aws

7 essential, data-driven solution areas for leaders

Maximizing mission success with data

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INTRODUCTION

Data is at the center of every application, process, and organization decision—it's the fuel for innovation and mission success. Advanced analytics, machine learning (ML), artificial intelligence (AI), and now generative AI have put a renewed emphasis on extracting value from data.

But harnessing the value of your data isn't easy. Managing diverse use cases, data types, and evolving needs requires more than a single database, data lake, warehouse, or business intelligence (BI) service. It requires thinking holistically and understanding how to make your data work together so you can put it to work for your organization.

We encourage you to look first at the problem area you want to address and the outcomes you want to achieve. From there, work backward to understand how you can use data and AI to drive results in the targeted area. The eight solution areas covered here offer prime opportunities to use your data to transform functions and capabilities across your organization.

Mastering customer obsession with end-to-end data visibility

Today, citizens expect the same convenient technology experience from government that they expect from their favorite brands. Expectations are at an all-time high.

To break meet these expectations and fulfill your mission, you must first get a holistic view of your customers using data and AI—and then provide them with hyper-personalized experiences across all channels.

Priority industries

- Government organizations
- Education institutions
- Nonprofits
- Healthcare systems
- Research institutions

Leadership areas

- Communications
- Citizen experience
- Contact centers
- Data products

Needs met

- **Robust customer data platform (CDP):** Create a precise, real-time, and persistent view of your constituent, student, or patient

- **Intelligent Document processing:** Automate content creation and customization to support public sector workers

- **Personalization:** Tailor services to individual citizens' needs

Bottom line

Use to data streamline processes, enhance the experience of those you serve, and deliver on your mission. The more you can meet, anticipate, and exceed customer expectations, the greater loyalty and lifetime value you can generate.

Create unified customer profiles.

Build your own CDP on Amazon Web Services (AWS) to unify first-party data along the customer journey—and create a 360-degree view of your customers. Continuous innovation in AWS services can further enhance the capabilities of your CDP, while comprehensive data governance and management tools help maintain data quality, consistency, and regulatory compliance.

Collaborate using data clean rooms.

Organizations need a secure and effective way to share data and collaborate with their partners. AWS Clean Rooms helps customers and their partners easily and securely collaborate, analyze, and build ML models using their collective datasets—without sharing or copying one another's underlying data or revealing sensitive information to each other.

Offer personalized customer experiences.

Improve the customer experience by creating personalized content services, and solutions with AWS. Amazon Personalize integrates personalized recommendations into existing websites, applications, email marketing systems, and more. Amazon Bedrock allows you to build generative AI applications that personalize content and conversations based on your customers' needs.

"According to a report by Adobe, 72% of global consumers believe that generative AI will improve their customer experience. Generative AI is instrumental in delivering a high level of personalization across various channels."[1]

1 "Generative AI And The Art Of Personalization," Forbes, November 13, 2023

FDA

The United States Food and Drug Administration (FDA) worked with AWS Partner DRT Strategies to migrate 27 mission-critical workloads from an on-premises data center to AWS. DRT created cloud migration strategies, financial analysis, and application rationalization while embracing the AWS Cloud Adoption Framework (AWS CAF). As a small, woman-owned business, DRT has also benefited from the AWS Think Big for Small Business Program, receiving access to business, technical, and marketing support resources from AWS.

As part of the migration, DRT created an AWS-based data lake that relies on AWS services like Amazon EC2 to help the FDA perform advanced analytics on unstructured and semi-structured data. The solution automates knowledge management and helps the FDA better capture genetic research data for analysis.

"The FDA can collaborate with partners to identify and respond to food-borne pathogens faster than before. By running on AWS, the FDA has optimized its operations and can work better, cheaper, and faster.'"

Rick Goodwin
Senior Manager of CFSAN Delivery, DRT Strategies

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Achieving supply chain excellence with an end-to-end data foundation

By 2026, Gartner predicts that more than 50 percent of supply chain organizations will use ML to augment their decision-making capabilities.[3]

As supply chains continue to expand, they're also becoming more complex and disparate. Modern supply chains require a unified view of orders, inventory status, purchase orders, supplier shipments, and more. That data then needs to be analyzed to understand how any changes might impact delivery or operational efficiency.

At the same time, end consumers demand more selection, on-demand delivery of goods and services, improved sustainability, and ethical vendor behavior.

The need for data-driven supply chain transformation is becoming more apparent than ever. Unify supply chain data and apply advanced analytics, BI, and AI/ML using data lakes and data warehouses built on AWS. And get insights and predictions you can use to bring agility and connectivity to your supply chain.

Priority industries

- Pharmaceuticals and healthcare
- Public safety and emergency services
- Infrastructure and transportation
- Defense and national security

Leadership areas

- Supply chain
- Fulfillment
- Logistics
- Finance
- Operations

Needs met

- **Unlock supply chain intelligence:** Gain end-to-end visibility of your supply chain and get ML-driven insights

- **Deliver on customer promises:** Improve the accuracy of your supply chain forecasting

- **Build resilient supply chains:** Identify patterns in data to assess potential issues and mitigate disruptions

Bottom line

Move quickly to bring agility, connectivity, and sustainability to the forefront of your supply chain with AWS.

PORT of vancouver

The Port of Vancouver needed to overhaul the container examination process for Canada's Western Gateway, a trade and logistics corridor. Due to a prevalence of manual processes—and operations distributed across multiple organizations—reliable data was lacking.

Without clear visibility and insight into ground operations, the container inspection process had become inefficient and costly. In partnership with AWS and Deloitte, the Port of Vancouver is developing a new class of insights on its physical operations using AWS Panorama to help:

- **Identify and track containers**
- **Feed real-time data into its blockchain system**
- **Assign costs properly**
- **Identify efficiency improvement opportunities**

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Create end-to-end visibility.

Offer a unified view of your supply chain with AWS Supply Chain. Gain clear visibility across your entire supply chain, make informed decisions powered by ML, mitigate risks, and reduce operational costs.

Improve demand forecasting and operations planning.

Set up forecasting to predict retail inventory demand and enhance your supply chain planning. Amazon Forecast uses ML models to generate more accurate demand forecasts—without the need for prior ML expertise.

Improve productivity.

Automate supply chain processes with AI and ML to free up your teams for more critical tasks. Using services like AWS Panorama, for example, you can track and optimize your operations—and quickly locate items.

Create supply chain resiliency.

Analyze all your supply chain data for better planning, risk analysis, and execution. Using third-party data sources, such as economic indicators and travel restrictions, can help you predict and mitigate disruptions. Enhance your supply chain risk prediction using our third-party data integration services, such as AWS Data Exchange, to access a vast array of third-party datasets.

Maximize the power of your supply chain data with generative AI.

Generative AI, capable of analyzing vast amounts of data and using it to create content, offers significant opportunities to enhance supply chain operations. It can optimize strategies and resource allocation; extract vital insights from large datasets; and help refine forecasting, demand planning, and distribution. Also, generative AI tools can be predictive and help to produce risk evaluations, scenario simulations, and proactive risk mitigation strategies for supply chain planners. Amazon Bedrock offers the easiest way to build generative AI applications using popular foundation models (FMs) and customizing them on your supply chain data.

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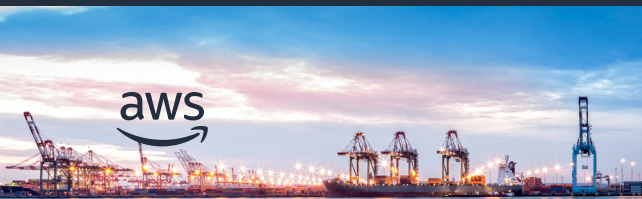
Faster, smarter decision-making across your entire organization

The power of data is undeniable. But your data alone is worthless.

As the volume of data surges across industries, the need for real-time insights to drive mission-critical decisions is more important than ever.

According to PwC, highly data-driven organizations are three times more likely to report significant improvements in speed and quality of decision-making than those who rely less on data.[4]

To extract value from your data, you must be able to transform it into clear, accurate— and easily accessible—business insights. Drive confident decision making across your organization using AWS to gather, manage, use, and act on your trove of data.

Priority industries

- Healthcare and pharmaceuticals
- Public safety and emergency services
- Infrastructure and transportation
- Defense and national security
- Education

Leadership areas

- Data strategy and analytics
- Organization strategy and operations
- Communications
- Budgeting
- Mission success

Needs met

- **No more data silos:** Give public sector workers the power to quickly access, share, and collaborate on data, with unified data accessible across your organization on AWS

- **Real-time business intelligence:** Empower users to make decisions with data, right when they matter most

- **End-to-end data governance:** Govern and share data more broadly across the organization, using cloud-based tools to catalog, discover, share, and govern data stored across AWS, on premises, and third-party sources

Bottom line

Give people and applications across your organization the data they need to make informed decisions that create value and fulfill your mission.

Eliminate data silos.

Facilitate flexible, seamless data sharing and access across organization units by unifying data across your organization with AWS. When the right people have access to the right data, you can align business outcomes with data-driven insights.

Propel real-time decision-making.

Free your teams from the heavy lifting required to create data pipelines. AWS has built zero-ETL (extract, transform, load) integrations between our services to make it easier and faster to do analytics, BI, and ML without the need for individuals to delve into the complexities of ETL.

Strengthen data security and governance.

Move faster and empower users with the right information at the right time. Gain precise control over where your data sits, who has access to it, and what can be done with it at every step of the data workflow using Amazon DataZone.

Empower organization users with BI.

Make data-driven decisions on a larger scale and at a faster pace. Give employees easy access to the insights, analytics, reporting, and visualizations they need to make data-driven decisions using Amazon QuickSight, a unified cloud-based BI service.

Foster a data-driven culture.

Drive data literacy across your organization and embrace new architectures using AWS services to make actionable insights easily available for everyday actions. Unlock the full potential of your data by expanding data-driven decision-making across all corners of your business.

National Biodiversity Network Trust (NBN) is a nature charity that supports the United Kingdom's conservation sector through an extensive public online atlas of biodiversity records. NBN works with 160 organizations that feed data through various pathways into the NBN Atlas, one of the world's largest repositories of publicly available biodiversity data. Over 20 years, the Atlas had become a conglomeration of seven separately hosted websites that were monitored, maintained, and backed up manually by two NBN developers.

NBN migrated to a new AWS cloud back-end to strengthen security, increase operational visibility, and streamline deployment within a modernized architecture optimized for cost. NBN implemented the AWS Well-Architected Tool, which helps organizations review the state of applications and workloads against architectural best practices, identify opportunities for improvement, and track progress over time.

"Using AWS to modernize and upgrade our infrastructure and code increases the efficiency of accessing biodiversity data for the organizations that rely on us."

Lisa Chilton
Chief Executive, National Biodiversity Network Trust

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Innovating faster with intelligent applications that evolve with citizen needs

When it comes to modernizing applications, these four objectives should be top of mind:

1. Building experiences that better support customers

2. Creating value for your constituents, patients, students, and beneficiaries

3. Reduce fraud and mitigate risk

4. Optimizing costs

For success, it's critical to build applications that are scalable, intelligent, high performance, agile, and always relevant. Build a robust data foundation to power your data-intensive applications, including generative AI applications that drive value, cut costs, and improve customer experience.

Priority industries

- Healthcare and pharmaceuticals
- Communications
- Public safety and emergency services
- Education

Leadership areas

- Data strategy and analytics
- Business applications
- Data products
- AI and digital transformation

Needs met

- **Cloud-first:** Build applications to run in the cloud so they benefit from its scale, flexibility, reliability, and security

- **Composable:** Scale and independently deploy application components with a microservices architecture

- **Responsive:** Ensure an excellent user experience across various devices and interfaces with adaptive design

- **Interoperable:** Ensure compatibility and integration capabilities with other systems and platforms

- **Intelligent:** Use advanced technologies like AI/ML or generative AI to help make your applications smarter

Bottom line

Move your applications to the cloud so you can innovate faster and evolve with citizen needs.

Universidad Francisco de Vitoria (UFV) integrated four core data sources into a data lake using AWS services, automating and simplifying data management while enabling near real-time reporting. This integration, including systems like UXXI and Canvas, stores data in Amazon S3, enhancing scalability and security. UFV's data lake architecture ensures data security, governance, and complies with Spain's National Security Scheme, emphasizing cybersecurity and regulatory adherence.

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Modernize application infrastructure.

Build applications with flexible, microservice-based architecture using AWS infrastructure. AWS offers eight purpose-built database engines, each uniquely designed to provide optimal performance for your applications. For instance, Amazon DynamoDB is a fully managed, serverless, key-value NoSQL database designed to run high performance applications at any scale. It delivers apps with consistent single-digit millisecond performance, nearly unlimited throughput and storage, and automatic multi-Region replication. Over a million customers use DynamoDB.

Develop new solution areas with low-code technologies.

By 2025, Gartner predicts that 70 percent of new applications will use low-code or no-code technologies.[5] Empower your teams to generate accurate predictions without prior ML experience or coding. Use Amazon SageMaker Canvas, for example, to build a visual point-and-click interface for data preparation, analysis, and building ML models.

Build and power generative AI applications.

Confidently build and scale applications with enterprise-grade security and generative AI capabilities using Amazon Bedrock. No coding required. Generative AI applications need databases that can store, index, retrieve, and search vector embedding or numerical representations of unstructured data such as text, images, and audio. AWS offers vector capabilities in its popular databases, including Amazon Aurora, Amazon RDS, Amazon OpenSearch Service Serverless, Amazon Neptune, and Amazon DocumentDB to support generative AI applications.

Enabling sustainable, high performance innovation with strategic cost optimization

The growth of generative AI is expected to drive data center infrastructure and operating costs to over $76 billion by 2028.[6]

As you work to make data-driven innovation and insights a core part of your organization's future, it's critical to prioritize cost optimization.

Technologies like generative AI are revolutionizing organizations across the public sector. But at the same time, the costs of managing data infrastructure are soaring as data volumes and use cases grow. Storing, processing, and analyzing large amounts of data require significant resources—including hardware, software, and personnel.

Cut costs on unnecessary heavy lifting and keep pace with innovation by migrating your data to AWS, where you can access the latest cloud technologies—without managing infrastructure.

Priority industries

- All industries

Leadership areas

- Organization strategy and operations
- Budgeting
- IT operations
- IT product development
- Procurement

Needs met

- **Optimize costs at scale:** Choose the end-to-end data foundation that offers the most comprehensive capabilities at the greatest price performance for your use cases

- **Spend less time on data management:** Use built-in intelligence and automation

- **Find cost-saving opportunities:** Use AI and data to gain insight into your operations and identify areas for improvement

Bottom line

Reduce the costs of putting your data to work by using best price performance services and using data-driven insights to find cost optimization opportunities across your organization.

6 "Generative AI Breaks The Data Center: Data Center Infrastructure And Operating Costs Projected To Increase To Over $76 Billion By 2028," Forbes, May 12, 2023

Optimize infrastructure costs.

Improve your business processes and reduce operational costs by moving from self-managed or on-premises data infrastructure to a fully managed, cloud-based, end-to-end data foundation. AWS provides the most comprehensive set of data capabilities to give you optimal price performance for any data workload or use case. This includes Amazon Aurora, which provides the performance and availability of commercial-grade databases at one-tenth the cost; Amazon Redshift, a fast, petabyte-scale data warehouse delivering up to six times better price performance than other cloud data warehouses; and Amazon S3 Intelligent-Tiering storage class, which has saved customers $2 billion in storage costs since its launch in 2018.

Reduce or eliminate data integration costs.

The data-driven insights that bring the most value come from getting a full picture of your organization and constituents. But connecting the dots between your different data sources across multiple departments, services, on-premises tools, and third-party applications typically requires complex ETL pipelines, which can take hours, if not days. AWS is investing in a zero-ETL future to help organizations accelerate decision-making. With direct integrations between AWS services, we are reducing and eliminating ETL for common use cases so teams can move faster.

Uncover cost-saving opportunities with analytics and ML.

Data analytics, BI, and ML can offer valuable insights into your operations by identifying areas for cost reduction and improved efficiency. You can reduce the cost of software by development, for example, by generating code suggestions in real time with Amazon CodeWhisperer.

Innovate efficiently.

Put your data to work to enable generative AI applications that increase productivity and reduce overhead. With fully managed Amazon Bedrock, you can evaluate FMs for your generative AI use cases and customize FMs with your own data. You can also accelerate and augment your generative AI applications with a choice of FMs from leading AI companies like Anthropic, Cohere, Stability AI, and Amazon.

Transport for London (TfL) has adopted innovative data sharing with the private sector to improve London's air quality and safety. This includes deploying air quality monitors and integrating traffic flow data to optimize traffic signals, reducing NO2 emissions by 20% in a pilot. TfL's RoadLab program also leverages open data to enhance road safety and efficiency, inviting tech startups to develop solutions to reduce congestion and roadwork disruptions.

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"Making our data more accessible has enabled private sector partners to develop apps and other digital resources which make it easier for Londoners and visitors to plan their journeys and get real-time transport and road updates. Through this innovative approach to our digital transformation, we have made our transport network far more efficient and are helping to build a better, greener, more prosperous London for all."

Theo Blackwell
Chief Digital Officer, City of London

Reducing and preventing fraud with data-driven insights

No organization is immune to fraud threats. With the increase in digital transactions, the potential for online fraud has grown, making it crucial to efficiently prevent, detect, and remediate fraudulent activity. Identifying suspicious activities early minimizes the risk of financial loss and maintains the integrity and trustworthiness of online systems.

Traditional, rule-based fraud detection methods are no longer sufficient to guard against the ever-evolving, sophisticated attacks.

Taking control of your data is essential to an effective fraud prevention strategy. By using data-driven fraud prevention tools from AWS, you can mitigate fraud losses and protect your organization's reputation.

Priority industries

- Government organizations
- Healthcare systems
- Federal Financial organizations
- Nonprofit organizations

Leadership areas

- Information security
- Data strategy
- Mission strategy
- Budgeting
- Customer experience

Needs met

- **Reduce fraud losses:** Spot and stop potentially fraudulent activity in real time using AWS services powered by ML

- **Safeguard your organization's reputation:** Avert loss of the public trust by using AWS data insights to adapt your fraud prevention strategy to evolve with the latest fraud trends

- **Keep customers happy:** Create secure and convenient online experiences with seamless fraud risk integrations

Bottom line

Use tools powered by advanced analytics and ML to effectively predict, detect, and prevent fraud.

NC DEPARTMENT of COMMERCE
EMPLOYMENT SECURITY

During COVID-19, North Carolina's Division of Employment Security transitioned call center agents to Amazon Connect. The system handled an unprecedented surge in unemployment claims, scaling to support 200,000 daily calls. Features like self-service claim status helped in reducing call volume by 20%, and Amazon WorkSpaces enabled efficient remote work. This modernization ensured timely claim processing and fraud detection, enhancing service to claimants.

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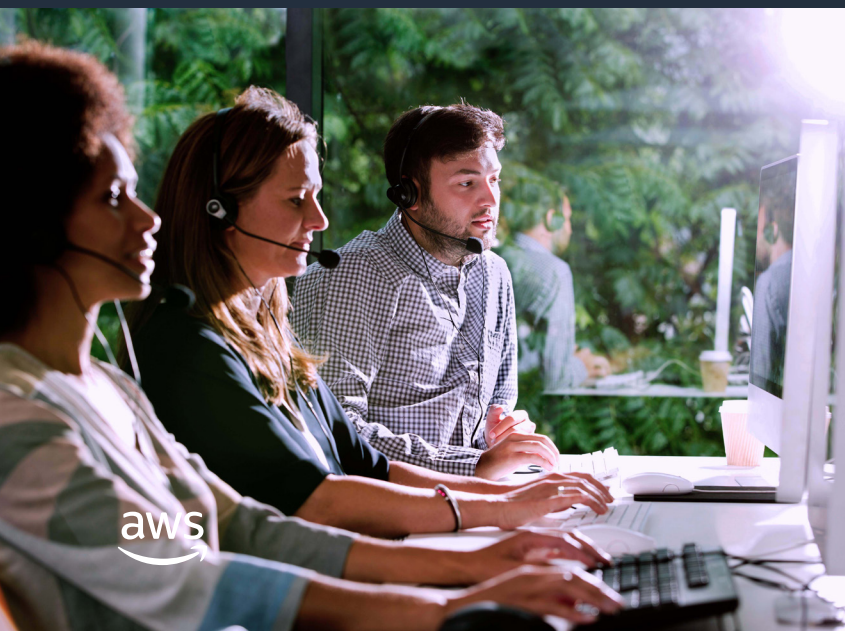
Detect fraud patterns.

Model relationships between people, places, and transactions with Amazon Neptune, a serverless graph database, to discover relationships that might not be obvious. The new Amazon Neptune Analytics makes it easier and faster for data scientists and application developers to quickly analyze large amounts of graph data and find insights in graph data up to 80 times faster by analyzing their existing Neptune graph database. Use ML to identify fraudulent activities with fully managed services like Amazon Fraud Detector.

Identify and prevent suspicious online activities.

Apply ML models to proactively detect potentially fraudulent activity. Identify and prioritize possible threats with Amazon GuardDuty and flag suspicious transactions with Amazon Fraud Detector.

Unlocking custom generative AI with an end-to-end data strategy

When you're customizing FMs to power your own generative AI apps, your data is your differentiator.

Successful generative AI initiatives begin with a strong data strategy that includes high-quality, relevant, readily accessible data. Good data is the difference between a generic generative AI application and one that truly covers every aspect of your organization—that drives not only cost efficiency but also operational efficiency and innovation—and creates real value for you and your constituency.

With an end-to-end data strategy in place, you can create generative AI applications that maximize the value of your data across your organization— to better understand your constituents, and make data-driven decisions.

Priority industries

- Government organizations
- Healthcare and pharmaceuticals
- Education
- Public safety and emergency services

Leadership areas

- Data strategy and analytics
- Organization strategy and operations
- IT operations
- Product development
- AI and digital transformation
- Customer experience and success

Needs met

- **Enhance content customization:** Streamline generative AI content ideation and production using your data and AWS generative AI services to achieve personalization at scale

- **Elevate customer experiences:** Create intelligent automation such as chatbots, virtual assistants, and content moderation tools to revolutionize customer interactions

- **Amplify productivity:** Boost employee and developer productivity with generative AI applications, such as conversational search, content creation, text summarization, and automated coding

- **Optimize organizational operations:** Use data-driven insights and generative AI to enhance model training and identify patterns for operational improvements

Bottom line

Harness the full power of generative AI's transformational capabilities with a modern data strategy.

Generate communications content.

Streamline and scale content creation—and reduce time and effort—while ensuring consistency in messaging and format with generative AI. Jumpstart your generative AI journey using Amazon Bedrock to access top-performing FMs. Experiment with different FMs for your use case, and upgrade to the latest model versions with minimal code changes.

Enhance customer operations.

Use chatbots, virtual assistants, intelligent contact centers, personalization, and content moderation to improve customer experiences. Generative AI-powered chatbots can provide immediate and personalized responses to complex inquiries, regardless of language or location. Improve the quality and effectiveness of automated interactions by fine tuning FMs and Retrieval Augmented Generation (RAG)to allow generative AI applications to access contextual organization data.

Speed up employee and developer productivity.

Use generative AI to automate routine tasks—and empower your developers to focus on more creative aspects of coding. Generative AI services like Amazon CodeWhisperer help improve productivity by generating real-time code suggestions.

Improve operations.

Streamline document tasks, automate categorization, and improve workflow efficiency with generative AI on AWS. Use data-driven solutions that incorporate ML to identify patterns in data for smarter operations. With unified data on AWS, you can enrich your datasets for better model training.

Amazon Q is a new type of generative AI-powered assistant that's tailored to your mission needs. It supports virtually every area of your business by connecting to your data for context of your role, internal processes, and governance policies. Ask Amazon Q questions in natural language to get actionable information that can help you manage your data and eliminate heavy lifting from common or repetitive data-related tasks, regardless of your job function.

quantiphi

QDox, developed by Quantiphi and powered by AWS, is an advanced intelligent document processing solution designed for public health. It automates data extraction from various document types using Amazon Textract and Amazon Comprehend, significantly reducing manual processing. QDox identifies, categorizes, and extracts key information from documents, enhancing data timeliness and completeness for public health decision-making. It supports a variety of documents, including laboratory reports and medical records, while ensuring data security and compliance.

Read the full customer story ›

aws

Data sets the foundation for transformation

Organizations are sitting on a treasure trove of data but struggle to extract value from it.

"In a survey of B2B companies, only 25 percent of respondents said they use data weekly to understand customer needs, while 9 percent admitted they never use data at all. An overwhelming 86 percent of respondents believed they could do much better with data."[7]

With an end-to-end data foundation—one that's comprehensive, integrated, and governed—you can fuel innovation, elevate customer experiences, and optimize performance.

Build yours on AWS, and propel your business into the future.

Take the next step: Learn more about AWS for Data

Additional resources
- Data-driven decision-making
- Customer 360
- Application modernization
- Supply chain transformation

7 "The data gambit: How large B2B companies can outmaneuver start-ups," McKinsey & Company, January 22, 2021