Document Management Systems

White Paper

JKCS

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1 INTRODUCTION

1.1 BACKGROUND INFORMATION

This White Paper provides an overview of Gartner Group information regarding ECM and DMS (Enterprise Content Management and Document Management Systems) as well as a more broad set of data regarding ECM components.

1.2 DOCUMENT CONTENT

This document provides the following Sections:

1. Introduction, this section
2. Gartner Group Information regarding ECM/DMS Systems
   a. Enterprise Content Management (ECM)
   b. Document Management Systems (DMS)
3. Document Management System Overview (DMS)
   a. What document/content management systems exist
   b. What are their differences and how do they add value
2 SUMMARY OF INFORMATION PROVIDED BY GARTNER

2.1 MAGIC QUADRANT FOR ECM PROVIDERS

Enterprises consider ECM as both a strategy to deal with all types of content and a set of software products with capabilities for managing the entire content life cycle.

This Magic Quadrant represents a snapshot of the ECM market at a particular point in time. Gartner advises readers not to compare the placement of vendors in prior years as this market is changing — vendor acquisitions, partnerships, solutions development and alternative delivery models are evidence of this — and the criteria for selecting and ranking vendors continue to evolve.

Our assessments take into account vendors' current product offerings and overall strategies, as well as their planned initiatives and product road maps. We also consider how well vendors are driving market changes and adapting to changing market requirements. This Magic Quadrant will help CIOs and business and IT leaders who are developing ECM strategies to assess whether vendors have the right products and enterprise platforms to support them.

ECM technology has changed greatly in recent years, with broader suite functionality, better process control, improved ease of use and a stronger focus on records. As a result, we strongly advise organizations with ECM technologies that are more than five years old, or with multiple products across departments and geographies, to re-evaluate their content architecture.

Use this Magic Quadrant to understand the ECM market and how Gartner rates vendors and their packaged products. Draw on this research to evaluate vendors based on a customized set of objective criteria. Gartner advises organizations against simply selecting vendors that appear in the Leaders quadrant. All selections should be buyer-specific, and vendors from the Challengers, Niche Players or Visionaries quadrants may be better matches for your business goals and solution requirements.
Organizations need ECM to manage the increasing growth, volume and diversity of the unstructured content that now represents up to 80% of enterprise information. There is an opportunity to start applying to this content some of the rigor currently devoted to structured data in terms of valuation, elimination of redundancies, optimization of architectures for availability, enrichment of metadata, and overall life cycle control.

The ECM market registered double-digit growth from 2004 to 2007, but its expansion slowed to a single-digit rate in 2008, primarily due to the deteriorating global economic conditions. According to Gartner’s statistics, worldwide ECM software license and maintenance revenue came to $3.3 billion in 2008.

We forecast that total software revenue in the ECM market will grow at a compound annual rate of 9.5% through 2013. The market's return to stronger growth is expected to start in 2010, with rates climbing to double digits and worldwide ECM software revenue exceeding $5.1 billion by 2013. This represents a healthy market, but it is also one that is undergoing transformation.

The ECM market went through a period of major consolidation from 2003 to 2007. The pace of acquisitions then slowed until 2009, when Autonomy purchased Interwoven and Open Text acquired Vignette. We are now in the final stage of market consolidation as vendors look to gain market share and augment broader strategies in relation to information management by expanding composite content application foundations or promoting integration with Microsoft's SharePoint. (For more details, see "Competitive Landscape: Content Management Software Market, Worldwide, 2009.")

Among the primary trends that IT architects and planners and business leaders must consider as they develop content management strategies and determine their strategic partners are the following.

**ECM is now part of IT infrastructure** and delivered by infrastructure vendors such as HP, IBM, Oracle, Microsoft and SAP. Inquiries received by Gartner suggest that enterprise architects and IT planners are increasingly looking to standardize on one or more of these vendors' strategic platform offerings to support multiple content applications.

**Integration and federation of content repositories** is now critical. Content Management Interoperability Services (CM IS), the Web services protocol jointly developed and proposed by EMC, IBM, Microsoft and others, may succeed where others have failed. It is designed to provide a vendor-neutral way of developing applications that can access content stored in any CM IS-compliant repository.

**Web channel technologies** that deliver improved experiences, customer conversions and loyalty are a primary focus of many enterprises. The influence of the chief marketing officer in directing spending on marketing machines that capitalize on Web content management (WCM), digital asset management (DAM), Web analytics, portals, e-forms, document composition features, social communities, mobile device...
support and business process management (BPM) is now obvious. The ability to deliver more compelling, dynamic, personalized and media-rich content to any audience on any device, and to measure more accurately the value of the interrelationships of people, processes and content, has led to a breakaway from the ECM suite: "WCM for marketing."

**Application specificity, based on evolving buying centers.** Fewer ECM vendors will focus on bundling generalist functions (such as imaging, library services and document collaboration), leaving these functions to infrastructure vendors. Most vendors will instead focus on adding value by bundling specific functions as "base configurations" — vertical or horizontal solutions that are integrated with industry, ERP or CRM applications. Composite content applications are how ECM vendors will deliver value to business buyers. Broadly, such solutions fall into three categories, according to the technologies most often involved in their development. Very few vendors have a market-leading emphasis on, and ability in, all three categories. The three categories are as follows:

- **Transactional content management solutions** focus on imaging, workflow/BPM, archive, records management and e-forms. Content contained within these solutions tends to be static. Processes tend to be long-running and have a high number of forms or documents that demand scalability, life cycle control and human approval (primarily on exceptions). An application interface is almost certain.

- **Collaborative content management solutions** focus on compound content object control and library services; document collaboration; workflow automation with alerts, calendaring and task-tracking; browser or portal viewing; and markup, annotation and version control. The focus is on high-value people being involved in the project-based or long-running development and delivery of high-value content and on optimizing the processes, interfaces and objectives that relate them.

- **Contextual content management solutions** focus on sets of Web channel technology, such as WCM, DAM, portals, e-forms, Web analytics, social software, XML authoring, rich media management and mobile device support, and on optimizing them to serve as Web-delivered engagement platforms for a variety of industry-focused solutions.

Gartner's analysis shows that organizations of all sizes and in all geographies are considering Microsoft Office SharePoint Server 2007 (MOSS 2007) because of the breadth of capabilities it offers, and because Microsoft is already one of their strategic infrastructure providers. As SharePoint takes hold in an organization, users naturally begin exploring its suitability for a wider range of content management applications and its potential as a replacement for existing solutions.

But organizations requiring advanced content management capabilities and process-centric applications will need to augment SharePoint's capabilities with partner
offerings or deploy MOSS 2007 alongside an ECM system, rather than as a replacement for it.

Gartner defines today’s ECM suites as encompassing the following six core components:

- **Document management** for check-in/check-out, version control, security and library services for business documents.
- **Document imaging** for capturing, transforming and managing images of paper documents.
- **Records management** for long-term archiving, automation of retention and compliance policies, and ensuring legal, regulatory and industry compliance.
- **Workflow** for supporting business processes, routing content, assigning work tasks and states, and creating audit trails.
- **WCM** for controlling the content of a website through the use of specific management tools based on a core repository. It includes content creation functions, such as templating, workflow and change management, and content deployment functions that deliver prepackaged or on-demand content to Web servers.
- **Document-centric collaboration** for document sharing and supporting project teams.

**Core components of an ECM suite are:**

- **Document management.** Advanced capabilities such as compound document support and content replication score more highly than do basic library services.
- **Document imaging.** For this component we require a vendor to offer two things: (1) document capture (scanning hardware and software, optical and intelligent character recognition technologies and form-processing technology) performed either using native capabilities or through a formal partnership with a third-party solution provider such as Kofax, EMC (Captiva) or Datacap; (2) the ability to store images of scanned documents in the repository as "just another" content type in a folder, and route them through an electronic process.
- **Records management.** The minimum requirement is an ability to enforce retention of critical business documents based on a records retention schedule. Higher ratings are given for certified compliance with standards such as the Department of Defense (DoD) Directive 5015.2-STD, The National Archives (TNA), the Victorian Electronic Records Strategy (VERS) and Model Requirements for the Management of Electronic Records (MoReq).
- Several ECM vendors qualify for independent analysis of their records management functionality (see "MarketScope for Records Management").
 Workflow. The minimum requirement is simple document review and approval workflow. Higher points are given to vendors with graphical process builders, and serial and parallel routing.

 Several ECM vendors qualify for independent analysis of their workflow automation or BPM functionality (see "Magic Quadrant for Business Process Management Suites").

 Web content management. The minimum requirement is a formal partnership with a WCM provider. Native capabilities score more highly than partnerships.

 Several ECM vendors qualify for independent analysis of their WCM functionality (see "Magic Quadrant for Web Content Management").

 Document-centric collaboration. Document sharing, project team support and support for ad hoc, threaded discussions about documents.

**2.2 MAGIC QUADRANT FOR DOCUMENT ARCHIVAL AND RETRIEVAL PROVIDERS**

The integrated document archiving and retrieval system (IDARS) Magic Quadrant is focused on providers that offer solutions related to storage, access, management, distribution and viewing of fixed content, which includes print-stream reports and images. Vendors are bringing their archiving products together, including IDARS, e-mail archiving, imaging and SAP archiving to leverage their repository capabilities. Today, more than one-third of the key vendors in the IDARS market are enterprise content management (ECM) suite vendors, so they have a significant influence on market direction.

Consolidation has slowed in the IDARS market; however, expect emerging competition from distributed output management (DOM) and document composition vendors that are providing archiving capabilities for the print streams that they process. DOM vendors, such as Levi, Ray and Shoup, are adding archiving capabilities as a natural extension to their processing of the print stream. IDARS vendors are also enhancing their DOM capabilities, such as ASG, Macro 4 and RSD. Although report management will continue to be the key requirement for most IDARS selections, including support for high-volume transaction applications and scalable archives, organizations need to take a strategic view of archiving in the vendor selection process. For companies that want to outsource their IDARS applications, vendors such as Anacomp and Archive Systems provide hosted IDARS solutions for imaging and presentation. Integrated content archiving products are emerging, and IDARS vendors will be key players as different archiving platforms converge.

The IDARS market has changed, and the evaluation criteria continue to evolve. Vendors that did not invest in new product functionality and marketing will naturally move to the left in the Magic Quadrant on vision. This does not imply that the products evaluated last year are now deficient. It just means that new requirements have added new challenges to the market that have yet to be met. The proliferation and influence of self-service applications with large populations of casual archive users mean that vendor contracts and archives have to scale almost infinitely. In an increasingly competitive market, financial terms and software license metering are becoming important issues.
There are fewer pure-play IDARS vendors than in the past. Vendors such as Systemware and RSD are broadening their functionality by adding document management, e-mail archiving, workflow and records management to compete in the ECM and compliance markets. Gartner expects further market consolidation, and leadership will remain with vendors having established customer bases and expanded product functionality.

In 2005, we forecast that the IDARS market would cease to be a stand-alone market and would be an integral component of an ECM suite, using the underlying content repository by 2007. Many ECM vendors have now included an IDARS in their suites, such as EMC, FileNet, Hyland Software, Mobius Management Systems, Open Text, Stellent and Vignette, while other IDARS vendors are moving to add content management functionality to complement their archiving solutions. We continue to be on track with our forecast.

Gartner expects that by 2010, organizations will be adding integrated content archiving solutions to support the management of a broader range of fixed content, and IDARS will be a key component of that solution. This presents an opportunity for IDARS vendors that may not be able to compete in the ECM space to focus on the emerging integrated content archiving market. Organizations will need to consider which vendors can support a unified content architecture in planning for the acquisition or consolidation of archiving platforms and technologies.

Gartner defines an IDARS as a consolidated system for storing, accessing, managing, distributing and viewing fixed content, which includes print-stream-originated reports, images and other fixed content. Leading IDARS applications include mission-critical customer support, e-bill/statement presentment, management and distribution of report data, such as mainframe output, transaction logs, financial reports and long-term archiving of historical data.

IDARS platforms are extending beyond traditional report management. Vendors are increasingly leveraging the repository architecture to support broader archiving applications ranging from SAP archiving to e-mail archiving. Expect content services, such as records management and discovery, to be integrated or added functionalities.
2.3 **MARKET SCOPE FOR RECORDS MANAGEMENT**

Records management has become an important initiative for many organizations as government regulations, changes to the rules governing legal discovery, and freedom of information legislation in different countries have all begun to be felt. Demand for records management solutions continues to grow, as the technology is imperative if an organization is to effectively implement an enterprisewide records management program. The worldwide records management market was worth approximately $460 million in software license and maintenance revenue in 2008, an increase of 15% from 2007. Market penetration for records management is still in its early stages with approximately 35% of organizations having implemented this technology. Records management products are also evolving, as broader retention management requirements grow and there is a need to manage content throughout its entire life cycle. While software as a service (SaaS) and open-source records management has not been significant up to this point, Gartner expects that these alternative delivery options for records management will emerge during the next two years. As emerging consumer and social software tools like wikis, blogs and Twitter are adopted at an enterprise level, this additional content may also need to be managed as records.

When considering records management, organizations should:

- Identify the specific business objectives for their records management initiative and select the right vendor, as a records management program requires a long-term commitment and the product needs to be compatible with the organization's content management strategy.
- Assess the records management product's capabilities to integrate and extend records retention policy into other content repositories, e-mail systems, document archives and file stores, as well as its search and legal discovery capabilities.
- Consider records management products with capabilities to support multiple content types and media — physical records, which may be in distributed record centers; electronic documents, which may reside in multiple repositories; and e-mail, which may exist in both the e-mail system and e-mail archives.
- Consider the records management product's certification under country- and regional-level standards such as Department of Defense (DoD) Directive 5015.2-STD, Model Requirements for the Management of Electronic Records (MoReq) and Victorian Electronic Records Strategy (VERS).

Tracking mechanisms for the preservation of paper documents to the preservation of electronic documents. As the range of digital content types continues to grow, electronic records management systems should now include mechanisms for dealing with audio, video and Web content. The emergence of wikis, blogs and social networking platforms also requires policies and approaches for retention of user-generated content. E-mail has proved to be especially problematic when it comes to
maintaining business records. While e-mail active archiving systems support role-based and event-based retention, records management is still needed for those e-mails that must be retained as records.

Many records management products are integral components of enterprise content management (ECM) suites and will require additional software licenses. The ability to integrate and declare documents from ECM applications should be a prerequisite for records management products. Integration with Microsoft Office is also important, because much of the creation of future business records occurs in this information worker environment. As e-mail and instant messaging are now staples of conducting business, records management products must also be able to integrate with these infrastructure applications. Records management vendors are also emphasizing increased integration with e-mail active archiving, compliance and e-discovery applications. As the diversity of applications and content repositories expands, policy-driven records management, allowing for the automatic classification of records, will become the preferred choice.

While ECM vendors are major players in the records management market, Gartner is seeing other vendors like Autonomy, CA and HP approach records management from a broader management in some of the e-mail archiving products. Records management products will increasingly be integrated into the organization’s content management infrastructure as a service, rather than operating as stand-alone departmental records management systems. Many enterprises have yet to standardize on a single ECM platform, and will typically have multiple content repositories. Gartner research and surveys have consistently shown that over 60% of organizations have six or more content repositories. Thus, the ability of records management products to extend their reach through federation to other content management repositories, archives and applications — as well as supporting compliance and discovery — is essential. While open source and SaaS records management solutions have been slow to appear, we expect more options to become available, with Alfresco expected to be the first open source records management vendor to be certified for DoD 5015.
2.4 **SHAREPOINT AND ECM/DMS (WORKFLOW SUPPLEMENT)**

Microsoft Office SharePoint Server 2007 and Windows SharePoint (WSS) Services 3.0 are two of the many Microsoft products that support its marketing tagline of "people-ready processes," a concept also supported by BizTalk Server, Visio and InfoPath.

Yet enterprise developers and business professionals have found that delivering "processes ready for people" requires more effort than they expected and additional technology to build even simple workflow solutions (let alone BPM scenarios), leveraging existing investments in their .NET architecture.

**Key Findings**

- There are a number of tools to support workflow automation, even within the SharePoint family. However, most enterprises seek to limit the costs and difficulty of development by adding easy-to-use supplements — whether tools, templates or pre-configured solutions.
- The ultimate advantages that enterprise strategists, process owners, business analysts, and developers seek from business process management (BPM) projects are as much about creating a process culture as they are about any technology investments.
- Vendors complementing SharePoint, range from small to very large. There are options to consider for every budget, although some may be less obvious, even though the vendors are already present in your architecture or applications layer.

**Recommendations**

- Given the development resources required to make the standard Microsoft SharePoint product set function as a process platform, enterprises should expect to supplement it with a range of technologies — some of which they'll use very little and are tactical, while others will be more strategic.
- There are several scenarios for better coordination of the interactions between people, process and content. Choose your workflow and BPM tools to match your enterprise needs and according to lessons learned by others.
- Before putting more development authority in the hands of casual users, consider how casually you'll be able to call back that authority if things go wrong.

Most enterprises have a number of immediate needs that could be fulfilled by workflow automation. Common administrative processes such as leave requests, budget approvals, new employee onboarding, action items or issues tracking, as well as a large number of primarily horizontal and not particularly complex solutions, are early opportunities to extend the investment value in SharePoint. After consulting with a
large number of enterprise clients, a few common characteristics have emerged that qualify their expectations for business user needs for better process coordination:

- Easy to use, where a business user could construct the workflow using a graphical modeler.
- A library of pre-designed modules (templates) that can be leveraged across the enterprise.
- No need to write scripts to develop the workflow.
- Rapid development, where the time for a workflow application to be created, tested and deployed is often 60 days or less.
- Scalable: the workflow engine has to be scalable across the enterprise and support hundreds of concurrent users.
- Will be able to develop workflows across distributed locations.
- Compatible with the current architecture (often .NET-based, but not always).
- Leverages or operates with WSS, MOSS, Workflow Foundation, Visio, SQL, BizTalk and Exchange.
- Easy to maintain and change, where a business user can maintain and update a current workflow.
- Long-term viability, where the workflow application will be compatible and leverage future Microsoft and Microsoft partner technologies.

Business users will want to know where a bottle-neck appears in the approval process more easily than they can now. This is a key indicator of the need for explicit process management, not just simple workflow coordination. Using graphical process models rather than SharePoint’s native text-based, menu-style workflow, users can easily answer this question and others regarding work item status. Microsoft’s own technologies are not yet strong enough for visual process and work item monitoring, or process simulation.

Most of the members of the Microsoft Business Process Alliance Partnership can easily meet or exceed all these expectations. So, too, can others (not part of the alliance) that have .NET-based engines or even connections built to leverage WSS. Note that “low cost,” “data integration” and “developers” are not the primary focus of the previous list of requirements.

Nuances among vendors are many, as are the total number in the market that could deliver against expectations, despite not having global presence, broader functionality, solutions templates, or any one specific competitive advantage.

Nevertheless, generally across all inquiries, a few vendors have repeatedly been considered as potential shortlist candidates for the following reasons:
- Ascentn. Advancing beyond simple workflows toward being embedded as part of .NET service-oriented architecture.
- CorasWorks. Up-and-coming solutions platform with a focus on user interfaces.
- Integrify. Yet another .NET engine, the difference being its software as a service delivery model.
- K2 Blackpoint. The closest fit for the lowest cost and potential upgrade to its BPMSuite.
- Nintex. Strong reporting and ex-Microsoft leadership.
- Open Text. Captaris Workflow acquisition positions this portfolio vendor even closer to Microsoft.
- ShareVis. A focus on forms.
- Skelta. Tools for developers and independent software vendors (ISVs).
- Workflowgen. Simple and fast implementation, though only slightly above Workflow Foundation in scale.

Enterprises should consider their ECM maturity before trying to leverage a content management platform to control SharePoint content or collaboration (see "Gartner Maturity Model for Enterprise Content Management"). The maturity model can help enterprises understand that process implications of content management must be considered early. Then, as organizations rise through each level of maturity, they must also grow their process capabilities.

SharePoint can stimulate examination and reconsideration of the larger content strategy within enterprises, but it cannot yet complete the content management puzzle without extended functionality that is typically provided by suites (see "Case Study: Pfizer Takes a Two-Pronged Approach to Content Management").

Through continued client interactions, Gartner has collected many data points on SharePoint's challenges regarding its suitability as an ECM platform. These challenges include server replication issues, scalability, significant infrastructure costs, inability to support compound documents, and limited process management capabilities. These limitations have led most client organizations we speak with to implement WSS or MOSS as a file management extension of, but not a replacement for current ECM platforms and content architectures.

However, some platforms have an advantage over others, whether by architecture, partnership, integration, or functionality. As part of the planning process we see a number of business analysts and enterprise content managers consider ECM platform vendors as shortlist candidates for relatively seamless coexistence on the process side of the content value equation — especially as workflow leverage over content objects and users is considered.
These vendors include:

- **EMC/Documentum.** Out-of-the-box integration is provided as a suite of native Web parts that let WSS or MOSS users, access, browse and interact with Documentum directly. Archiving services are also provided that let users or administrators automatically move content out of SharePoint's SQL-based repositories and into the Documentum repository.

- **Hyland.** Provides three levels of integration with MOSS 2007 to support customers who wish to leverage SharePoint for basic content services. Two of these integrations — Web Parts and Archive Services — are also supported with WSS. The third, Integration for Microsoft Search, is also supported with Microsoft Search Server products in addition to MOSS 2007.

- **IBM/FileNet.** FileNet Connector for SharePoint Web Parts (for WSS) extends SharePoint to allow FileNet document management and process management activities to be completed within the WSS environment. Support for MOSS includes upgraded Document Libraries capabilities and WebParts, bidirectional metadata flows, native P8 BPM and records management, and automatic SharePoint site discovery and Enterprise policy enforcement.

- **Open Text.** Livelink ECM MS/SharePoint Integration connects tightly with Microsoft WSS and Microsoft Office SharePoint Server framework, leveraging and extending site Administration, via the Livelink ECM .NET application programming interface (API). The API can also be used through Microsoft Workflow Foundation to enable archiving services.
2.5 **FIRST 100 DAYS OF ECM IMPLEMENTATION**

This guide will assist project managers, planners and architects who have been newly tasked with leading or organizing an enterprise content management (ECM) initiative and are responsible for its success. Activities in the first 100 days of an ECM initiative lay the foundation for future implementations.

**Key Findings**

- ECM is a strategic investment that can help organizations cut costs, maintain agility and preserve oversight.
- The emergence of Microsoft SharePoint and similar tools for collaborative and ad hoc content management has pushed adoption of content management (CM) technologies faster than the required analysis of needed business and process change.
- Diligent planning will ensure that the ECM initiative meets stakeholder expectations and delivers real business value.
- Enterprise deployments of ECM will risk failure if insufficient time is spent on planning and vendor selection.
- Enterprises often underestimate the process and organizational issues associated with ECM projects.
- Organizations should create a cross-functional project team, composed of representatives from each of the business areas involved and individuals from the IT organization.

**Recommendations**

- Tie ECM projects to business objectives to ensure that ECM is not seen as purely an IT infrastructure initiative.
- Assess your organization’s enterprise architecture and determine how ECM will support your company's current and future information management needs.
- Determine what content exists in the enterprise and how it is used. A content inventory is an important deliverable to accomplish this.
- Complete an ECM maturity assessment to establish a baseline of action steps and critical success metrics for the first 100 days. Optimize your ECM investments based on where your specific needs fall.
- Develop a long term enterprisewide plan for ECM. Upfront strategic planning is critical and should include an assessment of CM applications and technology platforms in place and how you acquire and implement future content technologies — on-premises software or software-as-a-service (SaaS)-based deployment.
ECM is a strategy, an architectural framework and a set of technologies that organizations must assess and deploy to manage unstructured content. ECM will be a strategic investment for organizations as they look to survive and compete in an uncertain economy. ECM can drive process efficiencies and compliance efforts, as well as collaborative information management needs that create value for the company. Our inquiries since 2007, however, have shown a somewhat disturbing trend. As ECM became much more commonplace due to the adoption of more basic approaches like SharePoint, the user base quickly spread — but the knowledge of how to approach the projects did not. This “mass market” proliferation of ECM has pushed the core technology faster than the required analysis of needed business and process change. Based on discussions with Gartner clients, we estimate that 50% of our client base does not have a clear understanding and business-goal oriented approach to their ECM strategy.

This is up from approximately 30% in the previous five years. Having a comprehensive strategy in place, rather than the bottom-up, departmental approach typical used in the past, can also enable organizations to better optimize costs. Gartner’s research consistently demonstrates that most organizations suffer from redundant costs because of overlapping CM systems. By eliminating at least two repositories and consolidating their content, your company can save substantially on ongoing maintenance costs, storage and infrastructure costs, as well as operational support for these systems.

In the first 100 days, your ECM initiative’s success will depend on two complementary but distinct achievements: developing a long-term ECM strategy and demonstrating progress for the initiative. Executing on the vision for ECM requires skills in program planning, stakeholder analysis, communications and expectation setting.

Despite an overall downturn in software spending, expenditure on ECM software held steady from 2008 to 2009. Compliance requirements, upgrades, added maintenance costs and point solutions have attracted investment from enterprises. IT buyers are looking to reduce the cost of content management applications, and shorten implementation and integration times, while also addressing new demands from increasingly impatient businesses and end users.

Business buyers are looking to take charge of critical content and process technologies, with increasing independence from the control of their IT departments. The proliferation of consumer technologies raises workers’ expectations for an applications’ ease of use and people will reject new ECM deployments that fall too far short of these expectations.

With this iteration of our first 100 days guidance, we reiterate the need for new leaders of ECM initiatives to remain focused on the basics, but also to expand their thinking regarding the applications of CM capabilities and the approaches via which they can be delivered. Therefore, we provide updated guidance in several topic areas relating to emerging trends, such as alternative delivery models (including, open source and cloud computing). In addition, we provide references to recent Gartner research on ECM best practices that new leaders can use in their efforts.
Key deliverables in the first 100 days are a:

- Business case
- Requirements document
- Content inventory
- Implementation road map

**Seek out an executive sponsor.** All ECM initiatives need executive sponsorship to ensure the proper level of investment and to communicate their importance throughout the organization. Gartner believes that having top-level business management backing is essential for ensuring a focus on the business impact and value of the ECM project. The team should aim as high as possible for a sponsor and getting C-level visibility is highly desirable.

**Designate a project management office/project manager.** The project management office (PMO) reports on the status of the project and raises issues, as appropriate, to the steering committee. Made up of personnel from the business and technical areas, the PMO is responsible for planning tasks, reporting project status, assigning resources and monitoring the progress against the project plan. The PMO will provide the project manager to lead the overall effort, ensuring that the project meets its goals and objectives, and is delivered on time and within budget. A critical competence for the project manager is prior experience or training in the management of complex enterprise systems development. Ideally, the project manager will already have an established track record as a result of previous application development projects such as enterprise resource planning. The project manager will also have an important oversight role in working with his counterpart from the external implementation team as most ECM projects will include an external team of project managers, architects and system developers.

**3. Identify key business drivers.** ECM is a strategic purchase, so the new leader of the initiative should link the project to the business objectives. Determine the organization’s drivers for ECM, which may include reducing cycle time, improving customer services, retaining critical knowledge and maintaining business continuity. Identifying business drivers requires interviews across the organization, facilitated by the cross-functional members on the project team. These drivers help confirm the business case for ECM. Respondents to Gartner’s annual survey of CIOs indicated that their top three business priorities for 2009 were: improving business processes, reducing enterprise costs and improving enterprise workforce effectiveness. Attracting and retaining new customers was their number four priority, while targeting customers and markets more effectively rose from number nine in 2008 to number seven for 2009. ECM cannot only help organizations meet these priorities but in some cases is vital to the core achievement itself.

**4. Define the ECM organizational structure.** What kind of (re-)organization may be required to support your vision and what change-management measures would help achieve the objectives? Administrators, content modelers and information architects are roles which must be filled if you are to succeed. These roles will be shared between IT and business units.
Tactics for first 100 days

Figure 1. Summary of Activities in the First 100 Days

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<th>Initiative Phase</th>
<th>Activities</th>
<th>Days 1-30</th>
<th>Days 31-60</th>
<th>Days 61-100</th>
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<td>Identify key business drivers</td>
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<td>Conduct an ECM maturity assessment</td>
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<td>Organization</td>
<td>Seek out an executive sponsor</td>
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<td>Create a steering committee (role is oversight of the ECM initiative)</td>
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<td>Create cross-functional project team</td>
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<td>Identify the skills and roles across the enterprise</td>
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<td>Strategy</td>
<td>Identify all ECM projects currently underway</td>
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<td>Examine current state. Identify ECM platforms in use</td>
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<td>Develop “future state” ECM plan and architecture</td>
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<td>Select an ECM delivery model</td>
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<td>Planning</td>
<td>Assess integration requirements among ECM systems and legacy applications</td>
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<td>Conduct detailed technical and business requirements analysis</td>
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<td>Governance</td>
<td>Define project goals and team member roles and responsibilities</td>
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<td>Establish a content governance board</td>
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ECM = enterprise content management  
Source: Gartner (December 2009)
Time Frame: 1 to 30 Days
During the first month the focus should be on getting the right people in place: selecting the project manager and the right team members, including business analysts, system architects and information architects.

1. **Create a cross-functional project team.** The project team needs support from a senior executive sponsor and an executive steering committee. Figure 2 shows how these groups relate and lists the roles that should be included. This project team will develop an enterprisewide strategy, build the business case, assess business and technical requirements, and plan and oversee the implementation. Gartner recommends that application managers form a core team and an extended team to work with the steering committee.

2. **Conduct a workshop.** Hold an initial workshop with the core and extended team to explain ECM and the project goals. Define the roles of the team members and create an action plan for the initiative. The team will also examine alternative business models along with IT standards, policies, process and architecture.

3. **Complete an ECM maturity assessment.** Use Gartner’s model to socialize the concepts around ECM maturity, assess your own organization's level, and help create your ECM vision, strategy and road map. As the program progresses, use our model to guide you toward the next maturity level.
PMO = project management office
Time Frame: 31 to 60 Days

During the second month, planners and architects should focus on assessing the current and desired states in terms of content-centric processes and functional requirements. Planners and architects must address the issues that arise from enterprises' traditionally fragmented implementation of content management systems and articulate the benefits of an enterprisewide approach.

1. **Examine the current state.** When developing their ECM strategies, application managers must first determine their enterprise's business needs. A needs assessment should consider two perspectives: process-centric and content-centric. Assessing process-centric requirements means flowcharting the existing state of affairs. Describe how the information flow occurs. Where does it stop or get bottlenecked? At what points in the process must it change state (for example, from paper to electronic, or from transactional data to a mixed state of document information and transactional information)? Often, transitional states are points of failure or delay in the overall process.

Organizations have traditionally looked to ECM to make their processes more efficient. For content-centric business needs, consider all the roles of workers in the organization who "touch" the content in one way or another. Some will be creators or writers; some will review the content; others will take additional actions on the content. Perhaps someone will have to stop interacting with one system to query a database, make a phone call or interrogate some other system. Some users will change the content. Some will simply consume information. Study how the information must change in the hands of these various players.

2. **Identify all current ECM applications and any ECM projects under way.** Since content management technologies have often been deployed as departmental solutions there are few "greenfield" initiatives. Replacement opportunities, consolidation, and coexistence strategies tend to be most common, based on our discussions with clients. Many organizations already have multiple ECM platforms and applications in place. Gartner surveys have shown that a typical organization has more than six different ECM repositories — more with larger organizations (see Note 1). The team should inventory current ECM products and applications and freeze any project in progress until an overarching strategy is in place. It should identify established content management applications to determine which should be kept — leveraged and extended — and which may be candidates for elimination or migration. ECM initiative leaders must plan for addressing issues like federated search, metadata strategies, and interoperability between content and records management systems.

3. **Conduct a detailed business and technical requirements analysis.** Organizations need to determine what ECM functions the enterprise needs — not just today, but in the future. ECM breaks down into many projects. It is critical to determine which ones will be addressed and implemented first (for example, will it be imaging/document management records management, document-centric collaboration, externally-facing WCM or internally-facing WCM?) Ascertain what capabilities are required for enabling users to find relevant content and to "mine" the content under management for its value. Web channel technologies that deliver improved experiences, customer conversions and loyalty are a primary focus of many enterprises.
The influence of the chief marketing officer in directing spending on marketing machines that capitalize on WCM, digital asset management (DAM), Web analytics, portals, e-forms, document composition features, social communities, mobile device support and business process management (BPM) is now obvious. Determine whether you need the full complement of ECM suite capabilities. You may not require all the functionality, in which case you can reduce the number of suite components, thereby reducing the initial software costs.

Collect detailed data, process and user interface requirements from users who will be involved in the initial rollout. This analysis can be conducted using either in-house or external consulting resources. Functional requirements should then be overlaid on the IT infrastructure to determine compatibility and to identify necessary additional investments (for example, additional software, hardware and network infrastructure).

They may necessitate the hiring of support personnel. Use a structured questionnaire to interview key business and technical personnel. A key outcome of this requirements analysis is to link to the content-centric and process-centric assessments completed in Step 1 as, ultimately, ECM technical architectures should be based on the structure and architecture of the business, the CEO's key objectives (such as transforming a key aspect of the way the business functions) and the ways in which existing people, processes, relationships and other assets can be leveraged to best achieve the CEO's objectives.

4. **Assess integration requirements among ECM systems and with legacy applications.** Application managers and project managers must anticipate ECM system integration issues and establish an integration game plan to share content. Determine your strategy for any existing content repositories and applications (whether hosted or on premise) — for example, federate or eliminate. Search technology allows content stored in multiple content repositories to be indexed and viewed through a single view. Organizations can save money and effort, however, by eliminating or retiring redundant content repositories.

Determine the requirements for integration with existing legacy systems and business applications. Assess the time and resources required to integrate with packaged software applications and legacy systems. Interfaces to business applications like SAP are often part of ECM products, while integration with custom applications needs to be built.

5. **Establish a methodology for, and sponsor, content inventories.** A content inventory can help identify document flow, retrieval and access patterns, volumes, and other important document population attributes. This inventory will help define the type and scale of the ECM system that the enterprise needs. It requires a cross-organizational commitment and an executive sponsor is critical, because the process transcends departments. Gartner recommends using an approach such as the Writer, Reviewer, Approver, Viewer (WRAV) model to develop a content inventory.
This simple approach captures essential information related to each document's lifecycle, based on four roles or types of interaction with documents:

- **Writer**: Writers create or revise documents. They also assign or update key aspects of the document, such as metadata. They will use the check-in/check-out and versioning functionality of an ECM system in their daily work activities.

- **Reviewer**: Reviewers participate in the review cycle of draft documents. They annotate the documents and route them back to the writer. Reviewers also may use the workflow tools that drive the distribution of documents. A work queue view into the ECM system alerts these users to the latest documents they must review.

- **Approver**: Approvers promote the draft documents to a next level of review or final status, depending on the rules defined for the review cycle. They use the workflow and sign-off capabilities of the ECM system.

- **Viewer**: Viewers use the final documents in the execution of their job functions. They search the content repository and attributes for a particular document or set of documents. Once the documents are found, they access them in a view-only mode.

**Time Frame: 61 to 100 Days**

The third time frame focuses on organization rollout, including producing the road map, firming up governance, planning for the post-100-day phase and producing project milestones and metrics. Road mapping activity must identify in what order the projects will be deployed. This ties back to the high level drivers of risk management, efficiency (save money) and generating value. These map to ECM projects such as: document and records management; process-oriented document management and legacy clean up; repository consolidation; and WCM or employee-facing, self-service websites.

1. **Create a project implementation plan.** Based on discussions and engagements with Gartner clients, Gartner estimates that most ECM implementations will take between nine and 18 months. Application managers should create a project plan, with releases scheduled no more than six months apart, to show value and test the return on investment. If the project goes on longer than that, without at least an initial rollout, the enterprise should reassess its project plan and the ability of the IT infrastructure to support ECM. The delivery model affects the cost and resources allotted to the planning process.

2. **Select an ECM delivery model.** ECM and the internal resources needed to implement and maintain ECM suites requires significant capital outlay. It is not unusual for an organization to spend $1 million or more on software and services for an enterprise deal. In a survey conducted by Gartner, 36% of organizations surveyed reported spending more than $500,000 on content management software in 2008 (see Note 1). A survey of attendees at Gartner’s 2009 Portals, Content and Collaboration conference showed that 52% of the respondents indicated their budgets for CM had
stayed the same in 2009 while only 15% reported a budget decrease. Organizations today have more options for procuring and delivering ECM, including SaaS, shared services or open source, in addition to the traditional on-premises software deployment. Which option works best for the organization depends on several factors, such as the available budget, time to value and the knowledge within the organization. With any of the available methods, it is imperative that you understand your requirements, be clear about what you are actually buying, and pay close attention to service-level agreements.

3. **Establish a content governance board.** Content governance requires organizations to establish: 1) accountability for bodies of content; and 2) effective enterprise content management with operational support personnel who enable and enforce retention and review policies. A good governance policy and a strong team increase your chances of making the ECM project a success. The governance team must have the right mix of representation from business units, business functions and IT. A business user, ideally from the executive sponsor’s team, should be the lead.

**Next Steps**

Beyond the initial 100 days, a number of critical next steps need to be undertaken. These include the following:

- Produce a request for information (RFI) or request for proposal (RFP).
  - Meet with the prospective ECM vendors.
  - Evaluate and select vendor or product finalists.
  - Develop implementation road map.
  - Create a document structure and indexing scheme.
  - Design a content repository.
  - Establish a competency center.
  - Determine your strategy for change management
2.6 GARTNER ECM TACTICAL GUIDELINES

2.6.1 What You Need to Know

Enterprise content management (ECM) consists of a vision and framework for integrating a broad range of content management technologies and content formats across the enterprise. A typical ECM project, however, involves considerable time (nine to 18 months to deployment) and cost (often more than $1 million, including software and services, for a large deal). These factors, coupled with tighter IT budgets, have resulted in greater scrutiny before executive sign-off on the capital expenditure. The economic crisis may make it more difficult to convince executives to invest in a full ECM effort. Thus it is critical to have a solid business case in place.

Steps for building a solid business case are as follows:

- Determine overall corporate objectives.
- Identify specific drivers for ECM.
- Identify key stakeholders and get sponsors on board.
- Perform a current state analysis and determine the desired state.
- Assess the costs and analyze the risks.

ECM projects should be guided by an activity cycle. The Activity Cycle provides a framework for organizing the initial and ongoing activities of the project. IT leaders tasked with building the business case for ECM projects must focus on the following activity cycle phases:

Vision: What are the business problems that ECM can address?

Plan: What are the major issues to tackle and how will you go about it?

2.6.2 Determine Overall Corporate Objectives

Given that ECM is a strategic purchase, the leader of an ECM initiative should link the project to the business objectives. Prior to embarking on an ECM initiative, enterprises must answer a key question: What high-level objectives are needed to achieve business goals during the next three to five years? Business objectives, typically statements by leadership in a chosen market, are underpinned by strategies for excelling in areas such as operational effectiveness, customer intimacy and product or service leadership. They often focus on three key areas: running the business, growing the business and transforming the business.

In most large, complex organizations, these goals are difficult, if not impossible, to achieve without well-functioning and well-integrated technologies, people and processes. The stated business goals must be met, or the ECM project will not be a success. ECM helps organizations: run the business through cost avoidance or reduction; grow the business via measurable productivity increases; and transform the business by treating content and information as an asset, encouraging collaboration and decision making and creating new business opportunities.
Respondents to Gartner’s annual survey of CIOs indicated that their top five business priorities for 2009 were: improving business processes, reducing enterprise costs, improving enterprise workforce effectiveness, attracting and retaining new customers, and increasing the use of information/analytics. ECM cannot only help organizations meet these priorities but in some cases is vital to the core achievement itself.

2.6.3 Identify Specific Drivers for ECM

Today, executives will fund content management only if it improves business directly. It is imperative to determine the organization’s specific drivers for the ECM initiative or initiatives, which may include: reducing the cycle time associated with applications such as claim or invoice processing, increasing automation via imaging and workflow; facilitating information sharing through document-centric collaboration; improving customer service; retaining critical knowledge and maintaining business continuity through document and records management. Link each potential ECM project to specific business goals in order to assess the business benefit. This benefit does not have to be a precise, quantifiable financial return, but it should be possible to determine which projects confer more benefits than others.

ECM is a strategic purchase, so it is vital to create a strategic tie-in for the project, by linking it to the overall business objectives. Business strategy tie-ins include:

- Improving operational efficiencies.
- Providing more efficient information sharing — quicker and better access to documents.
- Improving the quality of decision making.
- Reducing costs by automating and streamlining manual processes.
- Ensuring compliance, transparency, and reporting requirements for industry and government.

Organizations typically can build their business case for ECM on three high-level drivers:

- Cost reduction/avoidance.
- Increased efficiency/value.
- Risk management/compliance.

Cost Reduction/Avoidance

ECM can bring business process efficiencies and allow enterprises to achieve the goal of lower paper consumption at the same time by reducing paper-based processes and the inherent latencies and costs. Unmanaged documents pose many hidden — and not-so-hidden — costs, including those associated with on-site and off-site storage, electronic media proliferation, physical facilities (for example, filing cabinets and floor space), and postal and other distribution costs.

Analyze how you capture information from customers, prospects and suppliers. What are the different ways in which you capture information? Where does that information go and how is it used? An audit of the methods used by various functions to collect and route data, as well as serve up content, will expose processes in which e-forms could be integrated. The goal is to reduce the need to create a paper document, and also to reduce inefficient or redundant communications.
Adopters of document imaging technology have often been able to justify the implementation on the basis of reducing physical storage space by converting filing cabinets of paper documents into electronic files. For some organizations, implementing document imaging technology has enabled them to reduce head count as well as the labor costs associated with processing paper-based documents. Also, converting paper documents, such as memos, statements, and policies and procedures, into digital format and making them accessible via a Web site (intranet, extranet, or public site) can eliminate or reduce operational document costs such as printing, shipping and postage, as well as non-document costs such as phone and fax bills. Entering data with an electronic form can greatly speed processing time, hold down printing costs and increase the accuracy of data entry, so work doesn't have to be checked or done twice.

Direct savings can be derived from the increased efficiency of administering and developing enterprise Web sites. Reporting tools and templates in Web content management (WCM) systems can reduce webmaster staffing requirements by 50% to 75%. Templates, in particular, enable business users to post content without regard for its layout or format, or the design of the page around it. This ease of use increases the number of documents and business processes that the enterprise can migrate to the Web.

**Increased Efficiency/Value**

Document management, imaging and workflow applications are associated with productivity benefits on the individual and team level. Imaging and its associated workflow, for example, can reduce the costs associated with re-keying information for processing, allowing parallel process steps to be carried out, thus reducing overall process time. This not only holds down labor costs, but can also increase customer satisfaction, because things simply get done faster. Financial services firms, for example, have leveraged workflow and document management to shave days off a loan origination cycle. Workflow enables government agencies to improve their service levels to their constituents and to handle the workload more efficiently as increasing numbers of workers retire during the next five years.

A well-organized set of documents with associated metadata and information retrieval capabilities can decrease the amount of time employees have to spend searching for information, and raises their level of productivity. The use of document imaging technology also helps to eliminate misplaced or lost documents/files and allows multiple people to access the same document simultaneously, thereby improving productivity and increasing customer service responsiveness. When we look at Web content management, we can see that well-organized and accessible Web sites can help drive company revenue and improve customer retention.

While increasing the effectiveness of individual employees is a laudable goal, unless it can be mapped to a key performance indicator for the individual or the group, you typically can't base your business case on it. Saving time for an individual, particularly a salaried one, often does not equate to significant savings. However, if you can save individual employees time, you can use that extra time to enhance their efforts at team collaboration, a place where the company can realize benefits. A survey of research indicates that enhancing team performance can lead to real productivity increases,
ones that can be measured in terms of new product innovations, faster order-to-cash cycle times and increased bid-to-win ratios. These sorts of benefits can be realized from document management and document-centric collaboration systems, and can be easily mapped to individual objectives, team goals and up to key corporate key performance indicators (KPIs). Don't be taken in by unquantifiable statements such as "increasing individual effectiveness" or "enhancing information worker productivity." You can achieve hard-dollar return on investment (ROI) from content management initiatives only if they are properly targeted and measured.

**Risk Management and Compliance**

Risk management and regulatory compliance continue to be critical drivers for ECM adoption. Lost documents have a cost, and that cost can have a very high upper bound if the document that has been lost is required by tax authorities or regulatory agencies, or is needed as evidence in litigation. E-mail archiving and records management, for example, help organizations to reduce risk and meet compliance goals. These can sometimes be difficult to quantify, but once a company is hit with a big fine for noncompliance with proper information management, the case is easier to make. One area that can definitely be quantified is the cost associated with legal discovery. The better organized your unstructured content, including records and e-mail, is, the lower these costs will be. According to a 2008 survey conducted by the International Law Firm of Fulbright and Jaworski, 45% of U.S. companies spend $1 million or more annually on litigation (excluding cost of judgments or settlements). That compares to 34% for U.K. firms. Sixteen percent of U.S. firms are spending at least $5 million annually, including 9% reaching $10 million or more.

### 2.6.4 Identify Key Stakeholders

All ECM initiatives need executive sponsorship to ensure the proper level of investment and to communicate their importance throughout the organization. Gartner recommends creating a cross-functional project team, composed of representatives from each of the business areas involved in the project and individuals from the IT organization, to lead the ECM initiative. This team will also be tasked with gaining the commitment to and support for your ECM initiative across the organization. The project team needs support from a senior executive sponsor and an executive steering committee.

Stakeholders usually include business process owners, IT enablers and financial stewards. The number of these individuals, their roles and levels of involvement vary depending on the scope of the initiative. Who are the decision makers? Who has the money?

**Senior Executive Sponsor**

Although not actually a member of the project team itself, this senior executive will represent the ECM initiative at top-level management meetings. All ECM initiatives need executive-level sponsorship to ensure they receive the proper level of investment and that their importance is communicated throughout the organization. It is better to have a senior business executive as the project sponsor because this will ensure a focus on the business impact and value of the ECM project. The team should aim as high as possible for a sponsor, and getting CEO-level visibility is highly desirable.
Executive Steering Committee

This committee constitutes the first step in implementing an enterprisewide ECM strategy. Made up of representatives from the organization's senior management team and cross-functional groups, the executive steering committee is the project sponsor. It serves as the overall decision maker and governing body for the project. This group monitors the project's progress and makes strategic decisions, usually concerning budgeting, process and organizational changes.

Project Team

Form a cross-functional project team to support for your ECM initiative across the organization. The team's initial activities include developing an enterprisewide ECM strategy, building the business case, assessing the business and technical requirements, and overseeing the implementation. It should consist of the following:

- Business sponsor and pilot users — Create the business case.
- Legal advisor — Advise on a document retention schedule with deletion and destruction dates.
- Librarian/taxonomist/information architect — Creates metadata and document organization schemes.
- Document designers — Create document templates, preferably with a forms-based or XML editor.
- User requirements specialists — Design inventory questionnaires and process survey forms. Identifying business drivers requires interviews across the organization, facilitated by the cross-functional members on the project team.
- IT manager — Runs the vendor and partner selection process; oversees internal IT team; approves project plans and so forth.
- Software vendor — Helps with technical design and architecture.
- Implementation partner — Responsible for implementation.
- Internal IT — Works alongside the vendor and the system integrator to understand system design for administrative and maintenance purposes.

2.6.5 Perform a Current State Analysis and Determine the Desired State

When assessing the return on investment of an ECM initiative, be sure to start with reviewing the current business process. The assessment should consider two perspectives, one process-centric, and the other content-centric. The process-centric analysis would literally mean flowcharting the existing state of affairs. Describe how the information flow occurs. Where does it stop or get bottlenecked? At what points in the process must it change state (as from paper to electronic, or from a set of transactional data to a mixed state of document information and transactional information)? Note these points clearly. Often transitional states are points of failure, or at least points of delay in the overall process. Study the business processes that need improvement. Model and detail the changes required in the processes.

Content-centric workflow can be very much a part of a workplace efficiency plan oriented toward process re-engineering. These workflows and related content-enabled vertical applications (CEVAs) can provide substantial returns. Whether these projects are "fast payback" or "longer term" depends on the scope of the effort.
Then, take a content-centric approach as well. Look at all the roles of workers in the organization who "touch" the content in one way or another. Some will be creators or writers, some will review the content. Others will take additional actions on seeing the content. Perhaps someone will have to stop interacting with one system to query a database, make a phone call or interrogate some other enterprise system. All these human actions tend to add a lot of time and cost to the business and many will be interchanges that can be automated through the CEVA. Some users will change the content. Some will simply consume the information. Study how the information must change in the hands of these various players.

Ensure you benchmark your starting point so that when you declare success, you have a beginning state to compare it against. Any efforts at showing ROI will require this — documenting the initial state of affairs (such as, "it takes 15 minutes to do a certain task before ECM") against the state after the ECM implementation ("that task now takes five minutes").

2.6.6 Assess the Costs and Analyze the Risks

Costs

The costs for ECM solutions vary greatly, depending on the scope, assumptions and estimations that are made. A Gartner study conducted in 4Q07 found that over 41% of organizations surveyed planned to spend $500,000 or more on ECM in 2008. As indicated in "Gartner Framework for Projecting the Cost of Enterprise Content Management," the software license costs for a solution can be significant, easily exceeding $1 million for 1,000 users on average when implementing an ECM suite before discounts. The list price for an ECM software license can range from $400 to $1,200, depending on the breadth of functionality included.

IT managers and planners need to examine every potential content management software acquisition with some skepticism — each dollar you spend on the licensing in year one will be dwarfed by the total cost of ownership (TCO) over five years. Typically, the TCO analysis shows that licensing accounts for about 10% of total expenditure, with other major cost areas including maintenance (20% of license cost per year or more), implementation (two times to five times the license costs), storage, hardware and network, as well as operational costs for head count to maintain the applications. With ECM, the initial software licensing cost typically accounts for between 5% and 20% of the TCO over five years.

Few organizations are starting from scratch with ECM. Since the early 2000s, individual departments implemented their own content management systems, and, now — many years later — the IT organization still has not finished consolidating all these applications and repositories so that users across the enterprise can find and efficiently exploit relevant content. This may be the time to rethink those departmental solutions and put together a strategy for federation or consolidation as part of an ECM initiative. The cost of a repository consolidation project can begin in the $100,000 to $200,000 range — but can yield savings of at least twice the expenditure in year one following the consolidation. Savings opportunities include reduced maintenance, development and storage costs.
Risk Analysis

It is also important to identify the risks of doing nothing. What are the risks to your organization if you do not implement an enterprise content management solution? Will content volumes continue to grow, increasing storage costs? What is the potential impact on user productivity? Continuing to rely on manual, paper-based processes can result in inefficiencies and increased costs. For example, what is the cost if your organization is involved in litigation and discovery of your electronic information assets is required? Gartner recommends that IT and general counsel join forces to make executives aware of the costs and risks of bad information management practices. Fulbright and Jaworski’s 2008 Litigation Trends Survey tells us that "12% of companies said they had been before a court or other litigation tribunal ill-equipped to deal with complex electronic data discovery. For financial services and technology firms, which have mounds of e-files and other electronically stored data, 19% and 18%, respectively, reported facing courts and tribunals not up to the challenge."

Assessing the risks includes determining the impact on the business users. Implementing ECM technologies requires users to change how they work with documents and content and a change to familiar processes. If the chosen solution is too cumbersome, doesn't tie into familiar desktop applications or enforces radically different processes, workers simply won't use it, or they'll find ways to circumvent the process. Part of the cost and business case analyses requires assessing user readiness and buy in. Determine what change-management measures your organization will need to have in place to help achieve the objectives.
3 DOCUMENT MANAGEMENT SYSTEMS

3.1 INTRODUCTION

This section provides an overview of the kind of “document” and “content” management systems exist and explain their differences as well as how they complement each other.

3.2 CONTENT MANAGEMENT SYSTEM (CMS)

3.2.1 Introduction

A Content Management System (CMS) is the collection of procedures used to manage work flow in a collaborative environment. These procedures can be manual or computer-based. The procedures are designed to:

- Allow for a large number of people to contribute to and share stored data
- Control access to data, based on user roles. User roles define what information each user can view or edit
- Aid in easy storage and retrieval of data
- Reduce repetitive duplicate input
- Improve the ease of report writing
- Improve communication between users

In a CMS, data can be defined as nearly anything - documents, movies, pictures, phone numbers, scientific data, etc. CMSs are frequently used for storing, controlling, revising, semantically enriching, and publishing documentation.

3.2.2 Types of CMS

There are four main categories of CMS their respective domains of use:

- Enterprise CMS (ECMS)
- Web CMS (WCMS)
- Document management system (DMS)
- Component content management system

3.2.2.1 ENTERPRISE CONTENT MANAGEMENT SYSTEMS

An enterprise content management (ECM) system is concerned with content, documents, details, and records related to the organizational processes of an enterprise. The purpose is to manage the organization's unstructured information content, with all its diversity of format and location.

ECM was earlier defined as EDMS (Enterprise Document Management System) This document has in the Architecture section some architecture graphics that defines the system as an EDMS. Please translate this into ECM architecture for the purpose of this document.
See for details the ECM Section of this document

3.2.2.2  WEB CONTENT MANAGEMENT SYSTEMS

A web content management (WCM) system is a CMS designed to simplify the publication of web content to web sites and mobile devices, in particular, allowing content creators to submit content without requiring technical knowledge of HTML or the uploading of files.

Several web based content management systems exist both in the Open Source and commercial domains. However, this is one area where OSS software have gained dominance over their proprietary counterparts.

3.2.2.3  EVOLUTION OF WEB CONTENT MANAGEMENT FROM MICROSOFT

As more and more organizations move towards using the Web to develop better connections with employees, partners, and customers, it becomes important for these organizations to have a way to efficiently author and publish information to multiple Web sites while maintaining consistent branding and control over the look and feel of the content.

Microsoft has recognized this key investment area since the release of Content Management Server 2001, followed by Content Management Server 2002. Today, Microsoft continues to make enhancements to Web content management capabilities in our products. Based on extensive customer feedback, they have integrated the capabilities of CMS 2002 with SharePoint Portal Server 2003 and added new functionality for enterprise content management (ECM), business intelligence, and search. The result is the new Office SharePoint Server 2007 product, which also delivers the Web content management functionality previously delivered by CMS 2002.

3.2.2.4  DOCUMENT MANAGEMENT SYSTEMS

A document management system (DMS) is computer system (or set of computer programs) used to track and store electronic documents and/or images of paper documents.

The CORMS (Correspondence Management System) Section of this document is the DMS part of an Enterprise Content Management system.

See DMS Section of this document

3.2.2.5  COMPONENT CONTENT MANAGEMENT SYSTEM

Using a component content management system, content is stored and managed at the subdocument (or component) level for greater content reuse
3.3 ENTERPRISE CONTENT MANAGEMENT (ECM)

3.3.1 Introduction

The latest definition is intended to encompass the legacy problem domains that have traditionally been addressed by records management and document management. It also includes all of the additional problems involved in converting to and from digital content, and to and from the traditional media of those problem domains (such as physical and computerized filing and retrieval systems, often involving paper and microforms). Finally, ECM is a new problem domain in its own right, as it has employed the technologies and strategies of (digital) content management to address business process issues, such as records and auditing, knowledge sharing, personalization and standardization of content, and so on.

The technology components that comprise ECM today are the descendants of the electronic document management systems (EDMS) software products that were first released in the late 1980s and early 1990s. The original EDMS products were developed as stand-alone technologies, and these products provided functionality in one of four areas: imaging, workflow, document management, or COLD/ERM (see Components of an enterprise content management system below).

For the software companies, it made sense to develop different products for each of these distinct EDMS functions. At that time, most organizations that were candidates for EDMS generally wanted a solution to address just one overriding business need or application. They were looking for stand-alone solutions to address narrow application needs, many of them at the departmental level – such as imaging for forms processing, workflow for insurance claims processing, document management for engineering documentation, or COLD/ERM for distributing and archiving monthly financial reports.

The typical "early adopter" of these new technologies was an organization that deployed a small-scale imaging and workflow system, possibly to just a single department, in order to improve the efficiency of a repetitive, paper-intensive business process and migrate towards the paperless office. Even in these early years, when the market for these software products was still relatively immature, it was clear that each of the major technologies within EDMS offered tremendous value to specific organizational processes or applications, at a time when business processes were overwhelmingly paper-based. The primary benefits that the first stand-alone EDMS technologies brought to organizations revolved around saving time or improving accessibility to information.

Among the specific benefits were the following:

- Reduction of paper handling and error-prone manual processes
- Reduction of paper storage
- Reduction of lost documents
- Faster access to information
- Online access to information that was formerly available only on paper, microfilm, or microfiche
- Improved control over documents and document-oriented processes
Streamlining of time-consuming business processes
Security over document access and modification
Provide reliable and accurate audit trail
Improved tracking and monitoring, with the ability to identify bottlenecks and modify the system to improve efficiency

The leaders tended to be those vendors that already offered multiple stand-alone EDMS technologies. For these vendors, the early steps toward consolidation were small ones. The first phase was to offer multiple systems as a single, packaged "suite." Early suites were little more than multiple products being sold together at a reduced price, and there was a perception in the market that such suites were a strategy on the part of the vendors to capture additional seats within a customer account. Not surprisingly, market acceptance was limited – at least initially.

3.3.2 ECM Market

More recently, the ECM market has seen the entry of Microsoft and Oracle Corporation, two of the largest and most pervasive providers of software, at the value end of the market [4]. These companies have each taken steps to develop solutions for content management – Microsoft with its various offerings in the SharePoint product family in recent years, and Oracle in 2006 with its Oracle Content Management product. These two software companies look to provide software solutions with the basic ECM functionality that will address the functional requirements commonly required by the majority of organizations. The result is likely to be a stratification of the current ECM market, based on the level of content services that different organizations require.

Independently of Microsoft and Oracle, open source enterprise content management systems have emerged. These include WebGUI, Alfresco, Sensenet 6.0, eZ Publish, KnowledgeTree, Jumper 2.0, Nuxeo, Plone and freedom. Similarly to the operating system, application server and database markets, these entrants hope to apply the open source distribution model of freely available and downloadable software to compete against the traditional enterprise software sales model of the incumbent ECM vendors and commoditize the ECM market.

The need for scalability and scanning facilities for hundreds of millions of documents requiring Terabyte, Petabyte or Exabyte filestores that are in compliance with existing and emerging standards such as HIPAA, SAS 70, BS 7799 and ISO/IEC 27001 may make outsourcing to certified end to end service providers a viable alternative.

Content management has many facets including enterprise content management, Web content management (WCM), content syndication and digital or media asset management. Enterprise content management is a vision, a strategy, or even a new industry, but it is not a closed system solution or a distinct product. Therefore, along with DRT (Document Related Technologies) or DLM (Document Lifecycle Management), ECM can be considered as just one possible catch-all term for a wide range of technologies and vendors.
A comparison of the definitions of the different application fields of ECM and WCM makes it clear that the existing system category distinctions cannot last long, whether for products and technical platforms or for usage models.

### 3.3.3 Enterprise content management as integrative middleware

ECM is used to overcome the restrictions of former vertical applications and island architectures. The user is basically unaware of using an ECM solution. ECM offers the requisite infrastructure for the new world of web-based IT, which is establishing itself as a kind of third platform alongside conventional host and client/server systems. Therefore, EAI (enterprise application integration) and SOA (service-oriented architecture) will play an important role in the implementation and use of ECM.

#### Enterprise Content Management components as independent services

ECM is used to manage information without regard to the source or the required use. The functionality is provided as a service that can be used from all kinds of applications. The advantage of a service concept is that for any given functionality only one general service is available, thus avoiding redundant, expensive and difficult to maintain parallel functions. Therefore, standards for interfaces connecting different services will play an important role in the implementation of ECM.

#### Enterprise Content Management as a uniform repository for all types of information

ECM is used as a content warehouse (both data warehouse and document warehouse) that combines company information in a repository with a uniform structure. Expensive redundancies and associated problems with information consistency are eliminated. All applications deliver their content to a single repository, which in turn provides needed information to all applications. Therefore, content integration and ILM (Information Lifecycle Management) will play an important role in the implementation and use of ECM.

Enterprise content management is working properly when it is effectively "invisible" to users. ECM technologies are infrastructures that support specialized applications as subordinate services. ECM thus is a collection of infrastructure components that fit into a multi-layer model and include all document related technologies (DRT) for handling, delivering, and managing structured data and unstructured information jointly. As such, enterprise content management is one of the necessary basic components of the overarching e-business application area. ECM also sets out to manage all the information of a WCM and covers archiving needs as an universal repository.

### 3.3.4 Components of an enterprise content management system

Enterprise content management systems combine a wide variety of technologies and components, some of which can also be used as stand-alone systems without being incorporated into an enterprise-wide system.
The five ECM components and technologies of the ECM model were first defined by AIIM as follows:

- capture
- manage
- store
- preserve
- deliver

The model includes in the "Manage" category five traditional application areas:

- document management (DM),
- collaboration (or collaborative software, groupware),
- web content management (WCM) (including web portals),
- records management (RM) (archive and filing management systems on long-term storage media), and
- workflow/business process management (BPM).

These "Manage" components connect capture, store, deliver and preserve and can be used in combination or separately. While document management, web content management, collaboration, workflow and business process management are more for the dynamic part of the life cycle of information, records management takes care of information which will no longer be changed. The utilization of the information is paramount throughout, whether through independent clients of the ECM system components, or by enabling existing applications that access the functionality of ECM services and the stored information. The integration of existing technologies makes it clear that ECM is not a new product category, but an integrative force. The individual categories and their components will be examined in the following.

### 3.3.5 ECM market development

According to Gartner as of 2009 the key trends in the ECM market that IT architects and planners and business leaders must consider are the following:

- ECM is now part of IT infrastructure
- Integration and federation of content repositories is now critical
- Web channel technologies that deliver improved experiences, customer conversions and loyalty are a primary focus of many enterprises
- Application specificity, based on evolving buying centers.
- Alternative delivery models, including SaaS and open-source software.
- The influence of metadata is becoming clearer, whether abstracted from existing paper and digital documents or added when authored, and whether tied to a formal taxonomy or tagged informally by users.
- Enhanced usability for nontechnical target audiences.
- The continued influence of the midmarket as a buying center.
- Hybrid content architectures emerge alongside SharePoint

Cloud content management is emerging as a web-based alternative, combining the content focus of ECM with the collaborative elements of social business software.
3.4 DOCUMENT MANAGEMENT SYSTEM (DMS)

3.4.1 Introduction

Beginning in the 1980s, a number of vendors began developing systems to manage paper-based documents. These systems managed paper documents, which included not only printed and published documents, but also photos, prints, etc.

Later, a second style of system was developed, to manage electronic documents, i.e., all those documents, or files, created on computers, and often stored on local user file systems. The earliest electronic document management (EDM) systems were either developed to manage proprietary file types, or a limited number of file formats. Many of these systems were later referred to as document imaging systems, because the main capabilities were capture, storage, indexing and retrieval of image file formats.

These systems enabled an organization to capture faxes and forms, save copies of the documents as images, and store the image files in the repository for security and quick retrieval (retrieval was possible because the system handled the extraction of the text from the document as it was captured, and the text indexer provided text retrieval capabilities).

EDM systems evolved to where the system was able to manage any type of file format that could be stored on the network. The applications grew to encompass electronic documents, collaboration tools, security, and auditing capabilities.

3.4.2 Components

Document management systems commonly provide storage, versioning, metadata, security, as well as indexing and retrieval capabilities. Here is a description of these components:

3.4.2.1 Metadata

Metadata is typically stored for each document. Metadata may, for example, include the date the document was stored and the identity of the user storing it. The DMS may also extract metadata from the document automatically or prompt the user to add metadata. Some systems also use optical character recognition on scanned images, or perform text extraction on electronic documents.

The resulting extracted text can be used to assist users in locating documents by identifying probable keywords or providing for full text search capability, or can be used on its own. Extracted text can also be stored as a component of metadata, stored with the image, or separately as a source for searching document collections.

3.4.2.2 Integration

Many document management systems attempt to integrate document management directly into other applications, so that users may retrieve existing documents directly from the document management system repository, make changes, and save the changed document back to the repository as a new version, all without leaving the application. Such integration is commonly available for office suites and e-mail or collaboration/groupware software. Integration often uses open standards such as
ODMA, LDAP, WebDAV and SOAP to allow integration with other software and compliance with internal controls.

3.4.2.3 Capture

Images of paper documents using scanners or multifunction printers. Optical character recognition (OCR) software is often used, whether integrated into the hardware or as stand-alone software, in order to convert digital images into machine readable text. Optical mark recognition (OMR) software is sometimes used to extract values of check-boxes or bubbles.

3.4.2.4 Indexing

Track electronic documents. Indexing may be as simple as keeping track of unique document identifiers; but often it takes a more complex form, providing classification through the documents' metadata or even through word indexes extracted from the documents' contents. Indexing exists mainly to support retrieval. One area of critical importance for rapid retrieval is the creation of an index topology.

3.4.2.5 Storage

Store electronic documents. Storage of the documents often includes management of those same documents; where they are stored, for how long, migration of the documents from one storage media to another (hierarchical storage management) and eventual document destruction.

3.4.2.6 Retrieval

Retrieve the electronic documents from the storage. Although the notion of retrieving a particular document is simple, retrieval in the electronic context can be quite complex and powerful. Simple retrieval of individual documents can be supported by allowing the user to specify the unique document identifier, and having the system use the basic index (or a non-indexed query on its data store) to retrieve the document. More flexible retrieval allows the user to specify partial search terms involving the document identifier and/or parts of the expected metadata.

This would typically return a list of documents which match the user's search terms. Some systems provide the capability to specify a Boolean expression containing multiple keywords or example phrases expected to exist within the documents' contents. The retrieval for this kind of query may be supported by previously-built indexes, or may perform more time-consuming searches through the documents' contents to return a list of the potentially relevant documents.

3.4.2.7 Distribution

A published document for distribution has to be in a format that can not be easily altered. As a common practice in law regulated industries, an original master copy of the document is usually never used for distribution other than archiving. If a document is to be distributed electronically in a regulatory environment, then the equipment tasking the job has to be quality endorsed AND validated. Similarly quality endorsed
electronic distribution carriers have to be used. This approach applies to both of the systems by which the document is to be inter-exchanged, if the integrity of the document is highly in demand.

3.4.2.8 SECURITY

Document security is vital in many document management applications. Compliance requirements for certain documents can be quite complex depending on the type of documents. For instance, in the United States, the Health Insurance Portability and Accountability Act (HIPAA) requirements dictate that medical documents have certain security requirements. Some document management systems have a rights management module that allows an administrator to give access to documents based on type to only certain people or groups of people. Document marking at the time of printing or PDF-creation is an essential element to preclude alteration or unintended use.

3.4.2.9 WORKFLOW

Workflow is a complex problem and some document management systems have a built-in workflow module. There are different types of workflow. Usage depends on the environment the electronic document management system (EDMS) is applied to. Manual workflow requires a user to view the document and decide who to send it to. Rules-based workflow allows an administrator to create a rule that dictates the flow of the document through an organization: for instance, an invoice passes through an approval process and then is routed to the accounts payable department. Dynamic rules allow for branches to be created in a workflow process. A simple example would be to enter an invoice amount and if the amount is lower than a certain set amount, it follows different routes through the organization.

3.4.2.10 COLLABORATION

Collaboration should be inherent in an EDMS. In its basic form, a collaborative EDMS should allow documents to be retrieved and worked on by an authorized user. Access should be blocked to other users while work is being performed on the document. Other advanced forms of collaboration allow multiple users to view and modify (or markup) a document at the same time in a collaboration session. The resulting document should be viewable in its final shape, while also storing the markups done by each individual user during the collaboration session.

3.4.2.11 VERSIONING

Versioning is a process by which documents are checked in or out of the document management system, allowing users to retrieve previous versions and to continue work from a selected point. Versioning is useful for documents that change over time and require updating, but it may be necessary to go back to or reference a previous copy.

3.4.2.12 SEARCHING

Finds documents and folders using template attributes or full text search. Documents can be searched using various attributes and document content.
3.4.2.13 Publishing

Publishing a document is sometimes tedious and involves the procedures of proofreading, peer or public reviewing, authorizing, printing and approving etc. Those steps ensure prudence and logic thinking. Any careless handling may result in the inaccuracy of the document and therefore mislead or upset its users and readers. In law regulated industries, some of the procedures have to be completed as evidenced by their corresponding signatures and the date(s) on which the document was signed. Refer to the ISO divisions of ICS 01.140.40 and 35.240.30 for further information.

The published document should be in a format that is not easily altered without a specific knowledge or tools, and yet it is read-only or portable.

3.4.3 Standardization

Many industry associations publish their own lists of particular document control standards that are used in their particular field. The following is the list of some of the relevant ISO documents. Divisions ICS 01.140.10 and 01.140.20.[4][5] The ISO has also published a series of standards regarding the technical documentation, covered by the division of 01.110.

- ISO 2709:1996 Information and documentation—Format for information exchange
- ISO 15489: 2001 Information and documentation -- Records management
- ISO 21127:2006 Information and documentation—A reference ontology for the interchange of cultural heritage information
- ISO/CD 10244 Document management—Business process/workflow baselining and analysis associated with EDMs technologies
- ISO 32000 — portable document format

3.5 Summary

It is clear from the provided data in this section that Content Management System is an overall description of all other content management systems including Enterprise, Web etc and that document management systems are a subpart of this since it concentrates on a smaller scope of content management and concentrates on physical document management while content management includes all enterprise information management. An enterprise content management (ECM) system is concerned with content, documents, details, and records related to the organizational processes of an enterprise. The purpose is to manage the organization’s unstructured information content, with all its diversity of format and location.

A document management system (DMS) is computer system (or set of computer programs) used to track and store electronic documents and/or images of paper documents.