Smart Guide

AI in Utilities: From Innovation to Impact

A Smart Guide for Utility Leaders on Turning AI Strategy into Real-World Results

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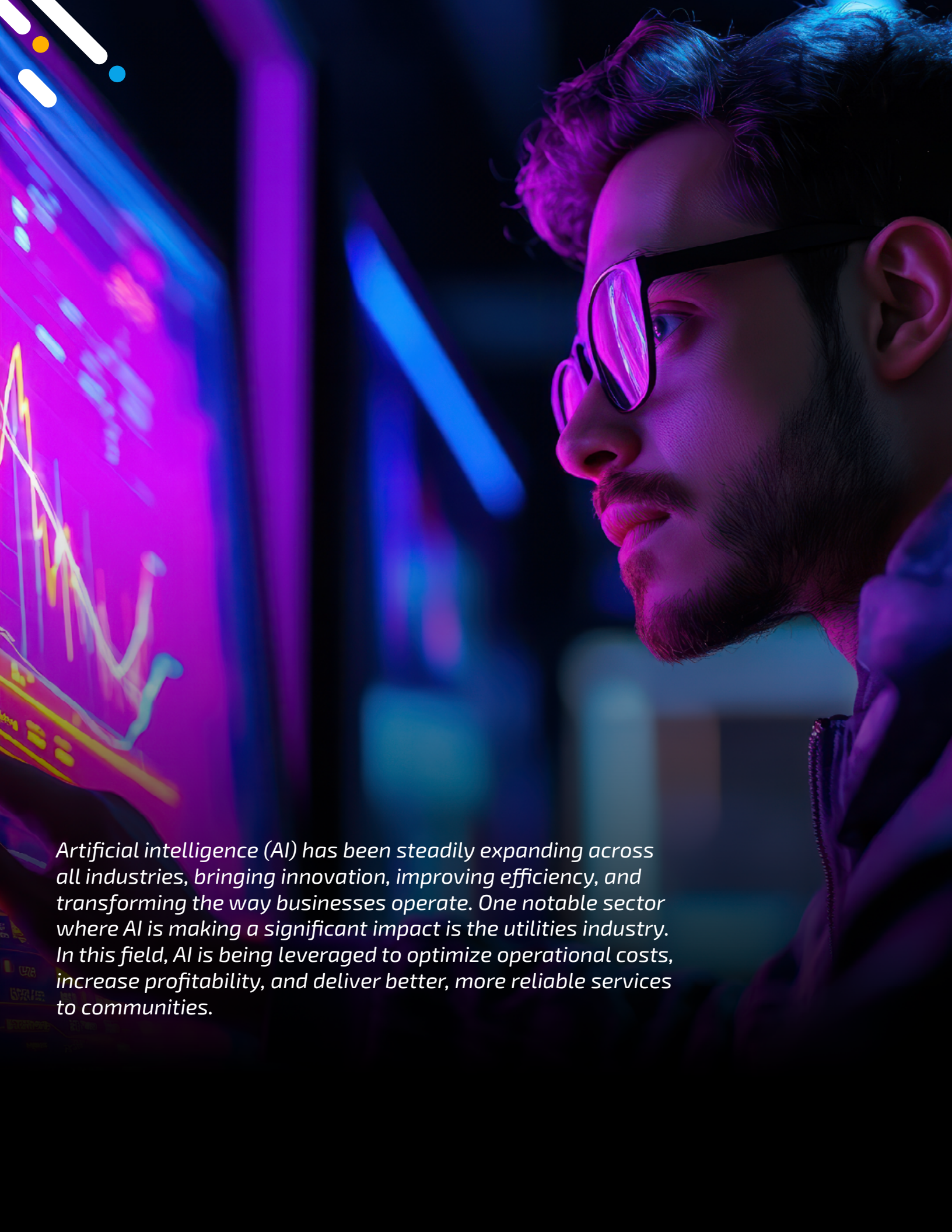


Artificial intelligence (AI) has been steadily expanding across all industries, bringing innovation, improving efficiency, and transforming the way businesses operate. One notable sector where AI is making a significant impact is the utilities industry. In this field, AI is being leveraged to optimize operational costs, increase profitability, and deliver better, more reliable services to communities.

Across the globe, utility companies are leveraging AI to transform their services and operations, these companies are not only adopting AI as a tool for automation but as a strategic asset that enables smarter decision-making and greater operational resilience. In fact, according to the 2024 Gartner® survey, **Artificial Intelligence** is the new technology CEOs believe will most impact their industries over the next three years [1]

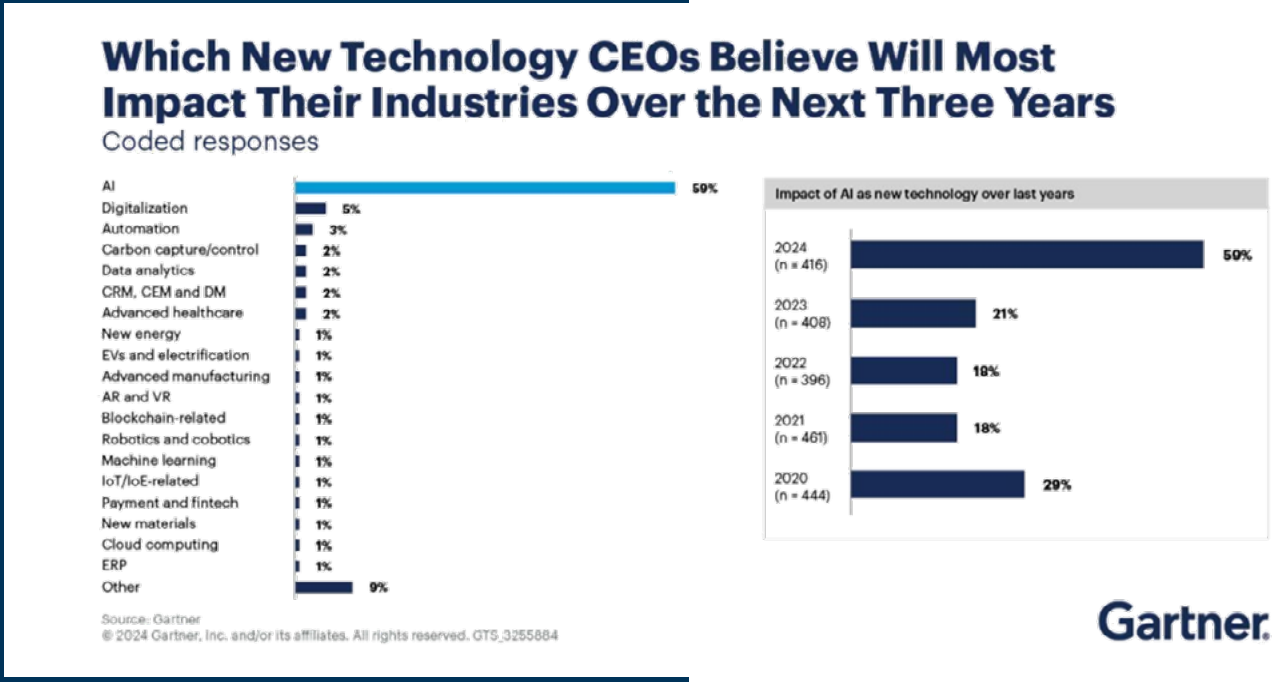


Image 1 – Gartner ® coded responses

The benefits that utility companies are gaining from using artificial intelligence span across multiple areas, driving both operational efficiency and financial performance. Some of these key areas where AI is delivering substantial value include predictive maintenance, demand forecasting, grid optimization, fraud detection, and revenue protection, among others.

Let’s take a look at what some utility companies are achieving by embracing AI:

Freeing up time to focus on valuable work

Maximizing cost efficiency by optimizing operations

Automating workflows to proactively reduce delays and errors

Improving customer satisfaction to increase engagement and loyalty

Enhancing business decision-making with real time, data-driven insights

A significant portion of the benefits from adopting AI in the utilities sector are focused on enhancing the company’s profitability and strengthening its financial position. For instance, AI-based systems can analyze usage and payment patterns to identify high-risk customers where non-payment is common, enabling companies to implement targeted debt collection strategies. Machine learning models can also flag irregular consumption behaviors that may indicate fraud or improper asset manipulation, enabling prompt actions that protect revenue streams.

Here are some examples of utilities leveraging AI's potential:

General Electric's Predictive Maintenance Story

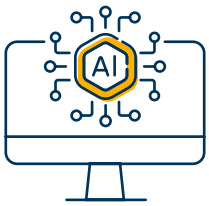
Problem

GE experienced costly, unplanned outages due to inefficient reactivity and calendar-based maintenance on aging turbines. This led to unnecessary costs, frequent downtime, and reliability issues.

Solution

GE implemented AI-driven predictive maintenance by:

Installing IoT sensors on turbines to monitor real-time conditions.



Using machine learning and digital twins to analyze data and forecast failures

Transitioning to proactive maintenance practices

Benefits

30%

reduction in maintenance costs

Advanced warnings extended from hours to weeks

Improved reliability and reduced downtime

Enhanced operational efficiency and safety. [2]

E.ON's AI-Driven Grid Maintenance Success Story

Problem

E.ON faced expensive, risky, and inefficient manual inspections of its extensive power grid, spanning over 700,000 km. Inspections were infrequent, labor-intensive, and subjective, resulting in delayed defect identification, high costs, and potential safety risks.

Solution

E.ON adopted AI-powered drone inspections combined with advanced computer vision technology to:

Capture high-resolution images rapidly and safely

Automatically detect anomalies such as corrosion, cracked insulators, sagging lines, and vegetation encroachment

Continuously improve AI models through expert feedback

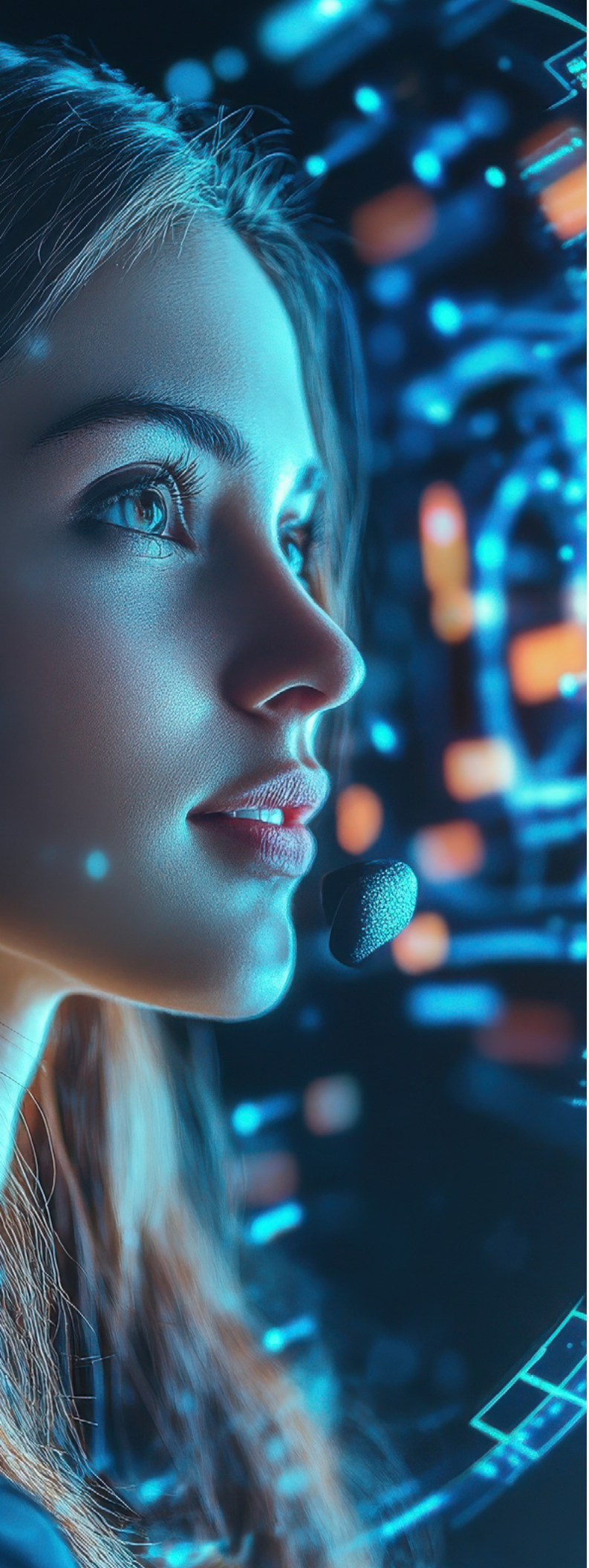
Benefits

Inspection costs reduced by approximately **25%**

Routine maintenance costs decreased by around **10%**

Increment in processing speed from **50,000** images annually by a human to **180,000** images per hour using AI

Improved safety and accuracy, freeing engineers for higher-value tasks. [3]



AI implementations can deliver the greatest impact when tailored to specific use cases, driving meaningful improvements in both customer experience and employee engagement.

In this sense, leveraging AI agents seems like a quick strategy to deliver significant improvements in customer interactions, knowledge sharing, and basic automation tasks, as large language model-based agents are generally easier and faster to implement. However, traditional machine learning techniques require high-quality data, which can be difficult to achieve with legacy systems. Also, data privacy and security remain critical: customer information should be protected through anonymization, encryption, and strict access controls. It is also advisable to adopt local, or enterprise-grade models to avoid sending sensitive data directly to external models. Techniques like Retrieval-Augmented Generation (RAG) can further help maintain control over sensitive information.

Throughout the adoption of artificial intelligence, utility companies face several challenges that must be addressed to achieve optimal and seamless results.

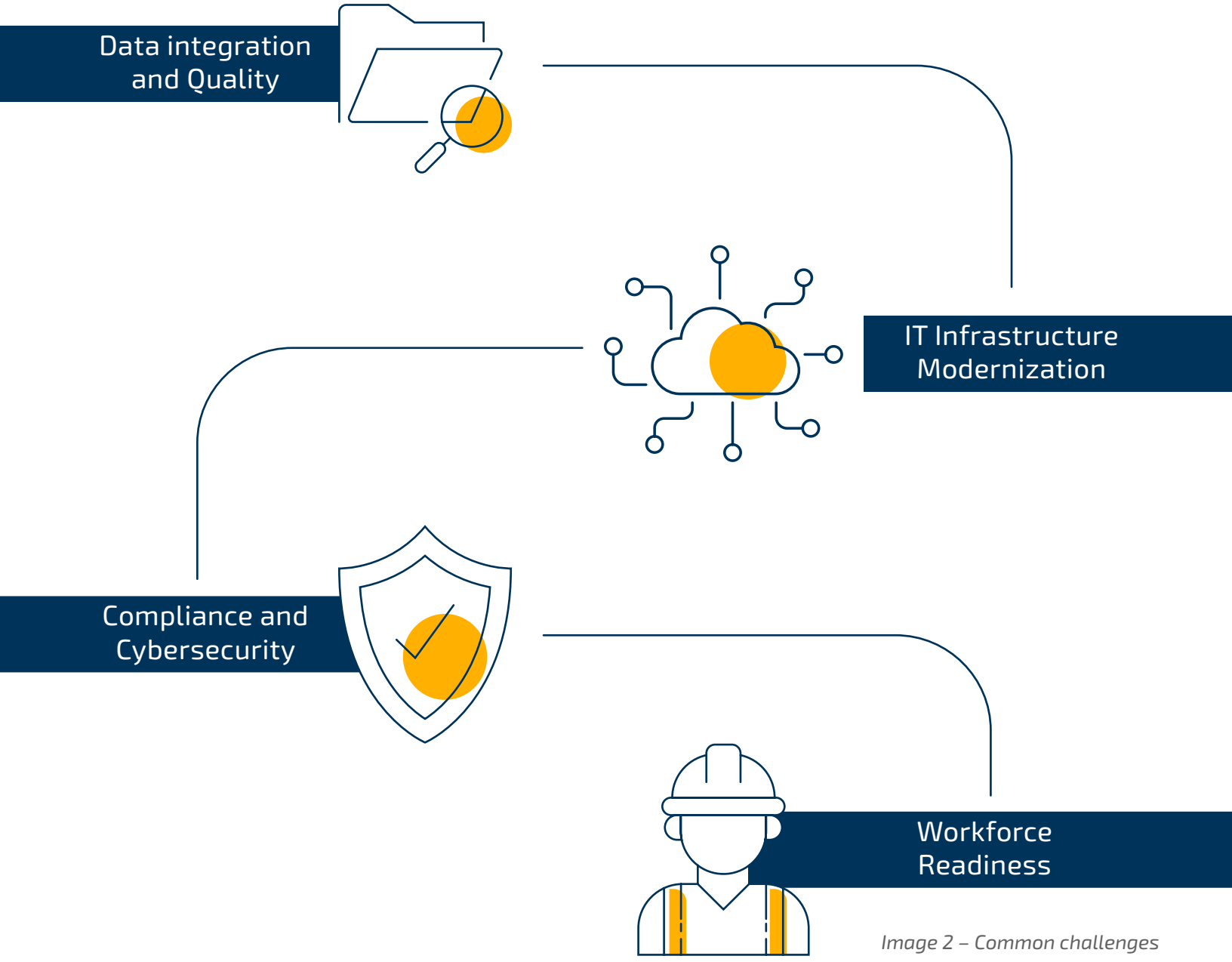


Image 2 – Common challenges

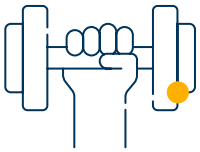
Many utilities operate with legacy systems that are not compatible with the advanced requirements of AI tools. Upgrading to a scalable, cloud-based, and **modern platforms** is essential to support AI integration, manage big data, and ensure reliable performance. Moreover, due to the large volume of data that needs to be processed, the adoption of systems with one single database and repository is necessary to ensure cohesion.

Another major challenge is **regulatory compliance and cybersecurity**. As utilities adopt AI technologies that often involve large-scale data processing and automation, they must ensure that all solutions comply with industry regulations, data privacy laws, and cybersecurity standards. Equally important is **workforce readiness**, where employees must be effectively trained to use new tools and understand the insights they generate. This requires technical training and fostering a culture that embraces digital transformation and continuous learning.

AI has the power to transform how utilities manage resources, deliver services, and interact with customers, making operations more efficient, predictive, and data driven. However, unlocking the full value of AI is not just about adopting new technologies. Utility companies will only realize these benefits and fully maximize the capabilities of AI, if they are willing to embrace a culture of change and continuous improvement. This means embracing a dual innovation approach: exploring new AI ideas, functionalities and outcomes rapidly and independently while incrementally moving away from traditional systems to modern platforms, ensuring ongoing flexibility, and readiness for future.

Improving utility KPIs with AI requires a dual approach: one path focused on long-term CIS transformation, and another designed to deliver short-term gains through AI applied to current operations. This roadmap outlines both strategies, each essential to achieving sustainable, measurable impact.

Short-Term Innovation Path
Exploitation



Train your teams and prepare the organization for AI adoption

Evaluate the state of your data to ensure it can support AI use cases

Deploy smart agents to automate repetitive tasks or enhance decision-making

Use ML models to predict, personalize, and optimize operations incrementally

Mid & Long-Term Innovation Path
Exploration

Understand the current system's constraints and opportunities

Shift your mindset on what a modern CIS should enable in the AI era

Evaluate future-ready platforms designed for scalability and intelligence

Plan and execute a (Customer Information Systems) CIS Transformation

Design a long-term roadmap that balances operational robustness with AI innovation

At **Open Intelligence**, we've taken a step forward. We have aligned our platform Smartflex, with cutting-edge AI tools to offer a modern **Customer Information System (CIS)** that empowers utilities to accelerate innovation and business growth.

Smartflex is an all-in-one, modern CIS solution, built to meet evolving customer and industry needs. It integrates advanced capabilities for meter-to-cash processes, digital customer experience, meter data management, and mobile workforce management, all within a single, cohesive platform. What makes Smartflex unique is its deep integration of artificial intelligence, that goes from **advanced analytics** to anticipating customer needs, **anomaly detection** for consumption patterns, **AI-driven chatbots**, **smart routing**, and **digital adoption tools** to support employee's daily basis, among many others.

Utilities leveraging Smartflex have reported significant benefits, including:

100%
automation of manual processes

Up to **30%**
increase in field crews' productivity due to routing optimization

Up to **30%**
reduction in onboarding time

32%
reduction
in inbound calls to the contact center

Additionally, we are currently embedding smart agents to support everyday activities. One agent is being developed to handle complex back-office requests. By automatically analyzing customer messages and complaints, such as high bills inquiries, this agent interprets context and leverages direct integration with billing, consumption, and service modules to autonomously investigate the issue. Based on its analysis, it identifies probable causes, presents actionable insights, and, if necessary, initiates subsequent

actions like scheduling field work orders or technical meter inspections. This significantly reduces resolution times, eliminates unnecessary manual steps, and boosts team productivity, resulting in approximately 80% improvement in operational efficiency.

To fully harness the transformative power of AI, organizations must take a structured, strategic approach. It begins with assigning clear ownership of AI initiatives and assessing internal capabilities in alignment with business goals. From there, it's essential to identify high-impact use cases and partner with experienced consultants and technology providers to select the right solutions. As AI technologies continue to evolve, it's equally important to establish a future-ready roadmap, starting with short-term integrations and scaling intelligently through core systems. Since legacy platforms may not support advanced capabilities, organizations should plan for upgrades or transitions to modern platforms with embedded AI and unified data models. By following this approach, companies can unlock the full value of AI, obtain a single source of truth of their information, and drive sustainable innovation across their operations.

References

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[3] EON Public Information
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Innovation in flight: how drones are helping to secure power grids | E.ON News

If you're interested in discovering how Open can support your short- and long-term AI journey, minimizing integration and maintenance efforts while delivering real business results, contact our CMO:

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