Case study

Resume Search: Supplying IT talent in contract engagements

HP Big Data Platform technology finds the right skills for the job

Industry
High Tech

Objective
Provide a fast, reliable means for finding the right talent for contracted service engagements in HP's client base

Approach
Leverage HP's Intelligent Universal Search (IUS) and Intelligent Data Operating Layer (IDOL), both key technologies supporting HP Haven, to create a new Resume Search solution. Integrate the solution into the Grow@HP application environment

IT matters
- Solution leverages HP's patented algorithms to form a conceptual understanding by extracting results that are accurate and comprehensive, finding resumes in all formats that are conceptually related to a query, yet not dependent on key words.
- The HP IDOL engine is able to store and retrieve unstructured data easily, even verbose, everyday language queries.
- Resume Search user interface is based on HP Haven's Intelligent Universal Search.
- Solution supports a wide variety of enterprise assets, such as Oracle or Microsoft databases, or Linux solutions.

Business matters
- Enterprise Services LDSM Resource Brokers use the new Resume Search solution to supplement the native PPMC Resource Finder.
- ES employees have currently posted about 70,000 resumes that are included in the repository.
- The solution extracts structured data from the resumes so that Resource Brokers can search on variables such as language, experience, education, and other characteristics.
- Future potential to empower HP recruiters and talent managers with new tools to find the right candidates for HP positions as well.

"Increasingly, today's IT organizations are being called on to effectively leverage technology to achieve better business outcomes. HP Enterprise Services can help drive the evolution of the enterprise."

– from HP's Enterprise Services website

As part of HP Enterprise Service's internal Qualifications Inventory resume repository, a new solution called "Resume Search" is based on key technologies supporting the HP Haven Big Data Platform. The solution helps Resource Brokers meet its labor demand more quickly by finding the right in-house talent for contracted service engagements worldwide.

When businesses need outside help to move their workforce in a new direction—say, enabling a mobile enterprise, improving customer experience, or making the most of combined resources following a merger—they need to move fast, and with confidence that the experts they hire will ensure a successful transition. Companies on the move need rapid change management, enterprise modernization, shifts in their business model. And they need a host of other transformations to happen smoothly, without interrupting the growth that got them to this critical decision point in the first place.

Major business transformations like this are the bread and butter of the HP Enterprise Services group, one of the largest organizations within HP. With more than 135,000 specialists, HP Enterprise Services (ES) needs to manage its own workforce carefully to handle the growing demands from its clients around the globe. "We need an accurate view of both the market demand and our talent pool. We need to know what people we have available, what their skills are, and how to balance the need in the marketplace with our supply of talent," explains Jeanne Brekelmans, business operations chief of staff for HP ES.

The complexity of HP ES's talent pool—a constantly growing body of individuals, each with different levels of skills, and different degrees of familiarity with current and emerging technologies—has made it critical for HP ES to understand the unstructured data in the steadily evolving resumes of its staff. To help with this need, HP created the "Labor Demand and Supply Management" program, or LDSM. The goal is putting the right people at the right place at the right time. One of the keys to LDSM is having a clear picture of all people's skills and resumes.

In June 2014 and as a part of the LDSM Program, HP introduced HP Resume Search, a new solution that leverages HP's patented algorithms to form a conceptual understanding by extracting results that are accurate and comprehensive, finding resumes in all formats that are conceptually related to a query, yet not dependent on key words. At the heart of HP Resume Search is HP Haven, a highly advanced big data platform which uses multiple search models to help significantly improve the speed, accuracy, and completeness of search while providing automatic extraction of entities such as names, email addresses, locations, and languages directly from the resumes. This powerful new capability is now part of HP ES's internal Qualifications Inventory resume repository.

What follows is a discussion of the business case for HP's talent supply and demand management, and the role that HP Haven plays among the various technologies involved.

Resume Search: The case for automation

There are two major roles for HP ES managers once service engagements become contracted and scheduled. “First, the project team describes the demand; second, our resource brokers determine how to fill that demand,” Brekelmans explains. “There are checks and balances, and we have many standard processes for handling this work efficiently and properly. When a contract is awarded, we need a fast, reliable system to provide the optimal matches. On a major development project, for example, we have many ‘pieces of demand.’ We need project managers, team leads, developers with specific skill sets; you have to find test leads, testers, training and documentation people. All of these pieces are captured in a project, detailed according to when we expect a person to start, finish, and how many people within a given discipline are needed. Our goal is to find someone internally, which is much faster process than trying to find someone externally. We have to locate the right people, and get them quickly.”

HP’s system for managing this challenge is based on HP Project Portfolio Management (PPM), the commercially available software package from HP that helps companies manage business needs and priorities against goals and resources. The internal solution HP ES developed is based on PPM, the Qualifications Inventory, and the enterprise data warehouse (EDW. Think of it as three pillars: PPM is the system of record for demand, Qualifications Inventory handles the supply, and the EDW handles reporting to tie it all together. This eco system is responsible for managing the demand within Enterprise Services, as well as matching the people to that demand. There’s also a delivery component, a Bid Management tool, which manages the bids provided to HP’s clients.

The Resume Search capability is a recently added function of the tool, and it’s where the HP Big Data Platform comes into play. HP Haven is the engine driving an automated text-based search solution that can “understand” the resumes of HP employees who are available to work on internal or external projects. This new search system is designed to help an ES Resource Broker identify resumes that meet the specific talents and skillsets required by any number of projects that come online within HP, especially customer engagements that demand experts in any number of software and hardware scenarios. The HP Resume Search solution is a major addition to the Resource Broker’s toolkit. It has enabled Enterprise Services to improve accuracy and speed, and to find and place internal candidates most likely to contribute to a project’s success.

“In addition to the skills listed on resumes, which can be found through the tool’s automated matching, I can also do free-format searches using the resume search capability,” says Brekelmans. “This is a nice and powerful addition. I can look for a certain skill set across 70k or more resumes, and see if I get any additional fits that didn’t show up on my original search. This is based on HP Haven’s ability to ‘understand’ the meaning and context for what is being asked for, even if the specific terms are not used to describe a type of skill on a resume.”

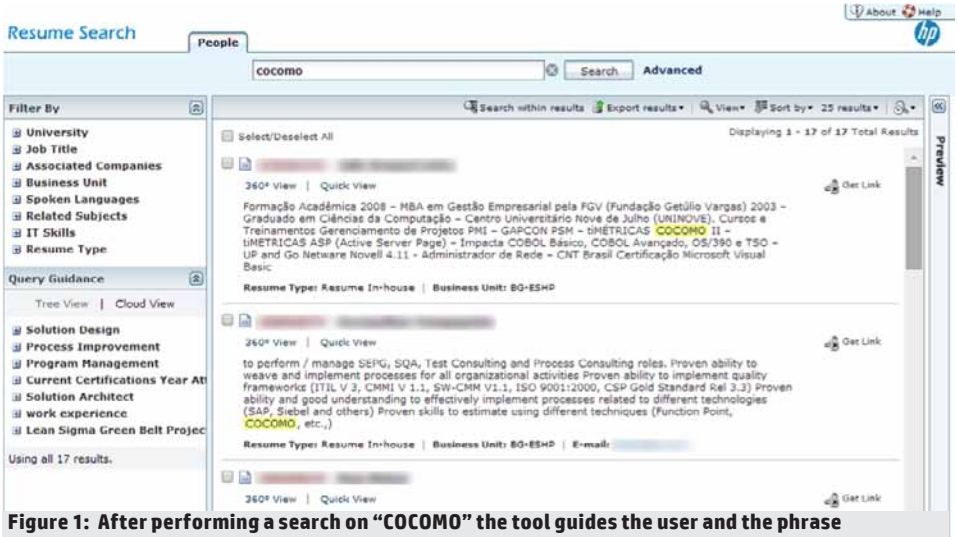

Figure 1: After performing a search on "COCOMO" the tool guides the user and the phrase "estimation of software" provides a clue to a deeper meaning.

'Meaning-based' search inside unstructured data

Gil Doron, project and program manager for HP Global Functions IT, explains the extent to which HP IDOL's search capability surpasses a simple search on a string of characters—what most of us do when we look for key words in a Word doc or PDF. "This is where the unstructured data capabilities in IDOL come into play," says Doron. "All resumes are unstructured; there are no tables created in order to 'enter' talent data into the system. Consider what this means. With structured data, say in a spreadsheet, you have columns and rows that can be addressed and often understood according to data type. With unstructured data, as in a resume, you're dealing with data that isn't at all consistent, especially from one resume to the next. And the HP IDOL engine is able to take that unstructured data, store it, and retrieve it easily through verbose, everyday language queries."

An example of a meaning-based search is a natural language query, for example: "I want a project manager who also has SAS skills." IDOL's breadth of connectors to different repositories, its ability to re-use existing indexes, and its meaning-based computing technology combine to create relationships within data that delivers intelligent, personalized search. IDOL is able to extract text from these documents and store it in such a way that allows queries to return results in seconds. It also can rate the likelihood of finding what you're looking for according to your set of keywords. When it finds a resume that contains the keywords you're searching for, it can then drill down and find other resumes that closely match it in a cross comparison.

"These resume documents can be in any format – a Word doc, a PDF, a plain text file, etc.," says Doron. "You can drop all these file types into a single directory, and Autonomy will search it without any additional work on the user's part. A resume comes in, you add it to a folder, and the system automatically indexes it for you."

Finding the right talent

"When you're searching for very common phrases, 'Project Manager,' you're going to find that phrase a lot within 70 thousand or more resumes," says Doron. "The phrase could refer to the person's skills, but it could also appear in a description of a project, referring to someone's boss or colleague, which has nothing to do with the person's skill. With Big Data, you can be inundated with information like this. The IDOL engine within HP Haven helps drive meaning out of that data."

"You can narrow down your search. Say you're looking for a project manager in a certain geography, or with a certain background, specific certifications. You're able to build your ideal profile, and the system will come back and show you all profiles that match. And while you may be searching for particular key words, there may be other very valuable things that you don't know to search on. Haven's IDOL technology can help you by, in some cases, ignoring keywords but focusing instead on a profile type for a certain person—taking the

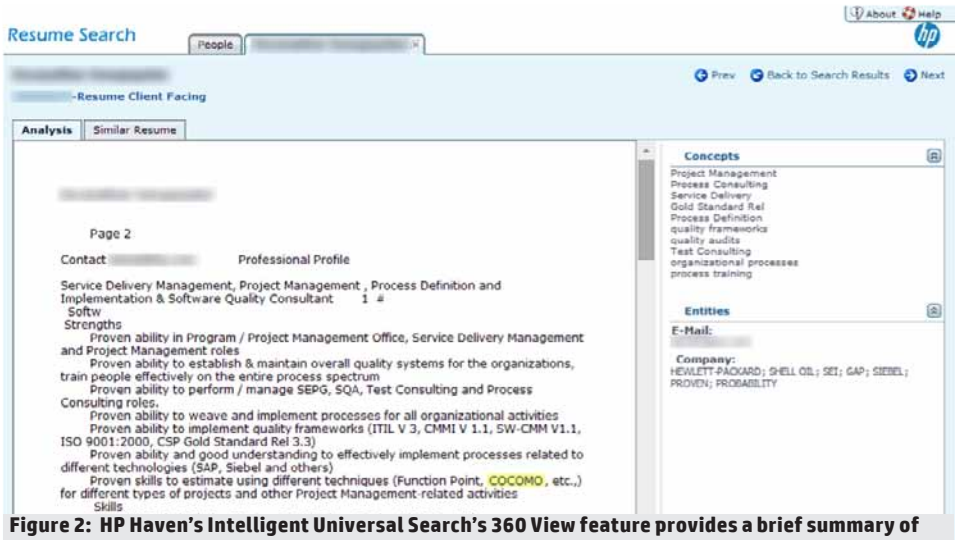

Figure 2: HP Haven's Intelligent Universal Search's 360 View feature provides a brief summary of the resume in addition to the resume's concepts and entities on the right hand side.

content of a specific resume (not the keywords you used to search) and its context to deliver more candidates that are similar. You'd never be able to do that with a traditional keyword search."

The Resume Search system also gives you a visual representation of your search. "You can look at the actual resumes, of course. But you can also give you a Vis rep the key words based on the set of resumes returned in the search. You can see how frequently a skill set occurs, because the system enlarges and bolds the font of the word that matches the skill." In addition to the resumes, you are also presented with concepts and entities, highlighting key concepts such as a person's roles, skills, and competencies, plus other entities, such as companies that person works for has worked for in the past.

Silviu Nedea, project and program manager for HP Global IT, offers another example, based on a use case that was discovered during a pilot with the ES Resource Brokers. "Let's assume that I'm a resource broker and have been asked by a project manager to find someone with COCOMO experience. Not knowing what COCOMO is, I perform a search on COCOMO and let the tool guide me. The results appear as shown in Figure 1.

"Now the phrase 'estimation of software' grabs my attention. At this point I might simply be interested in learning more about COCOMO. With the help of the 360 View feature of IUS, I can see a brief summary of the resume, along with concepts and entities on the right hand side. So I click on 360 View to learn more, and the results display as shown in Figure 2.

"After only a few seconds it is now clear to me that COCOMO is an estimation tool/model. Without HP Resume Search, the Resource Broker would have to check for 'COCOMO' against the list of skills in the catalog and would, in this case, come up empty handed. Not being able to help out, the Resource Broker may have gone looking elsewhere—possibly outside the enterprise—to source this position, when in fact we had people with COCOMO skill and experience within HP all along. Additionally, HP Resume Search can serve as an educational tool for anyone who's unaware of what a particular skill, competency, or certification means; something that's important with the myriad skills that are growing and evolving in today's constantly changing IT industry."

Figure 3 shows an advanced 360 view of other "similar resumes" based on the context found in a resume of interest.

Expanded use of Haven and features of Resume Search

HP's resource brokers not only use the LDSM system to know who has the right skills for an assignment, but also who needs training in certain areas. "We may be short on certain skills," says Brekelmans. "We may have too many people within a single skill set. There is all sorts of analysis that comes out of LDSM, which gets rolled up into many places within HP—for annual planning, for instance, where we're going with our people and our accounts."

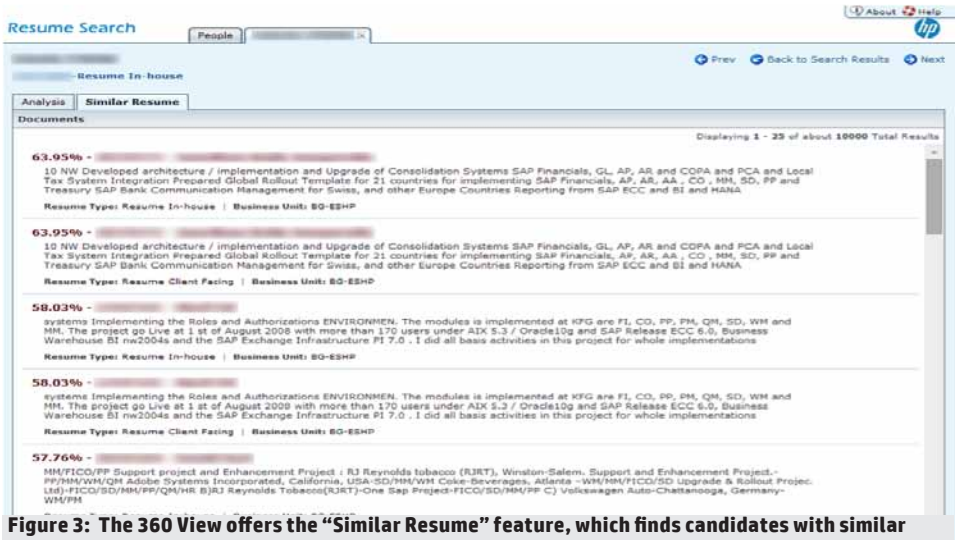

Figure 3: The 360 View offers the "Similar Resume" feature, which finds candidates with similar skills to the resume being viewed.

"Now that the solution has been in place for 6 months, we're seeing users reach out to us with new and innovative ways that will further enhance the product," says Nedea. "We are seeing requests to bring in additional information from PPM and the Human Capital Management system to provide a holistic view of the person's current availability and current location. In our bid process we ask applicants to quantify their depth in certain skill sets. We're starting to see more requests for rarer skills that are not in our qualifications catalogue. With the Haven-based Resume Search capability, we're able to answer those questions. These requests most often come from RFPs, but we're seeing them come increasingly from our own internal projects and analysis from Enterprise Services."

The faster and more accurately the ES team can answer these questions, the less time is wasted trying to find information. The tool also includes features for social search, tagging, etc. These features benefit teams of searchers who, for instance, have a "super recruiter" who can leave guidance via social tagging for her teammates along a successful search trail.

Implementation

The Resume Search solution was integrated into the Grow@HP application environment. The solution consists of the following software components:

- HP Haven's IDOL and Intelligent Universal Search (referred to as IUS in Figure 1) capabilities.
- Resume Search user interface based on HP Haven's Intelligent Universal Search.
- Java authorization plug-in, PPMC@ES security view Figure 1 shows the process flow of the solution, beginning with the Qualifications Inventory tool (Oracle database) that houses the resumes.
- Resume Search supports a wide variety of enterprise assets, such as Oracle or Microsoft databases, or Linux solutions. Very flexible.

Results

The Resume Search solution was successfully deployed in the Grow@HP environment in May 2014. With the new capability, Resource Brokers can identify resumes with key attributes, skills, and experience required by Enterprise Services projects. When combined with existing PPMC@ES tools, the Enterprise Services team has a powerful toolkit to match demand for specific skillsets to HP employees with those skills.

Since ES began using the tool 6 months ago, they are seeing some feedback from Resource Brokers regarding ways to integrate with other tools and features to make the already helpful search results stand out even more.

Business benefits

Any one company's skills taxonomy can never keep up with the ever-changing set of IT skills that are available. "Not only the skills taxonomy, but we need to get people to update their resumes, and that's hard," says Brekelmans. "The volume we're dealing with is huge—more than 130k resources, and

Customer at a glance

Software

- HP Haven IDOL and Intelligent Universal Search technology
- Java authorization plug-in
- Solution is based on HP Project Portfolio Management, plus HP's Qualifications Inventory, and HP's enterprise data warehouse (EDW)

that's not even all the resumes. HP receives an enormous number of resumes every day. And we absolutely need tools to keep us sane in our hiring processes."

"Enterprise Services LDSM Resource Brokers report that they are using the new Resume Search solution to supplement the native PPMC Resource Finder. It is a powerful addition to their toolset to identify the best resource to fill demand in Enterprise Services. Our ES employees have currently posted about 70,000 resumes that are included in the repository. As this grows, we expect the benefits of Resume Search to increase as well. A wonderful start and looking forward to great future with this tool."

– Jeanne Brekelmans, business operations chief of staff for HP Enterprise Services

"The Resume Search tool adds a powerful new text-based search tool and rich source of resume data to the Resource Broker's toolkit. It also extracts structured data from the resumes so that the Resource Broker can search on variables such as language, experience, education, and other characteristics."

– Silviu Nedea, Project and Program Manager, HP Global IT

"There's an obvious use case here beyond the HP Enterprise Services talent pool," says Nedea. "There are over 10,000 people applying to HP external job postings each month—that's over 10,000 resumes. So we have a real opportunity to empower HP recruiters and talent managers with powerful and highly efficient tools to find the right candidates for HP positions. We have already kicked off initial conversations with our talent management group and planning a pilot with a select group of recruiters, hands on as we build user stories describing how they envision using the tool on a day to day basis."

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