and one solution will most likely not fit all target markets. Since many countries are currently in the process developing or opening their flexibility markets, selecting a vendor that is close to the regulatory process can make all the difference.
- Pay special attention to integration. Flexibility sits at the intersection of several processes, such as billing, energy trading and risk management, customer experience management, and energy data management.



- Consider blockchain and distributed ledgers as lightweight options for automating the transaction layer of demand response and VPPs. These technologies offer a new paradigm for data access security, integrity, and protection that can benefit both the consumer and the industry, and several pilots have been carried out over the past couple of years.

***Prediction 5: In 2019, utilities/energy retailers will double their investments in artificial intelligence to improve convenience, customization, and control for clients, thus enhancing customer experience***

Customer experience is a top priority for everyone, including utilities and energy retailers across the globe, independent of whether the market has been liberalized or continues to operate in a regulate regime. As more consumer purchasing power shifts into the hand of more tech-savvy generations, utilities and energy retailers are increasingly investing in technologies that can best support them to cater to these customers as well as trim spending, and artificial intelligence is one such technology.

IDC Energy Insights research revealed a strong desire for utility and energy retail customers to move from more traditional communication channels (e.g., phone calls) to modern communication channels (e.g., mobile messaging applications). However, regardless of the communication channel, there is an abundance of use cases for leveraging artificial intelligence to support the customer experience with convenience, customization, and control. For instance, considering phone calls – which continue to force utilities to bear significant costs for call centers – artificial intelligence can be leveraged to listen to the content and tone of conversations to not only provide real-time support to customer service representatives, but also to gather insight into the general sentiment of customers toward the company. This enables a utility/energy retailer to preemptively carry out personalized marketing campaigns to support favorable opinions of the brand.

Considering more modern, and less expensive, communication channels such as mobile messaging applications and text messages, specialized chatbots support utilities and energy retailers provide their clients with convenience, customization, and control. It should be noted that additional IDC Energy Insights research revealed that an overwhelming majority of customer contact was driven by billing inquiries, so not a particularly complex artificial intelligence augmented messaging would be needed to meet most customer demands.

As utility and energy retailers expand into new revenue streams, such as selling or leasing photovoltaic panels or energy storage systems, or both as a package, it will be fundamental for these companies to provide customer experience comparable to those of customer-centricity leaders. Otherwise, the possibility to sell beyond a commodity will not be grasped.

### **Associated Drivers**

- Sense, compute, actuate – turning data into value
- Rising customer expectations – more convenience, customization, and control
- The Future of Work – bridging the digital talent gap

### **IT Impact**

- Since AI effectiveness depends heavily on high-quality (and diverse) data inputs, IT will need to invest in technologies to ingest, profile, validate, and cleanse multiple streams of high-volume data that feed machine learning and cognitive apps.
- Selecting digital services and apps without "AI inside" will put your organization at risk of falling behind competitors' pace of innovation. Talent, both AI engineers and data scientists, will be needed to support artificial intelligence initiatives.
- Fear of job displacement can make employees resistant to adopt AI.



## Guidance

- Select a few targeted use cases for artificial intelligence that could achieve quick but significant gains for your organization. Representatives from all departments that support customer experience should be brought to the table, and then a neutral party should decide which use cases to tackle first.
- Consider adopting an artificial intelligence layer from the beginning when deploying a new solution or communication channels. Having to go back and add the artificial intelligence layer on top at a later stage will prove more time consuming, and potentially costlier.
- Communicate internally and transparently on the use of artificial intelligence to avoid employee resistance for fear of job displacement, and to showcase the concrete benefits employees may derive from these investments.

### ***Prediction 6: By 2023, utilities will have digitally connected 75% of their critical assets to predict and prevent equipment failure and prescribe best maintenance options to optimize and extend asset life cycles***

Digitally connected utility assets will become the foundation of optimizing a utility's critical infrastructure. IT/OT convergence will create the ability to build tools that can provide a single accessible data repository for an asset's or fleet of assets' maintenance, regulatory, and operational data. This data can be utilized across an organization to improve overall efficiencies and the financial performance a utility's assets. Additionally, digitally connecting assets can help organizations meet key performance indicators in the areas of reliability and regulatory compliance. By digitizing assets, owners and operators of these assets can reap benefits of longer periods of continuous operation without unplanned outages, greater productivity, and a path to a more sophisticated asset strategy, which will produce the best operational and financial results and business outcomes for an organization.

Connected assets can use predictive analysis to get ahead of when an asset is in critical need for maintenance using analytic insights derived from anomalies in operational data. Connected assets enable predictive and prescriptive maintenance, which in the end can save enormous amounts of costs on unnecessary maintenance, labor costs, and parts. Digitally connecting assets can minimize downtime and increase an asset's performance and output, while ultimately extending asset life cycle and improving overall power system reliability.

## Associated Drivers

- Sense, compute, actuate – turning data into value
- Emerging autonomy – learning to live with AI

## IT Impact

- The integration of separated IT and OT systems will enable all asset data to be collected, structured, and analyzed in a single repository that is accessible across an enterprise, giving access to analytics and insights to all invested stakeholders within a utility, in efforts to fully optimize assets.
- Mobility will enable collaboration and make communication seamless between different stakeholders and active participants in a utility's connected asset strategy such as field technicians, plant operators, senior management, finance, and regulatory personnel.
- Continuous learning from real-time operational asset data will help stakeholders in departments across a utility to quickly mitigate potential asset issues while balancing associated risks, costs, and benefits related to the utility's asset management strategy.

## Guidance

- Implement machine learning capabilities at the edge of connected assets to ensure IoT applications respond quickly in advance of unplanned outages and events.

- Leverage advanced analytics from data collected from connected assets to gain insight from large operational data sets. Advanced analytics can help reduce complexity with the goal of accelerating the speed of prescriptive asset maintenance by taking advantage of actionable intelligence gained from analysis.
- Consider connecting all critical infrastructure and implementing an asset performance management strategy across all operational assets, even though generation should be one of the highest priorities for utilities. If possible, connected transmission, distribution, and substations can also benefit from a strategic asset performance approach, which will extend their life cycles and improve the performance of assets across the utility value chain.

### ***Prediction 7: By 2021, 35% of utility CEOs will have access to an intelligent personal assistant at work***

Technology is changing the concept of work as we know it. Artificial intelligence is reshaping the way work is performed and by whom. In the digital era, business processes are seeing the collaboration between humans and machines to augment and automate work, while creating new opportunities for value creation within organizations.

AI will progressively increase its impact on managerial processes, and decision-making will become more fact-based. Predictive analytics is becoming mainstream and will transform into prescriptive. Natural-language-based interfaces are continuously improving. At the same time, the C-level is more technology-savvy and will get used to interacting at home with intelligent personal assistants that they will challenge their IT departments to bring this same approach into the work environment. Based on IDC Tracker data, more than 800 million of smart assistant platforms will be sold in 2019. Business application of smart assistants is increasing, for instance, to quickly set up personal environments in virtual offices.

#### **Associated Drivers**

- Emerging autonomy – learning to live with AI
- The Future of Work – bridging the digital talent gap

#### **IT Impact**

- IT will be challenged to integrate consumer-technology-style applications with enterprise systems, requiring new skills and capabilities.
- Data utilization, governance, and security will be key areas of attention.
- Silos of innovation will need to be overcome to move toward the creation of what IDC defines as the "intelligent core." This is the platform in which algorithms, the code, models live, and which enables companies to glean the insights and actions from the data.

#### **Guidance**

- Use a borderless approach to acquire the talent needed to deploy these solutions. Traditional recruiting and sourcing could fall short to provide the desired innovation.
- Make sure that IT is not only focusing on technology acquisition, deployment, configuration, and support, but is also considering security, privacy, and compliance implications.
- Focus on building an enterprise platform, a digital core that integrates digital innovation and enterprisewide systems together in a single platform. The platform enables digital products, services, and experiences while modernizing and integrating the internal IT environment. It's important to realize that the data itself does not distinguish the company – what the company does with the data is what distinguishes it. How you build your intelligent core will determine your IP.

***Prediction 8: By 2022, 55% of utilities will use a core digital platform to automate, optimize, and orchestrate assets, business processes, customers, and employees, thus improving efficiency and business outcomes***

As utilities take on digital transformation, they will invest in core digital platforms that will integrate data and processes across the organization to improve efficiencies and business outcomes. As the industry faces disruption, utilities will need to transform themselves into digital and software-driven enterprises. A core digital platform will provide utilities with opportunities to improve customer satisfaction, create new products and services, and run operations more efficiently.

A true core digital platform will have the ability to touch all business units, employees, and customers. At the core of a digital platform are four pillar technology areas: Big Data and analytics, cloud, mobile, and social. These four technology areas are foundational elements to a digital enterprise. These are technologies that will accelerate digital transformation, helping utilities create a solid core digital platform. Technologies and innovation accelerators such as IoT, cognitive/AI systems, next-generation security, 3D printing, augmented and virtual reality, and robotics will become central in a utility organization's efforts to create a digital platform. These pillar technology areas and Innovation Accelerators will enhance a utility's core digital platform, creating better digital experiences both internally and externally (i.e., to customers).

### **Associated Drivers**

- Platforms, platforms, platforms – industry competes for innovation at scale
- Sense, compute, actuate – turning data into value

### **IT Impact**

- A quality core digital platform will have IT and OT priorities aligned. In an environment in which IT and OT are tightly integrated, IT will have a new focus on business outcomes in addition to the traditional roles of IT. Within a digital core platform, IT's performance will also be measured on business priorities that positive revenue or decrease costs.
- IT's fundamental disciplines of security around identity, trust, vulnerability, and threat management will not change when creating a digital core platform. The challenge will be to apply these fundamental security principals throughout the entire enterprise and ecosystem, protecting all service areas of the new platform.
- A core digital platform will need to support core data processing at scale, master data management, data governance, and data security.

### **Guidance**

- Communicate clear goals with all key stakeholders invested in creating the digital platform throughout the enterprise or with all departments that will be impacted.
- Consider the options of on-premise, cloud, or a hybrid approach when creating a digital platform. A cloud-based approach can result in faster implementation with better cybersecurity than a traditional on-premise warehouse approach.
- Prioritize your digital platform's data quality and governance. Primary data quality measures are accuracy, integrity, consistency, completeness, validity, timeliness, and accessibility. The data governance of the digital platform should encompass all systems within the utility's enterprise.

### ***Prediction 9: By 2020, artificial intelligence applied to revenue protection will enable water, gas, and electricity companies to reduce revenue losses by 70%***

With energy theft and non-revenue water greatly impacting utilities' books, especially in the developing world, artificial intelligence can significantly contribute to the detection of anomalous usage patterns that – combined with data on customer behavior – may signal illicit behavior. Improved revenue protection will allow for better pricing of commodities, since consumers will not have to implicitly carry the burden of covering electricity theft. Developing countries in particular would benefit from affordable prices per kilowatt-hour. On the other hand, it is primarily the developed world that could address the problem of aging water infrastructure and leakages that increasingly jeopardize the sustainability of systems. The complete digitization of processes exclusively pertinent to the sector (e.g., metering) makes further case for extensive AI usage.

In addition, energy generation assets will see both their maintenance and operation affected by this technology, which has already proven useful in increasing uptime of complex and costly equipment such as gas turbines and in greatly improving resource planning needed in wind farms. Both tasks lead to significant revenue losses for operators, which can only benefit from the wealth of data at their disposal.

Lastly, insights from this data will also enable them to preemptively alter the very structure of the customer journey, again to achieve the goal of revenue loss reduction.

#### **Associated Drivers**

- New nature of risk – innovation requires new thinking in security and risk management
- Emerging autonomy – learning to live with AI

#### **IT Impact**

- To enable meaningful use of AI, data quality and completeness must be high, and uninterrupted availability is fundamental, as well as having a single source of truth (SSOT).
- Advanced IT skills, which are often external to utilities' workforce, will prove necessary as the value and amount of ingested data increases. This will impact IT talent sourcing strategies.
- Agility will be key not only as far as utilities' IT departments are concerned, but also regarding other domains, predominantly marketing and billing. After insights based on data are gained, the challenge lies in transforming them into real actions affecting the customer journey of current and future customers.

#### **Guidance**

- Ensure a reliable IT infrastructure capable of providing the quality and quantity of input required to generate the right insights is in place.
- Augment utilities' IT skills with a hybrid workforce, blending full-time employees and contractors working on rapidly solving technological challenges, at least in the short term.
- Foster dynamic and flexible behavior, which would have to be supported by LOBs, for AI to be leveraged at full scale. Establish a coherent, sustainable process aimed at integrating in your marketing strategy in general, and in the customer journey in particular, the conclusions drawn from the use of AI.

***Prediction 10: In 2020, managing the risk of operational technology/IT cyberattacks and data privacy compliance will cost utilities an average of 1% of annual turnover.***

Utilities are faced with a double challenge – protecting customers' personal data and securing operational technology from potential threats that could affect physical infrastructure. Since energy is considered "critical" infrastructure, its security is of special interest, not least because of external, state-sponsored cyberattacks. Consequently, the cost of addressing this challenge will continue to rise in the forthcoming years. On the privacy front, data leakage and its prevention have and will continue to draw the attention of regulators worldwide, in line with the new sensibility regarding privacy. As utilities venture to the smart home domain as well as residential energy production and storage, utilities will also have to secure and protect access to personal data. The prospect of heavy fines will force utilities to be cautious and accept high compliance costs in the short term, in exchange for lowering the probability of being held liable for inadequate security measures. Regulatory compliance in general has topped utility executives' agendas for years, above that of the single IT department, and it will continue to be an area of zero risk tolerance.

Year after year, the impact of personal data breaches on customers' trust on service providers has been more and more devastating. Utilities are no exception to that trend, though to a lesser extent thus far. As this traditionally asset-centric industry is evolving toward increased data sophistication, the risk of becoming the target of cyberattacks is also set to become higher, and the same applies to corresponding fines. Strategic foresight regarding the IT and business sides of the problem will therefore prove invaluable.

#### **Associated Drivers**

- New nature of risk – innovation requires new thinking in security and risk management
- The Future of Work – bridging the digital talent gap

#### **IT Impact**

- Enhancing agility in utilities' IT is key to responding to the threat of cyberattacks, whose very nature is built atop the ability to be unpredictable.
- IT risks will not only involve asset operations – they will also include attacks aimed at customers' personal data. Cyberdefense strategies need to account for that shift.
- Rapid changes in regulatory compliance and OT/IT risks due to cyberattacks will have immediate implications on the need for attracting and retaining talent with highly specific skills.

#### **Guidance**

- Extend focus from defense against cyberattacks and operations to privacy issues for full compliance with regulation on personal data protection.
- Put in place an effective crisis management strategy for timely response to breaches or cyberattacks. The bar should be set higher than simply meeting minimum regulatory requirements.
- Work with cyberattackers to fully comprehend their tactics and methods before deploying them in your defense. Closing the generational skills gap will be essential if utilities are to keep abreast of cyberthreats and data privacy evolution. This will help also in handling the talent issue.

## ADVICE FOR TECHNOLOGY BUYERS

---

Electricity, gas, water, and waste companies are in the midst of their transformation journey. The sense of urgency may differ across the world in relation to economic and regulatory situation. Nevertheless, these companies face various common challenges. *Siloed initiatives* (i.e., the lack of transformation governance) reflect the inability of companies to govern and orchestrate disparate change initiatives across the organization. *Limited expertise* in terms of data scientists, IT architects, coders, and digital strategists are some of the profiles utilities expect to have trouble sourcing in the immediate future. *Weak road maps* are responsible for transformation deadlock – while a growing number of utilities have built a vision around transformation, several seem to struggle in prioritizing the use case journey. The *inability to scale* up innovation and the use of *outdated KPIs* that do not capture a company's true performance in the digital business are slowing down the utilities' journey. IDC Energy Insights summarizes the following guidance for utilities executives that want to master business transformation rather than surrender to it:

- **Strategize your own disruption.** Do not wait to be disrupted by others and initiate your business transformation journey, embed digital in your enterprise strategy, and do not separate it since *digital is the strategy*.
- **Execution matters.** Develop an agile enterprise road map that is *modular* (break the effort into chunks/use cases, delivering immediate business value), *scalable* (think through how the road map will evolve), and *extendable* (to accommodate changes as they unfold).
- **Digital platform matters.** Develop a digital platform that integrates digital innovation and the enterprisewide systems together in a single platform. The platform enables digital products, services, and experiences while modernizing and integrating the internal IT environment.
- **Culture eats strategy for breakfast.** Foster the development of a company culture that values innovation, proves commitment to employees' success, leverages agile and design thinking methodologies, and creates a borderless organization capable of crowdsourcing talent.
- **Time for new KPIs.** Size your success along the journey by integrating traditional performance indicators with a new set of KPIs measuring innovation rate, customer and employee advocacy, data valorization, business operations, work, and labor supply.

## EXTERNAL DRIVERS: DETAIL

---

### The Race to Innovate – Speed of Change, Delivery, and Operations Separates Thrivers and Survivors

Today, survival of the fittest is linked not to size or strength, but to the ability to change – to move quickly, adapt, seize opportunities, and be agile. The best-performing organizations – armed with Digital Native culture, tools and process – are speeding away from the rest, creating a bifurcated and unequal landscape where a few firms exhibit high productivity and profits. The new imperative is to keep pace with business change while increasing the speed of business operations, the speed at which changes are delivered, and the speed and scale of innovation. In an attempt to go faster, many organizations struggle under a legacy of siloes and innovations stagnate with redundancy and inconsistency. "At scale" innovation eludes all but the elite few, while the distance between thrivers and survivors widens. Some organizations adapt to new models and ecosystems and move from automation to autonomy; others struggle with the basics and fall behind.

Over the past 50 years, the average lifespan of a company on the S&P 500 has shrunk from around 60 years to closer to 18 years. The rate of change is accelerating dramatically. Time to decide and act requires near-frictionless, fact-based decision-making processes. To thrive, organizations need to be innovating simultaneously on multiple levels (industry change, delivery, operations) at a speed they are not used to. Digital capabilities provide modular, plug-and-play technology, business, and industry platforms, allowing businesses to quickly adapt and compete in digital transformation.

## **Platforms, Platforms, Platforms – Industry Competes for Innovation at Scale**

Understanding and building a DX platform that can sustain, advance, and scale business and operations may be the most important decisions leaders make for the next 10 years. The platform is the new battleground for innovation, developers, and marketplaces as the industry rushes to enable its customers with a range of platforms. Leaders must discover what their own platform should look like, how they compete in the platform business economy, and what platform vendors they choose. Megaplatforms compete to own infrastructure and development environments. Application-centric platforms look for the network effect to expand their reach. Industry-specific platforms harness multiplied innovation to build niche ecosystems. Every business must incorporate these new options into its own DX-platform.

Today, we are in a platform economy – one in which tools, capabilities, and frameworks based upon the power of information, cognitive computing, and ubiquitous access will frame and channel our economic, business, and social lives. Companies and industries must shift to compete in their own sectors, but also in the new, larger platform business economy. The DX platform concept expands from microservices, technology stacks, and software bundles, to PaaS, to entirely new digital business- and industry-specific platforms, ecosystems, and operating models. It lies at the heart of digital transformation strategy, providing the architecture that drives and accelerates every digital initiative.

## **Sense, Compute, Actuate – Turning Data into Value**

Today, data and intelligence represent a unique opportunity for creating unimaginable value. IoT, mobile devices, Big Data – combined with historical data, systems of record, and global information – continually sense an environment and put it into new contexts. Combined with AI and machine learning, organizations are spreading intelligence from the edge to the core to turn data into value. However, it is harder than it appears. Winners are differentiated by the ways they leverage data to deliver meaningful, value-added predictions and actions for personalized life efficiency and convenience, improving industrial processes, healthcare, experiential engagement, data monetization, or any enterprise decision making.

By 2020, in over half of G2000 firms, revenue growth from information-based products and services will be twice the growth rate of the balance of the product/service portfolio. Data as a service (DaaS) presents an expanding market for both providers and consumers. The volume, velocity, and variety of data, and large and diverse data sets create new challenges, but when combined with AI technologies and exponential computing power, they create ever greater opportunities. Any application, process, service, or organization that isn't part, or all of, the new "sense, compute, actuate" paradigm is missing the boat with digital transformation.



## **New Nature of Risk – Innovation Requires New Thinking in Security and Risk Management**

Digital transformation has significantly changed organizations' risk tolerances and exposure to security risk. AI, IoT, automation, networked ecosystems bring a broader risk exposure to all organizations. More organized threat actors exploit more vulnerable technologies that have larger attack surfaces. Ransomware, cybercrime, and even nation-state attacks are increasingly common events that cause significant business disruptions, costs and reputational damage. At the same time regulations, publicity, fines, and costs force risk tolerances lower, requiring new thinking, priorities, and vigilance.

Changes to the regulatory environment and innovation initiatives are pushing organizations to evolve their security and risk management functions, in particular to leverage advances in AI and analytics capabilities. Fiscal, business, and social repercussions from cyberattacks or breaches force risk tolerances lower, requiring higher levels of protection and compliance. Overcoming these challenges ensures that the business is operating at its optimal, managed risk level. Leading organizations are developing security economics frameworks that measure "risk reduced per unit cost" to manage risk.

## **Emerging Autonomy – Learning to Live With AI**

AI is actively impacting experiential engagement, business and manufacturing processes, strategies, and more – autonomously creating a significant portion of new innovations. Many future applications will be developed by AIs without human supervision. Beyond that, augmented humanity – the fusion of digital technologies and humans – for improved mobility, sensing, and cognition will start to become routine. Unfortunately, the "ethics of AI" have yet to catch up with the technology, leaving potential for bad AI as well as good. Bias in AI models is just beginning to get attention. Regulations are even farther behind. There will be a long period of augmentation before autonomy takes over. Unfortunately, society is unprepared; however, there is still time to adapt. As AI is changing the way people live, work, and play, learning to live with AI is essential.

Intelligent applications based on artificial intelligence and continual deep learning are the next wave of technology transforming how consumers and enterprises work, learn, and play. By 2027, 10% or more of applications will be developed by AIs without human supervision. Automated customer service agents, increased public safety, preventative maintenance, reduction of fraud, and improved healthcare diagnosis are just the tip of the iceberg driving spend today. IDC forecasts AI solutions will continue to see significant corporate investment over the next several years, achieving a compound annual growth rate (CAGR) of 46.2% through 2021 when revenues will be more than \$52 billion.

## **Rising Customer Expectations – More Convenience, Customization, and Control**

As disruptive organizations leverage breakthroughs in cloud, mobile, social, and AI to deliver personalized, rewarding, and immediate experiences, customers have more choices than ever. New devices and interfaces, wearables, AR/VR, home automation, information and connectivity are combining to instill a belief that people can have what they want, when, where and how they want it, and at the same time, be in control of the data and their experience. Yet, AI-based consumer reputational scoring may be at odds. Emerging economies are bringing hundreds of millions of new customers that businesses are competing to win. Enterprises live and die by Net Promoter Scores, apps, network integration, and more.

With new customer expectations being set by thriving companies that disrupted markets, the previously accepted levels of customer service are no longer good enough. New platforms and business, operational, and organizational models are required to meet consumer expectations. Customers now expect real-time support with answers to complex questions ready at the click of a button. More people are willing to share personal data in exchange for better service, but they also want more control around their personal data.

## The Future of Work – Bridging the Digital Talent Gap

New talent management techniques and technology accelerators are fundamentally changing the concept of work and how it is done. The future workspace will be a mix of physical and virtual. Work culture will be more collaborative, while the workforce will be a combination of people and machines working together. But until that vision materializes, the demand for digital talent outpaces the supply, and trends to limit free flow of workers localizes the problem. Platform providers are under pressure to address the talent crunch with new productivity environments such as low-code/no code. AI may help increase efficiency for some tasks, but this is not the talent in short supply. Organizations need to equip up-and-coming generations for the future while they bring current workers up to speed to address workforce needs.

The demographic shifts led by millennials entering the workforce and technology advances are driving fundamental changes in the workplace. The Future of Work is humans and machines, instead of human versus machines. This impacts organizations' culture, required skills, talent sourcing, workspace, and the nature and makeup of the workforce itself. It requires organizations to leverage digital technologies, attitudes, and behavior to reinvent the way businesses engage with their employees, partners, and customers to drive higher efficiencies and deliver superior experiences.

## LEARN MORE

---

### Related Research

- *Critical External Drivers Shaping Global IT and Business Planning, 2019* (IDC #US44330818, October 2018)
- *IDC TechBrief: Digital Twins in the Utilities Industry* (IDC #EMEA44235318, September 2018)
- *IDC MarketScape: North America Distributed Energy Resource Management Systems 2018 Vendor Assessment* (IDC #US41793416, August 2018)
- *IT-OT Integration Across European Utilities: How We're Doing* (IDC #EMEA44161718, August 2018)
- *Think Big, Start Small, and Scale Fast: Highlights from the 2018 IDC Pan-European Utilities Executive Summit* (IDC #EMEA42435018, July 2018)
- *IDC TechBrief: Asset Performance Management* (IDC #US43766918, May 2018)
- *IDC PlanScape: European Union General Data Protection Regulation (GDPR) Compliance for Utilities* (IDC #EMEA43699118, April 2018)
- *Blockchain in Utilities: The State of Play* (IDC #EMEA43629918, March 2018)
- *What Impact Will Digital Technologies Have on the Utilities Workforce?* (IDC #EMEA43595418, March 2018)
- *IDC TechBrief: Digital Marketplaces Empower Utilities to Transform Relationships with Customers* (IDC #EMEA43574918, February 2018)
- *Water Utilities IT Investment Priorities: Results from the Energy Insights 2017 Survey* (IDC #EMEA43372717, December 2017)

- *IDC FutureScape: Worldwide Utilities 2018 Predictions* (IDC #EMEA41791517, October 2017)
- *Future of Work: IDC Europe Thought Leadership Initiative* (IDC #EMEA43004717, September 2017)
- *The Dawn of the Utility in 3D: Decentralized, Divergent, and Digital* (IDC #EMEA42129317, April 2017)

## About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

## IDC Italy

Viale Monza, 14  
20127 Milan, Italy  
+39.02.28457.1  
Twitter: @IDCItaly  
[idc-insights-community.com](http://idc-insights-community.com)  
[www.idcitalia.com](http://www.idcitalia.com)

---

### Copyright and Trademark Notice

This IDC research document was published as part of an IDC continuous intelligence service, providing written research, analyst interactions, telebriefings, and conferences. Visit [www.idc.com](http://www.idc.com) to learn more about IDC subscription and consulting services. To view a list of IDC offices worldwide, visit [www.idc.com/offices](http://www.idc.com/offices). Please contact the IDC Hotline at 800.343.4952, ext. 7988 (or +1.508.988.7988) or [sales@idc.com](mailto:sales@idc.com) for information on applying the price of this document toward the purchase of an IDC service or for information on additional copies or web rights. IDC and IDC FutureScape are trademarks of International Data Group, Inc. IDC FutureScape is a registered trademark of International Data Corporation, Ltd. in Japan.

Copyright 2018 IDC. Reproduction is forbidden unless authorized. All rights reserved.

