Red Hat

Turkish Airlines accelerates innovation with organization-wide AI

TURKISH AIRLINES

Türkiye's national airline, Turkish Airlines, set about initiating a data-driven transformation program to gain a competitive advantage in the aviation industry. It wanted to allow its data scientists to develop the latest artificial intelligence (AI) models and use them for multiple use cases, effectively encouraging its entire business to become AI driven. To facilitate this transformation, the airline's technology company, Turkish Technology, launched a project to develop a scalable and cloud-ready technological infrastructure. Red Hat Consulting helped to implement Red Hat OpenShift AI and develop a culture of experimentation. The operations team can now create workspaces in minutes rather than days, and data scientists can deploy AI models themselves, halving deployment times. With all the necessary tools now available for its AI initiatives, the airline can continue to foster a culture of innovation across the organization.

Headquarters

Istanbul, Türkiye
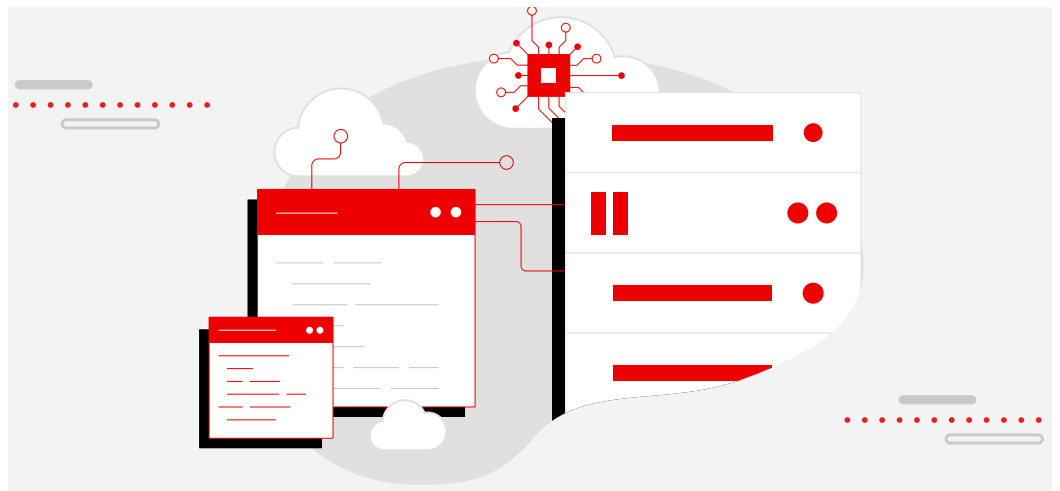
Industry

Transportation

Size

100,000+

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Emre Yavuz
Head of Data and AI
Turkish Technology –
Technology Company
of Turkish Airlines

Software and services

Red Hat® OpenShift® AI

Red Hat Consulting

Benefits

▸ Created workspaces in minutes and halved deployment time

▸ Fostered an open culture of innovation across the company

▸ Provided data scientists with access to key resources such as GPUs

▸ Automated processes and standardized templates

Red Hat Innovators in the Open

About Red Hat Innovators in the Open

Innovation is the core of open source. Red Hat customers use open source technologies to change not only their own organizations, but also entire industries and markets. Red Hat Innovators in the Open proudly showcases how our customers use enterprise open source solutions to solve their toughest business challenges. Want to share your story? Learn more.

Gaining a competitive advantage in the airline industry

Turkish Airlines, known legally as Türk Hava Yolları Anonim Ortaklığı (THY), offers scheduled flights to 353 destinations across Europe, Asia, Oceania, Africa, and the Americas. Individual travelers, corporate clients, and partners across various industries rely on the airline's extensive global network for their transport needs.

Aiming to build its competitive advantage in the aviation industry, Turkish Airlines set about initiating a data-driven transformation program across the organization. To realize this, the airline's technology company, Turkish Technology, sought to support its data scientists in developing the latest AI models to take full advantage of its data resources. The airline also wanted its entire business to become AI driven, so every business domain was tasked with delivering machine learning (ML) and generative AI (Gen AI) projects.

"Our CEO wanted employees from business departments to become citizen data scientists and create their own AI projects, whether to maximize revenues, optimize operations, enhance customer experience, or increase employee productivity," said Emre Yavuz, Head of Data and AI, Turkish Technology.

Turkish Technology first needed to ensure that the airline's technology infrastructure could handle large data volumes and support a growing user base. "Scaling was a challenge because there was no container orchestration platform between the Jupyter Notebooks and the compute resources," said Yavuz. "Anyone could consume all the compute resources, leaving none for others."

Adopting a cloud-ready orchestration layer based on open technologies

Turkish Technologies began searching for a platform to eliminate time-consuming manual data-connection tasks. It also needed a platform to simplify complex provisioning processes for model development environments and streamline model deployment.

"We wanted to give data scientists easy but managed access to data. Moreover, we wanted to automate workspace creation, standardize code and deployment processes, and manage compute resources," said Yavuz. "Overall, we wanted a cloud-ready solution so we can take advantage of cloud scalability when regulations permit."

After considering 10 vendor solutions, Turkish Technology selected OpenShift AI. "We chose Red Hat because its commitment to open source solutions aligns with our own values and strategy," said Yavuz. "The rapid pace of change in AI requires the flexibility and adaptability that only open source technologies can provide. With open source, we can create and integrate new technologies and remain at the forefront of innovation."

Red Hat ran a successful proof of concept with Turkish Airlines after which the scope of work evolved significantly to delivery. A team of 5 Red Hat consultants worked alongside Turkish Technology's DevOps, infrastructure, platform administration, and data science teams to design and implement the solution on bare metal, on premise.

The Red Hat team provided a fully customized OpenShift AI environment and integrated it with existing systems and requirements, including creating custom development environments, automated deployment for models and pipelines, and custom monitoring and alerts.

"Red Hat Consulting's technical expertise and communication skills were evident and instrumental in our success," said Yavuz. "The team provided mentorship and worked with us on a one-to-one basis, helping us adopt standardization and best practices, and make full use of OpenShift AI's capabilities."

Today, OpenShift AI provides the container orchestration layer that manages resource allocation for the graphics processing unit (GPU) compute resources. The airline's OpenShift AI ecosystem also includes the Dremio distributed query engine. This data ingestion layer stores curated data from a wide variety of data sources for OpenShift AI to use for model experimentation and training.

AI initiatives at Turkish Airlines currently span more than 60 live models. Use cases include real-time dynamic pricing based on passenger and behavioral data, payment fraud detection, and airline operations. AI also helps with ground-time predictions, tail assignments, and on-time performance predictions, giving the operations team the insight it needs to make proactive decisions and optimize operations. Multiple Gen AI cases for enhancing employee experience and productivity are also live on the Openshift AI platform.

Advancing at speed while expanding AI across the business

Created workspaces in minutes and halved deployment times

OpenShift AI has significantly improved both development efficiency and the deployment speed of AI models at Turkish Airlines. "OpenShift AI brings data access, development, and deployment together into a single suite, accelerating the AI model experimentation and go-live phases," said Yavuz.

Gathering, collecting, and preparing data takes nearly 80% of the AI model development project's time; OpenShift AI now mitigates manual processes such as building connections to various data research resources, which saves crucial time. During the model experimentation phase, speed is critical, as core models such as Llama—a family of large language models (LLMs)—change quickly. The predefined templates and images streamline the process for creating model development environments so they can be built rapidly.

"The data scientists just tell us how much memory and central processing units (CPUs) they need, and we create a workspace for them," said Yavuz. "With OpenShift AI, we can create a workspace in minutes, a process that previously took hours."

Deployments, meanwhile, have doubled in speed, thanks in part to standardization and to eliminating data scientists' dependency on the operations and infrastructure teams. "Our data scientists prepare a YAML file—a human-readable data serialization language that is often used for writing configuration files—with all their requirements going into production," said Yavuz. "OpenShift AI gives them the tools to move it into production easily."

Fostered an open culture of innovation across the company

Currently, more than 200 Turkish Airlines employees are working on AI-based development. Red Hat Consulting's efforts to help build trust in the platform among Turkish Airlines staff have contributed to its growing use, as well as breaking down barriers between teams by supporting data scientists in using OpenShift AI and opening new lines of communication.

A more open approach to experimenting and innovating with new packages, extensions, and technologies is now evident across the organization. "Previously, experimenting was a complex and risky process that often risked breaking the entire development environment," said Yavuz. "Thanks to Red Hat and OpenShift AI, our business teams—our citizen data scientists—can build their own models quickly and independently."

Now, various business departments can initiate their own AI projects on demand, and the data scientists can easily download and try new LLMs. Anyone can test new ideas and share their findings and best practices with Yavuz's team, which can then create new images for other data scientists to use. "If a data scientist solves a data cleansing issue, for instance, we can make a template for others encountering the same issue," said Yavuz.

Provided data scientists with access to key resources such as GPUs

With OpenShift AI, Turkish Airlines is well placed to respond effectively to growing business needs. The advanced infrastructure also gives data scientists access to resources such as GPU capabilities, which enhances the AI development process.

"Previously, we didn't have enough platforms or compute resources for the business to create all the AI models it wanted," said Yavuz. "OpenShift AI provides advanced tools and infrastructure that can not only streamline data preparation and accelerate AI model development but also scale compute resources."

OpenShift AI also optimizes compute resource utilization, reducing concerns about how individual workloads might affect others' work. "With OpenShift AI, we can allocate compute resources, so if anyone exceeds their allocation, they don't affect others," said Yavuz.

Data scientists and projects need to scale up and down from time to time, and some projects require instant and intense computing capabilities. Red Hat OpenShift's autoscaling and self-healing capabilities now safeguard access to vital compute resources while reducing the burden on the operations team.

Automated processes and standardized templates

OpenShift AI allocates data scientists' access to compute resources and data sources whenever a new environment is created. Automated processes and standardized templates reduce the risk associated with building connections manually, and ensure that regulatory requirements are always met.

"OpenShift AI gives us a standardized data connection layer," said Yavuz. "Operators no longer need to configure access to databases or enter usernames and passwords manually each time the team needs to connect to a data source."

Moreover, data scientists are only given access to the data sources and compute resources they need. An integrated Git repository provides appropriate access to AI models, whether read-write or read-only. Access management is also integrated with Active Directory, so users can use the same login details to access everything they require.

Expanding opportunities for innovation with AI

As the scope of the project evolved, Red Hat Consulting supported a range of new use cases. These included identifying the need for filtering and forwarding logs to external audit systems, implementing custom developer workbenches using mutating webhooks in Kubernetes, and implementing Sealed Secrets to prevent users from storing plain-text secrets in GitHub.

While Turkish Airlines is exploring more opportunities for AI to further develop its culture of innovation and capture efficiency gains, adopting OpenShift AI has already generated significant value.

"Our AI projects are targeted to create over USD 100 million in financial impact by boosting revenue, decreasing operational costs, and increasing efficiency," said Yavuz. "And we want to encourage a greater number of new citizen data scientists from within our business units. OpenShift AI is helping us to make AI a commodity where every corner of the business can build AI models. We hope our advancements set a precedent for our industry, influencing other organizations to adopt similar technologies."

About Turkish Airlines

Turkish Airlines or Türk Hava Yolları Anonim Ortaklığı (THY) is the national flag carrier airline of Türkiye. Established in 1933 with a fleet of 5 aircraft and fewer than 30 employees, the Star Alliance member now has a fleet of 477 aircraft flying to 130 countries worldwide.

About Red Hat

Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. A trusted adviser to the Fortune 500, Red Hat provides award-winning support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

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