SMART ENERGY: FUTURE-PROOFING UTILITIES ON THE CLOUD

The utilities industry is in the midst of a transformation to meet several mandates: integrate distributed energy resources into the grid, achieve decarbonization targets, comply with regulations that incentivize performance rather than captive assets, and share real-time data with stakeholders for collaborative energy management. Consequently, the goals of utility enterprises have broadened to include value-added services, seamless information access, effective load variation management, supporting 360-degree energy efficiency, and transforming customer engagement.

Progressive utilities are replacing the existing business model for one-way flow of electricity and information with a multi-dimensional model. They are not only modernizing grid operations to provide clean, reliable and affordable energy, but also adopting cost-effective mechanisms to mitigate operational as well as sustainability risks. Real-time collaboration, consistent data and predictive analytics are pivotal for digital utilities.

The transition to a more efficient, sustainable and distributed electricity system demands utility enterprises integrate diverse data sources for deriving actionable business intelligence from complex variables and making informed decisions. Utilities need robust, reliable and scalable infrastructure that powers data and analytics while rationalizing operational costs and capital investment. In this landscape, it is imperative for both brownfield and as well as startup energy enterprises to adopt cloud resources. Use cases for a robust cloud environment span the utilities value chain.

Streamline grid operations

The 'grid of the future' initiatives undertaken by utilities leverage next-generation solutions, including Distributed Energy Resources Management System (DERMS), Advanced Distribution Management Systems (ADMS), Outage Management System (OMS), Advanced Metering Infrastructure (AMI), and digital Transmission and Distribution (T&D) systems. These advanced solutions are required to create a self-healing infrastructure and a smart grid that can integrate distributed energy resources.

Utilities need to undertake cost-benefit analysis, compare strategies, forecast outcomes, and simulate scenarios to optimize investment in digital transformation programs and capital projects. In-depth techno-financial analysis is also required to capitalize on the demand for renewable energy, EV charging stations, microgrids, and other programs to facilitate generation closer to customers. Further, data-driven decisions are a must for smooth operations, be it grid safety or load balancing.

Mature master data management systems support grid modeling and sophisticated analytics. Accurate data is needed to establish baseline performance metrics, forecast cost of distributed generation, and predict energy storage capacity requirement. The cloud addresses data requirements of grids of the future - operational, computational, storage, and security. Further, cloud solutions provide reliable data for analytical tools, ML models and decision support systems.

Safeguard field assets

Many discrete services and interconnected technologies play a significant role in delivering uninterrupted power supply: edge computing to power smart grids, Wi-Fi, Private LTE and 5G networks for real-time field communication, Geographic Information System (GIS) for vegetation management and wildfire mitigation, network modeling to manage and control sub-stations, and mobility solutions to empower a digital workforce. These digital solutions generate a significant amount of data that can be not only cost-effectively managed on the cloud, but also can be harnessed by the cloud-based analytics solution to further drive new capabilities.

Predictive maintenance of generation as well as T&D assets makes a compelling business case for leveraging cloud computing. IoT-enabled assets stream real-time data to cloud-hosted asset management solutions. Continuous asset health monitoring helps the operations teams to detect issues and undertake timely repair to avoid issues or outages. Further, analytical solutions use the data to predict issues, which enables preventive maintenance to minimize asset downtime and maximize the lifespan of assets. Notably, predictive analytics increases grid resilience and drives safety as well as efficiency by providing utilities with the capability to avoid asset-related issues, forecast events such as a wildfire or storm, identify assets that need to be replaced / upgraded, and optimize field service management.

Maximize business value

SaaS products for corporate functions such as procurement, finance, HR, sales and marketing, and supply chain management have been adopted successfully by enterprises across industries. So, typically, utilities have embarked on the cloud journey by migrating non-core business processes to a public or private cloud infrastructure.

At the same time, value-driven ERP packages for a polycloud environment encourage SaaS adoption. This pathway enables utilities to easily transition to a cloud-first strategy. The cloud serves as a business catalyst by connecting customers, external partners, employees, and enterprise systems to unify data from the edge and derive meaningful insights. Notably, the proven methodologies used by hyperscalers, specialty cloud service providers and cloud solution optimization partners accelerate cloud maturity.

A clear roadmap and a template-driven approach mitigates the risks in moving OT systems, asset management and other core business applications to the cloud. Robust cloud platforms drive innovation by facilitating seamless integration of new applications, business models, Artificial Intelligence (AI) solutions, Machine Learning (ML) models, and IIoT-based systems.

Enrich customer relationships

Customer experience differentiates one utility enterprise from another. Household, commercial and industrial consumers seek diverse services: personalized tariff plans, digital payment systems, real-time information on outage and restoration, ability to monitor energy usage on mobile devices, self-service options to minimize consumption, and rewards for saving power and adopting energy efficiency.

A digital transformation mitigates customer churn across segments and builds advocacy by enabling personalized service. Cloud

Customer Information Systems (CIS) solutions, SaaS CRM products and AI technologies drive customer experience transformation, while rationalizing the cost of customer care including contact center operations. The agile and scalable cloud architecture enables utilities to migrate / upgrade customer portals or launch integrated solutions for customer journey, real-time customer analytics, and demand management. In addition, the cloud supports AIOps to accelerate cloud-native application development, robotic automation and ML models to boost business processes, and chatbots to enhance customer interaction.

Predictive analytics is an imperative for customer service innovation. Analytical tools integrate real-time and past data to address the requirements of diverse programs and deepen customer engagement: define thresholds for energy efficiency campaigns and offerings, determine rates for off-peak charging of electric vehicles, design gamification apps for energy conservation, and route customer service requests to improve productivity of contact centers. Moreover, cloud models analyze multiple parameters, including weather, asset health, vegetation growth, and aggregate demand, to predict outage and mean time for service restoration. It empowers utilities to adopt proactive measures to minimize inconvenience to customers and improve customer experience.

Utility enterprises can modernize their infrastructure and ensure seamless migration of workloads and applications to the cloud by leveraging the expertise of managed service providers. In addition, advanced platforms such as the Infosys Cobalt combine services and solutions to act as a force multiplier for cloud-powered enterprise transformation. Infosys Cobalt offers a rich ecosystem for cloud native application management, readily available cloud assets for business and engineering including Utility industry specific assets, and better management of SaaS / PaaS / IaaS models.
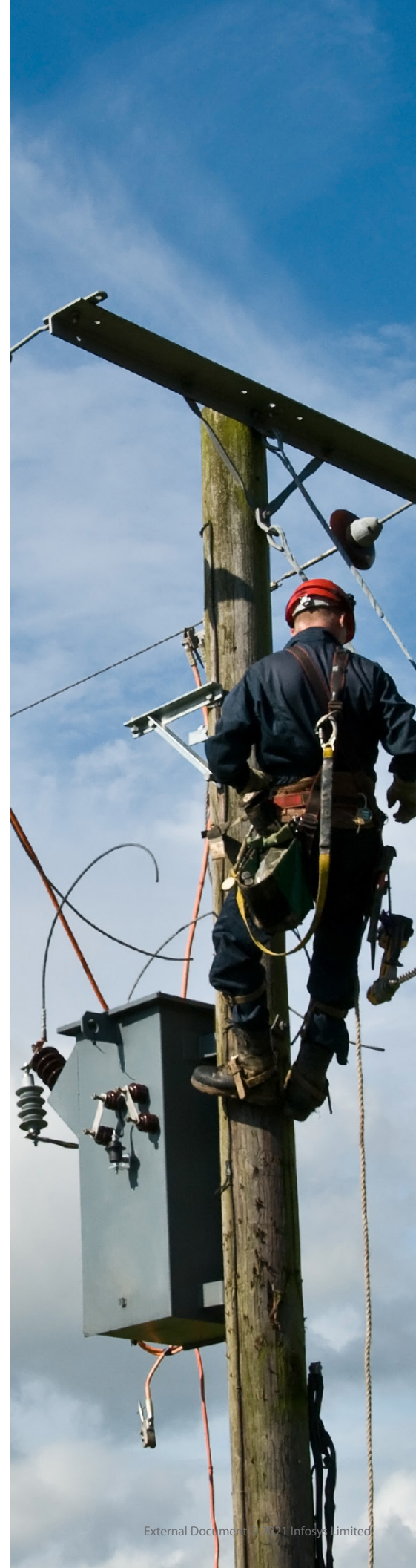
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As a Senior Director and Client Partner, Avinash leads Infosys client engagements for Energy & Utilities clients in the US. He has over 22 years of experience in IT and Consulting, helping clients realize business benefits from IT initiatives and transformation programs. His areas of expertise include IT Strategy and Transformation, Enterprise IT systems implementation, Business Intelligence & Analytics, leading large programs and helping business operations to drive benefits from technology-enabled transformation, across Oil & Gas, Utilities and Manufacturing industries. Avinash is passionate about the role technology is playing in the energy industry and how the industry is leveraging cloud, analytics and automation to drive the future. He has an academic background in Engineering and is a certified project management and supply chain professional.

Infosys Cobalt is a set of services, solutions and platforms for enterprises to accelerate their cloud journey. It offers over 14,000 cloud assets, over 200 industry cloud solution blueprints and a thriving community of cloud business and technology practitioners to drive increased business value. With Infosys Cobalt, regulatory and security compliance, along with technical and financial governance comes baked into every solution delivered.

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