



Content Management Case Studies and Pilot Implementation Approaches Discussion Paper

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Introduction

This document is intended as a discussion paper on the possible implementation approaches for a pilot Content Management System. A number of case studies of successful content management implementations are presented together with a high level introduction to the Documentum Content Management System and its key features.

What is Content Management?

Online content is growing at a dramatic rate within organisations. Sophisticated workflow and storage provide the foundation for effective content management solutions. Tagging, advanced search features and personalisation technologies will help stop an organisation from losing vital information.

Content Management provides an effective means of managing company data and knowledge available to the business thus enabling improvement in its decision-making capability. To succeed, firms need the right mix of best-of-breed tools using open standards and improved processes.

There is often confusion between Document Management, Knowledge Management and Content Management. Document Management systems were developed to handle the documentation needs of highly regulated industries such as pharmaceuticals, aerospace and defence. Knowledge Management focused on tools which could search, categorize and retrieve information.

Content Management Systems were focused very strongly on enabling an organization to keep the content of its site fresh and to help consumers make purchases on the site or get the information they required.

Traditional Document Management vendors such as Documentum or FileNet emphasized asset management capabilities like workflow and library services. Newer entrants like Vignette, BroadVision, Interwoven and ATG make more of their delivery features such as personalization.

Increasingly the distinction between Document Management, Knowledge Management and Content Management is blurring. Vendors have continued to develop and strengthen their products in all functional areas to offer a more complete and integrated solution.

Content Management Functional Areas

Content Management Systems should help automate content production and delivery in a reliable, secure and scalable fashion.

Production

- Creation;
- Collaboration;
- Personalization;
- Workflow;
- Lifecycle.

Delivery

- Deployment;
- Syndication;
- Multi-Channel;
- Multi-Lingual;
- Personalization.

Personalization is probably the differentiating factor between a compelling site and a site which is stale and frustrating to use. Content can be personalized based on user profiles

controlled via a log-in process or user behaviour on the site. Personalization can be at the level of the individual user, and extend back through the user's history at a site.

Business roles such as manager, graphic designer and customer service representative can all be presented with customized information related to their roles in the organization and given access to appropriate files and resources. Business partners can view pages where the content reflects the terms of each particular contract, with special pricing or product availability based on their location. Personalization is often based on behaviour captured while the visitor is at the site.

Content Management Systems which can provide these key features will allow an organisation to offer the following user connection possibilities:

Business Connections

- Online Procurement;
- Collaborative Design;
- Partner Self Service.

Customer Connections

- Online Commerce;
- Personalized Promotions;
- Customer Self Service.

Employee Connections

- Knowledge Sharing;
- Global Project Collaboration;
- Controlled Content Applications;
- Employee Self Service.

Issues to be considered

Currently most Content Management Systems implementations revolve around the publishing and sharing of information. This includes unstructured information such as text, graphics and document processes, as well as access to data on legacy application systems.

Implementing the technology to facilitate this is only one component: if change management, and direct organisation, people and cultural issues are neglected, an organisation is unlikely to reap full benefits from its Intranet investment.

There is an increasing realisation by management that competitive advantage stems from leveraging information, rather than leveraging technology.

Issues to be considered

- What is the value to my business of building an Intranet?
- How much does an Intranet cost?
- How do I maintain quality in the information which is provided over the Intranet?
- How do I guide my employees toward using the intranet to enhance employee productivity?
- How does an Intranet compare with traditional networking?
- Will an Intranet parallel my paper system or replace it?
- How are my competitors using their Intranet investment internally?
- How do I organise information to improve ease of use?
- What training will be required of my staff?
- What are the issues in indexing content?
- How do I manage the organisation culture?
- Why is Change management important?

Key drivers for Intranet development based on a Content Management System

- Reduced business paper print, storage, maintenance and distribution costs;
- Reduced duplication of effort across the organisation - shuffling, searching and recreating information for various audiences;
- Leverage the intellectual capital of the organisation providing accessibility and sharing of project ideas and developments, bringing people closer together;
- Increased consistency of messages sent by management within and outside the organisation, thereby reducing misrepresentation and rumour;
- Consistency of timing and delivery of information;
- Helps to reduce organisational barriers & boundaries by encouraging a devolved cross team working environment;
- Opportunity to review applicability of business processes in place;
- Greater openness and transparency in decision making – removes excuses and exposes information blockages;
- Abandons conventional boundaries between different hardware platforms (Mac/PC) moving to unlocking propriety system dependency;
- Extends life and improves quality of current IT systems;
- Users can remain unaware of IT infrastructure;
- Raise corporate feeling, morale and sense of identity;
- Encourages an improvement in the quality of information – leading to faster, better informed decisions.

Potential Intranet Typography

Intranet applications can be grouped into three categories as follows:

1. Information gathering & collaboration Intranets;
2. Information dissemination Intranets;
3. Business process support Intranets;

Information gathering & collaboration Intranets

- Individual project group web sites – aims of group, business plan & strategy, publications by group, commentary on research underway, product information, announcements, issues addressing currently, associations and achievements, how to get in contact directly and location information. This aims to:
 - encourage the sharing of information;
 - supports an empowered environment;
 - recognition of staff who are exemplary accomplishers;
 - breaks down organisational barriers;
 - cross fertilisation of ideas among information experts so discoveries/patents in one area may find exemplary uses in other disciplines;
 - visualisation of the company culture.
- Threaded discussion groups – self policed supporting liberalising nature of the technology acknowledging the grass roots interest.

Information dissemination Intranets

- Company Magazine – daily/weekly changing company information for general consumption, share price, press release information. Combination of international group information but with emphasis on local corporate and local people information – like an internal electronic magazine;
- Employee information: generic searchable phone/email book, organisation structure, departmental information with individual personal goals, activity descriptions and management biographies;
- Vision, mission & values, position statements on issues in the media;
- Financial information – performance of divisions, groups, budget heads, business plans;
- Organisation charts, common documents, forms, procedures, fax and letter headers;
- Personal health, industrial health & safety at work information, laboratory rules and quality control procedures;
- Maps and location details for visitors;
- Education and training opportunities, seminars, courses, training packs, training calendars;
- Competence analysis – and other HRM materials;
- Canteen information – menus, opening times, special offers;
- Product fact sheets, warnings, emergency rules;
- Patent information, library resource information available via CDROM to all rather than on paper in the library;
- Employment opportunities – current vacancies across all divisions;
- Manuals, guides, directories, forms, catalogues e.g.: stationery & laboratory supplies, booking systems – car parking, catering, research archives, databases of product information – document management systems;
- Helpdesk support, e.g.: visible help/repair job queue;
- Internal authoring support – tools, tips, commentary, FAQ's;
- Local train timetables, market days, chemist opening hours etc;
- Presentations and publicity activity conducted by management;
- Search – if internet information search conducted – auto add other linkages available in-house;
- Press releases – internal staff often hear of decisions via external media – much better if heard from internal management first;
- Search engine.

Business process support Intranets

- Gateway to legacy applications such as employee time and expense reporting;
- Unite range of IT systems with various user interfaces – move towards a standard user interface to allow software revisions to be made more easily, provide an increase in confidence in user interface as part of software development process, faster, cheaper and more effective systems development;
- Proactive customer account management for external access direct to product marketers;
- Access to constantly updated information about product lines and marketplace activity e.g.: competitor database holding information about competitors from the clients viewpoint;
- Value added strategy for partners – selective access available to up and downstream partners via the intranet to production systems to provide up to date information, delivery schedules etc;
- Shared whiteboards - brainstorming of ideas among researchers across time and space;
- Workflow applications such as bid collaboration which cross organisational boundaries;
- Project status and schedule tracking;
- Online training and new employee training;
- R&D/Collaboration – facilitates partnership and joint ventures between project teams. Disseminating resources more broadly with the aim of enlarging the research base by sharing results and approaches early on across the organisation;
- Complete access to sales and marketing materials;
- Environmental scanning – role of scanning the horizon for new opportunities – providing a direct feed into the organisation;
- Product support – direct access to support information as first line of support. Reduce dependency of person contact – e.g.: fault fixing on hardware, photocopies etc. Same as direct access to expertise but with a move to accumulate information within the organisation as a safety guard against staff turnover.

Case Studies

Multinational Medical Instrumentation Manufacturer

Challenge

- Reduced information loss, promote sharing, knowledge reuse and global working.

Solution

- A globally accessible Content Management System based on the Documentum suite of products.

Results

- Simplifies authoring, publishing and management by delegating authoring and editorial responsibilities to business users across the organization;
- Ensures delivery of approved content with processing workflow's maintained and controlled by the Content Management System;
- Provides speedy and global access to corporate information using business rules to automate the publishing process to the corporate Intranet.

A leading multinational medical instrumentation Manufacturer with operations in 32 countries wished to use content management technologies to provide a global repository for all documents and reports generated within the organization. This included product specifications, internal announcements, press releases, legal, procedure and other critical compliance documentation.

The Content Management System facilitated:

- Information sharing and re-use;
- Efficient and flexible global working;
- Reduction of paper storage;
- Increased regulatory compliance;
- Increased access to information and thereby reduced information loss.

The system comprised of a number of distinct components to provide an enterprise-wide Content Management System. The system was based on the Documentum suite of content management products, and was deployed to the 9600 global users with a mixture of traditional client server and Intranet web technologies. The system was the largest Documentum implementation on a Microsoft Windows NT cluster. The system integrated Documentum with ACE SecurID as a digital signature technology, CDC Aqua for PDF water marking and attribute stamping and Autorender Pro for PDF generation.

The design and development of the system was centrally coordinated to ensure that the overall system provided an efficient and effective solution. The foundation component provided basic library services while the document control application managed all of organisation's documents.

Using the system the company was able to distribute content creation and approval authority throughout the organization. Pre-defined authoring templates via a mix of predefined and ad-hoc process workflow's and content lifecycles allow business users to create, review and publish from to the Intranet, without requiring any familiarity with HTML.

All published and approved content was automatically made available on the corporate Intranet. Content which was due to be archived was automatically removed from the Intranet but remained available to key users of the Content Management System which quickly increased the accuracy and freshness of the information provided by the Intranet.

The company has reduced the overhead associated with managing its corporate Intranet. It has provided a flexible and scalable platform for the future and achieved its original goals of reducing information loss, promoting sharing, knowledge reuse and global working.

Organisational and Cultural Challenges

The system was implemented across all fifteen business units of the corporation including Legal, Marketing, Human Resources and Manufacturing.

Given a project of this scale it was fundamentally important that the benefits of an enterprise-wide Content Management System were not lost by allowing the individual business units to create sub-systems for their unique requirements. This would have resulted in the development of silo's of information and system fragmentation.

To help prevent this a representative from each business unit was authorised to make requirements and functional decisions. They worked as part of the core team and acted as project champions within their business units. As core team members there were responsible for highlighting their business units requirements whilst balancing these against the groups as a whole.

The system stored all content produced by employees. Each employee had a personal folder in which to store initial draft documentation before it was passed into a workflow. Once content entered a workflow complete auditing of every review, approval and editing event was kept. This meant that there was visibility and metrics available to show up bottlenecks in the business process flow and on individual employees performance. This was promoted by project champions in a positive light. It was now possible to provide statistical evidence of bad processes as opposed to anecdotal evidence. The power of the workflow system meant that if a member of staff was going on holiday they could delegate any workflow's in which they were involved to another qualified person. This helped to alleviate the problem of returning from holiday to find an in tray stacked high. The big brother side effect of Content Management Systems should not be allowed to inhibit use of the system. It is important that project champions promote the benefits of such systems. The fact that performance metrics can be gathered means that staff can also demonstrate how efficiently they are performing. Thus allowing the identification of staff who are exemplary accomplisners.

There was also a change to the initial process of content creation. Instead of creating a document based on a template which a user happened to have on their local hard drive the system ensured that the correct most up to date published template was used. The advanced search facilities and user perception that up to date approved content could be found on the system encourage knowledge sharing and avoided duplication of effort.

Multinational Pharmaceutical Company

Challenge

- Ensure greater levels of regulatory compliance and auditing capabilities whilst promoting sharing, knowledge reuse and cross departmental working.

Solution

- A globally accessible Standard Operating Procedures management system based on the Documentum suite of products.

Results

- Provided full auditing capabilities for compliance documentation;
- Provided electronic sign-off capabilities inline with the Pharmaceutical industry requirements of 21-CFR-11;
- Simplified authoring, publishing and management by delegating authoring and editorial responsibilities to business users across the organization;
- Ensured delivery of approved content with processing workflow's maintained and controlled by the Content Management System.

A leading multinational pharmaceutical company wished to use content management technologies to provide a global control repository for all Standard Operating Procedure (SOP) documents and reports generated within the manufacturing group.

The principle drivers behind the implementation of the Content Management System were to facilitate:

- Increased regulatory compliance by automating the processes as much as possible so as to reduce the likelihood of human error;
- Information sharing and re-use;
- Reduction of paper storage;
- Increased access to information and thereby reduced information loss.

The system was developed using Documentum as the control repository and the Documentum Rightsite server as mass publication method on the corporate Intranet. The principle business driver behind the implementation was to ensure regulatory compliance by tightly managing the process of SOP generation, review, authorisation and publication. The system integrated Documentum with a 3rd party Rendition Server for automatic PDF generation and CDC PDFControl for PDF print protection. It was vitally important to ensure that only the latest approved procedures were used during the manufacturing processes. As such published SOPs could only be accessed via the corporate Intranet and users with normal levels of security were not able to print any documentation. Users within the Quality Assurance group were able to print documentation but this would be automatically watermarked with copy number, name of user requesting the print and date / time stamp. This information would also be added to the audit table of the document in question.

Using the system the company was able to ensure a much higher level of regulatory compliance. This was achieved by tightly controlling the authoring, review and approval processes using predefined templates, workflow and auditing capabilities. All published and approved content was automatically made available on the corporate Intranet.

The company has reduced the overhead associated with managing the Quality Assurance and regulatory compliance within the manufacturing organisation.

Organisational and Cultural Challenges

The staff within the manufacturing divisions were well used to working within a highly regulated environment. They were already following strict paper based and manual procedures to manage compliance and Quality Assurance issues. Implementation of the

system allowed people to get on with their jobs as the process was now largely automated which took considerable pressure of those required to use it.

Possibly the greatest change in working practices was not allowing printing of approved compliance documentation. This generated some complaints during the initial pilot phase. However, those users who were involved with the pilot were used to the change in working methods by the time of the full system role-out and acted as project champions to promote the positive benefits of the system. A side-effect of the printing issue resulted in the organisation increasing the standard specification of monitors which was well received by all computer users within the organisation.

Implementation Approaches

To implement a successful Web Content Management System takes considerable analysis and the requirements-gathering process can take longer than the actual development.

The requirements analysis works best when led by an information architect from the corporate Web team and a core team from the strategic business units in conjunction with consultants. The core team represents the goals of the enterprise, the consultants provide insight on what will work best according to their experience with the chosen product. The result of the analysis should be the mapping of the two concerns together.

The phases of content management implementation can be broken into the following broad areas:

- Forming the core team;
- Educating the core team on technology and developing a common language;
- Start process of project promotion (presentations, progress updates etc.);
- Gathering and agreeing system requirements and setting success criteria;
- Design;
- Build;
- Test;
- Role out and training.

Each strategic business unit of the enterprise must outline their current needs and longer term goals. In order for a Content Management System to be scalable it must implement a scalable foundation which can support several years of growth. A typical development cycle can last anywhere from 6 to 18 months.

Every enterprise should evaluate its content management strategy against three criteria:

- 1) coverage of the content life cycle;
- 2) practices to leverage content and content management techniques;
- 3) practices to assure reliability or credibility of content.

As well as acting to provide functional and system requirements of each business unit the core team members are to act as project champions and promote the system and benefits. The system will change the way people work which can lead to the perception that the new system has increased their workload. This is almost never the case in reality but it is important at project initiation to identify high level and achievable success criteria against which to measure and promote the system on completion of the implementation.

The core team can be made up of one person per business unit or perhaps a smaller steering group with authority for all business units. Either approach can work well but the final decision will be made based on the scale and nature of the implementation and most importantly the corporate culture of the organisation. The project can often move more quickly when fewer people are involved with the core team but this could lead to the project not achieving buy-in from the business units. Again the role of the project champions is vital to promote the project positively.

Content management implementations are complex often-requiring extensive integrations and changes to working habits. It is therefore important that all members of the team have a solid understanding of what content management is and a functional appreciation of the chosen software vendor.

The software vendor will often present at software trade shows and exhibitions. It would be an advantage for members of the core team to attend such events which offer a good introduction to the whole content management arena. The software vendors will also offer product training aimed at business users which should also be attended by the core team.

Following initial training and before the start of requirements gathering the development of a project glossary is important. This will help cement understanding and reduce the risk of ambiguity during any requirements gathering and functional discussions.

The high level functional areas which need to be defined for any Documentum based project include:

- Defining the information hierarchy within the repository (cabinets and folders);
- Access Control Lists and security;
- Users and groups;
- Document Types and associated attributes (meta-data);
- Document centric workflow processes;
- Document life-cycle;
- Specific document / business rules which need to be enforced not cover by the document life-cycle or workflow processes.

For more details on these functional areas of a Documentum based system please see the section titled 'Documentum an Introduction'.

During the project build and test phases a change management system needs to be put in place to handle any amendments to the functional requirements which may arise. During this phase the core team in their role as project champions need to continue promoting the project within the business groups and start education the end users as to the potential areas of change to their normal working practices.

Pilot Implementation

The phases of the pilot implementation would be exactly the same as a larger implementation, namely:

- Forming the core team;
- Educating the core team on technology and developing a common language;
- Start process of project promotion (presentations, progress updates etc.);
- Gathering and agreeing system requirements and set success criteria;
- Design;
- Build;
- Test;
- Role out and training.

However, each phase would obviously be shorter. Another important consideration is amount of customisation which should be undertaking for a pilot. In general the customisation should be kept to a minimum and in fact be limited to configuration as far as possible. This will speed implementation of the pilot and avoid the potential problem of writing code which could not be re-used in the full implementation.

A specific functional domain should be selected which allows the scope of the project to be limited. Ideally the pilot implementation would cross business areas. This would allow the core team to road test the working processes and improve their understanding of the product and its capabilities.

Potential Pilot

News production and publication might well be an ideal for a potential pilot project for the following reasons:

- News could potentially be generated from each business unit so the pilot would cross business groups but have a specific and relatively limited domain;
- Has high visibility and would hopefully encourage readership/usage of the Intranet;
- The nature of the content means it has a clear but relatively compressed document life-cycle. That is to say a news item is written, will need review and approval prior to publication and will be archived quickly enough to demonstrate the complete life cycle and workflow processes in a timely and realistic manner.

The phases associated with a small pilot for news production and publication might be as follows:

Forming the core team:

- Identify news producers, authors or collators within each business unit – limit this to one or two key people;
- Identify news approvers within each business unit – limit this to one or two key people;
- Identify an overall editor to give final copy approval – perhaps from the marketing or corporate communications department;

Educating the core team on technology and developing a common language:

- A basic product installation should be set-up. This would allow the core team to be intensively trained on the basic product functionality (for perhaps two days);
- The training should introduce the common product / domain language – for example, document types, ACLs and key concepts like check in and check out etc.

Start process of project promotion, gathering and agree system requirements and set success criteria:

- Give presentations on the Pilot and what it is hoped to demonstrate and achieve. Begin to gather feedback and early general requirements from the business units;
- Set the success criteria – for example: i) the ability to publish breaking news within a specific timeframe following complete review and approval. ii) the ability to instantly remove an incorrect news item correct and republish within a given timeframe;
- Implement a means of gathering feedback on the effectiveness of the core team as a requirements gathering, decision making and project promotion entity.

Design and Build:

- Installation of a pilot system out of the box will have already been done as part of the education phase;
- This phase should be a relatively limited activity with an emphasis on configuration of the out of the box product as opposed to integration or customisation;
- Core tasks would include setting up users and groups, defining very simple workflow's and a repository hierarchy.

Test, Role out and Training:

- These phases should be limited to gathering user feedback on general usability issues, and further promotion of the system by project champions. Assess the pilot against the initial success criteria;
- Training can be run as almost a secondary pilot. The original team members should run brief training session (perhaps half days) to educate potential users of the system who have not had any exposure to the pilot. These users should then be asked to attempt to use the system for a fixed period (perhaps one week of intensive use) to highlight any further issues that the core team may have missed due to their increased understanding of the product and fuller involvement with the pilot;

- The production of an initial project glossary and lessons learnt document is often very valuable at this stage as it will prove worth while as a rules of engagement for the core teams members in a full implementation.

The pilot should be as much about gauging the potential corporate and organisation issues which might arise from the adoption of a Content Management System as it is about testing the product. It is also a useful means of testing the technology architecture of the organisation – is the network bandwidth great enough to support the added traffic generated by a Content Management System? Is the IT Department geared up to support and maintain a complex system which will become business critical and therefore require very high availability? To some extent the greater the failure of the pilot the more chance a full implementation will have of succeeding. The scope of the pilot should be limited enough to be achievable in a short timeframe but should also force out infrastructure and corporate culture issues to be a truly worthwhile exercise.

Documentum an Introduction

Documentum is a Content Management System used to automate content production and delivery in a reliable, secure and scalable fashion with many advanced features including:

- Repository Structure - Cabinets and Folders
- Access Control Lists and Security
- Version Control
- Document Types
- Search Features
- Workflow and Document Life Cycle

Repository Structure

In Documentum, documents are organised into a hierarchy of cabinets and folders. A cabinet is a top-level folder. Each cabinet or folder can itself contain any number of documents, folders or a mixture of both. There is no limit to the number of documents or folders that can be stored in a particular cabinet or folder, and no defined limit on the level of nesting of folders. In practice it is generally less convenient for users to find documents held in deeply-nested folders or in folders containing large numbers of documents.

Although cabinets and folders can contain a mixture of documents and folders, it is generally considered bad practice to mix the two types. Instead, a cabinet or folder should contain either folders or documents, but not both. In this way the documents are always stored in the lowest-level folders in the hierarchy, with the levels above being used to organise the folders.

It is also considered sub-optimal to skew the cabinet/folder hierarchy. A badly-skewed hierarchy is one which has a few long chains of folders leading to large clusters of documents, as opposed to a well-balanced hierarchy in which the documents are more or less evenly-distributed between the various folders. Usually, if the hierarchy becomes skewed, it suggests that the method of classification is inappropriate, although this is not always the case. Balancing the hierarchy reduces the average number of operations required to navigate down from a cabinet to a document.

A document classification system is a mechanism for partitioning documents into groups and sub-groups based on their content and purpose. This enables logically-related documents to be stored (conceptually) together, to facilitate storage and retrieval.

In any document classification system, it is imperative that the users are able to locate the required information in a convenient and intuitive manner, and that the classification system itself is well-defined, controlled and consistent. The classification system should be documented and made known to the users of the system, i.e. there is a known standard which can be referred to; users should not have to rely on inference to determine the system of classification used. The classification system should be designed and maintained by a few key individuals, with security mechanisms preventing the majority of users from undermining the integrity of the classification system. For example, allowing users to move documents arbitrarily to different parts of the classification structure can bring disorder and chaos to a system of shared documents. The classification system should be universally-applied, with no special rules being used in different parts of the system, and is subjected to regular checks to ensure compliance.

Consistency is often the most difficult property to obtain when designing a document classification system for a large organisation. It requires cooperation between the various business units and user groups, each of which probably use their own classification systems. Often it is only possible to establish uniformity in the upper levels of the document classification hierarchy, in which a cut-off point is agreed below which each group assumes control of their own documents. This is usually the most effective implementation approach as it enables each group to use familiar, tried-and-trusted classification schemes for their own documents, whilst also enabling them to explore the classification mechanisms used by other groups. As document sharing between groups increases, there is a natural tendency for

document controllers to reorganise their documents in-line with others, and eventually a uniform system of classification will emerge.

Access Control Lists and Security

Documentum provides better security than a file system. With a file system, if someone has access to a hard drive, they can often read, edit, and even delete any file on the drive. Documentum allows controls over which users (or groups of users) can perform actions on documents stored within the system.

There are seven levels of access within a Documentum system:

1. NONE - A user with NONE access will never know that the document exists. They will not be able to see the document within the repository hierarchy or query for it using any reporting functions.
2. BROWSE - A user with BROWSE access will be able to see the attributes of a document, but cannot view the document content. The user will see the document within the repository hierarchy, and can query for it.
3. READ - A user with READ access can view the attributes and content of a document, but cannot annotate it, version it or edit it.
4. RELATE - A user with RELATE access can view the attributes and content and can annotate the content.
5. VERSION - A user with VERSION access can read, annotate, and create new versions of a document, but cannot overwrite the current version of the document.
6. WRITE - A user with WRITE access can read, annotate, version, and overwrite the current document, but cannot delete it.
7. DELETE - A user with DELETE permission can perform any action on the document including deletion.

Users and Groups

In order for a person to access a Documentum based system they must be set-up as a user within the system. Documentum provides the facility to manage users in groups. When a user is created they must be assigned a default group. Documentum does not distinguish between groups, which have been used as a default group and groups generally.

User can belong to more than one group and a group may contain other groups. It is important to note that even if a user is specifically identified as having no access to a particular document they will still be able to gain access to the document if they belong to a group which has been granted such permissions. This is because Documentum will grant a user accesses based on the highest possible permission level of the user and the groups to which they belong.

Version Control

Each time a change is made to the file, it will be saved as a newer version of the file. It is also possible to see any of the previous versions of the document. To edit a document it must be checked out. This effectively locks the file and stops any other users attempting to edit the file at the same time. However, the file can still be viewed by users with the correct permissions. Once the editing processes is complete the file can be checked in so returning control to the repository. On check in a brief description of any changes can be added to the documents audit trail.

Document Types

Documentum is more than a Content Management System – it is an object management system. As an object-oriented repository, Documentum is made up of different types of objects that work together to provide the functionality in the system. As with any object-oriented system, Documentum's object types are made up of objects with a more general purpose.

In order to configure Documentum to fit particular business needs, most companies create custom object types with attributes specific to their organisation. For example, imagine the Documentum system was being used to manage a large number of staff files by the HR

department. A Curriculum Vitae is a type of document but has special attributes that describe it. The applicant's name, the position that he is applying for, and the date the CV was received are all attributes that describe a CV that do not apply to a generic document. In this case a custom document would be created called CV which might contain the following new attributes:

- Employee name;
- Position;
- Date Received.

However, since a CV is a sub-type of a generic document, it will also contain all the attributes of a generic document such as name, title, subject, keywords and authors.

For performance reasons, it is best to keep the object hierarchy as shallow as possible. The reason for this is that each level of the object hierarchy is stored in a separate table in the database. In order to manipulate an object, the Documentum server must join that object type's tables with the tables of all of the other object types in the hierarchy above it. The more levels in the hierarchy, the more tables that must be joined together.

For example the following object hierarchy must perform 4 joins (one for each level) when a query on Product Test Report is executed.

Document
↓
Technical Document
↓
Product Test Report

It is better to collapse the hierarchy. The typical way to do this is to add all the custom attributes to the report object and add an extra attribute that identifies the type of report. It is still possible to query for a Product Test Report by using a where clause.

Search Features

Documentum can be searched using simple full text search of phrases within the content of a document. However, Documentum attributes can also be used in conjunction with full text searches to greatly enhance the power of the search. For example, it would be possible to specify a document's author, title, subject, and any number of keywords to describe it. It is also possible to do wild card searches and date range searches (for example, give me all the letters written last month that have the word computer in the subject).

Workflow

Documents can be routed around for authoring, review and approval within the content repository. Each user has an inbox that shows all the files which need to be actioned. Keeping the content within the repository as apposed to attaching it to an email means that the system maintains full control of version history, security permissions and auditing. In simple terms a Documentum document centric workflow offers the following functionality:

- Send messages with each task while forwarding or rejecting it;
- Force the user to signoff before forwarding the task by entering a password;
- Pass a task to someone else (delegating) by creating a branch task;
- Change certain attributes of the document like status labels (DRAFT, REVIEW, APPROVE) as the document travels from one user to another and process through the pre-defined document life cycle (i.e. from draft to reviewed and published and finally archived);
- Run certain procedures in conjunction with a task, for example, changing permissions on a document when it becomes approved;
- Route conditionally to another recipient. For example, if the task is not opened within the due date, it can be re-routed to Recipient A else it goes to Recipient B;
- Track the progress of the workflow's using Workflow Reports;
- Full metrics can be generated in a workflow report to highlight bottlenecks in process flows.

References:

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