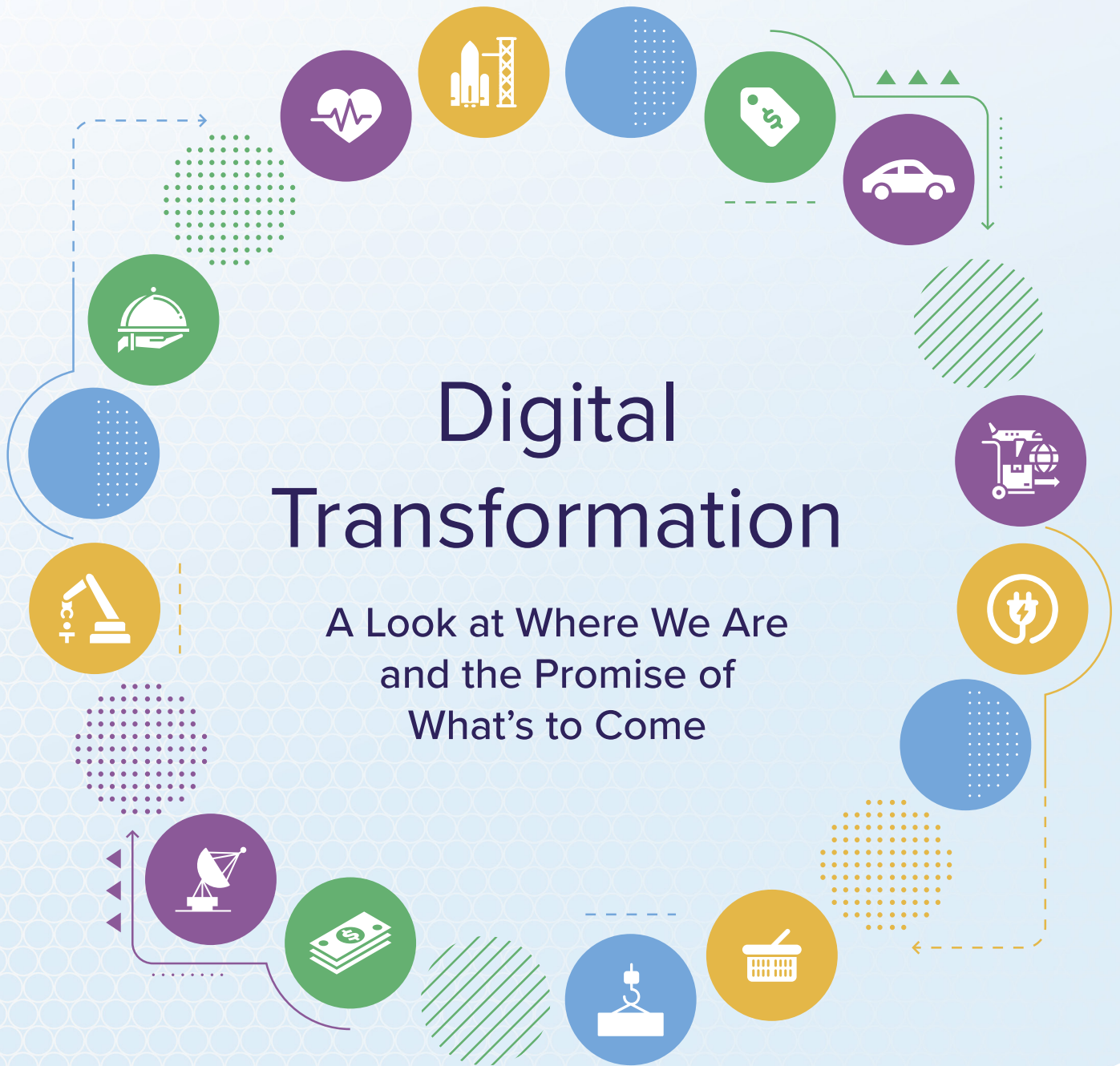# Digital Transformation NETWORK

An Initiative of BSA | The Software Alliance

Digital Transformation

A Look at Where We Are and the Promise of What's to Come

FOR YEARS, BUSINESSES AROUND THE WORLD have used software to become more efficient and to take existing industries in new directions. The typewriter gave way to the desktop computer. Email replaced paper communications. And more recently, software and data-enabled platforms have reshaped everything from how we order food to how we collaborate with our co-workers.

The casual observer, then, might be forgiven for not fully appreciating the dawning era of digital transformation. One might see discussions of artificial intelligence (AI), data analytics, and virtual reality (VR) as just the next step in business technology adoption—the office equivalent of a software upgrade or a shift from 3G to 4G speeds.

With digital transformation, though, things are different.

Vast improvements in software tools, the incredible power of cloud computing, and the widespread growth of connected devices promise to remake every industry and how business gets done all around the world. Manufacturers will revolutionize how their goods are designed and made with digital twins and just-in-time production; suppliers and distributors will retool the way those same goods are ordered and delivered with cleaner data and sharper analytics; and merchants will change how goods are bought and sold with VR store displays and more engaging sales materials. And these new digital tools won't just make businesses more efficient and better for the economy. Digital transformation can make companies better corporate citizens—by helping drive global sustainability goals, growing the workforce, and helping expand inclusive economic growth.

DX TRENDS

"For the first time ever, we see that the majority of enterprise organizations have an enterprisewide digital transformation strategy, a **42% increase from just two years ago**," states Shawn Fitzgerald, research director, Worldwide Digital Transformation Strategies.

IDC FutureScape: Worldwide Digital Transformation 2022 Predictions, October 2021.

KEY TERMS

Digitization: Transforming analog information into digital form, such as converting handwritten notes into computerized files

Digitalization: The use of computer technology and digitized information to update or improve existing tasks, such as email replacing paper communications

Digital Transformation: Applying digital tools across an organization in a way that creates a wide range of improved outcomes— new insights, new business models—by connecting previously separate processes

DX TRENDS

More digitally mature companies are more resilient and better able to navigate rapid change, and they do significantly better financially as a result.

2021 Deloitte Digital Transformation Executive Survey, April 2021.

The scale of the changes is unlike previous digital upgrades, and it will have far-reaching ramifications not just for businesses but for the people they employ and the government agencies that regulate them.

Businesses—even those outside the technology sector—will increasingly find themselves thrust into digital policy debates as they use software-enabled tools to maximize productivity and grow their operations. Some of these will be new issues for companies outside the technology sector, and the increasing focus on technology policy around the world promises to further complicate those discussions. At the end of the day, global conversations around privacy, cybersecurity, digital trade, and data governance will intertwine and expand in the same way that digital services continue to grow, creating new complexities for organizations of all sizes.

CASE STUDY

DIGITAL TRANSFORMATION HELPS SPEED THE FIGHT AGAINST COVID

The race to develop the COVID-19 vaccines is an amazing triumph of scientific progress. Never before have new vaccines been developed, tested, and rolled out so quickly. Less frequently discussed is the story of how that race would have gone much differently without the power of digital transformation. From the initial research to the final vaccine rollout, software has played a major role in the effort to address the global coronavirus pandemic.

IBM, Intel, Microsoft Help Vaccine Development

From the pandemic's early days, the software industry turned its tools toward developing a global response. More than 40 companies—including IBM, Intel, and Microsoft—joined forces in the COVID-19 High Performance Computing Consortium, a public-private partnership that provided computing and software capabilities to researchers focusing on COVID-19 related projects. By November 2020, with vaccine advances and other progress, the consortium turned its focus to helping researchers identify potential near-term therapies for patients afflicted by the virus.

Health researchers who tapped into the power of IBM's Watson AI technology could dramatically speed up development of vaccines and therapeutic solutions. "What would have taken weeks to model and run in a standard and traditional computing environment can literally be done in minutes," a representative said. "You can get months' worth of modeling and work done in the course of a day."

SAP Speeds Vaccine Supply Chain

But vaccine development was not the end of the story. Once companies finalized their immunization formula, reliable production and logistics were the next hurdles. But the distribution and administration of vaccines at the scale of COVID-19 is a monumental challenge. Companies must be able to react quickly to unexpected interruptions, and that can only be done by managing the complete supply chain from end-to-end—from procurement through production and on to delivery.

For years, governments have faced long-standing supply chain challenges related to inadequate storage, transportation, and human capacity. Failure to overcome those challenges in the past led to significant bottlenecks and the need to discard many much-needed vaccine doses.

Today, though, 95 percent of the world's major vaccine producers have adopted SAP solutions to manage the end-to-end vaccine effort—from manufacturing to distribution to administration and even post-vaccine monitoring. SAP's software products are helping vaccine makers:

» Procure the raw materials that make up vaccine formulas;

» Oversee manufacturing, resulting in improved worker efficiency;

» Manage global businesses in a way that allows the companies to use their data to improve operations; and

» Help distribution and prevent counterfeit drugs from reaching patients.

How Are Companies Doing This?

No single roadmap exists for a company's digital transformation, and no single technology or digitized business process would qualify as a true transformation. Instead, the next wave of business development involves the combination of a number of existing and emerging software-based solutions.

The varying paths to digital transformation involve integrated approaches that overhaul a company's internal efforts as well as its interactions with customers and other business partners. To achieve such change, companies are examining and implementing a range of new technologies, including:

Artificial Intelligence and Machine Learning

AI promises to be at the forefront of digital transformation for both big industries and small businesses. Tools that are just now emerging for commercial use will help digitize tasks and quickly make complex decisions. In combination with the tremendous computing power that is available in the cloud and emerging machine learning technology, AI tools can provide once-impossible analytics for almost any business.

DX TRENDS

This year, digital transformation spending is set to reach **$1.78 trillion.** Between 2020 and 2023, direct digital transformation investments could hit almost $7 trillion.

Spending on Digital Transformation Technologies and Services Worldwide from 2017 to 2024, Statista, August 23, 2021.

Augmented and Virtual Reality

Augmented reality (AR) and VR technologies seamlessly connect the physical and digital worlds. They offer unique possibilities for engineers, operators, and technicians, and they are changing the way companies design, manufacture, operate, and maintain their products and assets.

Cloud-Based Technologies

Cloud computing is no longer new, but many businesses still stand to fundamentally change their current business models by moving to remote computing. The use of the cloud allows companies to flexibly use off-site resources to store and process data on demand. That shift can substantially reduce hardware and infrastructure costs. It also enables teams to work efficiently online while maintaining a high level of cybersecurity.

Industrial Internet of Things

The at-home Internet of Things that so many people have adopted with smart devices and tech-enabled gadgets will be dwarfed by the enterprise-scale Industrial Internet of Things, a vast network of web-connected devices and sensors that will transmit and exchange data without human intervention.

Real-Time Data Analytics

The term "big data" is used to describe structured and unstructured, large-volume datasets and the methods that allow that data to be analyzed in different ways. As businesses adopt software solutions that capture and analyze their relevant data, the amount of data involved will grow exponentially. That requires careful processing to prevent a business from being overwhelmed and to produce reports that allow quick—and accurate—decision-making.

And So Much More

The umbrella of digital transformation encompasses a wide—and growing—variety of technologies, including applications and software, networking capabilities, sensing technology, video-based analytics, robotic process automation, and beyond. It's important to remember that digital transformation is less about the specific technologies involved and more about how it will change business outcomes—and how companies think about and manage technology policy.

Where Is This Happening?

Examples of the potential for digital transformation are as wide-ranging as its potential. Consider, for example, how integrated software solutions and new technologies will transform just a few industrial sectors:

Retail

Software solutions will transform the shopping experience for both online and brick-and-mortar operations. In-store shoppers can expect AR and VR offerings that create a more engaging and interactive environment, and other tools will provide more convenient customer service operations. Online, new tools will create seamless customer experiences tailored to specific customers.

Healthcare

Healthcare providers will use various digital solutions to create patient-centric and value-based outcomes that both improve care and reduce costs. Virtual doctor visits and networked electronic medical records are just two modes of digitalization that are transforming healthcare. Pharmaceutical and healthcare companies such as Abbott and Amgen will use digital tools to quickly develop new therapies and to deliver new services to patients.

Manufacturing

The Industrial Internet of Things helps companies improve production by reducing downtime and wasting less material while still ensuring high-quality goods. Predictive maintenance and other process upgrades will improve worker efficiency and increase profits. AR solutions can enable advance training and allow for collaboration across widespread operations.

Smart Cities

Mixing physical infrastructure like roads, bridges, and buildings with cutting-edge digital technologies will ensure safer communities and improve citizens' quality of life. From utility monitoring to public safety to environmental sustainability, technologies such as sensors, AI, and video analytics are helping the public sector transform the way it provides essential services to achieve greater efficiency, lower costs, and a higher level of citizen engagement. Already, smarter vehicles are driving the need for smarter roads, and the push for self-driving vehicles will have automakers like General Motors innovating like software companies that just happen to sell hardware that comes on four wheels.

SMART CITIES: ONE SMALL PIECE

Self-driving vehicles and connected cars hold the promise of reducing congestion, shortening commutes, and improving public safety. By sharing vehicle information through networked systems of sensors and cameras, residents and public officials will have access to a range of previously uncertain information: When will my bus arrive? How long will my drive to work take? How can we best manage traffic from major events? A coordinated, smart city approach will improve everything from routine backups to mass evacuations.

What's Next

The new wave of digital transformation promises major changes for businesses—in both how they operate but also in how they approach technology policy overall.

The combined impact of the wide-ranging changes of digital transformation will be so all-encompassing that the sector-specific technology policy strategies that many governments have implemented will be insufficient to the task of managing the legal implications and ensuring continued growth of tech-enabled businesses. The traditional silos around different vertically regulated industries will deserve a fresh look and new baseline rules across sectors may be needed. Companies from across the economy will want to pay close attention to ensure that new technology rules and regulations don't create uncertainties or unforeseen consequences in other sectors. To ensure continued growth, countries will need to focus on expanding digital adoption and digital literacy of the future workforce. Governments should therefore focus on workforce development and training.

The digital transformation era promises great change and tremendously exciting developments for industry and society. Managing those changes in a way that maximizes the benefits while ensuring the safety and security of all will require thoughtful approaches across the entire business and policy landscape. The potential, though, is nothing less than world changing.

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.

Sign Up for Digital Transformation Network Updates

dtninfo@bsa.org

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.

AN INITIATIVE OF

The Software Alliance

BSA

www.dxnetwork.org