Discover how organizations speed AI/ML adoption with Red Hat OpenShift

See what's inside

Your data is a critical business asset

Turn your data into a valuable business asset and a competitive advantage. Artificial intelligence (AI) and machine learning (ML) technologies employ data to deliver business insight, automate tasks, and advance system capabilities. These technologies can help you transform all aspects of your business to achieve measurable business outcomes like improving customer satisfaction and becoming more competitive.

Red Hat® OpenShift® provides an enterprise-grade Kubernetes hybrid cloud platform for running containerized workloads and developing AI workflows and applications. On-demand compute resources, support for hardware acceleration, and consistency across on-site and cloud infrastructure deliver the speed and flexibility teams need to succeed. Quickly deploy familiar, preapproved tools and languages without manual IT intervention. Accelerate modeling and inferencing tasks with support for NVIDIA graphics processing units (GPUs). Create and share containerized modeling results across teams in a consistent manner. Streamline development of AI/ML-based applications with built-in DevOps capabilities.

This e-book shows how enterprises across industries are using Red Hat OpenShift to build AI/ML solutions that deliver real business outcomes.

Turn data into a business asset

This e-book discusses several technologies for actionable data analysis.

▶ **Artificial intelligence** involves machines imitating human behavior to perform tasks that typically require human intervention.

▶ **Machine learning** is a subset of AI that uses algorithms and statistical models to perform tasks without explicit instructions.

Read **Top considerations for building a production-ready AI/ML environment** to learn more about AI/ML.

AI/ML use cases across industries

Healthcare

▶ Increase clinical efficiency.

▶ Boost diagnosis speed and accuracy.

▶ Improve patient outcomes.

Financial services

▶ Personalize customer services.

▶ Improve risk analysis.

▶ Detect fraud and money laundering.

Telecommunications

▶ Gain insight into customer behavior.

▶ Enhance customer experiences.

▶ Optimize 5G network performance.

Automotive

▶ Support autonomous driving.
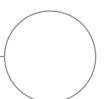
▶ Predict maintenance needs.

▶ Improve supply chains.

Insurance

▶ Automate claims processing.

▶ Deliver use-based insurance services.

Energy

▶ Predictive maintenance.

▶ Optimize field operations and safety.

▶ Energy trading.

Government of Ireland

Government agency improves data analysis for grant process with Red Hat

Challenge

The **Government of Ireland's Department of Agriculture, Food, and the Marine (DAFM)** processes grant applications submitted by farmers and their agents. However, incorrect document submissions by applicants led to data breaches in violation of the EU's General Data Protection Regulation (GDPR). To mitigate the risk of GDPR breaches, DAFM sought to replace its legacy data system and processes with an intelligent solution that would help correctly identify Personally Sensitive Information (PSI) and automate detection of breaches.

Solution

DAFM worked with Red Hat and Version 1 to create Smart-Text, an ML text analytics solution that can extract metadata from submitted documents to correctly identify PSI, in just a few weeks. To meet EU requirements for data ownership, this solution runs on Red Hat OpenShift on premise in DAFM's datacenter. With a foundation built using Red Hat container and management technology, DAFM can correctly categorize documents while protecting back-end systems and delivering new features faster.

"Our research showed that we needed an enterprise Kubernetes platform to create our machine learning text analysis solution. Red Hat OpenShift was the clear leader in that market. Red Hat also provides the security and control we need as a government organization."

Gareth Sheerin
Enterprise Architect, Government of Ireland Department of Agriculture, Food, and the Marine

Significantly reduced GDPR breaches with intelligent, AI/ML text analysis solution

Reduced development time from weeks to days with automation, application programming interfaces (APIs), and DevOps

Improved security and stability with enterprise technology and support
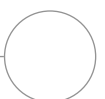
BMW Group

Global automotive group races to automated driving with data platform

Challenge

Headquartered in Germany, the **BMW Group**, including car brands BMW, MINI, and Rolls-Royce, is the world market leader in premium automobiles. To develop the driving algorithms for its automated vehicle initiatives, the BMW Group needed to access, analyze, and apply massive quantities of data—and update its driving applications with new algorithms as they are developed. The group wanted to create a high-performance, data-driven development platform as the IT foundation of its autonomous vehicle efforts.

Solution

The BMW Group chose to work with DXC Technology to build a solution for its data and performance challenges. To create a Kubernetes-based platform with robust automation capabilities, DXC Technology deployed DXC Robotic Drive, a managed Platform-as-a-Service (PaaS) based on Red Hat OpenShift and other Red Hat technology. This solution helps the BMW Group develop faster with scalable machine learning and big data processing capabilities. The platform was configured and created in just three months. It offers close to 230 PB of usable storage and the compute power to simulate up to 240 million kilometers of test data. The BMW Group now uses this cloud-based platform to gather data to create new, tailored customer experiences.

"Without this solution, achieving the right level of analysis and efficiency would take literally millions of years of effort. Red Hat OpenShift makes the deployment of new applications as easy as possible for the entire DevOps team."
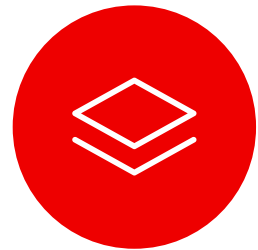
Dr. Jochen Thaeder
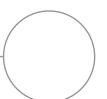Chief Architect, High-Performance Data-Driven Development (D3) Platform, DXC Technology

Reduced development time for autonomous driving technology
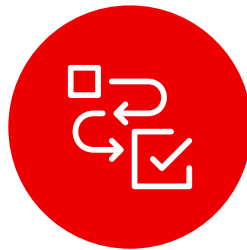
Deployed compute power to simulate up to 240 million kilometers of data

Developed a foundation for a future artificial intelligence program

ExxonMobil

Energy company speeds information sharing and gains agility and productivity

Challenge

ExxonMobil, one of the world's largest publicly traded energy providers and chemical manufacturers, develops and applies modern technologies to help safely and responsibly meet the growing demand for energy and chemical products. Research data scientists at ExxonMobil needed a better way to share their algorithms with their customers—the engineers, geo-scientists, and researchers who determine how and where to extract oil and gas. Previously, research data scientists had to configure and update their users' machines to share proofs of concepts. This process was time consuming, and the data exchange was complicated.

Solution

ExxonMobil deployed Red Hat OpenShift, enabling its data scientists to develop and share a higher number of projects per year. Now, research data scientists use modern software development best practices to iterate and fail faster, greatly accelerating project delivery. By combining agile practices with open source technology, data scientists have better tools to share important information with customers. The effort has been so successful that the practice is spreading within the company.

Improved research
data scientist productivity

Increased agility to support iterative
project validation and updates

Established remote collaboration
capabilities with greater security

"The proof of concept was so successful that there was no question if we should move forward with the project. The most interesting challenge that we have had to overcome is convincing individuals that this technology is real and can work in conjunction with various public cloud technologies."

Data Science and Optimization Technical Advisor, ExxonMobil
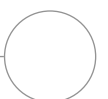
Kasikorn Business–Technology Group

Thai bank scales for high transaction volume with Red Hat

Challenge

Kasikornbank (KBank) is among the top five largest banks in Thailand, as measured by total assets, loans, and deposits. To prepare for future changes and challenges, KBank established Kasikorn Business–Technology Group (KBTG). KBank's K PLUS mobile banking application, managed by KBTG, has doubled its user base over the last five years. To support this growth and bring new features and services to market faster, KBTG needed to overhaul its existing IT environment. For example, KBTG introduced K PLUS AI-Driven Experience (KADE), a solution that incorporates AI into its legacy back-end systems to analyze customer behavior and provide personalized experiences. The bank also wanted to build an open banking platform that could connect with its business partners' systems.

Solution

KBTG worked with Red Hat Consulting to migrate from its existing platform to Red Hat Enterprise Linux® and Red Hat JBoss® Enterprise Application Platform (EAP). The company also deployed Red Hat OpenShift and Red Hat AMQ to create a unified notification system and achieve the speed and scale needed to handle massive transaction volumes as its user base continues to grow. Combining its new Red Hat container, platform, and messaging technology with DevSecOps and agile development approaches has helped KBTG cut its application development time by half. With this foundation, KBTG plans to work with partners to continue exploring new performance- and security-focused use cases for its responsive, reliable application environment.
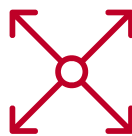
> "Previously, it took us over a month to add new features, but now it takes as little as two weeks. We can react much more quickly to changing consumer demands and give them the features they expect, with less time invested."
>
> **Thanussak Thanyasiri**
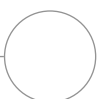> Senior Delivery Manager, Kasikorn Business–Technology Group (KBTG)

Cut development time from one month to two weeks

Achieved scale to handle 5,000 transactions per second

Simplified management for better operational insight and security

Royal Bank of Canada

Global bank powers digital transformation with Red Hat platforms

Challenge

Royal Bank of Canada (RBC) is one of North America's leading diversified financial services companies, handling massive amounts of data, with around 10 billion new client transactions each month. The company launched its own AI research institute—Borealis AI—to analyze this data, deploy AI and ML, and create new customer offerings. However, inefficient infrastructure required engineers and researchers to wait up to two months for project platforms. RBC wanted to build a new AI infrastructure to speed time to market for intelligent applications and deliver an enhanced experience for clients.

Solution

RBC deployed Red Hat OpenShift with NVIDIA's DGX AI computing systems to create a new private cloud infrastructure that delivers intelligent software applications and boosts operational efficiency. Red Hat OpenShift gives the bank a consistent private cloud platform for both AI/ML research and production applications that result from the research. ML applications run on OpenShift, and the team is able to take full advantage of the compute power of NVIDIA GPUs. Thanks to the NVIDIA GPU Operator, it's easier for data science teams to access, use, and share the GPU infrastructure.

RBC's AI private cloud has the ability to run thousands of simulations and analyze millions of data points in a fraction of the time that it could before. The flexible and highly reliable self-service infrastructure will allow RBC to build, deploy, and maintain next-generation AI-powered banking applications.
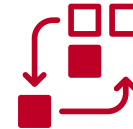
Improved trading execution and insights
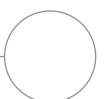
Reduced client calls

Accelerated delivery of new applications

"We are proud to have delivered a unique AI Private Cloud capability in-house, leveraging our strong collaboration with Red Hat and NVIDIA."

Mike Tardif
Senior Vice President, Tech Infrastructure, Royal Bank of Canada

Boston Children's Hospital

Leading children's hospital helps shape the future of medical image processing

Challenge

Boston Children's Hospital is dedicated to improving and advancing the health and well-being of children around the world. In medically critical scenarios, faster image processing and the ability to share critical data through real-time collaboration can lead to quicker and more accurate diagnoses, helping to improve patient outcomes. At Boston Children's Hospital, radiologists spent hours looking through images every day, giving them less time to interpret findings and treat patients. The hospital wanted to create an infrastructure to provide advanced imaging analysis and patient data to clinicians while they are treating patients.

Solution

Boston Children's Hospital used Red Hat's open source technologies to develop the ChRIS Research Integration Service, a web-based medical image platform, and deploy it on the Massachusetts Open Cloud (MOC). The hospital built ChRIS using a flexible, open hybrid cloud architecture that is designed for agility and scale. ChRIS provides a standardized way of deploying imaging applications, which reduces the barrier that currently exists between developers of those apps and users who need quick access to them. With a foundation built on open technology, the Boston Children's Hospital and MOC teams are committed to keeping the open data sets created by ChRIS open to all to further broaden innovation in children's healthcare.

> "With Red Hat's technology, we are able to create an open, scalable, and shareable platform capable of reducing the time it takes to analyze key images from hours to minutes."[1]
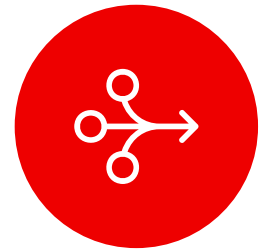
Dr. Ellen Grant
Director of Fetal and Neonatal Neuroimaging Research, Boston Children's Hospital; Professor of Pediatrics and Radiology, Harvard Medical School

Improved image processing time from hours to minutes

Gained ability to share critical data through real-time collaboration

Simplified imaging, analytics, and diagnosis application operations

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1 *Red Hat press release.* "**Red Hat Collaborates with the Massachusetts Open Cloud and Leading Children's Hospital to Help Shape the Future of Medical Image Processing**," *9 May 2018.*
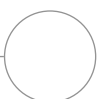
HCA Healthcare

Large U.S. healthcare company develops predictive analytics to help save lives

Challenge

HCA Healthcare, one of the largest healthcare service providers in the United States, uses data and technology to support modern healthcare. Its leadership identified sepsis rates as a key challenge that data could help solve. Sepsis is a treatable condition that commonly affects hospital patients. Delays of even an hour in sepsis diagnosis and treatment can greatly affect the patient outcome. Previously, nurses manually diagnosed sepsis in patients at HCA Healthcare's hospitals, resulting in patient evaluations only every 12 hours. HCA Healthcare wanted to create an application that uses ML models and algorithms to help nurses diagnose and treat sepsis faster and more effectively.

Solution

A cross-functional team of clinicians, data scientists, and technology professionals at HCA Healthcare used Red Hat OpenShift Container Platform and Red Hat Ansible® Automation Platform to create a real-time predictive analytics product, SPOT (Sepsis Prediction and Optimization of Therapy). SPOT collects and analyzes clinical data—such as patient location, vital signs, and pharmacy and laboratory data—and signals caregivers in real time to initiate early sepsis care. With SPOT, the company can more accurately and rapidly detect sepsis, helping to save lives across more than 160 hospitals. SPOT is the first of many initiatives across the organization to use real-time data at scale to improve patient care with new insights.

Sped sepsis detection by up to 20 hours

Gained new insights using machine learning algorithms

Reduced risk and cost of innovation

"About 80% of a patient chart is not computable. Working with great colleagues at Red Hat means we can use new tools like natural language processing and machine learning to develop new insights from that unstructured data."

Dr. Jonathan Perlin
Chief Medical Officer, HCA Healthcare
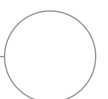
Public Health England

Public health agency drives on-demand high-performance computing

Challenge

Public Health England (PHE) is an executive agency of the Department of Health and Social Care in the United Kingdom that delivers a wide range of public health services, including scientific research and predictive modeling and inferencing for transmissible disease outbreaks. PHE was established in 2013 to bring together specialists from more than 100 organizations into a single public health service. The agency needed to restructure their central IT department to merge the numerous disparate IT systems and vast amounts of data. To support their scientific community, PHE decided to pursue a technology strategy that embraced modern computing architectures and solutions. The agency also wanted to deploy solutions built from an open, automation-centric ecosystem that could integrate their fragmented, proprietary set of existing systems.

Solution

Using Red Hat platforms, PHE reshaped their IT infrastructure and created a technology innovation roadmap that shifts their organization from a restricted stack of proprietary technologies into a more open orchestrated ecosystem. The agency's new open source cloud infrastructure platform accelerates service delivery, reduces operational costs, offers IT infrastructure resources as a service, and manages hybrid cloud and multicloud environments. PHE now uses open source technology to deliver modern public health services, including the processing and analysis of DNA samples from patients for diagnostics and surveillance of infectious diseases and the running of real-time AI and ML models and simulations to predict expected pandemic disease dynamics. PHE is improving scalability and cost efficiency for high performance computing workloads, primarily in three departments: informatics, statistical modeling, and economics and emergency response.

Sped service delivery while reducing costs

Accelerated pathogen identification

Developed innovative public health services

"PHE's ability to take better advantage of the opportunities created by open source technology is vital in its work in keeping the nation safe and healthy and ensuring that public health principles are maintained and developed."

Francesco Giannoccaro
Head of HPC and Infrastructure, Public Health England
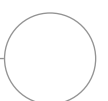
Ready to get started with AI/ML?

AI/ML has the power to transform nearly every aspect of your business. Red Hat can help you build a production-ready AI/ML environment that supports your organization's goals and prepares you for a digital future.

Learn how your business can benefit from effective AI/ML deployment:
openshift.com/ai-ml
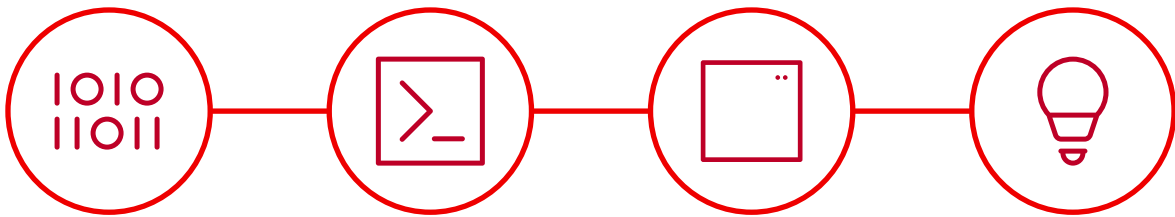
Get started faster with Red Hat Services.

Work with Red Hat experts to jump-start your AI/ML projects. Red Hat offers consulting and training services to help your organization adopt AI/ML faster.

→ Learn about AI/ML services: **red.ht/ai-consulting-services**

→ Schedule a complimentary discovery session: **redhat.com/consulting**

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