



INNOVENT  
SOLUTIONS

*Spotlight*  
*on*  
*Client Success*

## CLIENT PROFILE

### Name:

Top Maker of Consumer communication devices

### Description:

Client offers integrated technologies that enable people to stay connected with their family, friends, and colleagues; access and share the information; and manage their daily lives on the go.

### Industry:

Technology

### Need:

Enhanced site and document search solution, focused on improving the relevancy and unifying search from various web portals into an intuitive interface.

### Results:

Indexed content that can be quickly retrieved from anywhere within the Client's domain from a uniform search box with results displayed consistently.

## BACKGROUND

In preparation for the 2009 International Consumer Electronics Show (CES) and a major product announcement, the Client set out on a project to redesign their web site to improve their Internet presence. Part of this redesign required the need for a better site and document search solution, focused on improving the relevancy of search results and unifying search from various web portals into a clean, intuitive interface.

## BUSINESS CHALLENGE

The project tasks were essentially organized around three themes:

- ◆ Execute search from any Client site or sub site
- ◆ Unify the results from disparate sources into a single interface
- ◆ Utilize a highly-portable, lightweight framework

Following are details on each of these specific themes.

### Execute Search From Any Client Site

A critical issue for the Client was the ability to search from within any of their sites or sub-sites and be able to see results from the entire Client domain. The results were federated into three specific areas:

**Shop** – Display results from the main Client site, the store site, and the software site. Both the store and software sites are third-party vendor sites, and not within the same server infrastructure as the Client's main site.

**Support** – Display results from the main Client site, knowledgebase, and forums. In each case, the source pages are controlled by entirely different content management systems, on different web server architectures, and in the case of the forums, are hosted by a third-party vendor.

**Company** – Display results primarily from the Client's main site.

In the cases of Shop and Support results, there was a further federation of data: For Shop it was Equipment, Accessories and Software; for Support, it was Answers, Downloads and Community.

Originally, each of the third-party vendors carried its own isolated search solution, which would only show results explicit to that solution's data. Before this implementation it was not possible to search from one Client sub-domain to another, and as such it was not possible to see products for sale from within support, to see support search results from within the main company site, or to see the main company search results from either. Additionally, the design for each of these sub-domain sites was different, which lent to a confusing and unintuitive experience for the user. (continued...)

## BUSINESS CHALLENGE (CONTINUED)

### Unified Results In A Single User Interface

The search solution needed to present information from multiple sources seamlessly, giving the impression that all of the information resides within the same user experience of the web site. This data needed to be gathered from separate hosts and federated into collections and sub-collections of data that would allow the user to refine results by clear categories.

### Utilize a Highly-Portable, Lightweight Framework

A unique technical constraint was added to the project. The decision was made to have little to no application servers to provide functionality, instead offloading functionality onto the client through extensive use of JavaScript. This decision was primarily driven by a desire to efficiently scale the solution worldwide with maximum cost efficiency.

The challenges faced were several. The Client needed a way for the search solution to integrate seamlessly across all of the website implementations. Integration needed to be done in a way that calls to the search could be performed in an Ajax-type fashion, in client side only code, without the assistance of a backend technology such as J2EE or .Net.

Finally, the search solution needed to be launched from and resolved to multiple web sites hosted across different server farms. In doing so the solution must not violate the Same Origin Policy that web browsers implement to protect users from cross-site scripting attacks. A primary concern was for the solution to be successful and efficient in multiple browsers, accounting for varying idiosyncrasies in rendering and script handling.

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## SOLUTION

The Client partnered with Innovent Solutions for its search expertise and another vendor to create and implement a platform combining Dojo, Mootools, and several other Web 2.0 frameworks. For the specific search solution, the Client decided to move away from its disparate and isolated search solutions and utilize the Google Search Appliance for all of its site search requirements.

In implementing a Google Search Appliance search solution, the Client was leveraging proven technology developed by Google. This was a solution grounded by a well known search paradigm, allowing the Client to expose search results in a uniform interface from several different aspects of their online presence, such as their knowledge base, online shop, company announcements, and online forums.

The Google Search Appliance was easily configured to resolve two requirements for the Client : the loading of data from multiple disparate sources, and the federation of results into categories that could be clearly refined. The data is loaded into the index once, but presented in multiple ways through the configuration of collections. Once configured, the search solution was able to present results from multiple locations as if they belonged to a single search concept. In this way, for example, "support" results could be presented as a single set of data, even though they were loaded from forums, a knowledge base, and general pages throughout the Client's primary domain. These results could be further refined into sub-categories through collection configuration.

In order to create a Search API that was client-side only, cross browser compatible, and capable of doing search requests in an Ajax like manner, Innovent Solutions leveraged the Google Web Toolkit to build a search API that could be called from any JavaScript based framework to implement search and return results. (continued...)

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## SOLUTION (CONTINUED)

The Google Web Toolkit, with the combination of a utility called GWT Exporter, allowed Innovent Solutions to build a Search API that only required simple object interaction to create complex search requests. By exposing a small handful of objects using the GWT Exporter utility, it became possible to expose an API in a very simple manner. From there, development of the API could be handled similar to any Java project, with full featured debugging capabilities and performance profiling provided by Eclipse in order to optimize search execution and eliminate bugs. A simple function call is now all that is required to interact with the Google Search Appliance and receive search results. By using the Google Web Toolkit, cross-browser compatibility issues were resolved by leveraging the same technologies that allowed Google to create applications such as Google Maps and Google Docs.

With an API constructed and fully tested with JUnit tests, the API could then be implemented into any Javascript based environment, including the Mojo framework being developed by Blast Radius. Best of all, the GWT Java to Javascript compiler results would enable the API and the framework to work together well. The API was embedded into each of the search sections of the site, and into the global search functionality. Now, each individual section, such as company announcements, online shop, and support sections, could receive category specific search logic and result handling based on the Search API that was created.

The resolution of the Same Origin Policy issue required an HTTP request proxy using Perl in an Apache environment. By creating a proxy that was capable of handling search requests and return results, the detail of the implementation were abstracted from the search API and could be run on the same server as where the HTML pages are stored. This would allow the client to communicate within the same domain as the serving pages, and proxy the requests to the Google Search Appliance. The proxy was extremely lightweight and highly portable, providing a fair degree of flexibility in the web server architecture.

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## THE RESULTS

In coordination with the Client's IT staff Innovent Solutions created a robust, extensible solution which was delivered successfully, on time and on budget.

Approximately 75,000 pages of data exist within the index, with a large blend of data being used through collections throughout the website. Search results can quickly be retrieved from anywhere within the Client's domains from a clear search textbox in the upper-right corner of the site. The search results interface has the same look-and-feel regardless of what source data is being previewed, giving the user uniform access to the Client's information.



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### Enabling Intelligent Decisions

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Innovent Solutions is a consulting firm, dedicated to the improvement of decision making through effective information management. We build systems that enable our clients and our client's customers to:

Find the information they want and need

Understand the relationships and meaning of that information

Trust the information to be accurate and timely

Innovent Solutions is a privately held company headquartered in Los Angeles with offices in Minneapolis.

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## How can we help you?

As a certified partner within the Google Enterprise Program, and utilizing the Google Search Appliance, Innovent Solutions helps organizations drive effective information sharing by enabling access to structured and unstructured data, all through the well known user interface of Google.

Our services include:

- ◆ Installation and configuration of the Google Search Appliance
- ◆ Connectivity to specific content systems
- ◆ Integration with existing websites, intranets and portals
- ◆ Integration with security systems such as LDAP
- ◆ Front-end customization and branding of the standard Google interface
- ◆ Certified, Google Search Appliance Training