Case Study

Using Knowledge: Advances in Expertise Location and Social Networking

Best practices from IBM Global Business Services

IBM provides business insight and IT solutions to help its clients become more efficient and competitive. Reporting $98.8 billion in revenue and $10.4 billion in net income in 2007, IBM operates in 170 countries and maintains a work force of 370,000 employees serving the financial services, public, industrial, distribution, small and medium business, and communications sectors. The organization's five major lines of business are Global Business Services, Global Technology Services, Systems and Technology, Software, and Global Financing.

IBM's Global Business Services (GBS) division, which is featured in this case study, provides professional services and application outsourcing services focused on:

- **consulting and systems integration**—consulting services for client relationship management, financial management, human capital management, business strategy and change, and supply chain management; and
- **application management**—services related to application development, management, maintenance, and support for packaged software as well as custom and legacy applications.

This division represents approximately 150,000 employees globally, most of whom work at client sites or telecommute. Figure 1 provides additional information about GBS, its service areas, and the sectors/industries at which its services are targeted.

IBM GBS maintains a robust Learning and Knowledge Organization that provides:

- **knowledge sharing services**—community- and practitioner-driven knowledge sharing, a unified learning and knowledge experience, and infrastructure and core enablement;
- **education services**—development and delivery of virtual, componentized curriculum; and
- **benchmarking services**—using an open standards approach to provide self-service capabilities and specific support.

GBS' Learning and Knowledge Organization is focused on promoting a knowledge-sharing culture through effective processes, technical infrastructure, business research services, content management, and communities of practice.

IBM Global Business Services Organization

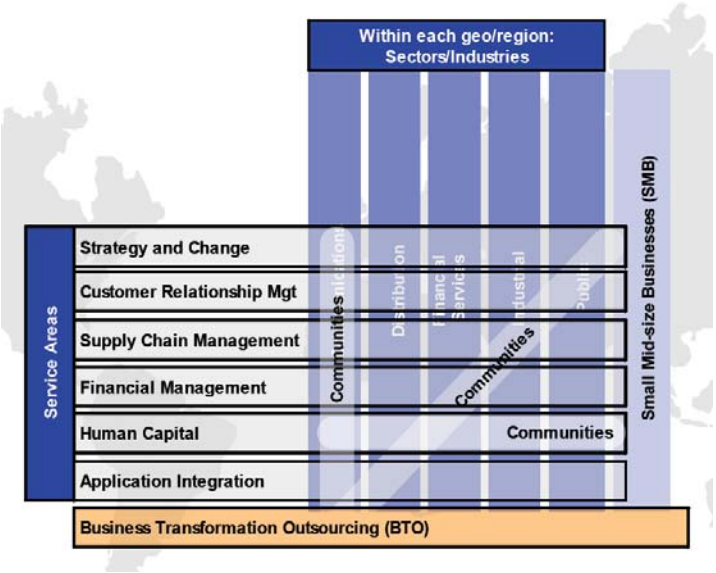

Figure 1

Strategies for Effective Expertise Location

At IBM GBS, knowledge management (KM) has progressed through three distinct phases over the last several years. In the first phase, KM was decentralized. All KM programs across the organization were designed and owned by separate entities, and business areas were free to create their own repositories, infrastructure, and processes. In the second phase, KM was centralized to optimize resources, increase efficiency, and minimize costs.

In the third phase, GBS created its Learning and Knowledge Organization to integrate KM processes and tools and simplify the overall process of knowledge sharing. During its first five years, the Learning and Knowledge Organization was responsible for many elements of the content life cycle, including content harvesting, approvals, and archiving. In addition, a team of support personnel was made available to help employees find information and people.

In 2008, the Learning and Knowledge Organization transformed its knowledge-sharing approach, including how it integrates people, processes, and technologies. Previously, the organization had focused its KM services on KnowledgeView, a global asset repository. This intranet portal provided reusable assets to people across GBS. In shifting to a social software–based self-service model, the organization created a new Practitioner Portal that improves access to content and people by leveraging social computing tools, user involvement, and fluid knowledge in communities.

"We've been on a change agenda," explains Bryant Clevenger, global knowledge strategy leader at IBM Global Business Services. "In the past, we had KnowledgeView, which we were quite proud of—it was content-rich and had robust search and navigation capabilities. We've changed our whole approach, though, to a new, Web 2.0-based portal and behavior model that leverages user activity while requiring less formal infrastructure support. The whole working structure of our organization is now different. We feel we have greater capabilities, better user enablement, and lower overhead. The core of this new model is the Web 2.0 technologies."

GBS' Learning and Knowledge Organization cites a number of forces that are driving GBS toward a new knowledge-sharing model:

- The amount of content being created and consumed is increasing exponentially, making it impossible to formally codify all knowledge.
- It is hard to identify a set group of subject matter experts because the definition of "expert" is contextual.
- The most valuable intellectual capital is often tacit.
- The global nature of business makes it difficult to cultivate personal networks.

> "Content consumption is exploding. We have 25,000 different wikis—not a wiki with 25,000 pages, but 25,000 different wikis. We can't really manage that. Content proliferation is one of several factors driving a shift from traditional KM to knowledge sharing."
>
> —Bryant Clevenger
> Global knowledge strategy leader
> IBM Global Business Services

Because employees need hard-to-codify information to do their jobs, and because people's natural inclination is to exploit their social networks, the Learning and Knowledge Organization decided to design its knowledge-sharing approach around the exchange of tacit knowledge through human networks.

As part of this effort, the organization has redesigned GBS' strategy for expertise location and social networking. Traditionally, the division's expertise location approaches included:

- **BluePages**—a corporate directory,
- **Practitioner Support Network**—a person-brokered service,
- **BlueGroups**—e-mail/distribution list management,
- **forums**—support for formal and informal communities, and
- **other common means**—such as telephone and rolodex.

"A lot of people use BluePages to search for people," Clevenger notes. "But I don't really think of it as an expertise location system. It contains a wealth of facts, but lacks any contextual information or social networking data. Our Practitioner Support Network also used to provide a service around finding experts. As we have introduced new tools, however, we have been able to adapt the scope of this network to focus on analytical research, while expertise location is provided in a self-service manner through the portal. Our objective is to put new capabilities in front of people so that they don't have to rely on other people to find expertise."

GBS's new Practitioner Portal provides a single point access to people, content, and knowledge-sharing services (Figure 2). A federated search function integrates multiple repositories and social applications. The portal has a distributed content ownership model that incorporates social computing and automated expertise location. Through the use of Web 2.0 tools, GBS is embracing activities such as social bookmarking and tagging. Instead of relying on application-specific functionality, the new model focuses on Web services that feed up through the portal, and the nature of the platform will enable GBS to integrate new capabilities more quickly and easily.

Practitioner Portal Model

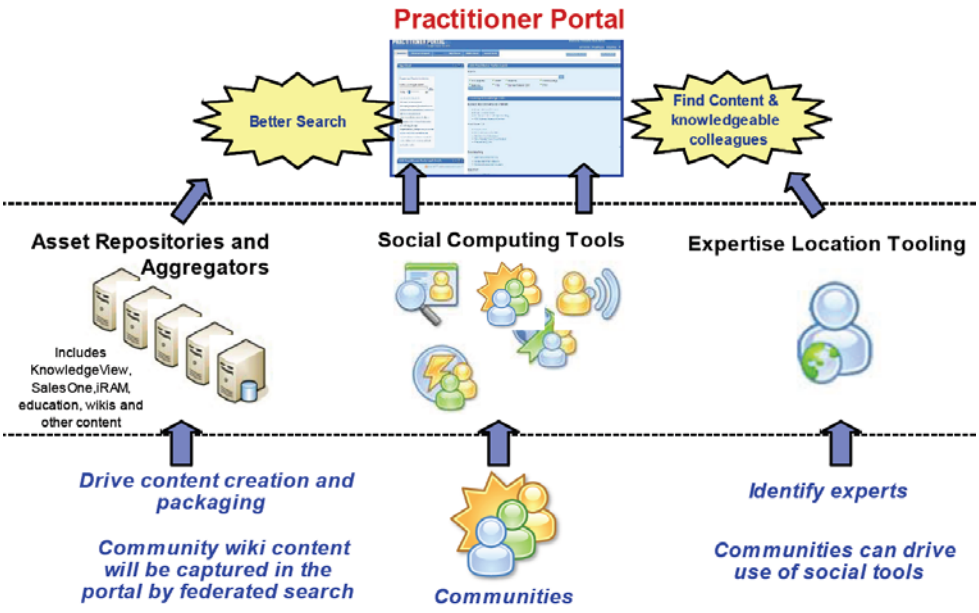

Figure 2

The Learning and Knowledge Organization anticipates that the Practitioner Portal and its Web services model will help GBS unlock hidden knowledge and expertise, tap into the power of extended social networks to increase knowledge sharing and collaboration, and optimize the value of content through social networks. For employees, the new knowledge-sharing model will simplify the process of locating experts and expertise. As detailed in Figure 3, the Learning and Knowledge Organization wants to provide social solutions that offer users business value.

Value Matrix for GBS' New Knowledge-Sharing Model

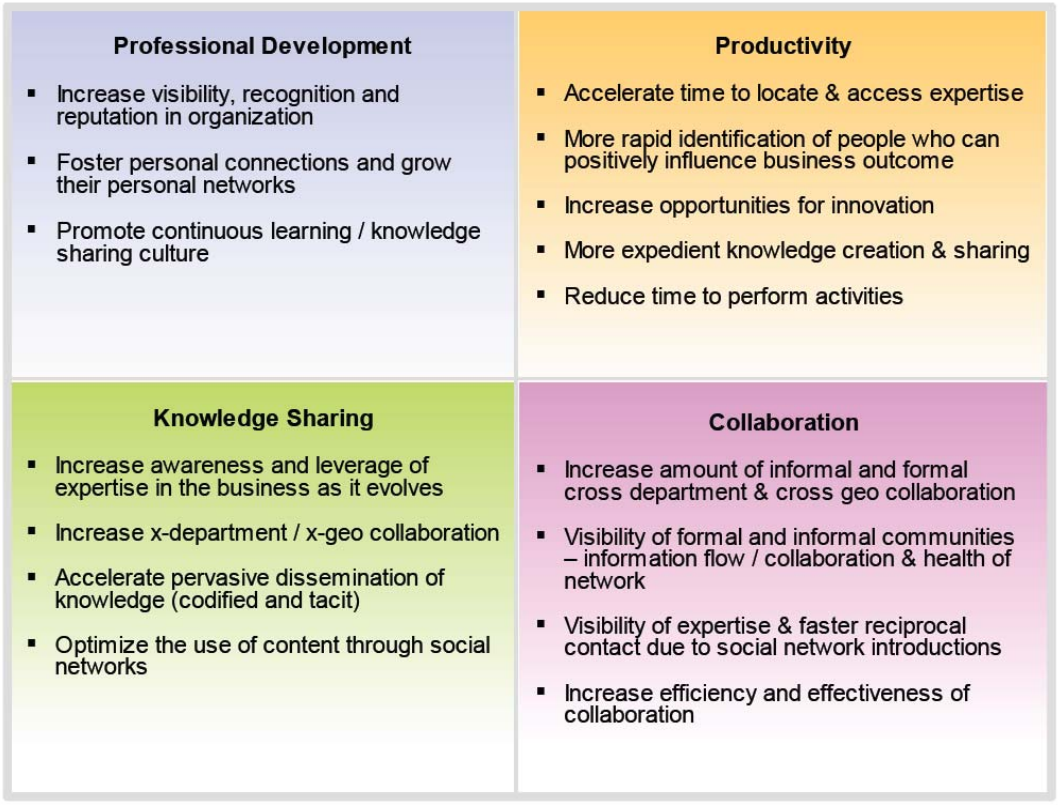

Figure 3

The Learning and Knowledge Organization is currently focusing its expertise location approach on data and how it can be leveraged through analytics. "We don't staff people to serve exclusively as experts," Clevenger explains. "The experts are people out on project sites, so we have to tap into that wherever it occurs naturally." Figure 4 shows how analytics will drive the technology landscape for expertise location and social networking. Automation and federated search functionality will reduce the organization's distributive labor model while extending the reach of knowledge held by individual employees and communities of practice.

"Like most consulting organizations, our consultants have utilization targets," Clevenger notes. "Formal knowledge-sharing activities are sometimes perceived as detracting from utilization, so we're trying to give our users fast, easy access to content and people so they can be more effective and efficient. As part of our shifting model, we're simplifying and automating the contribution process as much as possible. We expect our new model not to be perceived as a hit to utilization, but instead as a performance-enhancing enablement that is a fundamental part of people's jobs."

Social Networking and Expertise Location Technology Landscape

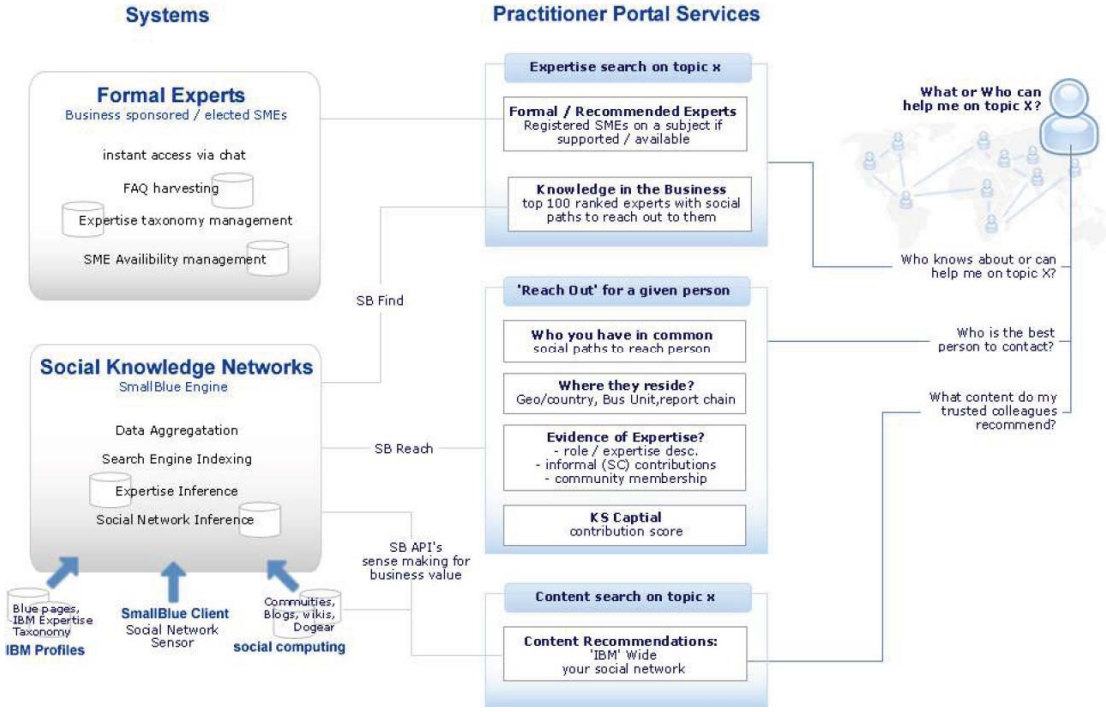

Figure 4

Processes and Tools for Expertise Location

As an aggregation of several back-end services, the Practitioner Portal's main purpose is to provide a single point of entry with easy navigation. IBM has a primary corporate intranet site, but the Practitioner Portal acts as the hub for learning and knowledge activities within GBS. (Other lines of business within IBM have their own portals, although they may share some underlying services.)

The Practitioner Portal is organized into "portlets," which are unique sets of services and/or content derived from many different sources (Figure 5). Within each portlet are tabs to enable searches, expertise location, and business functionality. May aspects of the portal can be personalized so that users see only the information they need to do their jobs. Personalization can include anything from major applications, networks, and communities to less formal applications such as currency calculators or time zone clocks.

The GBS Practitioner Portal

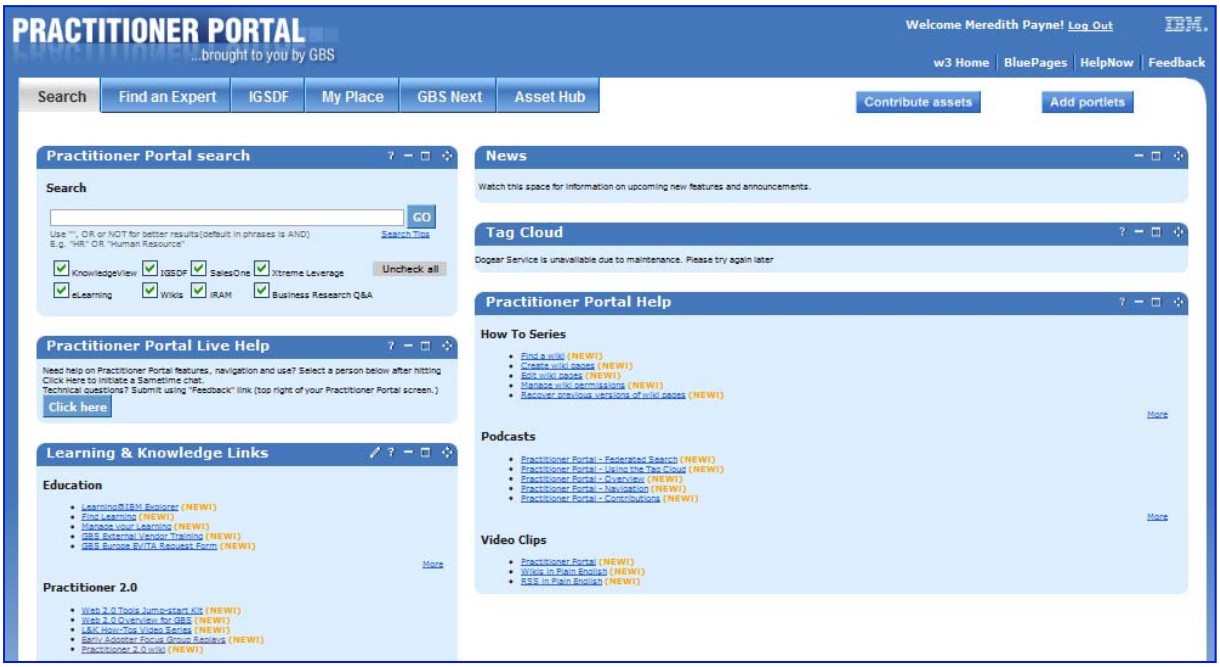

Figure 5

A major feature of the Practitioner Portal is its federated search, which pulls content from various IBM knowledge asset repositories and other sources into a single search interface. The resources aggregated in federated search include documents, wikis, community libraries, employee profiles, and on-demand training. Users can search these knowledge assets using social tags or their own search strings and then easily refine results.

Although the list of Web services available through the Practitioner Portal will remain fluid, current services include:

- a federated search for content across multiple sources, including asset repositories and wikis;
- a SmallBlue/Atlas–enabled search for expertise and social networks;
- a service that connects employees to designated experts via instant messaging functionality embedded in key enterprise applications;
- a customizable "My Place" tab where users can add any portlets they desire;
- a social bookmarking feature for individuals and teams to store, catalog, and share URL bookmarks;
- RSS feeds for Web sites or any new or changed content; and
- notifications summarizing specific employees' tagging activities.

Several of these Web services are described in detail below.

SMALLBLUE/ATLAS

One of the Web services provided through the Practitioner Portal is called SmallBlue (commercially known as Atlas for Lotus Connections), which is a statistical expertise and social network inference platform and search engine developed by GBS' Learning and Knowledge Organization in partnership with IBM Research and IBM Software Services for Lotus.

SmallBlue combines data from the IBM internal public domain with statistical data contributed by consenting opt-in users to make inferences about people's expertise in particular areas and generate an enterprise-wide social network map. The SmallBlue service enables GBS employees to locate knowledgeable colleagues in their social networks, formal and informal communities, and across the organization.

Suggested social paths enable people to reach out and collaborate with colleagues in an expedient manner. SmallBlue also enables employees to view, manage, and optimize their own personal social networks. As shown in Figure 6, SmallBlue analyzes numerous data sources to make deductions about social networks and expertise. The data is aggregated and used to create the inference indexes that power the SmallBlue tools.

As a social network tool, SmallBlue has been designed to respect individual employees' privacy. Users contribute on an opt-in basis, and the system allows participating users to select terms to be excluded from analysis. In addition, the SmallBlue service supports a master list of terms that are not searched or indexed.

SmallBlue Analytical Process

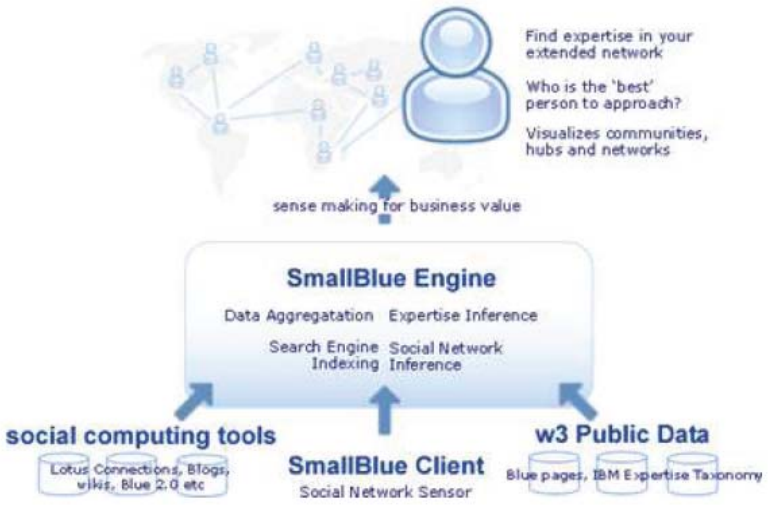

Figure 6

The SmallBlue engine is used to power four distinct tools:

1. **SmallBlue Find**—This tool helps employees locate knowledgeable colleagues by identifying people within existing social networks and across the organization who have information on a given search topic.
2. **SmallBlue Reach**—This tool helps employees analyze lists of suggested connections and decide who to contact. The tool presents the social networking path connecting the employee to each potential expert along with formal and informal views of each expert's interests and knowledge.
3. **SmallBlue Net**—This tool helps employees visualize the social networks associated with particular subject areas by displaying social network diagrams for expertise searches, distribution lists, and communities.
4. **SmallBlue Ego**—This tool helps employees understand and capitalize on the value of their personal social networks by creating visualizations of those networks. The visualizations reveal various colleagues' potential social network value by displaying the types of people to whom those colleagues are connected.

When an employee conducts a search using SmallBlue Find, the system displays the top 100 people associated with the search topic (i.e., the 100 people most knowledgeable about the topic according to the inferred data). Users can filter the results to locate experts within their immediate and extended social networks; results can also be refined by parameters such as country and line of business. From the search results, employees can see contact information for each expert as well as the social networking path that connects them to that individual. Clicking on a person's picture in the SmallBlue Find search results automatically opens SmallBlue Reach.

SmallBlue Reach helps employees look through SmallBlue Find search results and decide who is the "best" person to approach for information on a particular topic. For each knowledgeable colleague, SmallBlue Reach displays:

- a description of the person's skills;
- a list of the communities to which that person belongs; and
- links to the person's contributions to blogs, forms, and social bookmarking tools.

As shown in Figure 7, this enables users to delve into the details of each connection's expertise and determine who is most likely to have the necessary knowledge.

Once an employee has chosen a colleague to contact, SmallBlue can show the employee how to get an introduction by listing the connections that the employee has in common with the colleague. Employees can even view visualizations of social networks based on community memberships, social tags, expertise, or organizational hierarchy (Figure 8). Using inferred data about extended social networks, the tool displays the social network path to each colleague and related content that the colleague has tagged as "recommended."

SmallBlue Reach

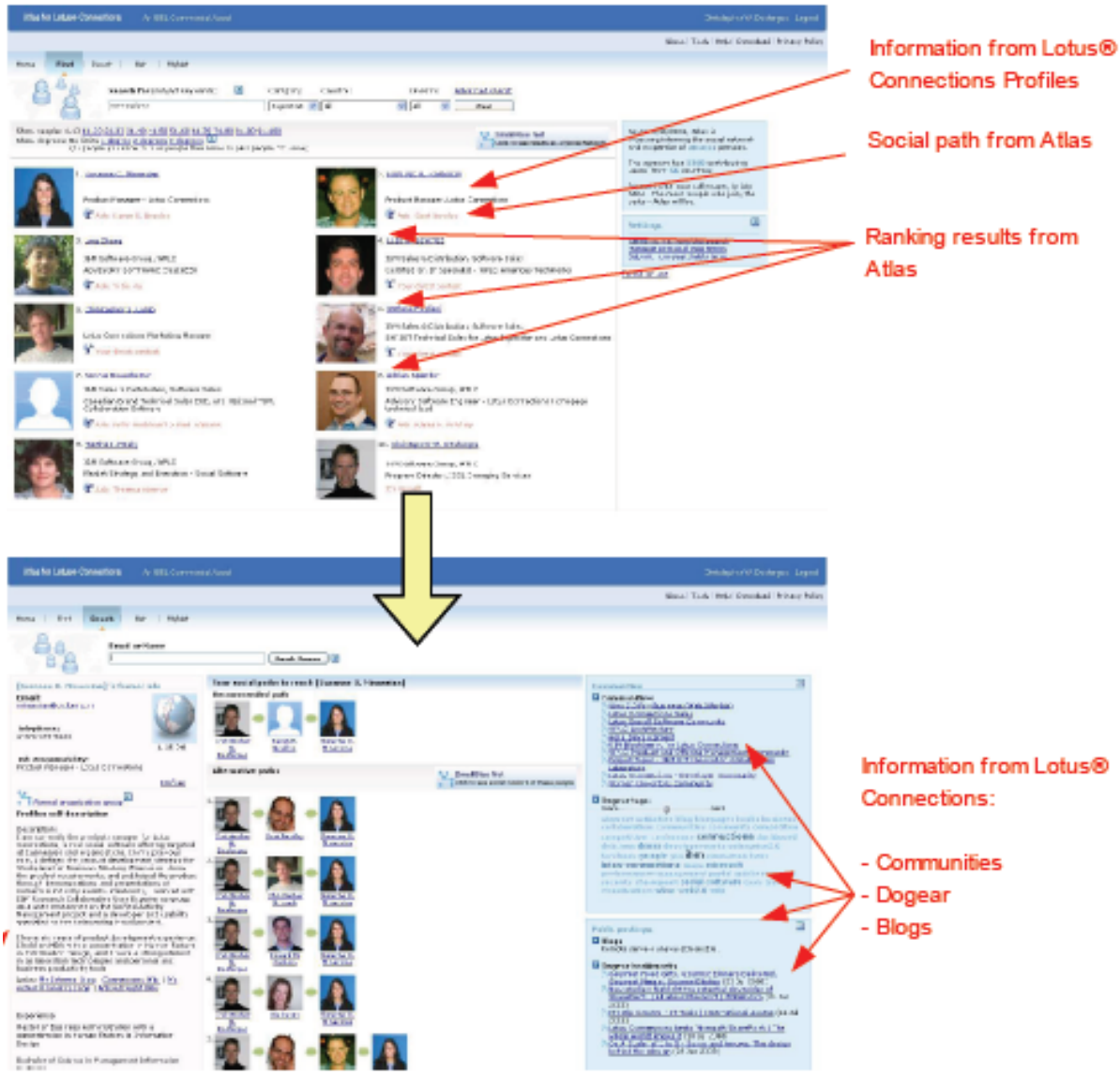

Figure 7

Social Networks on SmallBlue Reach

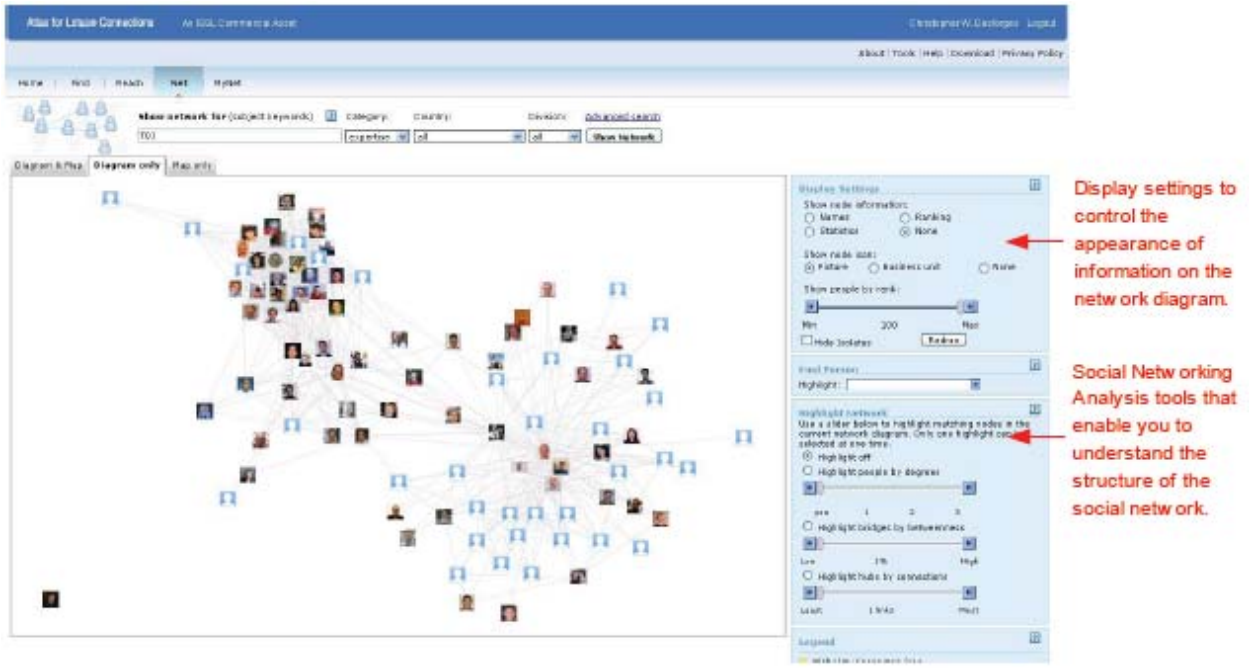

Figure 8

It's all about the data," Clevenger notes. "The power of analytics and social networking offers many opportunities to revolutionize knowledge sharing and collaboration."

SmallBlue started as a pilot in 2007 and was added as a service to the Practitioner Portal in 2008. As of October 2008, 6,100 employees had opted in and agreed to contribute data to the system.

The SmallBlue/Atlas team is developing the application by leveraging extended social network and expertise data gained through SmallBlue to improve search functionality and content recommendations. For example, the Synergy Search tool will allow an employee to enter a search term and then provide personalized results based on content that the employee's social network has tagged as relevant to that topic.

The SmallBlue/Atlas team also plans to develop additional social content recommendation services. Its SmallBlue Whisper tool will use social networking and social bookmarking to recommend content based on what others within an employee's social network are tagging. This aggregation prevents the need for people to subscribe individually to colleagues' bookmarks.

EXPERTISE LOCATION VIA INSTANT MESSAGING

In 2005, IBM began working on a way for employees to contact designated experts directly from e-learning or other online applications. The objective was to provide just-in-time access to expertise via an instant messaging (IM) application so that neither experts nor those in need of knowledge would have to access a separate system in order to interact. This core service is now being leveraged in many applications around the organization, including the Practitioner Portal.

The service is embedded in over 200 different applications at IBM, connecting peers and experts via instant messaging or e-mail in the context of parent applications. In addition to highlighting relevant experts, the tool provides links to frequently asked questions (FAQs) and reference materials.

The participating experts volunteer to answer questions during certain hours in addition to performing their typical, day-to-day responsibilities. Once an expert has answered a particular question via IM, the text from the chat can be incorporated into a FAQ and made available to future knowledge seekers.

In addition to embedding this functionality in other applications as a Web service, IBM offers the tool as a stand-alone application. In both cases, the tool identifies officially recognized experts who have made themselves available to answer questions on specific topics.

> "We're very careful about how we define an expert because, in some circumstances, that term can mean something very specific. We have one tool that highlights formal expertise and a different application that more broadly infers expertise. Depending upon a user's circumstance, these two tools can provide very different but powerful information."
>
> —Bryant Clevenger
> Global knowledge strategy leader
> IBM Global Business Services

"One of our biggest uses of this system is in our systems and technology group," notes Laurie Miller, an expertise program manager in IBM Learning. "A huge number of people are retiring soon, and there is no way to ask all of those people to please write down everything they know. There's also a shortage of young people coming out of college who want to go through core dumps and learn things like C++. So we've tried to figure out a way to make these people who have critical knowledge available, when they can be, to other people with questions."

IBM has patents pending on both the technology and the process involved in this method of connecting employees to recognized experts.

THE EXTENSIBLE POWER OF WEB SERVICES

IBM GBS leverages Web services to expand the channels of access to knowledge resources. For example, key features of the Practitioner Portal—including its federated search and the SmallBlue/Atlas expertise search—are available as browser toolbars and instant messaging application plug-ins. This approach improves access by making the resources more readily available from applications that employees are already using.

Organizational and Cultural Issues

IBM's embrace of Web 2.0 technologies has led to a cultural shift at the organization, as well as a shift in focus for GBS' Learning and Knowledge Organization. "We think of ourselves now in a perpetual beta," Clevenger says. "Two years ago, we had a much more traditional software life cycle model, where we would receive many requirements, prioritize them, and deploy those we were able to fund on an annual cycle. We became dissatisfied with that model and the length of time it took from requirement to deployment. Today, we have changed the model so that we consider ourselves more in a perpetual beta, always evolving and improving. Our approach now is that we strive to get capabilities out more quickly and be more flexible to user feedback."

According to Clevenger, Web 2.0 applications allow GBS to meet evolving knowledge-sharing needs more effectively because such technologies make it easier to take risks and experiment. The fluid nature of the Practitioner Portal enables the organization to quickly launch and test new functionality while improving existing applications and services.

When the portal was launched in 2008, it was tested via pilot projects and focus groups before it was introduced to the wider GBS employee base. Virtual training is available in the form of short, instructional videos and online help documents, but the team believes that using the portal is largely intuitive. "We are leveraging a training model much like YouTube or Facebook—where there is little formal education required," Clevenger explains.

A key feature of the Web services available through the Practitioner Portal is their voluntary nature. For SmallBlue, employees must opt in before certain data about them is utilized by the system. Employees can opt out of any feature or function and can ask that their information be excluded from any given expertise topic. Similarly, for the more formal expertise location applications, experts must explicitly agree to be included. All the Web services comply with IBM's corporate privacy and data protection policies. "We have been working diligently with our privacy experts to ensure that our design preserves the privacy of our employees," Clevenger says.

Impact: Indicators and Measures of Success

At the time of this writing, the Practitioner Portal is still very new, and IBM has not been able to measure its full impact. The learning and knowledge team can easily measure activity such as the number of assets submitted and the number of employees opting into SmallBlue, but it is still determining how best to translate such activity into measures of financial impact.

> "We find it challenging to systematically measure ROI in social networking and expertise location. How do you really measure the value of a conversation? We believe that the measures we are able to put in place actually under-report the value."
>
> —Bryant Clevenger
> Global knowledge strategy leader
> IBM Global Business Services

"Even though this toolset is relatively new, adoption trends are heading in the right direction," Clevenger remarks. "We've had over 100,000 searches in SmallBlue from February to October 2008."

During the first seven months that the IM expertise location service has been available, experts from 16 service areas and 23 countries have volunteered to participate. More than 4,000 questions have been asked, and experts have spent almost 60,000 minutes answering those questions. The service has been embedded in 200 internal IBM Web applications, including the Practitioner Portal, a help desk application, and various communities.

This level of interest in expertise location reflects IBM employees' general embrace of Web 2.0 technology. For instance, several million wiki pages were viewed in the first 10 months of 2008. During that same time, 130,000 blog entries were written by 63,000 employees. Clearly, IBM's work force is excited about Web 2.0 applications and eager to adopt new social applications; this cultural current bodes well for the future of the organization's expertise location Web services.

Lessons Learned and Future Plans

IBM GBS' Learning and Knowledge Organization cites the following lessons learned from its experience developing and launching social networking and expertise location toolset described in this case study.

- **Engage your organization's legal department and privacy experts early in the process.** It can take a long time to get approval. "The last thing you want to do is invest your time and find out later that you are in violation of the law," Clevenger says.
- **Determine what is indicated by various data sources.** When mining data about employees' knowledge, make sure that you differentiate between expertise and interest. Someone may be interested in a particular topic, but that does not make him or her an expert. For this reason, IBM had chosen not to mine wiki and blog content when making inferences about expertise.

- **Usability and user experience are critical.** "We try not to get in our own corner to develop something," Clevenger says. "We engage users to define the problems we need to solve and validate functionality."
- **Leverage the power of analytics, but take privacy into account.** Web 2.0 technology provides a great opportunity to centralize search services while mining social networking data for valuable content, and organizations should take advantage of that. However, it is important not to impinge on people's privacy. "We're lucky to have both technology and research organizations with people who understand this," Clevenger notes.
- **Analytics alone are not enough.** Even when introducing automated solutions, success requires leveraging context and getting people involved.

> "We've seen a large acceptance of Web 2.0 technology after we introduced the new capabilities. We're at the front end of what I'm sure is a very long and exciting evolution."
>
> —Bryant Clevenger
> Global knowledge strategy leader
> IBM Global Business Services

In the future, the GBS learning and knowledge team is planning to enhance SmallBlue by increasing the amount of corporate and extended social networking data on which inferences are based. The team is also exploring the use of visual interfaces to improve content searches. Visual interfaces that help users expediently find useful content and people will be a powerful tool for the Practitioner Portal.

"The opportunities for leveraging social networking data are huge," Clevenger says. "We've only scratched the surface. We'll cast the net wide and then pull into the portal the capabilities that add the most value."

ABOUT APQC

For over 30 years, APQC has been on the leading edge of improving performance and fostering innovation around the world. APQC works with organizations across all industries to find practical, cost-effective solutions to drive productivity and quality improvement. We are a member-based nonprofit currently serving more than 500 organizations in all sectors of business, education, and government.

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