# Recommendation types

**Beta**

This product is in a pre-release state and might change or have limited support. For more information, see the product launch stages (https://cloud.google.com/products/#product-launch-stages).

This page describes the recommendation types, or models, provided by Recommendations AI, with their default placements and optimization objectives, available customizations, and supported event types.

## Introduction

When you sign up to use Recommendations AI, you work with Recommendations AI Support to determine the best recommendation models and customizations to use for your site. The models and customizations you use depend on your business needs, and where you plan to display the resulting recommendations.

When you request recommendations from Recommendations AI, you provide the `placement` value, which determines which model is used to return your recommendations. You can also filter your results (https://cloud.google.com/recommendations-ai/docs/predict#filters).

## Available recommendation types

Recommendations AI offers the following recommendation types:

- "Others you may like" (#oyml)
- "Frequently bought together" (#fbt)(shopping cart expansion)
- "Recommended for you" (#rfy)
- "Recently viewed" (#rv)

## Others you may like

The "Others you may like" recommendation predicts the next product that a user is most likely to engage with or purchase. The prediction is based on both the entire shopping or viewing history of the user and the candidate product's relevance to a current specified product.

**Default optimization objective:** click-through rate (#ctr)

**Default placement:** `product_detail`

**Available customizations:**

- Change optimization objective to conversion rate (#cr)
- Add price reranking (#price-reranking)
- Add diversification (#diversification) (supported but not recommended)
- Disable personalization (#personalization)

**Supported user event types:**

- detail-page-view (https://cloud.google.com/recommendations-ai/docs/user-events#detail-page-view)

## Frequently bought together (shopping cart expansion)

The "Frequently bought together" recommendation predicts items frequently bought together for a specific product within the same shopping session. If a list of products is being viewed, then it predicts items frequently bought with that product list.

This recommendation is useful when the user has indicated an intent to purchase a particular product (or list of products) already, and you are looking to recommend complements (as opposed to substitutes). This recommendation is commonly displayed on the "add to cart" page, or on the "shopping cart" or "registry" pages (for shopping cart expansion).

**Default optimization objective:** revenue per order (#rps)

**Default placement:** `shopping_cart`

**Available customizations:**

- Add diversification (#diversification) (supported but not recommended)

**Supported user event types:**

- detail-page-view (https://cloud.google.com/recommendations-ai/docs/user-events#detail-page-view)
- add-to-cart (https://cloud.google.com/recommendations-ai/docs/user-events#add-to-cart)
- add-to-list (https://cloud.google.com/recommendations-ai/docs/user-events#add-to-list)
- shopping-cart-page-view (https://cloud.google.com/recommendations-ai/docs/user-events#shopping-cart-page-view)
- checkout-start (https://cloud.google.com/recommendations-ai/docs/user-events#checkout-start)
- purchase-complete (https://cloud.google.com/recommendations-ai/docs/user-events#purchase-complete)

## Recommended for you

The "Recommended for you" recommendation predicts the next product that a user is most likely to engage with or purchase, based on the shopping or viewing history of that user. This recommendation is typically used on the home page.

**Default optimization objective:** click-through rate (#ctr)

**Default placement:** `home_page`

**Available customizations:**

- Change optimization objective to conversion rate (#cr)
- Add price reranking (#price-reranking)
- Add diversification (#diversification)

**Supported user event types:**

- home-page-view (https://cloud.google.com/recommendations-ai/docs/user-events#home-page-view)

## Recently viewed

The "Recently viewed" recommendation is not actually a recommendation. It provides the catalog IDs of items the user has recently interacted with, with the most recent items first.

**Default optimization objective:** N/A

**Default placement:** `recently_viewed_default`

**Available customizations:** N/A

**Supported user event types:**

All

## Optimization objectives

Machine learning models are created to optimize for a particular objective, which determines how the model is built. Each model placement has a default optimization objective, but you can request a different optimization objective to support your business goals by contacting your support representative.

After you have trained a model, you cannot change the optimization objective. You must train a new model to use a different optimization objective.

Recommendations AI supports the following optimization objectives:

### Click-through rate (CTR)

Optimizing for CTR emphasizes engagement; you should optimize for CTR when you want to maximize the likelihood that the user interacts with the recommendation.

CTR is the default optimization objective for the "Others you may like" (#oyml) and "Recommended for you" (#rfy) recommendation types.

### Revenue per order

The revenue per order optimization objective is the default optimization objective for the "Frequently bought together" (#fbt) recommendation type. This optimization objective cannot be specified for any other recommendation type.

### Conversion rate

Optimizing for conversion rate maximizes the likelihood that the user purchases the recommended item; if you want to increase the number of purchases per session, optimize for conversion rate.

## Other tuning options

Depending on the placement type, there are some other model tuning options you can request. Talk with your Recommendations AI support representative to find out if these options are right for your implementation.

### Diversification

If you want to ensure that results returned from a single prediction request are from different categories of your product catalog, you can enable diversification.

Diversification reduces the likelihood that similar catalog items are shown in the recommendation panel, at the risk of removing some good recommendations. It is normally used for "Recommended for you" (#rfy), and is not recommended for "Others you may like" (#oyml) or "Frequently bought together" (#fbt) unless you are concerned about too many items from the same category.

### Personalization

By default, prediction results are personalized by user for the "Others you may like" (#oyml) recommendation. If you would prefer to show catalog items relevant to the product being viewed rather than based on the user's previous engagements with your site, you can disable personalization.

Personalization is also used for the "Recommended for you" (#rfy) recommendation type, but cannot be disabled for that recommendation type.

### Price reranking

For the "Others you may like" (#oyml) and "Recommended for you" (#rfy) recommendations, you can enable price reranking. Price reranking causes recommended catalog items with a similar

recommendation probability to be ordered by price, with the highest-priced items first. This setting could result in a decrease in click-through and conversion rates.

### Results filtering

You can filter the prediction results for a placement by the tag value you provided with the catalog item and by whether the item is in stock. Learn more (https://cloud.google.com/recommendations-ai/docs/predict#filters).

## Available placements

Each recommendation you create comes with a default placement. You can create more placements for your existing recommendations; for more information, see Managing recommendation placements (https://cloud.google.com/recommendations-ai/docs/manage-placements).

You can see your active recommendations and their placement IDs in the Recommendations AI Dashboard (https://console.cloud.google.com/recommendation/datafeed/dashboard).

## Requirements for starting with a new recommendation

The first time you use a specific recommendation type for your site, you are training a new machine learning model, which requires sufficient training data, as well as time to train and tune the model. These are the steps required to start using a new recommendation type:

1. Import your catalog (https://cloud.google.com/recommendations-ai/docs/upload-catalog) to Recommendations AI, if you haven't already, and implement processes to keep the uploaded catalog up to date.
2. Start recording user events (https://cloud.google.com/recommendations-ai/docs/record-events) to Recommendations AI, if you haven't already.
3. Identify the recommendation type (#model-types) and optimization objective (#opt-obj) you want to use.
4. Determine the user event data requirement (#import-reqs) for your desired recommendation type and objective.

5. Import historical user event data (https://cloud.google.com/recommendations-ai/docs/manage-user-events#import) to meet the event data requirements, or wait until the user event data collection meets the requirements.
6. Contact your Recommendations AI support representative to initiate training and tuning.

   This process can take up to two weeks.
7. When your model is available, create your placements (https://cloud.google.com/recommendations-ai/docs/manage-placements#create).
8. Start requesting predictions (https://cloud.google.com/recommendations-ai/docs/predict).

## User event data requirements

The type of user events you import, and the amount of data you need, depends on your recommendation (model) type (#model-types) and your optimization objective (#opt-obj). When you reach the minimum data requirement, you can begin model training. The data collection window represents the maximum length of time Recommendations AI looks back for user events; bulk importing more data has no effect on model quality.

| Recommendation type | Optimization objective | User event type | Minimum data requirement | Data collection window |
|---|---|---|---|---|
| Recommended for you | Any | `detail-page-view` `add-to-cart` `purchase-complete` `home-page-view` | 1 week | 3 months |
| Others you may like | Click-through rate | `detail-page-view` | 1 week | 3 months |
| Others you may like | Conversion rate | `add-to-cart` `detail-page-view` | 1 week | 3 months |

| Recommendation type | Optimization objective | User event type | Minimum data requirement | Data collection window |
|---|---|---|---|---|
| Frequently bought together | Any | `purchase-complete` `detail-page-view` | 3 months | 12 months |



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