
AWS
re:Invent
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AIM318

Taking personalization to the next level with Amazon Personalize

James Jory

Applied AI Principal Solutions Architect
Amazon Web Services

Vamshi Krishna Enabothala

Applied AI Senior Solutions Architect
Amazon Web Services

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Related sessions

- Build a customer recommendation engine in 2 hours with Amazon Personalize (AIM312)
- Boost user engagement with Amazon Personalize (AIM203)
- Launching personalized delivery with AWS (CPG201)
- Integrate AI and ML into customer engagement (BIZ309)
- Nestlé Purina’s modernization of Petfinder (CPG202)

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Agenda

Chalk talk format refresher

Amazon Personalize overview (brief)

Taking personalization to the next level

- It all starts with data!
- Understanding offline metrics and leveraging A/B testing (demo)
- Optimizing recommendations with promotional filters and dynamic range filters (demo)

Resources

aws

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Chalk talk format refresher

- Intended to be interactive
- Share real-world experiences
- Dive deep into delivering next-level personalization
- Ask questions
- Focus of this session is on Amazon Personalize

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Amazon Personalize overview

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Amazon Personalize key benefits

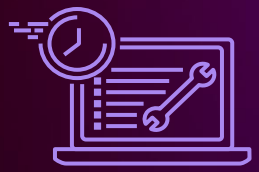
CREATE PERSONALIZED USER EXPERIENCES, NO MACHINE LEARNING EXPERTISE REQUIRED



Impactful features that go beyond basic ML practices



Respond quickly to changing user intent using **real-time recommendations**



Automate steps to **reduce time to market**



Integrate seamlessly with existing systems



Encrypted to be **private and secure**

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Amazon Personalize

HOW IT WORKS

1 Add your data

User interactions (views, sign-ups, conversions, etc.)

Item metadata (details of articles, products, videos, etc.)

User metadata (age, location, etc.)

2 Create solutions/ recommenders

User-level recommendations

Intelligent user segmentation

Item-item similarity

Personalized ranking

3 Tune recommendations

New item bias

Business rules/filters

Promotions/ trending now

Optimize for any business metric (e.g., profit, revenue watch time)

4 Access recommendations

Real-time recommendations

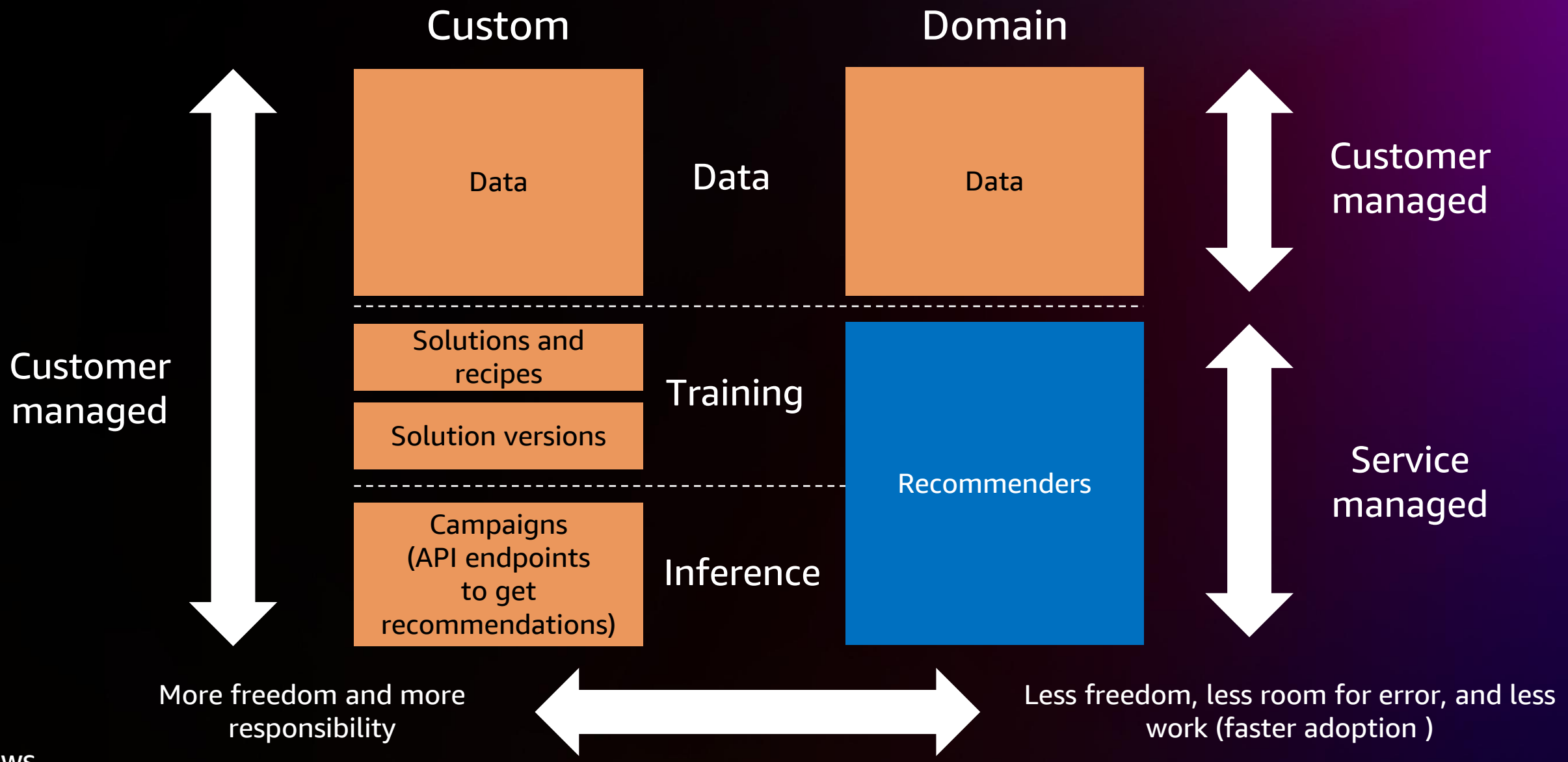
Download batch recommendations

Contextualize recommendations (e.g., device type, location)

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Custom recommendation solutions versus domain recommenders



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It all starts with data!

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Check your data quality

Bad data



Amazon Personalize

Bad recommendations

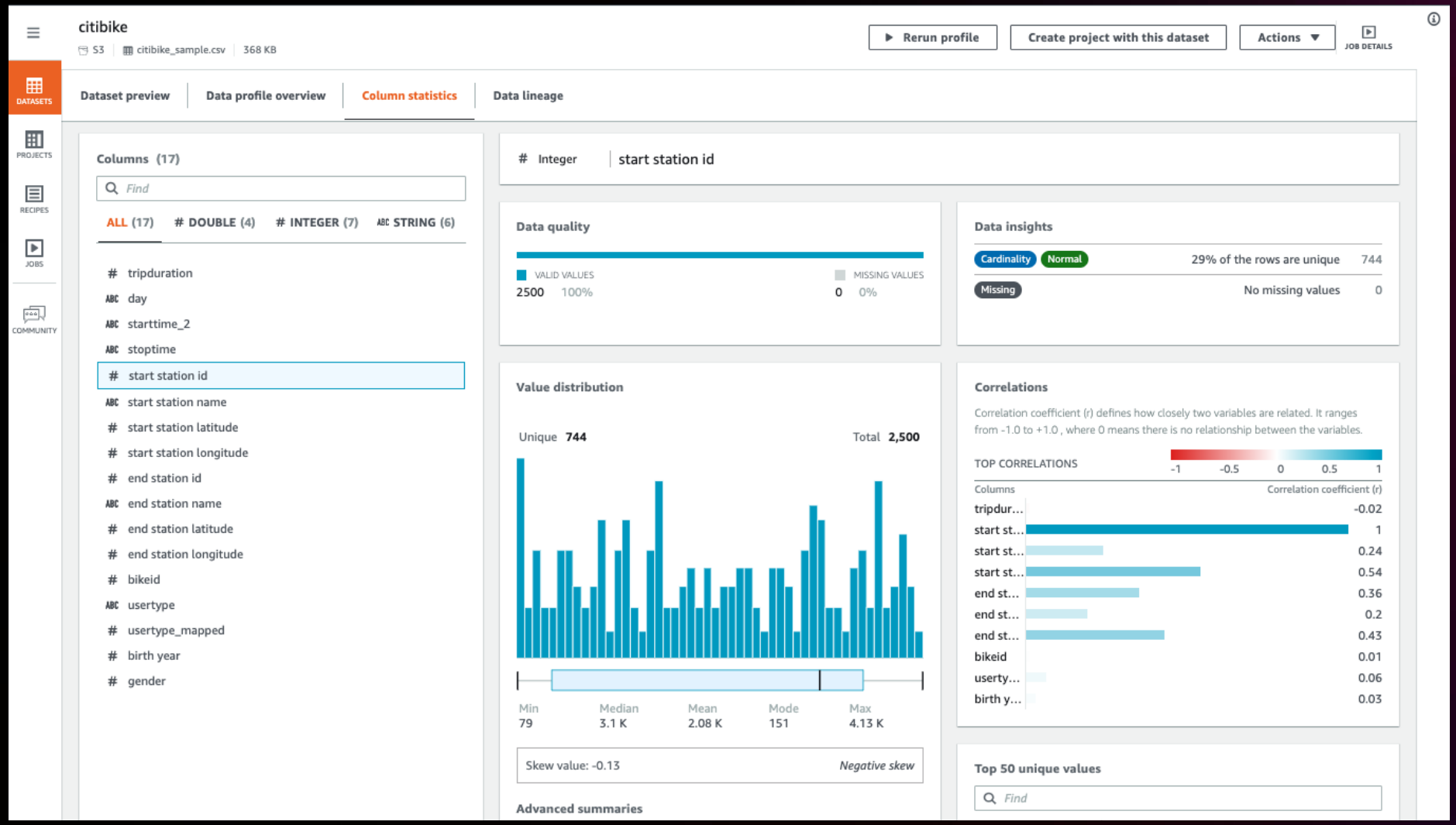
Clean your data!

- Look at your data distribution
- Check for sparsity, unexpected null values, and outliers
- Normalize categorical fields to have consistent spelling/formats
  - Be aware of cardinality
- Are you providing good features? Consider feature engineering!
  - May require trial and error (start simple, then build up)

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Profile your data using AWS Glue DataBrew



Evaluate the quality of your data by profiling it to understand data patterns and detect anomalies; connect data directly from your data lake, data warehouses, and databases

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Recipe to dataset mapping

	Interactions	Items	Users
User-Personalization	Required	Recommended*	Optional*
SIMS	Required	Ignored for training*	Ignored for training*
Similar-Items	Required	Optional*	Ignored for training*
Personalized-Ranking	Required	Optional*	Optional*
Item-Affinity	Required	Optional*	Optional*
Item-Attribute-Affinity	Required	Required	Optional*
VOD domain	Required	Optional*	Optional*
Retail domain	Required	Optional*	Optional*

* Metadata may still be useful for filters

https://docs.aws.amazon.com/personalize/latest/dg/data-prep-creating-datasets.html

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Recipe to dataset mapping

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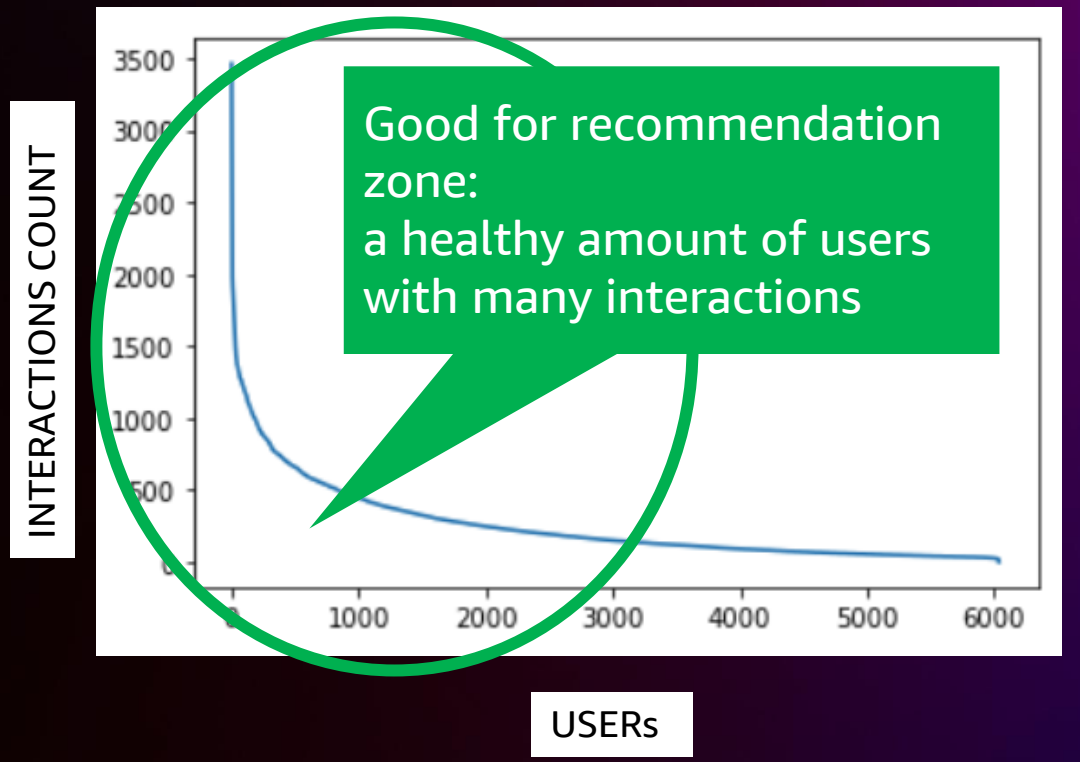
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Look at your data distribution

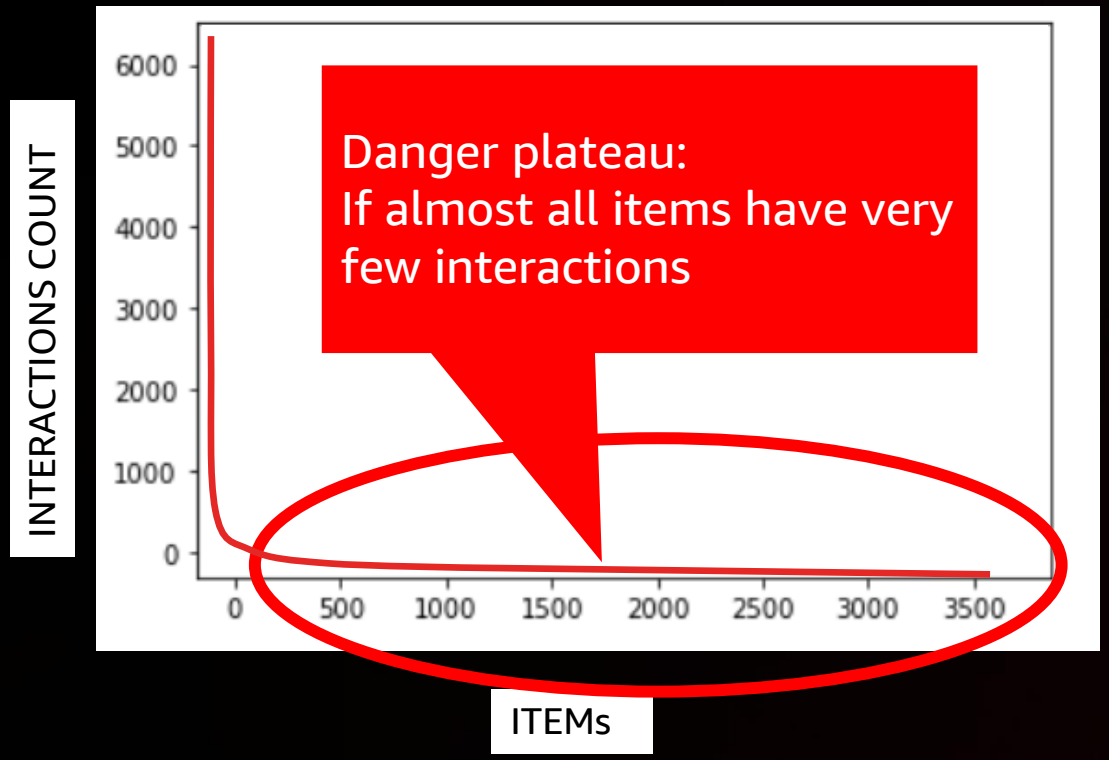


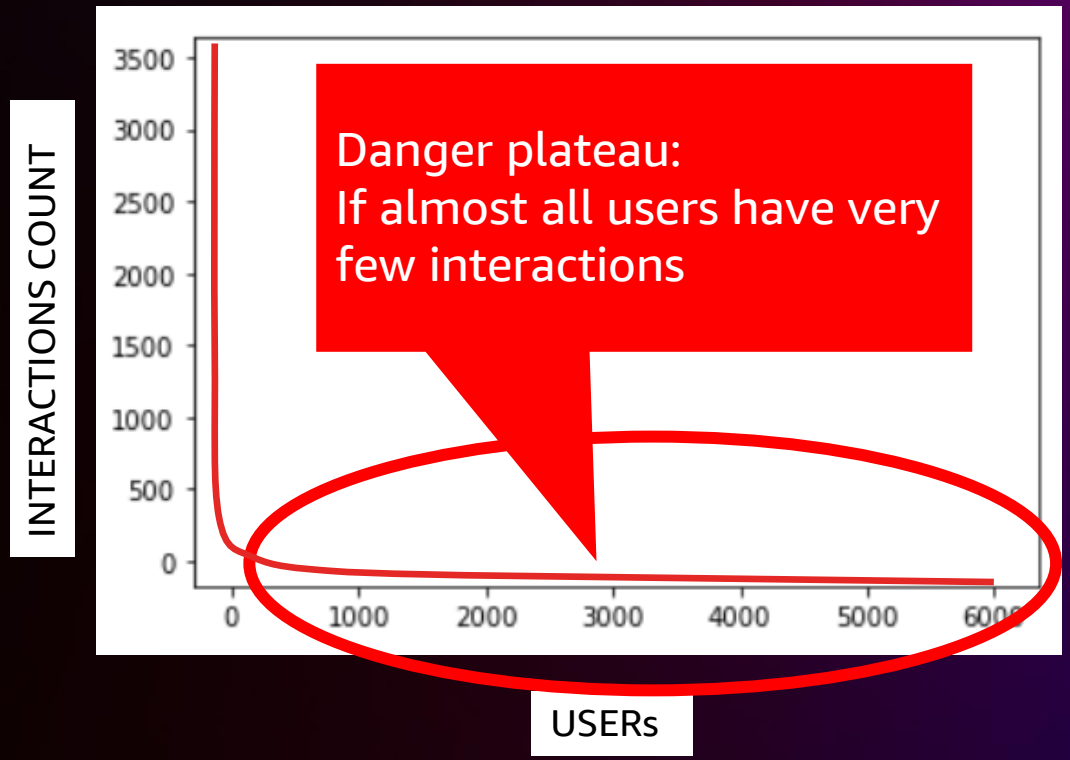


Based on: https://github.com/aws-samples/amazon-personalize-samples/blob/master/next_steps/core_use_cases/related_items/personalize_aws_similar_items_example.ipynb

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Look at your data distribution





The model will not learn a lot!

Based on: https://github.com/aws-samples/amazon-personalize-samples/blob/master/next_steps/core_use_cases/related_items/personalize_aws_similar_items_example.ipynb

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Look at your data distribution

Mitigation strategies

- Import more historical data
- Track user activity more broadly to get more data points
- Consider if there are other sources of data that can be leveraged
- Maybe it is too early for Amazon Personalize and more interaction data needs to be collected

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Data Q&A

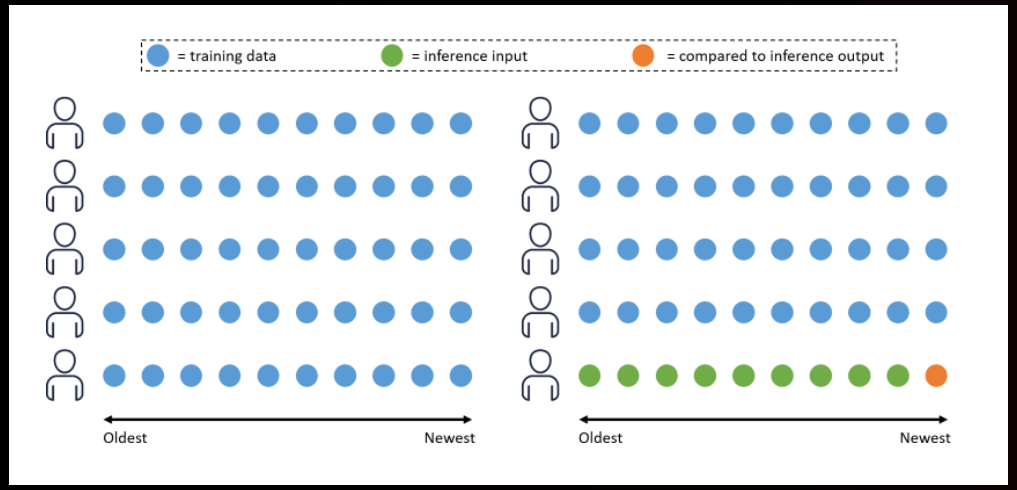
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Understanding offline metrics and leveraging A/B testing

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Amazon Personalize model metrics

Offline metrics



1. Coverage
2. Mean reciprocal rank
3. Precision (at K)
4. Normalized discounted cumulative gain (at K)
5. Average rewards (at K)

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Amazon Personalize model metrics

Online metrics

Create metric attribution

Specify event type and function

Import data: putEvents (or) incremental bulk upload

View or publish metrics

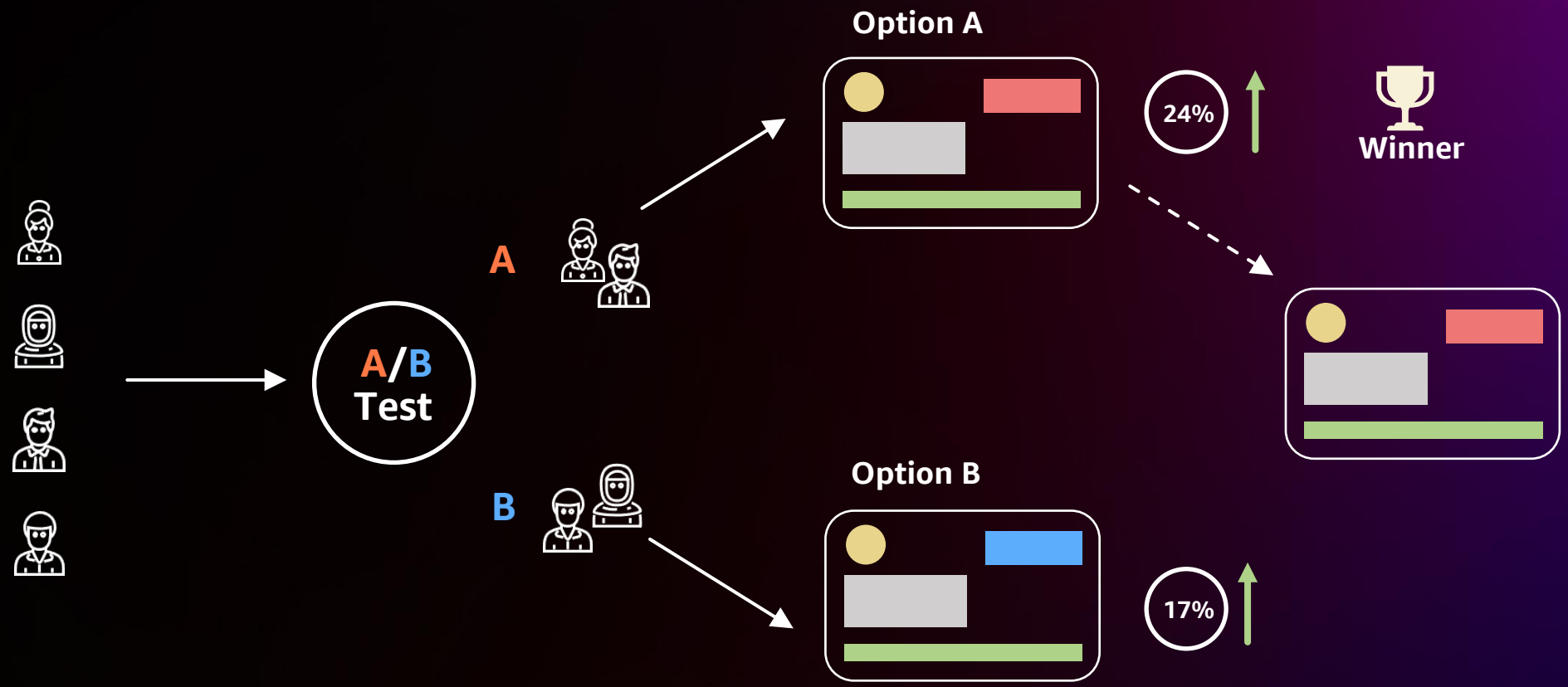


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Amazon Personalize model metrics

A/B testing



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A/B testing – Amazon CloudWatch Evidently

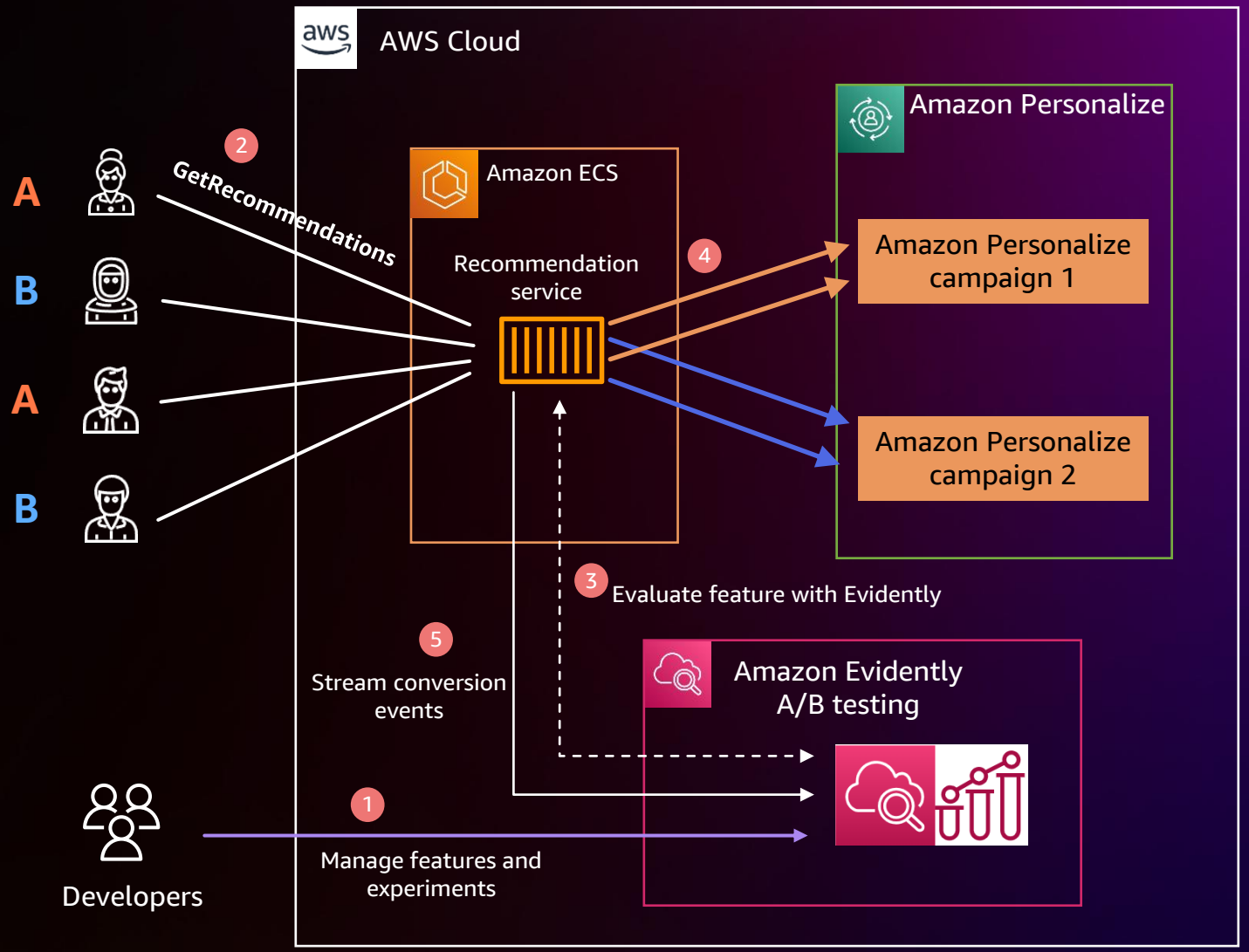


Set up experiments

Traffic splitting

Monitor variations and features

Compare results on **business metrics**



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Offline/online measurement Q&A

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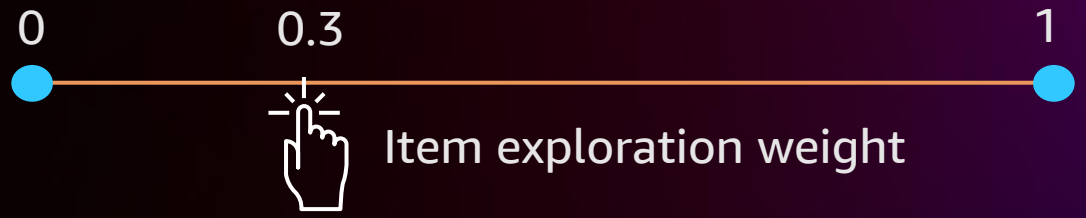
Optimizing recommendations

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Improve recommendations for new catalog items

New items have no interaction history, which makes personalization challenging

Amazon Personalize enables you to create a balance between recommendations for new and existing items in your catalog



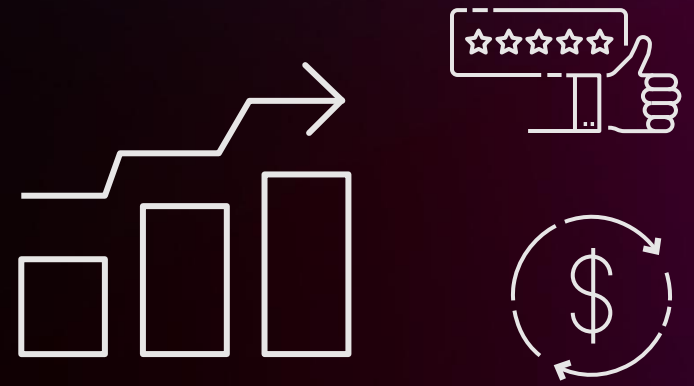
Using deep-learning algorithms, Amazon Personalize creates quality recommendations for new products and fresh content when data on user preference is scarce

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Optimize recommendations for business goals



Most recommender systems are designed only to increase user engagement



Amazon Personalize can optimize for relevance while improving business metrics:

- Optimize for revenue, profit margin, video watch time, or any numerical attribute in your catalog
- Control the amount of influence business metrics have on recommendations

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Gain explicit control over your recommendations

Include

- Promote finance articles featuring oil stocks
- Promote at least 3 sports documentaries
- Fill carousel with 20% white labeled products
- Only show items introduced in the last 7 days

Promotion example for travel

Amazon Personalize finds relevant items to recommend based on a rule that says 50% of carousel must be top city destinations

Trips recommended for you...



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Optimizing recommendations Q&A

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Resources

Amazon Personalize Developer Guide

Amazon Personalize Deep Dive Video Series

Amazon Personalize samples

Retail Demo Store

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Thank you!

James Jory
jjory@amazon.com

Vamshi Krishna Enabothala
enabov@amazon.com



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