



**Predica**

**PredSell product recommender**

# Overview

Our recommendation system is based on 2 main components, which can be separated or enhanced.

**A.**

Intent  
detection



PredSell

**B.**

Recommendation  
engine



# Concept – Intent detection



- In order to build user profiles, we identify key indicators throughout the user's lifecycle. Another option is to ingest the existing datasets and combine them with explicit user signal.
- User profiles are used together with our enriched data, real-time trending topics, and understanding of the wider user-base, to empower the recommendation engine.
- **Intent detection results can support many solutions (recommendation engines, chatbots, real-time marketing campaigns). Using this module leads to an increase in customer's satisfaction and supports content personalization.**

## Sample scenario

Generating personalized promotions, or reducing price in real-time, if the specific customer's intent is detected.

## Challenges

- There is a huge variation when it comes to individual consumption patterns and behaviors
- People do not always want to buy specific products
- "Cold start" issue in case of new customers
- Finding answer to the question: What can I offer to this specific user?

## Solution components

- **Azure Machine Learning** – machine learning model, responsible for intent detection
- **Azure Stream Analytics** – real-time data analytics engine

## Desired benefits

- Rich user experience, enhanced by personalized content
- Reduced customer loss rate
- Real-time marketing campaigns and content adjustment

# Concept – Recommendation engine



- Cross-sell / up-sell, by showing customers specific products, based on collaborative filtering and on-site user's behavior.
- Showing visitors complementary products, based on their buying behavior.
- **Showing visitors new product offers, based on individual user's preferences and product similarities.**
- **Displaying the most relevant product offers for each individual user, to satisfy their specific needs and save time.**
- **Showing the trending products, based on your user's purchases and general trend.**

## Sample scenario

Extracting only relevant content from large bulk of information for further documentation.

### Challenges

- Recognizing preferences of individual users
- Real-time response during large traffic
- Covering multiple brands, collections and products
- "Cold start" issue

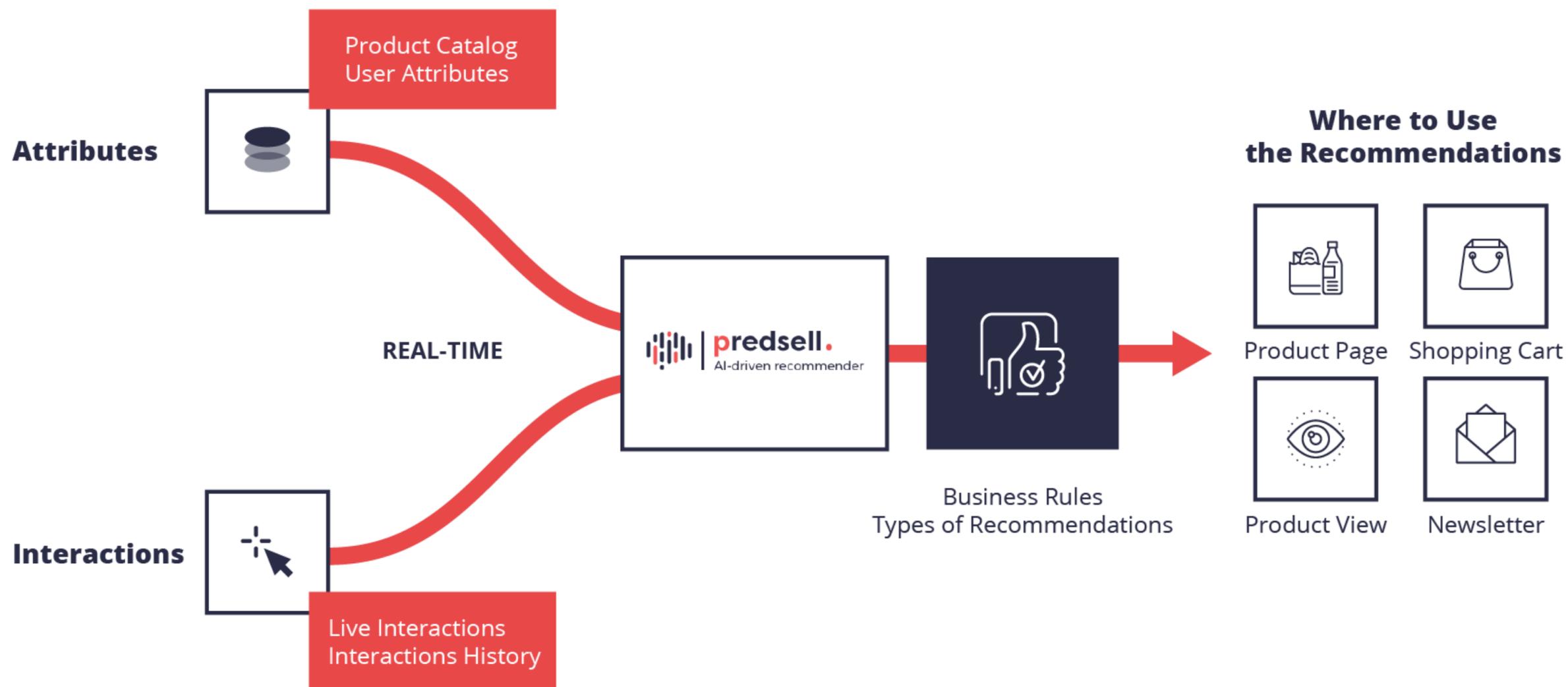
### Solution components

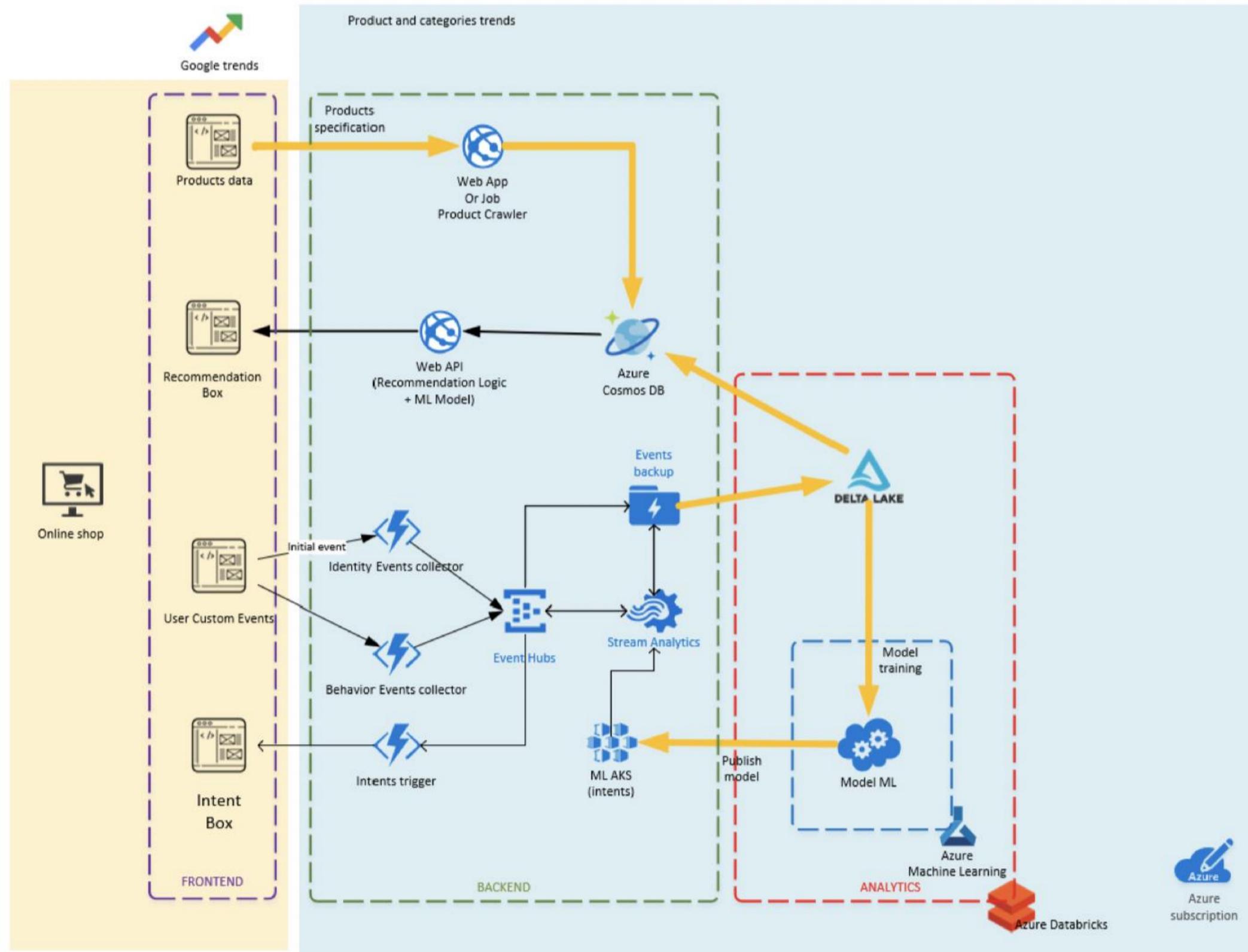
- **Azure Databricks**, for data processing pipelines
- **Azure Machine Learning**, used by models as a web service

### Desired benefits

- **Increasing relevance** of recommendations for individual store visitors.
- A complex ensemble of incrementally-trained ML Models:
  - **Collaborative filtering models**, accelerated through sparse locality-sensitive hashing
  - **Association rules models**, to use most common baskets in recommendations
  - **Hybrid models**, as the most advanced recommendation technique, using content for recommendations
- One engine for multiple frames on the website.

# Solution concept





- Product metadata crawler or integrator – Azure WebApp or Azure Data Factory
- Serving recommendations to different frames – WebApp, CosmosDB
- Gathering custom events from online store in real-time – Azure Functions and Event Hub
- Stream Analytics – detecting intents in real-time
- Azure Data Lake – storing raw data for ML purposes
- Data processing and Machine Learning activities – Azure Databricks and Azure Machine Learning

# Why choose PredSell?

Our solution is not a predefined product, limited to certain functionalities. It is a collection of Microsoft Azure services, which can be extended or narrowed, depending on the customer needs and business profile.

Cloud-based **01**

The solution is based on Microsoft Azure cloud. Therefore, it doesn't require investment in hardware and is easily manageable.

Secure **02**

It is fully secured by Azure AD and the data is stored in highly protected data centers. Additional solutions, such as Okta, can be integrated.

Scalable **03**

Thanks to using Azure Data Lake for storage and tiered Azure Machine Learning, the mechanism is efficient and scalable. Desired storage and computing power can be enlarged with a single click.

AI-based **04**

PredSell is based on the most recent, state-of-the-art services, such as Azure Machine Learning and Databricks mechanisms. This suite of tools is being constantly developed by Microsoft.

Customizable **05**

Reference architecture addresses the problems of the recommendation system in general. However, the web app can be adjusted to the client needs and enriched with additional mechanisms, such as role-based access and managerial Power BI dashboards.



# Want to see PredSell in action?

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