



Digital Transformation NETWORK

An Initiative of BSA | The Software Alliance



Sustainability

Digital Tools for a Sustainable Future

Software Tools Help Increase Efficiency, Reduce Climate Impact

The world stands at the edge of an incredibly important environmental era: The still-growing global need for energy production is running headlong into the increasingly urgent need to address climate change. This isn't a new problem. It's one that scientists, politicians, and the public have been agonizing over for years. There are, however, an increasing array of new tools to address the interconnected energy issues and the increasingly important issues of sustainability. And there is one new tool that promises to help on both sides of the equation: digital transformation.

By both addressing the increasingly important need to address climate change and continuing to grow economic opportunity and jobs, software and other digital technologies will deliver cleaner, greener economies that are more distributed, more resilient, and more affordable. Leveraging data and software will make our energy use more efficient, take advantage of underused data, and allow companies to rethink the way they do things in almost every sector of the economy.

How is this happening? On the production side, software is making the energy sector's grid smarter—and greener—than it has ever been. Elsewhere, drones are taking powerline, pipeline, and wind turbine inspections in new directions, and bits and bytes of data are helping drill bits see through rocks to reach untapped energy resources.

A NEW AGE OF DIGITAL TOOLS

Digital technologies hold huge promise for helping achieve key energy goals. Maximizing the use of data and software has the potential to:

- ↓ Reduce overall electricity demand by 25 percent by 2050
- ↓ Slash global greenhouse gas emissions by 19 percent
- ↑ Increase wind farm power output by 20 percent and improve solar energy forecasts by 30 percent

On the sustainability side, digital transformations are helping companies do everything from reducing energy and water use right down to reducing the climate impact of the very buildings they fill. At home, individuals are helping the effort by turning to connected devices that can save energy and reduce costs everywhere from our kitchens to our cars.

How great is the potential? Research shows that software can help reduce overall net electricity demand by more than 25 percent, cut greenhouse gas emissions by 19 percent, and save billions on our energy bills.

Corporate Sustainability Across Sectors

For businesses, as the world moves on from the pandemic and companies increasingly internalize this new industrial revolution, sustainability has become a core part of organizations' digital transformations. They are seeking to harness the power of technology to enable optimal growth while being good corporate citizens. Software companies across the board are finding ways to ensure that 100 percent of their office and data center electricity come from renewable sources.

For companies in other sectors, digital solutions are helping them manage sustainability opportunities by allowing them to gather and analyze vital data from across the entire business and providing a more holistic view of their operations. That information, in turn, will help them decide how to manage compliance concerns in real time. Finally, as government reporting requirements and consumer interest in sustainable initiatives both increase, digital tools will provide companies with new ways to track and trace their activities—and to measure their impact.

What It Will Take

Maximizing these gains will take more than just a software upgrade. To help achieve these ambitious goals, policymakers need to address key issues, including:

1. **Ensuring robust cybersecurity.** With the energy grid becoming more connected, it is more important than ever to ensure that appropriate cybersecurity efforts are in place to defend the integrity, privacy, and use of the system.
2. **Upgrade the outdated electric grid.** Investing in smart grid technologies will help reduce energy use, cut greenhouse gas emissions, and put money back into consumer pockets.
3. **Close the software jobs gap.** As the energy sector becomes more digital, we face a looming shortage of people with skills to help us take full advantage of these opportunities. To address this, we need more workers trained to design and run the transformative software-enabled tools that power our energy grid.
4. **Modernize government IT and digitize public services.** The same digital tools and technologies improving energy and resource efficiency throughout the private sector can be more widely implemented by government enterprises.



AUTODESK

Building Information Modeling (BIM) software can help dramatically reduce the carbon footprint of the architecture all around us. With buildings using almost 70 percent of electricity and accounting for 30 percent of greenhouse gas emissions, smarter construction and design could slash those figures and save businesses \$25 billion in annual energy costs. BIM products from companies like **Autodesk** can create intelligent design options with algorithms that orient a building to maximize the use of daylighting, ensure energy efficient HVAC systems, and offer other improvements.



ExxonMobil

ExxonMobil is collaborating with **Microsoft** to use software-enabled IoT technologies in operations in the Permian Basin to monitor and optimize a vast number of widely dispersed field assets. Data is collected from an extensive network of sensors and stored in the cloud, allowing engineers, scientists, and analysts seamless, real-time access from anywhere. The insights gleaned from this data are used to enable performance optimization and workflow automation. Over the course of a field's life, this can lower costs, increase production, and reduce methane emissions.

Further, the use of advanced digital technologies such as artificial intelligence and machine learning to make ExxonMobil's Permian operations more efficient is a first step as the company moves toward closed-loop automation, a process that allows systems to recognize and respond to events without human intervention.



IBM

The **City of Copenhagen** turned to **IBM** to help them achieve their goal of becoming the first carbon-neutral capital by 2025. Working with the country's largest utility to reimagine energy consumption, the company helped develop a platform that dynamically adjusts heat and power consumption based on renewable energy supply and engages consumers to help. The solution allows big energy consumers—like building owners, companies, and retail firms—to opt to use less or make their own facilities available to the grid to address low supply. Such a model avoids relying on fossil-fueled power plants to meet demand and slashes the associated greenhouse gas emissions.


Microsoft

Worldwide, the demand for water is set to outpace supply by almost 40 percent in less than 10 years; two-thirds of the world population may suffer from lack of fresh water. Looking to operate more sustainably, organizations worldwide are turning to Ecolab to help achieve net-zero water usage—producing goods with infinitely recycled water—and providing access to fresh water for more people. **Ecolab**, in turn, is using **Microsoft's** cloud services to help those companies measure their systems' performance and drive improvement. The company collects information from 36,000 water systems in more than 100 countries across five continents to help its customers reduce their water, energy, and operational costs.


ORACLE

As one of the leading suppliers of home and personal products, **Unilever** faced a major challenge as it looked to reduce the environmental impact of their need to deliver high-quality goods to the consumers who need them. Unilever turned to **Oracle's** automated transport planning software to help them optimize vehicle use, reduce the number of trucks required, cut carbon outputs, and shrink inventory requirements. As a bonus, the company was even able to minimize invoice paperwork and free up IT staff for other priorities.


salesforce

With utilities around the world looking to optimize their electricity grids, digital transformations are helping them bring more power online. One example of this is the UK's National Grid, where operators wanted to connect more renewable power to the existing grid. This required working through the engineering challenge of dealing with the exacting specifications, detailed language, and countless rules for connecting traditional coal, gas, and nuclear suppliers. National Grid operators simplified these processes and rationalized them for renewables by using **Salesforce** technology to develop ConnectNow, a portal that streamlines the onboarding of new connections.


SAP

The freight rail industry turned to software to make itself more fuel efficient, resulting in freight trains being able to move a ton of freight with just half the fuel they once required. **SAP's** IoT platform analyzes huge amounts of data on train length, weight, route topology, and wind—leading to greater fuel efficiency and reduced maintenance costs.


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SIEMENS

Ingenuity for life

Using plant simulation software from **Siemens Digital Industries Software, BMW Group** was able to improve the overall energy efficiency of car engines by lowering the energy required for its production. To produce an energy simulation, Siemens' technology mapped the power consumption of each machine in line with the production stages in the process control system. The resulting energy savings are predominantly achieved by reducing energy supplied during non-productive phases.


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splunk>

Trane, the world's leading air conditioning provider, turned to **Splunk** for a data analytics solution to improve the operation of remote chiller plants that provide cooling on a large scale to commercial customers. By providing real-time asset visibility and predictive insights, Splunk's solution helps Trane to boost the efficiency of chiller plants, uphold green building practices, and reduce costs for customers.


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workday

To minimize climate impact, it's important to first understand the impact of business strategies on emissions. **Workday** and integrated solutions allow companies the ability to understand where material emissions come from, model the impact of emissions reduction initiatives, and source from sustainable suppliers.

Cross-Sector Series Overview

Digital transformation is having profound impacts across all industries. This series of reports is intended to demonstrate how software-enabled technologies and innovative companies are enabling the creation and improvement of business processes, culture, and customer experiences across sectors.



Financial Services: Digital Tools Transform How We Save, Spend, and Invest

This report explores how digital transformation enables banks, insurers, and payment providers to personalize services, save employees and customers time and money, and comply with global regulations upstream.



Construction: Digital Tools Help Build a Better Future

This report explores the digital tools and processes that enable architects, engineers, and contractors to design, construct, and maintain the built environment worldwide.



Automotive: Digital Tools Help Drive the Next Era of Transportation

This report outlines digital transformation in the automotive sector, including innovation toward important objectives, including lowered emissions, improved safety features, and enhanced connectivity.



Manufacturing: Digital Tools Transform How Things Get Made

This report delves into how digital tools are transforming the manufacturing process from beginning to end, allowing for increased revenue, improved productivity, enhanced safety, and greater sustainability.

Learn more at www.dxnetwork.org/sectors/.



Digital transformation is redefining business and society, initiating an unprecedented new era of opportunities and challenges. Digital transformation enables the creation and improvement of business processes, culture, and customer experiences and has the potential to yield profound benefits in the areas of sustainability, inclusive growth, and workforce development.

Governments around the world are seeking to regulate the digital environment in key areas such as privacy, artificial intelligence, cybersecurity, cross-border data, and other areas more boldly surfaced by digital transformation. Learn more at www.dxnetwork.org.

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The Digital Transformation Network (DTN), an initiative of BSA | The Software Alliance, brings together cross-sector business and technology leaders for constructive dialogue and information exchange in the areas of government regulation, public policy, and impacts to society associated with software-enabled digital transformation. Charter subscribers represent market leaders experiencing digital transformation across advanced manufacturing, automotive, consumer goods, energy, financial services, healthcare, retail, media, and telecommunications industries.

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