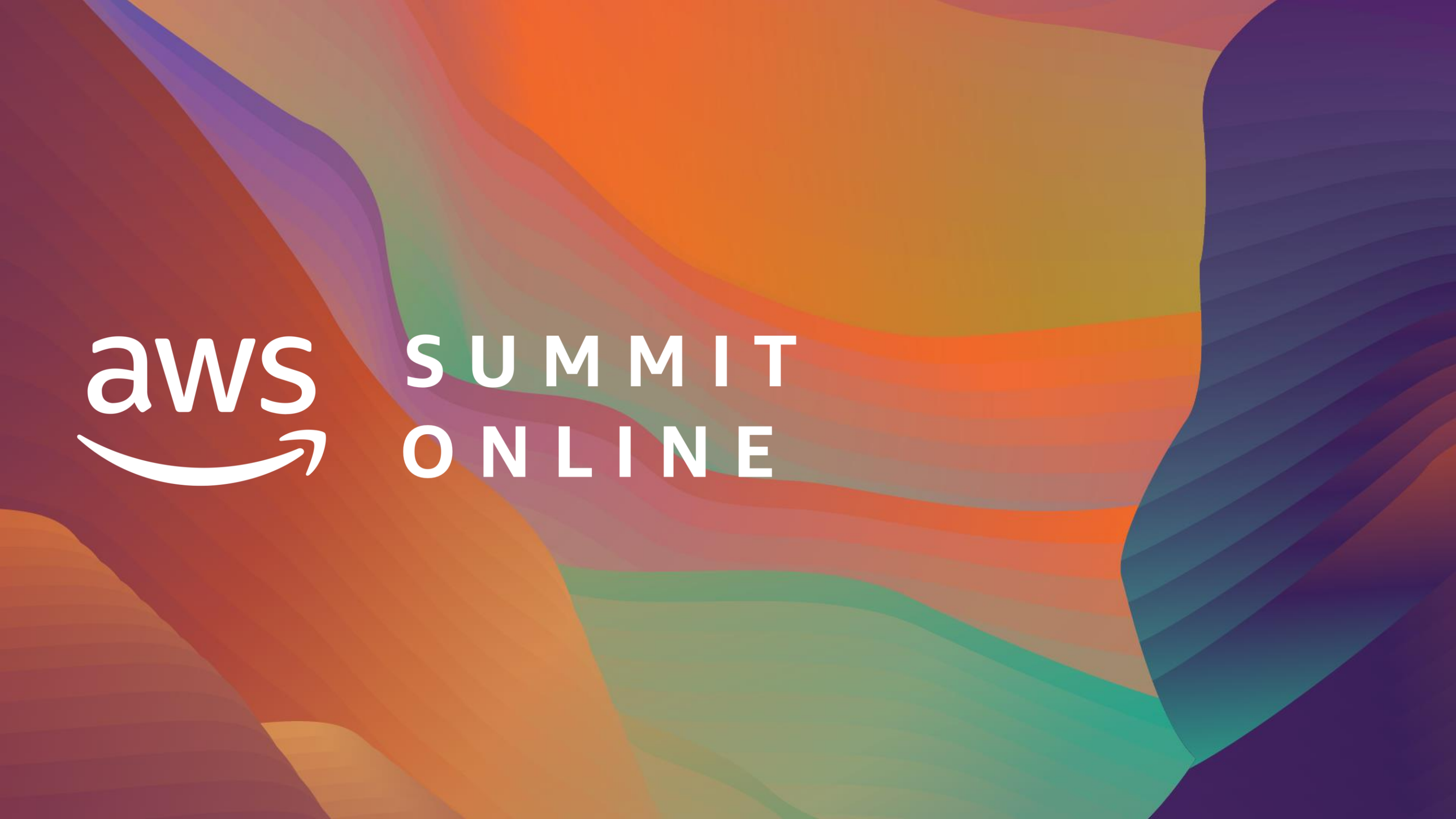
aws
SUMMIT
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INT07

Fraud detection: Using ML to identify and manage fraudulent activities

Eric Greene

AI Specialist Solutions Architect with Service Team
Amazon Web Services

aws SUMMIT ONLINE

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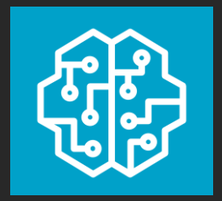
Agenda

Amazon fraud learnings



Machine learning and fraud

Amazon Fraud Detector

Demo

Go build

Amazon fraud learnings

Amazon has over 20 years of experience dealing with fraud

Payment fraud in Australia

https://www.auspaynet.com.au/sites/default/files/2019-08/AustralianPaymentCardFraud2019_0.pdf

Payments in Australia

$789B

Relative size of payment fraud

Amazon’s fraud experience

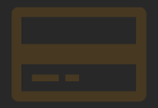
245 countries and territories

Fraud comes in all shapes and forms

Payment fraud

- Compromised payment Instruments (e.g., stolen cards)
- Intentional non-payment (e.g., pre-paid cards)

Fraud comes in all shapes and forms



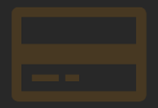
Payment fraud

- Compromised payment Instruments (e.g., stolen cards)
- Intentional non-payment (e.g., pre-paid cards)

Account takeover or compromise

- Username and password
- API key

Fraud comes in all shapes and forms



Payment fraud

- Compromised payment Instruments (e.g., stolen cards)
- Intentional non-payment (e.g., pre-paid cards)

Account takeover or compromise

- Username and password
- API key

Abuse

- Free tier misuse
- Premium phone number

Fraud prevention strategy

Prevention

Score events

Fraud loss versus customer friction

Real-time

Fraud prevention strategy

Prevention

Score events

Fraud loss versus customer friction

Real-time

Detection

Behavior anomalies

Fraud loss versus remediation costs

Frequent batch

Fraud prevention strategy

Prevention

Score events

Fraud loss versus customer friction

Real-time

Detection

Behavior anomalies

Fraud loss versus remediation costs

Frequent batch

Containment

Rules limit damage

Fraud loss versus friction and remediation

Prevention and detection

Fraud prevention strategy

Prevention

Score events

Fraud loss versus customer friction

Real-time

Detection

Behavior anomalies

Fraud loss versus remediation costs

Frequent batch

Containment

Rules limit damage

Fraud loss versus friction and remediation

Prevention and detection

Remediation

Humans qualifying

Reduce time

Human and queue

Fraud prevention strategy

Prevention

Score events

Fraud loss versus customer friction

Real-time

Detection

Behavior anomalies

Fraud loss versus remediation costs

Frequent batch

Containment

Rules limit damage

Fraud loss versus friction and remediation

Prevention and detection

Remediation

Humans qualifying

Reduce time

Human and queue

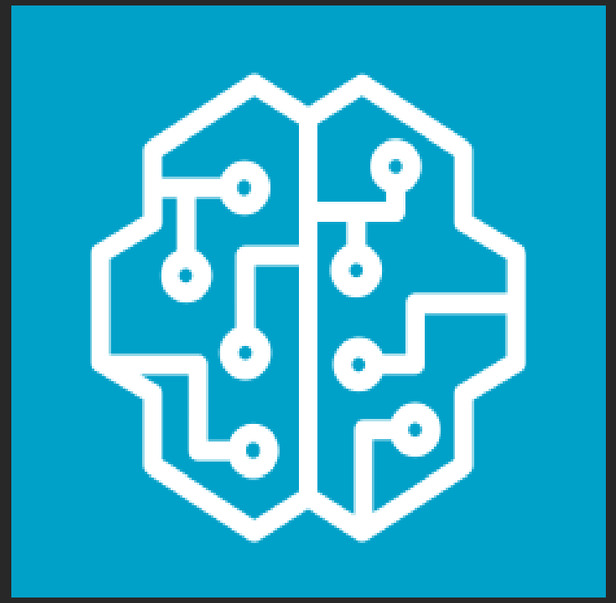
Data

All pillar generate and exchange data

Raw data for training models

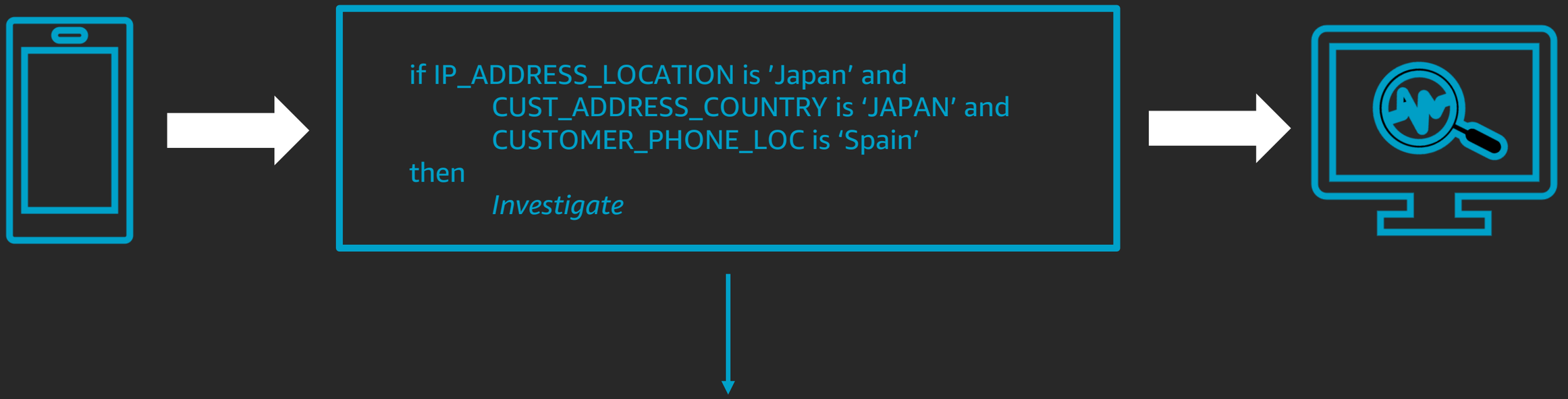
Data analyses for research and to inform how to modify rules

Machine learning and fraud



Machine learning enables adaptive fraud systems that perform well in a rapidly changing fraud landscape

Fraud detection with rules



Low detection rates = Bad customer experience and increased fraud loss

High false detection = Customer friction and higher investigation costs

Supervised machine learning

Features

Inputs into your prediction

Location

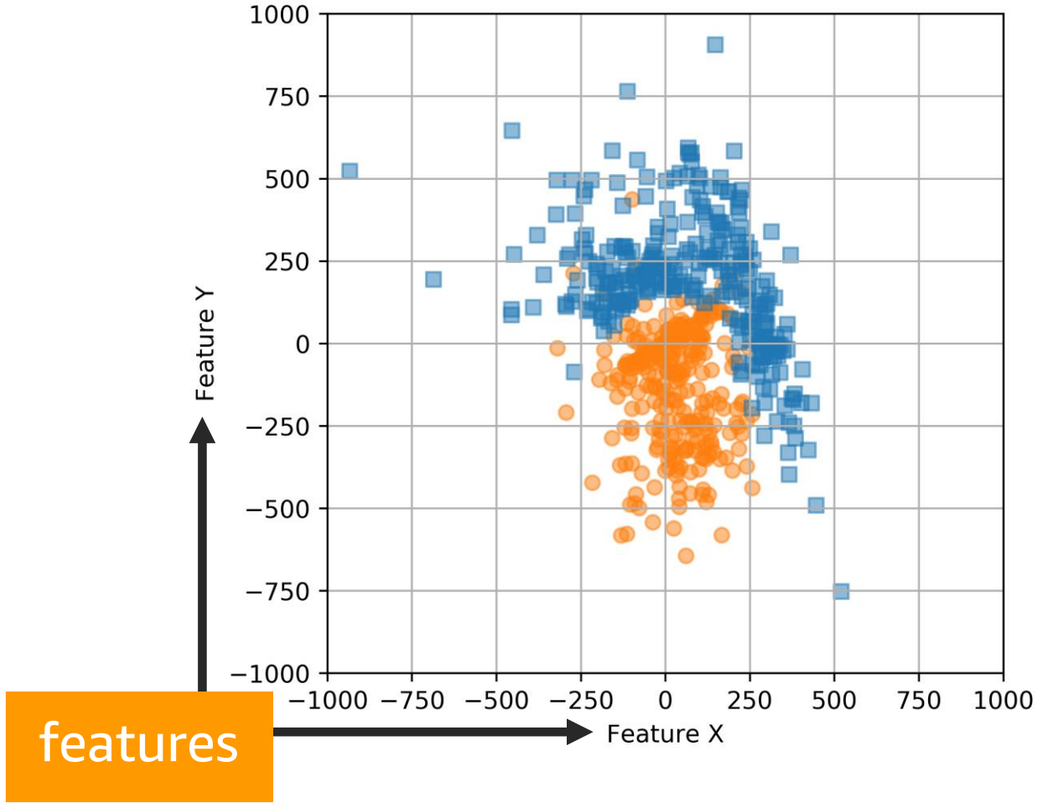
Email

Time

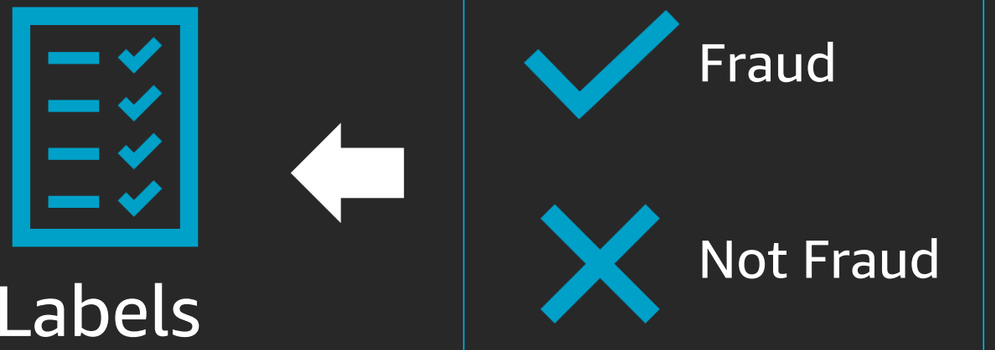
Payment Info

?

...many more

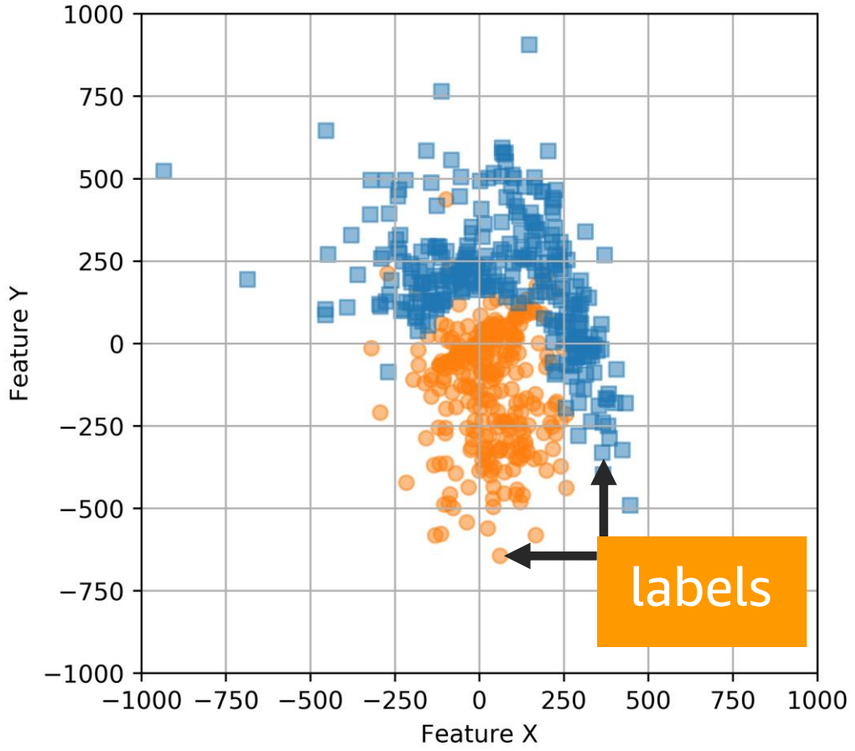


Supervised machine learning

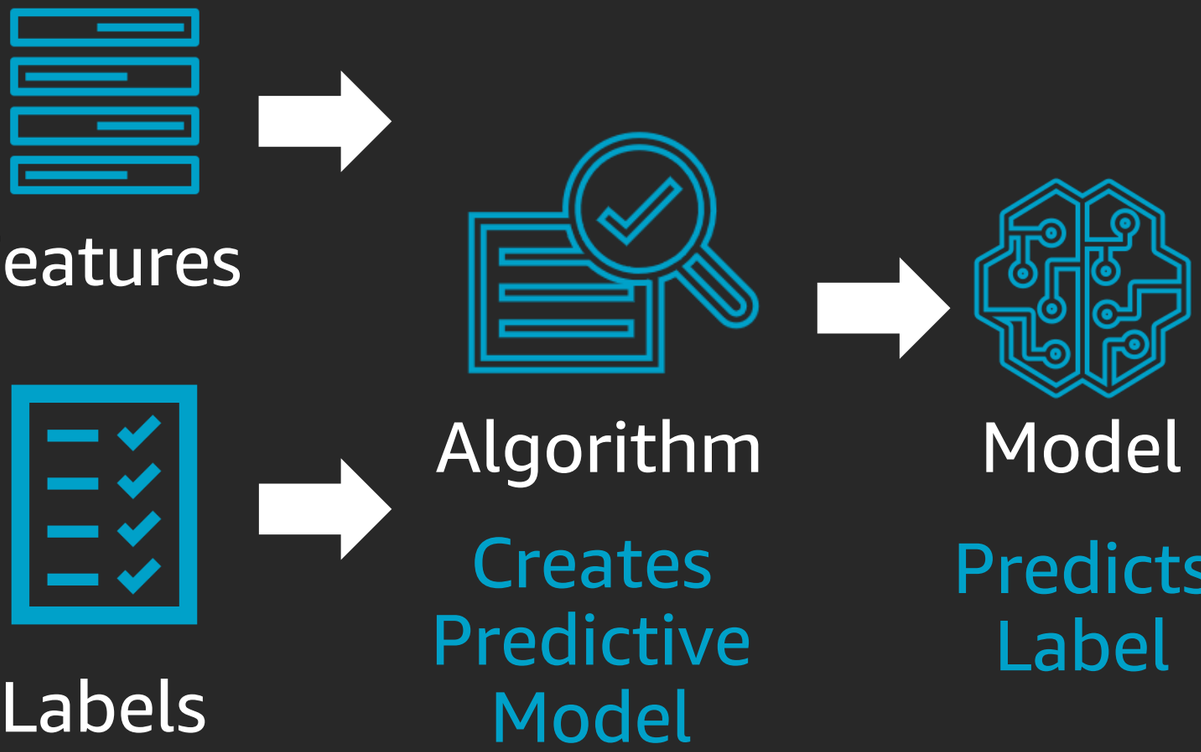


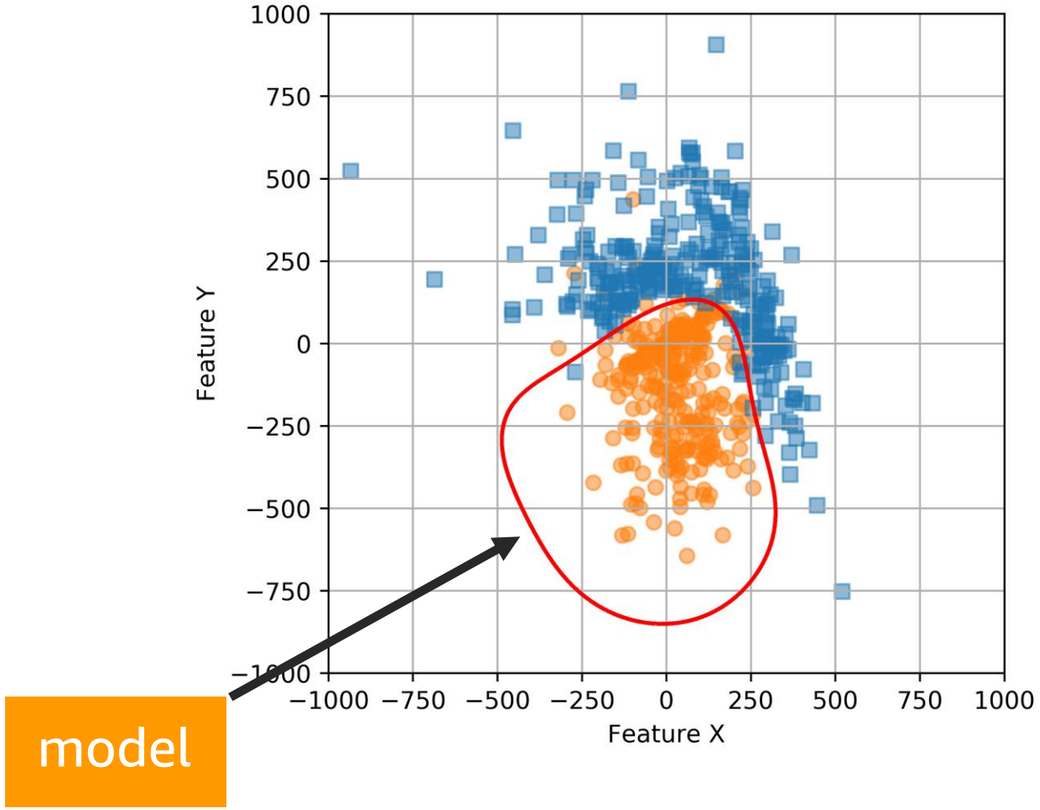
Labels

What will be predicted?



Supervised machine learning





Unsupervised machine learning

Features

Properties for analyses

Location

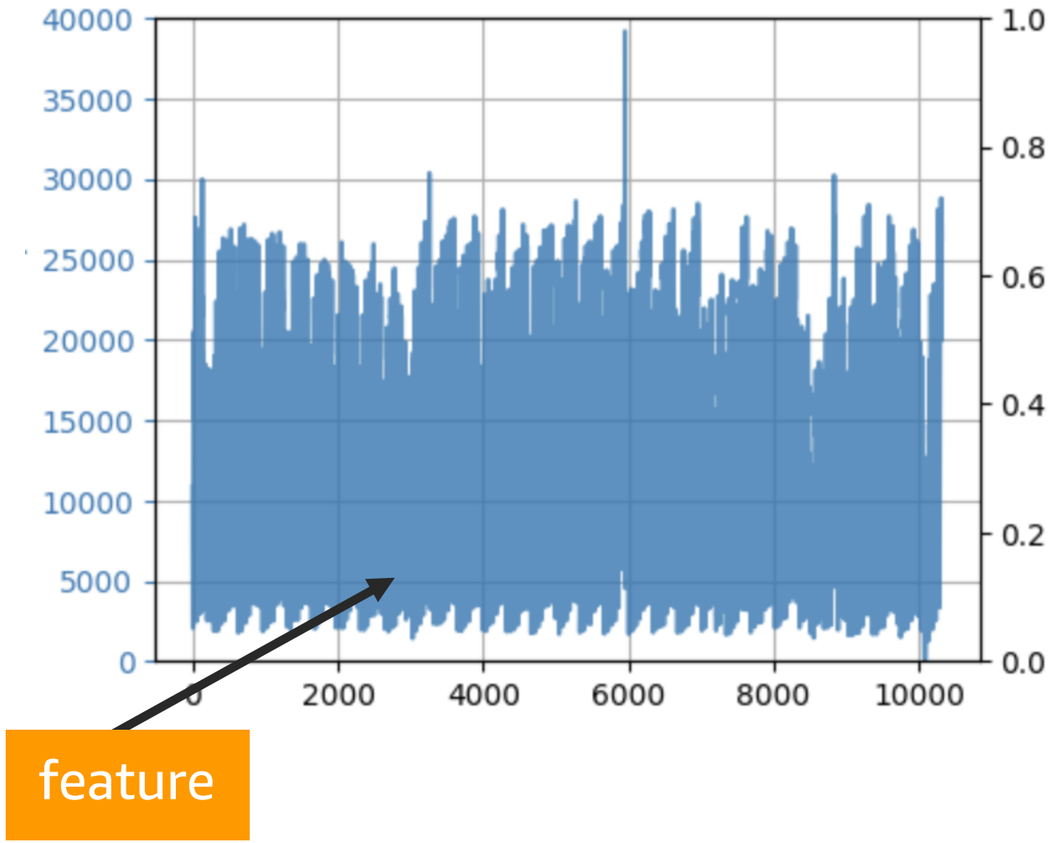
Email

Time

Payment Amount

?

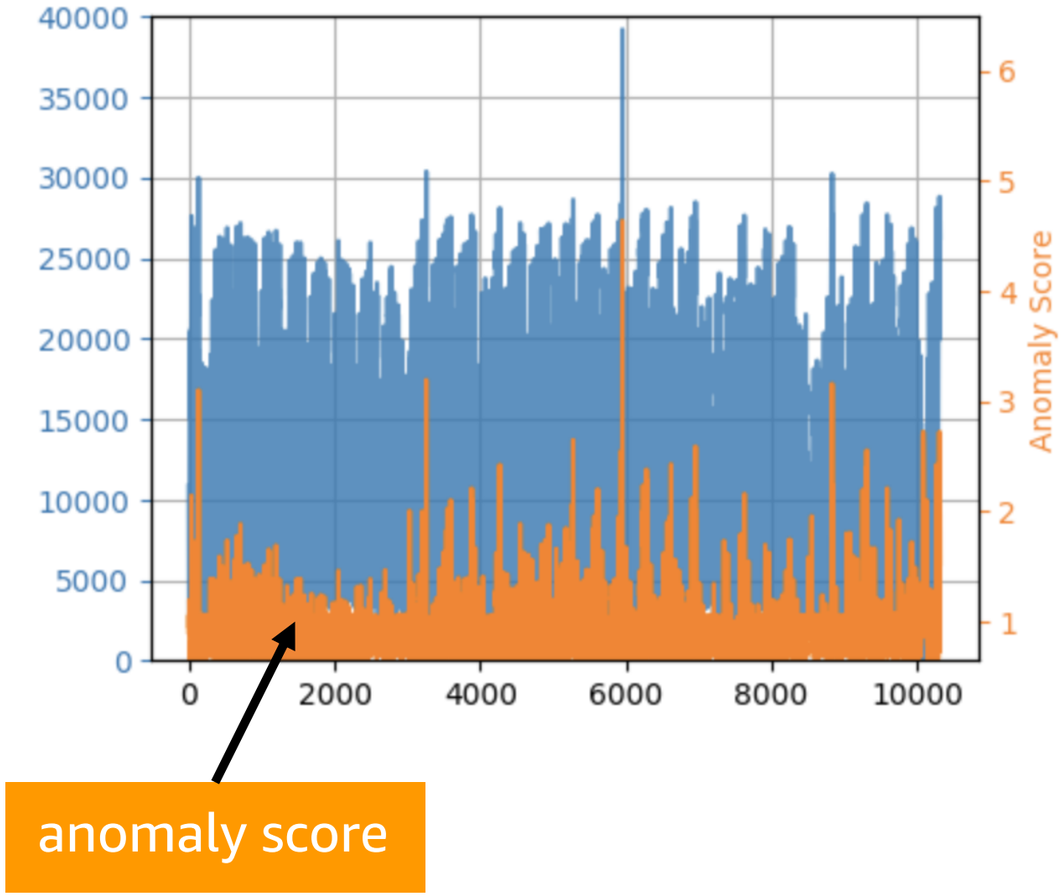
…many more



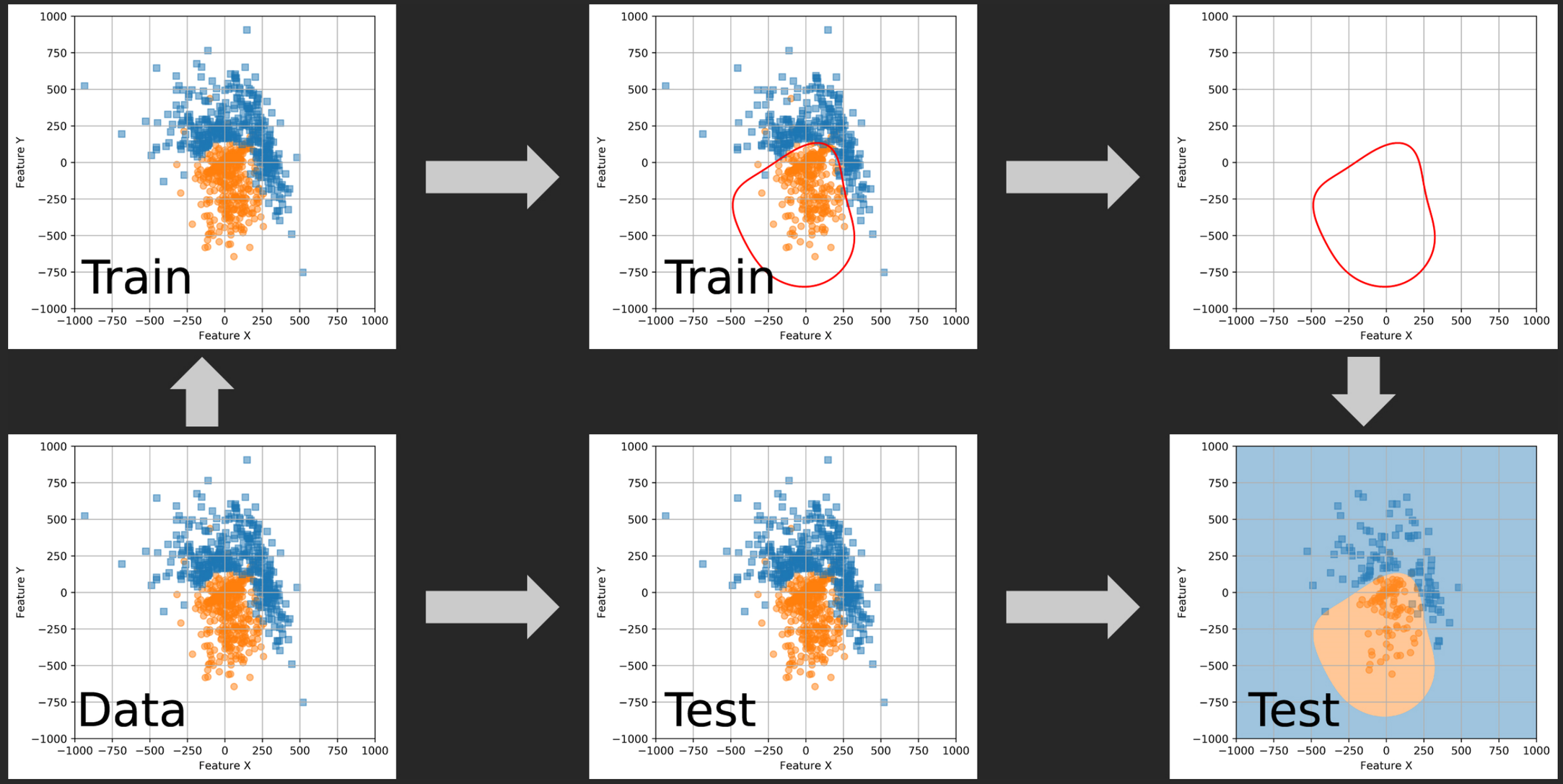
Unsupervised machine learning

Features → Algorithm → Model

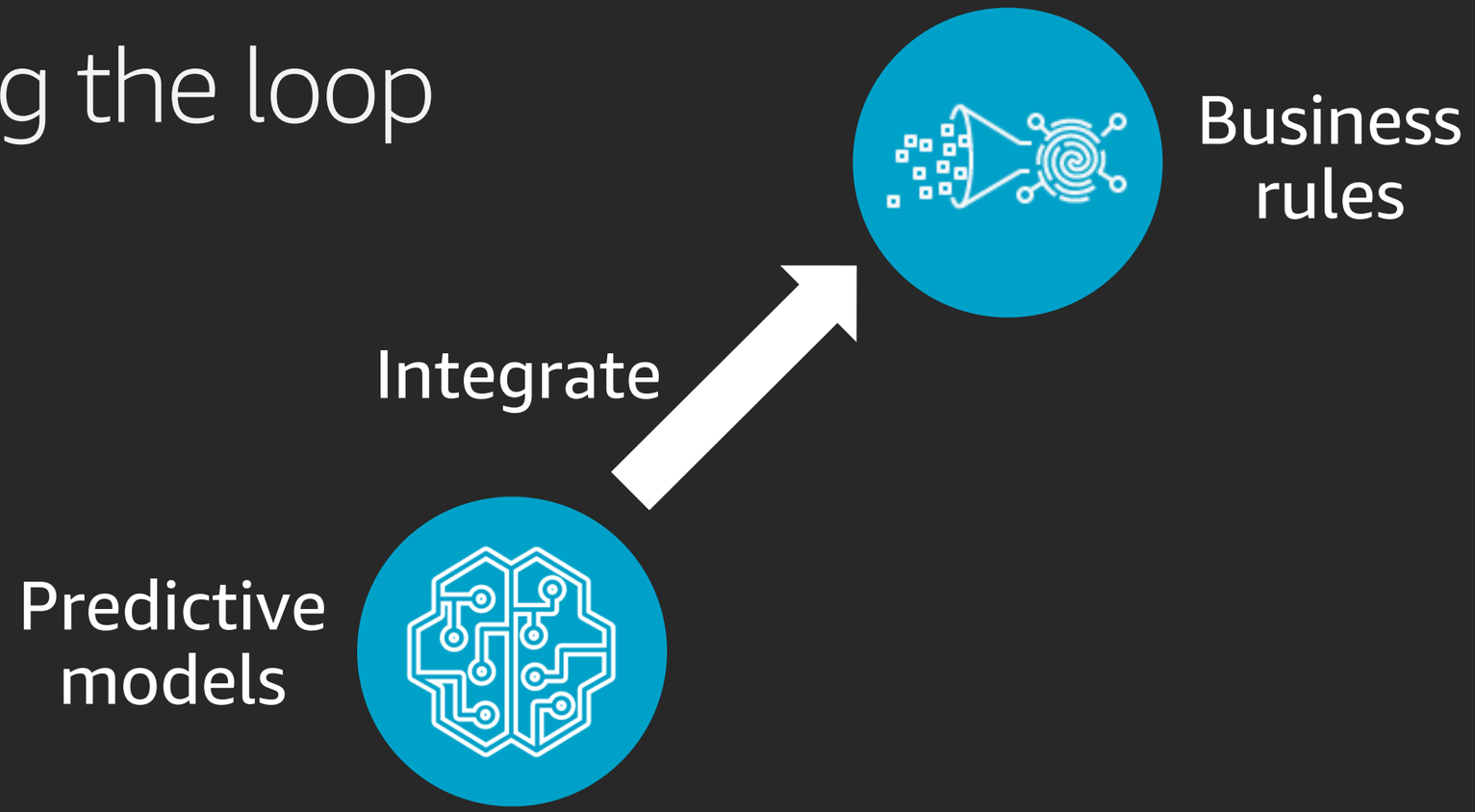
Creates model



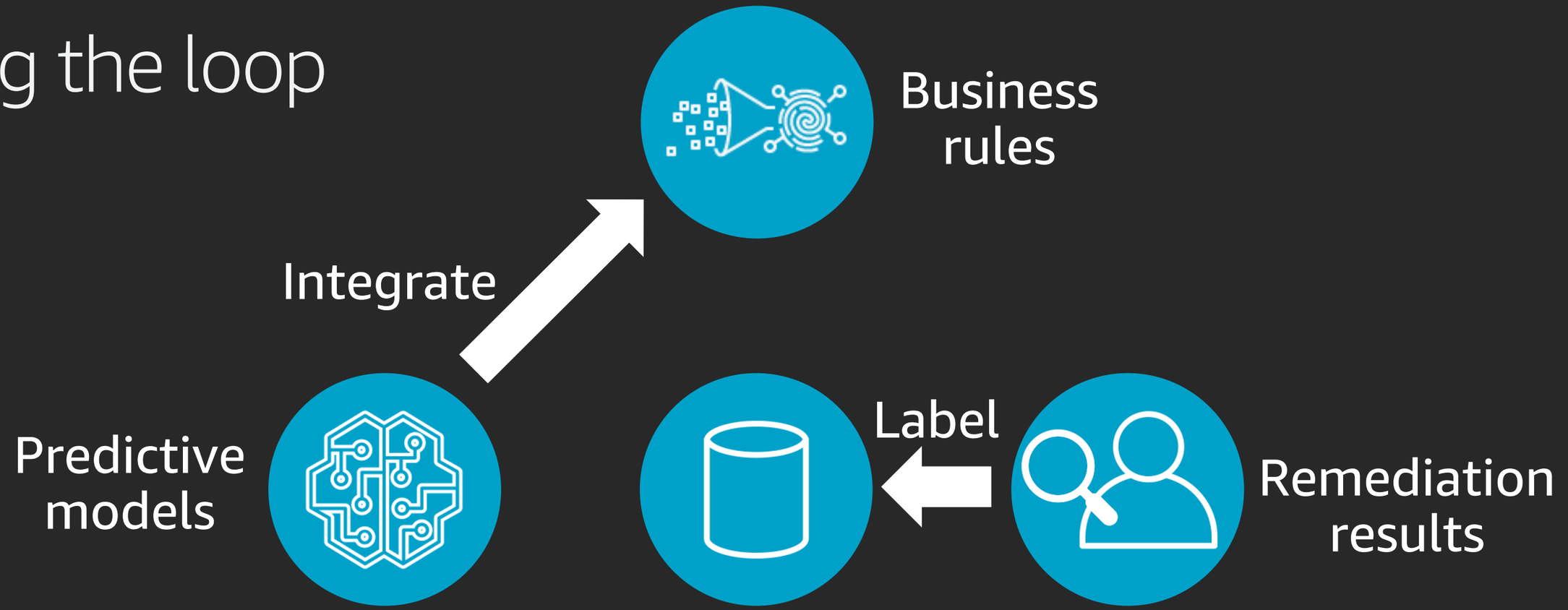
Building and evaluating machine learning models



Closing the loop



Closing the loop



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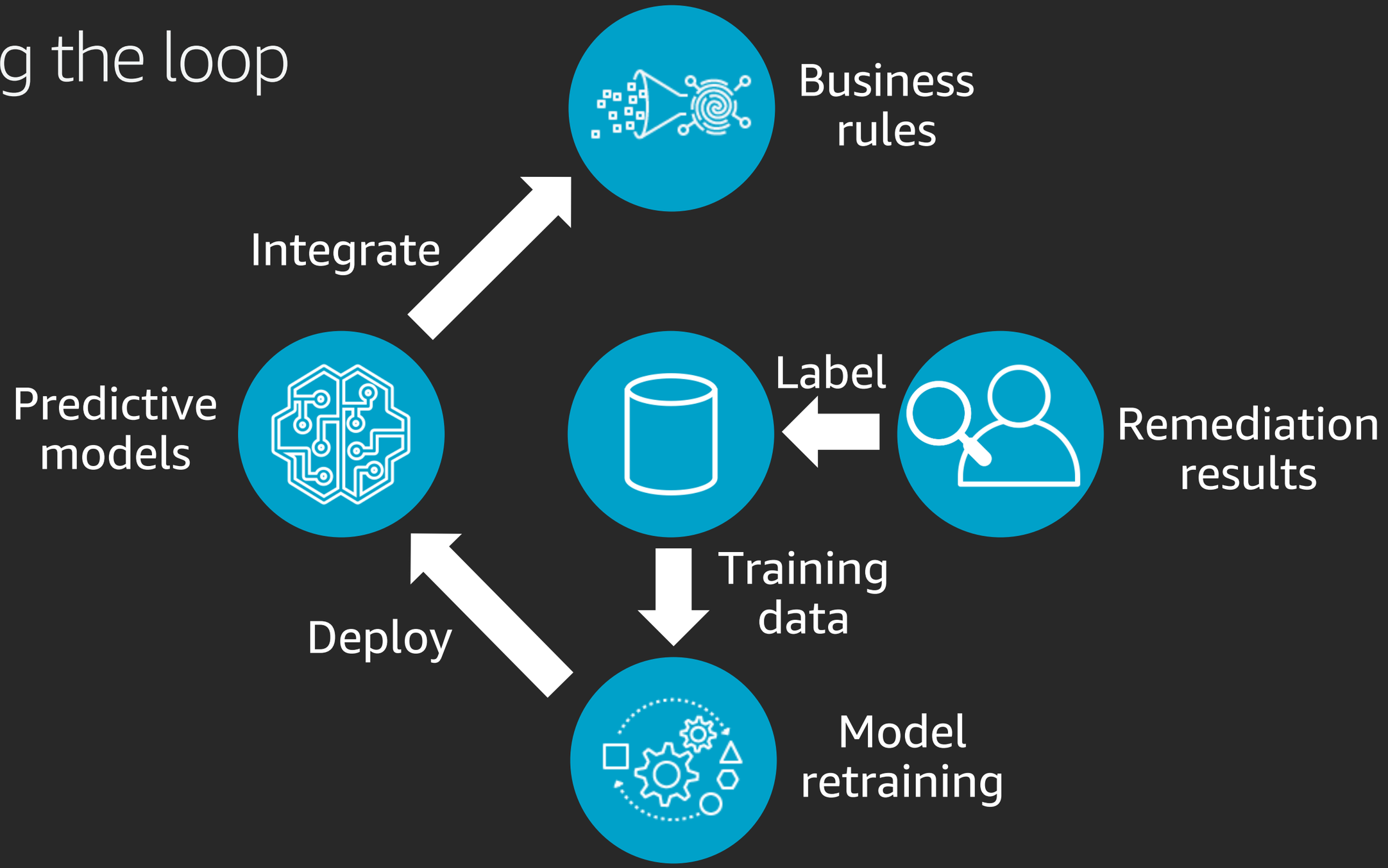
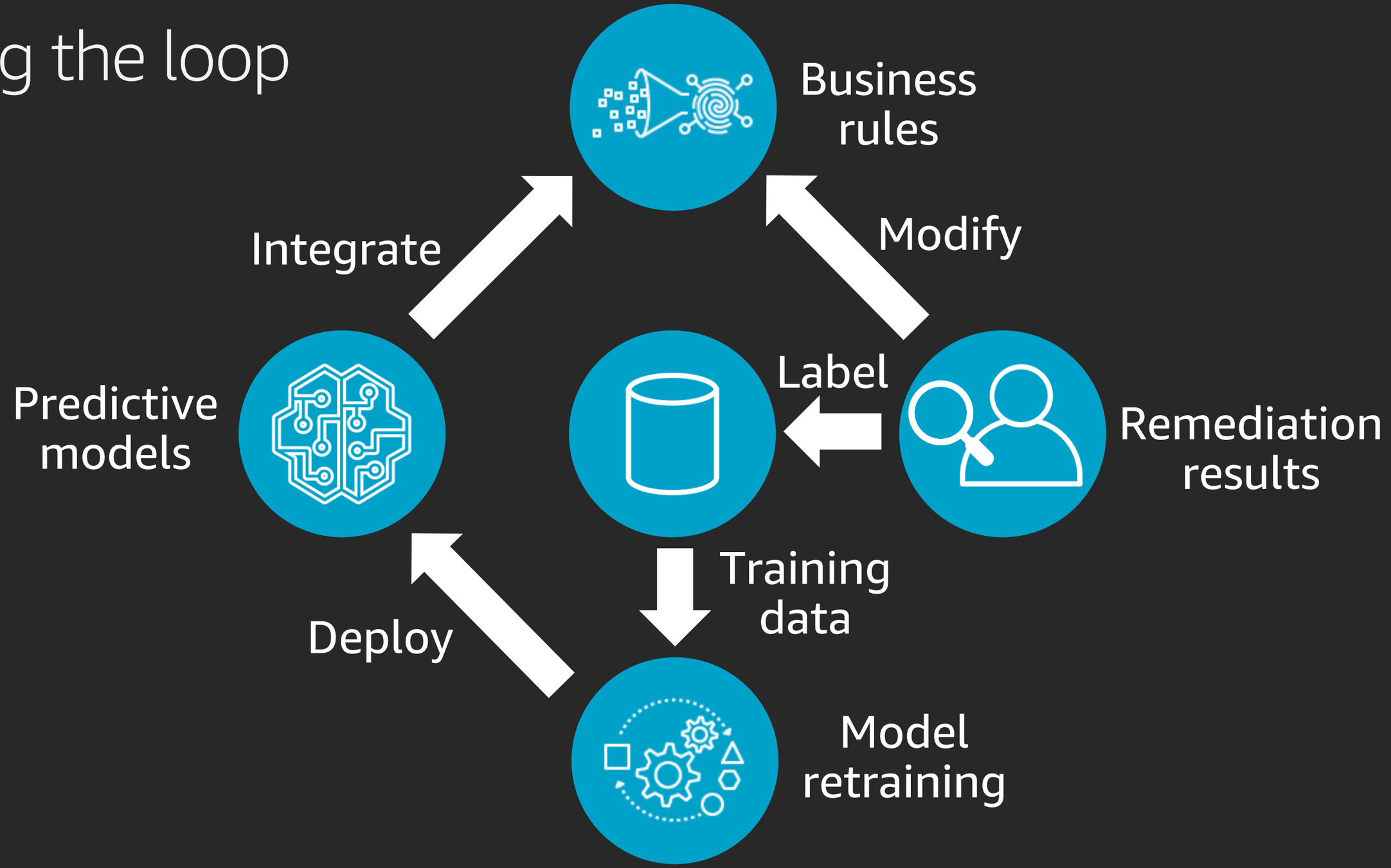


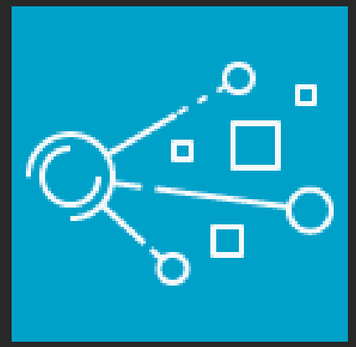
Closing the loop



Machine learning is difficult

ML experts costly, hard to find

Generic models underperform



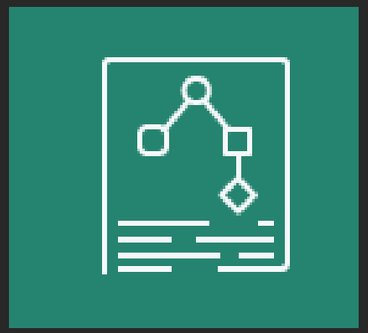
Time-consuming data transforms

Needle in a haystack

Introducing Amazon Fraud Detector

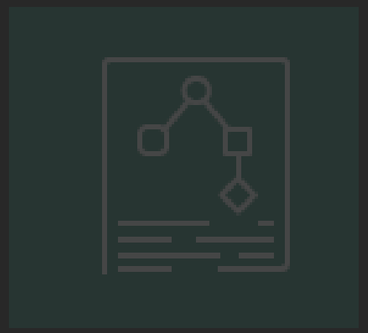
A fraud detection service that makes it easy for businesses to use machine learning to detect online fraud in real-time, at scale

Key features

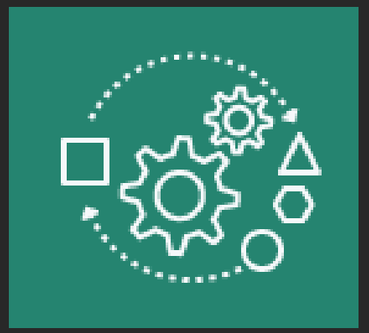


Pre-built fraud detection model templates

Key features

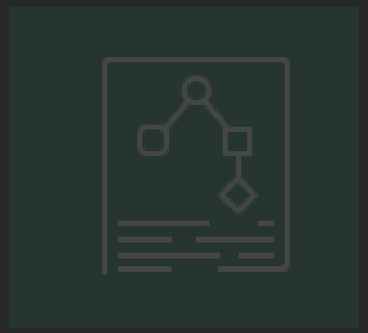


Pre-built fraud detection model templates

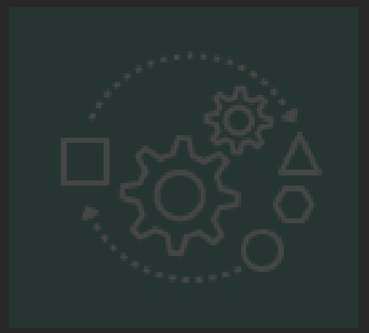


Automatic creation of custom fraud detection models

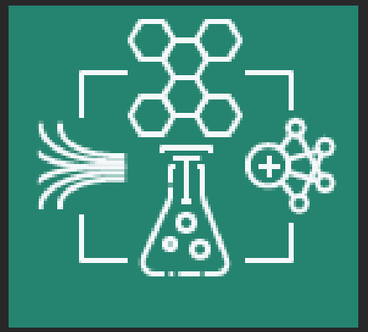
Key features



Pre-built fraud detection model templates

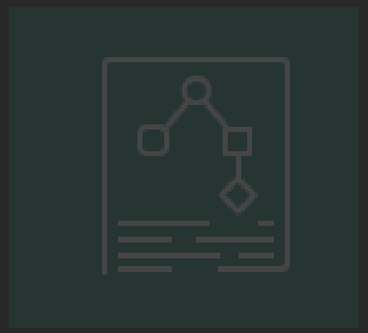


Automatic creation of custom fraud detection models

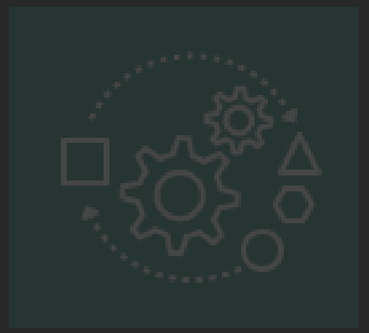


Models learn from past attempts to defraud Amazon

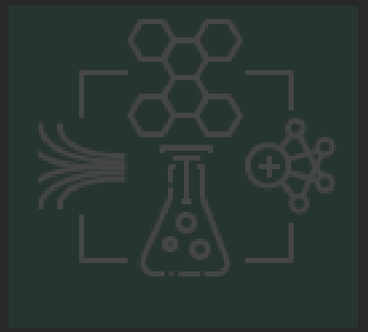
Key features



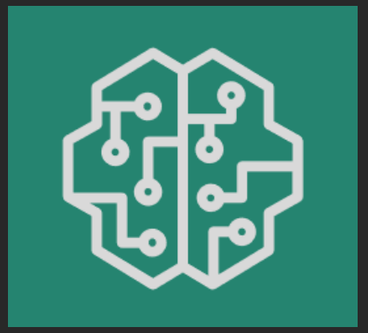
Pre-built fraud detection model templates



Automatic creation of custom fraud detection models

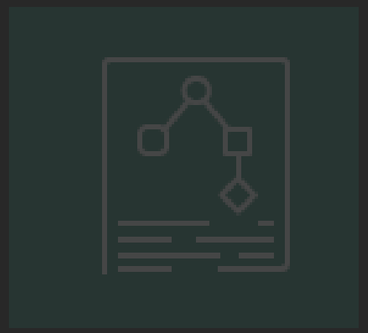


Models learn from past attempts to defraud Amazon

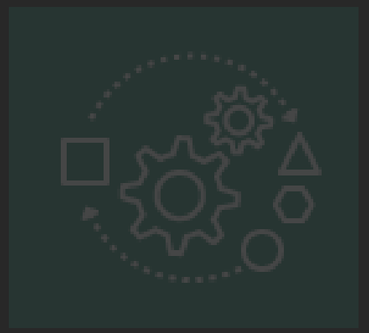


Amazon SageMaker integration

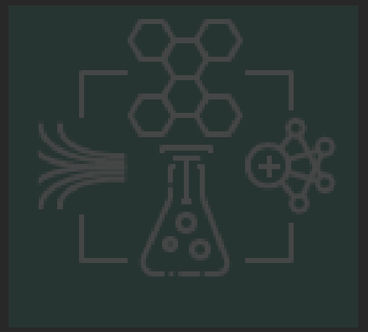
Key features



Pre-built fraud detection model templates



Automatic creation of custom fraud detection models



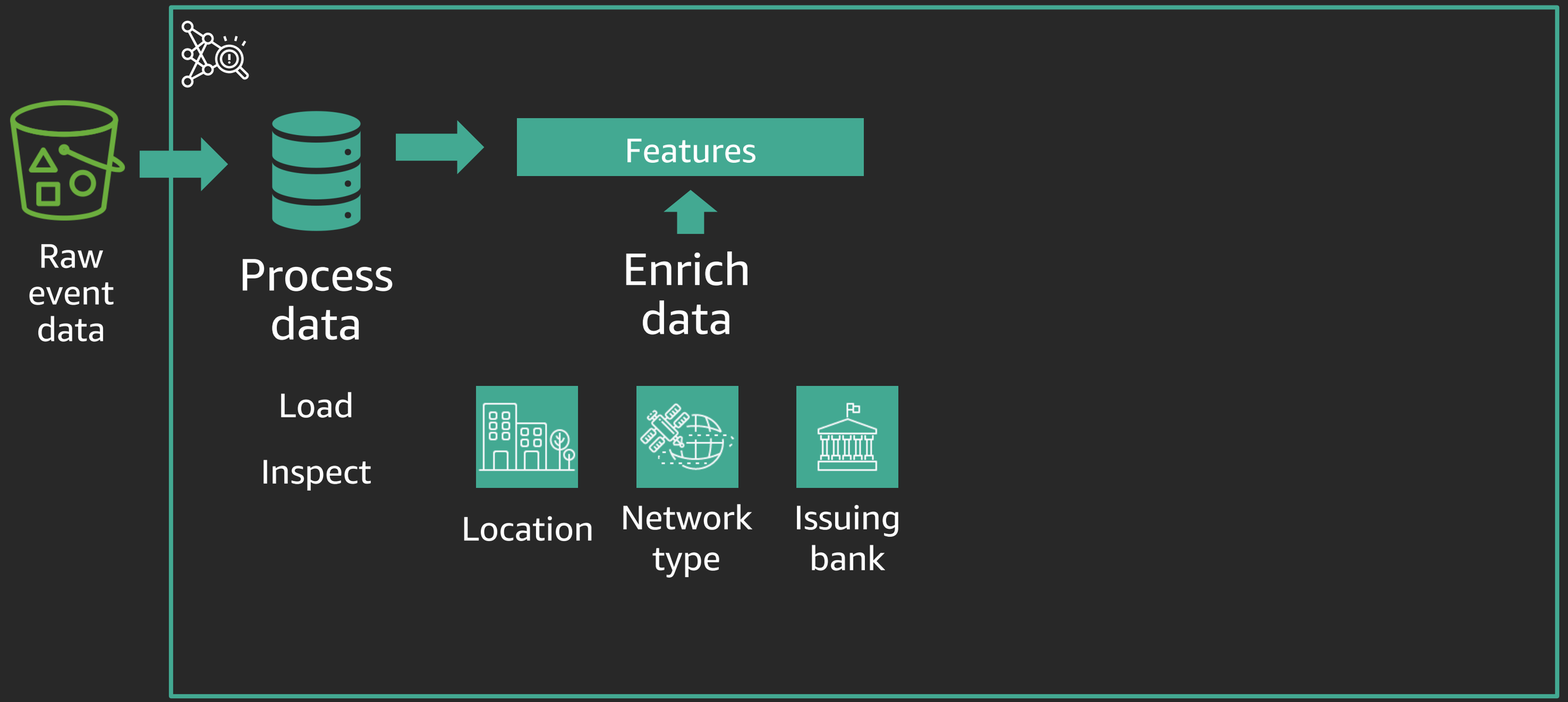
Models learn from past attempts to defraud Amazon

Amazon SageMaker integration

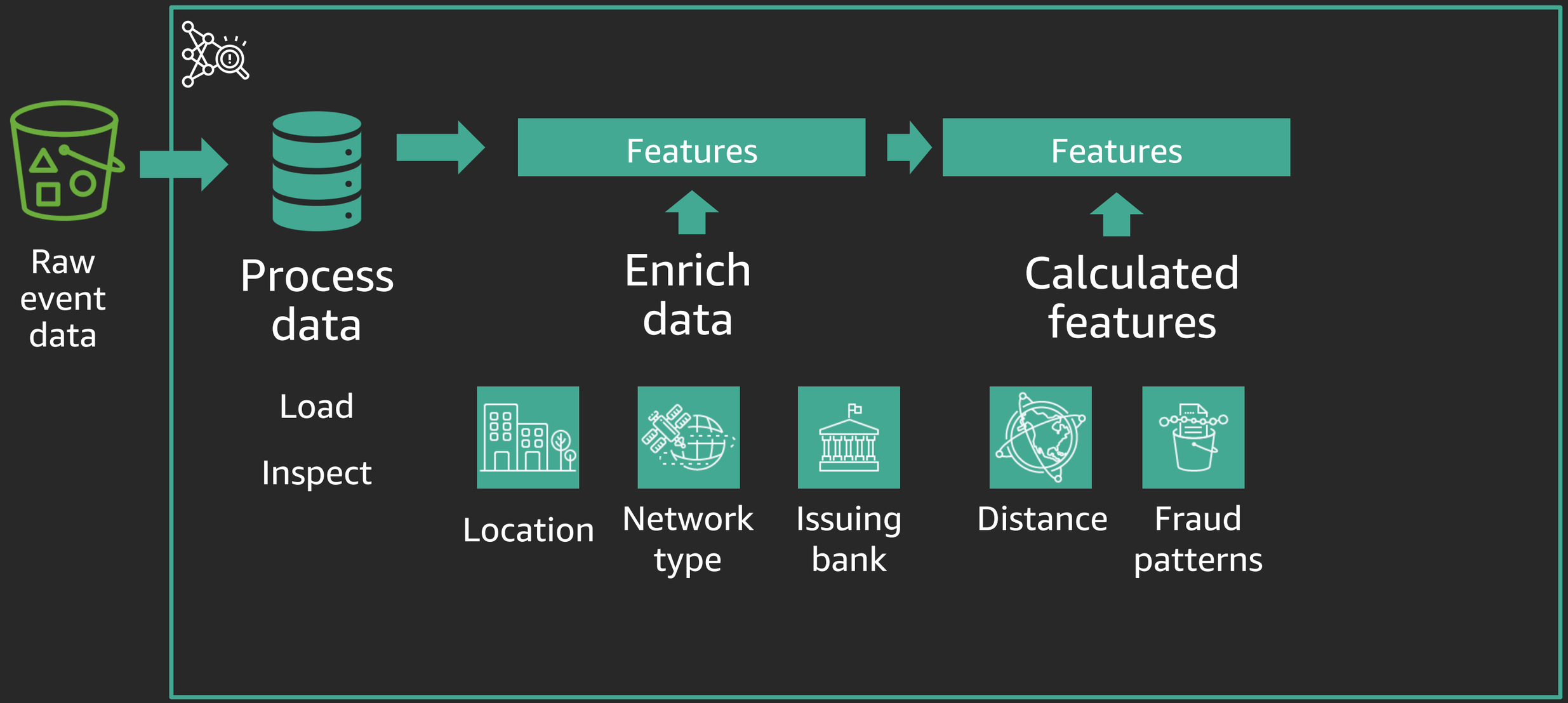
Interface to review past events and detection logic

How it works

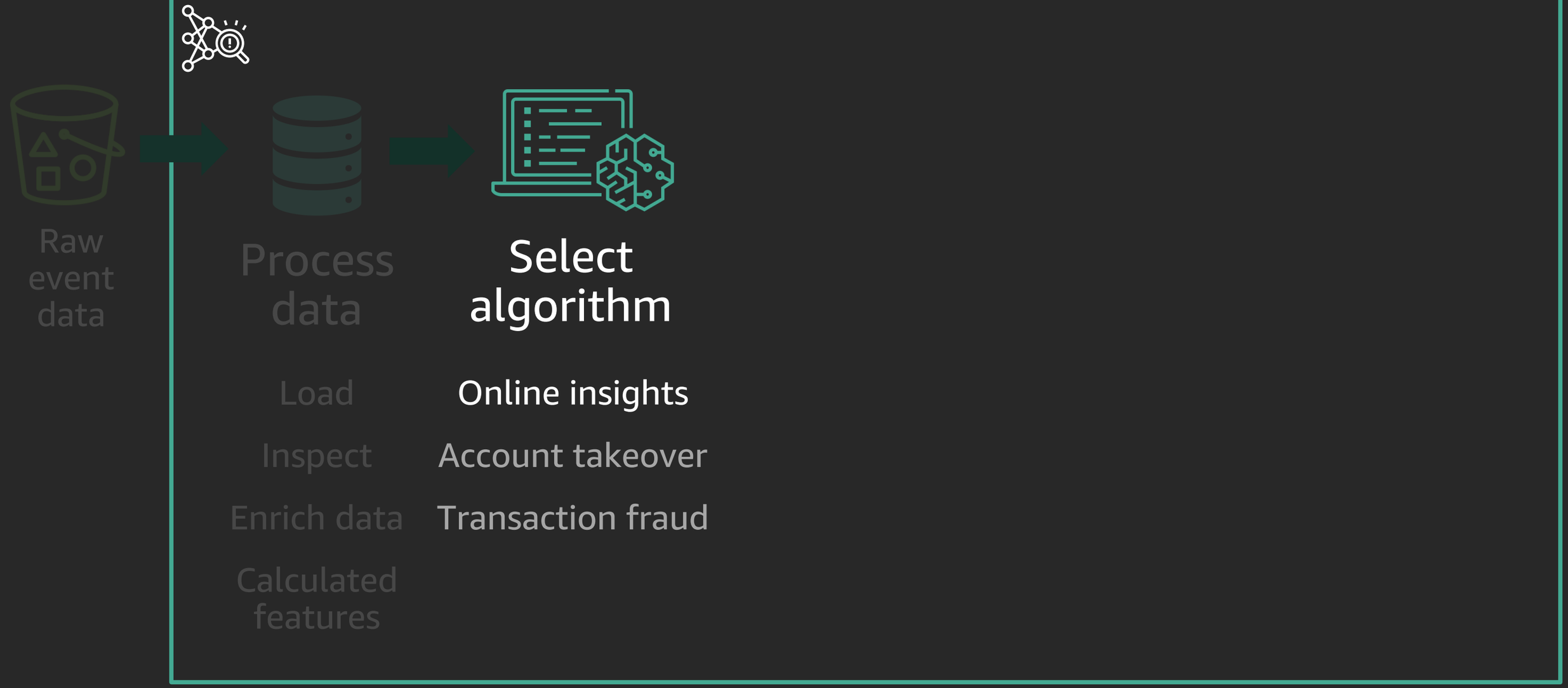
How it works


Raw event data
Process data
Load
Inspect
Features
Enrich data
Location
Network type
Issuing bank

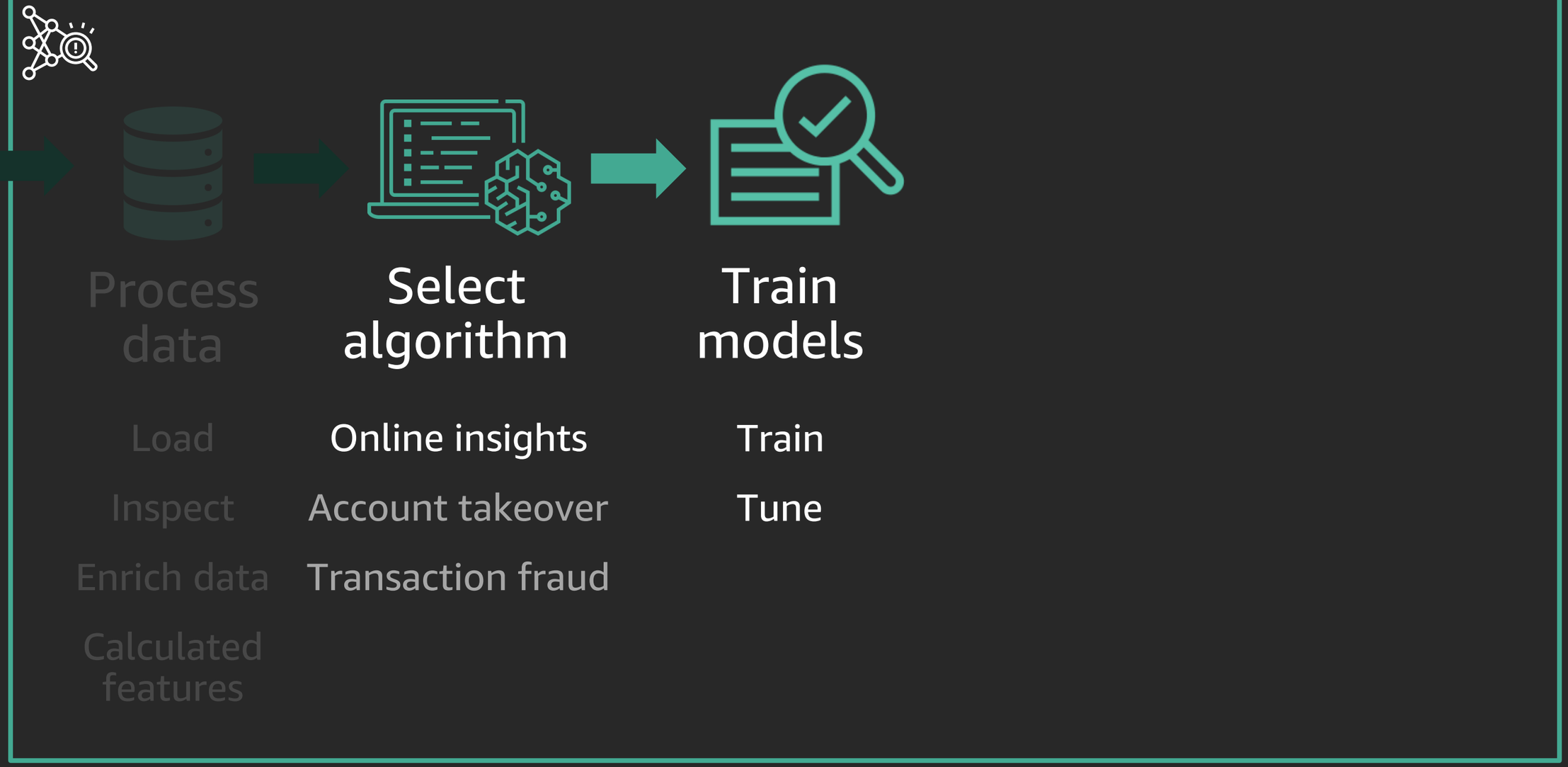
How it works


Raw event data
Process data
Load
Inspect
Features
Enrich data
Location
Network type
Issuing bank
Features
Calculated features
Distance
Fraud patterns

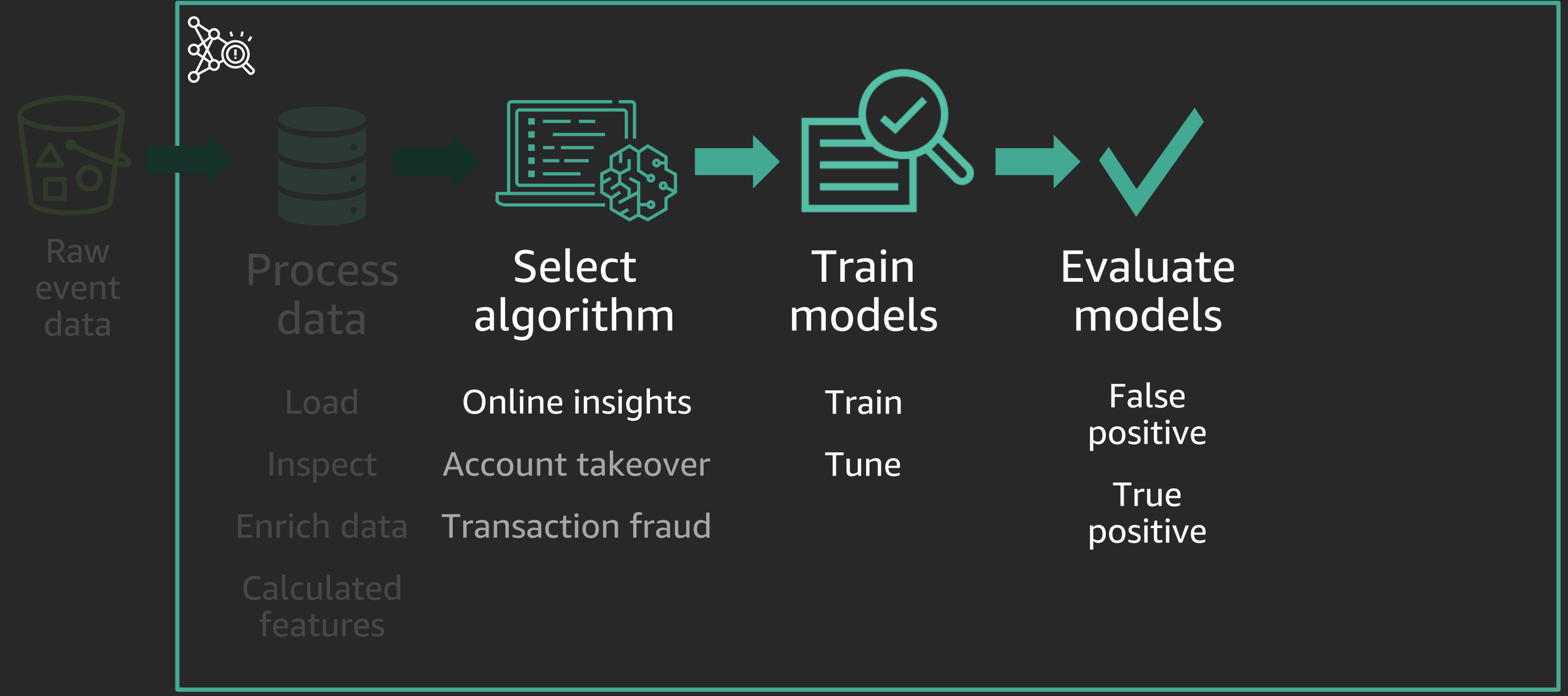
How it works


Raw event data
Process data
Load
Inspect
Enrich data
Calculated features
Select algorithm
Online insights
Account takeover
Transaction fraud

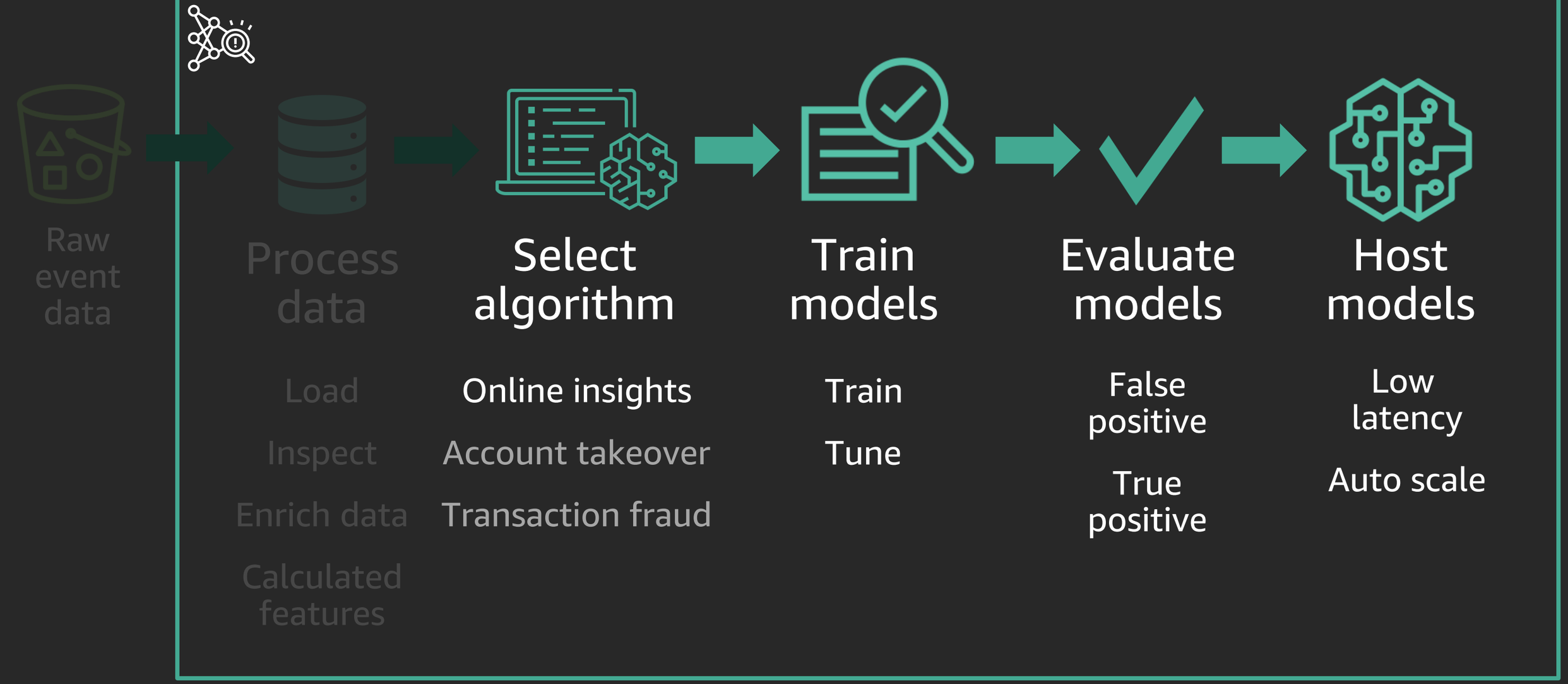
How it works


Raw event data
Process data
Select algorithm
Train models
Load
Inspect
Enrich data
Calculated features
Online insights
Account takeover
Transaction fraud
Train
Tune

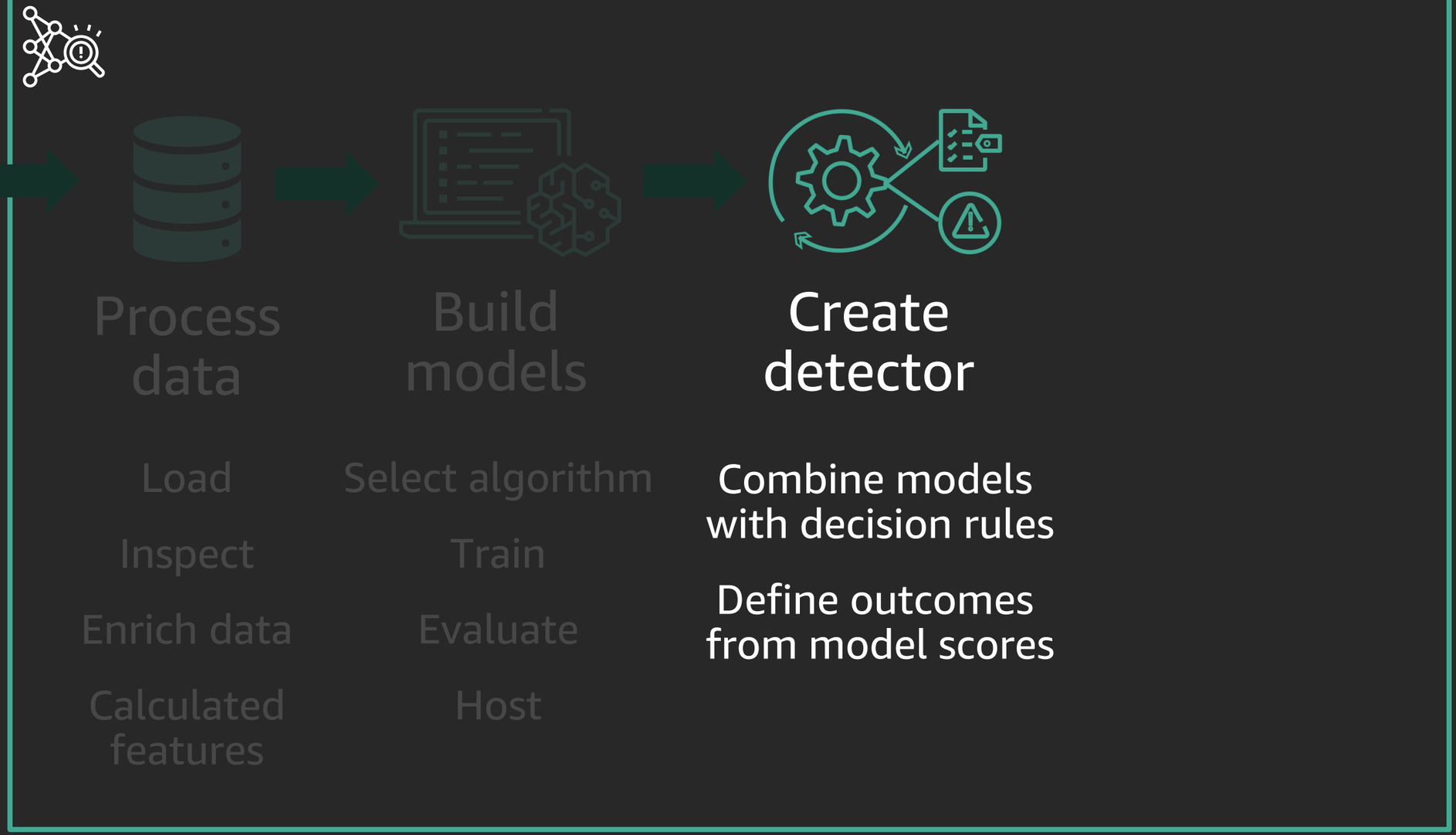
How it works


Raw event data
Process data
Load
Inspect
Enrich data
Calculated features
Select algorithm
Online insights
Account takeover
Transaction fraud
Train models
Train
Tune
Evaluate models
False positive
True positive

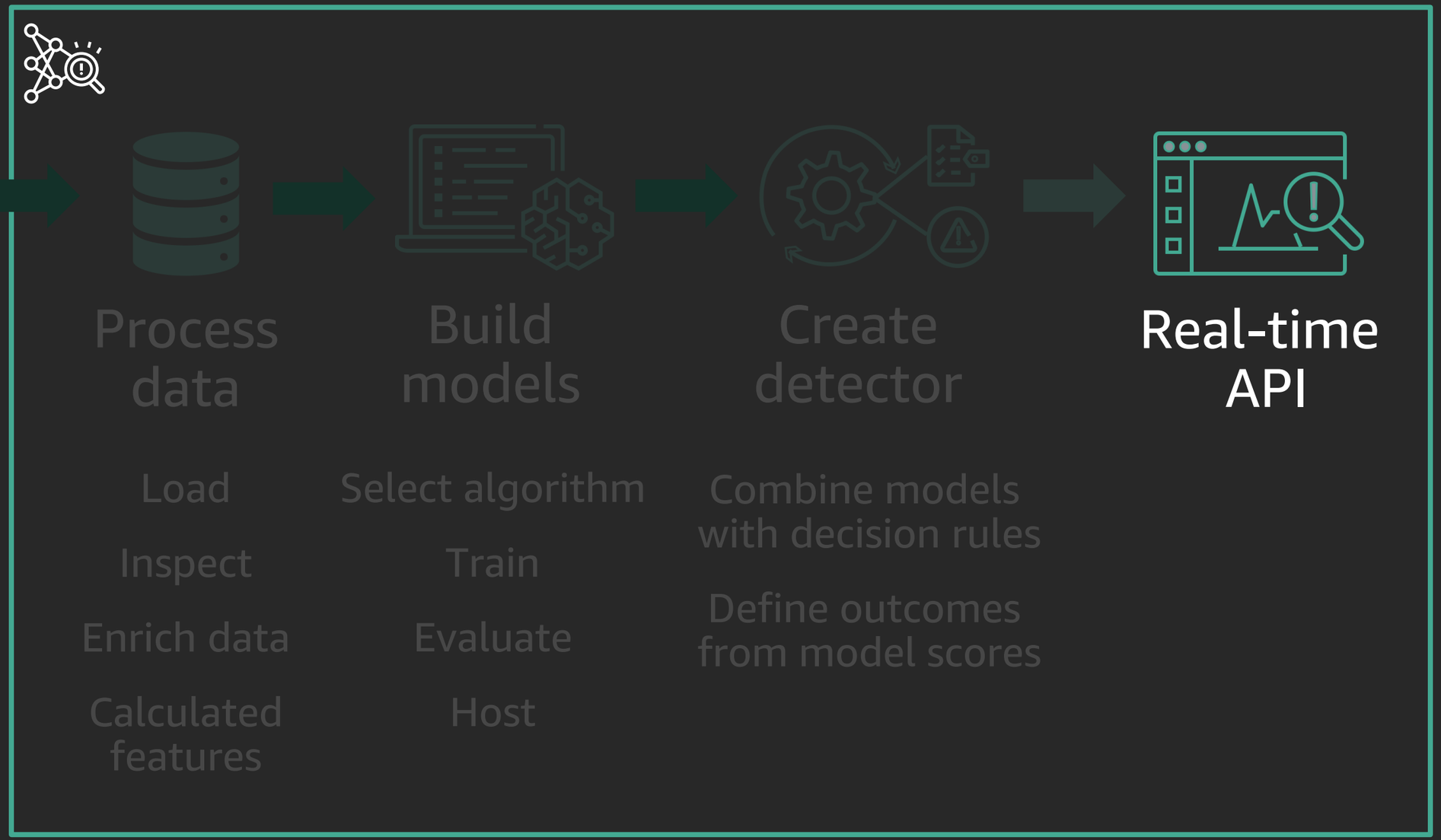
How it works


Raw event data
Process data
Load
Inspect
Enrich data
Calculated features
Select algorithm
Online insights
Account takeover
Transaction fraud
Train models
Train
Tune
Evaluate models
False positive
True positive
Host models
Low latency
Auto scale

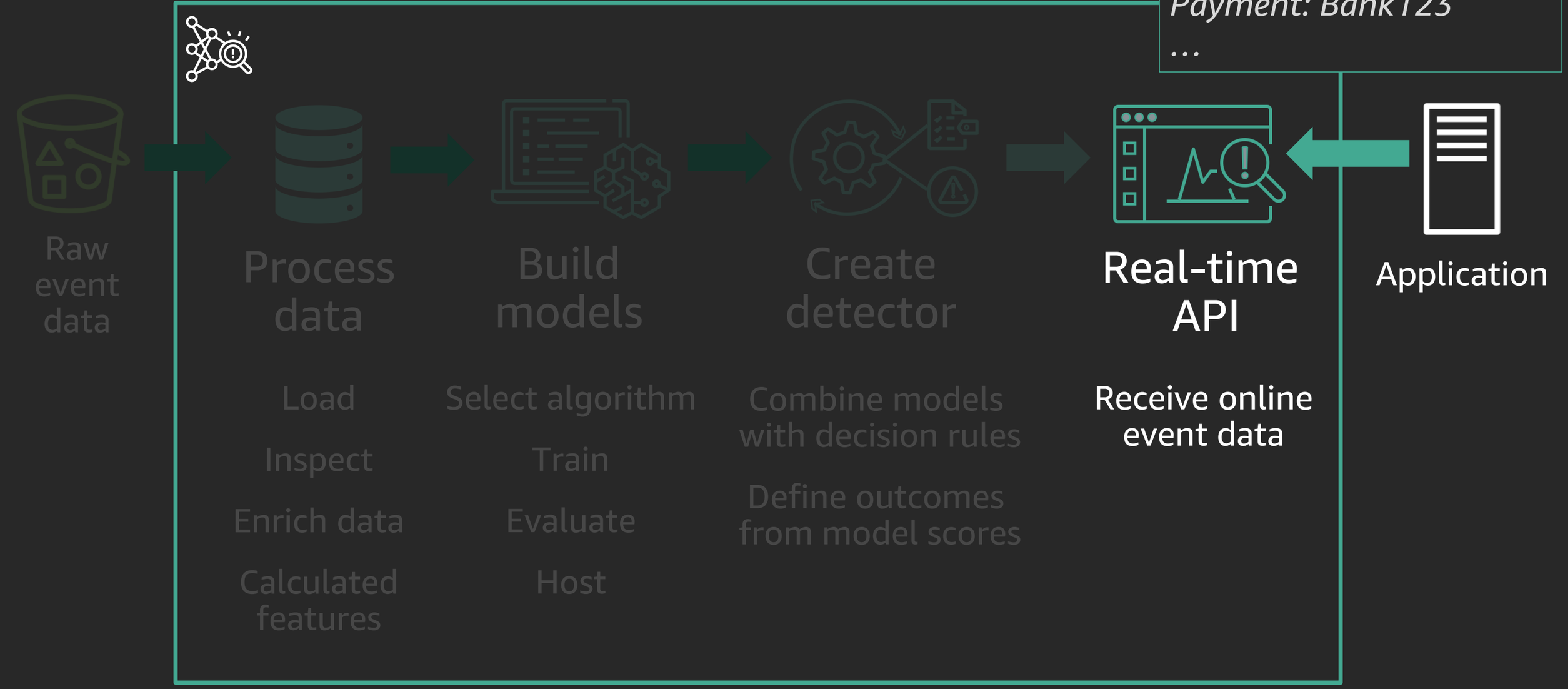
How it works


Raw event data
Process data
Load
Inspect
Enrich data
Calculated features
Build models
Select algorithm
Train
Evaluate
Host
Create detector
Combine models with decision rules
Define outcomes from model scores

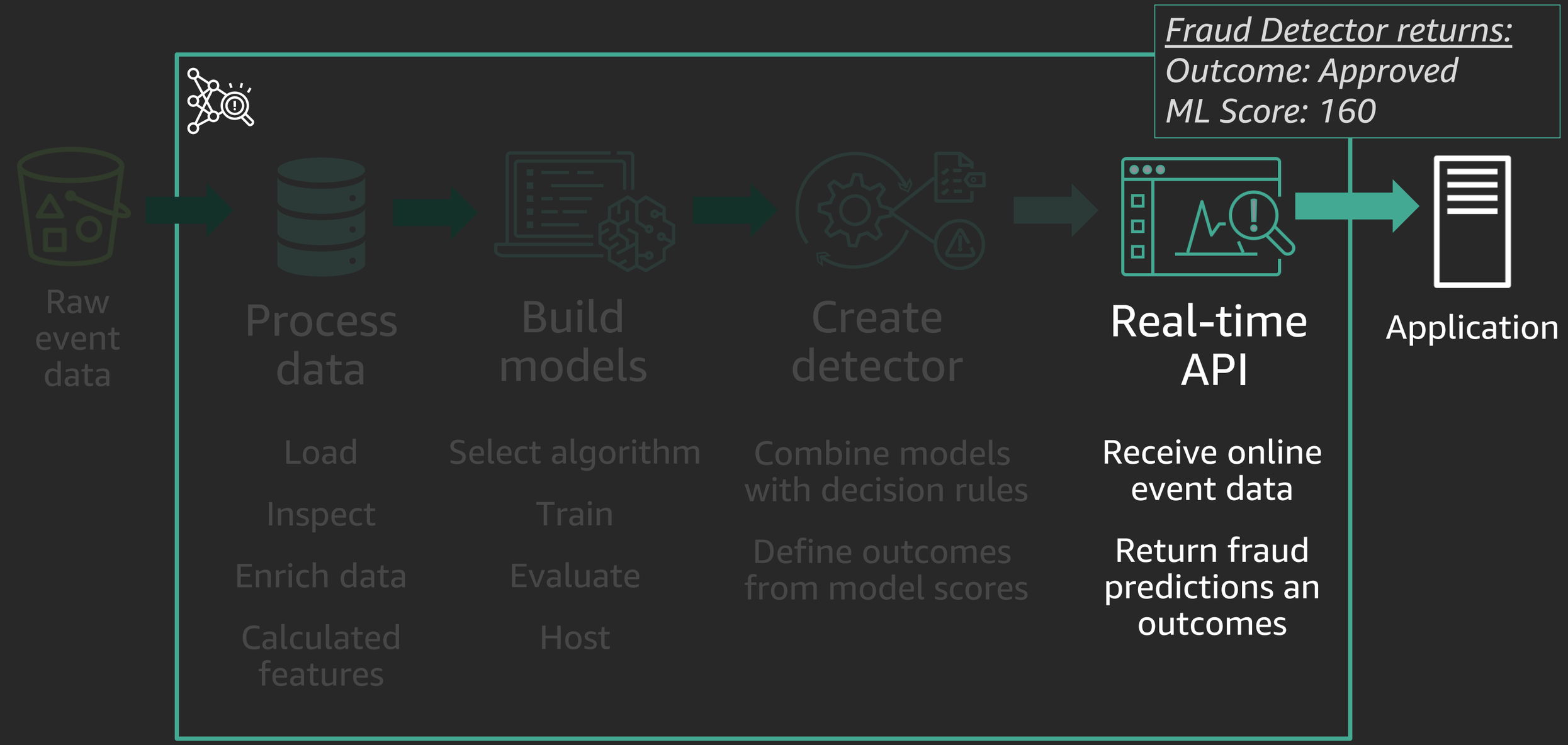
How it works


Raw event data
Process data
Load
Inspect
Enrich data
Calculated features
Build models
Select algorithm
Train
Evaluate
Host
Create detector
Combine models with decision rules
Define outcomes from model scores
Real-time API

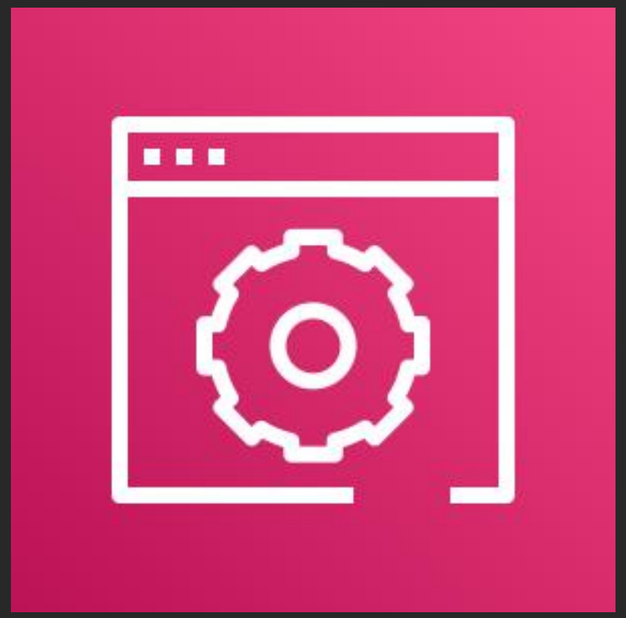
How it works


Application purchase
IP: 1.23.123.123
email: joe@example.com
Payment: Bank123
…
Raw event data
Process data
Load
Inspect
Enrich data
Calculated features
Build models
Select algorithm
Train
Evaluate
Host
Create detector
Combine models with decision rules
Define outcomes from model scores
Real-time API
Receive online event data
Application

How it works


Fraud Detector returns:
Outcome: Approved
ML Score: 160
Raw event data
Process data
Load
Inspect
Enrich data
Calculated features
Build models
Select algorithm
Train
Evaluate
Host
Create detector
Combine models with decision rules
Define outcomes from model scores
Real-time API
Receive online event data
Return fraud predictions an outcomes
Application

Amazon Fraud Detector demo



How to build a fraud detector through the Amazon Fraud Detector console

Go build!

Customers are already experimenting with Amazon Fraud Detector

Stopping more fraudsters

Vacasa is the largest full-service vacation rental management company in North America, with more than 23,000 vacation homes in 17 countries serving over 2 million guests per year.

"…we can more easily use advanced machine learning techniques to accurately detect fraudulent reservations. Protecting our 'front door' from potential harm enables us to focus on making the vacation rental experience seamless and worry-free."

Eric Breon founder and CEO of Vacasa

How to get started

Available in preview US East (N. Virginia)

Sign up for preview
https://aws.amazon.com/fraud-detector/

User documentation
https://docs.aws.amazon.com/frauddetector/latest/ug/what-is-frauddetector.html

Use sample data (you're your own)
https://docs.aws.amazon.com/frauddetector/latest/ug/step-1-get-s3-data.html

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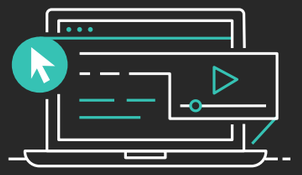

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Thank you!

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