Building a Knowledge Management System with Documentum

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Introduction

This article describes best practices to architect and build a knowledge management system with a Documentum\textsuperscript{®} platform. It derives from a real case of a well-known automotive customer, but it can be applied across other industries.

We will discuss the following topics:
- What is knowledge?
- Keys to success when building a knowledge management system
- Best practices of deployment
- Real world examples

Target Audience

This article is written for audiences who are interested in or responsible for building an enterprise knowledge management system. It discusses both business and technical factors to consider when building a knowledge management system with Documentum. There is no need for Documentum experience.

What is Knowledge?

Knowledge is an abstract concept that exists within organizations and individuals. It is the valuable product of human perceptions generated by flaws, gaps, errors, practices, and even crises within the process of daily work. It may be displayed as reports, business processes, training materials, guidelines and best practices.

There are two categories of knowledge.

One is tacit knowledge. Tacit knowledge is knowledge based on experience and observation. It's just the way that things are done. It's something that is immensely powerful because it is relevant. It can be directly applied to the activities that need to be done in the future. One example of tacit knowledge comes from a senior automotive worker on the product line, sprinkling all sorts of skills and tricks among junior
employees. Tacit knowledge can only be obtained through observation and oral coaching. Therefore, it is limited and time-consuming.

The other type is explicit knowledge. Explicit knowledge can be quantified, written down, and clearly communicated to others. It is something that has been converted to a rule. For instance, workers must observe the security guidelines before operating the stream line, or engineers must look into national specification books when designing a car engine. Explicit knowledge is comparably easier to reuse.

According to some surveys, only 5% of knowledge is explicit knowledge whereas 95% of knowledge is tacit.

source: http://www.cognitivedesignsolutions.com/KM/ExplicitTacit.htm

What is Knowledge Management?

Knowledge management coordinates the processes to capture, organize, store and distribute information within an enterprise to make it available to others. This access to information is designed to go beyond databases and document repositories to also include the experiences of workers and teams through communication and collaboration technologies. Knowledge management seeks to deliver information in a manner that
makes it actionable — to dynamically convert information into knowledge. Making information actionable is ultimately a human process, not simply a machine process.

**Make Knowledge Conversions Magic Happen**

Converting tacit knowledge into explicit knowledge is a key element to accelerate knowledge reuse, retain knowledge assets, and maintain organizations’ competitive advantages.

On the other hand, tacit knowledge may contain a more precise understanding of how to make things work than explicit knowledge. So there comes the exciting knowledge cycle.

Workers and engineers may get inspired based on explicit knowledge in the system, and adopt it into routine works. This will certainly generate more tacit knowledge. They may also turn the knowledge into a company patent or other intellectual property rights.

Enabling the cycle is not as easy as it looks. But with the help of a knowledge management software platform such as Documentum, things can be different. Knowledge can easily be created, shared, identified, consolidated, and retained. New techniques can be applied, new systems can be deployed, and new products can be developed faster than ever before. Eventually, it drives the momentum of your business growth and supports the foundations of a companies’ cultures by calling for team work.

**Obstacles to Conquer**

Accuracy is the first obstacle when making this conversion. Tacit Knowledge is complex. Remember, it is always harder to describe a human face than to recognize it.

A Knowledge Management System can help you to subjectively define tacit knowledge simply by describing explicit perspectives. In the system, the perspectives are called object types and attributes. By using them, the conversion begins accurately without losing information. The limitations of oral knowledge are overcome. Moreover, relevant knowledge can be grouped into knowledge sets to ensure efficiency. Of course, defining the types and attributes requires effort but certainly there are industry samples to follow.
The next obstacle is to motivate employees. Motivation and commitment of knowledge workers, professionals, and managers are being increasingly realized as critical success factors for the implementation of any enterprise knowledge management system.

Pillsbury Co. of Minneapolis is a case in point. A scientist proposed creating a forum in which everyone could contribute knowledge about all aspects of batter and related products. The IT department built the system, seeded it with a few thought-provoking questions, and invited participation via e-mail to all relevant parties. After waiting for six months, the scientist found that not a single user had signed on. The application was deemed a failure and shut down. In retrospect, the organizational diagnosis of the failure of the knowledge management system concluded that there was no incentive for anyone to invest time and energy to solve other people’s problems.

A shared sense of motivation and commitment comes from above. In this framework, experts play important roles as they are the ones to start the conversation and encourage communications. To accomplish this, you need a platform that enables any document to be generated by collaboration among colleagues or different lines of businesses. Documents can go through a recommendation process. When reviewed and approved by knowledge experts in specific areas, it becomes published knowledge that can be shared across the enterprise. Comments or Q & As can be developed and attached to the knowledge to assist other workers who need this relevant information.

The knowledge management systems’ operation and user interface should be easy to use by non-IT employees. Limited, if any, training should be needed. If it is too complicated, users will simply not contribute. The Documentum Webtop product offers a user-friendly interface to all enterprise users.

**Keys to Building a Successful Knowledge Management System**

Before building a knowledge management system, ensure that employees have expertise to share, that they have developed experience. They should know the principles and have tested their accuracy. This is a long, cumulative process before it is time to think of knowledge management.

Here are the keys to success when building a knowledge management system:
• Content is useless until it becomes knowledge that is precisely defined and organized.
• Knowledge is not valuable until it is assessed and acknowledged by experts, knowledge administrators, and relevant employees.
• Experts play important roles as they are the ones who start the conversation and encourage communication, especially cross-functional communication.
• Employees Motivation Methods can be deployed as an added incentive.
• The operations and user interfaces should be easy to handle by non-IT employees with minimal, if any, training.
• The cycle of ‘contribute and reuse’ should be formed in the system.

Knowledge Life Cycle Perspective

In a complete knowledge management model, there are eight sequential phases that forms a process cycle.
1. Internalizing
Internalizing is the process of understanding information, putting it into context with existing knowledge, and transforming it into knowledge. This part of the cycle happens inside the human mind and therefore can be supported but not replaced by technology.

2. Create
New knowledge is created in the minds of individuals, typically by combining previous knowledge with their own insights or experiences. Other ways to create knowledge in a company are to hire new people, rent knowledge by hiring consultants or professionals for specific jobs, or acquire companies including their knowledge base. Again, this part of the cycle is outside the scope of technology.

3. Externalizing
Externalizing is the process of explaining knowledge, thus transforming it into information. This can be as simple as speaking to someone, writing a document, drawing a figure, preparing a presentation, or teaching. This is a significant failure point in knowledge management initiatives as they fail to motivate people to do this.

4. Capturing
This is the process of transforming information into data so that it can be stored and processed by computers (also called codifying). This process should be as easy as possible. It should be easy to capture the information, and to search for it. It should be enriched with metadata when possible (most importantly who created it and when), and accessible by a wide range of users without requiring special hardware or software.

5. Storing
Storing is the process of entering data into the corporate knowledge base. It should be as simple as possible for users to store files, data, or metadata.

6. Organize / Refine
Once information is stored in the system, its usability and accessibility can be greatly improved by putting it into context and enriching it with additional knowledge.
7. **Disseminate**
Dissemination is the process that publishes access to the data stored in the corporate knowledge base. Publishing and accessing schemes may vary, depending on the application and requirements at hand.

8. **Access**
Process where the data or knowledge artifacts are invoked by authorized users so that they can make use of it.

Then, from a technical perspective, some of the phases can be merged so that the knowledge management lifecycle can be simplified. It consists of five activities during its whole lifecycle processes.

- **Creation**
Convert scattered content into knowledge through collaboration.

- **Review**
Experts review whether the knowledge content is correct and the objectives are helpful. Knowledge administrators review whether the information and attributes are complete. The review process may include collaboration. This is the key activity that distinguishes a knowledge management system from a simple content management system.

- **Publish**
Combine knowledge into knowledge sets and publish into pre-defined categories.

- **Presentation and feedback**
Employees can search for and find the knowledge they want and add comments.

- **Archive or disposal**
When knowledge becomes obsolete, there are systematic ways to archive or dispose of it.
Managing these five states or activities, and automating them by deploying suitable software, will improve your control of knowledge and lead the way to success within the enterprise.

The Documentum Platform consists of a powerful process management engine that helps you automate your processes throughout the entire knowledge lifecycle.

**Users Perspective**

**Knowledge Components**

Surveys show that 70% of the effort should be focused on people management to ensure effective results of knowledge management system implementation. In a large organization, as some best practices suggest, people can be divided into different groups and play distinct roles in the knowledge management system. The groups are not quite the same as the organization chart. However, there are several other key points that deserve consideration.
Staff
Anyone can conduct a search or contribute knowledge. There are the majority users and beneficiaries of the knowledge management system. They are more sensitive to the user interface, operation, and methods. They are also the target people to motivate.

KM Manager and KM Administrators
The KM manager role involves the creation and maintenance of knowledge repositories and influencing the culture of an organization toward improved knowledge sharing, reuse, learning, collaboration and innovation. These functions are associated with different departments in different organizations. It may be combined with Quality, Sales, HR, Innovation, Operations etc. The KM Administrator role involves detailed work with the platform.

Knowledge experts
An effective knowledge expert is likely to be someone who has a solid background of industry knowledge and has the capability to discover useful knowledge,
consolidating it, and making amendments. He should have recognized authority within the enterprise in a specific field.

✓ Leadership

Leaders are the ones who develop and facilitate the achievement of the mission and vision, drive organization culture, and encourage cross-functional collaboration.

The Documentum Platform consists of complete functions of user management and group management to ensure that everyone is performing within his own job role and targeting relevant information.

Deployment Best Practices

If we are in a world without computers, what can we do to make knowledge sharing attractive to an enterprise?

Different organizations have tried various knowledge incentives, including making content submission mandatory and incorporating rewards into performance measurement plans.

One KM strategy involves actively managing knowledge (push strategy). In such an instance, individuals strive to explicitly encode their knowledge into a shared knowledge repository as well as retrieving knowledge from other individuals who have also contributed to the repository.

Another KM strategy involves individuals requesting knowledge from experts associated with a particular subject on an ad hoc basis (pull strategy). In this case, expert individual(s) can provide their insights to the particular person or people needing them.

Other knowledge management strategies include:

* Reward (as a means of motivating for knowledge sharing)
* Storytelling (as a means of transferring tacit knowledge)
* Cross-project learning
* After action reviews
* Knowledge mapping (a map of knowledge repositories within a company accessible by all)
* Communities of practice
* Expert directories (to enable knowledge seeker to reach to the experts)
* Best practice transfer
* Competence management (systematic evaluation and planning of competences of individual organization members)
* Proximity & architecture (the physical situation of employees can be either conducive or obstructive to knowledge sharing)
* Master-apprentice relationship
* Collaborative technologies
* Measuring and reporting intellectual capital (a way of making explicit knowledge for companies)
* Knowledge brokers (some organizational members take on responsibility for a specific "field" and act as a first reference to talk about a specific subject)
* Social software (wikis, social bookmarking, blogs, etc)
* E-mail communication and corporate intranet portal linking all members of an organization to common resources (IT infrastructure)
* Expertise access tools
* E-Learning resources and applications
* Discussion & chat (asynchronous technologies)
* Online virtual meetings (synchronous interaction technologies)
* Search and data mining tools

These are the practices we can choose to deploy and implement with the help of enterprise software. But you should know which has priority.

A knowledge management system should consist of at least four major logical modules plus some functional modules:

**Knowledge Center**: a huge centralized knowledge base repository. A Knowledge center is a highly consolidated repository of knowledge. Knowledge in it is already assessed and recognized organization wide.
**Knowledge map**: helps employees find the right knowledge they want, knowledge are tagged by industry keywords, and also categorized by organization chart and process fields and products. Knowledge engine provides alternative ways to search knowledge by accurate attribute values.

**Knowledge Set**: organizes the knowledge from several different views. A Knowledge set is the product of expert works. Experts find relevant knowledge in the huge knowledge center, consolidate them, and promote them by groups. The sets considerably enhance the reusability of scattered knowledge. Ratings and recommendation sub modules are optional.

**Expert Base**: ways to communicate with experts online. In the Expert Base, employees can meet experts virtually, see their specific field, offer their recommendations and contact information. There is a way to populate a question to the expert or start interaction when both parties are online.

**Personal Space**: manages personal belongings and draft-state knowledge. In Personal Space, employees can upload their own stuff. They can also publish, subscribe, recommend, and share knowledge.

**Miscellaneous modules**: encourage knowledge sharing and facilitate administrators’ work. The system may consist of several optional modules.

**Reporting module**: calculates contributions by individuals, departments, or knowledge categories on a regular basis.

**Ranking module**: displays popular authors, experts and knowledge sets.
Real World Challenges in a Multi-national Automotive Company

Background

In the car manufacturing industry, the enterprises' key competitive advantages are the car design cycle and timing. In the design process, knowledge management becomes very important. The following diagram shows a typical process to design cars:
During the research period, project participants need to carefully study past experiences, consult old car model design methods, and determine ROI. Then, project leaders can make a decision on whether to move forward.

New car models are never built from scratch. Engineers use the old models as blueprints and design new products based on the specification, enhancement, and budget that the new model will require. During the process of design and validation, knowledge is generated constantly. Even a short internal discussion can spark creativity. The meeting minutes can provide references to the others.

Implement

This company implements the Documentum Platform as the knowledge management system. Documentum acts as an engineering repository that facilitates everyone’s work during the car design process.
The key components they implement:

- Knowledge sharing and recommendation
- Knowledge discussion
- Navigation views and maps
- Knowledge set management
- Expert online
- E-learning
- Access Control

Outcome

Employees are willing to use and share information on this platform because it is easy to use, and accurate to provide search results. Moreover, car design experts are available to answer questions. The whole company enjoys the following benefits:

- Prevailing collaboration and team work spirit
- Increasing intellectual property and patented knowledge
- Increasing quality of products
- New and innovative products in emerging markets
- Increasing agility, adaptability, flexibility and responsiveness
Knowledge is a valuable asset and we need to use it to gain competitive advantage. A knowledge management centric company is a successful company. It all means one thing: arm people with the right information so they are able to make better judgments, smarter decisions, and create environments that encourage innovation. Full benefits and return on investment will only be realized when People, Process and Technology issues are addressed simultaneously.