

Smart Analytics Reference Patterns

How to build an e-commerce recommendation system with BigQuery ML to improve shoppers' experience through personalized product recommendations

What is a product recommendation system?

A product recommendation system helps you understand customer behavior by creating an advanced set of complex connections between products and users, and compares and ranks these connections in order to recommend products and/or content accordingly.

What are the benefits of a product recommendation system?

- Improve shoppers' experience resulting in better customer acquisition and retention
- Introduce customers to additional complementary products (or services) as they browse your website
- Better understand customers' purchasing behavior and patterns
- Personalize product recommendations based on past shopper behavior
- Increase clickthrough rates, conversions, and revenue; and build brand affinity



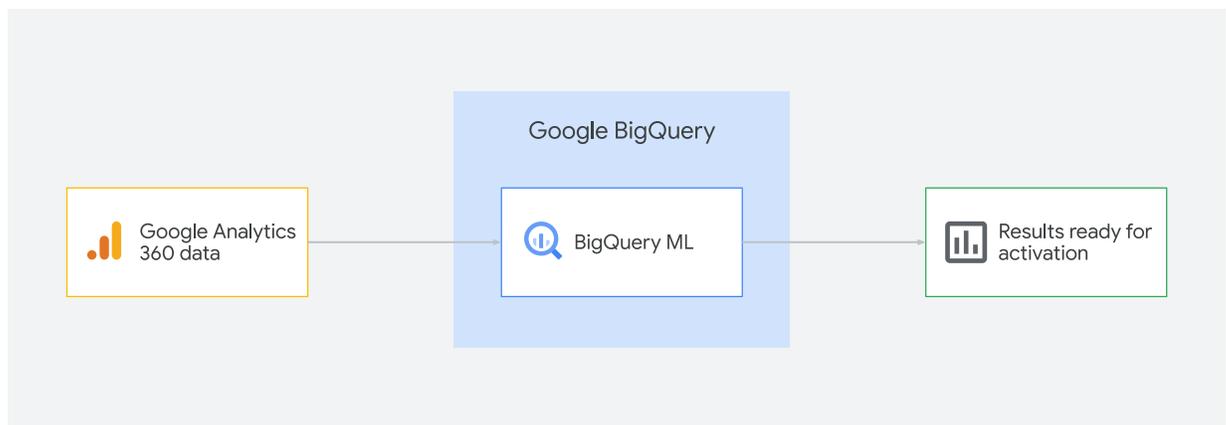
How does the e-commerce recommendation system pattern work?

In a nutshell, recommender systems predict the preference a user might have for a given product or service based on the collective behavior of many users.

Many companies instrument their web pages to understand their users' sessions; for example, what products do they look at, how long do they look at them, what do they do next. These data points can be used to infer implicit product feedback, for example: if someone looks longer at a product page then they are more interested in that product. Of course, explicit feedback can be used as well, for example, a customer's rating of a product.

[Google Analytics](#) provides companies with a way to instrument their website and understand their users. For this pattern, we provide sample Google Analytics 360 data in BigQuery, and you will be happy to know that [exporting your own Google Analytics data into BigQuery](#) is just a few clicks away. Your data could be captured from any sources your company currently uses.

Once your data is in BigQuery. Generating recommendations is just a matter of some SQL querying and some ML muscle under the hood.



For this reference pattern, you will:

- Process sample data into a format suitable for training a recommendation model using BigQuery ML
- Create, train, and deploy the recommendation model in a single step
- Get predictions from the deployed model about what products your customers are most likely to be interested in
- Export prediction data from BigQuery to Google Analytics 360, Cloud Storage, or programmatically read it from the BigQuery table

To get started with building a product recommendation system, check out all the code written, packaged, and ready for you to test, customize and deploy [here](#).

Benefits of this Google Cloud approach

- Fewest number of moving pieces means simplicity – the data storage, data processing, and ML are all within BigQuery
- BigQuery provides a fully managed, highly-scalable, performant, and cost effective data warehousing solution
- Simple, integrated data ingestion and export for activation of the trained model
- The same person can now analyze data and also train and operationalize models in BigQuery using BigQuery ML. You no longer need a data engineer in-between to export data out of BigQuery for ML purposes
- Helps automate recurring, labor intensive tasks, especially if your assortment of products (or services) is large
- Ability to quickly take into consideration your customers' (changing) behavior because the data is readily available in BigQuery

Smart Analytics reference patterns are designed to reduce the time it takes for you to implement analytics and ML solutions so you can get up and running as quickly as possible. To get started, check out all existing reference patterns [here](#) and select the one that best fits your needs.

