10 ways to use AutoAI

Accelerate time to value with intelligent automation

Intelligent automation as part of the IBM data and AI platform

Accelerate time to value and expand the benefits of your data science AI investment

AutoAI enables you to automatically build models faster and scale experimentation and deployment. Expert data scientists can speed experimentation and reach better predictions faster. AutoAI makes AI model development more transparent for more people in your organization such as business and domain experts, application developers and DevOps teams, while still benefiting experienced and citizen data scientists.

As part of IBM Watson® Studio and IBM Watson Machine Learning, AutoAI is available as part of IBM Cloud Pak™ for Data. You can use AutoAI in conjunction with Watson OpenScale™. AutoAI helps practitioners reduce the manual and tedious parts of AI and spend more time enhancing the business impact and improving models. Here are 10 ways you can use AutoAI.

Read about the benefits of AutoAI as part of IBM Cloud Pak for data →

Content

Forrester Research: Organizations are frustrated operationalizing AI and machine learning (ML)

**1/5**   of firms are always able to get their models into production.

1/3   of firms say most AI and ML models are less accurate in production.

1/2   of firms say that most models aren't monitored or retrained regularly.

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, August 2019.

Automating AI lifecycle management is a requisite for winning with AI.

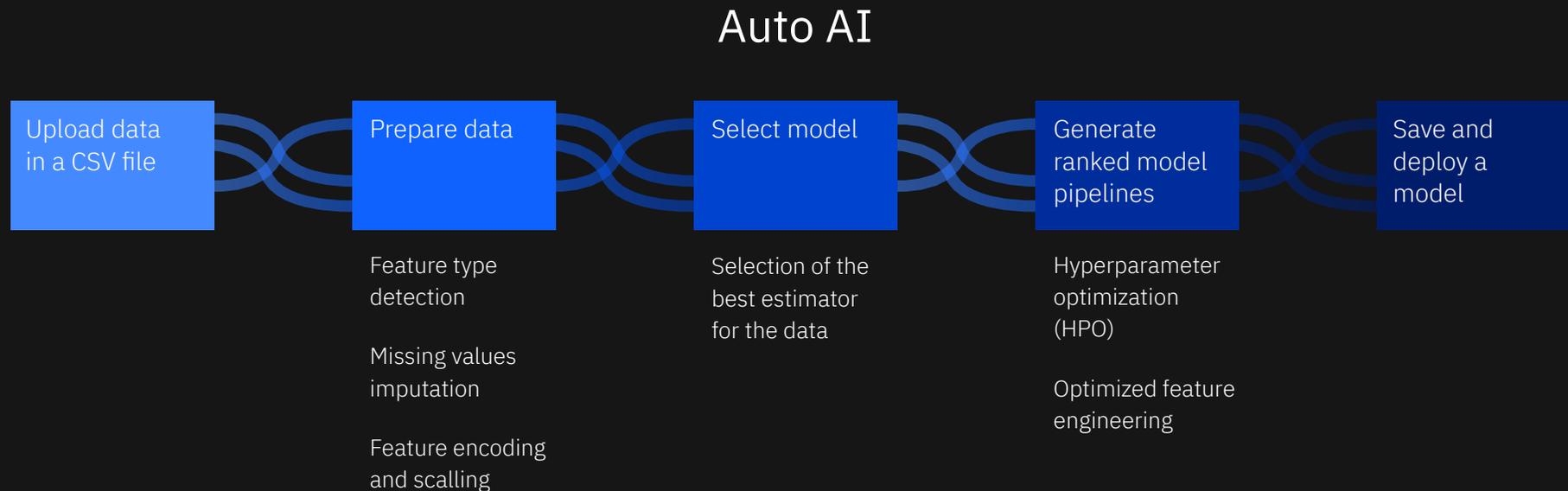Three-part webinar series: Winning with AI—A playbook for building transformative AI solutions →
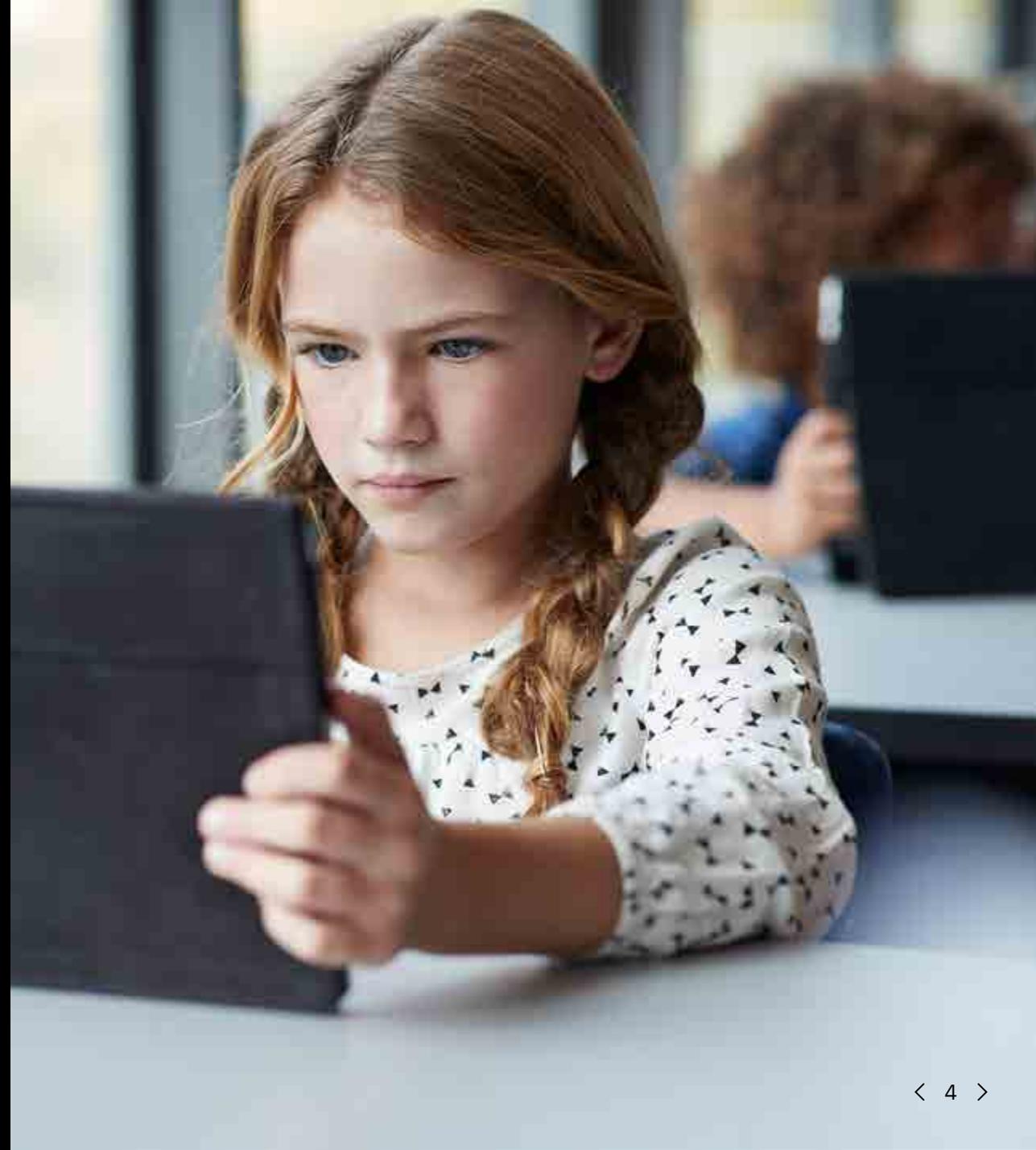
01

See results in minutes

Because AutoAI automates the time-consuming portions of data science and AI, you can see the results—for yourself—faster. If you're in the business, you don't have to wait for an AI and data science artisan or expert data scientist to prepare data, select the model, engineer the features, or choose the best hyperparameter. Instead, you get candidate model pipelines customized for your predictive modeling problem that are optimized over time and displayed on a leaderboard, showing the automatically generated model pipelines ranked according to your objective. The leaderboard is easy to understand, so a much broader team can get value from it.

Auto AI

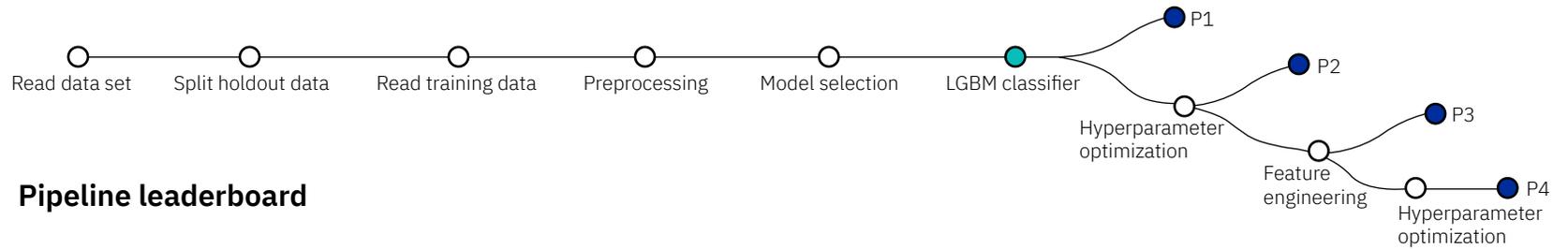| Upload data in a CSV file	Prepare data	Select model	Generate ranked model pipelines	Save and deploy a model
	Feature type detection	Selection of the best estimator for the data	Hyperparameter optimization (HPO)	
	Missing values imputation		Optimized feature engineering	
	Feature encoding and scalling			

02

Start on the right foot

AutoAI enables you to get a clean start with data science and AI experimentation, evaluation and deployment—no coding or lengthy training required. And, because it automates tasks, you can experiment and produce results more systematically.

AutoAI enables data scientists to understand which factors contributed to a specific outcome and what correlations may occur. Also, AutoAI can enable the team to align on the results by looking at the leaderboard and studying what algorithms were used.

Read AutoAI for Data Scientists: From Beginner to Expert →

Read data set — Split holdout data — Read training data — Preprocessing — Model selection — LGBM classifier

P1
P2
P3
P4

Hyperparameter optimization

Feature engineering

Hyperparameter optimization

Pipeline leaderboard

Rank	ROC AUC	Pipeline information		Compare models	Ranking based on:

ROC AUC
Accuracy
Average precision
f_1

> **1**   **0.994**   P3 – LGBM classifier estimator
Transformers (4): Preprocessing > Sigmoid > Feature selection type 1 > LGBM classifier estimator

> **2**   **0.992**   P1 – LGBM classifier estimator
Transformers (2): Preprocessing > LGBM classifier estimator

> **3**   **0.992**   P2 – LGBM classifier estimator
Transformers (2): Preprocessing > LGBM classifier estimator

> **4**   **0.983**   P4 – LGBM classifier estimator
Transformers (4): Preprocessing > Sigmoid > Feature selection type 1 > LGBM classifier estimator

03

Set up and run experiments

A visualization is worth a thousand statistical expressions. AutoAI has a graphical tool that makes data science and AI easy to understand. You can easily check performance of model pipelines on the leaderboard. Try visually inspecting a model for accuracy, precision and more. You can see if the processing time will be brief or require more time. You can work on other parts of the product while the pipelines build. The pipeline summary view provides the correlations between estimators and transformers.

Try building an AutoAI model →


View how Seth Dobrin of IBM discusses AutoAI →
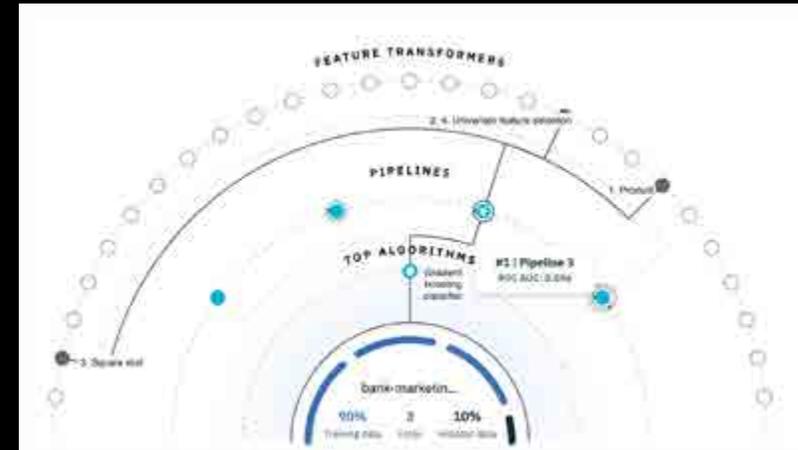
04

Train and select a model

During AutoAI training, your data set is split into training data and hold-out data. The training data is used in the AutoAI training stages to generate the AutoAI model pipelines and cross-validation scores used to rank them. After AutoAI training, the hold-out data is used for the resulting pipeline model evaluation and computation of performance information such as Receiver Operating Characteristic (ROC) curves and confusion matrices, as shown in the leaderboard.

As the training progresses, you are presented with a dynamic tree infographic and leaderboard. After the leaderboard is completed, you can inspect the results.

Learn more about model selection →
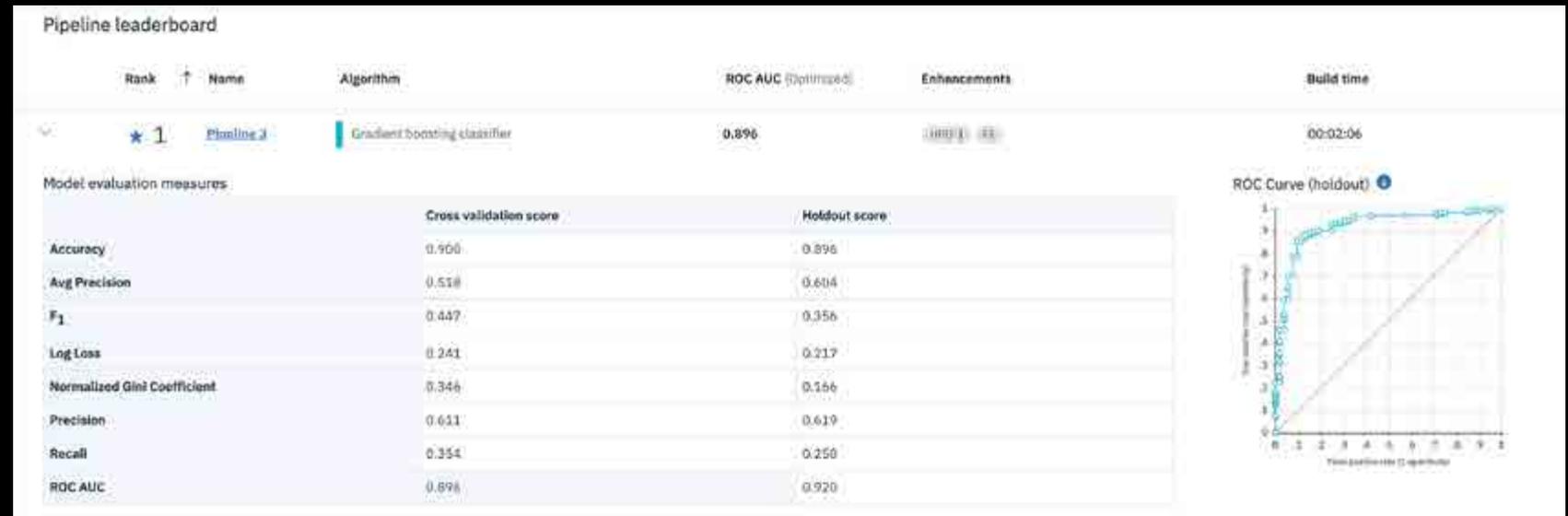
05

Save and
run models

AutoAI is unique in helping you manage the end-to-end AI lifecycle. Any model built by AutoAI can be saved and deployed using Watson Machine Learning. This feature means that as you select a model, you can save and deploy the model within the same platform. Furthermore, you can test the deployment with Python codes. Watson Machine Learning can also automatically generate Representational State Transfer (REST) application programming interfaces (APIs) so you can collaborate with DevOps and application development teams efficiently.

Learn how to deploy and run an AutoAI model →

06

Verify AI implementations

AutoAI automatically prepares data, and applies and builds model pipelines best suited for your data and use case. Many businesses require the details of your AI implementations to be documented before progressing from experimentation to production. The following links provide the technical details that help generatethe pipelines:

Estimators used for classification models →

Estimators used for regression models →

Metrics by model type →

Data transformers →
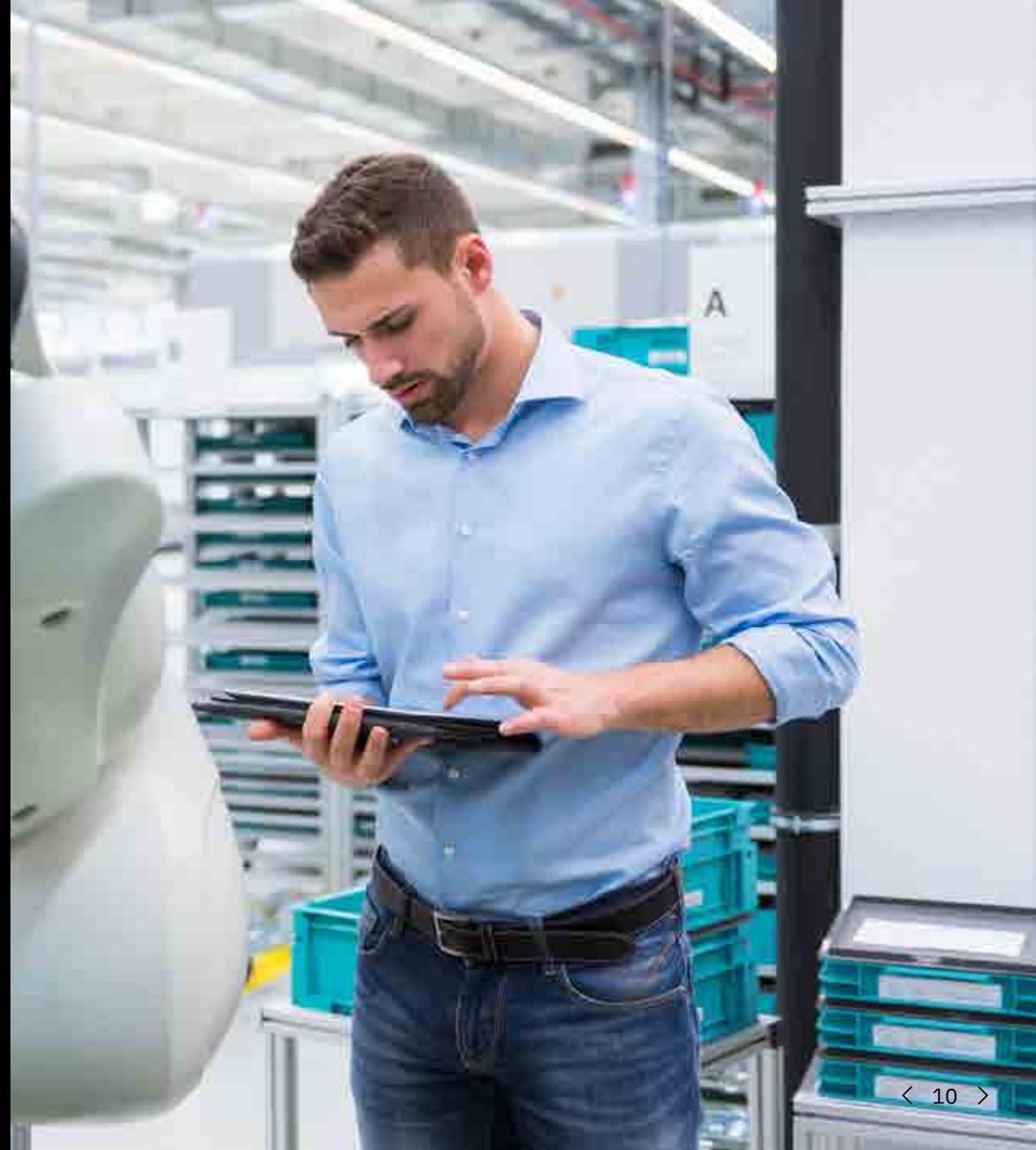
07

Generate code
from AutoAI

Although AutoAI has numerous benefits, the solution isn't intended as a substitute for human data scientists and data science teams. On the contrary, AutoAI is designed to let data scientists do what they do best—use human intelligence to deliver AI solutions to business problems.

Data scientists can take code produced by AutoAI and modify it further to suit their specific needs. For example, AutoAI might have generated code that makes a prediction for the first data item in the training data set. That code can be tweaked so the prediction also fits a new, previously unseen item.*

*This feature is currently in beta.

08

Help train data scientists and analysts

Data and analytics professionals are eager to learn about data science. AutoAI helps organization leaders train their scarce personnel resources to learn about data science and how data is prepared and models are created automatically. This process promotes collaboration within and beyond the data science teams and consequently helps increase productivity enterprise-wide.

Try AI and machine learning tutorials →
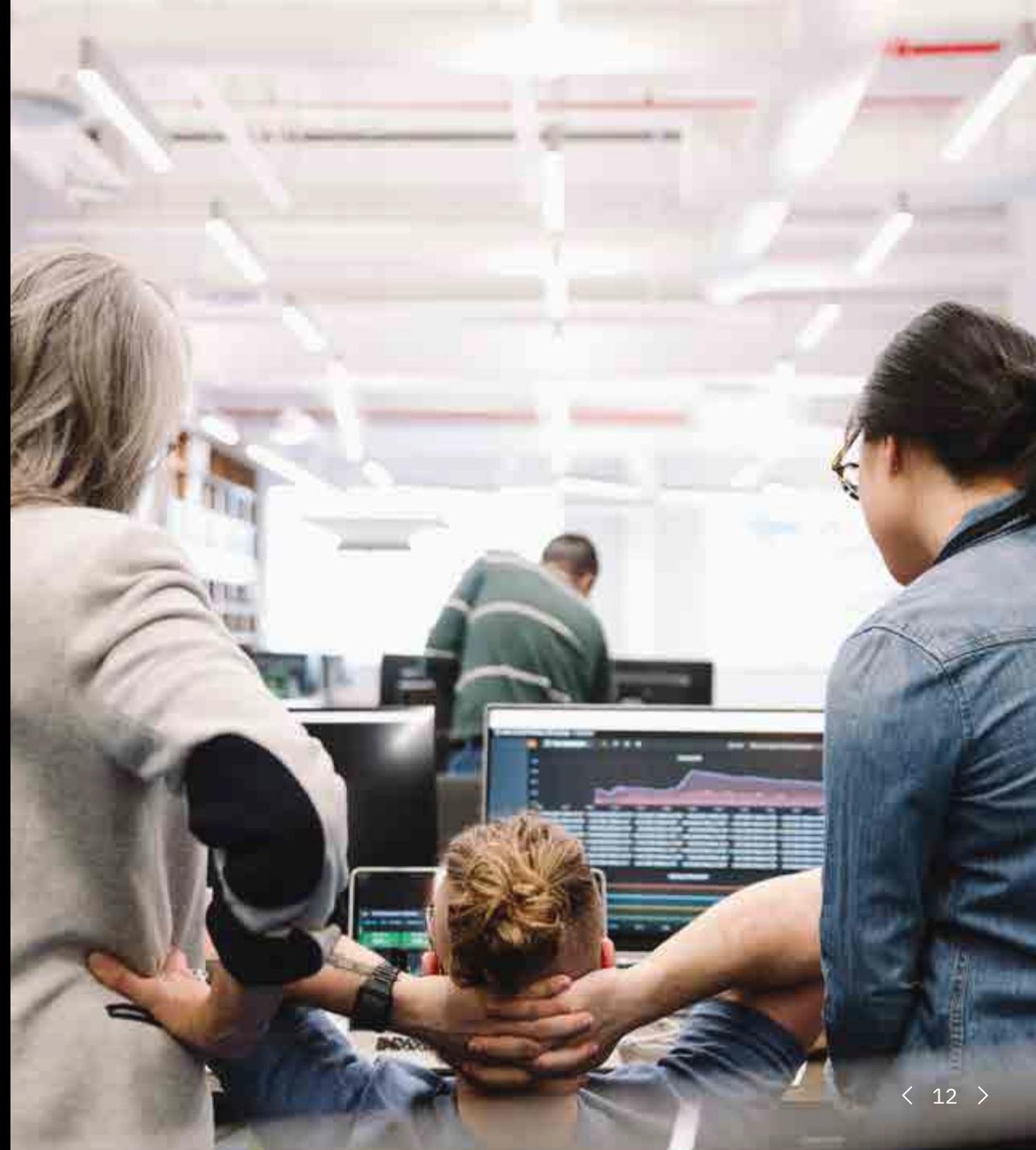
09
## Build an AI-
enabled app

AutoAI facilitates collaboration between the data science team and DevOps and app developers, making it easier for the business to benefit from models in production. If you're in DevOps and app development, you can take the REST API endpoint from AutoAI and deploy the model. The API connection can be configured to share more information for scoring and prediction. Using information from these scores and predictions, you could build an application that acts only on the certain conditions, such as an app that flags possible risk based on suspicious words or emotional responses in a phone call. You can always access the endpoint URL of a deployment in IBM Watson Machine Learning, available as one click from AutoAI with Watson Studio.
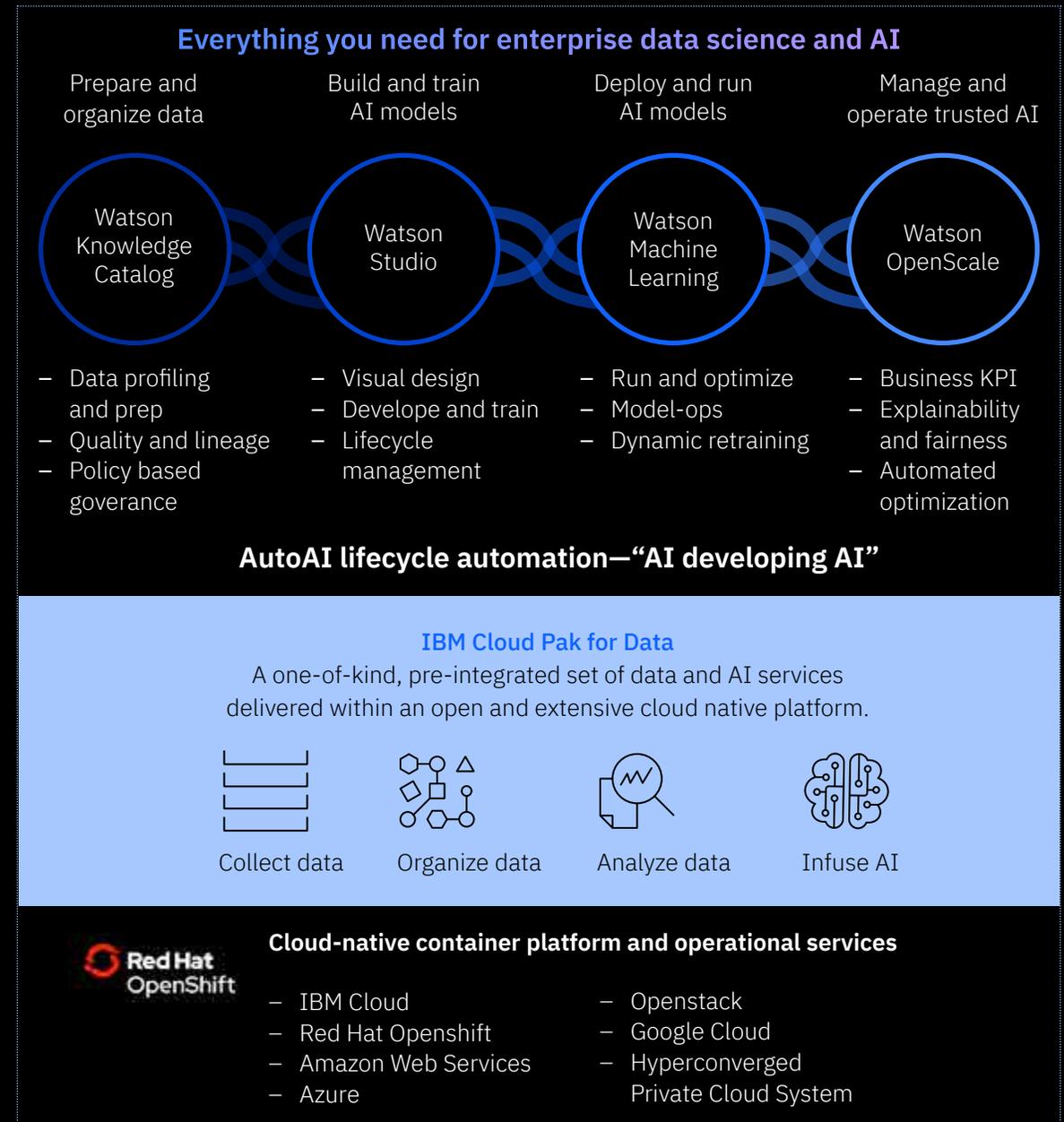
Learn how to get an endpoint for your model →
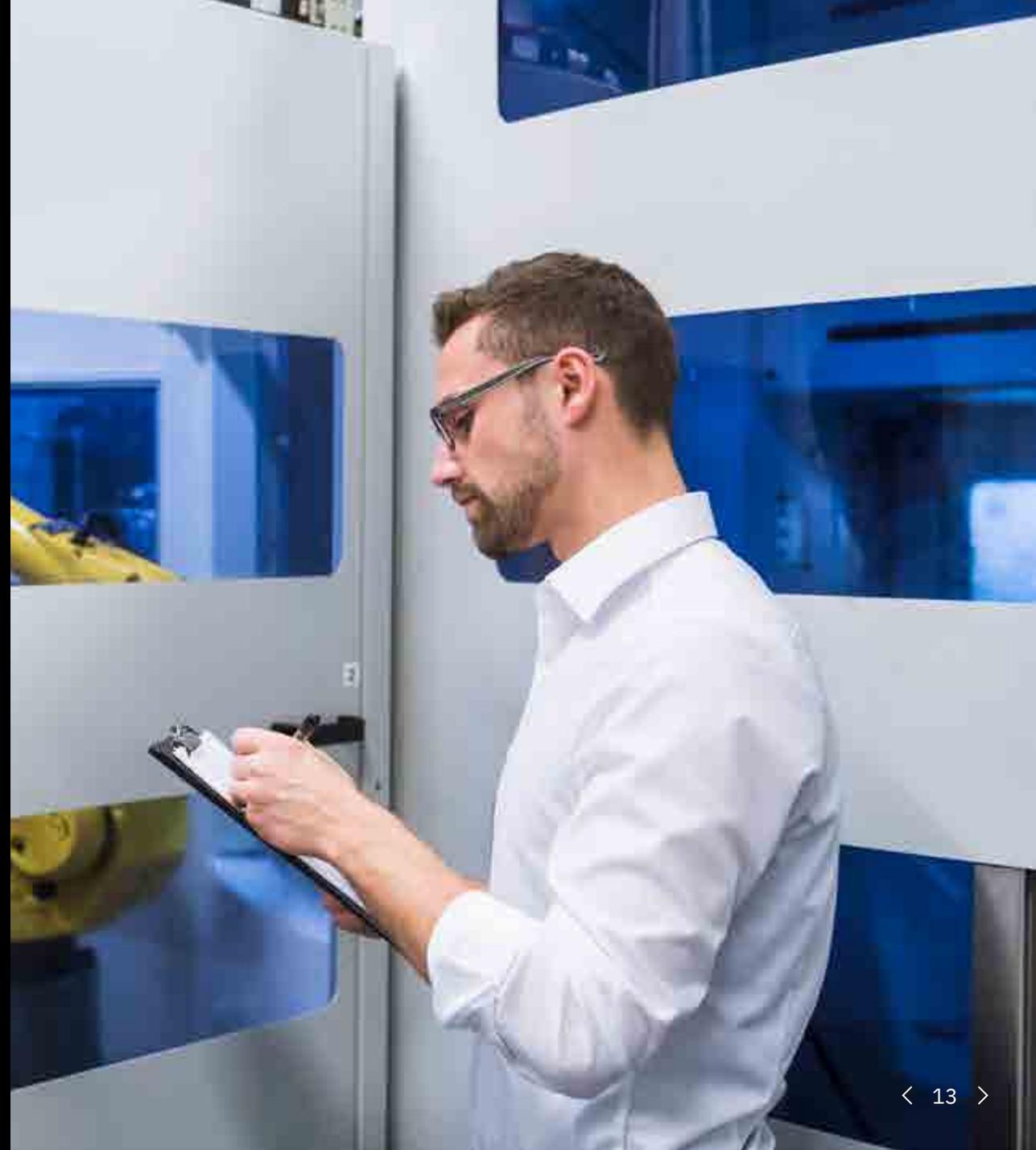
10

Modernize your business with AI faster

AutoAI automates AI lifecycle management. As part of IBM Cloud Pak for Data, AutoAI is designed to provide a pre-integrated set of data and AI services for a modern enterprise. Watson OpenScale and AutoAI work in concert as base offerings of IBM Cloud Pak for Data. With Watson Studio Premium for IBM Cloud Pak for Data, you can use Decision Optimization and SPSS® to increase agility and productivity across organizations. Open to the core, IBM Cloud Pak for Data is an ideal base for AI-powered application development and other modernization initiatives as part of digital transformation.

Read the analyst technical validation on Cloud Pak for Data →

Everything you need for enterprise data science and AI

Prepare and organize data	Build and train AI models	Deploy and run AI models	Manage and operate trusted AI
Watson Knowledge Catalog	Watson Studio	Watson Machine Learning	Watson OpenScale

- Data profiling and prep
- Quality and lineage
- Policy based goverance

- Visual design
- Develope and train
- Lifecycle management

- Run and optimize
- Model-ops
- Dynamic retraining

- Business KPI
- Explainability and fairness
- Automated optimization

AutoAI lifecycle automation—"AI developing AI"

IBM Cloud Pak for Data
A one-of-kind, pre-integrated set of data and AI services delivered within an open and extensive cloud native platform.

Collect data   Organize data   Analyze data   Infuse AI

Red Hat OpenShift

Cloud-native container platform and operational services

- IBM Cloud
- Red Hat Openshift
- Amazon Web Services
- Azure

- Openstack
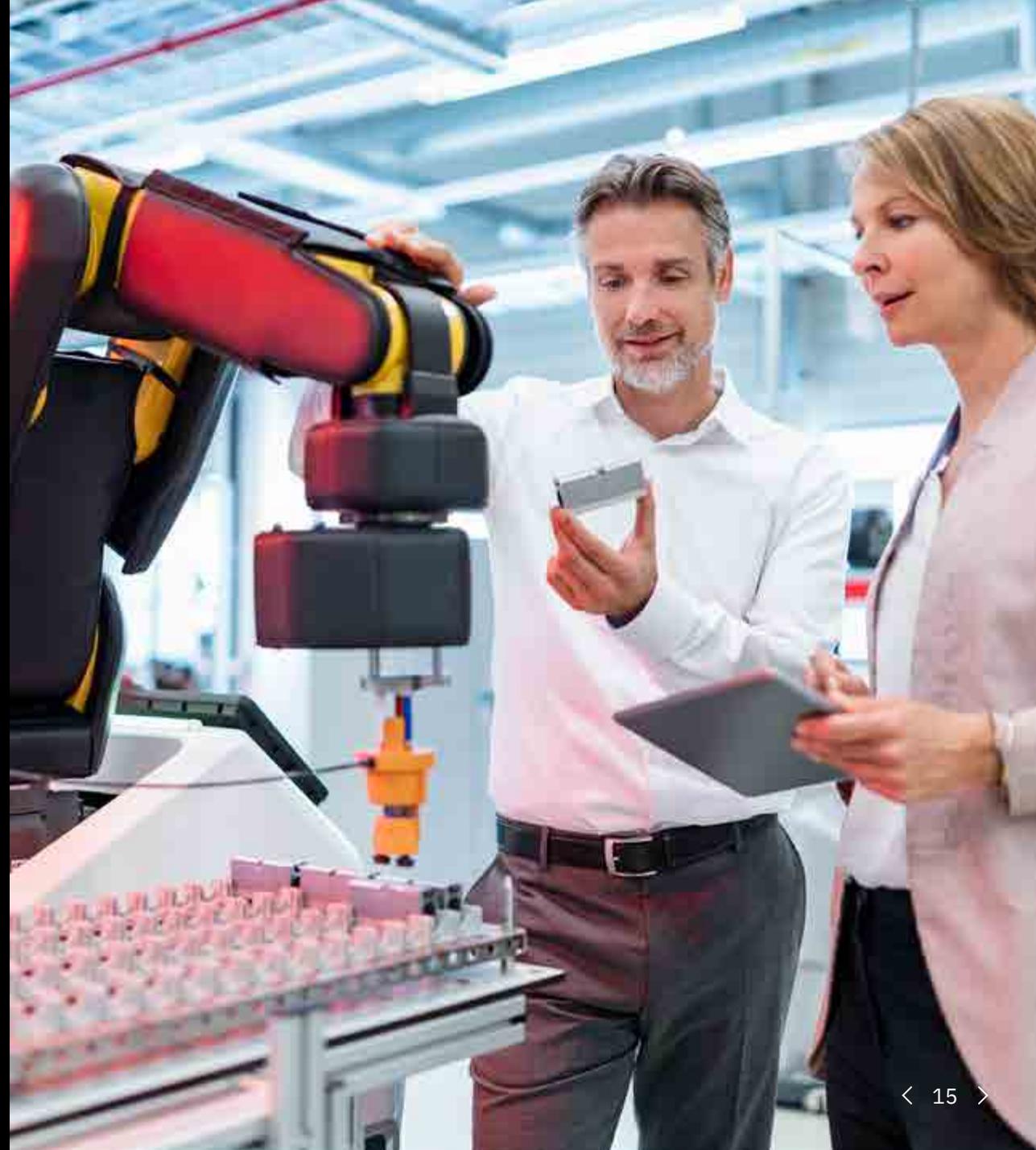- Google Cloud
- Hyperconverged Private Cloud System

Choose the right option for your AutoAI deployment

IBM Cloud Pak for Data is a fully-integrated data and AI platform that modernizes how businesses collect, organize and analyze data and infuse AI throughout their organizations. Built on the Red Hat® OpenShift® Container Platform, IBM Cloud Pak for Data integrates market-leading IBM Watson AI technology, and AutoAI is available as part of the base. Learn more at:
ibm.com/products/cloud-pak-for-data

Available as an optional purchase, Watson Studio Premium for Cloud Pak for Data accelerates and increases the business value of your AI journey. Learn more at:
ibm.com/downloads/cas/K6OQMOEA

Get started on using AutoAI on the IBM Watson Studio Cloud at no cost here:
dataplatform.cloud.ibm.com/registration/stepone?context=wdp&apps=all