Amazon Personalize

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Context

What is Personalization? What is Recommendation?

This castle hath a pleasant seat. The air
Nimbly and sweetly recommends itself
Unto our gentle senses.

-DUNCAN
Macbeth Act 1 Scene 6

To Generalize is to be an Idiot. To Particularize is the Alone Distinction of Merit — General Knowledges are those Knowledges that Idiots possess.

-William Blake, in his annotations to his personal copy of Joshua Reynolds' Discourses

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So good! It's Legendary!

"Amazon engineer Greg Linden originally introduced doppelganger searches to predict readers' book preferences, the improvement in recommendations was so good that Amazon founder Jeff Bezos got to his knees and shouted, "I'm not worthy!" to Linden. But what is really interesting about doppelganger searches, considering their power, is not how they're commonly being used now. It is how frequently they are not used. There are major areas of life that could be vastly improved by the kind of personalization these searches allow."

— Seth Stephens-Davidowitz, Everybody Lies: Big Data, New Data, and What the Internet Can Tell Us About Who We Really Are

https://www.cs.umd.edu/~samir/498/Amazon-Recommendations.pdf
http://glinden.blogspot.com/2006/03/early-amazon-similarities.html

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Osmosis

Amazon Personalize

Built on 20 years of operating Personalization at scale across segments, geos, and industries

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Personalizing user experience is proven to increase discoverability, engagement, user satisfaction, and revenue

30% of page views on Amazon are from recommendations

… However, most customers find personalization hard to get right

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Effective personalization requires solving multiple hard problems

Reacting to user interactions in real time

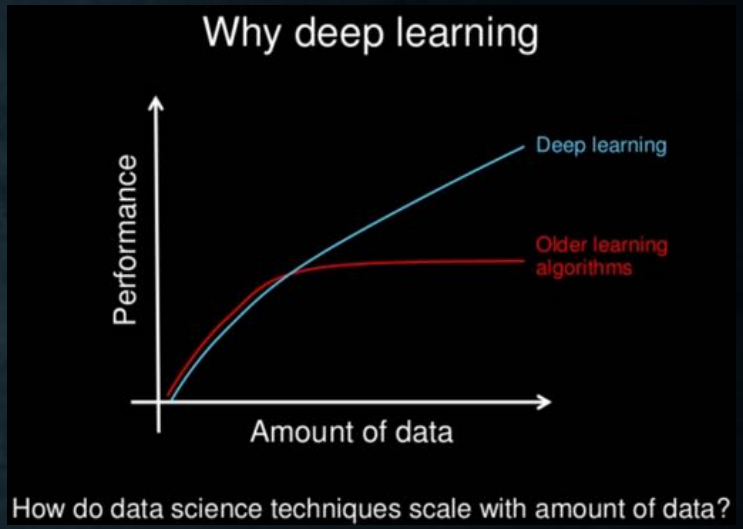
Avoiding mostly showing popular items

Handling cold start (insufficient data about new users/items)

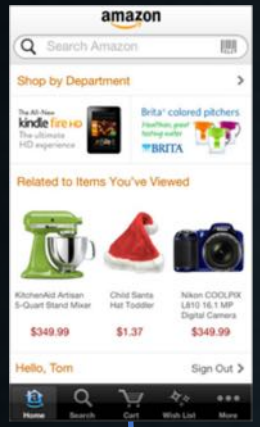
Scale

Traditional recommender systems aren't adequate

- Rule-based systems perform poorly, don't scale and are hard to maintain
- Collaborative filtering and matrix factorization methods are good for v1, but deep neural networks, esp. recurrent neural networks, that take into account the sequence of a user's activity (clicks) out-perform other methods



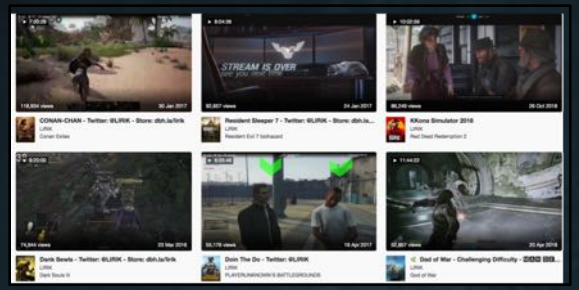
Deep learning techniques have a direct impact on the bottom line



Rule-based card ranker

Bayesian network model

+29% Click Through



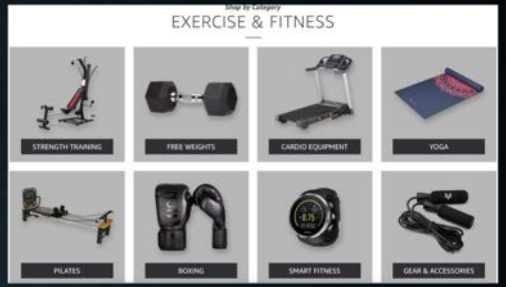
Popularity

Matrix factorization

+15.4% Engagement

Neural network

+7.4% Engagement



Similarity

Recurrent Neural Net + Bandit

+20% Click Through

https://www.slideshare.net/AmazonWebServices/add-realtime-personalization-and-recommendations-to-your-applications-aim395-aws-reinvent-2018

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Introducing Amazon Personalize

Real-time personalization and recommendation, based on the machine learning technology used by Amazon.com

Generates personalized recommendations for your users via API calls

- State-of-the-art deep learning algorithms that out-perform traditional methods
- Auto-ML capabilities that automate the entire process from data ingestion to inference
- Real-time personalized recommendations – Ability to ingest activity/clickstream data and generate recommendations, in real time, based on the session/context of the use

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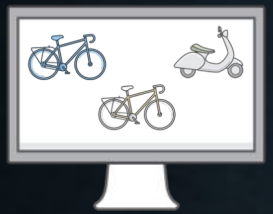
Common applications & use cases



Personalized recommendations

Related Items

Search reranking

Notifications and emails

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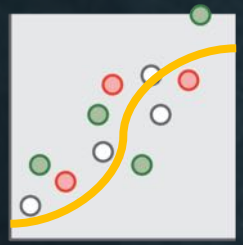
Applicable across multiple domains

Amazon Personalize can be applied to many domains including

- Retail and E-commerce
- Video on demand
- News
- Travel
- Personalized notifications

Amazon Personalize – Overview

Prepare your data, then upload with the Amazon Personalize API



Choose one of our algorithms or tell AutoML to find the best fit

Modify your code

Retrain continually to improve the model

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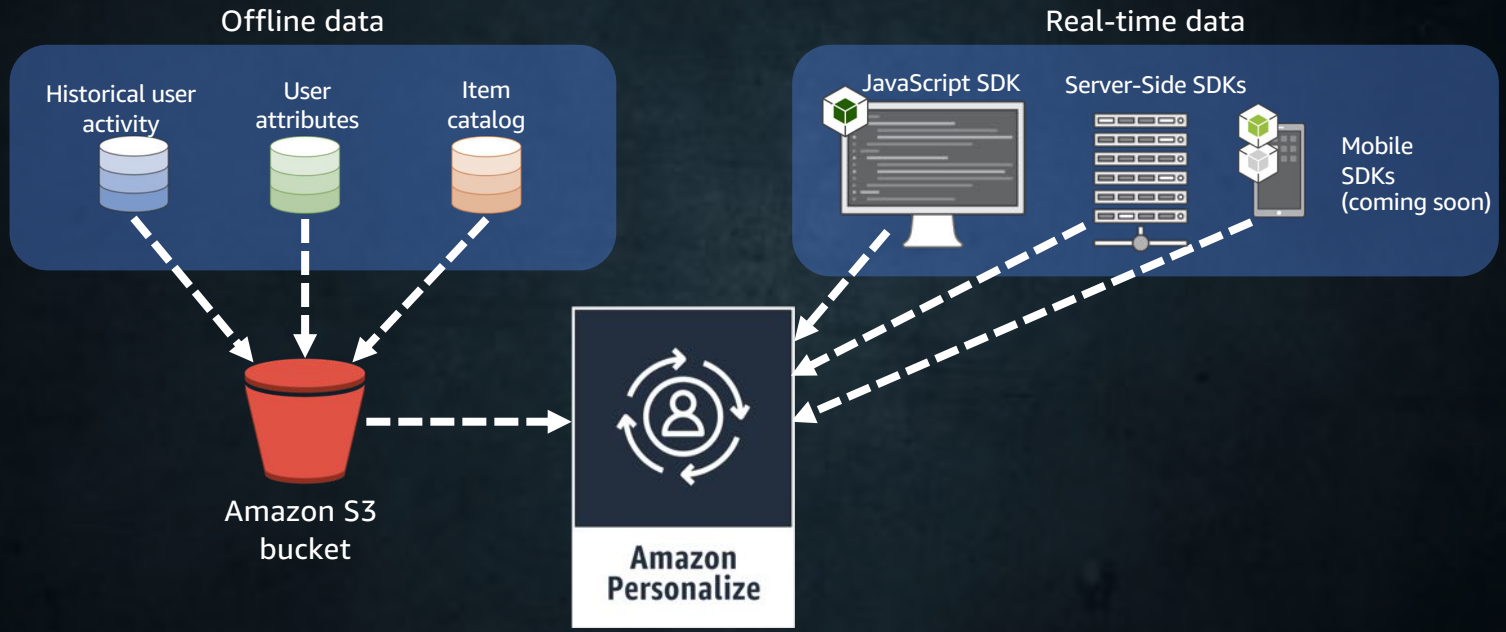
Real-time data can be consumed by Amazon Personalize



The Science of Personalization

Why Amazon Personalize?

(hierarchical sequential models) work well for many personalization tasks

(stable) solutions out of the box

Includes many tricks from deep learning practitioners

AutoML and HPO

Best possible results (on your data) with minimal intervention

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Amazon Personalize Demo

Real-time personalization and recommendation service, based on the same technology used at Amazon.com. No ML experience required.

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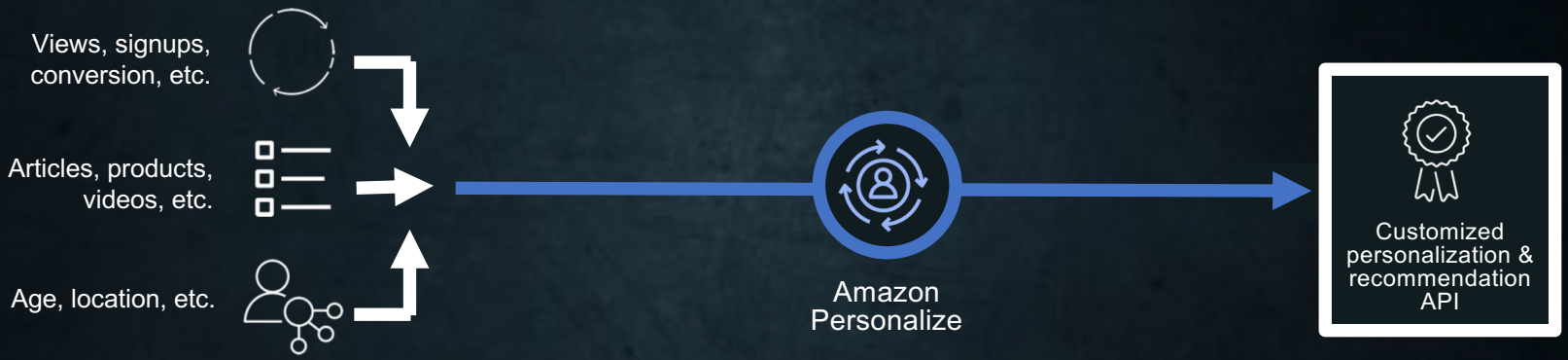
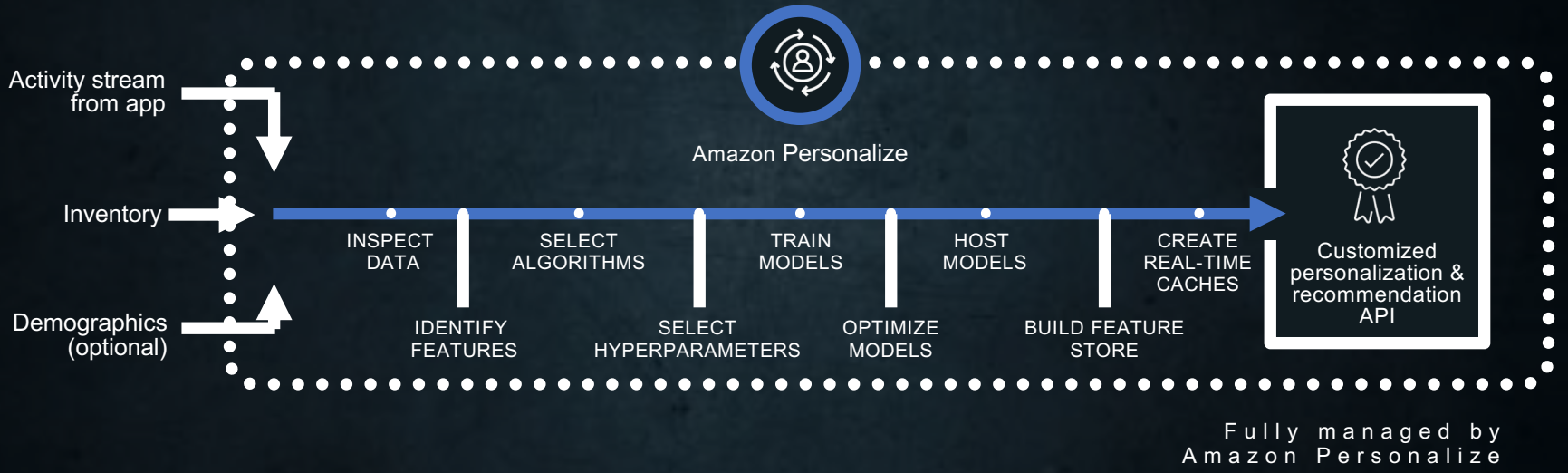
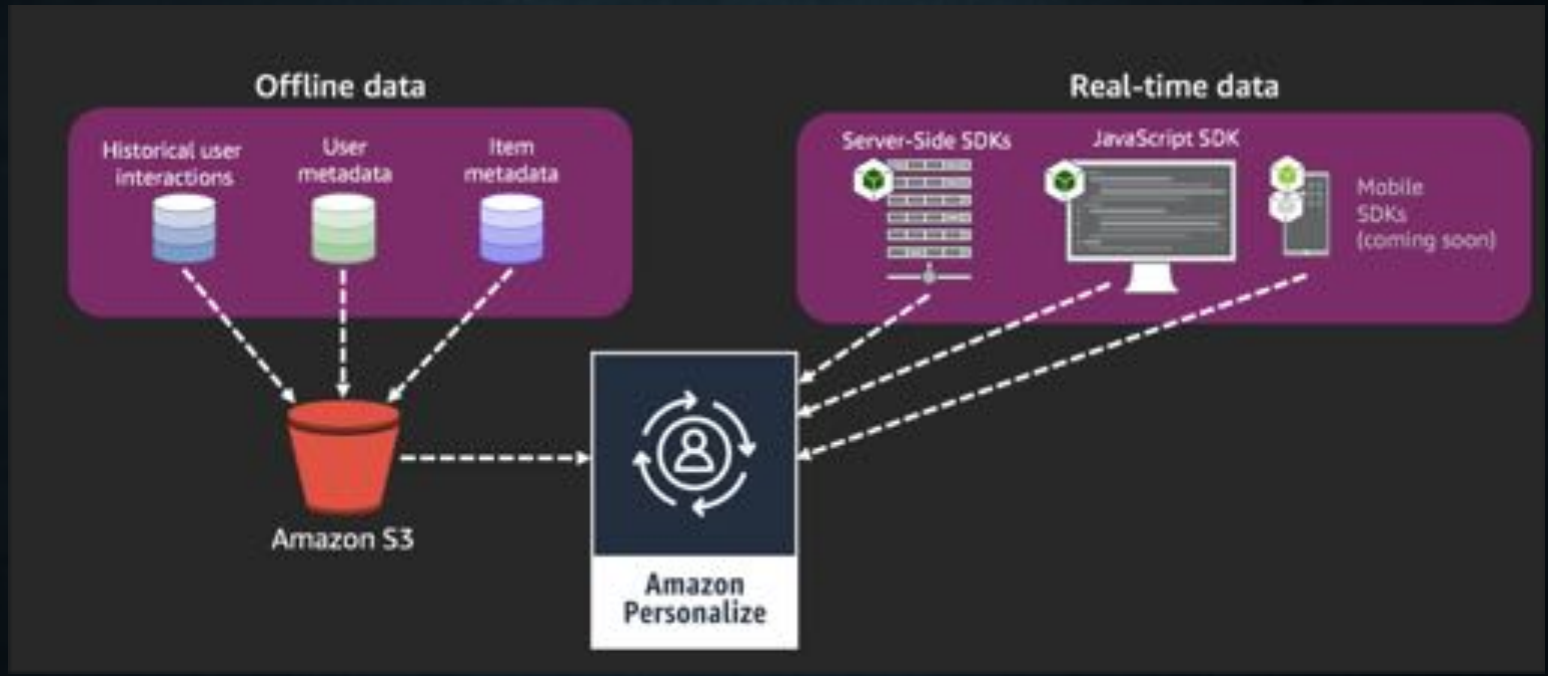
Amazon Personalize: machine learning personalization and recommendations



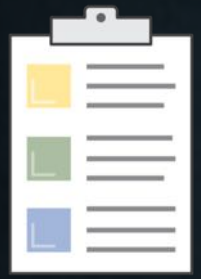
Amazon Personalize: machine learning personalization and recommendations



Data: Add Real-time data via server side, client side integration; add batch data via S3



Use the Console/API to train and experiment with models



Use AutoML or pick a pre-defined algorithm

- Choose a pre-existing algorithm (packaged as Personalize Recipes) or use AutoML and Personalize will pick the right recipe for you
- You can train custom deep learning models on your data and compare accuracy metrics with 2 API calls

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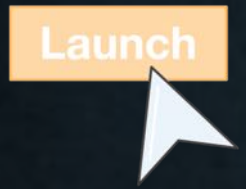
Deploy the best models (solutions) by launching a campaign



Amazon Personalize Campaigns

- Launching a campaign will deploy all the infrastructure needed to create a personalize endpoint
- Personalize will automatically scale to serve you real time traffic
- Use the getRecommendatons() or getPersonalizeRanking() API for inference

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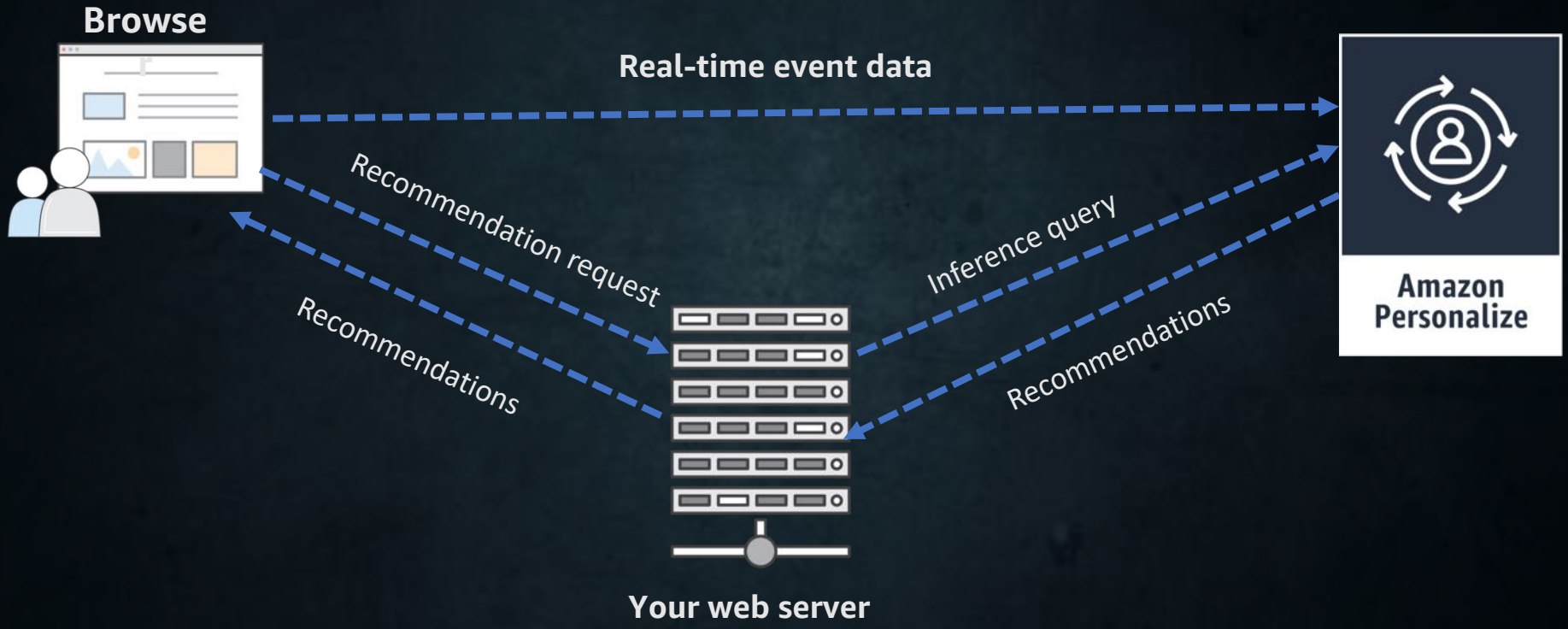
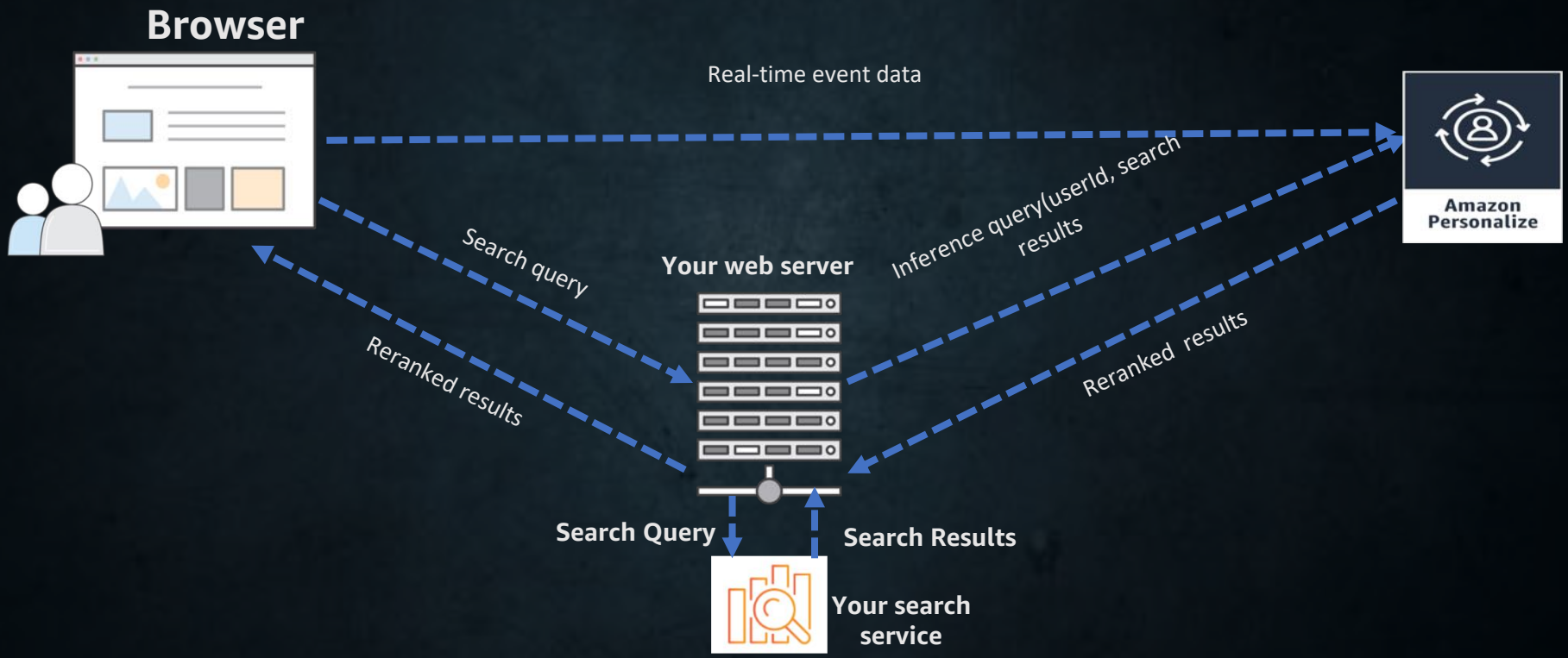
Building Integrations with Amazon Personalize

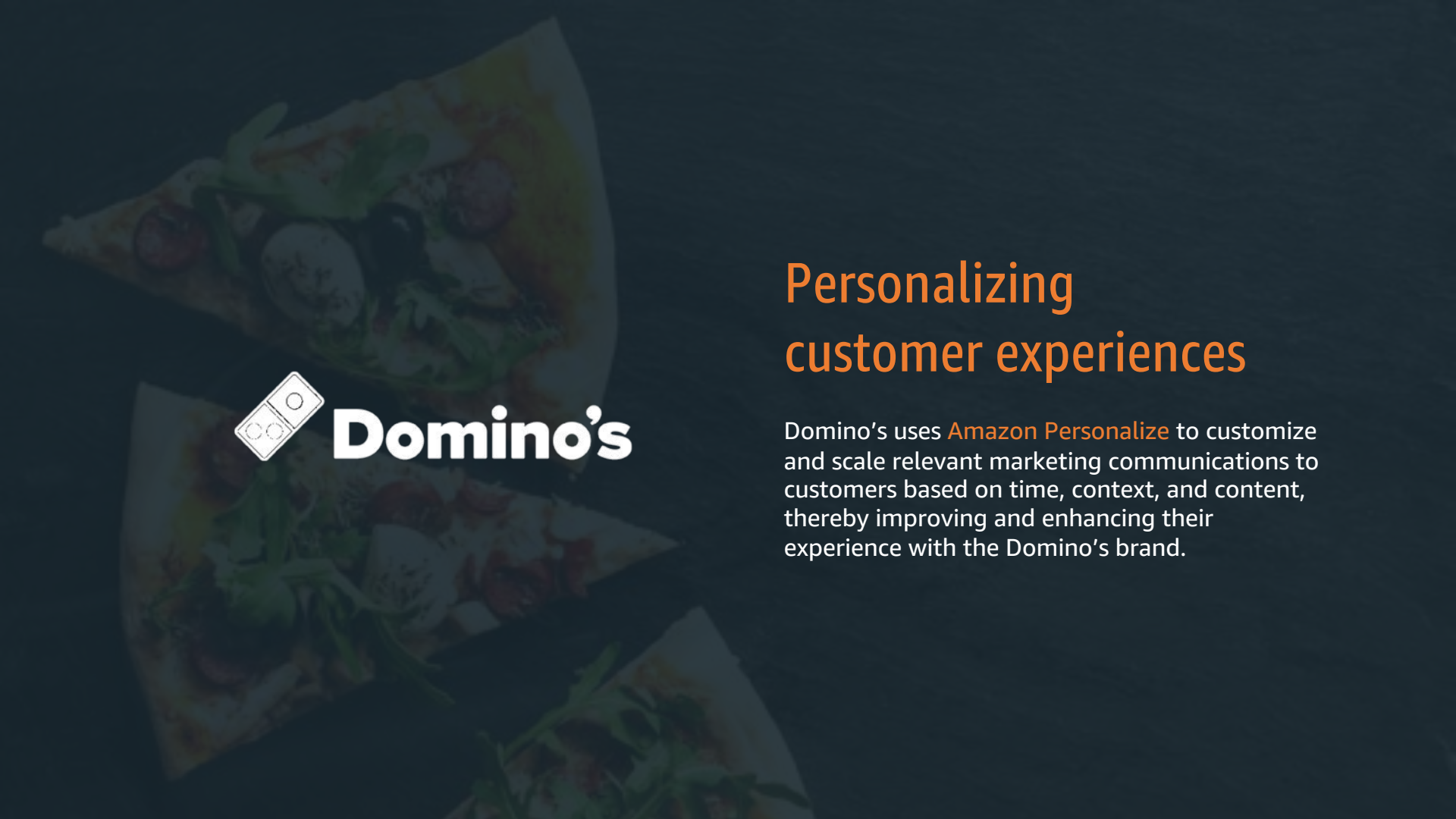
Real time personalization for web applications



Search personalization for web applications



Email personalization



Personalizing customer experiences

Domino's uses Amazon Personalize to customize and scale relevant marketing communications to customers based on time, context, and content, thereby improving and enhancing their experience with the Domino's brand.

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Thank you !

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aws.amazon.com/personalize