



## **Fogbeam Vision Series - The Modern Intranet**

### **Where It All Started**

Intranets began to appear as a venue for collaboration and knowledge sharing in corporations in the mid 1990's, and have since become ubiquitous. Every organization needs a way to simply and easily share documents, news, updates, and information in a timely and easy to use fashion. By using existing Web technologies like HTML, CSS, Javascript and HTTP, from the earliest days Intranets were able to provide functions including:

1. Document Sharing
2. Wikis
3. Forums
4. Blogs
5. Keyword Search

By the early to mid 2000's, Intranets had evolved to include more advanced functionality including application portals and workflow integration. By the late 2000's, the first social features were beginning to appear in enterprise Intranet environments.

### **The State of the Art**

Since the mid 2000's, the idea of the Intranet has continued to absorb new technologies, as the scope of Intranets and knowledge sharing technology has grown. The current state of the art Intranet will often include some or all of the following facilities.

#### ***Collaborative Real-time Editing***

Using a real-time collaborative editor, multiple users can edit the same document simultaneously, with each seeing near instantaneous updates as they are made by other users. Conflicts are highlighted to each user participating in the conflicting region, making it possible for the users to quickly merge their changes into a mutually acceptable version. This kind of real-time collaboration drastically improves collaboration in many contexts: writing sales proposals, statements of work, whitepapers, and any other text oriented document which needs the input of multiple creative editors. This technology is not limited to text however, as spreadsheets may also participate in this kind of real-time collaboration.

#### ***Application Wikis***

Like any wiki, an application wiki supports a massively distributed approach to document editing, knowledge sharing and collaboration. Application wikis represent a later generation of wiki technology, with support for storing structured data, and executable code within the wiki itself. This support allows the development of powerful extensions, and allow the ability to easily connect unstructured data with data stored in database form. Scripting allows users to program scripts which operate on the data stored in either form.

## ***Social Networks***

The earliest social networks to begin appearing in Intranets simply allowed users to edit a profile in the “company directory” and to search for other users based on their profiles. As this technology has evolved, Intranet social networks have gained more of the interactive aspects of their consumer facing counterparts, ala Facebook or Twitter. Intranets now support micro-blogging, posting and sharing of status updates, and the ability to “follow” and “friend” other users.

## ***Tagging***

In years past, Intranet administrators were tasked with creating and enforcing a rigid hierarchy to define relationships and categories for the Intranet. This approach was overly limiting, too rigid and did not support the kind of rapid evolution required by the real-world. Tagging, or “folksonomy” in technical terms, allows users to assign arbitrary levels of categorization and distinction to content on the Intranet. Once content is “tagged” by users, these tags can be used to locate and group content and navigate through the Intranet. Unlike the old approach, tags can change as rapidly as events in the real-world demand.

## ***Application Integration***

Over time Intranets evolved from simply serving as content repositories and became gateways to interactive applications delivered over the network. Portals based on technologies like Java Portlets, or OpenSocial / Google Gadets allow uses to assemble convenient dashboards that provide fingertip access to the applications they work with on a routine basis.

## ***Automation / Scripting***

The most powerful Intranet platforms expose APIs that allow for programmatic interaction with the content and services of the Intranet. With APIs available, users engaging in “end user computing” or IT staff can develop even more powerful applications which build on top of the fundamental capabilities of the Intranet itself.

## **Beyond the Intranet – an Enterprise Knowledge Network**

Now, in mid 2015, we are ready to for the next stage of Intranet evolution. New technologies and techniques allow cutting edge intranet environments to do even more to enhance and support knowledge sharing, collaboration and innovation. For anyone deploying an advanced Intranet in 2015, here are a few topics that must be considered.

### ***Semantic Wikis***

An advance beyond the application wiki, semantic wikis build a structured model of the knowledge contained in the wiki, and expose this knowledge model for for querying like a database. Using a semantic wiki, users can easily answer questions using the knowledge contained within the wiki, which would take much painstaking, tedious work to answer by hand. For example, if a user of Wikipedia wanted a list of, say, “Capital cities of countries in Africa that heavily export palm oil”, they would have to compile this answer in stages, performing multiple queries and aggregating information by hand in a separate document.

### ***Semantic integration***

Semantic integration refers to the ability of an Enterprise Knowledge Network to extract meaningful semantics from content as it is encountered, and build a comprehensive knowledge-base from that content. As content is analyzed and its semantics extracted, this knowledge-base allows a very powerful level of integration between content, applications and events. For example, a user interested in RFQ's may task the system to identify RFQ's meeting a specific parameter (perhaps requests for a category of product where the firms offering is not quite ready for market yet) and automatically route that event to the relevant engineers and product managers, launching a review-and-comment workflow, which will then deliver a report to the user. This example illustrates a powerful capability we call “connecting content to action”.

## ***Semantic Search***

Semantic search moves beyond old style keyword search by using knowledge of the underlying meaning associated with terms, words and identifiers in order to search more precisely and accurately. This is especially beneficial when searching around terms which are often overloaded with many multiple meanings. For example, a user searching for information about “Java” might be looking for information about a programming language, or an island in the South Pacific, or a slang term for coffee. With a keyword based search engine, it is difficult to tell the system *which* “Java” you intended to search for. Semantic search makes this possible, and also allows the search to navigate links between semantically connected resources. The earlier example regarding cities in Africa was also an example of semantic search in action.

## ***Advanced Social Interaction***

Beyond simple user profiles and status updates, an Enterprise Knowledge Network supports interactions throughout the system based on users and the social and contextual relationships between those users. Using an EKN, a user editing a document which deals with a product like “Widget AXQ-BR997” will have fingertip access to a list of users connected to that item – the engineers who designed it, the product manager responsible for it, the sales-people who sell it, and so on. Furthermore, when searching for content within the system, this social information is used to enhance the search ranking, so that a document authored by a user directly connected to the topic of the query is more likely to be returned near the top of the search results. An EKN will also support the ability of users to associate semantically meaningful tags to other users, which also become part of the knowledge-base used for semantic search and semantic integration.

## ***Agents / Virtual Users***

The world around us is in a constant state of flux, and events are happening at far too high a volume and pace for any individual user to keep track of everything. An Enterprise Knowledge Network supports the creation of “agents” or “virtual users” to which a user can delegate tasks, like monitoring a list of news feeds, and alerting the user to items of specific interest, or items which meet some pre-defined threshold. Using a conversational interface, users can “talk” to their agents, to send them instructions or re-define their parameters on the fly. By the same token, agents can alert their users of important events, or ask for further instructions.

## ***Interactive workbook computing***

Interactive workbooks are shared collaborative workbooks which allow users to enter code and equations, and run queries against a wide variety of data-sets. Results can be visualized with a variety of charts and graphics. Workbooks can be shared with other users, making it easy to share results or pull in additional collaborators. This web-based workbook environment integrates with “big data” back-end analytics systems, like Apache Spark, as well as specialized programming environments like the R statistical programming system. Using this workbooks, rapid-fire exploratory data analysis can be performed in real-time, by multiple users collaborating anywhere in the organization.

## ***Visualization***

As mentioned above, a modern Enterprise Knowledge Network integrates data analysis capabilities and supports the ability to research data questions and visualize the results. Additionally, the visualization capability works with the semantic integration to allow a visual navigation through the “knowledge space” of the firm, which allows rapid visual knowledge exploration and mining.

## ***Social Network Analysis***

Social Network Analysis is the application of techniques drawn from graph theory, network science and sociology, to explore and reason about social connections within an ecosystem. Applied to an organizational setting, SNA provides the ability to identify and optimize the routing of knowledge in the firm, and the ability to identify social structures that affect the firm's ability to adapt, innovate and compete – even when those structures are not visible on the formal org-chart. In a modern Enterprise Knowledge Network, the social and semantic information mined from interactions across the network are used to provide rich insights into how knowledge sharing and collaboration take place.

## ***Collective intelligence***

Collective Intelligence is an emergent property of the interactions of many individuals within a system, in which the “crowd” displays greater intelligence than any individual could display alone. Collective intelligence emerges when individuals communicate, collaborate and compete. The idea itself is old, dating back to the late 1700's. But it is only with the advent of modern information technologies that we are able to expand the range and extent of human interactions sufficiently to maximize group intelligence. In the context of an Enterprise Knowledge Network, collective intelligence emerges in multiple ways. On one hand, collective intelligence is in effect when users comment on, share, tag, and rate content. It is also a factor when users leverage real-time collaborative editing, interactive workbook computing, and other facilities to dynamically create and share knowledge in real-time.

## **Other considerations**

When considering the implementation of an Enterprise Knowledge Network, technological capabilities are one important factor. Beyond that, however, are a number of other factors that must be evaluated.

## ***Open Standards***

Many vendors offer products in the Information Technology marketplace which attempt to achieve “vendor lock in” by using proprietary, non-standard interfaces and protocols. When deploying solutions of this nature, the customer is limited to *only* being able to use products from the selected vendor, with limited – or no – ability to integrate the product into a larger solution. To develop a system truly worthy of the name Enterprise Knowledge Network, all of the components of the system **must** be based on open standards, well-defined APIs, non-proprietary protocols and formats, and interfaces which maximize interoperability. This is a non-negotiable part of what it means to build a truly ubiquitous, enterprise-spanning Enterprise Knowledge Network.

## ***Open Source***

Going beyond even open standards, the ideal products and solutions to use when assembling an Enterprise Knowledge Network will be open source, licensed under an OSI approved license, and developed in true community fashion. It is only when products are open source that customers can have total confidence that their solution can remain supported, active and viable, regardless of the whims of the vendor(s) involved. Development using only open source components ensures that the customer always has access to the source code of the solution, and can make any modifications or alterations that are needed – without depending on a vendor.

## ***Enterprise Integration***

An Enterprise Knowledge Networks is more than simply a place to share documents, or post status updates. The EKN is the backbone of how knowledge is shared throughout the firm, facilitating collaboration, innovation, and decision making. In order to serve this function, all elements of the EKN must be designed from the ground-up with a focus on integration. If the products chosen to build an EKN do not support integration with your Customer Relationship Management (CRM) system, or your Human Resources Management (HRM) system, or your Manufacturing Resource Planning (MRP) systems, and so on, it will not be possible to achieve the kind of holistic, enterprise-wide knowledge-base which amplifies organizational effectiveness to its peak potential.

## **Summary**

The modern Intranet has moved far beyond its humble beginnings as no more than a disorganized collection of documents and links. Today's Intranet serves as the foundation of an Enterprise Knowledge Network. Building on technologies developed as part of the semantic web initiative, Fogbeam Labs EKN solutions offer the capabilities needed to enable rapid and efficient knowledge capture, sharing, and reuse, as well as effective collaboration and rapid innovation.

For help building an Enterprise Knowledge Network within your organization, contact Fogbeam Labs today. Email [info@fogbeam.com](mailto:info@fogbeam.com), or call us at 919-265-4489.