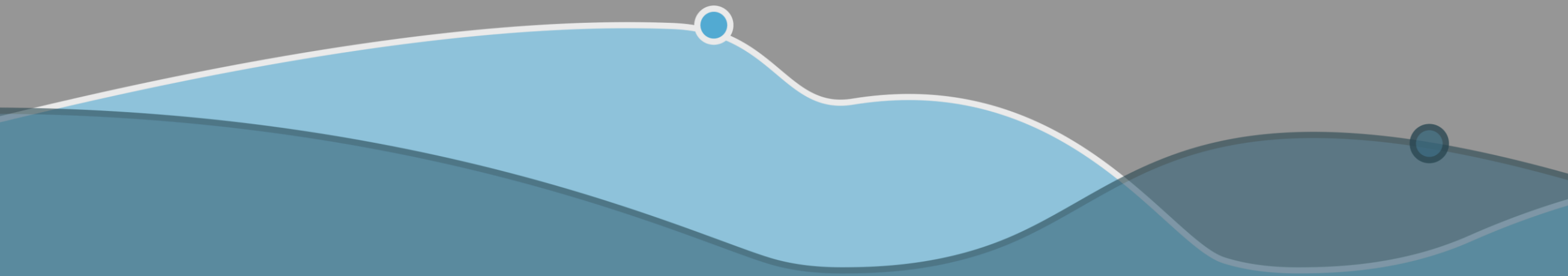




Cortana Analytics Workshop

Sept 10 – 11, 2015 • MSCC



Intelligent Retail, The Machine Learning Approach

Luis Cabrera
Senior Program Manager

Vesselin Diev
Senior Data Scientist



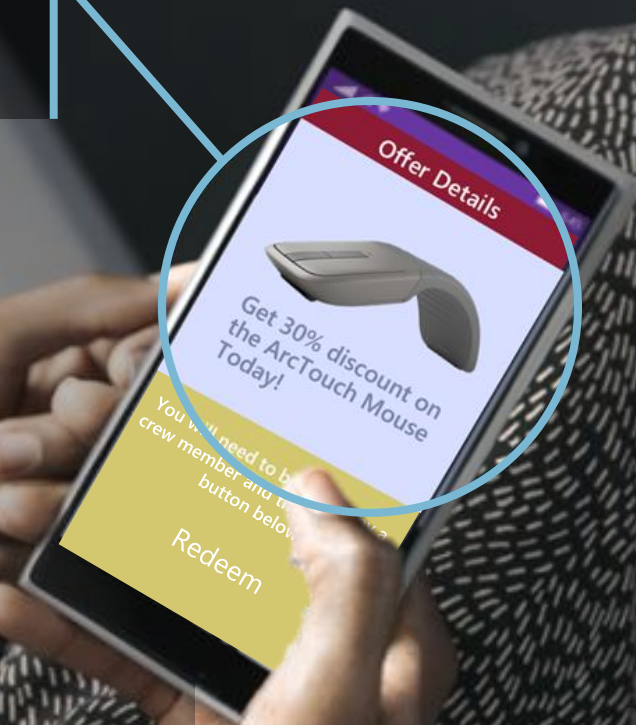
What product is Joe most likely to buy?



Will Sarah come
back to shop with
us next month?



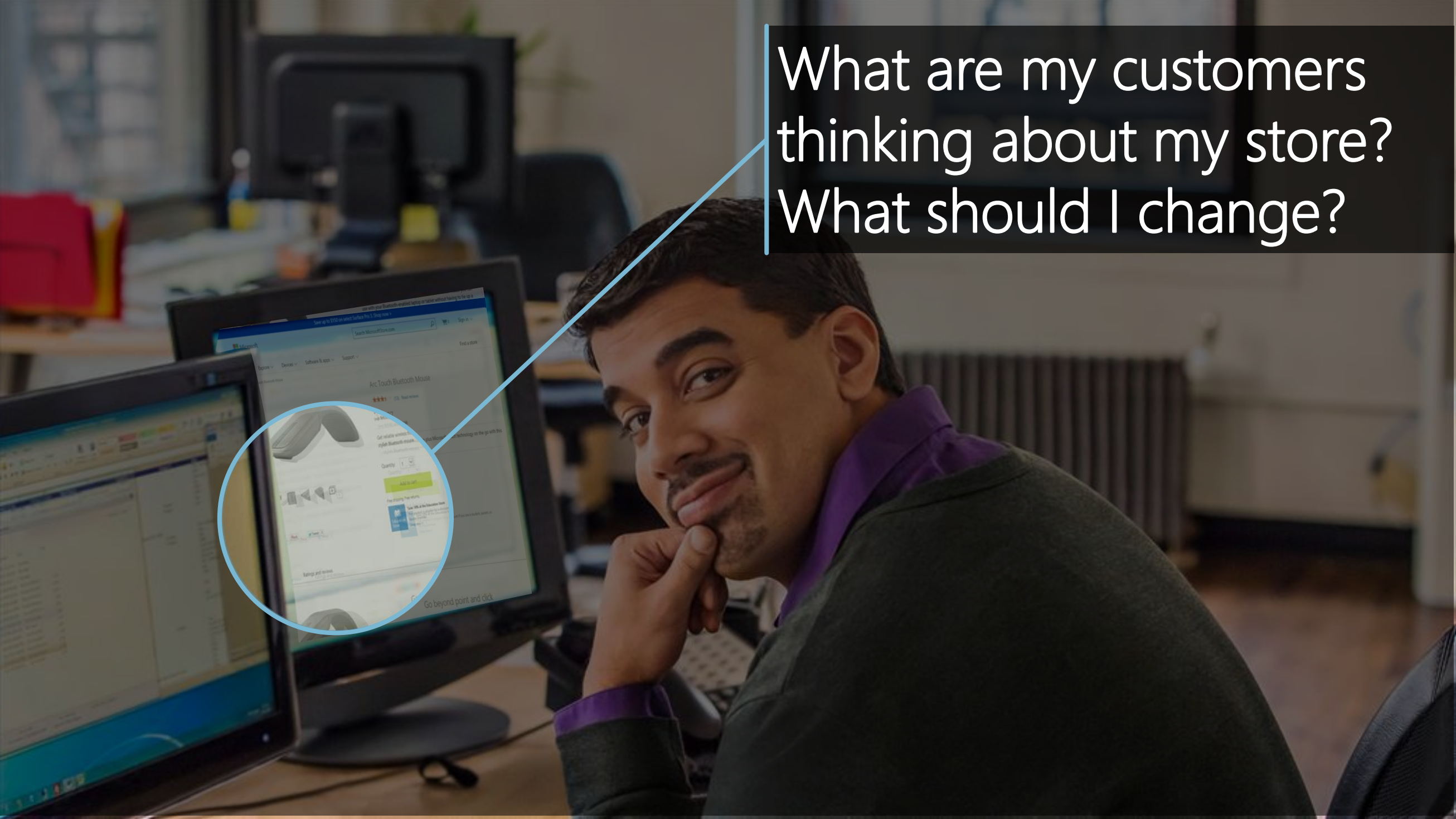
What incentive will bring Jing
back to my store?





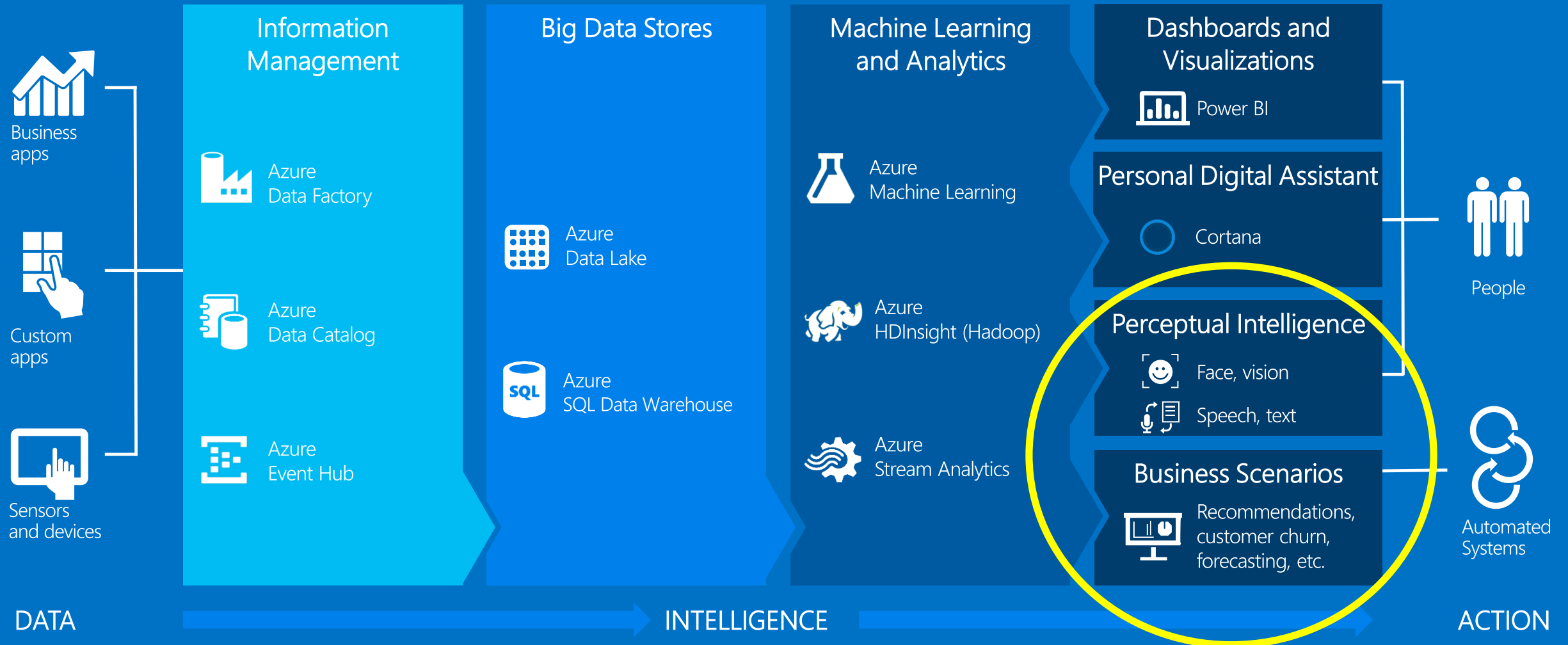
What advertising would be most effective to get Johan's attention?

What are my customers
thinking about my store?
What should I change?



Cortana Analytics Suite

Transform data into intelligent action



Cortana Analytics

*Make machine learning **accessible** to every enterprise, data scientist, developer, information worker, consumer, and device anywhere in the world.*



Machine Learning Services in the Cloud

⚙️ MACHINE LEARNING API

Face APIs



Microsoft's state-of-the-art cloud-based face algorithms to detect and recognize human faces in images.

Face Image Vision

👁️ 759529

13 days ago



⚙️ MACHINE LEARNING API

Speech APIs



Easily include speech driven actions into your applications using algorithms to process spoken language.

Speech Text Intent

👁️ 1227

13 days ago



⚙️ MACHINE LEARNING API

Vision APIs



Image processing algorithms designed to return information based on visual content and generate your ideal thumbnail.

OCR Image Vision Thumbnail

👁️ 1139

13 days ago



⚙️ MACHINE LEARNING API

Text Analytics



Bring your unstructured text, and use this API to perform sentiment analysis and key phrase extraction.

Speech Text Intent

👁️ 878

13 days ago



⚙️ MACHINE LEARNING API

Recommendations



Help your customers discover items in your catalog. Customer activity in your website is used to recommend items and improve conversion in your store.

Recommendations Retail Media

👁️ 726

13 days ago



⚙️ MACHINE LEARNING API

Customer Churn Prediction



⚙️ MACHINE LEARNING API

Anomaly Detection



⚙️ MACHINE LEARNING API

Cluster Model API



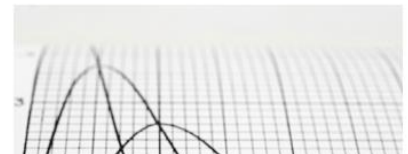
⚙️ MACHINE LEARNING API

Forecasting - ETS + STL API



⚙️ MACHINE LEARNING API

Normal Distribution Quantile Calculator API



Machine Learning Services in the Cloud



<http://gallery.azureml.net/>

MACHINE LEARNING API

Face APIs



Microsoft's state-of-the-art
based face algorithms to de
recognize human faces in im

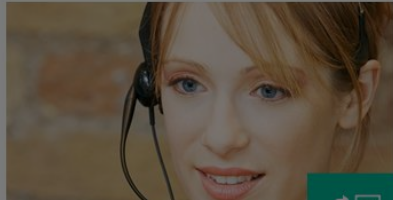
Face Image Vision

759529 13 days ago

Microsoft

MACHINE LEARNING API

Speech APIs



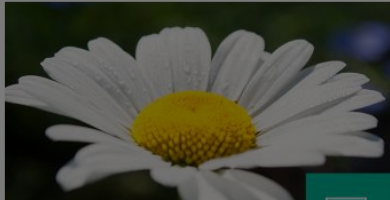
Speech Text Intent

1227 13 days ago

Microsoft

MACHINE LEARNING API

Vision APIs



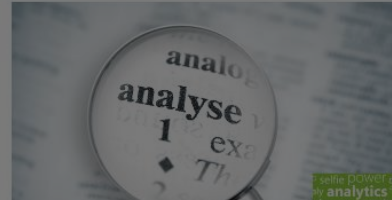
OCR Image Vision Thumbnail

1139 13 days ago

Microsoft

MACHINE LEARNING API

Text Analytics



Speech Text Intent

878 13 days ago

Microsoft

MACHINE LEARNING API

Recommendations



Discover items
mer activity in
o recommend
version in

Recommendations Retail Media

726 13 days ago

Microsoft

MACHINE LEARNING API

Customer Churn
Prediction



MACHINE LEARNING API

Anomaly Detection



MACHINE LEARNING API

Cluster Model API



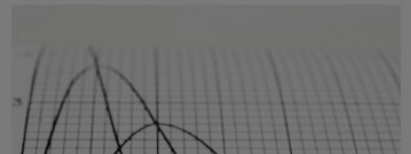
MACHINE LEARNING API

Forecasting - ETS + STL
API



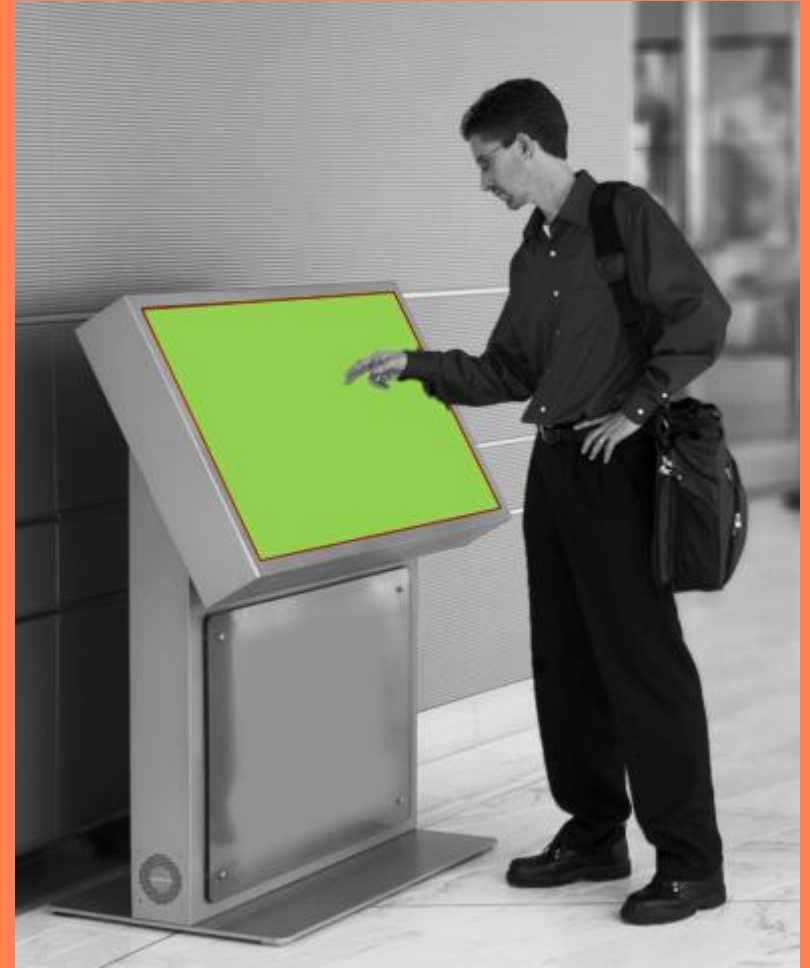
MACHINE LEARNING API

Normal Distribution
Quantile Calculator API



Demo

Personalizing the experience using
Perceptive Intelligence



Text Analytics

How do your customers feel about your products?

Text Analytics



Bring your unstructured text, and use this API to perform sentiment analysis and key phrase extraction.

Speech

Text

Intent

👁️ 4194

3 months ago



HOME

BED & BATH

WOMEN

MEN

JUNIORS

KIDS

ACTIVE

BEAUTY

SHOES

HANDBAGS

JEWELRY

the **gift** guide

lists

deals & promotions

gift ca

You are in: [Women](#) > [Coats](#)

Kenneth Cole



Kenneth Cole Faux-Fur-Trim Chevron Quilted Down Coat

★★★★☆ [264 reviews](#)

Special Savings

Reg. \$225.00

Was \$199.99

Sale \$156.99

Sale ends 8/25/15 [Pricing Policy](#)

EXTRA 15% OFF Extra 15% off select merchandise! CODE: TICKET

[details](#)

Color: **Champagne**



Size:

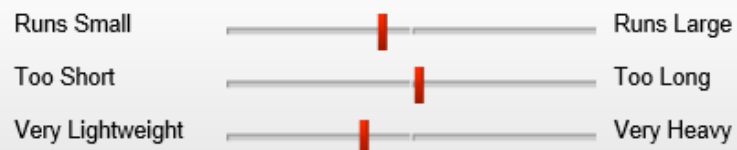
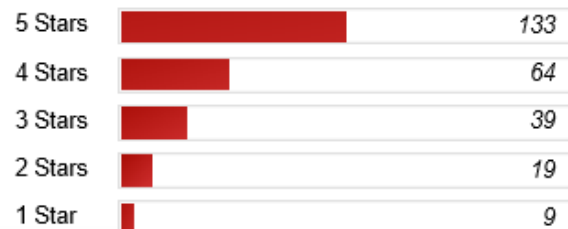
[size chart](#)

Qty:

ADD TO BAG

[Product Details](#)[Reviews](#) ★★★★★[Product Q&A](#)[Shipping & Returns](#)[Special Offers](#)

Overall: ★★★★★ 264 reviews



82% of reviewers recommend this product.

Write a review for a chance to win a \$1000 gift card! [see details](#)

[write a review](#)

Customer Ratings and Reviews

[What is relevancy sort?](#)

Lowest rating



Overall Rating ★☆☆☆☆

worst jacket I ever buy

November 28, 2014

sherine123

from **online**

This jacket no good I waste my money tore in pocket



Was this helpful?



1



8

[report](#)

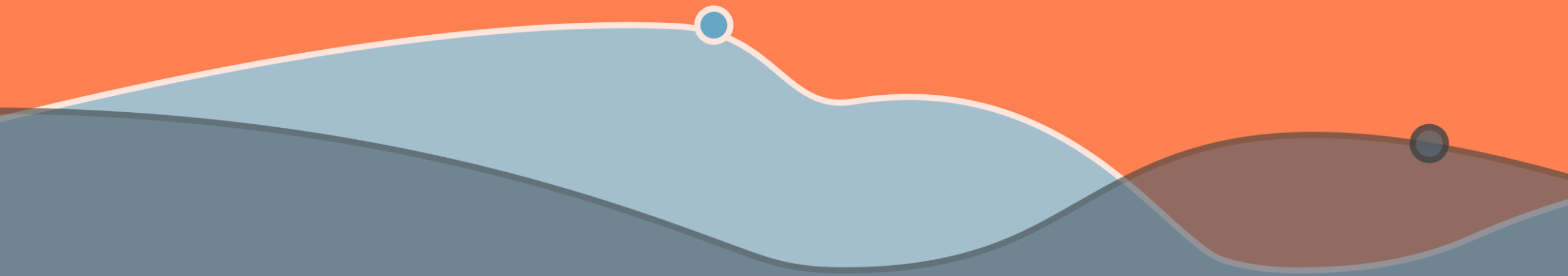


What are people saying on this coat

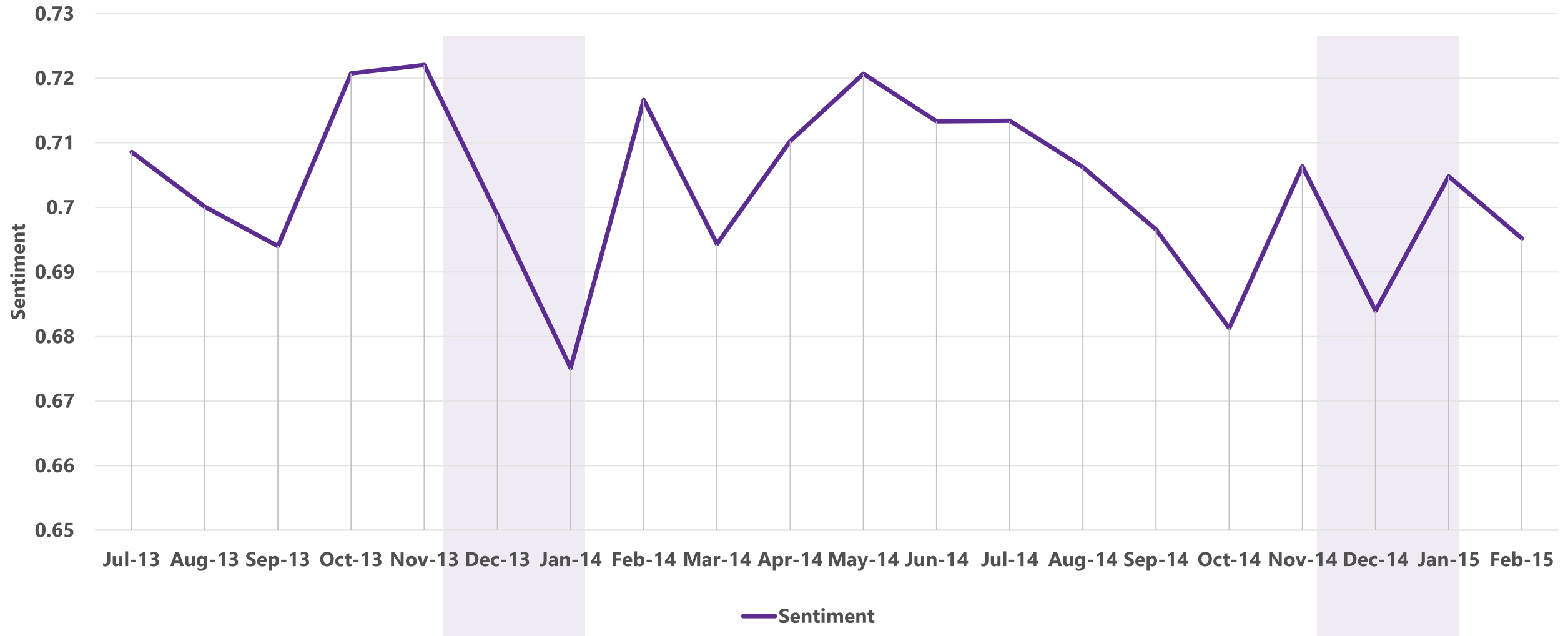
Good	OK	Hit or Miss	Bad
cute color	petite fit		armholes tight
warm light weight		Michigan winter	
	price		pockets inside linen

Demo

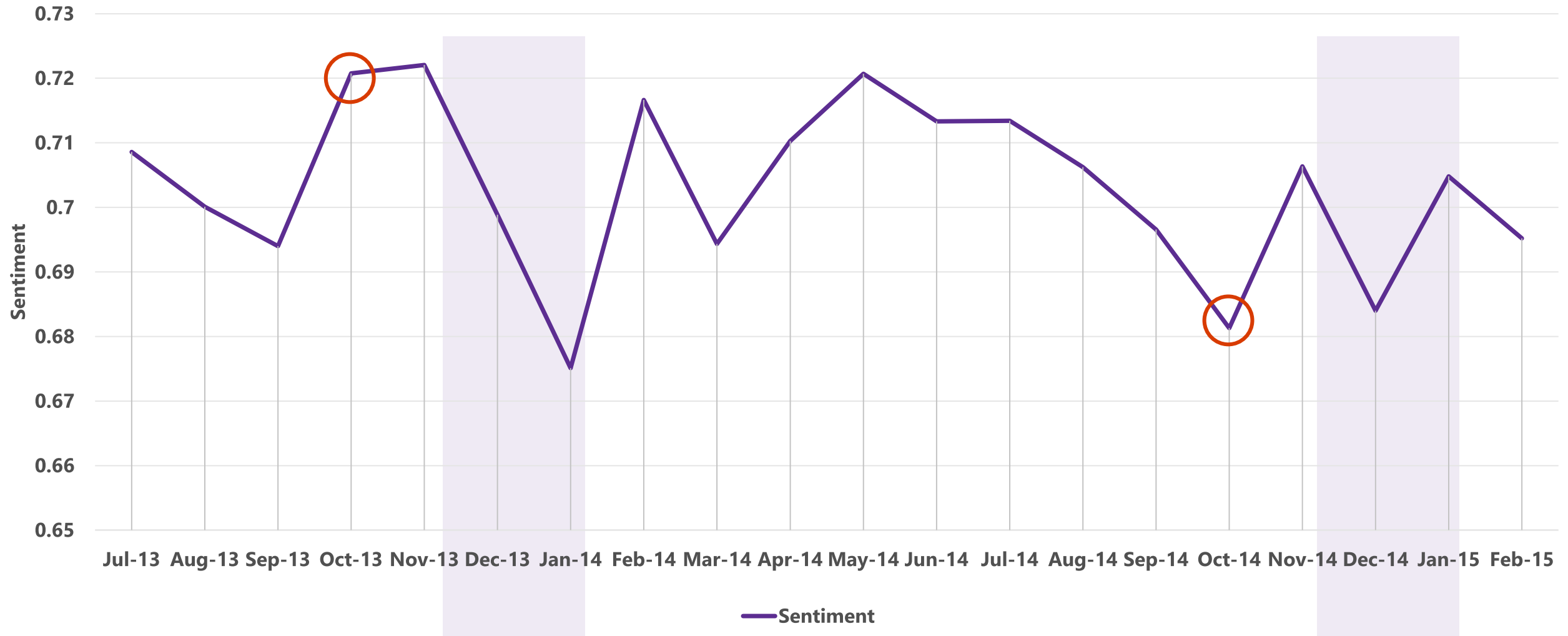
Understanding Customer Sentiment



Sentiment over time



Sentiment over time



Who their influential customers are

Fans

USER	AVG SENTIMENT SCORE	# OF IDEAS
user77	0.758117	69
user23	0.833552	58
user243	0.716238	53
user396	0.974862	40
user1403	0.716291	38
user215	0.929712	35
user862	0.838113	27
user40	0.972512	27

Spotlighting them

Critics

USER	AVG SENTIMENT SCORE	# OF IDEAS
user1723	0.390934	8
user228	0.323264	6
user1250	0.392574	6
user955	0.245724	5
user229	0.28559	5
user518	0.328739	5
user1532	0.398888	5
user4963	0.179529	4

Renew relationship

Recommendations

What products are they likely to purchase ?

Recommendations



Help your customers discover items in your catalog. Customer activity in your website is used to recommend items and improve conversion in your store.

Recommendations

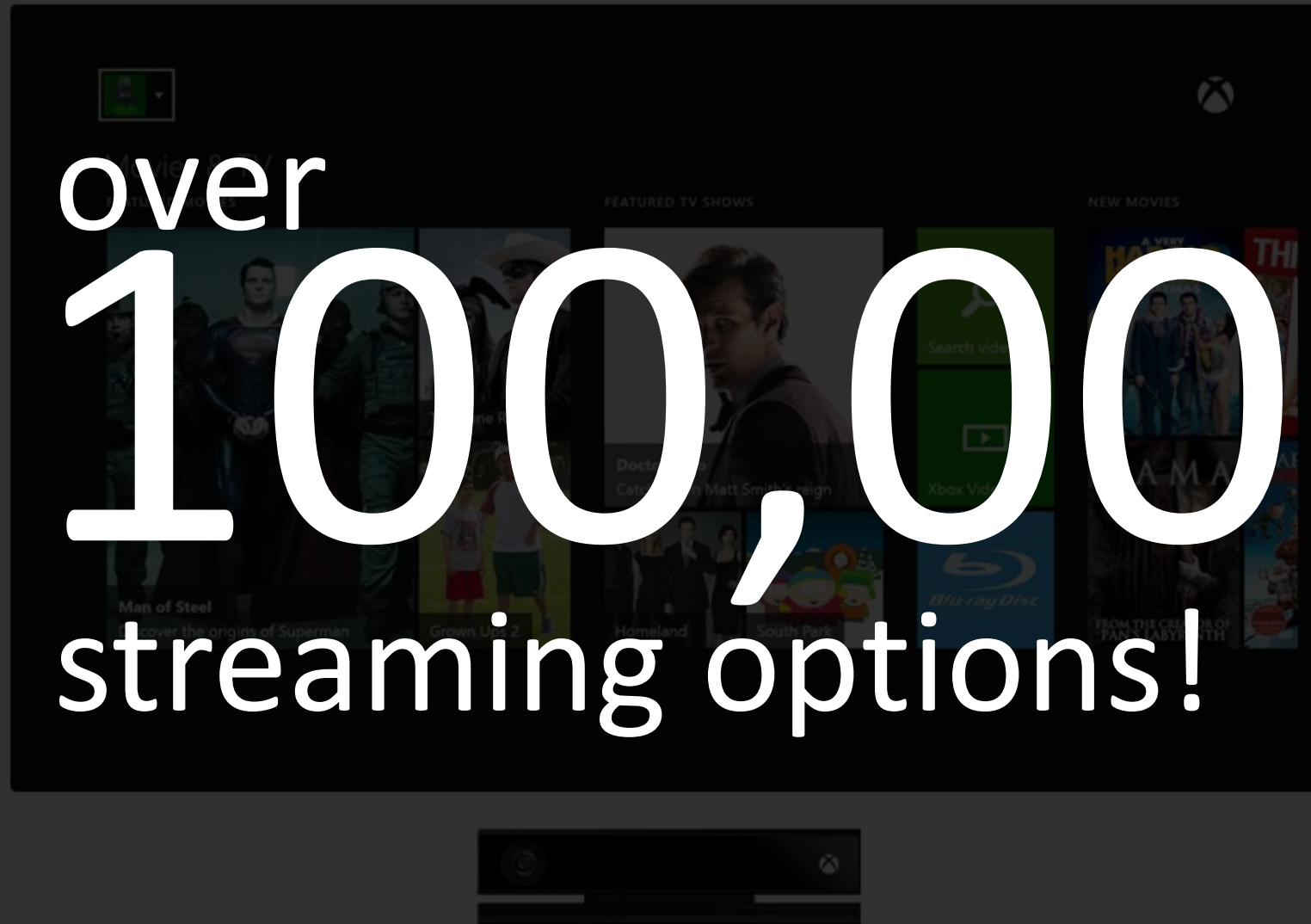
Retail

Media

👁️ 5557

12 days ago





over
100,000
streaming options!

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Search for entities by name, algorithms or tags



MACHINE LEARNING API

Recommendations

by [Microsoft](#) April 22, 2015

Description

The Recommendations API built with Microsoft Azure Machine Learning helps your customer discover items in your catalog. Customer activity in your digital store is used to recommend items and to improve conversion in your digital store.

The recommendation engine may be trained by uploading data about past customer activity or by collecting data directly from your digital store. When the customer returns to your store you will be able to feature recommended items from your catalog that may increase your conversion rate.

Microsoft Azure Machine Learning's Recommendations supports 3 common scenarios:

Frequently Bought Together (FBT) Recommendations


In this scenario the recommendations engine will recommend items that are likely to be purchased together in the same transaction with a particular item.

For instance, in the example below, customers who bought the *Wedge Touch Mouse* were also likely to buy the at least one of the following product in the same transaction: *Wedge Mobile Keyboard*, the *Surface VGA Adapter* and *Surface 2*.

Item to Item Recommendations

A common scenario that uses this capability, is "people who visited/clicked on this item, also visited/clicked on this item".

For instance, in the example below, most people who visited the "Wedge Touch Mouse" details page also visited the pages related to other mouse devices.



Wedge Touch Mouse

★★★★ 4.0 (4) [See reviews](#)


\$49.99

The Wedge Touch Mouse lets you comfortably navigate Windows 8 using Microsoft's touch technology with fluid, four-way touch scrolling and navigation in every direction.


Quantity:

[Add to cart](#)


Frequently Bought Together



Wedge Mobile Keyboard



Surface VGA Adapter



Surface 2

[SIGN UP](#)

1419 views

[Tweet](#)[in Share](#)

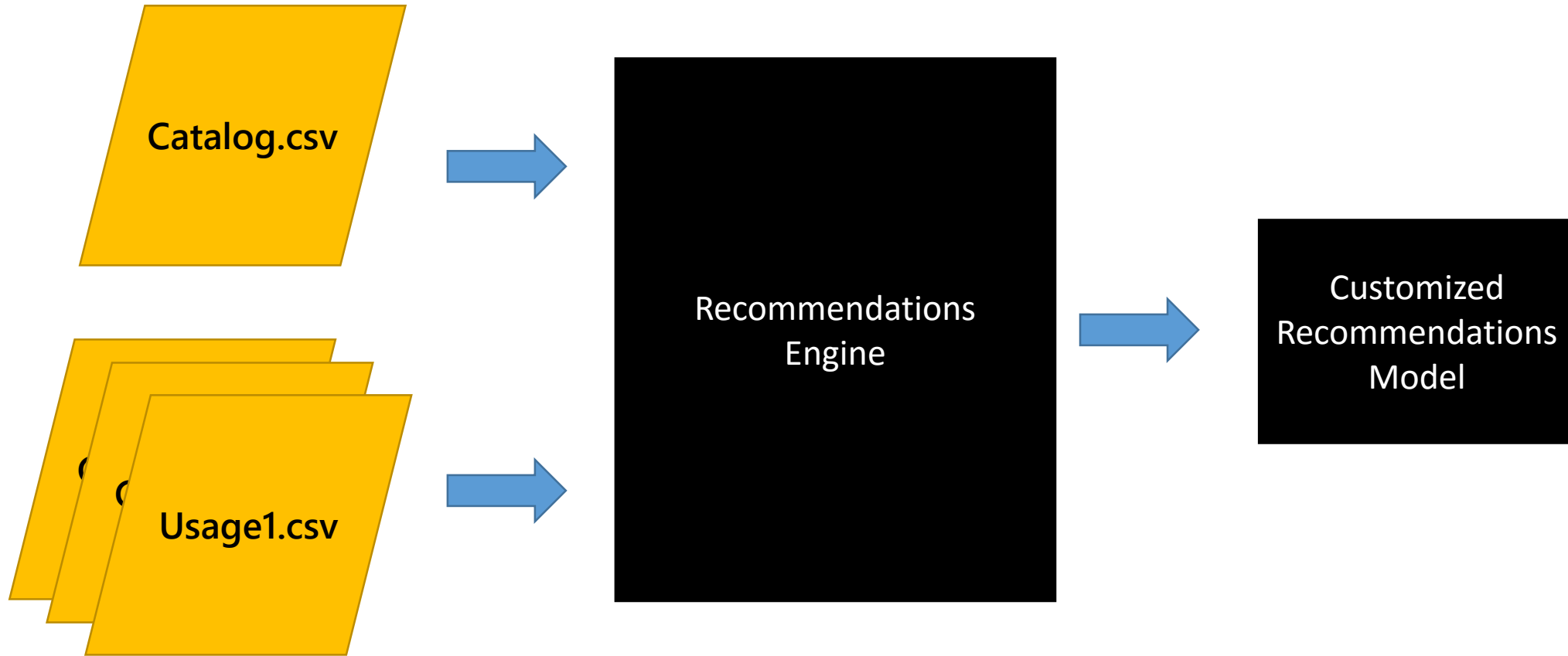
Links

[Quick Start Guide](#)[Documentation](#)[Sample Application](#)[Sample Application Guide](#)[JavaScript Library](#)[JavaScript Integration Guide](#)[Frequently Asked Questions \(FAQ\)](#)[Publisher Offer Terms](#)[Publisher Offer Privacy Statement](#)

Tags

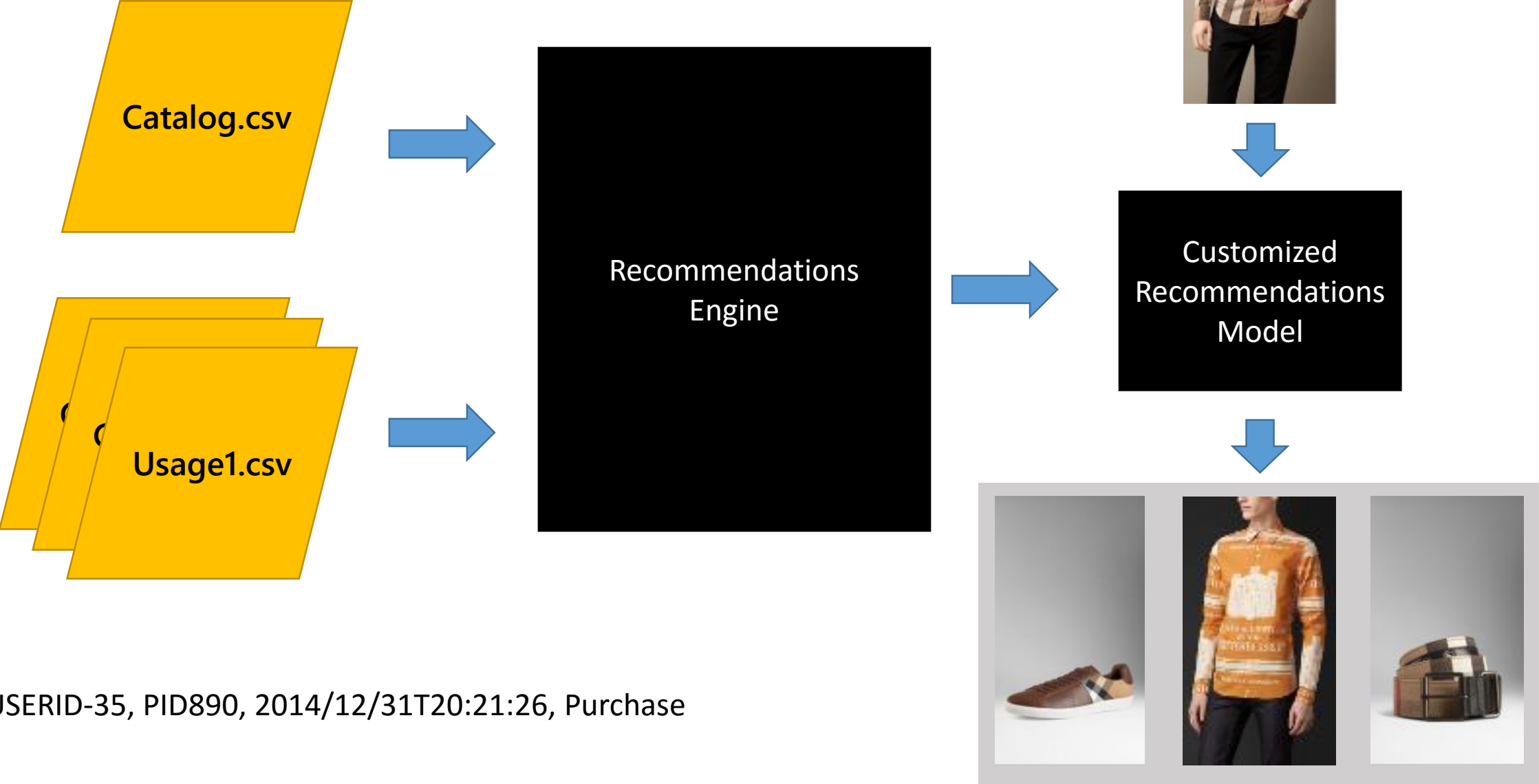
[Recommendations](#)[Retail](#)[Media](#) [Report Abuse](#)

PID890, Sumi Scarf, Apparel, Description

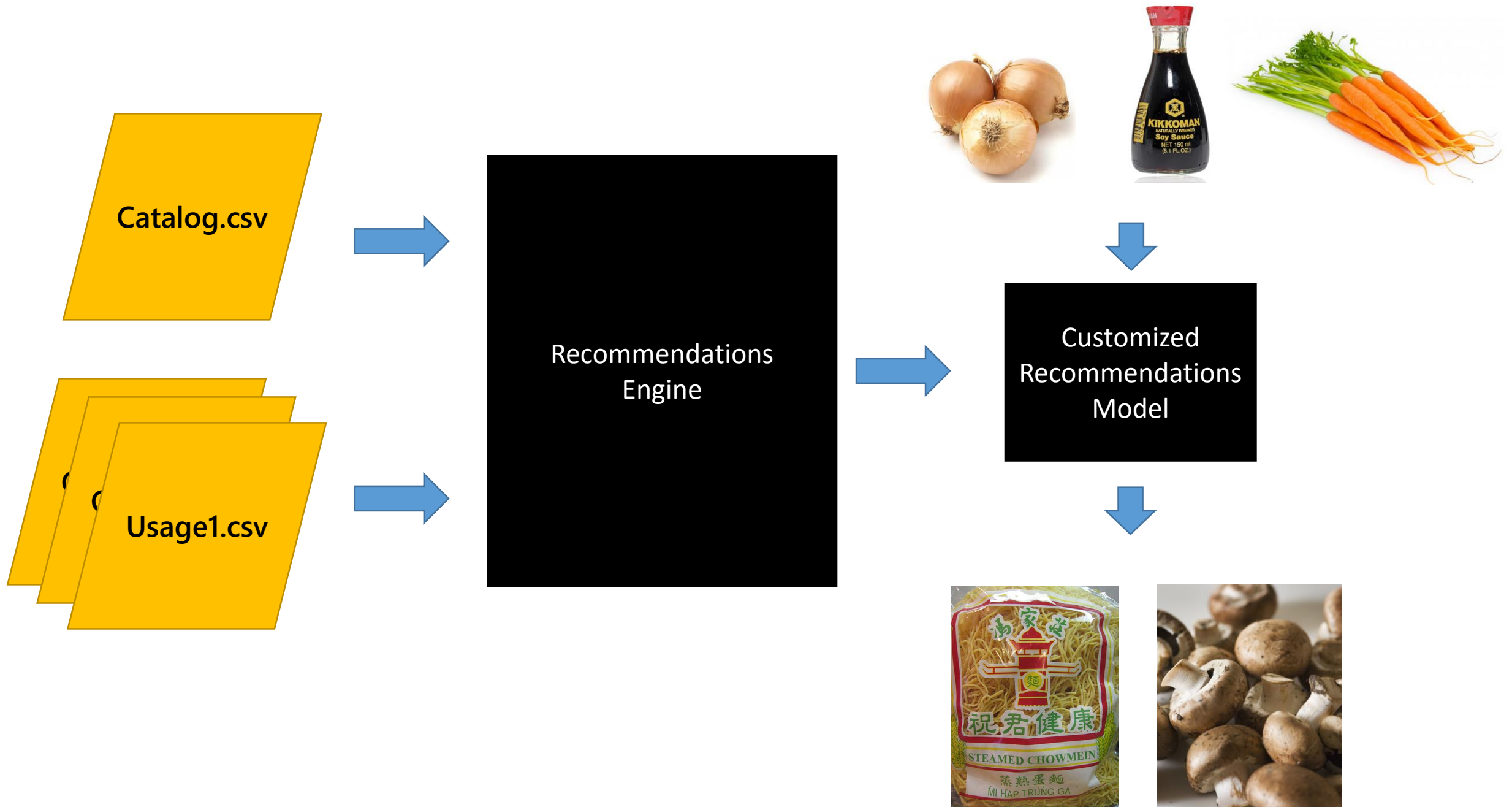


USERID-35, PID890, 2014/12/31T20:21:26, Purchase

PID890, Sumi Scarf, Apparel, Description



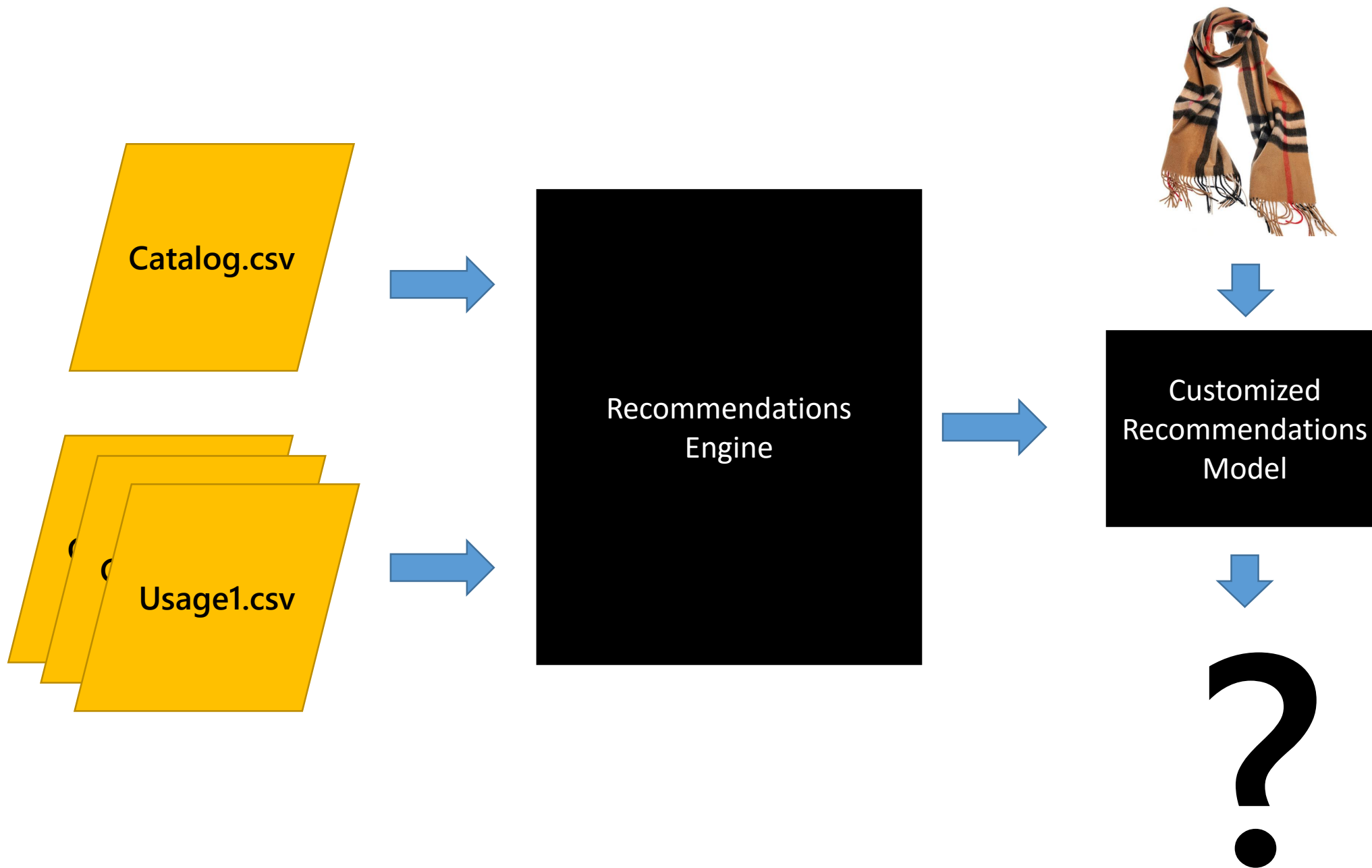
USERID-35, PID890, 2014/12/31T20:21:26, Purchase



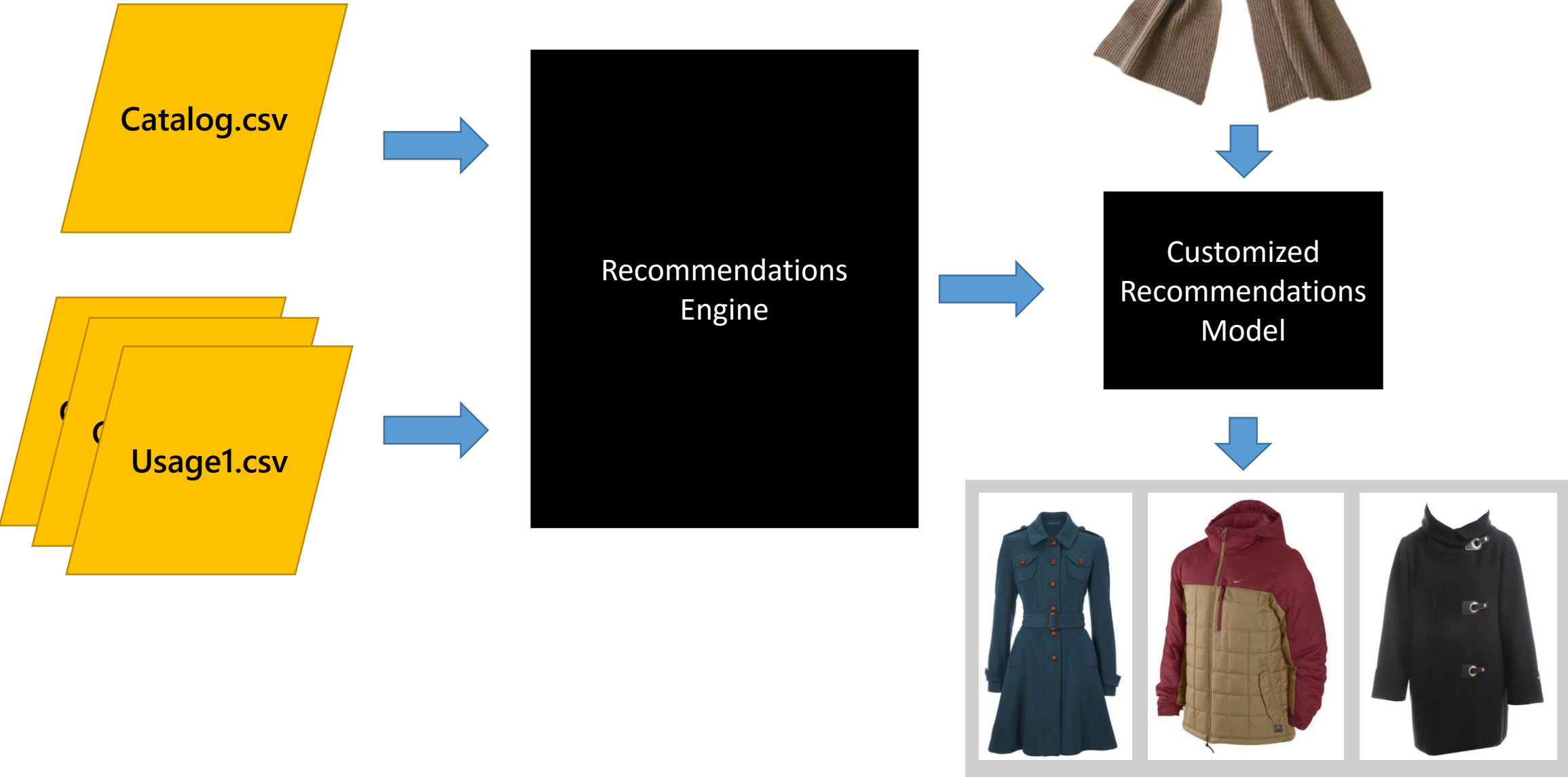
Cold items

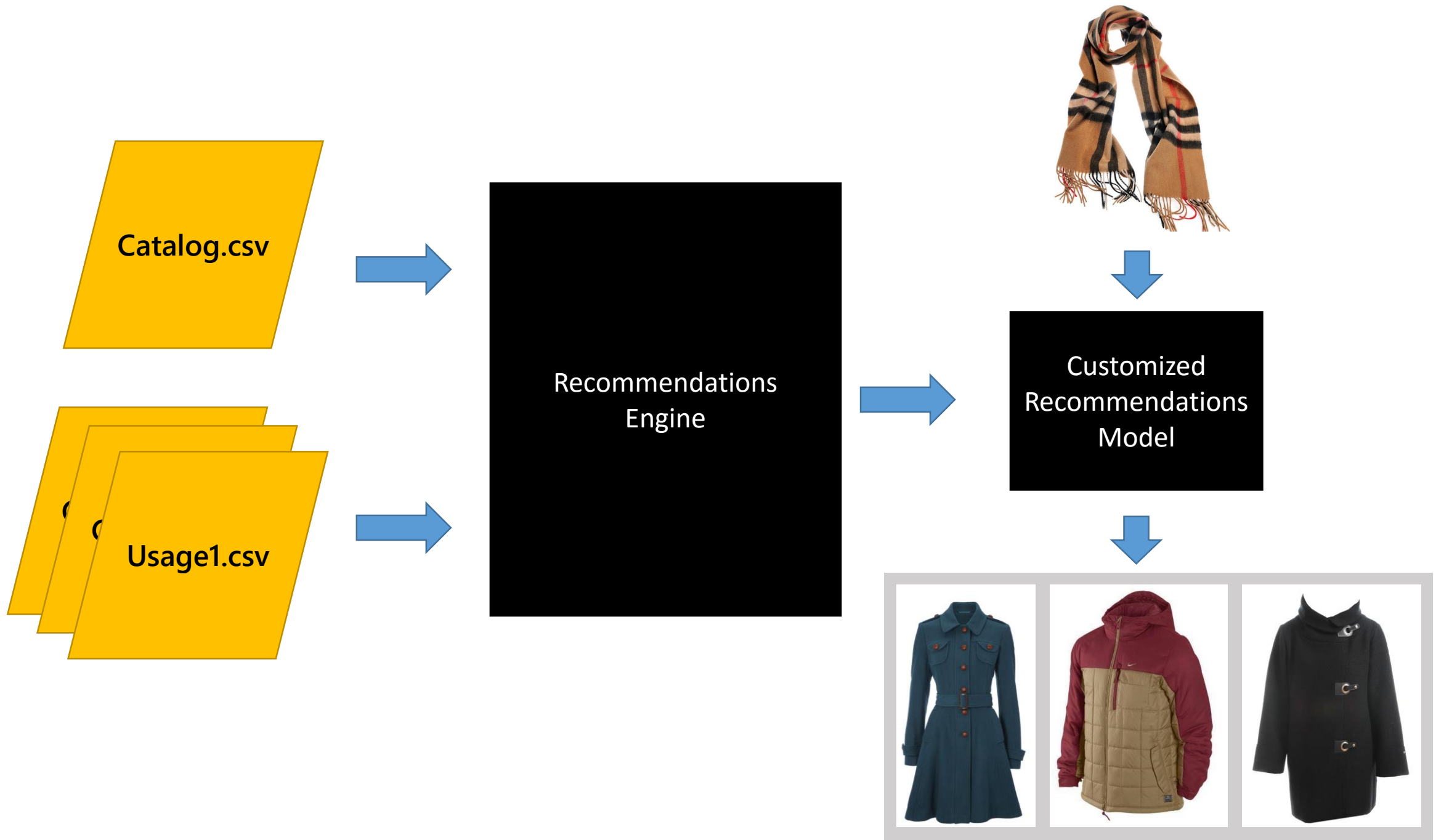
What to do about items you have never seen in your usage data before?



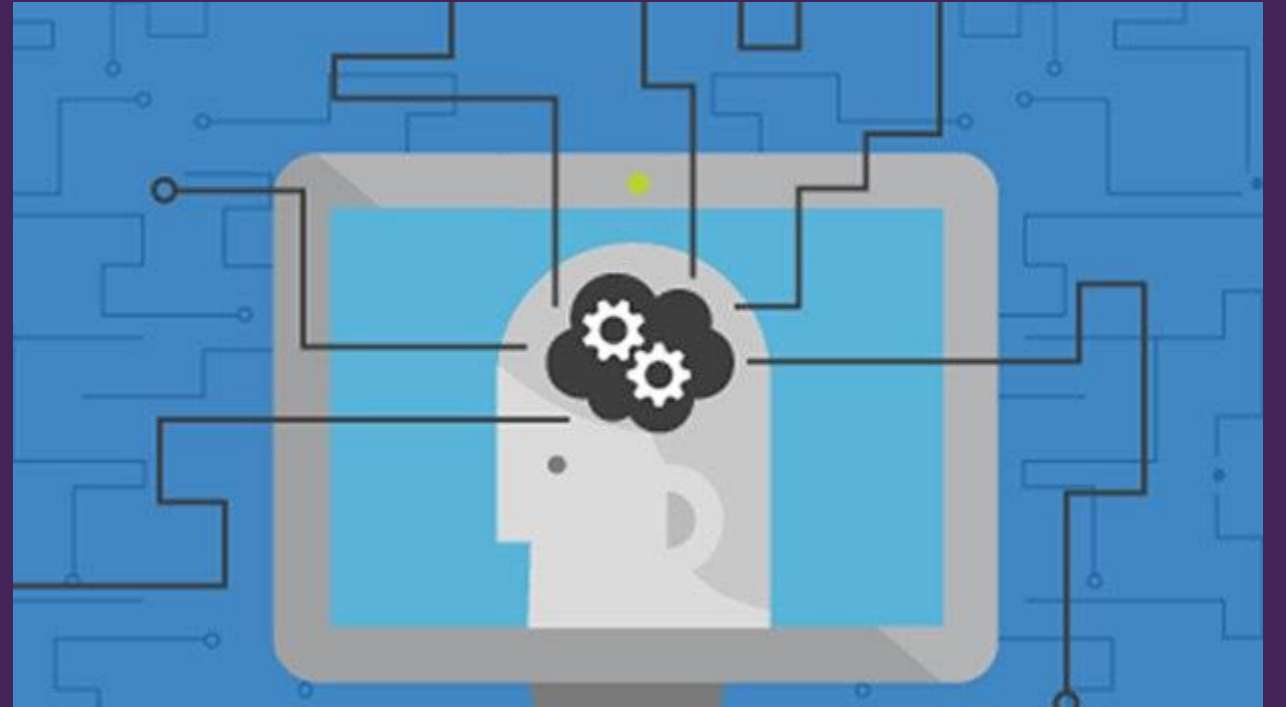


ID890, Sumi Scarf, Apparel, , Price=\$50.00, Season=Winter, Material=Cotton

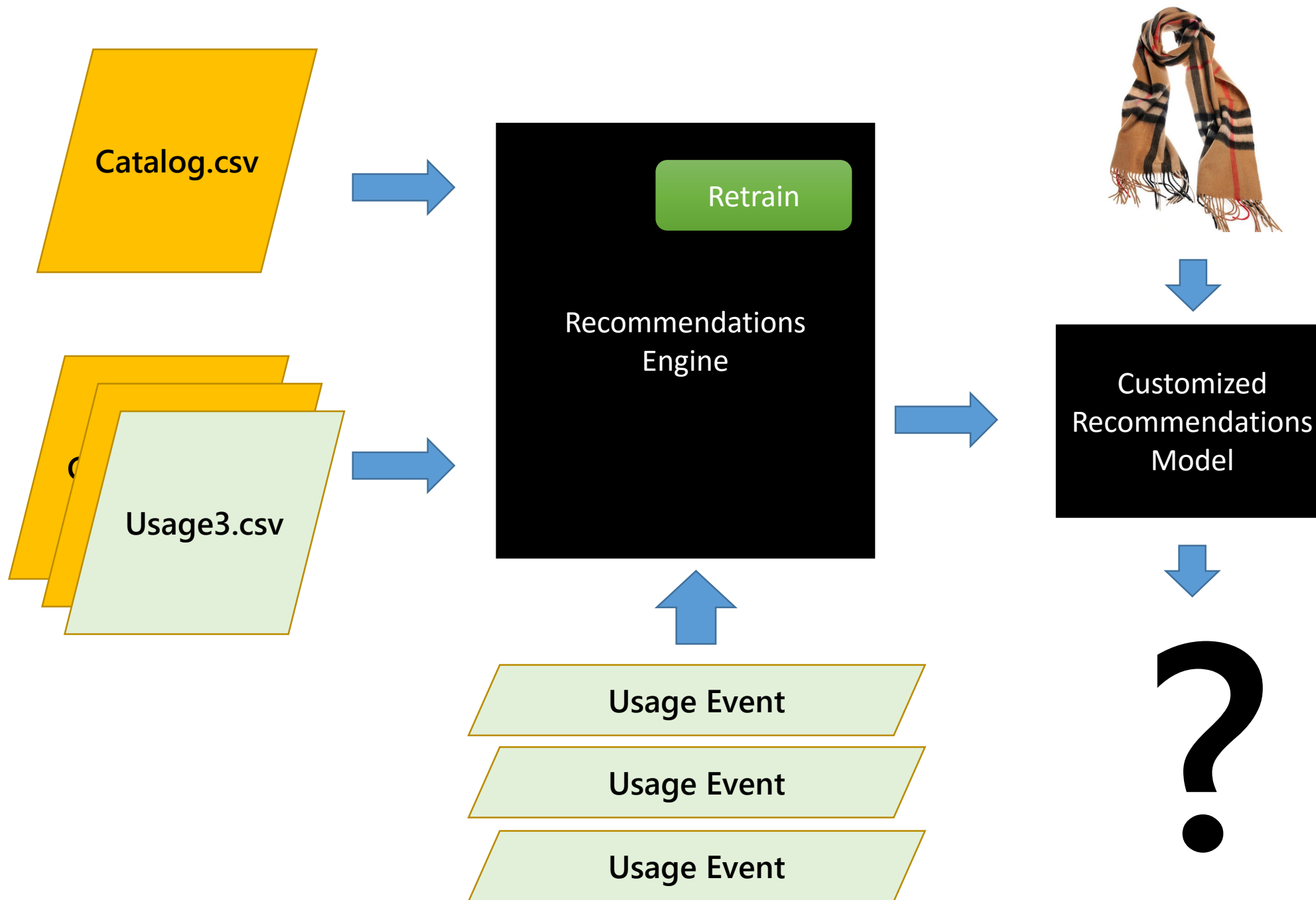


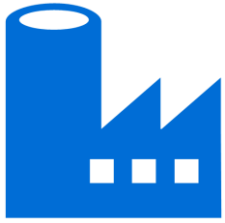


Retraining

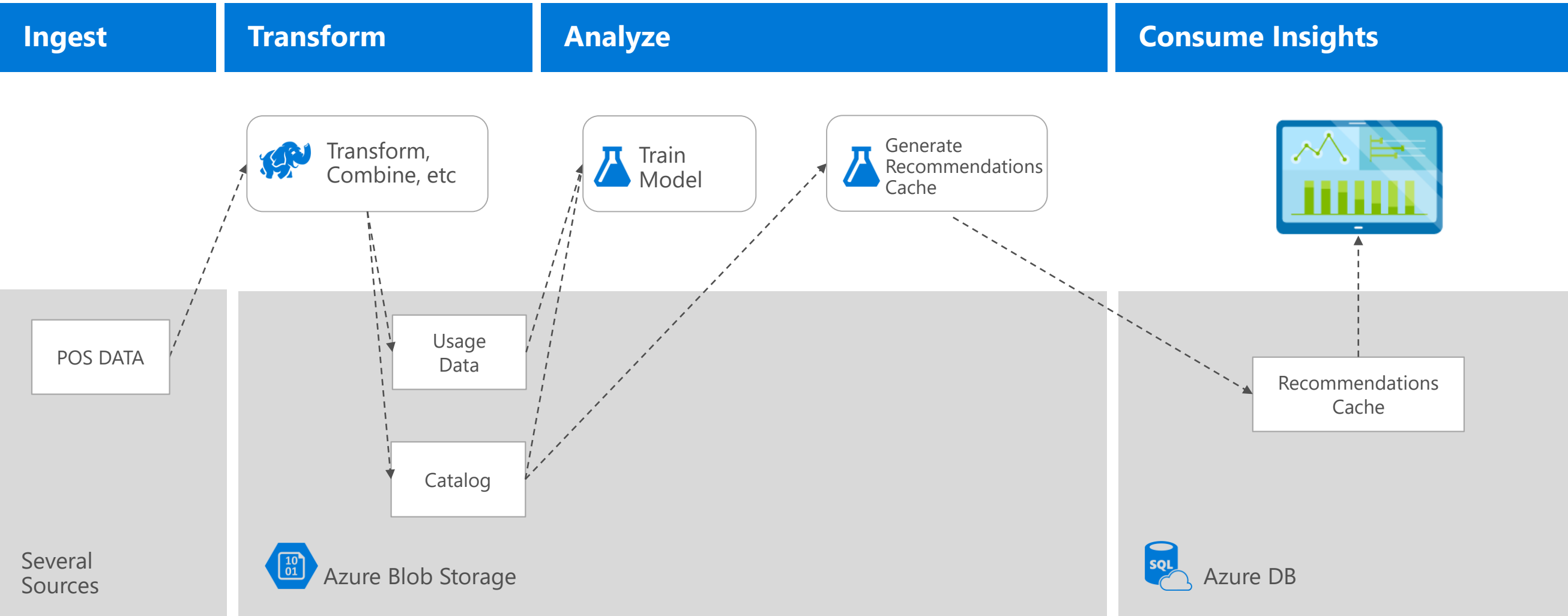


What if your catalogue changes often?
How do I adapt to the latest usage patterns?





Sample Architecture Using Data Factory



Think Beyond
Retail





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Microsoft for Startups: (Part 1) Women Building the Future

Posted: Mar 04, 2015 at 1:00 PM

By: DevRadio, ChrisCaldwell, David Giard

★★★★★ (2) | 29,027 Views

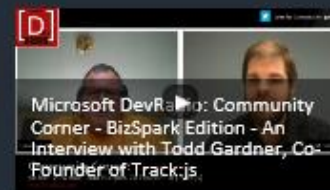
Avg Rating: 5

reddit

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powered by
azure machine learning



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Canvas

Results **1-20** of about **903,000** for: **Canvas** **System.Windows.Controls.Canvas (WPF) (.NET Framework 4)**

A Canvas contains a collection of UIElement objects, which are in the Children property. Canvas is the only panel element that has no inherent layout characteristics. A Canvas has default Height and Width properties of zero, unless it is the child of an element that automatically sizes its child elements. Child elements of a Canvas are never resized, they are just positioned at their designated coordinates. This provides flexibility for situations in which inherent sizing constraints or alignment are not needed or wanted. For cases in which you want child content to be automatically resized and aligned, it is usually best to use a Grid element.

Other Versions: [Silverlight](#), [3.0](#), [3.5](#)**Common Methods/Properties:**
[Children](#)**Assembly:** [PresentationFramework.dll](#)**Recommended for you:**

- [WPF Controls Gallery Sample](#)
- [Panels Overview](#)
- [Painting with Solid Colors and Gradients Overview](#)



page 92

page 23

page 50

Customized
Recommendations
Model

page x

page y

page z

Demo

Building your first recommendations model



MACHINE LEARNING API

Recommendations



Help your customers discover items in your catalog. Customer activity in your website is used to recommend items and improve conversion in your store.

Recommendations

Retail

Media

5555

12 days ago



Microsoft

JJ Food Service

- 2 recommendation /personalization scenarios
 - Item-specific recommendations
 - Checkout-specific recommendations
- 6% of items added to cart come from Azure ML models
- 5% Conversion rate at checkout



Customer Churn Prediction

Which of your customers are likely to leave you?



MACHINE LEARNING API

Customer Churn Prediction



Predict the likelihood of a customer ending its relationship with a company or service.

Retail

Churn

Gaming



2489

12 days ago



Microsoft

Case Study

Access Softek



Access Softek

- Innovative software that keeps over 400 credit unions and banks ahead of the technological curve.
- Relentless innovation helps smaller institutions compete against big banks.



Access Softek

Goal

Predict which users of the app will likely churn.

Initial Churn Definition

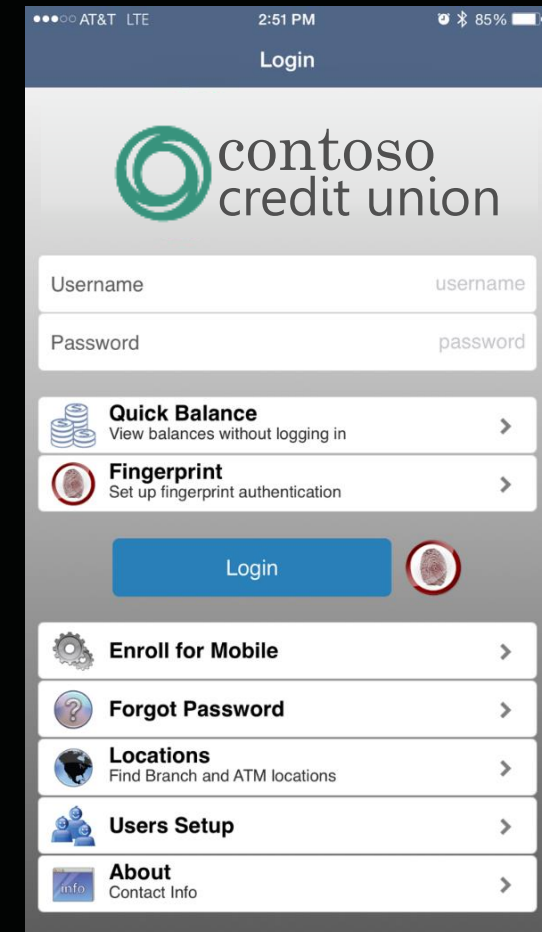
No mobile banking activity for 21 consecutive days

Training Data Period

February 10 – June 15, 2015

Validation Period

June 16 – July 6, 2015



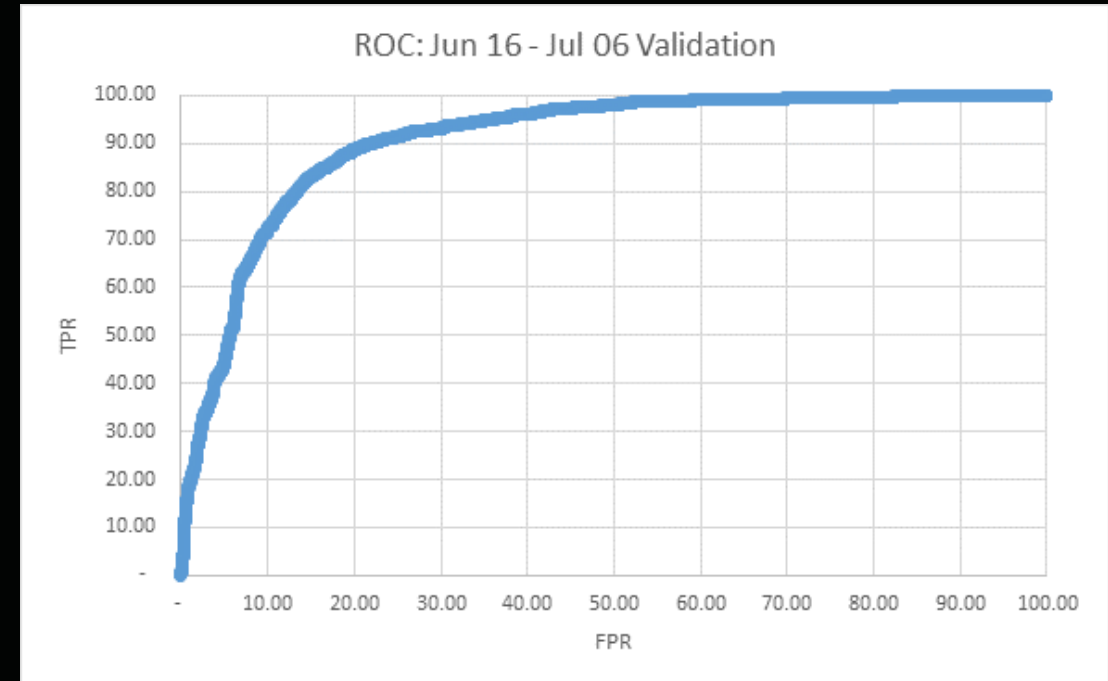
Access Softek

At 10% false positives, the model captured 72% of all churners

- This corresponds to a population percentage of about 19.6%.
- **AUC = 0.91.**
Competitive with similar projects evaluated.

If we targeted the top 100 users most likely to churn...

- A random model would have correctly identified 15 churners
- The churn model would have identified 76 churners — 5x more!



Access Softek

Easy to use

Input

POS Data, Churn Definition

Output

Likelihood to Churn for each user

Fully automatable

PARAMETERS STATS SCORING SHARES API

Data to use

Please specify a date range for the data you want the service to use for learning. Make sure that all the relevant activity data that happened within this date range is uploaded to the service prior to starting the learning process.

It is recommended that you will use less recent data for learning and more recent data for scoring

Start Date

2015-02-10

End Date

2015-05-25

Your Business Settings

Measuring Interaction ?

How often do customers interact with your business?

DAYS

WEEKS

MONTHS

Training Period ?

How much interaction data should be used for learning?

3 weeks

Churn Condition ?

What is the maximum amount of interaction a customer can have with your business and still be considered churned?

0 interaction/s

Labeling Period ?

How long does it take to see that a customer have churned from your business?

3 weeks

How will churn mitigation be applied? ?

How will you try to stop customer from leaving your business?

PASSIVE

ACTIVE

Q&A

LuisCa@microsoft.com
VeDiev@microsoft.com

Call to Action



Discover the Machine Learning APIs at Gallery.AzureML.net



Contact us! MLAPI@microsoft.com

