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# DIGITAL TRANSFORMATION IN THE ENERGY & UTILITIES SECTOR

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MINI-ROUNDTABLE

# DIGITAL TRANSFORMATION IN THE ENERGY & UTILITIES SECTOR



## PANEL EXPERTS

**Ian Wright**

Principal, Energy, Resources & Industrials  
CMO  
Deloitte Consulting LLP  
T: +1 (215) 430 6271  
E: iwright@deloitte.com

**Ian Wright** is a principal with Deloitte Consulting LLP, where he leads the Public Utilities practice and serves as energy chief marketing officer (CMO). For more than 25 years, Mr Wright has specialised in the delivery of business and technology transformation programmes. He provides consulting services to a variety of clients, including Fortune 500 energy clients and a variety of public utilities. He focuses on delivering value to clients through technology enabled business transformation services. Mr Wright's current focus is on industry transformative issues such as decarbonisation, the digital utility, and the technology challenges associated with achieving them.

**Sharon Chand**

Principal, Deloitte Risk and Financial  
Advisory  
Deloitte Consulting LLP  
T: +1 (312) 486 4878  
E: shchand@deloitte.com

**Sharon Chand** is a principal with Deloitte & Touche LLP's Cyber Risk Services practice, helping critical infrastructure providers be secure, vigilant and resilient. She is a CISSP with more than 20 years of experience helping her global clients manage their cyber risks. Ms Chand focuses on the energy industry and brings experience in policy and risk governance implementation, cyber threat monitoring, vulnerability management, identity and access management, and data protection. She has worked with industry frameworks including NIST, ES-C2M2, and ISO in addition to regulatory requirements including PCI, NERC / FERC, and HIPAA.

**Jian Wei**

Principal, Energy & Resources, Strategy &  
Operations  
Deloitte Consulting, LLP  
T: +1 (415) 602 8672  
E: jianwei@deloitte.com

**Jian Wei** is a principal leading digital transformation in the Power and Utilities practice of Deloitte Consulting LLP. For more than 20 years, Ms Wei has directed high-level engagements from strategy through execution for more than 50 companies across the United States, Asia and Europe. She moves easily from the factory floor to the corner office, effectively building relationships across all levels of the enterprise, and thrives at the intersection of innovation, digital technologies, operations and organisational maturity. She has envisioned and led multi-year transformation programmes to achieve sustainable and measurable improvements at some of the largest and most progressive utility companies.

**R&C: Could you provide an overview of the way digital transformation is reshaping the energy & utilities sector? What facets of the industry are experiencing substantial change?**

**Wright:** The fundamentals of what consumers want from their energy providers has shifted over the last few years. According to our research, in the past, consumers – both commercial and residential – just wanted safe, reliable and efficient supplies. Now they want safe, reliable, green and efficient energy. They want energy efficiency programmes. They want information. They want choices. And they want help in all this from their energy providers. The use of digital technologies to capture and control operational and customer energy usage is enabling not only new business models to deliver this, but providing the customer with valuable information that they can use to make real energy decisions.

**Wei:** Besides customer interactions, digital is reshaping the rest of the utility value chain, including generation, grid and back office. Generation will evolve toward a more diverse and decentralised network of lower capacity, more flexible units with intelligence, comprehensive monitoring, and the ability to manage demand and supply in a real-time fashion. The transmission and distribution grid will be a communications-enabled, self-healing network

with the ability to increasingly act as a balancing entity, manage two-way power flow, and optimise asset lifecycle management using sensors and data analytics. The back office operations in a digital age will feature touchless transactions, self-service, automation and real-time insights. Leaders in the industry seize the digital opportunity to drive business model and operating model innovations. Utilities are making money based on data, insights and services instead of moving electrons. As a recent example, a leading European utility launched a new business model focused on energy management: putting an electric vehicle charger in a customer's garage, installing roof top solar panels coupled with battery storage and a smart home energy management system to optimise power generation and consumption, implementing a peer-to-peer trading system to allow customers to buy and sell locally generated electricity, and getting compensated for the services associated with running the connected network on behalf of customers.

**R&C: To what extent is digital transformation redefining the relationship between energy & utilities companies and their customers?**

**Wei:** We see digital as an age where customer engagement is expected, relationships are real time, choice is infinite, delivery is on demand, change is constant and technology enables everything we

do. Customers expect utilities to provide digital experiences on par with what they have with their banks, retailers, telecom service providers, and so on – 24 hours a day, 365 days a year. Enabling self-service via a true omni-channel platform will become table stakes. The ability to rapidly develop and deploy products and services that meet customer needs will be differentiating. For example, customers expect to be able to buy energy in a way that suits their needs; the molecule or electron of choice at their time of choice. This is especially true of businesses that want to tailor their energy consumption to the values of their consumer base, demanding 100 percent renewable energy sources or using the utility to supplement their own micro-grid and generation facilities. This is forcing utilities to take a hard look at their rate structures and offerings, using data to segment their customers and then micro-target offerings and rate structures to appeal to specific sub-segments.

**Wright:** We are also seeing forward-looking utilities innovate the ways that they serve their customers. Just to take one example, utilities can use analytics to predict the type of query or event a customer needs to transact based on prior history, any recent events in their consumption or other factors. Instead of directing a call, then, to an agent who can further triage the need, it can be directed to artificial

intelligence (AI) – think Alexa or Siri – which can then address the customer’s need, or very quickly hand them on to an agent with additional information about, for example, the type of budget plan that needs to be tailored and approved. All of this shortens

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Deloitte Consulting, LLP*

call times and has been well received by customers in pilots and initial roll outs. Other examples include online capabilities and apps that allow customers to compare rate plans, apply for rebates, query a high bill, pay their bills, request a shade tree, perform move in or move out, and so on, from the convenience of their device, or a kiosk in a payment centre.

**R&C: In what ways are energy & utilities companies altering their operations through technology and digitalisation? What impact are current trends having on the sector’s workforce?**

**Wei:** Digitalisation is becoming an increasingly important part of operations. Use cases are being deployed around mobile, web, digital reality, automation, analytics, cognitive intelligence and AI in production – all of which is redefining the scope of work that is done, how it is done, by whom, and where it is done. The workforce impact is far reaching. Start with the work processes. Eliminate repetitive, manual parts of the processes and introduce new processes that add greater value, such as additional analytics. Next, define the new jobs and organisations that are required to manage digitalised processes, and build and maintain digital capabilities, and upskilling of workers in these new jobs. Then, define the sourcing of talent to do the work, including employees, ‘gig’ workers, crowdsourcing and outsourcing. Lastly, optimise the location of the work, for example at the location of the business consumer of services, in headquarters or service centre locations, and offshore. We call this ‘future of work’.

**Wright:** We have also seen some groundbreaking new applications of digital technologies across the industry. Whether this is completing regular safety training and updates using virtual reality, or the use of drones to monitor critical infrastructure and improve security, we only see the application of these technologies continuing to grow. The next step may

be the use of drones to repair pipes and wires before issues impact service.

### **R&C: How are new innovations driving energy efficiency and distributed generation?**

*“Finding an ‘after the utility’ market for trading excess energy will grow as distributed energy grows beyond that developed by utilities.”*

*Ian Wright,  
Deloitte Consulting LLP*

**Wright:** In a recent paper on decarbonisation, we described a lot of the smart building technologies that are helping to drive down the consumption of individual homes and businesses. Since then, the application of data science techniques along with home and business automation and smart meters has started to provide more and more data that can be analysed to find energy efficiency opportunities. The ability to share energy in peer-peer scenarios is becoming much more technically viable. The ability to share energy generated by an individual’s self-

generation or excess battery capacity can go beyond just selling back to the utility. Finding an 'after the utility' market for trading excess energy will grow as distributed energy grows beyond that developed by utilities.

**Wei:** Traditionally, energy efficiency and distributed generation are programmes that utilities have been executing based on regulatory mandate. A modernisation trend is underway to rationalise the programmes, make the offerings more customer-centric, tie them to an overarching goal such as greenhouse gas emission reduction, digitise customer experience and use data to drive decisions. In our survey, 73 percent of commercial customers are either very or extremely interested in energy management analytics. And the use of data science techniques coupled with smart meters allows you to pinpoint specific appliances or machines that are running inefficiently and should be serviced or replaced. When these are brought together with rebates, shade trees and other energy efficiency programmes, you can use marketing and targeting techniques to increase adoption. The development of smart home solutions is growing immensely, but there is a consistent model that providers of such capabilities are driving toward. As these solutions mature, it will enable much greater efficiency management opportunities by customers themselves or with offerings of utilities. Collaboration with behind-the-meter device and energy management system

providers to leverage a broader set of information and streamline customer experience is also on the rise. Electric vehicles and battery storage systems are changing the traditional energy efficiency and distributed generation landscape. Going after an integrated offering, including energy efficiency, demand response, EV charging, distributed generation and storage, is another trend. We have also seen wider adoption of distributed generation, both by businesses with self sufficient campuses on micro-grids, and residential customers. The falling cost of solar panels has greatly assisted this, and where the costs of entry for a particular consumer may still be too high, other mechanisms, such as community solar schemes, have started to gain traction.

**R&C: Given the rising cyber threats targeting vital infrastructure and valuable assets owned by energy & utilities companies, how can digital transformation help manage this risk?**

**Chand:** It is critical to not only consider cyber risk management throughout the digital transformation, but also to take advantage of new digital solutions to improve cyber risk capabilities. We are seeing advancements in automations like robotic process automation (RPA) to drive increased efficiency and accuracy in cyber processes, as well as the use of artificial intelligence (AI) to drive threat and vulnerability correlation across the enterprise.

It is important to note, too, that the cyber digital transformation can and should apply to the legacy OT environment that makes up vital infrastructure – exciting innovations are demonstrating advancements in protecting the components that run the grid.

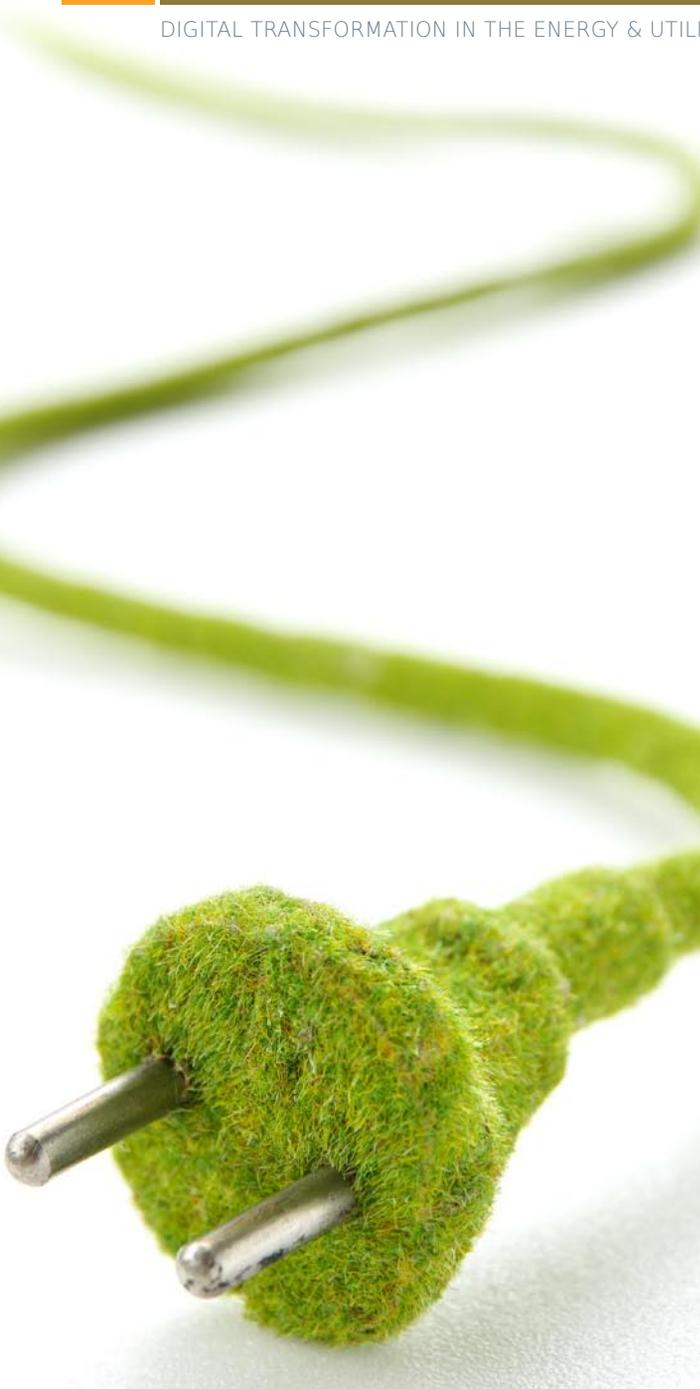
**R&C: Could you outline some practical strategies that companies can deploy when implementing digital transformation across their operations? In your experience, what key considerations do they need to make during the process?**

**Wei:** The common struggle we see is that many organisations swirl in an endless loop of ‘doing’ digital things – an illusion of being digital – rather than making necessary changes to business, operating and customer models. They tend to only focus on implementing new digital technologies, try to design their way to digital, or approach digital transformation as a single large event like a major enterprise resource planning (ERP) implementation, or hire or buy digital skills without training existing talent. The starting point is to link digital with company strategy, define appropriate digital ambitions and create a roadmap with prioritised digital capabilities to be developed and value to be realised. From there, focus on several key dimensions: organisation and governance; data, technology and infrastructure; skills, culture and talent; and operations and processes. For example, the ability to manage and

refresh a digital portfolio that balances solutions which can yield near-term benefits and that drives long-term transformational changes is critical to digital transformation. Governance will need to support faster decisions made by people closest to the solutions instead of people with authority. Decision criteria will be more dynamic and allowing ‘fail early, fail fast and learn faster’.

**Wright:** The other thing we see is utilities designing what is important to them. A good example is some of the self-service apps that were produced in the early days of mobility. A lot of effort was put into the move in or move out process, and outage information. It makes sense from a call centre perspective, as move in or move out is a complex and time-consuming interaction, and during outages call centre volumes peak. But these are, for most people, relatively infrequent events. A more useful app for most customers would tell them if their usage is unusually high, ping them and let them take advantage of any rebates or special energy efficiency deals, let them know if they have a leaky toilet or pipe and let them pay their bill with a single touch or fingerprint. You should try to walk in the customers’ shoes and serve them first.

**Chand:** You should also carefully consider cyber security up front, and address it early. Not only could you expose your customers’ data to bad actors, you could inadvertently provide access to critical



infrastructure. Every new device added to your network or in communication with it is a potential attack vector and needs to be secured. Many underestimate the thought and effort that needs to go into this.

**R&C: Drilling down, what role can user-centric design, agile methodology and governance models play in achieving digital transformation?**

**Wei:** These are the basic building blocks that take us away from the old waterfall approach of building solutions that energy companies are familiar with from their days, and years, of doing large-scale ERP and customer systems.

Putting customers or users in the centre allows uncovering real problems and enables unbiased pursuit of value. Take one recent example, in which a large electric utility contemplated sending customer weather alerts with the belief that doing so would enhance customer satisfaction and reduce call volume. The utility launched a user-centric design sprint involving both generative and evaluative research to uncover the real drivers. The sprint discovered that the number one call volume driver is low-income customers having challenges paying their bills. Sending weather alerts alone is not going to move the needle. Instead, a holistic low-income customer solution that addresses awareness,

payment options, energy saving tips and analytics around when and if disconnect is warranted, would reduce call volume, improve customer satisfaction and reduce operating cost. Without the user-centric sprint, the company would have gone ahead with building the weather alerts only to find out later that the 'hammer' is not that useful. By taking an agile, fail fast and deploy minimal functionality approach, you are able to try a great many things at the same time, gain user feedback early and focus on most valuable product features. It is completely different than the traditional waterfall approach many utilities are familiar with. It requires scrum-based team structure with new roles, such as scrum master, product owner, creative director, user interface and user experience designer, full stack developers, and so on. Governance will also be very different. Instead of authorising the entire budget for the project at the beginning, being agile calls for constant reprioritisation based on value validated by user feedback. Funding is authorised only for the next sprint.

**Chand:** The one thing that is critical to consider as you embark on this free-wheeling, entrepreneurial approach to change, is that you want to execute with a framework that is safe and secure. While the business is free to engage in any new activity it wishes, and deploy that to the relevant stakeholders,

it needs to be done within an agreed technology framework that ensures that at the same time you do not create risks and avenues for bad actors to impact your operations.

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*Sharon Chand,  
Deloitte Consulting LLP*

**R&C: What final advice can you offer to energy & utilities companies on altering corporate culture to overcome any resistance and actually embrace the kind of change that digital transformation implies?**

**Wright:** Energy companies typically operate with an engineering mindset that stresses safety first and minimises risk taking. Digital transformation takes the opposite approach, taking risks and embracing failure. That is a fundamental mindshift that may not be comfortable for a lot of people. Helping them

to understand that innovation is still, in Thomas Edison's words, 10 percent inspiration and 90 percent perspiration, and creating a subculture in which failure and risk taking is accepted, is critical for any digital transformation.

**Wei:** The change management approach for digital needs to place an emphasis on 'experiential', as it is hard to talk about digital tangibly. Intentionally creating experiences for employees to learn the digital technologies, witness the value unlocked by them, apply user-centred design, and be part of an agile sprint is the way to go. Understanding what

the culture is and how work gets done is a critical step in helping to lead through the change. To close the gap between now and the desired future state, minimal viable changes (MVCs) will be defined to accentuate enablers and tackle blockers. The MVCs will be organised into 90-day sprints for execution. For example, implementing a collaboration tool is a good MVC, whereas changing the compensation system in 90 days is not. Lastly, advanced tools leveraging social media monitoring, user behaviour analytics, real-time survey and feedback, and visualisation are deployed to manage the digital transformation journey with a new level of precision and responsiveness. **RC**