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Utilities Digital Services 2022–2023 RadarView

Transforming the utilities industry through digital transformation

December 2022

RADARVIEW™

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Key drivers

- Short-term demand reduction
- Sustainability-led regulatory pressures
- Infrastructure losses due to extreme climatic events
- Shortage of experienced workers
- Customer service to prosumers
- Increasing cyber risks

Enterprise response

Developing solutions to enable higher adoption of renewable energy by consumers:
- Designing EV charging management, electric temperature controls, and smart buildings
- Creating smart energy storage solutions with use cases like energy storage as a service and cloud-based energy storage

Pushing toward sustainability by optimizing energy consumption, reducing wastage, improving transmission and distribution efficiency, and making customers aware through:
- Leveraging specialized energy management systems (EMS)
- Using smart equipment and analytics for managing energy usage and blockchain for energy source tracing and peer-to-peer energy trading

Focusing on developing predictive capabilities using AI, such as the following:
- Predicting weather-related hazards using forecasting engines for outage management and proactive asset maintenance
- Managing vegetation to protect distribution lines from wildfires

Reevaluating the workforce strategy:
- Automating rule-based tasks and upskilling new-generation employees for skilled tasks
- Investing in workplace safety for workers dealing with hazardous equipment to promote increased applications for such jobs

Transforming customer service and experience using digital technologies for the following:
- Providing interactive billing systems, prosumer support, energy insights, and complaint resolution
- Supporting bidirectional grids using grid analytics and smart metering infrastructure

- Adopting cybersecurity measures to combat ransomware attacks and prevent complex and critical grid infrastructure from being hacked

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Key drivers

- Global water shortage
- High investment cost due to aging infrastructure
- Regulatory pressures for water quality and wastewater treatment
- Customer service and insights

Enterprise response

- Developing advanced metering infrastructure by using data analytics and real-time usage monitoring to conserve water
- Improving customer service through mobile meter reading and automated billing solutions

- Performing water quality inspections using IoT sensors and analytics to ensure safe water for every purpose
- Filtering wastewater using artificial intelligence and machine learning to promote water reuse
- Forecasting water consumption demand and understanding present water usage patterns by leveraging ML algorithms and data analytics

- Enabling predictive maintenance and identifying pipe bursts and pipeline leakages by using IoT sensors, advanced analytics, and digital twins
- Implementing as-a-service models to reduce investment and maintenance costs while improving operational efficiencies over key areas such as meter management, grid maintenance, and billing

Avasant recognizes 17 top-tier service providers supporting the utilities industry in digital transformation

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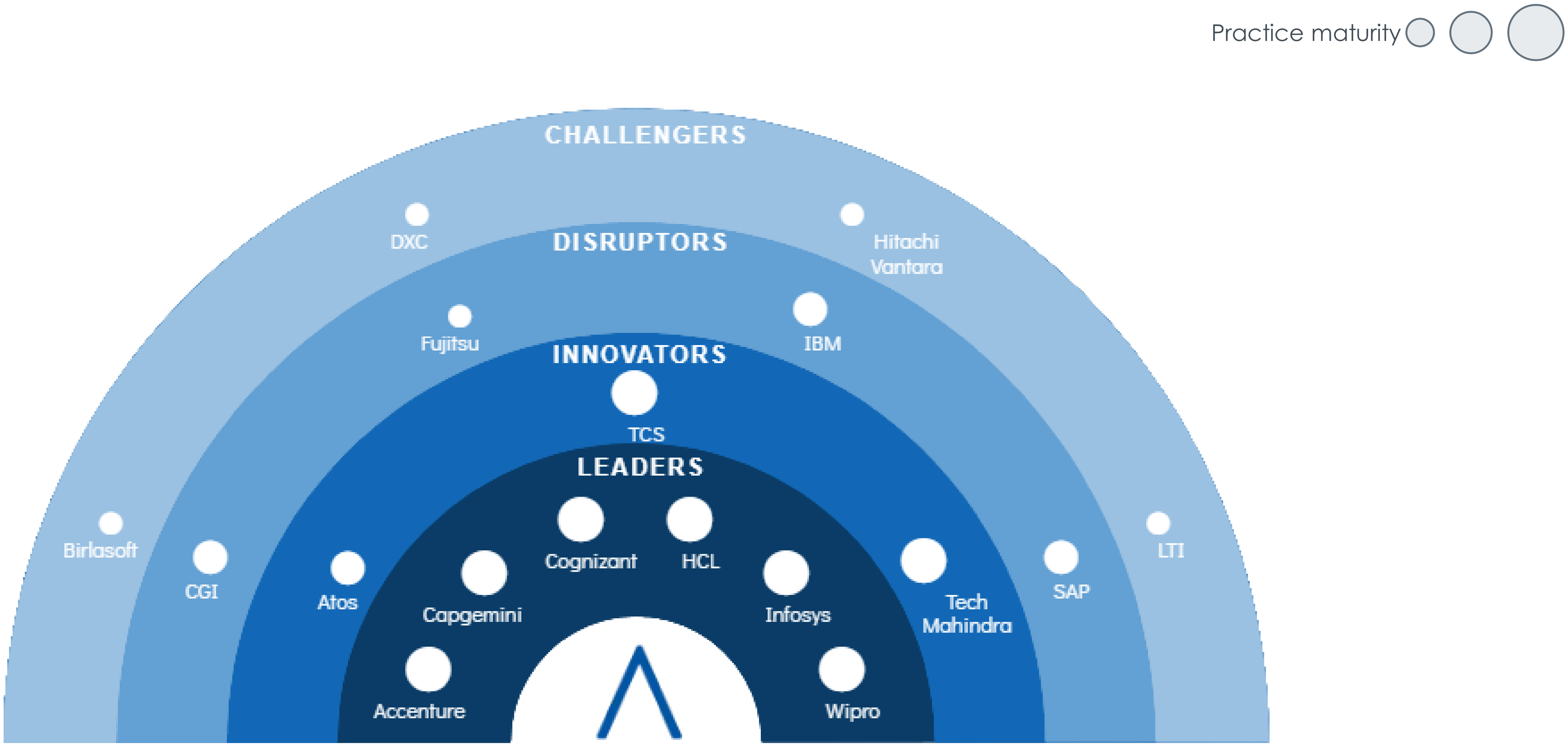

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Sample report pages

New regulations are pushing utilities to explore smart solutions for EV charging, building services, and energy storage

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In response to increasing regulations, rising oil prices, and growing geopolitical uncertainties, utilities are adopting modern solutions for battery storage and replacing fossil fuel-based building and mobility services with electric ones.

Federal guidelines and policies for electric adoption

In August 2022, California Air Resources Board (CARB)* issued guidelines that mandate all new vehicles sold in California be electric or plug-in hybrid electric by 2035 to promote zero emission.

In October 2021, the EU parliament passed an Alternative Fuels Infrastructure Regulation (AFIR) policy requiring all EU member states to build EV charging points every 60 km on their motorways.

In June 2022, the European Association of Energy Storage (EASE) issued a target of adding about 200 GW of energy storage by 2030 and 600 GW by 2050 to achieve Europe's renewable energy goals.

In August 2021, the California Energy Commission passed a building code that mandates using electric heating and appliances in new buildings from 2023 to reduce gas and fossil fuel use.

Mobility and building management systems	EV charging management system	Itron	In February 2022, the US-based technology company Itron launched a cloud-based solution that leverages digital twins to plan, forecast, and simplify EV charging from distributed energy resources.
	Electrifying building elements	75F; J2 INNOVATIONS A Siemens Company	The building automation company 75F has partnered with California-based J2 Innovations to develop cloud and IoT solutions to reduce energy spent on HVAC systems in commercial buildings.
Energy storage	Vehicle-to-grid energy storage	VW	In September 2022, Volkswagen partnered with a Belgian utility company to integrate electric vehicles' batteries into the power grid to manage energy demands and stabilize costs while incentivizing drivers.
	AI in energy storage	CONVERGENT	Convergent's energy storage solution, PEAK IQ®, leverages AI and ML to optimize storage and energy cost through data-driven decisions for charging and discharging.

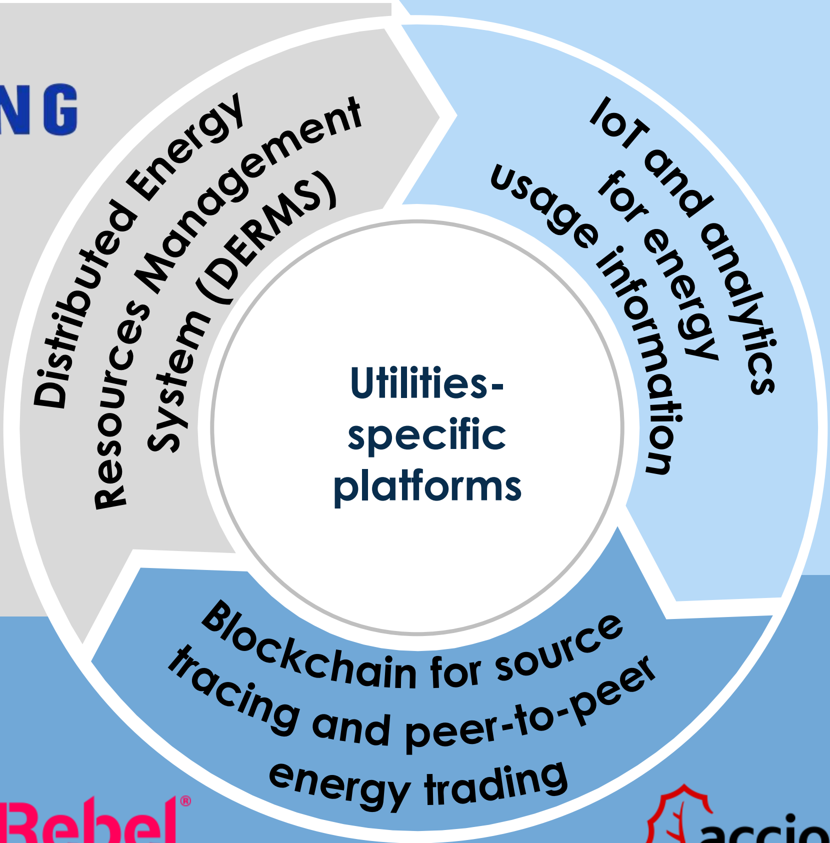
*The guidelines issued by the California Air Resources Board have been adopted by 17 other states in the US.

Source: Avasant Research

Utilities are investing in IoT, analytics, and blockchain to drive their sustainability agenda

Utilities companies are seeking ways to achieve sustainability targets by certifying their energy sources and reducing energy wastage.

In September 2022, Itron developed a DERMS platform by linking its Industrial IoT network with Samsung's SmartThings Energy analytics solution to have a more comprehensive view of energy sourcing and consumption and carbon reduction.



A Kenyan utility company, Mpaya, deployed IoT and analytics software solutions to help customers find gas leakages and anomalous electricity consumption to reduce their energy wastage and optimize their energy bills.

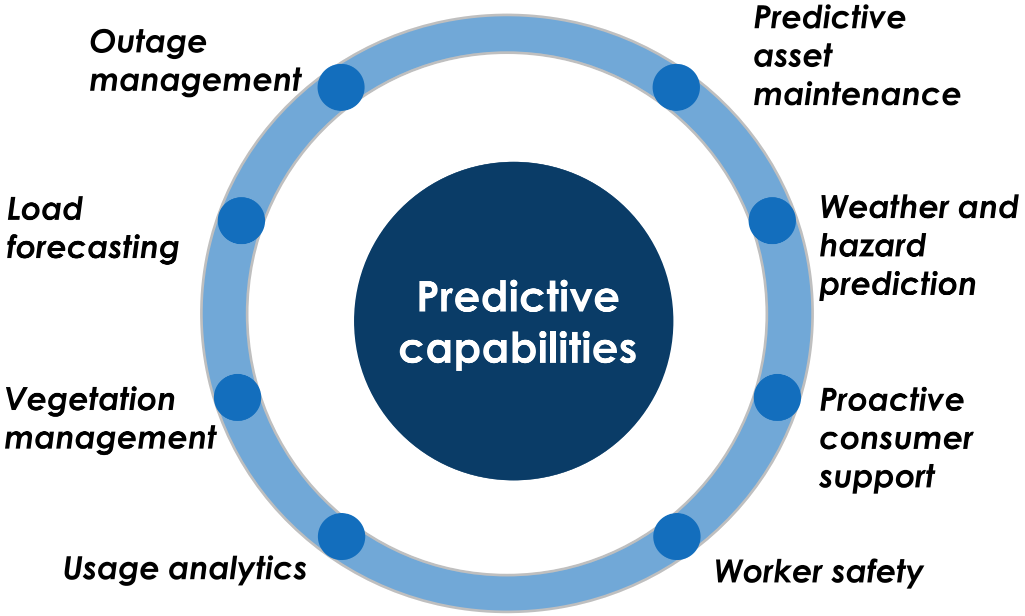
A UK-based utility company, Rebel Energy, has signed up more than 3,000 households in Britain for a peer-to-peer energy sharing scheme using blockchain to add to the electric supply from renewable sources.

In February 2021, a Spanish renewable energy company, Acciona, developed a blockchain platform, GreenH2chain, that would help customers trace the origin of green hydrogen to accelerate decarbonization.

Sources: Avasant Research

Utilities are relying on AI/ML to move from a reactive to a predictive approach to combat grid-related risks

Extreme weather events are likely to become more frequent in the coming years. Utilities companies are investing in digital technologies to strengthen infrastructure resiliency and handle the growing intensity of climatic events.



Illustrative examples

ENGIE

Engie is using Google's AI-powered wind prediction capabilities to forecast wind patterns, thereby optimizing and rationalizing power generation sources.

PACIFICORP

PacifiCorp is investing in AI systems to predict weather and wildfire-related hazards ahead of time, schedule outages for minimum energy loss, and avoid customer discontent.

nationalgrid

National Grid is using satellite imagery, GIS data, and AI to analyze real-time imagery of trees around transmission lines and predict areas that need vegetation control.

DUKE ENERGY

Duke Energy is leveraging IoT sensors and self-healing grid technologies to automatically predict power outages and reroute power to other lines for faster restoration, primarily during natural calamities.

Sources: Avasant Research

Water utilities are focusing on improving water consumption and quality using digital inspections and forecasting

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As water utilities companies are facing increased regulatory and sustainability pressures to maintain water quality and availability, they are seeking ways to forecast consumption and check for water contaminants and pollution levels.

Strategies	Illustrative examples	
Preventing water pollution	YorkshireWater	Yorkshire Water leverages asset management services from Samotics to automate sewage clog detection and removal, thus preventing the pollution of freshwater sources.
Water quality monitoring	RefillBot	RefillBot, an IoT startup, has developed an IoT-driven water quality monitoring system for real-time water quality checks in rural areas.
Wastewater treatment	Delhi Jal Board	Delhi Jal Board uses AI, IoT, and automated processes to treat wastewater by removing biological oxygen demand and total suspended solids.
Contaminant filtering	Vitens	Vitens, a Dutch utility company, utilizes nanofiltration technology to procure safe drinking water by treating surface water.
Water consumption forecasting	SA Water	SA Water, an Australian water utility company, has deployed a demand forecast tool that uses Azure-based ML algorithms to forecast water demands and plan production and operations in advance.

Source: Avasant Research

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