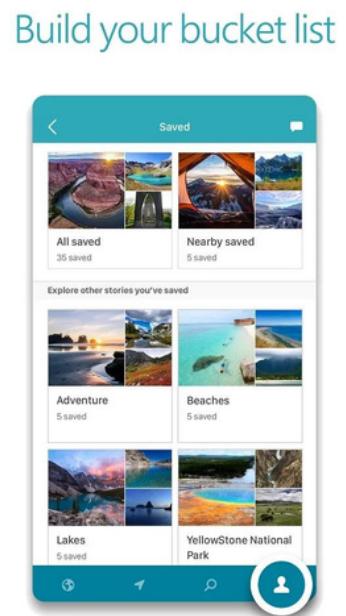
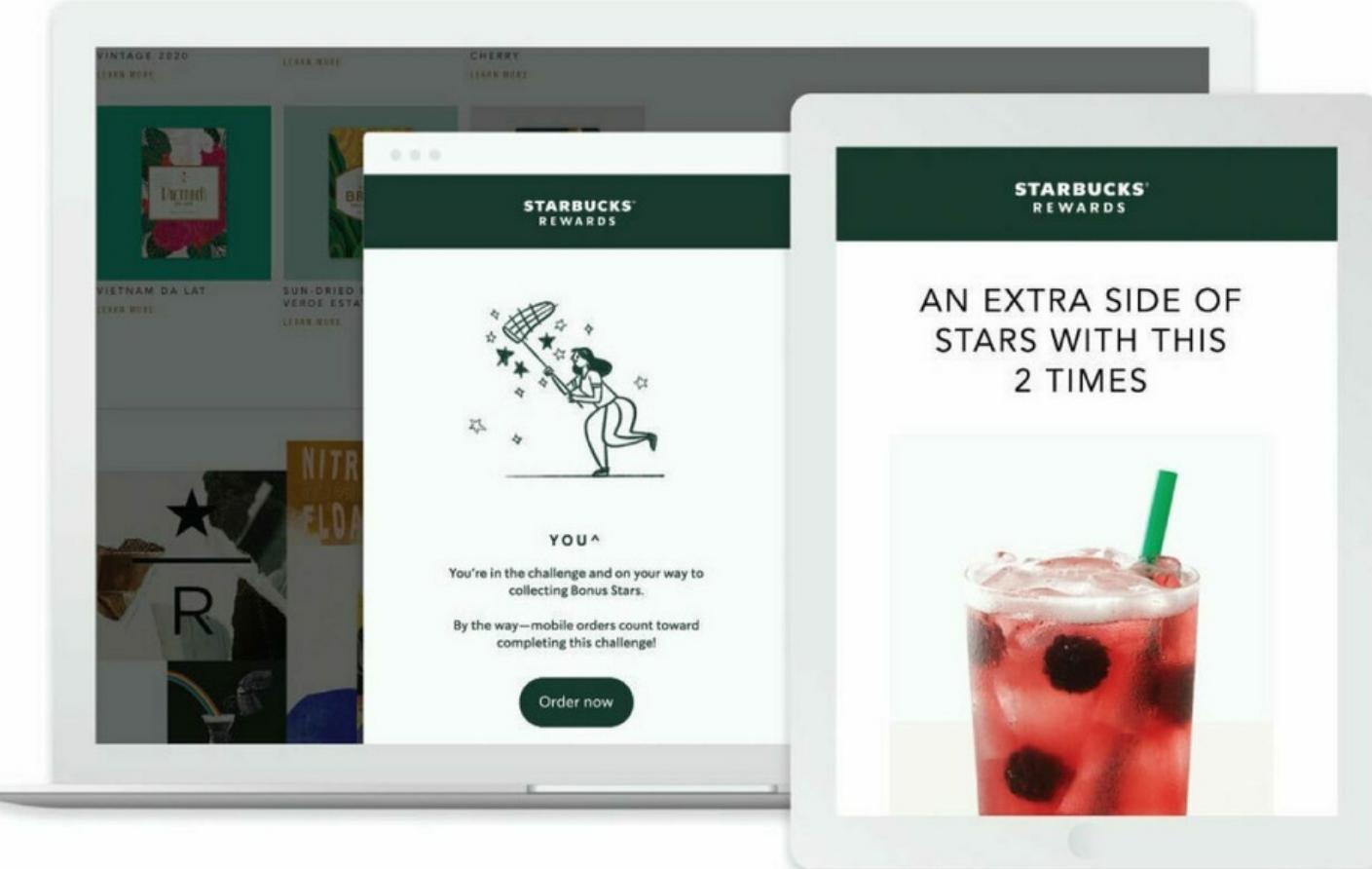




# Personalized Offers and Marketing Automation Using AI – Azure

Radhika Tripurani



**SEPHORA**

MAKEUP SKIN CARE FRAGRANCE GIFTS SALE STORES

**BEAUTY INSIDER**

**WE'VE MISSED YOU**

COME BACK TO SEPHORA AND TAKE **10% OFF** ALL PURCHASES NOW THROUGH MONDAY, APRIL 20.\*

**SHOP IN STORE** Present email or mailed invitation  
**SHOP ONLINE** Use code BILOVE at checkout

FIND A STORE

STORE INSTRUCTIONS

1. Scan BI card # or perform a client search
2. Scan item(s)
3. Scan any BI rewards
4. Scan 10% off barcode
5. Press Total and touch Done
6. Complete transaction per standard procedure

STEP 4: BI 10% OFF  
MC45 3030000300000910115



# Do these Look Familiar?

**Welcome!**  
Get 10% OFF at your first buy!  
 I have read and agree on the Terms  
 I want to receive personalised recommendations

**Hello Mary!**  
You will receive our newsletter at mary@youemail.com.  
See the recommendations we crafted just for you!

**Hello John!**  
You will receive our newsletter at john@youemail.com.  
See the recommendations we crafted just for you!

**Hello Helen!**  
You will receive our newsletter at helen@youemail.com.  
See the recommendations we crafted just for you!

**SHOP NOW**

**10% OFF YOUR FIRST ORDER**  
when you sign up to our newsletter for exclusive news, recipes, discounts and loyalty rewards

**SIGN UP NOW**

**RECOMMENDED JUST FOR YOU**  
Shop the beauty fixes we've selected for you.

**EDIT YOUR PROFILE**

**FOR YOUR GREEN EYES ONLY**  
STILA Magnificent Metals Foil Finish Eye Shadow \$32.00

**YOUR LIGHT COMPLEXION PERFECTOR**  
CLINIQUE Even Better Makeup SPF 15 \$27.00

**YOUR OILY SKIN SOLUTION**  
CLINIQUE Dramatically Different Moisturizing Gel \$26.00

Highlight green eyes with this versatile foil-finish shadow that builds from a sheer shimmer to a metallic opaque.

This mineral-based liquid foundation brightens and evens light skin tones.

# What is a Personalized Offer?



**Personalized offers** are a means to leverage a user's real-time and historical data (user's preferences, shopping history, viewing history, clicks, etc.) to deliver meaningful and appealing discounts, products, and services to individuals. They enable a more efficient engagement between business owners and customers, which greatly enhances user experience and leads to an increase and repeat visitors and an opportunity to cross-sell or up-sell with little or no human labor

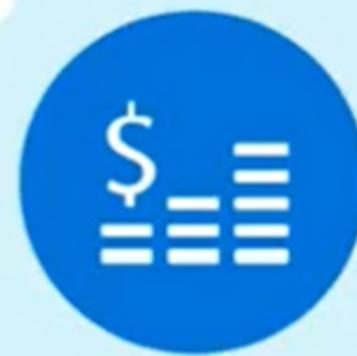
The most common ways of displaying offers are

- Arbitrarily
- Targeted approach
- Marketing plan based on historical data



Marketing strategies demonstrate improved conversation and effectiveness when offers are personalized and in real-time.

# Personalized Offers | Goals



## INCREASE REVENUE

Shoppers are more likely to respond to an offer that is based on their current interests and needs.



## IMPROVE EXPERIENCE

Users feel focused on and that they have a personal connection to the vendor or brand.



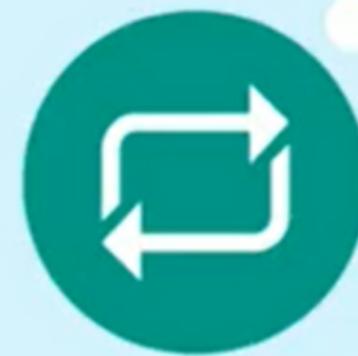
## ENSURE QUALITY

Using real-time and historical data helps to avoid misplaced or irrelevant offers and keeps customers.



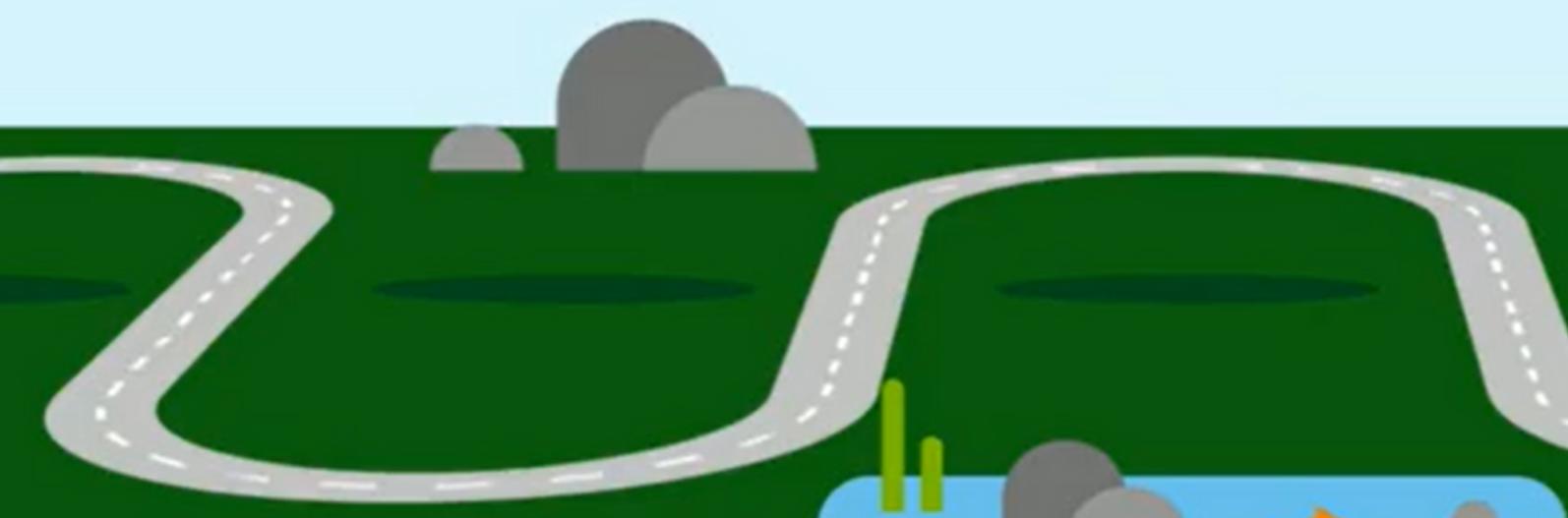
## BUILD PROFILES

Customer preferences are aggregated and analyzed regularly, making them more focused.



## INCREASE TRAFFIC

Customers that feel catered to are more likely to become repeat visitors



# Personalization has significant positive effects.

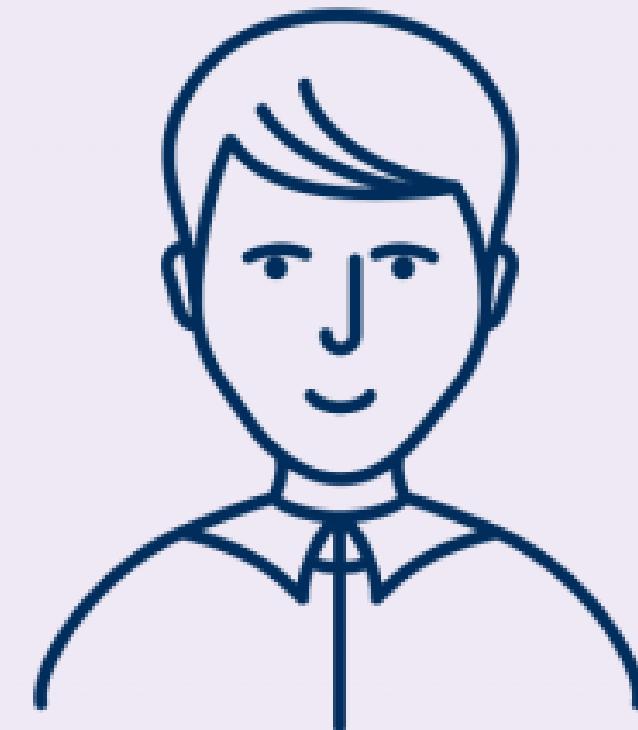
After consumers have personalized shopping experience:

**44%** will be likely to become a repeat buyer

**39%** will be likely to tell friends and family

**32%** will be likely to leave a positive review

**22%** will be likely to post a positive comment on social media



# Building a Personalized Offer



# Personalized Offers | Data Integration

## Actions

Clicks, abandoned pages, views, cart information and purchases help to build an accurate model and make better offers. Depending on the goal of the project, the definition of 'action' varies.



## Behaviors

It refers to customers' past and present visits to the business and contains detailed customers' information from which the predictive models can learn customers' preferences.

## Demographic and Firmographic Information

User specific information such as age, gender, etc., which assists prediction, as customers with similar background may have similar preferences

## Product/Offer Information

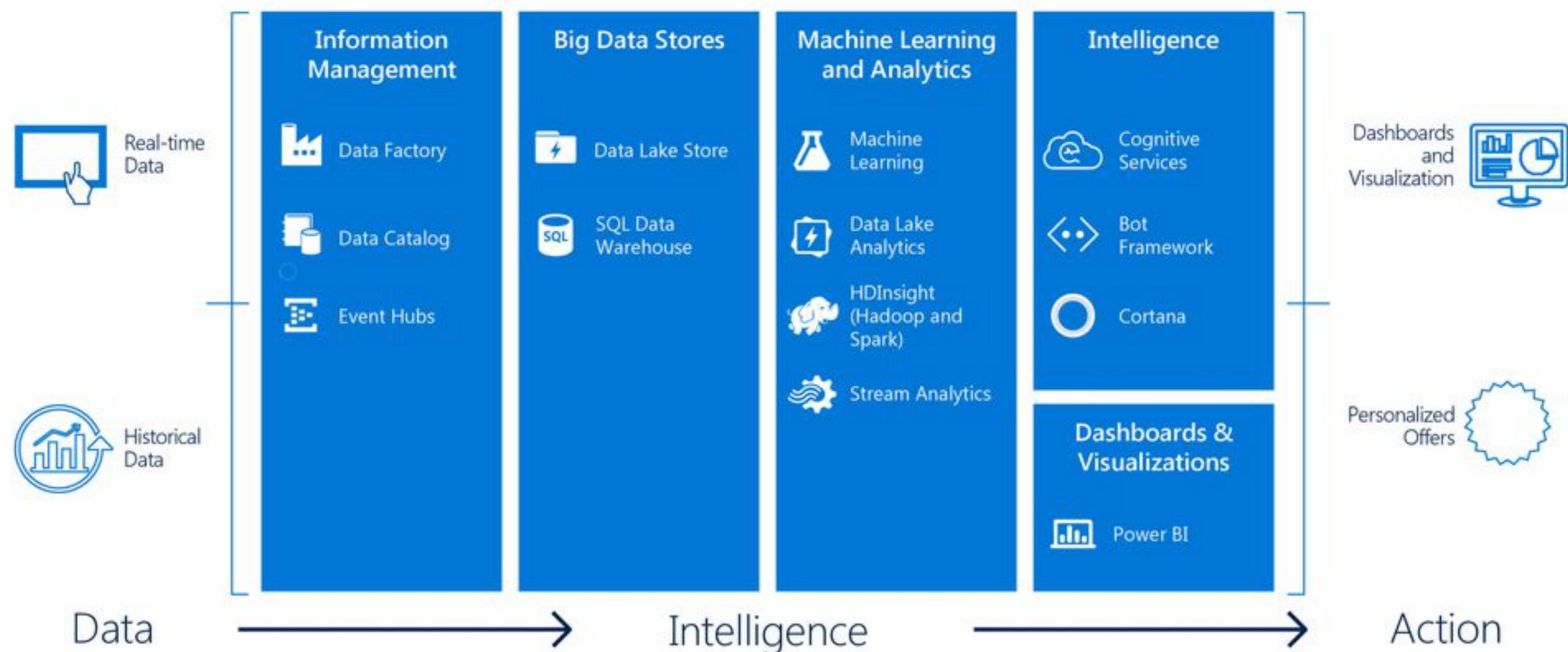
This information helps to characterize the preferences of customers & determine how well other potential products and offers fit customers' needs

**General information:** Other useful data can include: weather, holiday seasons, time of year, etc.

Cortana Intelligence Suite  
unlocks the power of data  
that is already available



# Cortana Intelligence Suite | Overview

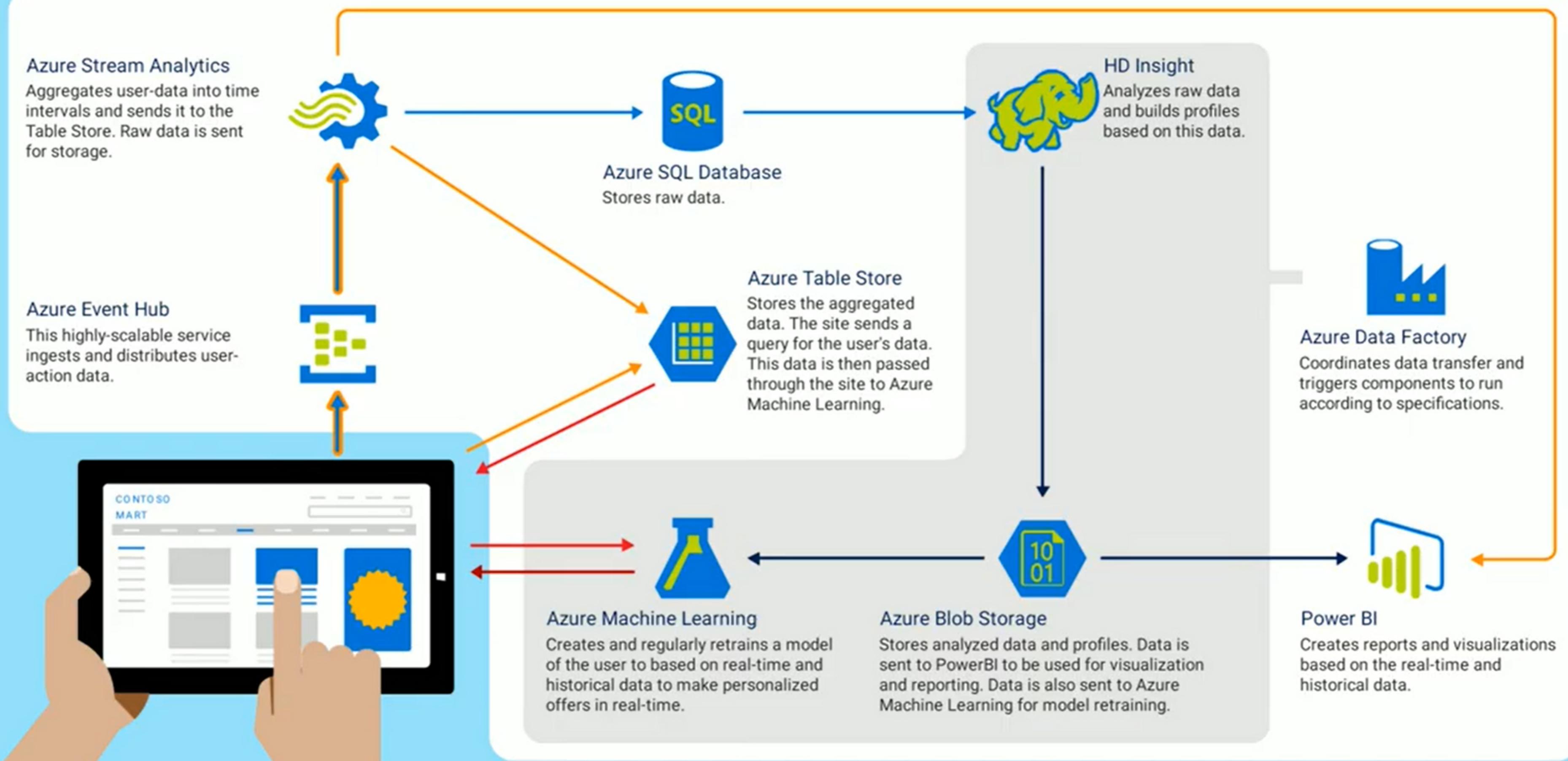


Source: Microsoft (<http://bit.ly/1r7dBXz>)

As we can see from the architecture diagram, the following are the key pillars of Cortana Intelligence Suite:

- **Information Management:** Consists of services that enable us to capture the incoming data from various sources including the streaming data from sensors, devices, and other IoT systems. Manage various data sources which are part of the data analytics ecosystem within the enterprise, and orchestrate and build end-to-end flows to perform various activities and data processing and data preparation operations.
- **Big Data Stores:** Consists of services that enable us to store and manage large-scale data. In other words, enables us to store and manage big data. These services offer a high degree of elasticity, high processing power, and high throughput with great performance.
- **Machine Learning and Analytics:** Consists of services that enable us to perform advanced analytics, build predictive models, and apply machine learning algorithms on large-scale data. Allows us to perform data analysis on large-scale data of different varieties using programming languages like R and Python.
- **Dashboards and Visualizations:** Consists of services that enable us to build reports and dashboards to view the insights. It primarily consists of Power BI which allows us to build highly interactive visually appealing reports and dashboards. Apart from this, other tools like SQL Server Reporting Services (SSRS), Excel, etc. can also be used to connect to data from some of these services in Cortana Intelligence Suite.
- **Intelligence:** Consists of advanced intelligence services which enable us to build smart interactive services using advanced text, speech, and other recognition systems.

# Personalized Offers | Architecture End-to-End



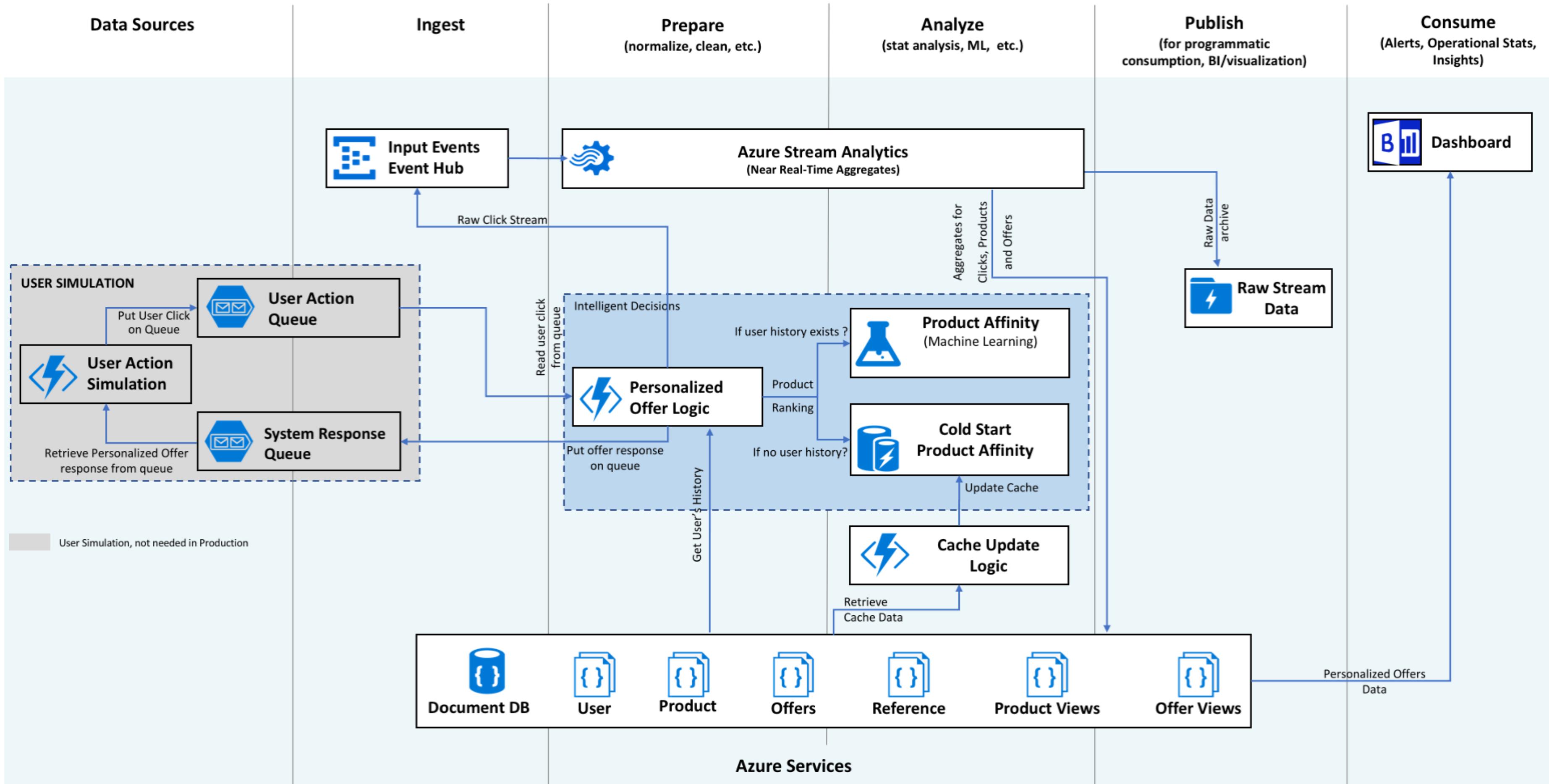
# Azure Services

This solution combines several Azure services to provide powerful advantages in making personalized offers to the customer.

- ***Event Hubs*** collects real-time consumption data.
- ***Stream Analytics*** aggregates the streaming data and updates the data used in making personalized offers to the customer.
- ***Azure Cosmos DB*** stores the customer, product, and offer information.
- ***Azure Storage*** is used to manage the queues that simulate user interaction.
- ***Azure Functions*** are used as a coordinator for the user simulation and as the central portion of the solution for generating personalized offers.
- ***Azure Machine Learning*** implements and executes the product recommendations
- And when no user history is available ***Azure Redis Cache*** is used to provide pre-computed product recommendations for the customer.

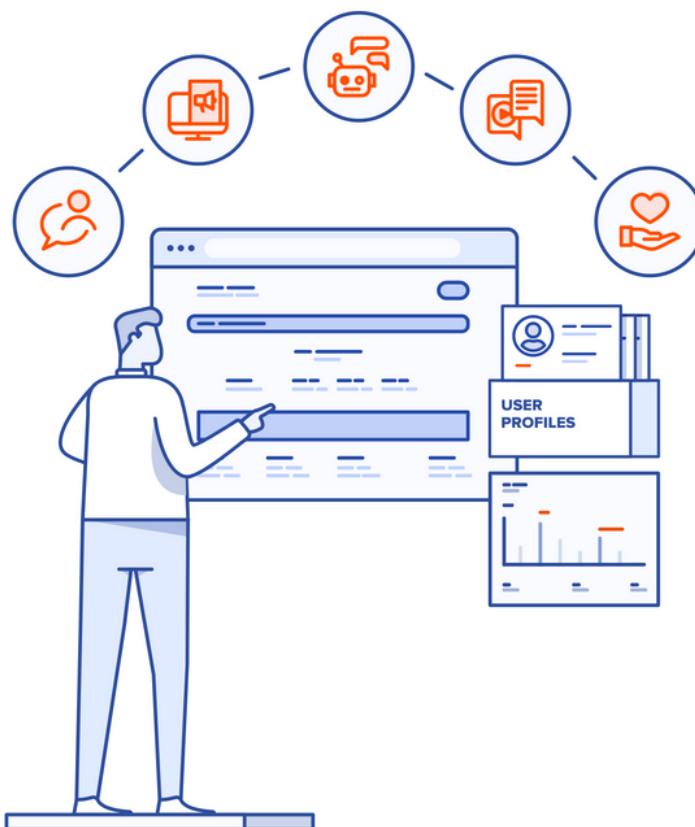


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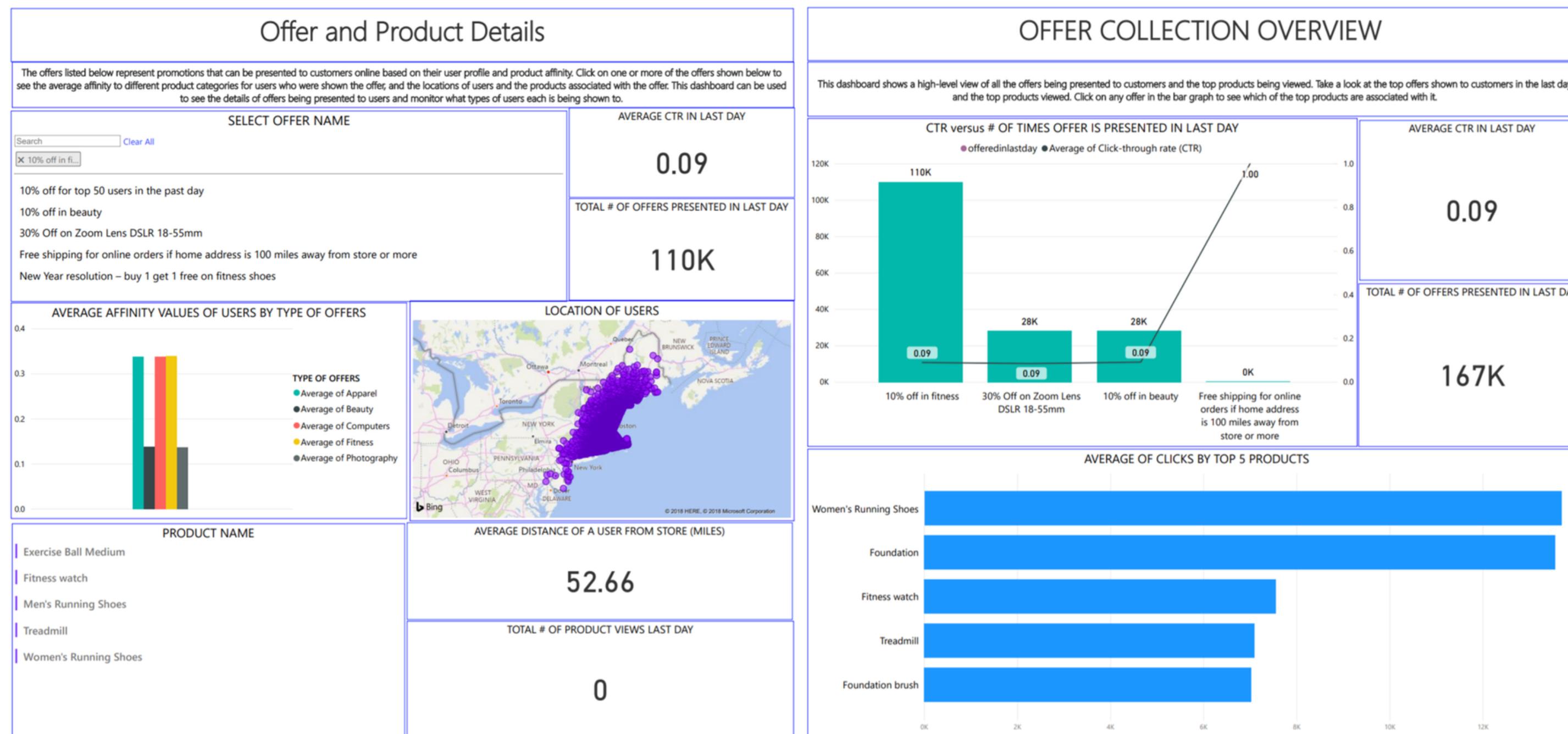
# Technical details and workflow

1. User activity on the website is simulated with an **Azure Function** and a pair of **Azure Storage Queues**.
2. Personalized Offer Functionality is implemented as an **Azure Function**. This is the key function that ties everything together to produce an offer and record activity. Data is read in from **Azure Redis Cache** and **Azure Cosmos DB**, product affinity scores are computed from **Azure Machine Learning** (if no history for the user exists then pre-computed affinities are read in from **Azure Redis Cache**).
3. Raw user activity data (Product and Offer Clicks), Offers made to users, and performance data (for **Azure Functions** and **Azure Machine Learning**) are sent to **Azure Event Hub**.
4. The offer is returned to the User. In our simulation, this is done by writing to an **Azure Storage Queue** and picked up by an **Azure Function** in order to produce the next user action.
5. **Azure Stream Analytics** analyzes the data to provide near real-time analytics on the input stream from the **Azure Event Hub**. The aggregated data is sent to **Azure Cosmos DB**. The raw data is sent to **Azure Data Lake Storage**.



# Solution Dashboard

PowerBI visualizes the activity of the system with the data from Cosmos DB. The snapshot below shows an example PowerBI dashboard that gives insights into the offers being shown to customers and predicted customer affinity to those offers.



# TripAdvisor's Dynamically-Generated Suggestions

TripAdvisor makes travel planning easy with suggestions and deals based on visitors' search history.

When a visitor is searching the internet for travel information, they are targeted by TripAdvisor's dynamic ads, and they get very specific.

Booking Providers

- Alaska Airlines \$541
- Delta \$456
- Expedia.com \$444
- Hotwire \$989
- JustFly \$440
- United \$550

More filters ▾

\$456 Delta 6:00a MCO → 12:35p MSO 8h 35m 1 stop (SLC)  
5:45p MSO → 5:08a MCO 9h 23m 1 stop (SLC)

Show details Operated by Delta, Skywest DBA Delta Connection

\$456 Delta 2:19p MCO → 9:46p MSO 9h 27m 1 stop (MSP)  
5:45p MSO → 5:08a MCO 9h 23m 1 stop (SLC)

Show details Operated by Delta, Skywest DBA Delta Connection

Come back for low fares and nonstop flights.

tripadvisor HOTELS Best Prices on Missoula Hotels Only on TripAdvisor—millions of reviews to help you get it right TripAdvisor View Deal Ad

Save \$460 Delta 6:00a MCO → 12:35p MSO 8h 35m 1 stop (SLC)  
5:45a MSO → 4:42p MCO 8h 57m 2 stops (MSP, CVG)

Show details Operated by Delta, Endeavor Air DBA Delta Connection, Skywest DBA Delta Connection

\$460 Delta 2:19p MCO → 9:46p MSO 9h 27m 1 stop (MSP)  
5:45a MSO → 4:42p MCO 8h 57m 2 stops (MSP, CVG)

Show details Operated by Delta, Endeavor Air DBA Delta Connection

Compare Sites vs. KAYAK

justfly.com Compare

ORBITZ Compare

cheapair® Compare

priceline® Compare

hotwire® Compare

Expedia® Compare

OneTravel® Compare

CheapTickets® Compare

For example, when a visitor searches the internet for flights to a specific destination, a dynamic TripAdvisor ad appears with a competitive deal offer on accommodation where the person is traveling to. TripAdvisor's ad is personalized in a number of ways here, from the product to the destination to and from.

Personalized Offers | References

<https://docs.microsoft.com/en-us/azure/architecture/solution-ideas/articles/personalized-offers>  
<https://github.com/Azure/azure-ai-personalized-offers>

