How to Create an Amazon-Like Experience with Fusion

The massive global success of Amazon can be tied to how the company employs search. Yes, of course, customers love free shipping, liberal return policies, and competitive prices. But first and foremost, customers know when they go to Amazon.com, they'll find exactly what they are looking for. Every part of Amazon.com is a big search UI powered by a powerful, scalable back end with several key features. You, too, can have these capabilities using the Lucidworks Fusion suite of products.

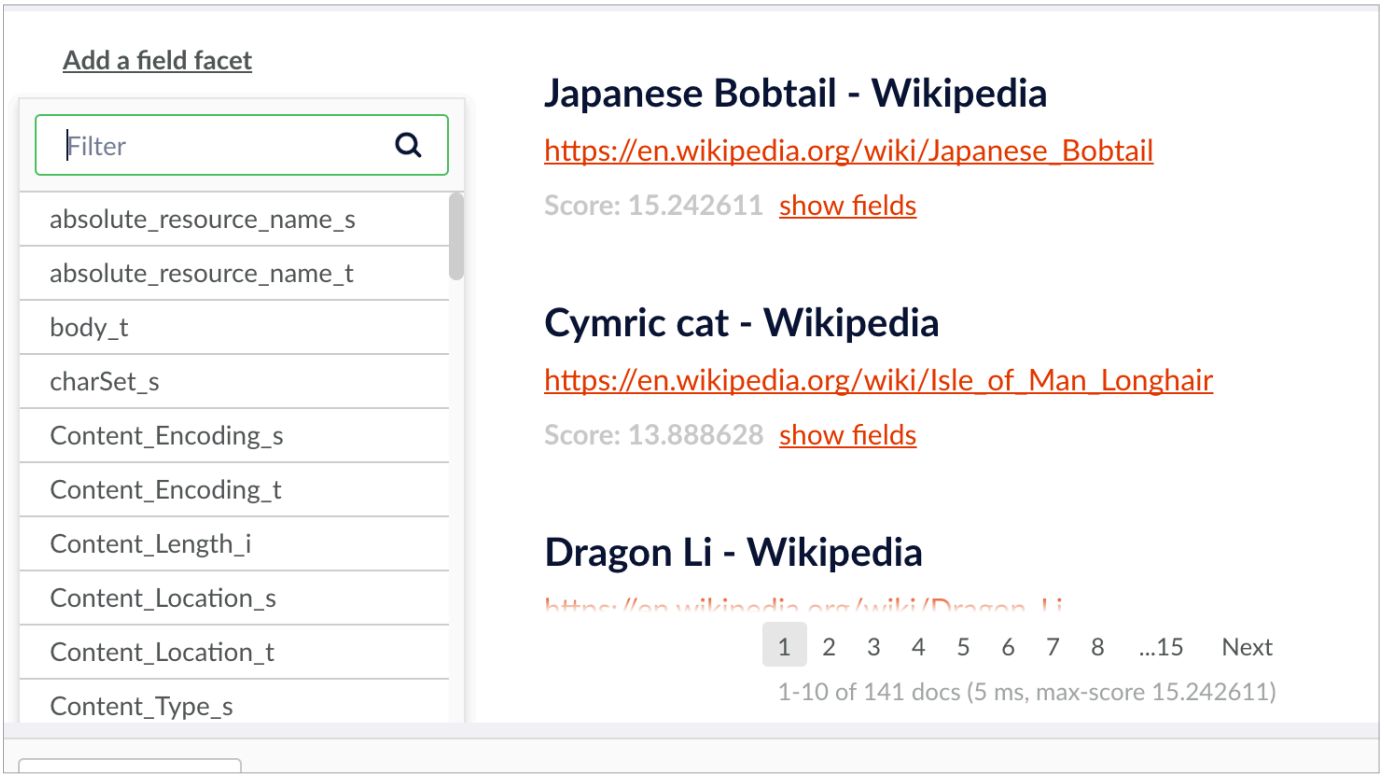
Let's take an inventory of these features, from the top of the Amazon homepage all the way down to the footer.

The Search Bar

The Amazon search bar demonstrates two fundamental features: typeahead and faceting. Typeahead guesses what you're about to type before you finish typing the query. Faceting suggests departments you might limit your search to. For instance, once I type "blue sue," Amazon suggests I look for blue suede shoes in the men's shoes and music departments.

Once I select "blue suede shoes in men's shoes," I'm taken to a set of search results showing that type of shoe in the men's shoe category. I also see a dropdown box next to the search bar that lets me pick other departments. Fusion allows you to implement similar functionality to the typeahead (aka autocomplete) functionality. This is available by default.

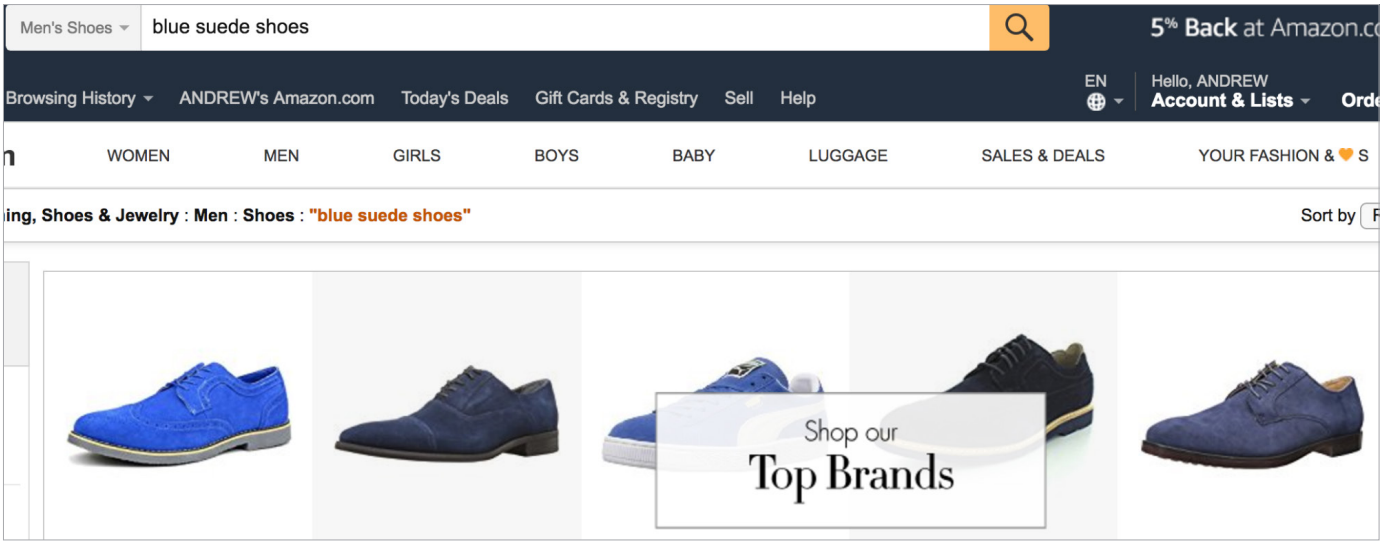
Faceting is part of a Fusion query pipeline. You can add faceting via a point-and-click interface to select the field you want to facet. You can also easily develop search UIs that incorporate typeahead and faceting features.



Adding a faceted field via the Fusion Query workbench

Top Brands

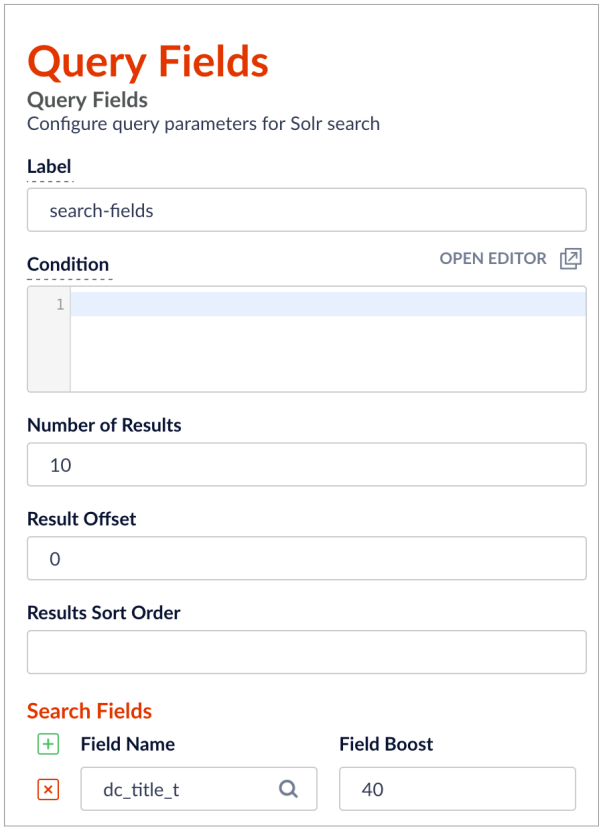
After searching on “blue suede shoes” and going to the results page, Amazon boosts “top brands,” most likely based on merchandising policies or paid sponsorships.



Amazon Promoted Items

These top brand results can be “boosted” into the main set of search results or shown as a separate companion query. You can boost on a field in Fusion using the Query Fields stage of the Fusion query pipeline. This is all set up by default. You just specify the field (i.e. “sponsored”) and boost it.

You can also have a separate sub-query against a collection of brands and boost results matching those brands. Alternatively, this may just be another form of faceted search based on brand name.

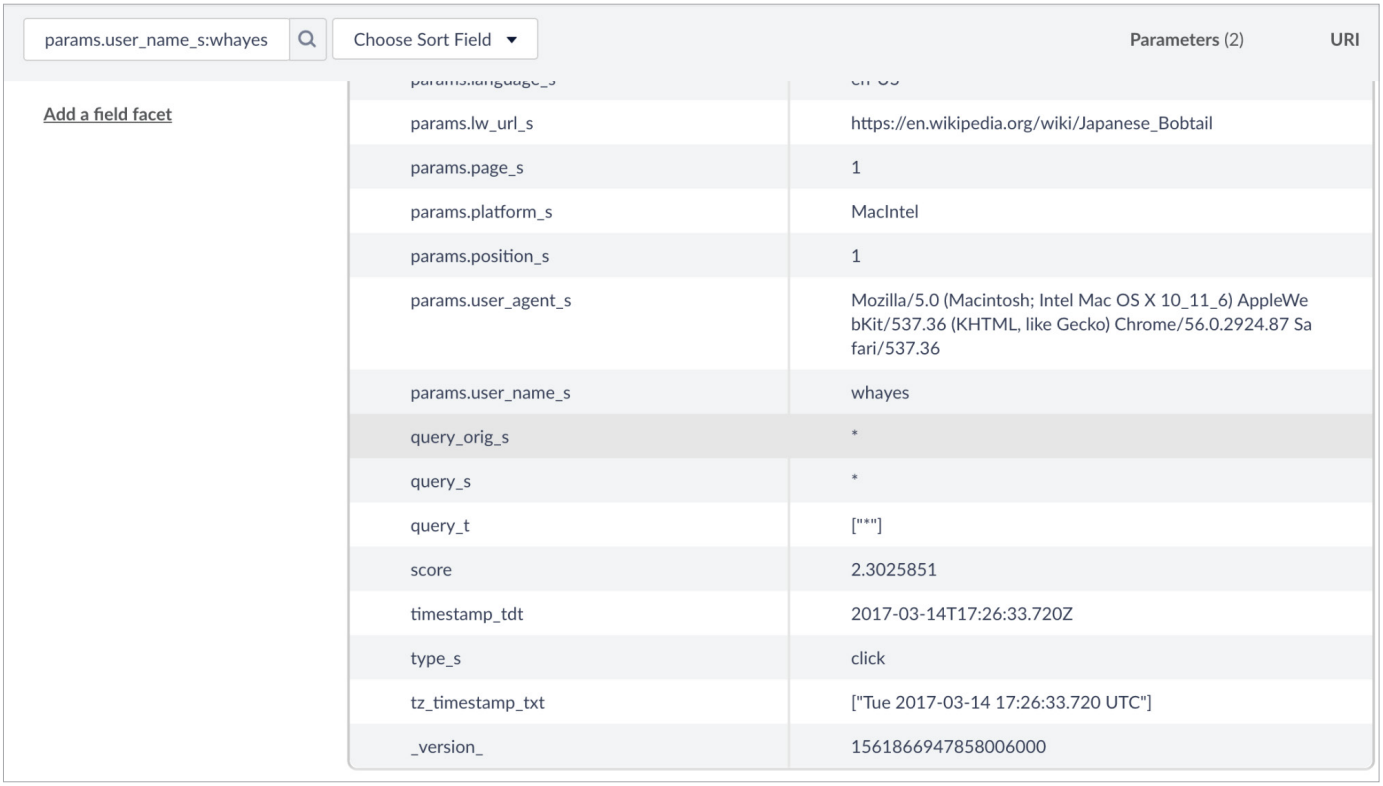


Boosting a field with Fusion “Query Fields” stage

Related to Items You've Viewed

On the Amazon homepage, you can see what are essentially the results of your most recent search or a few previous searches where you actually clicked on something. Using Fusion's signals you can get a list of recently clicked items or just recent searches generally.

Amazon Promoted Items



Signals for user clicks from Fusion Query Workbench

Based on your signals and the items you picked, you can use the Item for Item recommender to find other things things a user might be interested in purchasing.

More Items to Consider

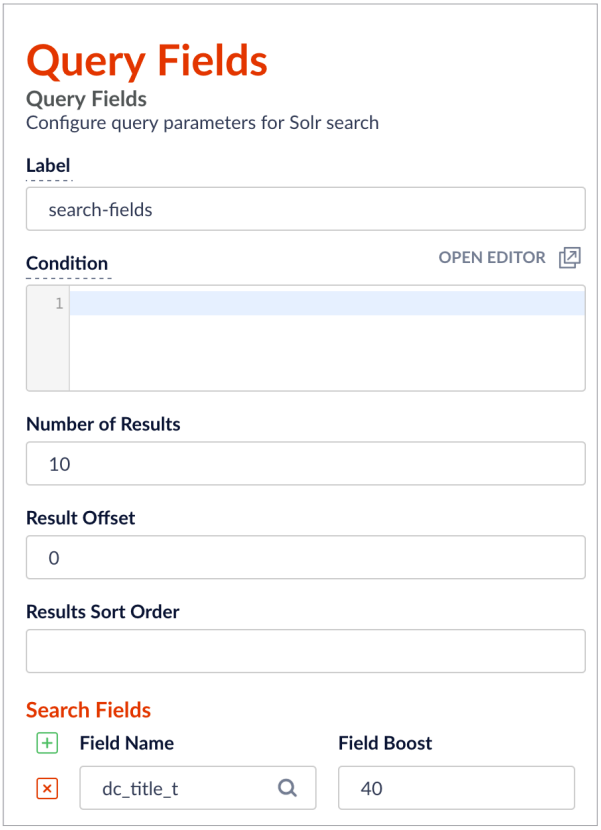
Amazon also suggests even more items to consider based on your previous searches.

Amazon top picks

These are "similar" to things that you've clicked on. For users that have history, Fusion can do this automatically with the Recommend Items for User recommender. Previous user searches, clicks, shopping cart adds or purchases can be captured as Fusion signals.

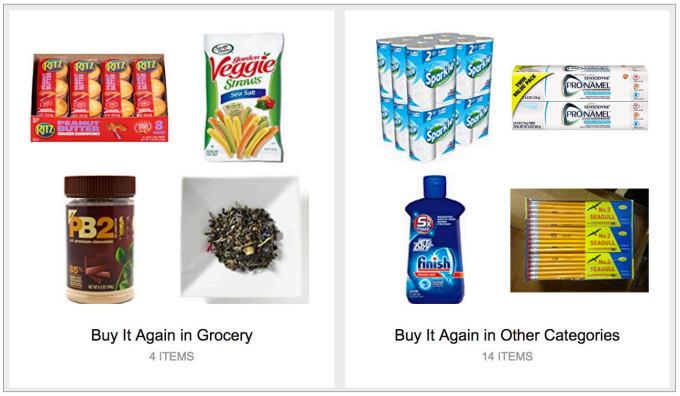
What about users without a lot of history? Using the "More Like This" feature you can provide the same functionality for your search UI. All you need is a single or list of item IDs.

MoreLikeThis takes the ID of an item and returns a list of similar items. It is accessed via a simple REST API for easy integration into your search application.

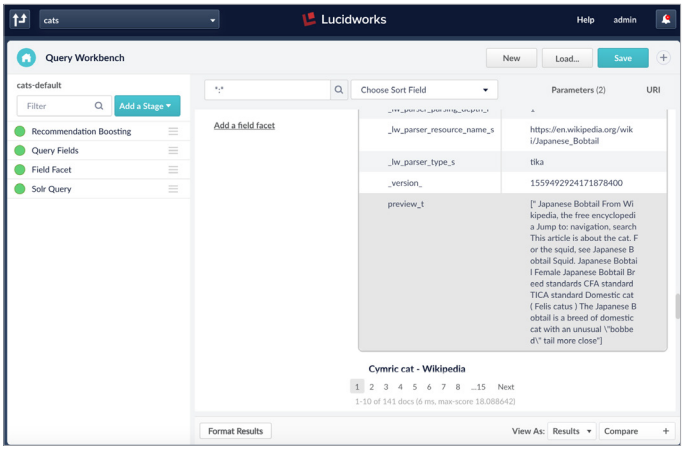


Your Amazon.com

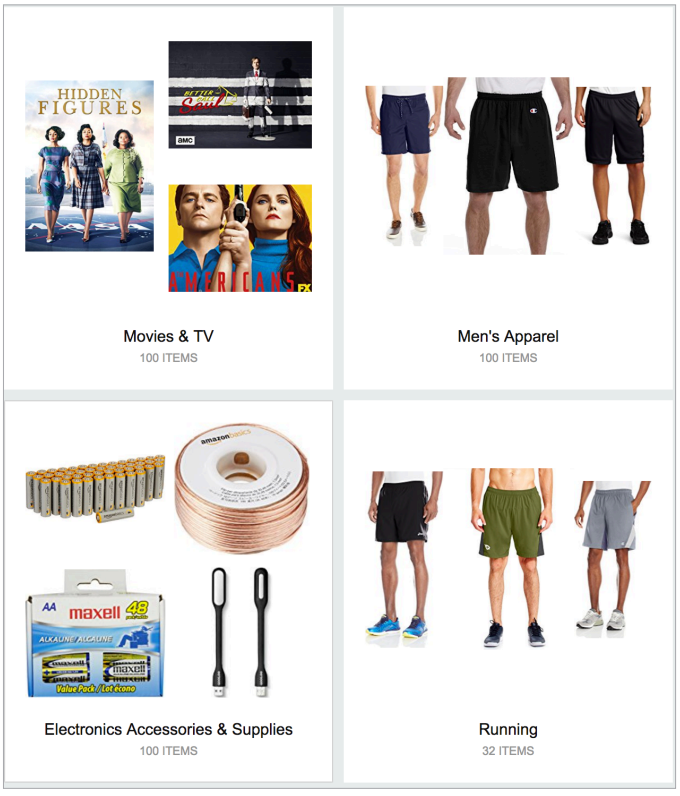
When you click on Your Amazon.com you get a much closer look at of how Amazon views you. First, they show you things that you've bought (which you can capture via signals). Next, they show you categories (Facets) which you've purchased items from with key items shown as representations (mainly Item or User recommendations or MoreLikeThis on a searched item or purchase) and finally a set of movies "inspired by your purchases." Which can just be accomplished by an Items for User recommendation based on a collection of your past purchases (signals).



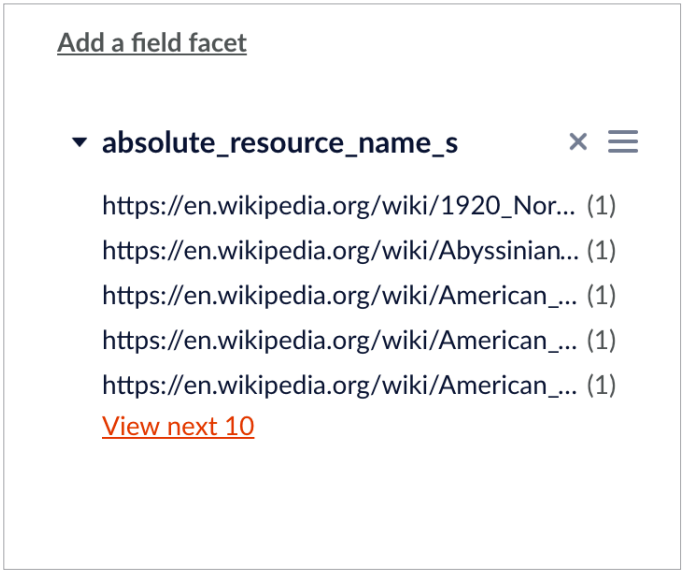
Amazon "buy it again"



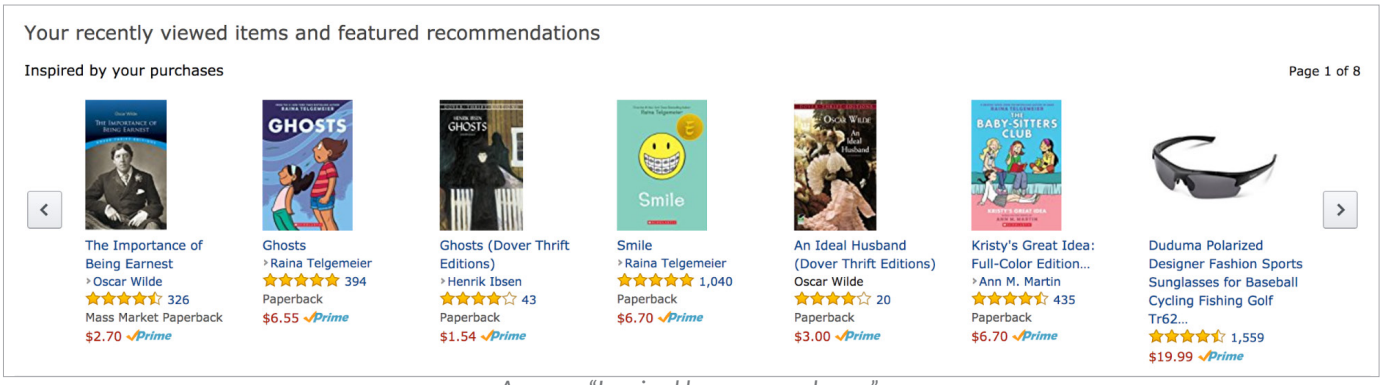
Fusion signals in the Query Workbench



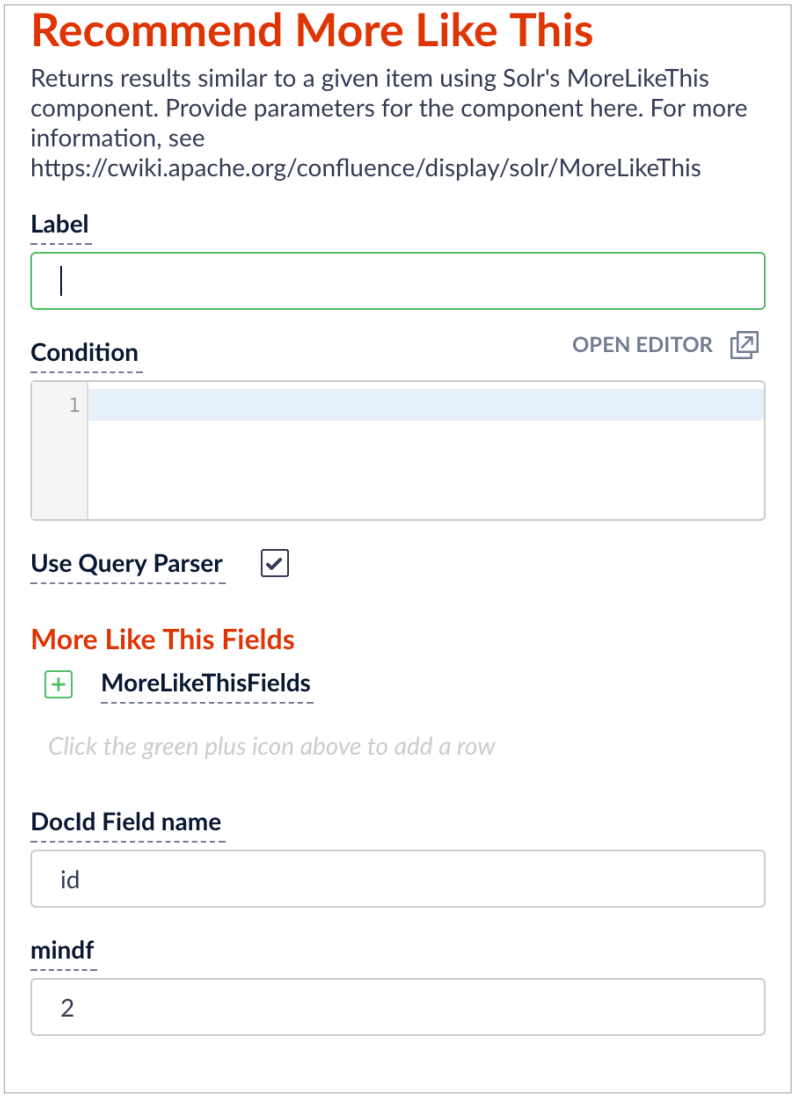
Amazon Recommended categories that you've made purchases in



Fusion Faceted Field in Query Workbench



Amazon "Inspired by your purchases"



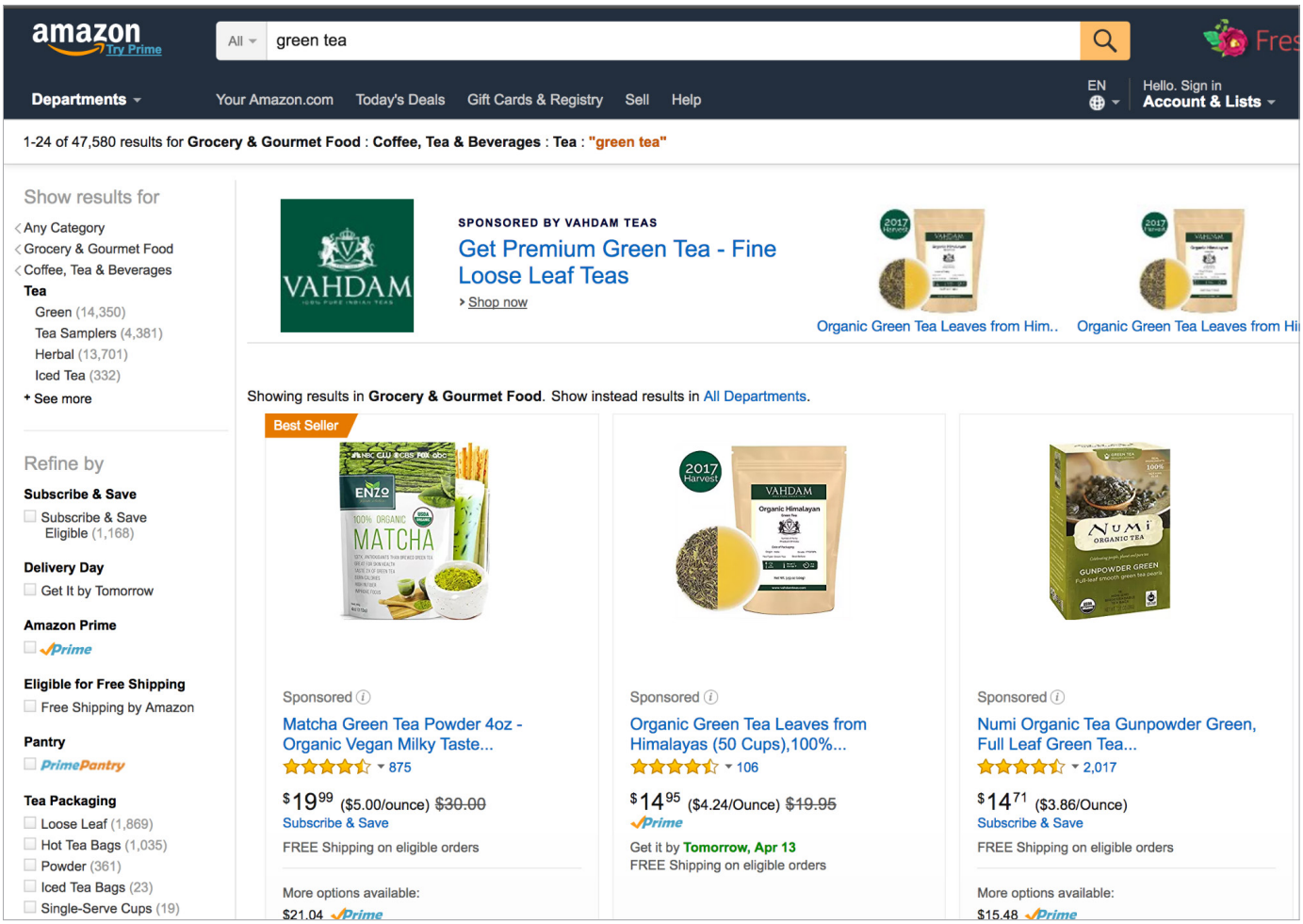
Fusion AI Recommend Similar Items stage (update to More Like This)

Improve your Recommendations

If you click on Improve your Recommendations you see a list of purchases and an opportunity to control how they affect Amazon's recommendations. You could do something similar with Fusion by capturing the feedback in another collection and aggregating it together in a subquery, boosting items with highly rated purchases first. You might also opt to simply remove purchase signals that users remove from this feedback or rate poorly. One might suspect that this "improve your recommendations" form is used rarely, but user ratings on other parts of the site are considered in a similar way.

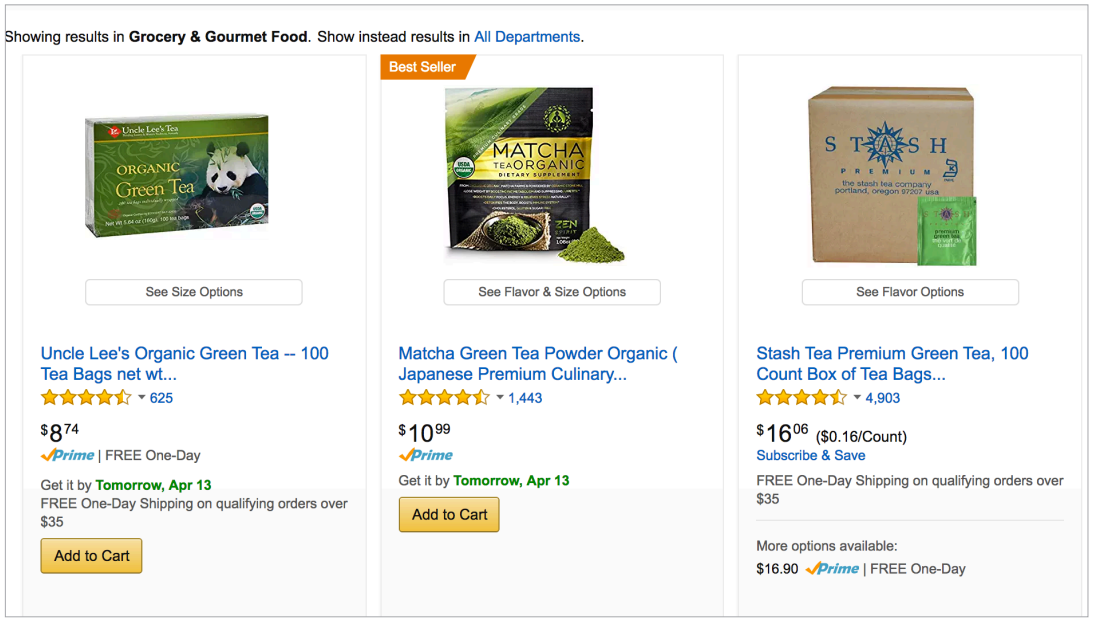
Beyond Personalization

Normally at Lucidworks we'd put this first, but it isn't quite as obvious on Amazon.com as the more personalized features. When you search on a generic term like "green tea," what other users do affects your results as well. You can see this when you search while logged out and compare it to what you see when logged in.



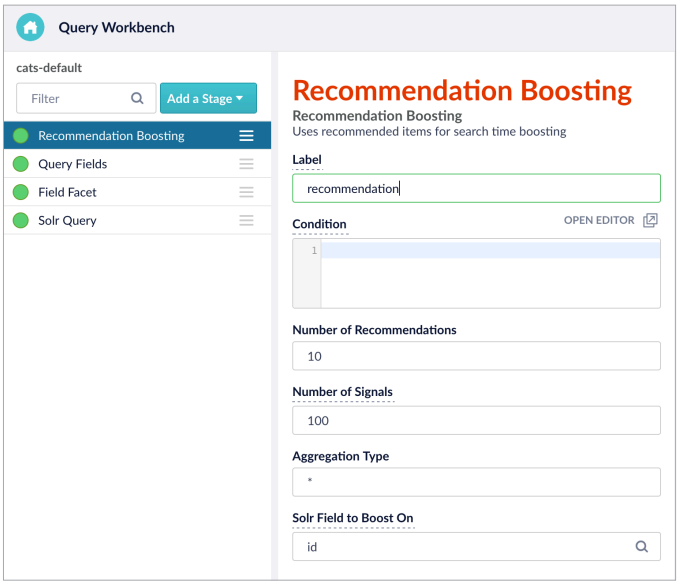
Amazon "green tea" recommendations for an anonymous user

Users that have not logged in see sponsored content first and results boosted based on what other users clicked on or purchased based on that search. You see that Matcha brand is boosted to the first slot for the anonymous user. A more experienced tea drinker wouldn't have clicked on or purchased matcha powder when searching on green tea. So when a tea drinker, with a tea search, and purchase history is logged in, they see less sponsored content, and less content recommended by the broader user community.



Amazon "green tea" Recommendations for a logged in user

The recommendations based on what other users do is a type of collaborative recommendation. This is a feature offered by the default Fusion query pipeline. A search application merely needs to capture the signals.



Fusion Recommendation Stage

```
/**
 * Helper method to document click events.
 * @param  {string} docId      The document id
 * @param  {object} options     An object containing parameter overrides and options.
 *    - The object can be any parameter which will be passed through, including parameters.
 *      Ex: {type: 'custom', params: {filterQueries: ['something']}}
 * @return {promise}
 */
function postClickSignal(docId, options) {
  var date = new Date(),
    data = {
      params: {
        docId: docId,
        head_field: ConfigService.config.head_field,
        language: ClientStatsService.getBrowserLanguage(),
        platform: ClientStatsService.getBrowserPlatform(),
        user_agent: ClientStatsService.getBrowserUserAgent(),
        user_name: ConfigService.getLoginCredentials().username || ConfigService.config.anonymous_access.username,
        query: QueryService.getQueryObject().q
      },
      pipeline: ConfigService.config.signals_pipeline,
      timestamp: date.toISOString(),
      type: ConfigService.config.signal_type
    };

  _.defaultsDeep(data, options);

  return postSignalData([data]);
}
```

A signal as written in JavaScript

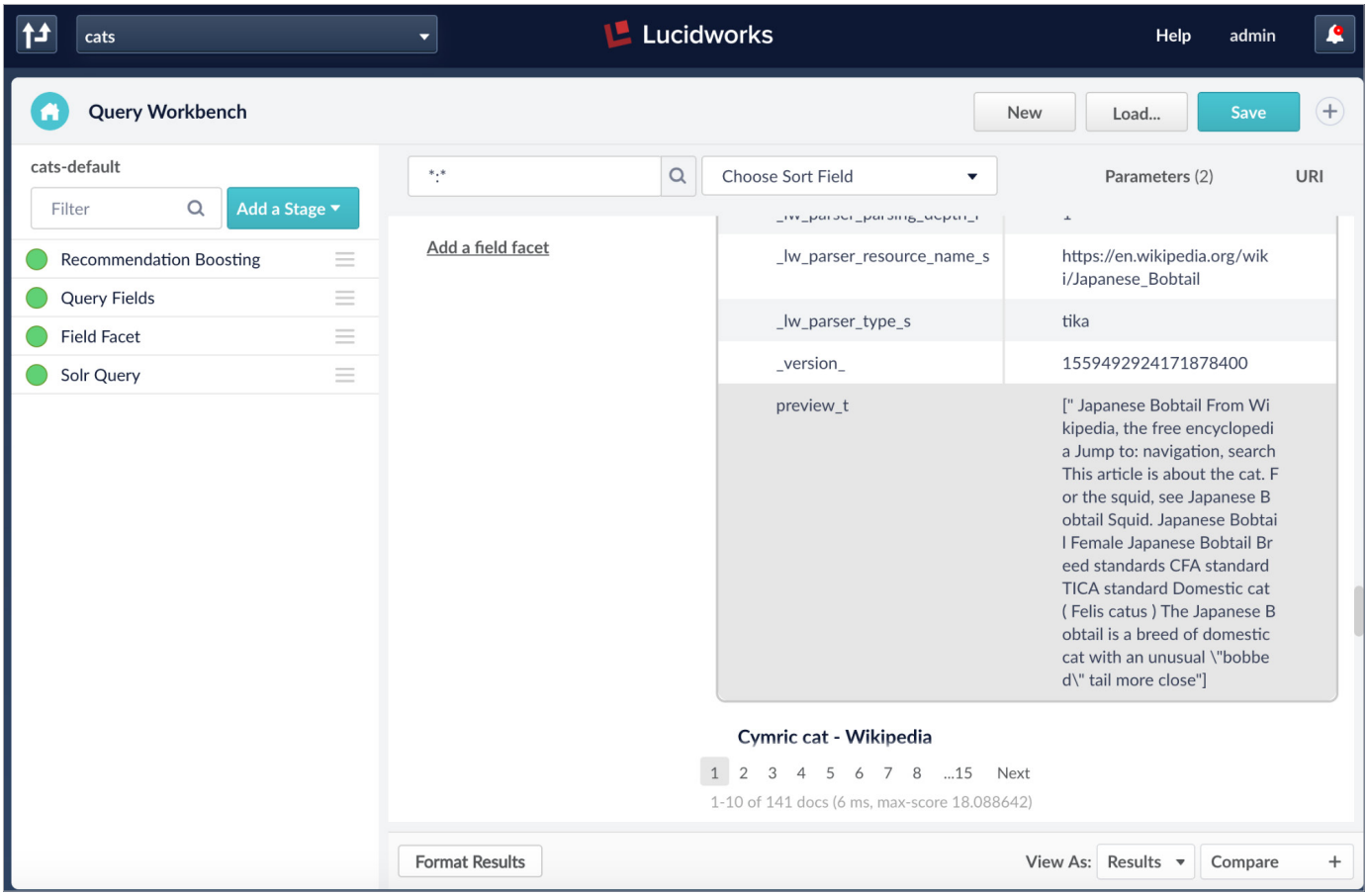
Another key feature of Amazon is the longer spread analytics. By capturing user purchase signals, they're able to see when two purchases are frequently made together and recommend purchasing them together. Sometimes they even offer deals for these complimentary purchases.

Amazon Frequently Bought Together

Fusion captures not only signals but allows for aggregations and other kinds of derived information. This might include purchases that usually happen in the same cart or close together in time.

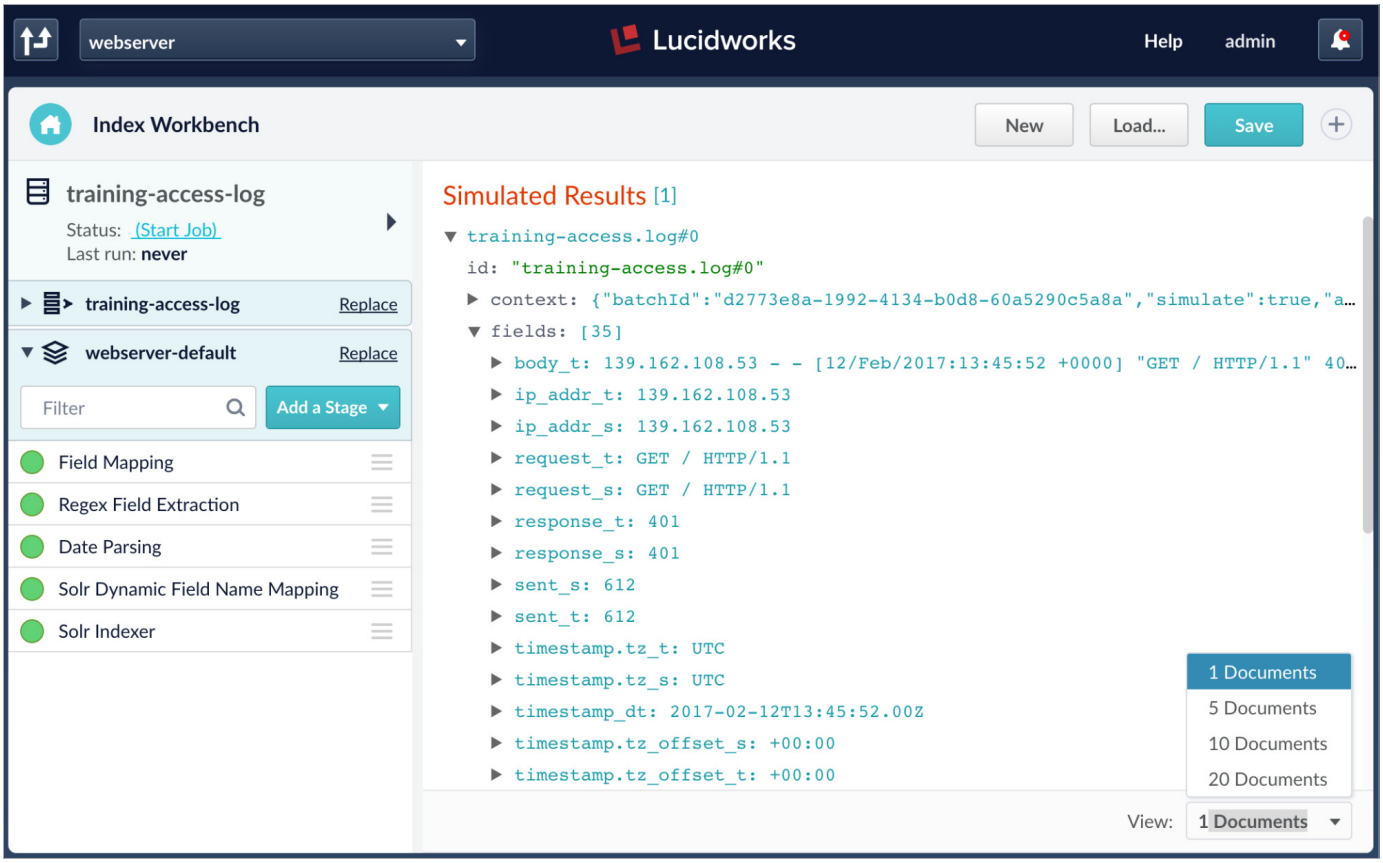
User Intent

As you can see, you can implement similar features to Amazon using Lucidworks Fusion. You can install Fusion, **ingest data and have basic collaborative recommendations with typeahead and faceting in less than an hour**. When you get into deeper personalization, you'll need to measure and tweak your results. A key aspect of this is time. Just because someone purchased diapers 12.5 years ago, doesn't mean they're particularly likely to purchase them today. Quite a bit of **research has gone into the factors that make up measures of user intent**. This includes derived results like demographics with time. Some research indicates that older users tend to be "more certain" and younger users "less certain." An older customer buying a particular type of soap is more likely to buy that same type for a longer time in the future than a younger customer. In concrete terms, this might mean you expire signals for older shoppers more quickly than for younger ones.



Fusion's Query Workbench

The Fusion platform is perfect for everything that goes into measuring user intent. Fusion's Index and Query Workbench features let you test your personalization and recommendation algorithm tweaks before you deploy them or change your data. Fusion includes powerful recommender features as well as machine learning functionality powered by Apache Spark. Additionally, Fusion is especially adept at managing time series data which is key to handling the kind of event measures that go into user intent.



Fusion's Index Workbench simulating a change

Going Beyond Amazon

Automatic Groups (Clustering)

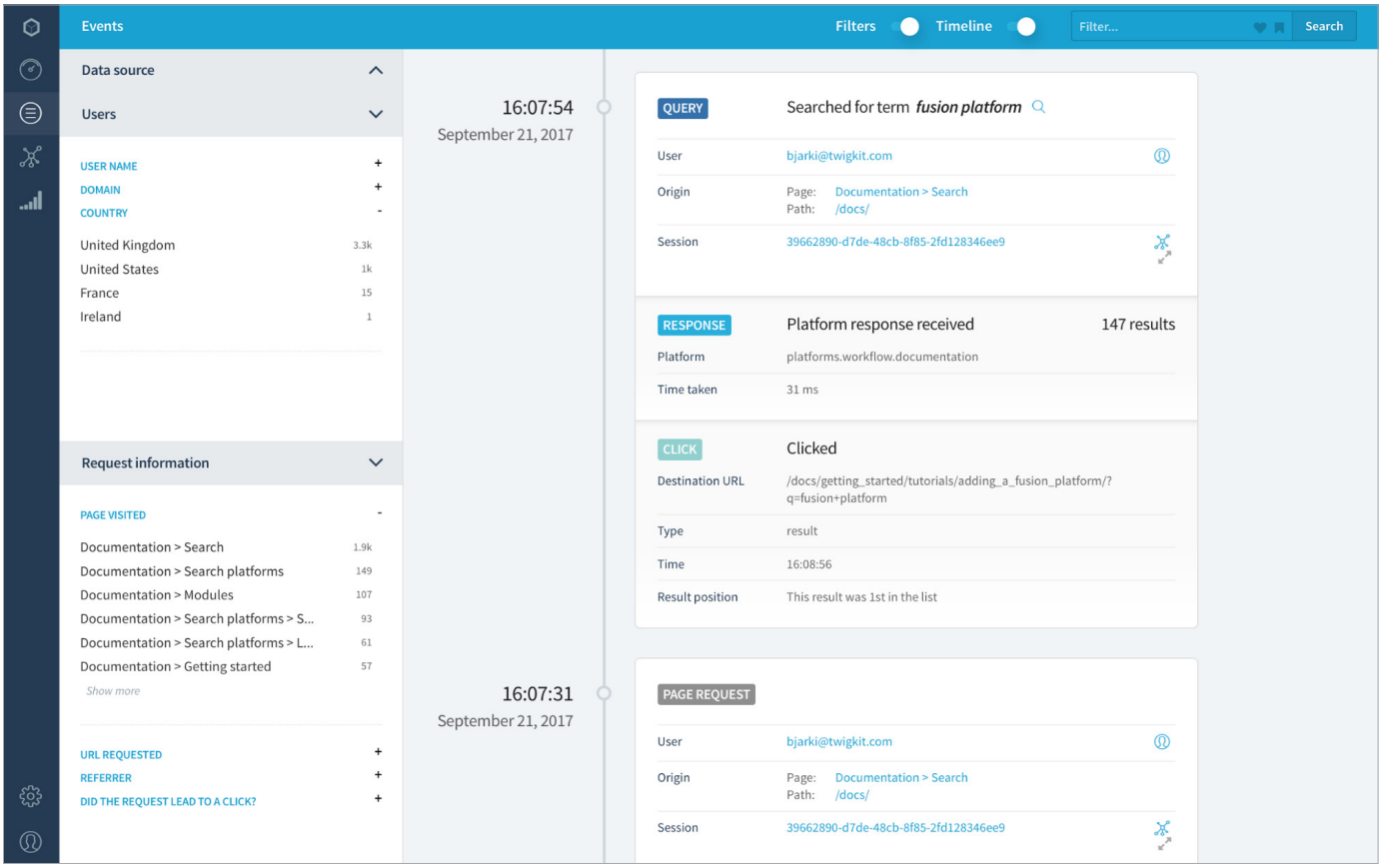
However, you can get one leg up on Amazon. Using Fusion's clustering capabilities, you can automatically group items. This means that even though you might not have a facet or category identified for an item, you can still create a type of grouping with Fusion. This has several uses in retail. A user can find items that are in the 'same group' as other items and refine searches within that group in order to achieve more precise results. I can also use clustering to tune my promotions, matching up similar users with similar offers.

Classification

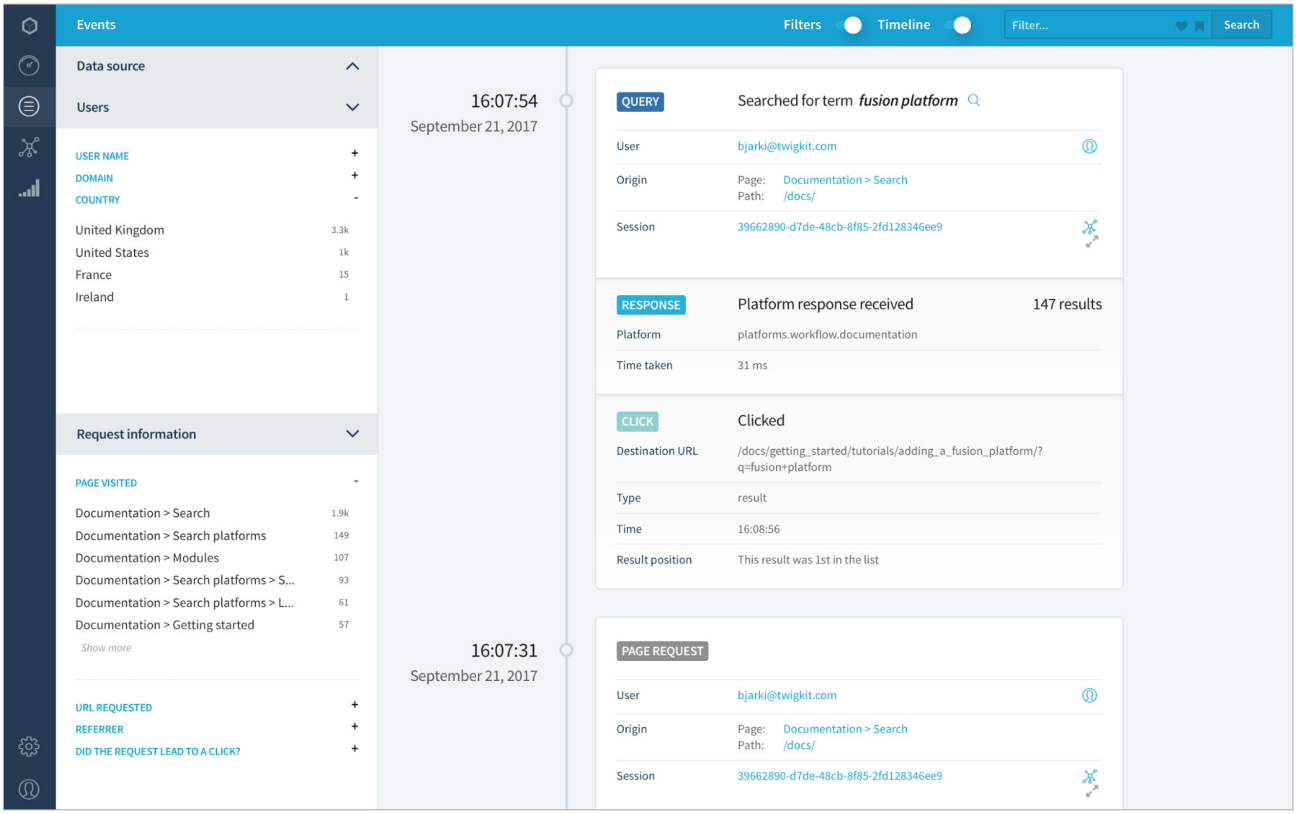
Where you do have categories, you can automatically determine which products fit into those categories via Fusion's classification capabilities. This means you can avoid a manual process of sorting new inventory into categories. It also means you can discover what other categories an item might fall into. For example, just because the manufacturer called it a "4k smartphone" doesn't mean it isn't also a "android phone" or "phablet."

Effectiveness

One thing that is clear for longtime customers of Amazon is that they tweak their algorithms. Every ecommerce company has to do this. Customer behavior changes. For example, some years back, customers rarely used their phones to make a purchase. Now, it is an everyday occurrence for many people.



It is critical to use analytics to measure the effectiveness of your site's personalization and general relevance tuning choices. Fusion comes with powerful analytics tools to do just that. You can use these capabilities to understand your top searches, your most frequent searches that didn't return a result, and other important metrics.



The Search UI

Using Fusion App Studio, you can easily develop a basic search UI with collaborative recommendations. You'll still need some additional attention to UI to achieve the same kind of personalized recommendations as above. But the back end is relatively straightforward. Future Lucidworks releases will accelerate personalized search UI development just like Fusion has accelerated the back end data processing of search.

If you're selling stuff on the Internet, there is no reason you can't have all of the same features that make Amazon a success. All it takes is a little determination and the Lucidworks Fusion platform.

Getting Started

So you're thinking, "That's great! Where do I get this stuff?" You can get started with the Fusion platform with these simple steps:

- The first step is to download Lucidworks Fusion.
- Check out our webinar on Implementing Site Search in an Hour. Consider trying that out!
- Sign up for training.
- Talk to our experts who have accelerated sales for companies like yours!

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