Demystifying Coveo Machine Learning

Automated Relevance, Query Suggestions and Recommendations

Richard Tessier
SVP Products
Key Use Cases

1. Intelligent Query Suggest
2. Automatic Relevance Tuning
3. Recommendations
4. Intelligent Term Detection
5. Personalization
General Concepts
Coveo Machine Learning Flow

Users ➔ Events ➔ Models = Relevance

Interface & APIs
Transmit interaction events and leverages the models built using these events

Events
Captured in our Cloud infrastructure and available for ML models processing

Predictive analytics
Wisdom from the interactions’ sumtotal cues likely intent

Machine learning
Data science drives “what you need next” recommendations
Useful Field Query Examples

The following table presents a few field query examples that you may find useful.

Predefined Queries

Predefined queries are a feature that was added in Sitecore 7.0 Update-1, and it is ... Upon querying the object, the expression templatename="Airport" will be added to the LINQ expression ...

Advanced Field Queries

The advanced field queries require that the queried field is a facet field (see ...
### Visit Browser

Search and browse user visits.

#### SHOW VISITS CONTAINING

- **at least** an event

#### EXCLUDE VISITS CONTAINING

<table>
<thead>
<tr>
<th>Date</th>
<th>Start time</th>
<th>End time</th>
<th>User Name</th>
<th>Location</th>
<th>Browser</th>
<th>Event count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 14, 2016</td>
<td>11:58:12 PM</td>
<td>11:58:15 PM</td>
<td><a href="mailto:beverley.rhodes@facebook.com">beverley.rhodes@facebook.com</a></td>
<td>United States, North America</td>
<td>iOS Mobile Safari 9.0</td>
<td>2</td>
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<td>11:58:01 PM</td>
<td>11:58:02 PM</td>
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<td>China, Chongqing Shi, Chongqing</td>
<td>Windows Outlook 2013</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>11:58:01 PM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:58:02 PM</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- **Search, inputChange**
  - Type & Cause: not enough memory
  - User Query: Swapping Your Laptop Graphics Card

<table>
<thead>
<tr>
<th>Click id</th>
<th>Click Rank</th>
<th>Collection Name</th>
<th>Document Author</th>
<th>Entitlement</th>
<th>Ipadress</th>
<th>Is Anonymous</th>
<th>Is Mobile</th>
<th>Language</th>
<th>Origin (PageHub)</th>
<th>Product</th>
<th>Search Id</th>
<th>Source Name</th>
<th>Recommendations</th>
<th>Search Id</th>
<th>Source Name</th>
<th>Visit Id</th>
<th>Visitor Id</th>
</tr>
</thead>
<tbody>
<tr>
<td>a299fb8-4d10-430e-9b78-df292755c109</td>
<td>2</td>
<td>Default</td>
<td>Hugh Kelly</td>
<td>Basic</td>
<td>106.83.123.87</td>
<td>false</td>
<td>false</td>
<td>en</td>
<td></td>
<td>9133f29e-5d0f-4813-a6f0-d5d27d407832</td>
<td>Salesforce - Knowledge - <a href="mailto:demouser@besttech.early">demouser@besttech.early</a></td>
<td>Certifications</td>
<td>9133f29e-5d0f-4813-a6f0-d5d27d407832</td>
<td>Salesforce - Knowledge - <a href="mailto:demouser@besttech.early">demouser@besttech.early</a></td>
<td>8052e887-fddf-4c83-bb29-83089f31371</td>
<td>99ca6d9-ccc0-4d84-a8f4-3214579cd941</td>
<td></td>
</tr>
</tbody>
</table>

- **Case Creation, submitButton**

<table>
<thead>
<tr>
<th>Date</th>
<th>Start time</th>
<th>End time</th>
<th>User Name</th>
<th>Location</th>
<th>Browser</th>
<th>Event count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 14, 2016</td>
<td>11:57:54 PM</td>
<td>11:57:54 PM</td>
<td><a href="mailto:wallace.james@hotmail.com">wallace.james@hotmail.com</a></td>
<td>United States, North America</td>
<td>iOS Mobile Safari 9.0</td>
<td>2</td>
</tr>
<tr>
<td>Sep 14, 2016</td>
<td>11:57:47 PM</td>
<td>11:57:49 PM</td>
<td><a href="mailto:shannon.brown@facebook.com">shannon.brown@facebook.com</a></td>
<td>United States, North America</td>
<td>iOS Mobile Safari 9.0</td>
<td>2</td>
</tr>
<tr>
<td>Sep 14, 2016</td>
<td>11:57:39 PM</td>
<td>11:57:40 PM</td>
<td><a href="mailto:wallace.lawson@gmail.com">wallace.lawson@gmail.com</a></td>
<td>United States, Tennessee, Colleagedale</td>
<td>Windows Chrome 49.0</td>
<td>3</td>
</tr>
</tbody>
</table>
# Machine Learning configuration

<table>
<thead>
<tr>
<th>Type</th>
<th>Status</th>
<th>Training Set Data</th>
<th>Condition</th>
<th>User Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tune relevance</td>
<td>Active</td>
<td>Analytics data where Country is Canada</td>
<td>Query contains secure</td>
<td></td>
</tr>
<tr>
<td>Tune relevance</td>
<td>Active</td>
<td>Analytics data where Country is United States</td>
<td>Search Hub is not</td>
<td></td>
</tr>
<tr>
<td>Suggest queries</td>
<td>Active</td>
<td>Analytics data: all events</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Recommendations
Collaborative Forecasts

Predict and plan the sales cycle from pipeline to closed sales, and manage sales expectations throughout the organization with Collaborative Forecasts. A forecast is an expression of expected sales revenue based on the gross rollup of a set of opportunities. Forecasts include adjustments made by forecast managers to their subordinates' forecasts as well as adjustments made by these subordinates on the forecasts of the users below them in the forecast hierarchy. In the rollup table on the forecasts page, forecasts are organized by forecast category, time period, and optionally by product family. Administrators can enable up to 4 different types of forecasts for your organization simultaneously.

Learn It

Forecast Accurately With Collaborative Forecasts

- Forecast Users Overview
- Understanding the Elements of a Forecast
- Forecasts Adjustments Overview
Coveo JavaScript Search UI Framework

Coveo Usage Analytic JavaScript client

This project provides 3 ways to interact with the Coveo Usage Analytics service.

- A JavaScript Node.js client
- A JavaScript browser client
- A code snippet to add in websites pages
### Add a Machine Learning Model

<table>
<thead>
<tr>
<th>Training set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update frequency</td>
</tr>
<tr>
<td>Weekly</td>
</tr>
</tbody>
</table>

##### Train on events
- All
- Specific

##### Recommended items
- Recommend item types
  - All
  - Specific

##### Condition to be applied
Recommendation

Record Users Actions
- **Type**: Page View and Query
- **Mandatory**: Key/Value (identifies one document in one language)
- **Optional**: contentType (to recommend a specific type of document)

Usage Analytics

Previous Users

Current User

Recommendation Request
- Actions History (e.g. page view, query)

Query Pipeline

ML

Index

Build a model (0..n contentTypes)
Query Suggest
Useful Field Query Examples

Markdown... User Help > More Advanced Search > Useful Field Queries Examples Useful Field Query Examples

The following table presents a few field query examples that you may find useful.

Coveo Platform 7 > User Help > More Advanced Search

Predefined Queries

Predefined queries are a feature that was added in Sitecore 7.0 Update-1, and it is... Upon querying the object, the expression templatename="Airport" will be added to the LINQ expression ...

Coveo for Sitecore 4.0...

Advanced Field Queries

User Help > More Advanced Search > Advanced Field Queries Advanced Field Queries The Coveo query syntax ...

The advanced field queries require that the queried field is a facet field (see...

Coveo Platform 7 > User Help > More Advanced Search
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>User Name</th>
<th>Event Type</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun 12, 2017</td>
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<td>anonymous</td>
<td>User Profile, popoverAutoOpen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Click, documentOpen</td>
<td>Step 4 - Modifying the Query</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Page Visit, <a href="https://developers.coveo.com/display/public/UsSearchV1/Step+4=+Modifying+the+Query">https://developers.coveo.com/display/public/UsSearchV1/Step+4=+Modifying+the+Query</a></td>
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<td>Page Visit, <a href="https://developers.coveo.com/display/public/UsSearchV1/Step+3=+Understanding+the+Event+System">https://developers.coveo.com/display/public/UsSearchV1/Step+3=+Understanding+the+Event+System</a></td>
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<td>Page Visit, <a href="https://developers.coveo.com/display/public/UsSearchV1/Step+4=+Modifying+the+Query">https://developers.coveo.com/display/public/UsSearchV1/Step+4=+Modifying+the+Query</a></td>
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<td>Page Visit, <a href="https://coveo.github.io/search-ui/classes/querybuilder.html#advancedexpression">https://coveo.github.io/search-ui/classes/querybuilder.html#advancedexpression</a></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>Page Nav, InTopic</td>
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<tr>
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<td></td>
<td>Page Visit, <a href="https://developers.coveo.com/display/public/UsSearchV1/Step+4=+Modifying+the+Query">https://developers.coveo.com/display/public/UsSearchV1/Step+4=+Modifying+the+Query</a></td>
<td></td>
</tr>
</tbody>
</table>
Edit a Machine Learning Model

Model type

Suggest queries

User note

Training set

Update frequency
Weekly

Data period
3 months

Train on events

All
Specific

Condition to be applied
Query suggestion

Model = list of suggestions candidates
Past queries that were successful
Score based on the relevance index
Language-specific models

At query time
Partial query compared to all candidates using a distance metric
Candidates are ranked based on their distance metrics and their relevance score
Time constrained: compute for a predetermined duration.
Ce document présente les réponses aux questions fréquentes sur la maintenance pour actualisation de l'instance.

**Performance Summaries**

- **Documentation** Pages Lightning
  Une page Lightning est une présentation personnalisée qui vous permet de créer des pages spécifiques à utiliser dans l’application mobile Salesforce ou dans Lightning Experience.

- **Documentation** Conseils relatifs à la création de macros en masse
  Pour réussir l’utilisation d’une macro en masse, la clé consiste à sélectionner les enregistrements appropriés sur lesquels exécuter la macro. … Les agents de support peuvent filtrer les vues de …

- **Documentation** Activation de la création de tâches dans des publications
  Améliorez le fil avec une action qui permet aux utilisateurs de créer des tâches directement à partir d’une publication.

- **Documentation** Attribution manuelle d’un territoire ou plus à un compte
  Attribuez un ou plusieurs territoires à un compte directement depuis l’enregistrement du compte. … Seuls les territoires qui appartiennent à des modèles dans un état Planification ou Actif peuvent…

- **Documentation** Remerciement de vos collaborateurs
  Exprimez votre reconnaissance à vos collaborateurs avec des badges et publiez vos remerciements directement dans leur fil Chatter.

- **Documentation** Conversion des données de région et de pays
  Pour convertir des données de texte de région et de pays existantes vers des valeurs compatibles avec la liste de sélection, vous sélectionnez des valeurs de texte spécifiques, puis choisissez les …
Automated Relevance Tuning
Results 1-10 of 3,361 in 0.16 seconds

**Coveo Cloud Query Syntax Reference**

URL ... Searching with Coveo Cloud > Query Syntax Reference ... The query syntax applies to all Coveo JavaScript search interfaces. **Query syntax example** Returns all items Simple Queries term

**Coveo Query Syntax Reference**

... > Basic Search > Query Syntax Reference Coveo Query Syntax Reference The following table presents ... (JavaScript Framework v0.9)) Query syntax example Returns all items Simple Queries term

**Query Extension Language Basics**

A query extension can take arguments and return values of those types: ... that can be interpreted by the Coveo query syntax (see Coveo Query Syntax Reference) and produce undesired behavior ...

**Changing the Coveo Query Syntax Default "AND" Behavior**

Looking at the documentation (Coveo Query Syntax Reference), the default behavior of a query, such as 'My Coveo query' is to look for document containing 'My' and 'Coveo' and 'query'.

June 05
### Visit Browser

Search and browse user visits.

**Show Visits Containing**

- **at least** a search event
- WHERE Has Clicks is True
- Country is United States

**Exclude Visits Containing**

### June 16, 2017

**6:22:51 PM to 6:24:13 PM**

<table>
<thead>
<tr>
<th>Event</th>
<th>Start date</th>
<th>End date</th>
<th>User ID</th>
<th>Type &amp; Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Click, documentOpen</td>
<td>June 16, 2017 6:23:42 PM</td>
<td>June 16, 2017 6:24:13 PM</td>
<td>anonymous</td>
<td>Click, documentOpen</td>
</tr>
</tbody>
</table>

**Data Exports**

- Dimensions
- Named Filters
- Permission Filters
- SQL Export

**Analytics**

- Reports
- Search Optimization
- Query Pipelines
- A/B Tests
- Conditions

**Organization**

- License Plan
- Source Usage
- Users
- Settings
- Query Performance
- Query Volume

**Infrastructure**

- Organizations
- Organization Tools
- Platform Users
- Clusters
- Cluster Tools
- Recommended Actions
Automated Relevance Tuning

Favors most popular and pertinent documents for each query

Implicit synonyms detection

Understands common typos

Learns from search sessions
Links each query to all subsequent clicks
Learns the relation strengths between query parts and clicks

Automatic parameter optimization

Typical Search Visit

Query → Clicked Search → Clicked Search Result → Query → ... → Query → Last Clicked Search Result

Diagram illustrates the flow of search queries and results, showing how each query is linked to subsequent clicks and how the system learns from these interactions to optimize search relevance.
Intelligent Term Detection
Intelligent Term Detection

Goal is to query the index with long text strings or natural language queries ex: case description

Algorithm extracts the most important terms, using the customer vocabulary from past queries

Improved relevance over partial match - when enabled automatically boosts documents matching terms
Hi I’m using **Coveo for Sitecore** (3.0 1116) and my CES is indexing Sitecore data as well a DB as an external **source**. I am able to issue queries from the Sitecore Search page using REST and get results for the DB and Sitecore data. Now, I’m trying to issue a query using **Linq** to get results from the external source (DB data), but I’m not getting results back. I even checked the CES Console and 0 results were being returned. Now, when I take the raw query from the console and run that in the index browser and I get results! This makes me think it’s a security issue. The external **source** has the “everyone” group added from my **sitecore security provider**. Any other hints on what might the issue be? Cheers, David
Questions?
Thank you!

Richard Tessier
SVP Products

rtessier@coveo.com
https://www.linkedin.com/in/richardtessier/

Don’t miss tomorrow’s session on Getting the most out of Coveo Machine Learning!