BA Insight Federator

How the BA Insight Federator Extends SharePoint Search

BA Insight
2015

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The BA Insight Federator helps organizations go beyond the standard search paradigm of returning documents that match a set of keywords. Instead, it enables the implementation of powerful search-driven applications that noticeably improve productivity and agility by channeling users to a single access point for information. The outcome is that users can effectively use any technology available within the organization to obtain the best search results possible.

Search Has Evolved

At the core of any search technology is the basic concept that search results must match the keyword terms entered. Over the years, however, expectations of search engines have grown beyond this and now include more complex, sometimes implicit, needs.

Google and Bing increasingly provide "smart answers" in response to a number of prevalent queries. If you search for a city, for example, you will get a map of the city. If you search for "city A to city B", then the engine will be even smarter, and depending on how far apart the two cities are, it may provide driving directions or available flights. If a math formula or currency exchange rate request is entered, then the search engine will compute the answer for you. The use of mobile devices with Internet companies such as Yelp and Open Table have made geo-localization a critical factor when finding restaurants and shops matching your needs. In today's world, consumers have come to assume that search engines will go beyond their explicit needs and also understand their implicit ones to return the best answers possible, while filtering out the noise and irrelevant results. Increasingly, these same expectations are being brought to the workplace.

In addition to the necessity to meet the expectations of Internet search, enterprises have a set of challenges of their own. The pace at which new data is produced continues to accelerate, and the data is also often distributed in many different physical locations, creating scalability challenges for search deployments which can make the single search index approach impractical. Regulations and compliance policies may prevent content from being indexing across "content borders". The proliferation of enterprise systems, on premise or in the cloud, also creates its own set of integration challenges from security to compatibility between applications.

Implementing unified access to information with such complex requirements and expectations can be extremely difficult. There is no single solution that will respond to end user queries simply and effectively, while at the same time shielding users from the complexity of the underlying IT infrastructure involved. Finding the best answer to queries requires an understanding of the user intent, a sense of the context of

the query, knowledge of the appropriate content sources, and dynamic decisions about the best way to respond to the inquiry based on the technology and tools available. This means that the search infrastructure must include an intelligent brokering layer between the users and the actual search engines capable of receiving queries, and then decide on the fly the most efficient way to deliver a response.

Federator: a Search Supervisor for SharePoint

The BA Insight Federator provides intelligent brokering capabilities for the SharePoint platform. Federator presents itself as a search service application similar to the out-of-the-box SharePoint search engine. The SharePoint Administrator merely configures SharePoint to send all search queries to Federator instead of the out-of-the-box SharePoint Search.

When Federator receives a search query, it transforms and dispatches the query to the appropriate back-ends to obtain the best responses. It then recombines the responses collected from various systems into a unified set of results returned to the user. This is demonstrated in the diagram below.
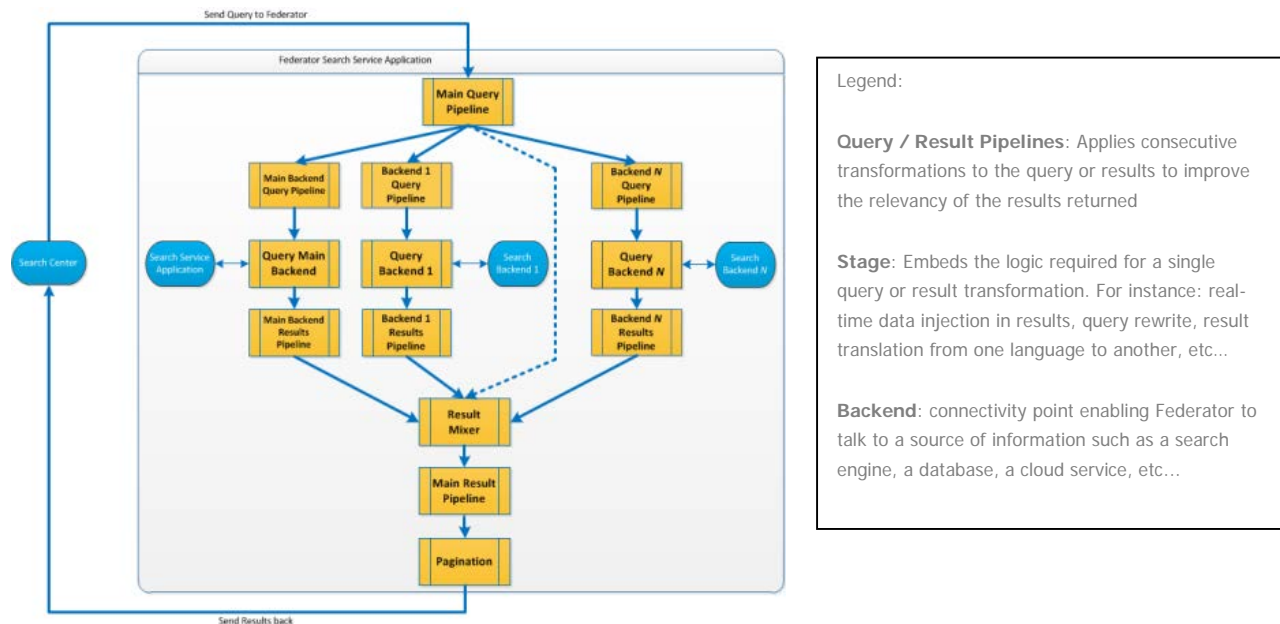

Figure 1: Execution flow for a search query

Federator has been designed with flexibility and adaptability in mind. As it is deployed, an enterprise can add its own logic and set of transformations by adding stages to the query and result pipelines, effectively enabling the creation of "smart answers", similar to Internet search engines. Each stage allows a distinct transformation to the query or results to be applied. For example, synonym expansion, stemming, rank

boosting, query rewrite (*white paper federator* could be rewritten as: *"White Paper"* as a phrase and the *Product* metadata must be equal to *Federator*, resulting in much higher accuracy), translating results to English, injecting real-time inventory status for a product or part or check-in/check-out status for a document, etc. If the answer is not in the SharePoint Search index, then Federator can be used to reach out to other source systems to seek the answer. This is done by adding back-ends to Federator. BA Insight already provides back-ends for SharePoint (2010, FAST Search for SharePoint, 2013), FAST ESP and Google Sites/Drive. New back-ends can be created using the built-in Connector Toolkit.

Federator takes care of interfacing with SharePoint, dispatching queries to external systems asynchronously, merging results back together, paginating through results, etc. This enables enterprises to focus on understanding end user needs and optimizing their search experiences.

A key benefit of Federator is that it is implemented as a SharePoint service. Any search optimization done through Federator is independent of the presentation layer and can be immediately reused from anywhere- in a SharePoint search center, in a web UI, in the Office applications (Word, PowerPoint, Excel), or in a mobile app.

Federator in the Real World

Federator is an essential component of the BA Insight Software Portfolio and one that many of our customers deploy. Its uses range from helping customers quickly fine tune and unlock the SharePoint search engine potential, to lightweight changes, to building full-blown search based applications with finely tuned search logic.

Following are some examples:

Synonyms and Stemming

Customers have asked BA Insight to help them modify SharePoint's behavior to align with user expectations. Specifically, the way in which synonyms (on 2010) and stemming (in 2013) were working in a manner they deemed counter-intuitive. SharePoint 2013, for instance, only applies stemming to plural forms (customers to customer, mice to mouse) but not on other forms (running/ran to run). This is done to ensure consistent performance, whether there are one hundred thousand items or one hundred million items indexed. However, for a small corpus or when querying against a subset of content indexed, stemming may be valuable. Since the search center UI did not expose the functionality needed to adjust the search behavior, organizations were faced with two options: build their own search UI or train their end users to understand SharePoint's behavior- neither of which were satisfying to them.

With Federator technology, BA Insight was able to intercept and transform queries with customer-specific logic using the search API provided by SharePoint, without changing the presentation layer. Since this change was done at the service layer, it automatically applied to all search pages within SharePoint, thus significantly lowering the upfront investment and long-term maintenance cost compared to the solution these organizations had envisioned.

Remarkable User Experience

In this second example, a retail organization wanted to implement a product catalog search application on SharePoint 2013. Using Federator, BA Insight was able to substantially increase the likelihood of converting a click to a sale by maximizing the return of matching products based on customers' needs. To do so, we modified the search behavior to automatically reprocess any query returning no matches to find the nearest match possible. Examples of query transformations used in this search application include:

- For queries that contain misspellings, Federator automatically submits a follow-up query using the SharePoint spelling suggestions.
- If a multi-keyword search leads to zero results, Federator resubmits the query, this time with an OR between keywords rather than an AND.
- Single quotes (') or double quotes (") in queries (for inches or feet) are translated accordingly.
- Context-sensitive refiners are displayed based on the query entered rather than showing a static list of refiners which may not be relevant.

An Alternative to Indexing

In this example, Federator was used to bridge the gap between SharePoint on premise and Google Drive and Google Sites. As with many cloud-based services, Google Drive and Sites have web-enabled APIs (Rest, JSON, OAuth2, etc.), but these APIs do not allow content to be securely crawled and indexed by SharePoint. Federator was used to intercept the user query, submit it to both SharePoint on premise and Google Drive/Sites in the cloud, and merge the results to seamlessly present a single, merged list of security-trimmed results.

Here are some other scenarios and use cases in which BA Insight's Federator can be leveraged:

- Recognize a conference room name in a search query and provide real-time information about it: Is it available now? What is the next available free time slot? How far is it from an office or building?
- Recognize a customer name and provide a quick profile about the customer: Who is the main point of contact? What product or services does the customer have? When was the last interaction with the customer? With whom?
- Recognize queries such as vacation status, expense reimbursement, etc. and provide data relevant to the current user: vacation policy for his/her own country or office, number of vacation days he/she has left, the point of contact in HR for such matters.

Summary

Federator is an intelligent broker service for SharePoint that extends the SharePoint Search out-of-the box capabilities to provide "smarter" search results. It enables organizations to unify access to information and deliver a remarkable user experience that is more aligned with what users have come to expect with Internet search.

About BA Insight

BA Insight's Software Portfolio accelerates and future-proofs the creation of cloud-based and on-premise SharePoint portals for enterprises, transforming how users find information. Our software dramatically reduces the time, cost, effort, and risk of implementing SharePoint portals while providing a greatly improved user experience. Customers use our Applications to improve productivity by finding the right information faster using Visual Refiners, Smart Previews, User-Generated InfoSites, and Matter Comparison; our Classification software to increase findability using auto-tagging, metadata generation, and text analytics; and our pre-built connectors and federation to provide secure connectivity to a wide variety of content systems.

We serve organizations of all sizes around the globe including the Australian Government Department of Defence, CA Technologies, Chevron, Deloitte, Ford Motor Company, Keurig Green Mountain, Pfizer, and Travers Smith. BA Insight is a Microsoft Gold Certified Partner and member of the Microsoft Business-Critical SharePoint Program.

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