aws

AWS Starter Kits

Analytics | Machine Learning | IoT |
Microservices | Search

www.griddynamics.com

Grid Dynamics

Contents

Thought Starters: AWS Starter Kits

Analytics & MLOps

- Translate data into business value
- Cut operational and maintenance costs
- Capture substantial value from improved efficiency
- Uncover new revenue and growth opportunities

Smart Manufacturing & IoT

- Monitor manufacturing processes in real-time
- Reduce operational and maintenance costs
- Control compliance across your suppliers by analyzing IoT data
- Reduce cost of quality control through automation

Microservices

- Create operational efficiencies migrating to the cloud
- Drastically reduce infrastructure costs
- Accelerate migration from months to days
- Focus on creating differentiating business value

Search

- Connect customers with products they love
- Recommend products with awareness of personal style
- Personalize results with customer behavior analytics
- Improve engagement, CTR, conversions, and average order value

Analytics Platform Starter Kit for AWS

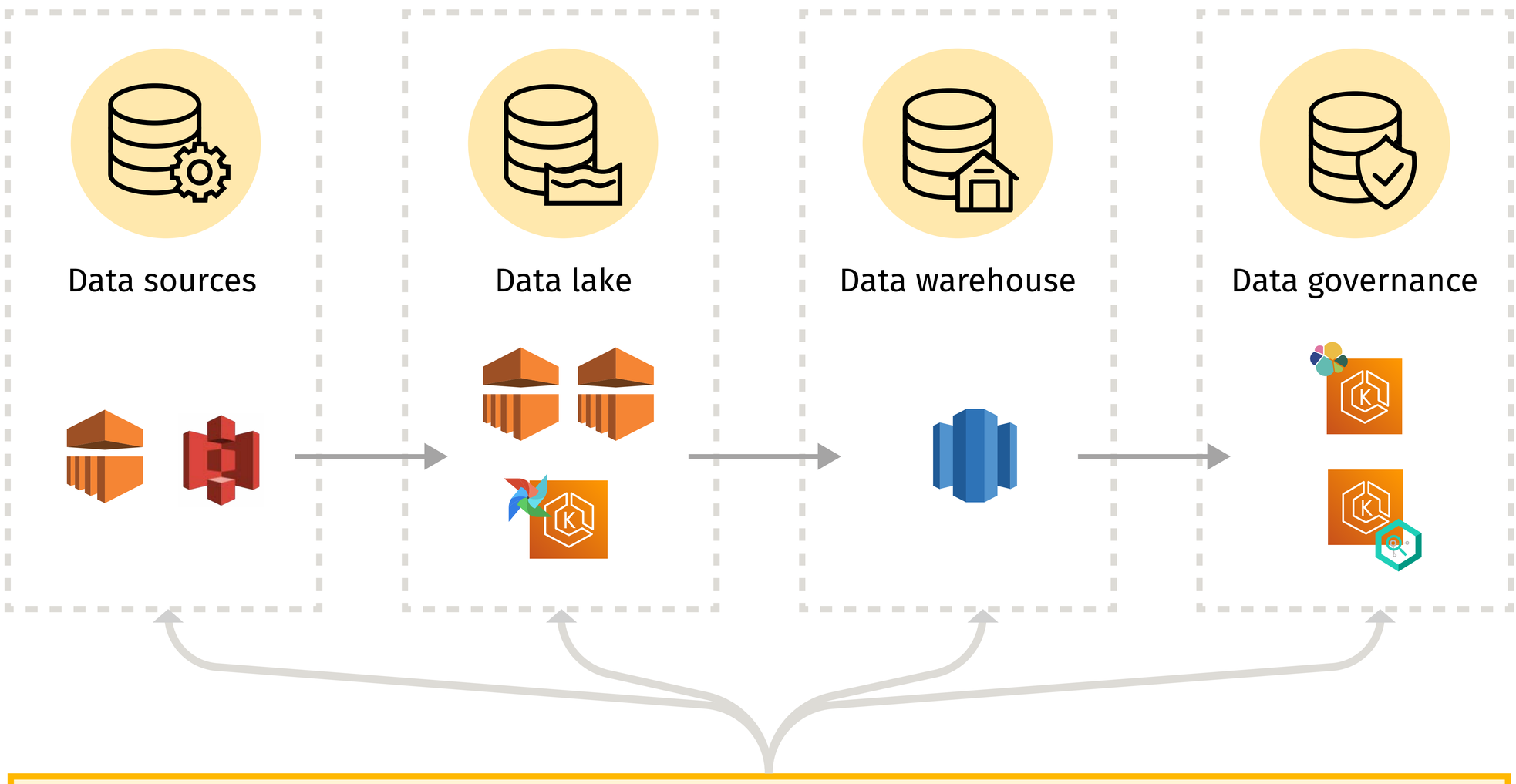
Analytics Platform Starter Kit: Overview

Get to insights fast

Our Analytics Platform Starter Kit for AWS is a culmination of years of experience that enables rapid provisioning of an AWS-native analytics platform and implementation of data pipelines at scale. The pre-integrated, battle-tested starter kit is designed to drastically reduce time-to-market, improve data accessibility and quality, increase speed-to-insights, and achieve significant ROI. You can build a production-ready, modern analytics platform within weeks on AWS cloud.

Enterprises enjoy a significant reduction in the cost and risk of initial investment and get to value 10x faster, while focusing on what's important for business: business intelligence, data science, and data driven decisions with machine learning.

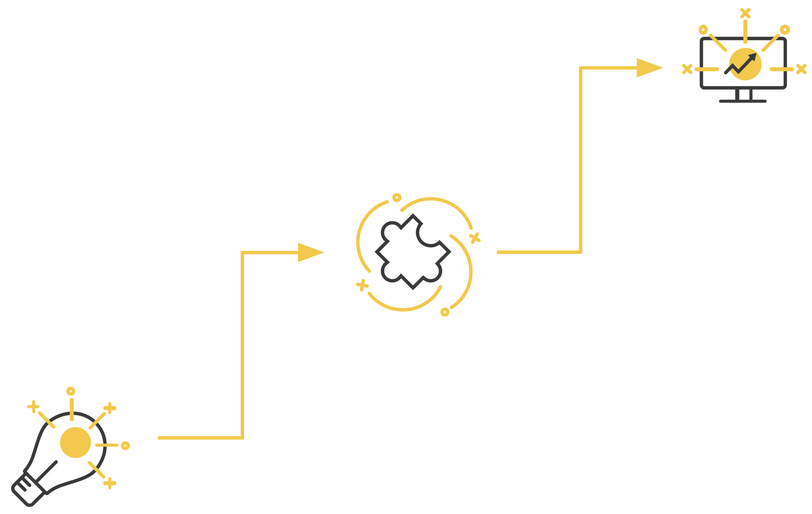
We leverage AWS services for sophisticated batch and streaming data pipelines, reporting, data governance, data quality, pipeline orchestration, data catalog and data lineage information, distributed compute, and deployment automation.



Analytics Platform Starter Kit: Features

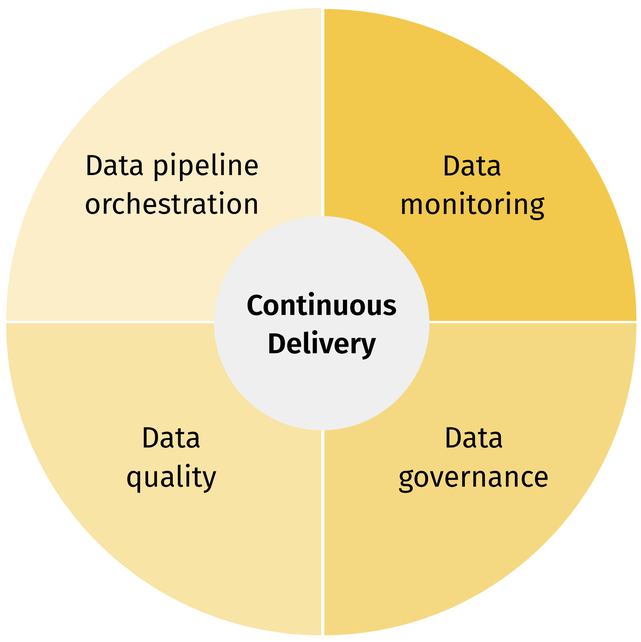
Infrastructure-as-code starter kit

With infrastructure-as-code architecture, initial platform provisioning is reduced from weeks to days, and deployment automation vastly simplifies and speeds up the adoption of business-specific use cases.



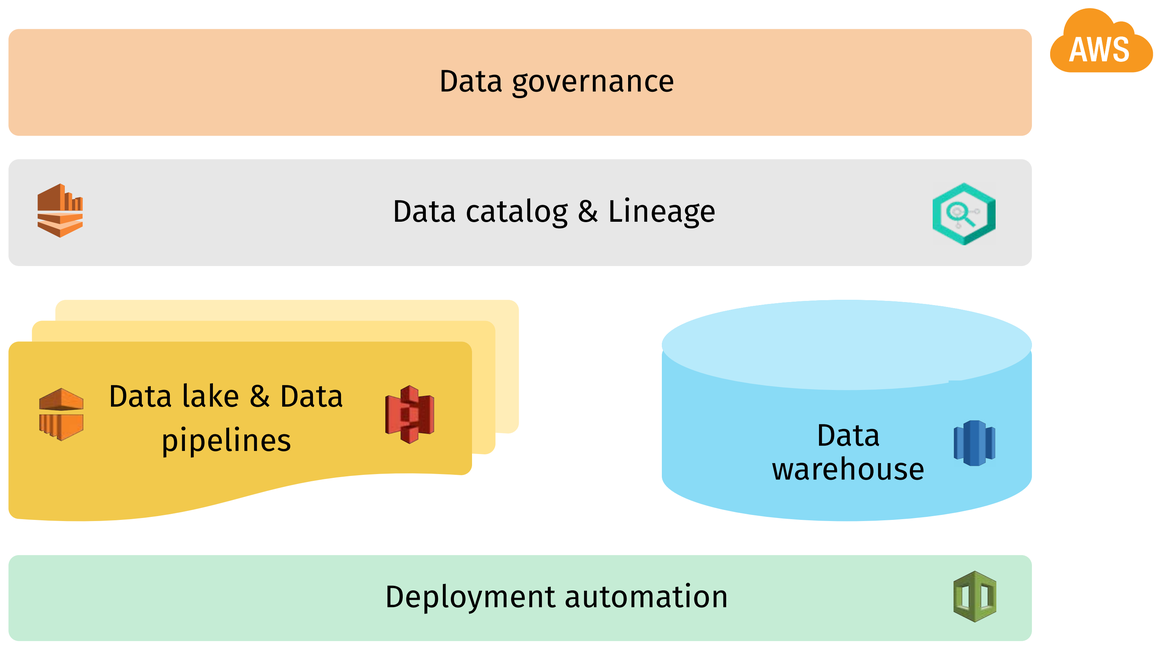
Adopt leading DataOps practices

Develop a brand new platform or extend your existing analytics platform with DataOps practices to achieve continuous delivery. Leverage cloud-native tools in AWS for sophisticated batch and streaming data pipelines, reporting, data governance, data quality, pipeline orchestration, data catalog and data lineage information.



Modular Analytics Platform

Our Analytics Platform Starter Kit for AWS comes with a modular architecture that enables you to provision exactly what you need when you need it. For example, if you only need a data lake and not a data warehouse, you can provision the data lake now, and if your priorities change, you can easily provision a data warehouse later on.



Analytics Platform for a leading apparel company

A leading apparel company interacts with millions of customers worldwide through digital channels. The company was looking to consolidate stock and shipment data in a single dashboard for a specific region. Grid Dynamics was engaged to build a data platform along with data reporting and visualization. Dashboards were used by multiple teams to track fulfillment and shipment status.

10M
daily updates

US & Europe
regions

Outcomes

real-time
inventory views

2 months
from the initial analysis to production

- The solution enabled immediate visibility of fulfilment and shipment status, with the following features:
- Data platform with pluggable data sources;
- Infrastructure-as-a-code;
- Near real-time dashboards with stock and shipment information.

ML Platform Starter Kit for AWS

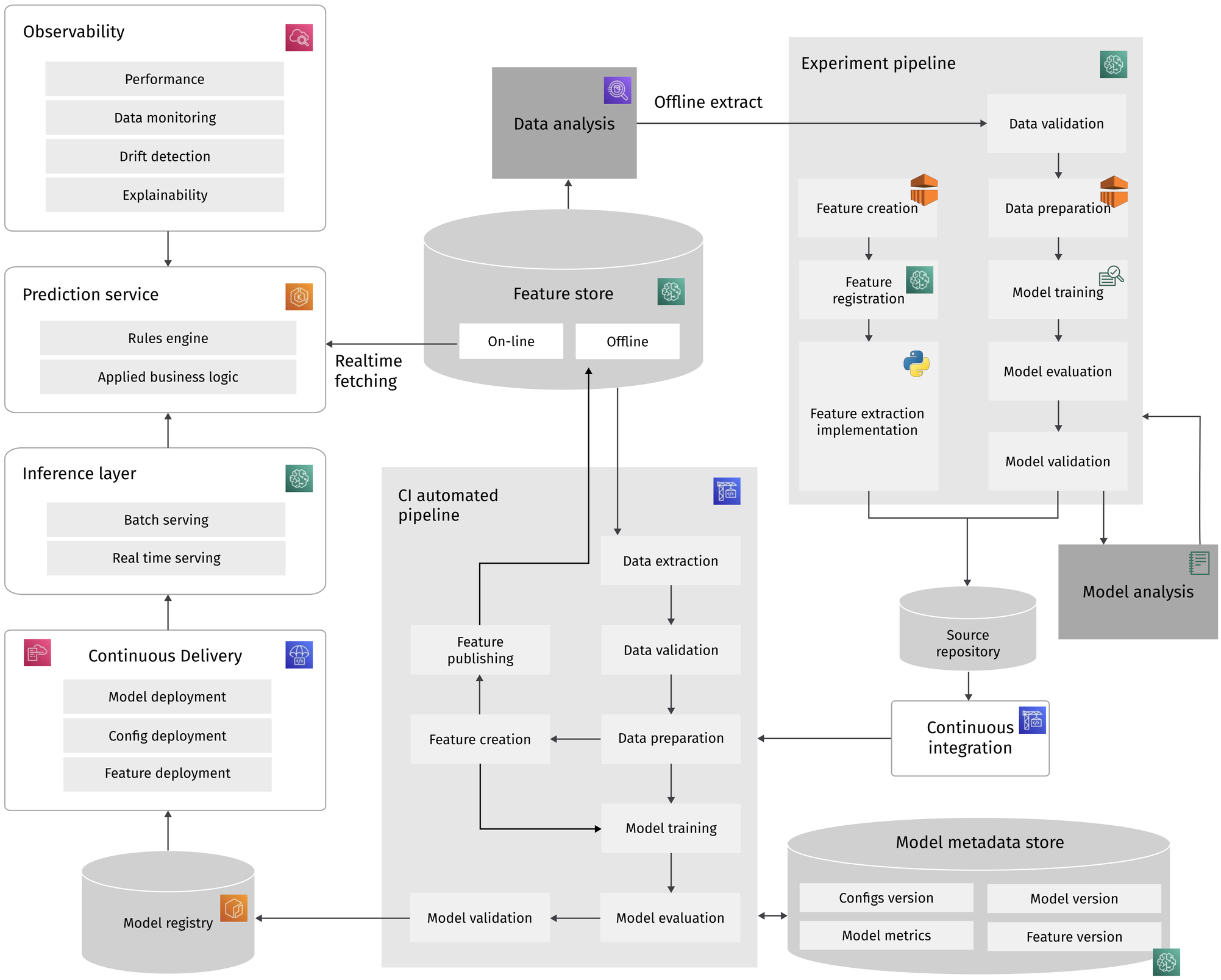
ML Platform Starter Kit: Overview

Innovate with AI

Efficiently scale machine learning efforts in the enterprise while adopting MLOps and increasing the quality of insights on an AWS-native ML Platform with our ML Platform Starter Kit for AWS. You can build a production-ready, cloud-native machine learning platform that enables end-to-end AI productization within weeks on AWS cloud. The starter kit is designed to improve data accessibility and quality, increase speed to insights, and achieve significant ROI.

Data scientists will enjoy a 10x productivity boost and have more time to create differentiating value for the business.

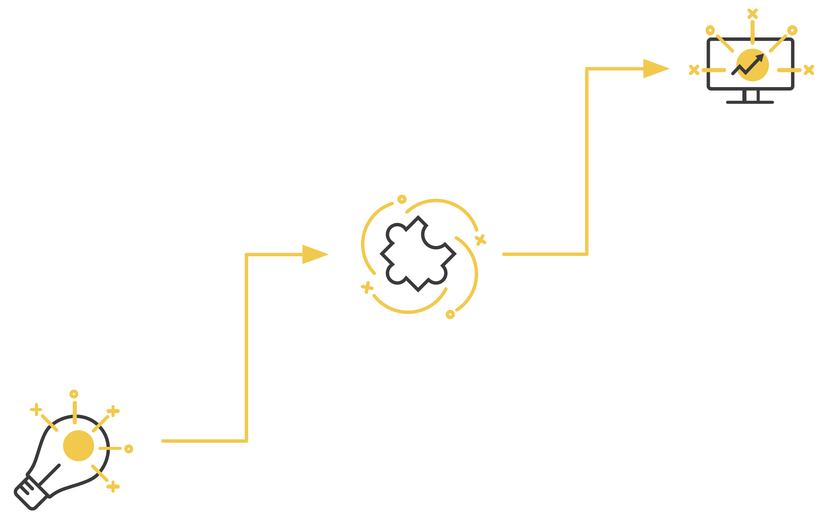
We leverage AWS services for robust feature store and model repository, experiments tracking, serving layer for batch and real-time inference, model CI/CD, and deployment automation.



ML Platform Starter Kit: Features

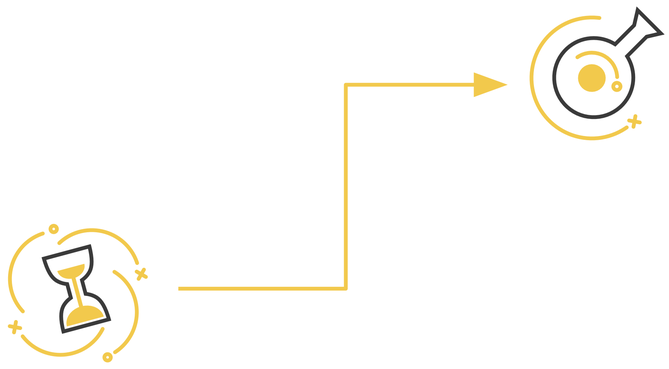
Infrastructure-as-code Starter Kit

The ML Platform Starter Kit for AWS enables rapid provisioning of the Machine Learning Platform, and provides a CI/CD framework, as well as sample models for reference.



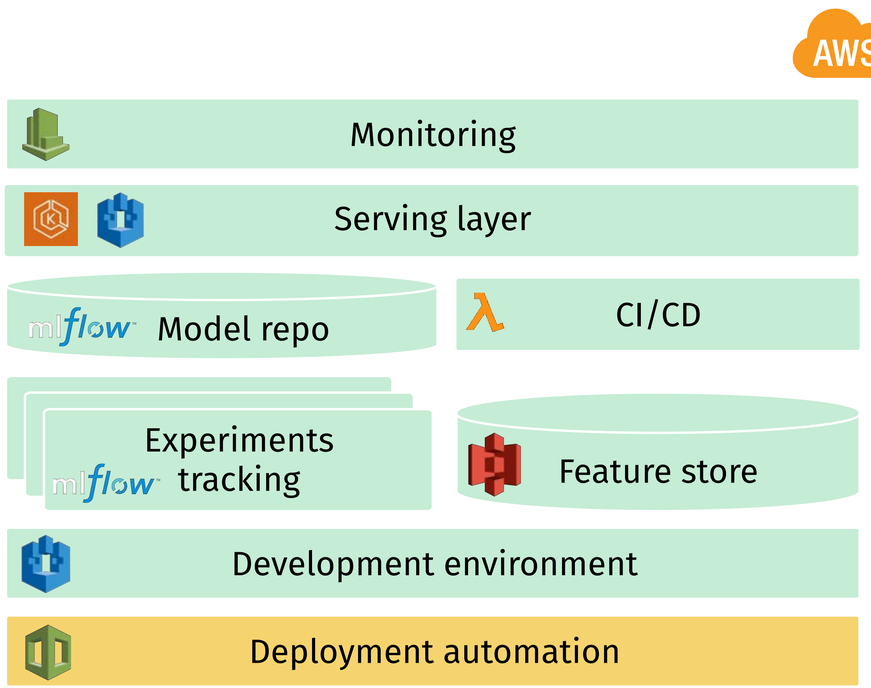
Introduce experiments tracking

A managed Machine Learning Platform on AWS means you have a unified portal to manage experiments with the ability to track model-specific parameters, compare model versions and visualize model key attributes.



Production-ready Machine Learning Platform

Our Machine Learning Platform Starter Kit for AWS provides a full spectrum of ML capabilities: feature store and model repository, experiments tracking, serving layer for batch and real-time inference, and model CI/CD.



ML Platform for a leading insurance company

This major US insurance company was looking for a partner with which to start a cloud journey.

The company decided to migrate their data platform to AWS cloud and build MLOps services on top of it.

Grid Dynamics was engaged to build a new generation data platform and integrate it with ML capabilities.

50M
customer profiles

30+
ML use cases

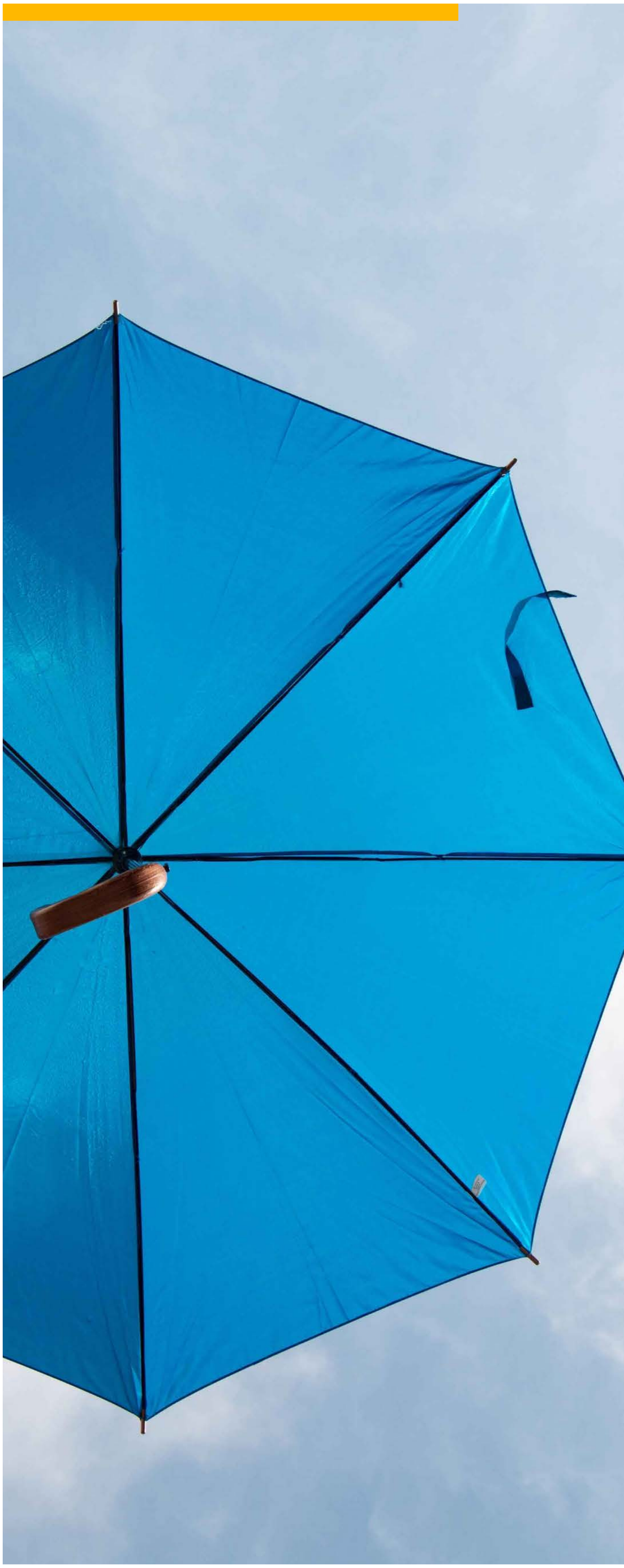
ML models
batch and real-time

Outcomes

cloud
infrastructure

GDPR/CCPA
compliance implemented

- Grid Dynamics helped the company migrate part of the infrastructure and services to AWS.
- We developed a data platform with MLOps capabilities.
- The applications were built from scratch according to modern practices and standards.



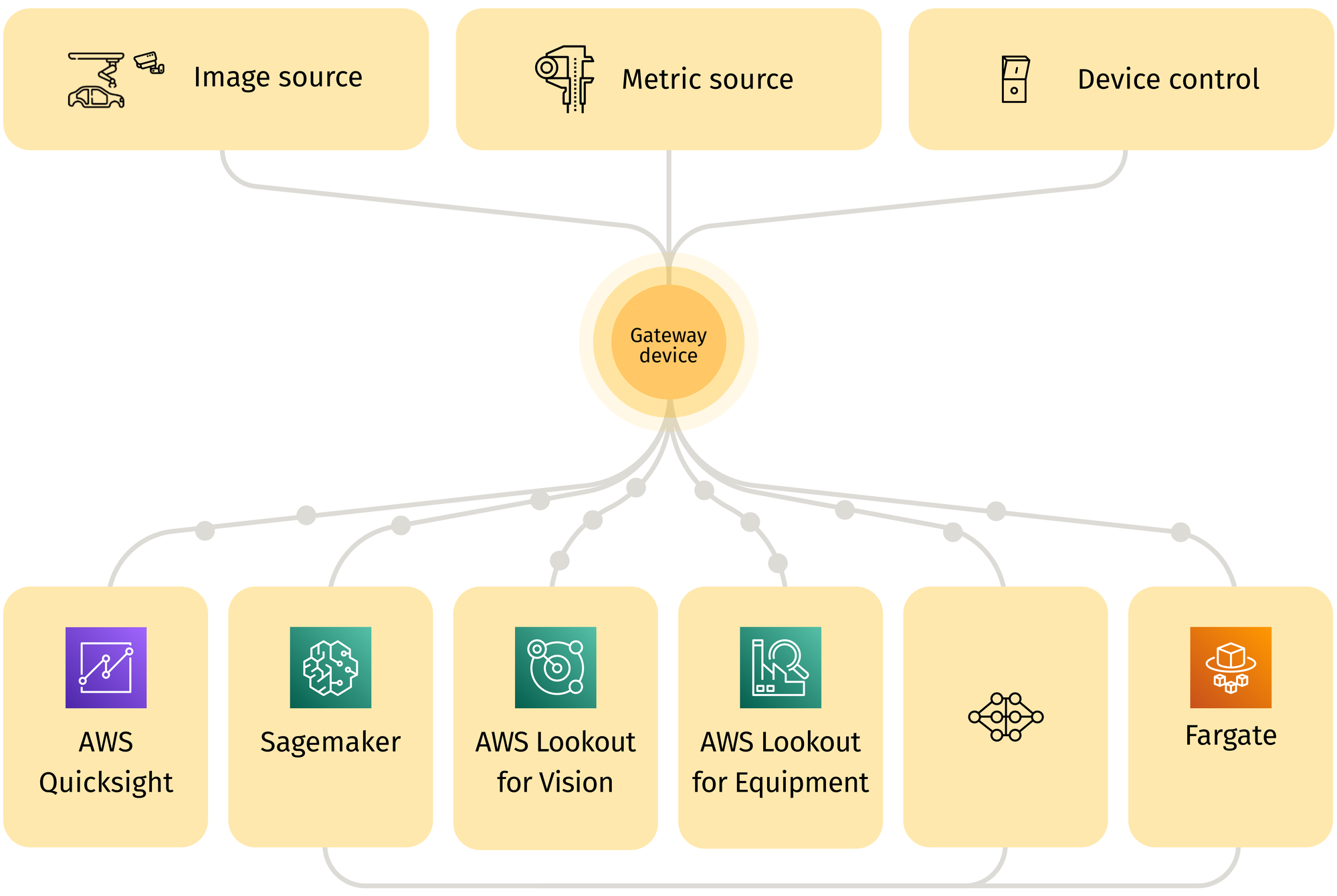
IoT Analytics Platform Starter Kit for AWS

IoT Analytics Platform Starter Kit: Overview

Reimagine smart manufacturing quality control

Our IoT Analytics Platform Starter Kit for AWS helps manufacturers transform their traditional production ecosystems into smart factories of the future — ones that can predict equipment failures, detect inefficiencies or defects, perform root cause analysis, and respond to real-time changes across the production chain without human intervention. Manufacturers can now push themselves to the forefront of the Fourth Industrial Revolution by building a powerful, distributed, scalable, AWS-native analytics platform that leverages AI-powered anomaly detection, predictive maintenance and visual quality control for a significant reduction in maintenance costs, and increased productivity and scalability.

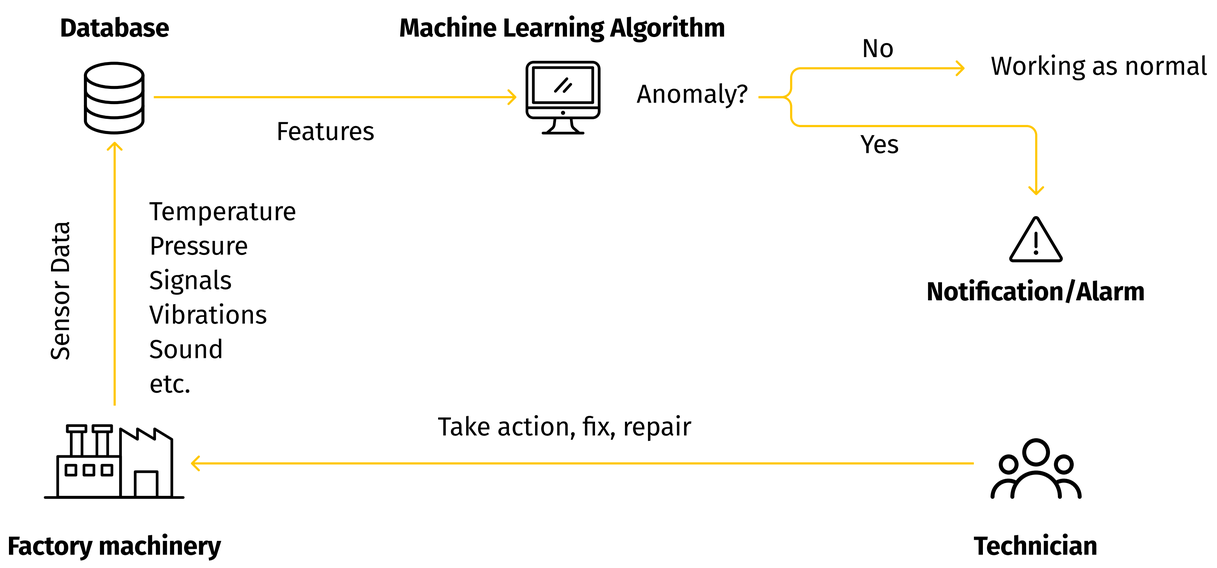
We leverage AWS services for sophisticated batch and streaming data pipelines, reporting, data governance, data quality, pipeline orchestration, data catalog and data lineage information, distributed compute, and deployment automation.



IoT Analytics Platform Starter Kit: Features

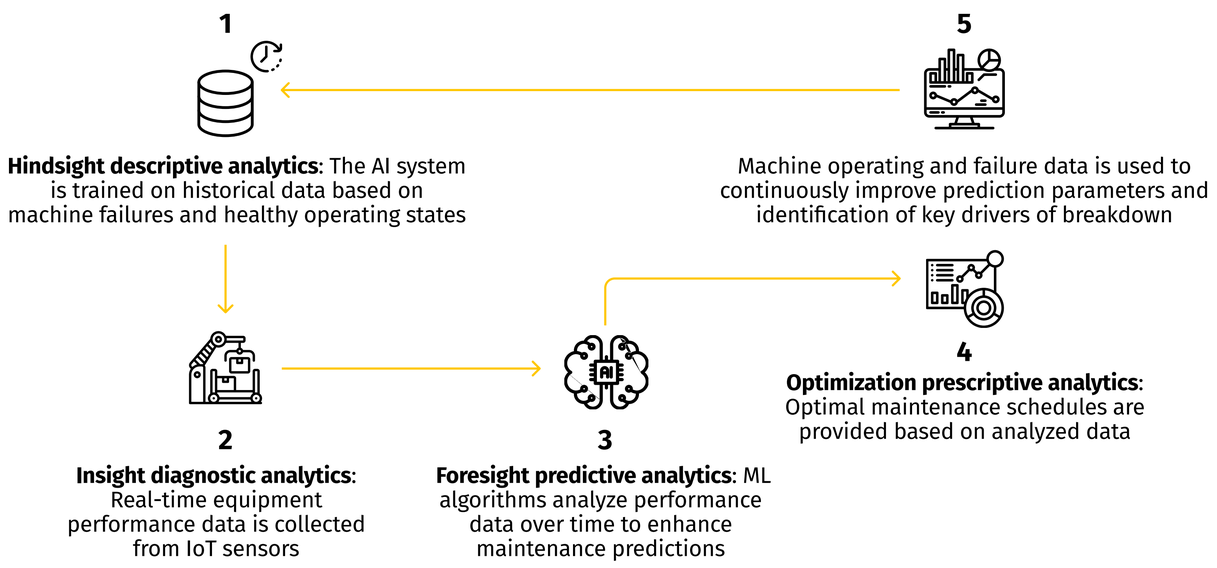
Anomaly detection

Data from assembly line sensors is monitored and analyzed to detect failures that affect quality, performance, or stability. Deep learning models account for hardware and sensor topology to detect cross-metric patterns, and provide insights on issue triaging, root cause analysis, troubleshooting, and feedback-based system tuning.



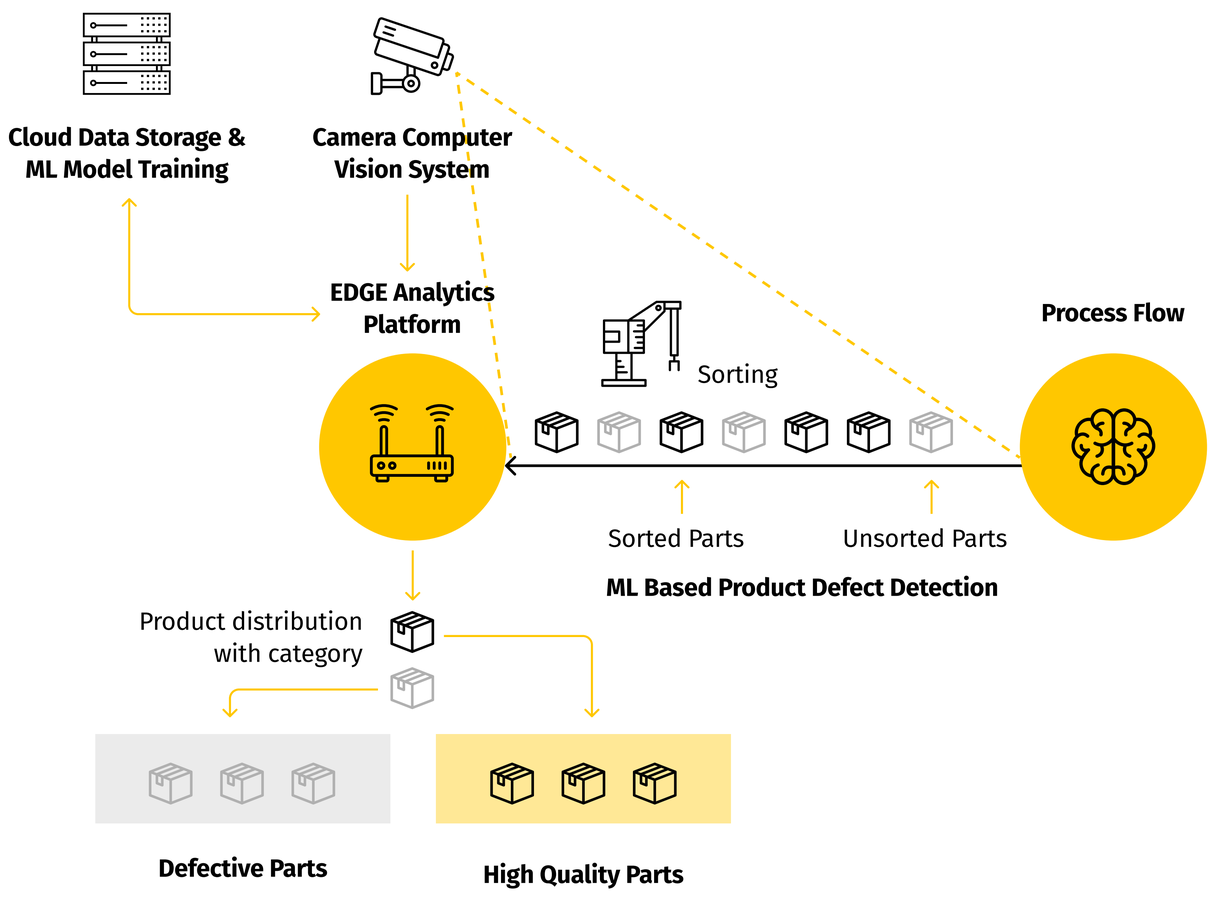
Predictive maintenance

Machine learning models analyze healthy state, failure, and real-time data from assembly lines, heavy machinery, and robots to track the risks associated with individual components, mitigate the risk of major losses and liabilities, optimize maintenance schedules, reduce labor and parts costs, and help to extend the remaining useful life of assets.



Visual quality control

Visual quality control relies on a comprehensive toolkit of computer vision algorithms for anomaly detection. Visual quality control can detect anomalies, prevent more significant failures and outages, and improve product quality by using a wide range of signals and data sources, such as IoT sensor data, infrared and X-ray imagery, and video streams.



IoT anomaly detection for a fuel distribution company

A leading supplier of fuel dispensers and fuel delivery services, collects sensor and maintenance data from its storage tanks, gas trucks, and gas stations. Grid Dynamics was engaged to design and implement an anomaly detection and predictive fuel consumption solution that automates the process and ensures near-real-time issue detection.

5000+
IoT devices

17
types of anomalies

2000+
customer locations

Outcomes

50%
reduced analysis time

6 months
from the initial analysis to pre-production

- The solution drastically decreased anomaly identification time.
- Anomaly root cause analysis was simplified.
- Product scalability increased significantly.
- Grid Dynamics helped the client migrate from on-premise to AWS.

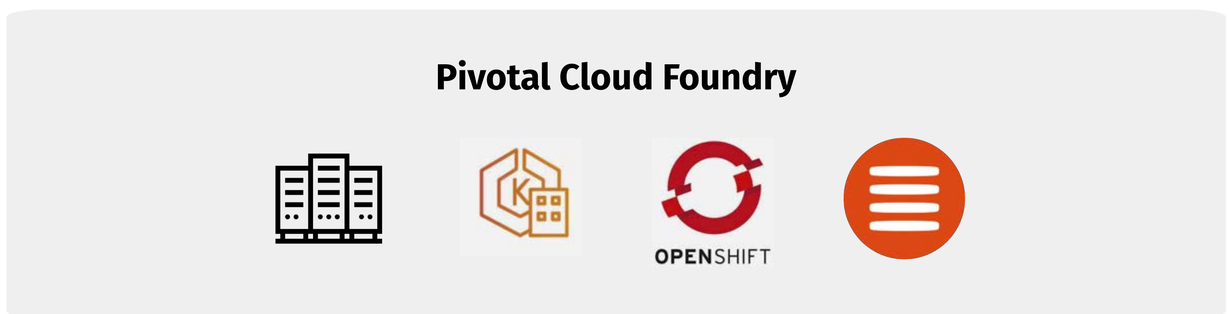
Microservices Platform Starter Kit for AWS

Microservices Platform Starter Kit: Overview

Accelerate migration from PCF to Amazon EKS

We turned years of experience building custom microservices platforms into a starter kit leveraging AWS Elastic Kubernetes Service (EKS) Blueprints. The starter kit addresses the majority of questions that arise when companies encounter the world of cloud and microservices for the first time. AWS provides industry leading services to architect modern solutions including IoT, containers, serverless, and AI/ML. Our cloud practice brings a set of capabilities to enable application and data modernization including our Pivotal Cloud Foundry (PCF) to EKS starter kit as well as devops, quality engineering and advanced analytics.

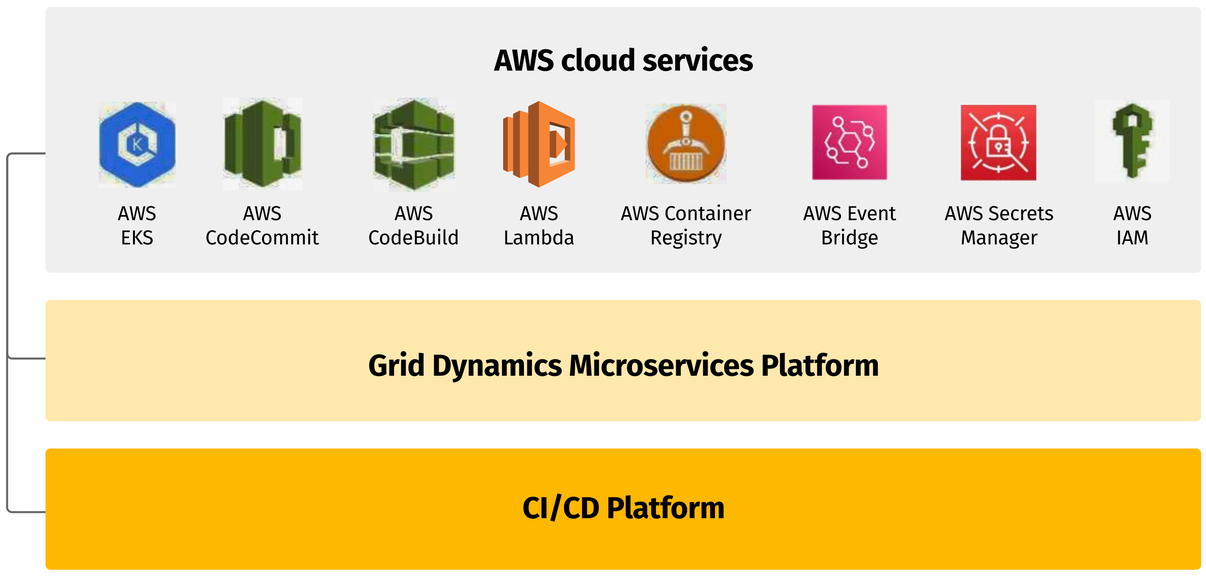
Application modernization requires toolchains and platforms to transform code with velocity while ensuring minimal defects and risk. Our reference implementation allows companies to focus on their business domain logic and enables quick onboarding of “clean slate” implementations. It is primed for easy migration of existing PCF microservices workloads and eliminates the time usually spent on the infrastructure work associated with the beginning of a cloud journey.



Microservices Platform Starter Kit: Features

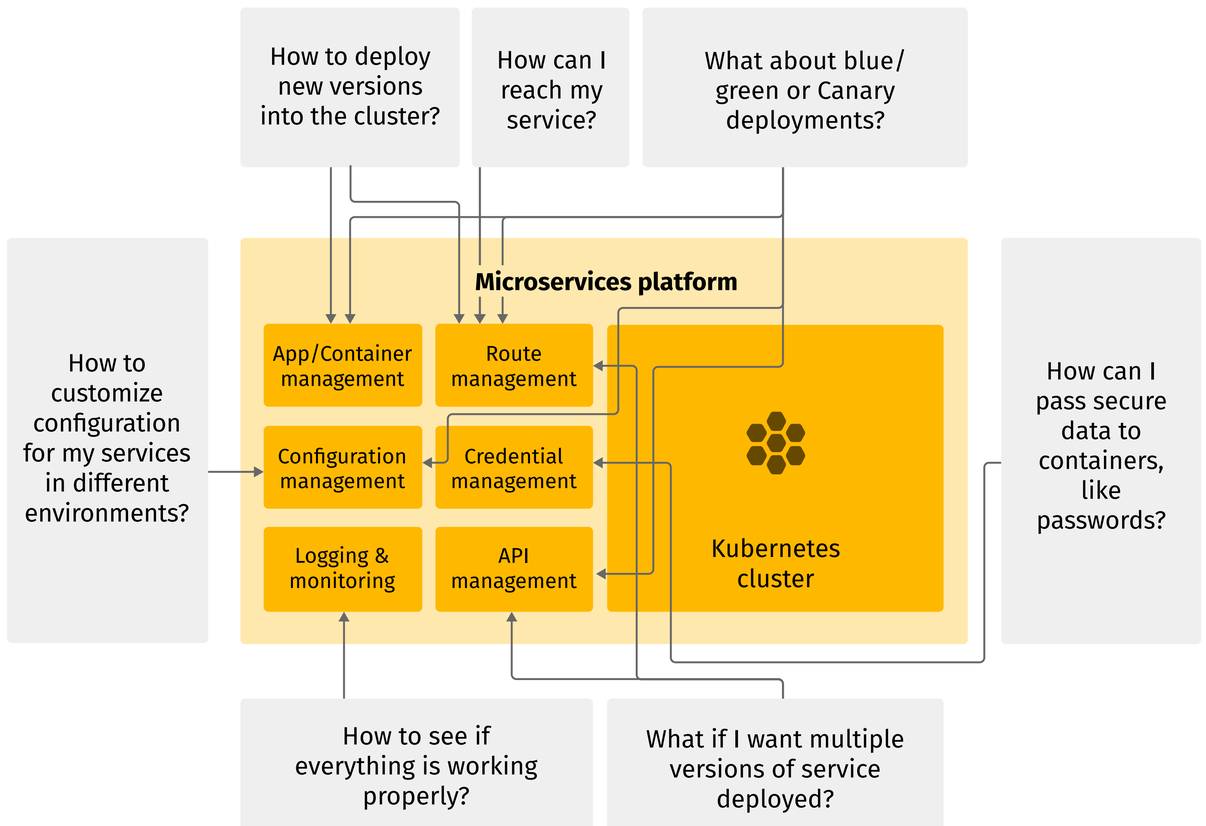
Microservices Starter Kit

Grid Dynamics' microservices Starter Kit leverages Amazon EKS Blueprints for fast, seamless cloud migrations from PCF (VMware Tanzu) to AWS Kubernetes. Coupled with our microservices and CI/CD platforms we provide a foundation for speed, cutting infrastructure provisioning time by 60% in a fully integrated cloud-native environment.



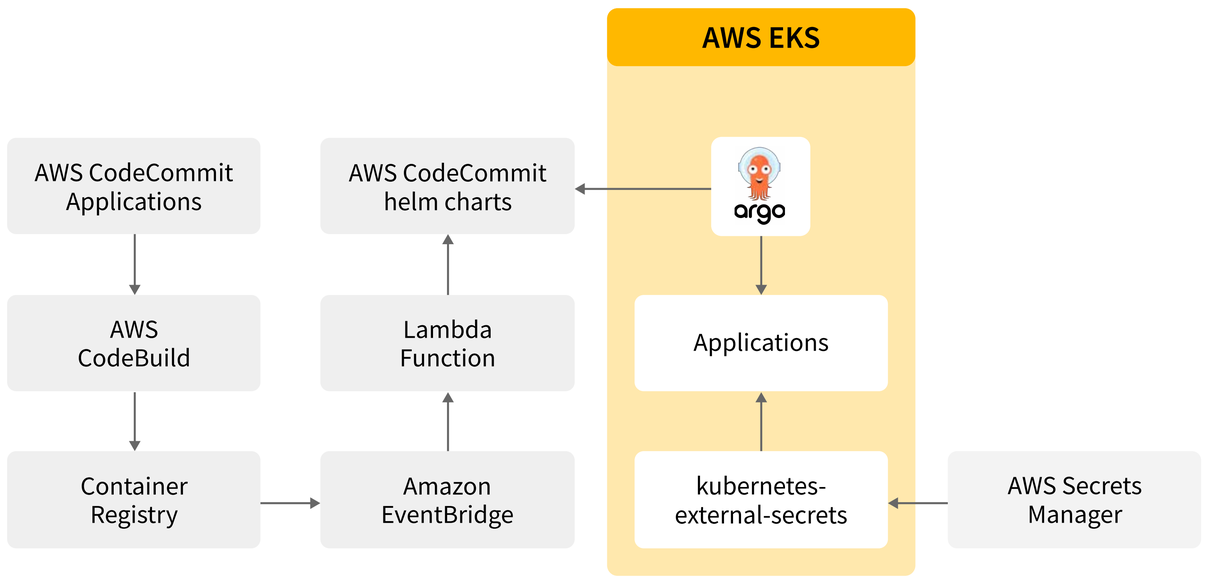
Microservices & CI/CD Platform

Our microservices and CI/CD platforms come as a pre-defined ecosystem blueprint that provides pre-packaged solutions to common questions raised when migrating to the modern technology stack. The platform provides capabilities for CI/CD processes, infrastructure automation, security and compliance management, and operational processes such as AIOps.



Powered by AWS EKS Blueprints

Based on Amazon's EKS Blueprints, which are customized to support easier migration of real workloads and provide additional support for Code Build pipelines provisioning, the PCF to EKS Starter Kit includes CI/CD provisioning that requires no code changes on the application side, enables a secure workflow for credentials and secrets for applications, and provides capabilities for future enhancements.



AWS-native personal shopping assistant portal for a luxury retailer

This American chain of luxury department stores focuses on high-end curated products and excellent customer service, including unique experiences like personal shopping assistants and more.

Grid Dynamics was engaged to support the client's vision of providing new ways to shop by creating a set of omnichannel experience solutions developed separately from the main system. The long-term strategy is to migrate all (or the majority of) workloads to the cloud, with AWS being the platform of choice.

legacy ATG system
limited functionality to meet changing customer experience demands

slow & difficult
to support and extend the system with new functionality

Outcomes

AWS-native solution
Amazon API gateway, SNS, Kinesis, S3, DynamoDB, and AWS Lambda for CI/CD provisioning

$60 million
increase in customer spend

- Grid Dynamics developed a custom application that facilitated new ways for sales associates and personal stylists to collaborate.
- The solution is based on an AWS-native technology stack and heavily employs AWS API gateway, SNS, Kinesis, S3, DynamoDB, and other AWS-specific technologies.
- The business logic is represented by a set of Lambda functions, which are built and deployed to AWS via CI/CD pipelines implemented company-wide.
- The solution was able to provide unique differentiating experiences for customers that helped improve conversions, customer loyalty, and ultimately provide impactful business value for the company.

Search Platform Starter Kit for AWS

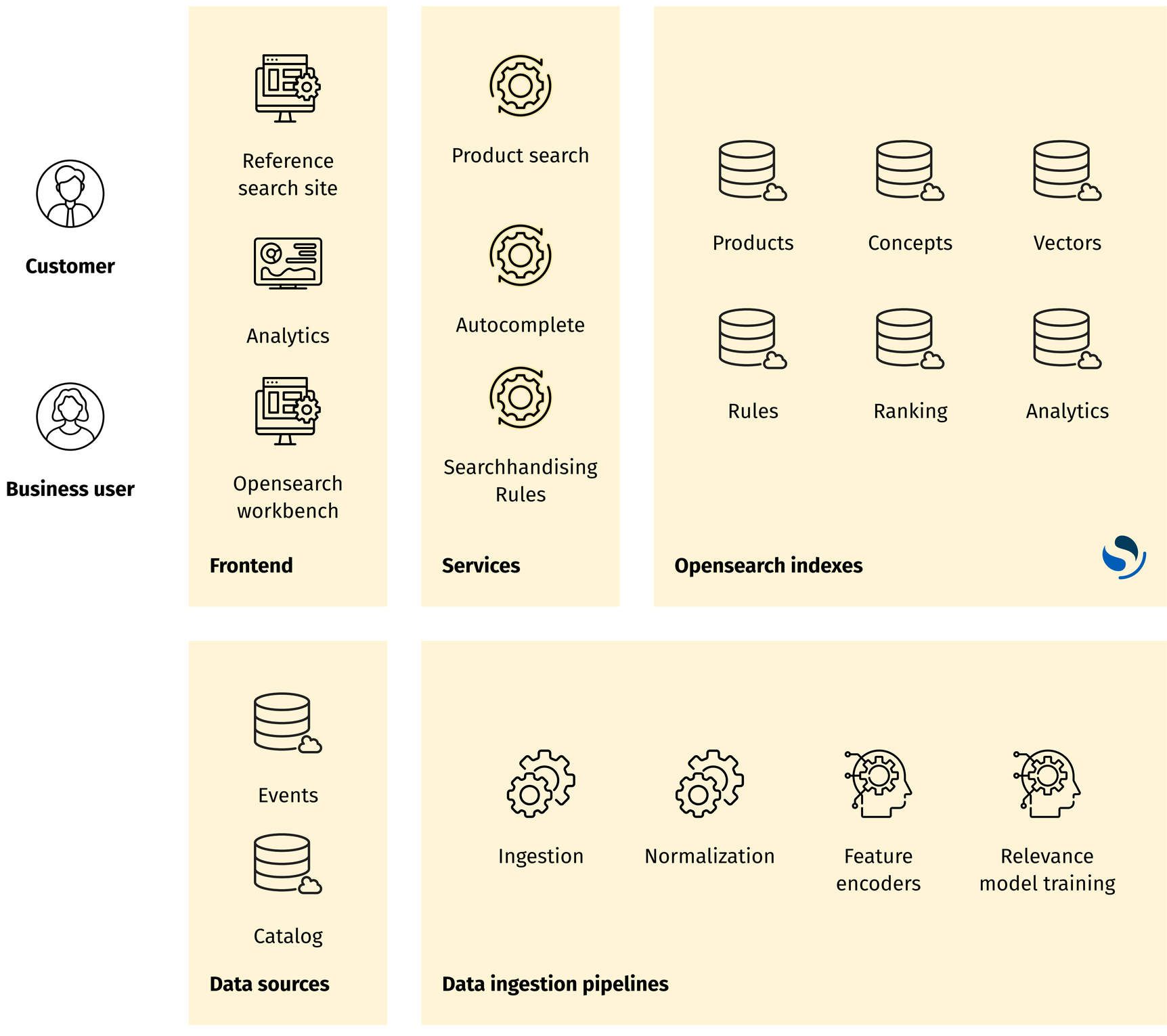
Search Platform Starter Kit: Overview

AWS Opensearch

We combined a decade of our experience in search and product discovery solutions with AWS Opensearch platform capabilities to build a comprehensive starter kit for in-house search solutions. The AWS Opensearch Starter Kit includes all the building blocks necessary to implement a modern, open source product discovery solution that personalizes search experiences and drives conversions.

We leverage AWS OpenSearch capabilities to easily ingest, secure, search, aggregate, view, and analyze data for enterprise search.

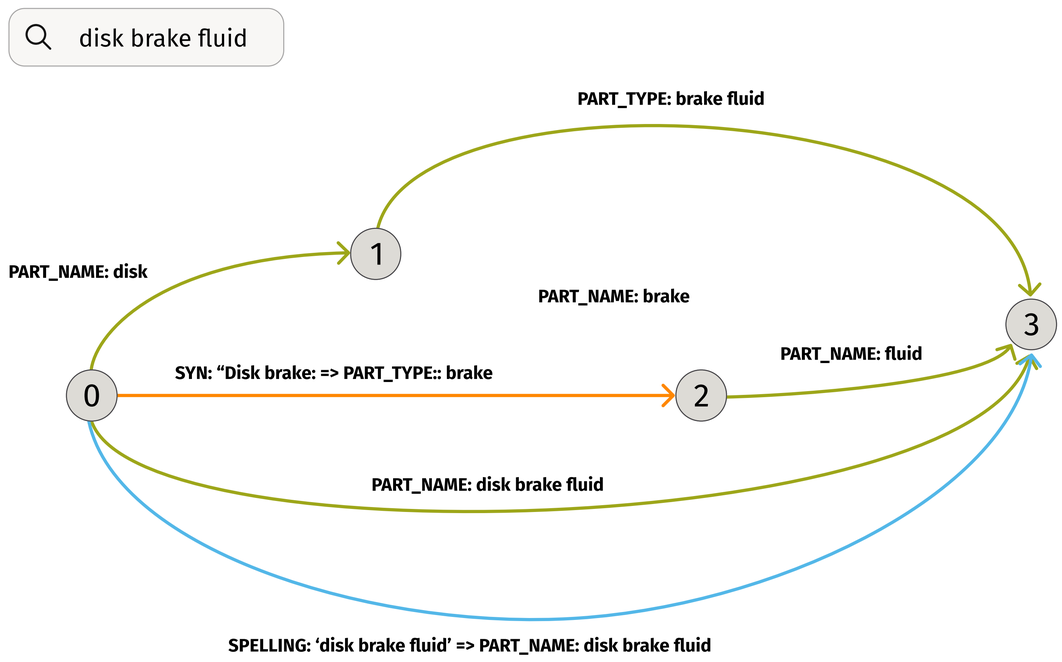
OpenSearch provides a highly scalable system for providing fast access and response to large volumes of data with an integrated visualization tool, OpenSearch Dashboards, that makes it easy for users to explore their data. OpenSearch is powered by the Apache Lucene search library, and it supports a number of search and analytics capabilities such as k-nearest neighbors (KNN) search, SQL, Anomaly Detection, Machine Learning Commons, Trace Analytics, full-text search, and more.



Search Platform Starter Kit: Features

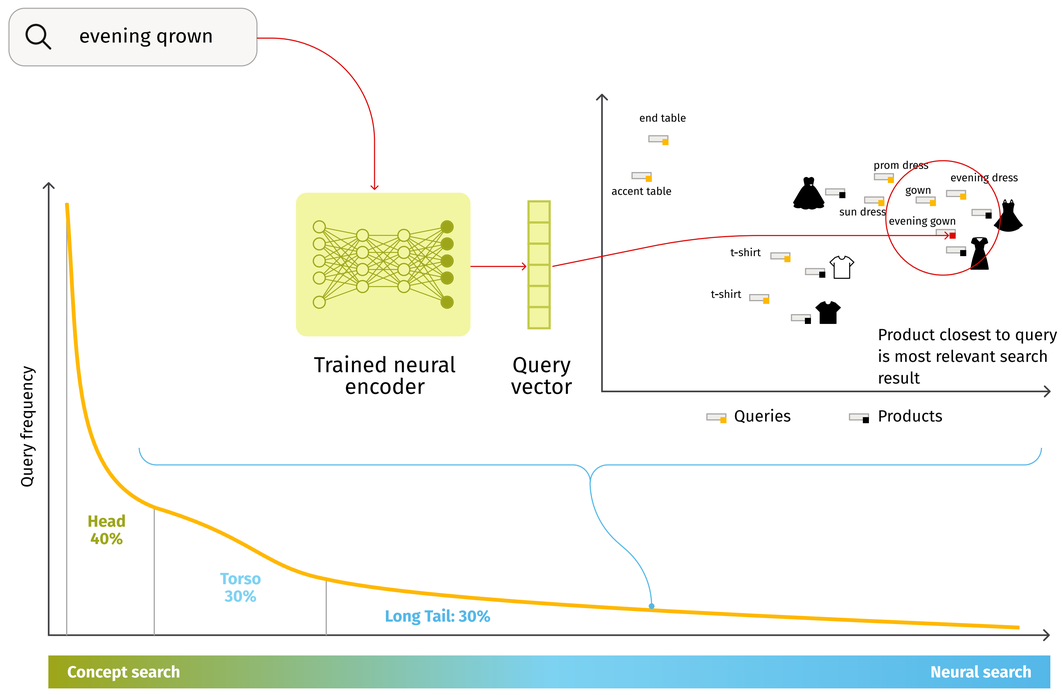
Semantic query graph

A semantic query graph is a uniform, extendable and human-readable way to represent query interpretation and normalization results, and to organize query processing steps into a pipeline. Leveraging this representation, our search solution can create a high-precision query for the Opensearch engine to retrieve the most relevant results.



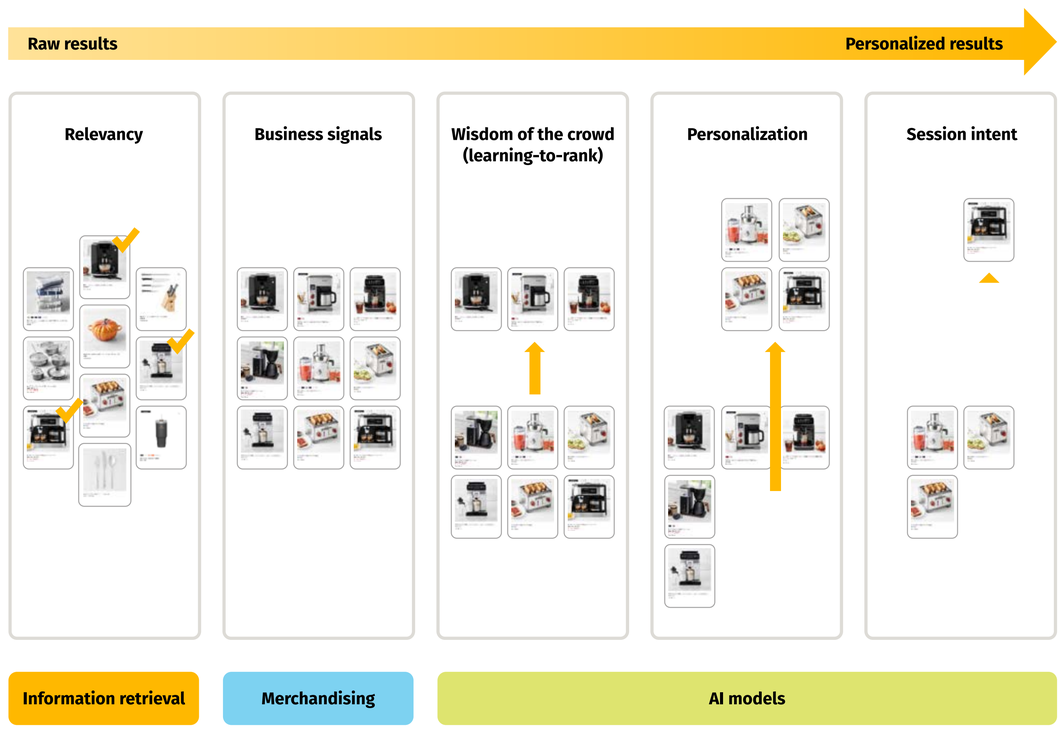
Neural Search

Neural search leverages deep learning models to encode both queries and products as semantic vectors and represents them in such a way that similar products and queries are clustered together, where nearest neighbours are the most relevant matches. Our search solution provides all essential capabilities to train and run deep learning encoders and vector indexes for neural search.



Relevancy Tier Ranking

Semantic query understanding enables splitting search results into relevance tiers. Additional ranking happens inside those relevance tiers, which prevents irrelevant items appearing in the top results. Our search solution combines multiple rankers based on rules and business signals with AI models such as wisdom of the crowd, personalization models and session intent models.



Search Platform Starter Kit: Features

Concept-oriented analytics

Semantic query understanding opens opportunities for concept-oriented query analytics, helping to identify trending concepts, data gaps and unrecognized terms, and to guide search relevance tuning efforts.

Integration with customer engagement signals can also identify overexposed and underexposed content and perform corrective actions.

Query analytics

Filters <Date range> <Channel>

No results found

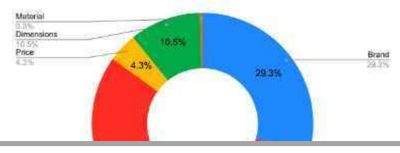
QUERY	COUNT
Faux leather chair	1203
Toner for Brother printer	234
#10 envelopes	12

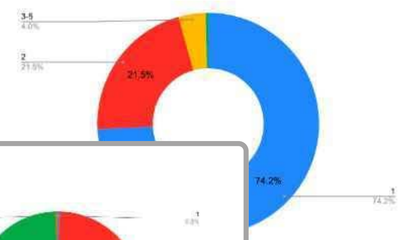
Unrecognized terms

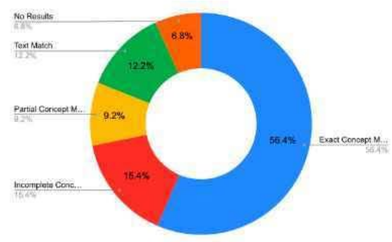
QUERY	COUNT
Faux	345
bergain	124
34”	123

Low CTR

QUERY	COUNT	CTR
cyan toner	984	5%
faux chair	325	3%

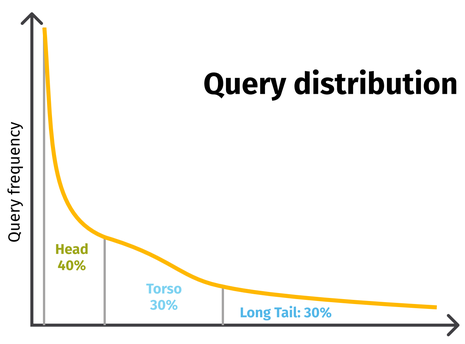






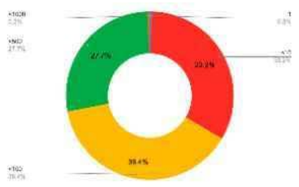
Search pass destribution

Query distribution



Query Stats

STAT	VALUE
Total queries	129,305
Unique queries	32,341
No search results	6,403
...	...



Top queries

QUERY	COUNT	TERMS	RESULTS
office desk	25,000	2	120
toner	15,424	1	322
computer desk	12,405	2	234
...			

Top concepts

QUERY	COUNT
office desk	25,000
toner	15,424
computer desk	12,405
...	

Semantic search for iconic footwear brand

The website and apps of this influential brand are used by millions of customers worldwide to find, research and purchase footwear & apparel products. Customers bring their own vocabulary, experiences and interests. The brand needed an innovative search solution to connect customers with the products they love across countries and languages.

600M
searches/year

40+
countries

25+
languages

Outcomes

5-10%
conversion uplift

-50%
null results

+$100M
incremental revenue

- Grid Dynamics modernized the search platform with semantic search, engagement-based ranking and smart autocomplete capabilities.
- Enriched results relevance improved conversion rates across all channels.
- The neural search approach based on deep learning proved especially efficient for complex queries, cutting zero results and further uplifting conversions.

Engage with Grid Dynamics

1

Our team of cloud and enterprise technology experts works with you to **define roadmaps** for cloud migration, application modernization, or other enterprise capabilities.

2

We work with you to define the optimal **engagement model** that can include both your and Grid Dynamics teams. We leverage our **starter kits** built using open source and cloud-native components to accelerate the implementation.

3

We deploy **cross-functional teams** with proper domain/technology leadership to execute projects from the roadmaps and deliver solutions end-to-end. Our teams usually work with client's stakeholders and product owners in a **co-innovation** mode.

4

We focus on **iterative execution** of the roadmaps to deliver business value in short phases, but also continuously **refine the strategy** and come up with improvement proposals.

5

The co-innovation approach helps you to **establish a strong technology culture** in your organization, efficiently manage the roadmaps, and scale your Cloud and DevOps capabilities.

About Grid Dynamics

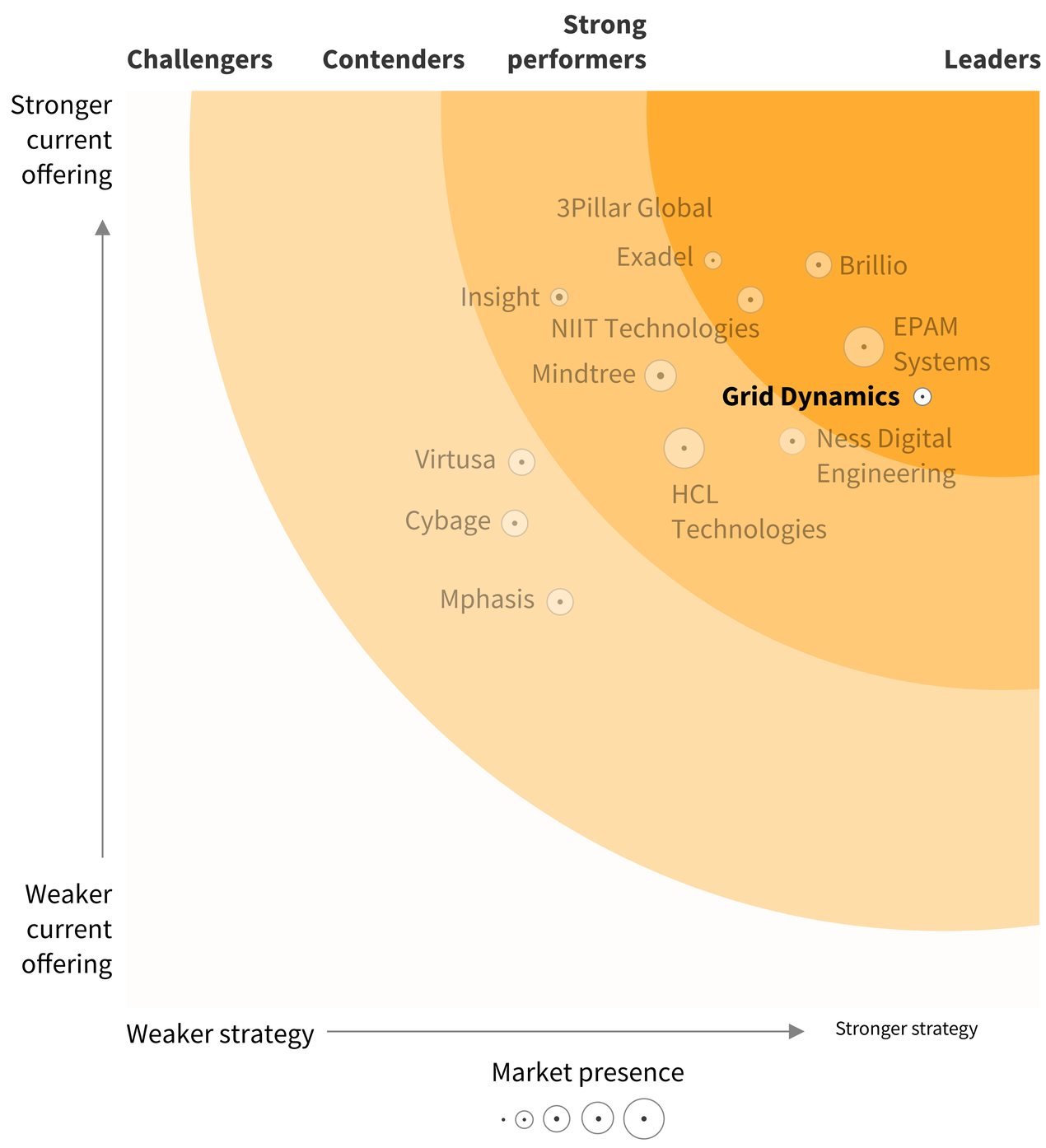
Grid Dynamics is a global digital engineering company that co-innovates with the most respected brands in the world to solve complex problems, optimize business operations, and better serve customers. Driven by business impact and agility, we create innovative, end-to-end solutions in digital commerce, AI, data, and cloud to help clients grow.

Headquartered in Silicon Valley, with delivery centers located throughout the globe, Grid Dynamics is known for architecting revolutionary digital technology platforms for 7 of the 25 largest retailers in the US and 3 of the 10 largest consumer goods companies in the world, as well as leading brands in the digital commerce, manufacturing, finance, healthcare, and high tech sectors.

Our secret sauce? We hire the top 10% of global engineering talent and employ our extensive expertise in emerging technology, lean software development practices, a high-performance product and agile delivery culture, and strategic partnerships with leading technology service providers like Google, Amazon, and Microsoft.

In 2019, Forrester named Grid Dynamics a leader among midsize agile development service providers. In 2020, Grid Dynamics went public and is trading on the NASDAQ under the GDYN ticker.

The Forrester wave™
Midsize Agile Development Service Providers Q2 2019



About Grid Dynamics

Key facts

- 13 countries across North America, Europe, and Asia
- 3,800 employees in Q3 2022
- Forrester Leader Midsize Agile Software Development Service Provider Q2 2019
- Proprietary starter kits developed in collaboration with AWS other partners

Areas of expertise

- **Experience engineering**
  Web | Mobile | AR/VR
- **Data Science and AI**
  Search | Personalization | Supply chain | IoT
- **Platform engineering**
  Microservices | MACH | Composable
- **Data engineering**
  Big data | Streaming | MLOps
- **Cloud and DevOps**
  CICD | AIOps | SRE | QE

Clients

Apple	Google	Nike
align	Levi's	StanleyBlack&Decker
Raymond James	Silicon Valley Bank	American Eagle
LVMH	Inspire Brands	HelloFresh

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