

**Whatever happened to
the “I” in IT?**

The impact of enterprise content
management on your business

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Foreword:

Often in the world of IT we spend our time looking forward, trying to predict what the future will bring. However, we start this EMC perspective by following the historical approach by looking at the past. Twenty years ago seems like ancient history in the world of IT. What do we see?

With the advent of the PC, organizations began losing their traditional skills in records management and at the same time, their culture of “care” towards information. They invested in new technology—software, servers, storage, and PCs—the “T” in IT, but not the “I”. They also limited investments in new work processes for information workers, further eroding the “I” in IT.

A great deal of money and time was spent implementing line-of-business systems to automate the production work force, but this failed to address the raw material of the front and back office—the electronic document.

Although PCs, word processors, spreadsheets, and network file stores were provided to automate the management of information, something else was missing—the technologies, standards, and best practices to support business processes for organizing and indexing information. Essentially, it is hit or miss whether employees can find the information they need to collaborate effectively using electronic documents. Is it any surprise that the use of paper is still so prevalent? And in some organizations, the use of expensive storage on shared network drives shows significant growth through unrestricted copying of content and reinvention of information.

As a result, many organizations are still—now more than 20 years after the invention of the PC—stuck in a kind of no-man’s land between the old world of paper and the new digital world.

Why in the digital world do we continue to use the term “document?” Here, a document is defined as a collection of information/content—with a beginning, middle, and end—designed for a business purpose and for human consumption. This is contrasted with streams of unbounded data designed for computer consumption. So, it matters little if the document is digital and read via a computer screen—it is still a document.

Organizations have effectively lost control over their information—they are required to repeatedly reinvent business intelligence, an extremely wasteful process. One high tech company estimated that it recreates more than 80 percent of the content that goes into the development lifecycle of each new product.

Government and industry leaders have correctly recognized that we belong to both a knowledge and digital economy. Knowledge is often perceived as being mainly expressed through unstructured information—for example, as words and pictures—traditionally intended to be shared as printed documents. The digital economy is seen as the “silver bullet” that allows us to create this vast collection of digital information and collaborate with anyone.

So what happened to knowledge management in the 80s and 90s? Was it a failure of content management systems (or as they were then called, document and image management systems) to deliver on the paperless office? No. Even though the technology was in its infancy—most failed principally because the impact of the transformational pressures on the organization were underestimated and misunderstood.

Enterprise content management is now mature, and consolidation in the market has ensured that a critical mass of integrated capabilities covering the full content lifecycle (from high volume ingestion, through management, to complex distribution and publishing) are available in product suites from the major vendors, most notably EMC.

Business culture and processes must completely adapt to the digital economy to realize the potential of enterprise content management.

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Introduction

This EMC Perspective is aimed at executives and business managers who wish to understand the potential impact of enterprise content management (ECM) to their business, but do not want to be overwhelmed with technical jargon. We will explore the outcomes of ECM rather than the features and functions. The goal here is to help businesses that want to invest in ECM to avoid some of the pitfalls that can occur in ECM projects and programs.

Why should you care about ECM?

Before looking in more detail at the impact of ECM, it is worth asking some key questions.

Does your organization understand:

- The value of the content or information it generates?
- The full life-cycle costs in relation to the processes that govern information?
- Its duties to protect and secure its information?
- How its intellectual property or business intelligence is managed and exploited?

After analyzing these points, an even bigger question emerges: What work have you done to develop a strategy for managing this information and knowledge, articulated in business terms?

A strategic plan should address ECM in a holistic manner, and look to maximize the value of content and information across a wide range of business processes in areas such as product development, compliance, customer care, and resource planning.

In your organization—as in many others—you may discover that despite considerable IT investment, little has been done to develop an ECM strategy. In many large organizations, a number of content management initiatives exist, but they are pursued either in isolation in different divisions and departments, or without the benefit of an overarching vision.

Why should you be interested in ECM? Because it's much more than a slightly better file share that can be completely managed by IT. An effective ECM strategy requires that business leaders join with IT to understand the issues. Working together, they can enable the business to realize the significant benefits of ECM, including the most important—maintaining a competitive advantage.

Many sectors have identified the critical role of information in their core business processes:

- Pharmaceuticals—facilitating the relationships with doctors and hospitals as the focus moves to long-term chronic conditions and extended drug trials
- Consumer electronics—co-designing chips with value-added consumer product partners
- Engineering enterprises—collaborating with complex networks of service providers and partners
- Utilities—improving customer service by providing online access to account information and issue tracking
- Government—integrating services, processes, systems, data, and applications to connect government tiers and enable better communication and information sharing with citizens

These are not abstract goals. Information and content are mission-critical. The technology is key, but the scope of the vision and the effectiveness of the delivery are just as important.

There are many generic drivers for moving from localized initiatives within organizations to a truly enterprise-wide approach to content management:

- Increasing regulation
- Globalization
- Mergers and acquisitions

- The drive to compress product cycle times
- External collaboration and dynamic organizational boundaries (geographical, outsourced, co-design, competency teams, brand equity)
- Massive increases in content volumes within organizations and across the Internet
- The need to manage the costs of an information management infrastructure
- Trend toward right-shoring services

Even in a digital world, documents—crucial to business processes—remain the foundation of business interaction.

While organizations may recognize the need to implement ECM, they find that such an initiative struggles to rise up the corporate agenda to the point of developing real momentum and management focus. When this does occur, it is often in response to a compelling business event (litigation, compliance issues, or safety threats), which then gets attention at the executive level.

In addition to its impact on internal business processes, ECM can have a significant impact on customers.

As organizations have increasingly exploited digital channels—such as the web—for gaining a more intimate relationship with consumers, the information that was often hidden within the enterprise is now finding its way to the public domain.

This has raised many opportunities, but also raises difficult questions:

- Are you maximizing the way you use content to enhance sales and service channels?
- Does the published information follow processes that ensure proper review and approval?
- Is it authoritative and irrefutable?
- Are you being exposed to unexamined risks?
- Is there a single unified approach to customer service across multiple channels?
- Have you addressed issues of cross-border legislation on trade?
- Is the content retained for the period it is needed? Is it ever discarded?
- Do you understand by, or from whom, the information was originally created or captured?
- Have you observed regulations on data protection and freedom of information?

Once again, the need for an ECM strategy is highlighted by such questions.

Risks of a patchwork ECM

Many organizations have successfully implemented ECM solutions within their businesses. The issue has been that these initiatives often address only specific processes or functional needs. They have been point solutions. Enterprise-wide programs, if they existed at all, have tended to run out of steam.

The results have been effective at one level, as content management solutions. However, the “E” in ECM stands for enterprise, and the objective is to address cross-functional needs and synergies within the business. Many organizations have struggled to realize the benefits of ECM at this more ambitious enterprise level.

One key theme in ECM is the concept of standardized indexing and information descriptions. Standardization ensures that all relevant information can be accessed across the value chain, by the right people, within each specific context. For example, a marketing employee could work on a new product brief based on information that has emerged from product development. Point solutions undermine these cross-functional objectives and create a patchwork of systems with no overall guiding vision.

ECM programs have traditionally tended to identify tactical opportunities in the business to address certain information/content-centric applications and issues. These initiatives have taken place without an overarching strategy, vision, or program. The result has been a lack of the standards or synergies organizations require. ECM has therefore been technology-led, rather than business-led.

Although there is an increasing need for organizations to demonstrate agility, the impact of these point solutions has actually limited the flexibility of the business. For example, a pharmaceutical company might selectively outsource clinical trials and manufacturing, while collaborating in a more dynamic way on research and development. The approach to ECM must similarly adapt to enable support of business goals, such as agility.

Is there a business case for ECM?

Building a business case for a significant investment in content management is essential. For many organizations, the case is so compelling that detailed calculations on the return on investment analysis is academic—in a digital world, ECM is an absolute necessity to create and maintain a competitive advantage.

	Operational Benefits	Strategic Benefits
Tangible	Automates, simplifies, and standardizes content delivery process <ul style="list-style-type: none"> Reduces the cost and cycle times of content creation, update, and publication 	Presents the most compelling and up-to-date content possible <ul style="list-style-type: none"> Improves service offering Improves customer relationships Speeds up launch of new product information
	Makes it easier for processes to be integrated across departments, business units, and decentralized locations <ul style="list-style-type: none"> Increases the extent and effectiveness of internal and external collaboration Facilitates innovation 	Enables content to be used consistently across marketing and sales channels <ul style="list-style-type: none"> Improves brand consistency Extends brand recognition
	Ensures effective management of operational costs <ul style="list-style-type: none"> Streamlines information infrastructure and IT services Reduces material costs (paper, photocopying, etc.) 	Ensures effective management of application costs <ul style="list-style-type: none"> Streamlines information management applications to deliver consistency and cost-effective solutions Enables evolving solutions to be managed under enterprise wide ECM governance and standards Ensures right-sourcing of skills
Intangible	Ensures accurate, appropriate, and secure information / content is deployed <ul style="list-style-type: none"> Reduces operational risk 	Enables content to be redeployed flexibly <ul style="list-style-type: none"> Makes content available for additional uses and distribution channels
	Ensures information used in operations and decision making is properly attributed and auditable <ul style="list-style-type: none"> Increases ability to comply with regulatory requirements 	Introduces high degrees of agility into the organization <ul style="list-style-type: none"> Makes an organization quicker and more responsive to business change Increases an organization’s information agility
	Ensures employees can capture and reuse information and content to perform efficiently <ul style="list-style-type: none"> Increases employee satisfaction 	Enables more effective business-to-business trading <ul style="list-style-type: none"> Makes it easier to implement e-commerce business solutions that require content sharing Ensures that incremental sales can be obtained at little or no extra cost

For each industry, the generic benefits shown can be reinterpreted in relevant terms. It is also possible, even with intangible benefits, to place monetary value on them.

An example may help. The generic benefit “increased capability to comply with regulatory requirements” can be translated, in a pharmaceutical context, into the need to implement good manufacturing practice (GMP), which would result in reduced risk of a fine from the regulator.

Some benefits are straightforward to quantify. For example, consolidating disparate content management systems to a common application and platform generates significant bottom line benefits. This infrastructure streamlining is often the focus of IT.

However, the top line benefits will often dwarf these benefits. An oil and gas company that keeps a facility operating with less down time or a pharmaceutical company that gets to market earlier with a new drug is anticipating numbers that far exceed IT infrastructure savings.

Obstacles to ECM

A key aim of ECM is to get the “knowledge chain” to follow the “value chain” through the business, and do it in a way that enables flexibility in meeting changing business needs and customer requirements.

The information, or knowledge, needs to be managed across the full value chain, whether this relates to products or services. Accomplishing this requires some extensive capabilities from ECM systems, and some new skills within the enterprise.

To obtain real benefit from an investment in ECM, an organization needs a strategy that addresses whole sets of processes, such as the product development value chain, or customer service operations, and does not merely meet a departmental need.

Organizations usually have to overcome several obstacles to implement ECM. A lack of executive sponsorship leads to point solutions without overarching governance, and a resulting lack of shared standards and solutions. This undermines strategic goals, such as cross-functional information sharing, and can lead to very high net costs, which are often hidden because they are spread across a number of departmental budgets.

When ECM is part of a wider transformation program, an obstacle to effective ECM can exist when there is a gap between a high-level business vision and goals, and a low-level technical view of the challenge. This gap is often not recognized. The missing piece is a compromise between the top-down vision and the bottom-up technical capabilities of the ECM products. The result should be a realizable long term “solution vision” that acts as a target and guide. Without such a vision, the risk is that silos will be recreated or applications will be generated that do not build towards a clear endpoint. Solutions are often too complex—features do not add commensurate business value, or too simple—fail to use full product capabilities. Getting the balance right requires extensive experience in delivering ECM solutions.

IT systems are traditionally data-centric, whereas knowledge is content-centric. The majority of corporate investment has been in data systems—content-centric systems have received relatively little attention, at least at executive level. The remedy requires not only a shift in mindset, but also the development of a new set of competencies to support the change.

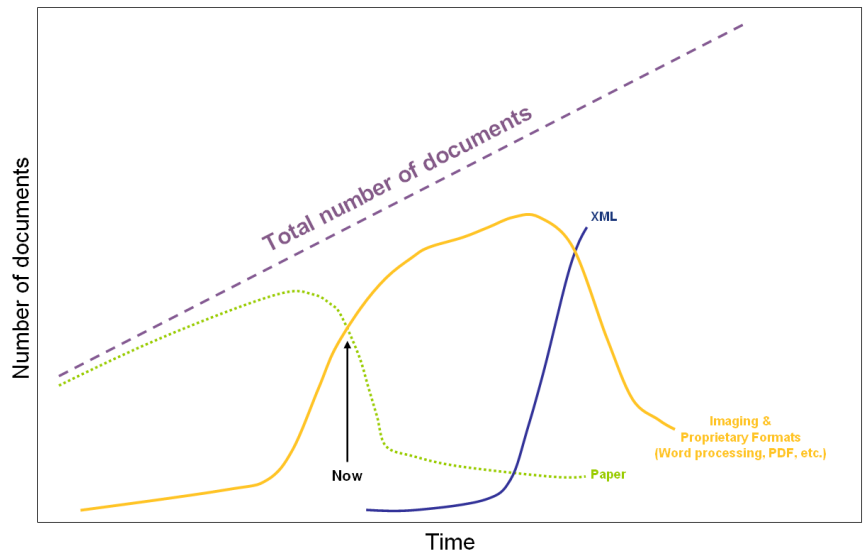
Behavioral changes required within the organization are probably the greatest hurdle of all. Organizations need to establish new habits with digital content to replace the old ones that applied in the paper world. ECM will need to support the new digital culture, behaviors, and policies.

A tendency of enterprise resource planning (ERP) or customer relationship management (CRM) technologists is to believe that ECM is a minor extension of what they do. Some vendors of major systems will claim to address content management, but it is clear they do not have the range of capabilities required. Similar issues arise with products that address specific processes or applications. Many organizations fall into the trap of investing in point solution products, without recognizing that 80 percent of the deliverables are generic ECM capabilities.

The convergence of content and data

The journey from paper to the final destination—true management of digital content—has become increasingly complex to manage. Many organizations will find themselves in a messy transitional state with a number of electronic document standards uncomfortably co-existing with paper.

As time progresses, the hope is that the mix of standards will evolve, moving more and more towards standards such as XML (eXtensible Mark-up Language)—and its sector-specific dialects—that are truly open. However, for many organizations, particularly those that are driven by external content that is often paper-based and therefore must be scanned, the documents themselves will continue to remain important. This is changing only over time, as the consumer moves to new ways of doing business. This may take years in some industries, and for some, the end result may be different. A typical profile of the expected evolution in the mix of standards is shown in the following graph:



The evolving mix of document standards

Today, most of the unstructured information we create in enterprises is held in proprietary format documents.

When they were introduced, word processors tended not to deliver the expected increases in productivity because employees ended up spending too much time making documents pretty, rather than focusing on content. With XML, a business goal is to encourage the use of templates to ensure that the focus is on content, rather than formatting, which can now be automated.

The XML standard was invented to help turn this implicit structure into a formal explicit syntax, and distinguish the content from its presentation. XML provides the basic rules of syntax, not the semantics.

To make the documents human-readable again, we use style sheets to apply formatting to the presentation-neutral XML. This gives us the flexibility to publish content to many channels—computer terminal, mobile phone, website, printable document—merely by applying different styling, without changing the content.

This separation of content from its presentation is the key idea of XML and provides significant benefits to enterprises. It also means that those organizations with high levels of corporate “memory” can stop worrying about knowledge being locked into legacy document formats that will be unreadable in years to come.

Once we begin to delve into XML content we recognize the need to manage structures, not files. A compound document containing various elements can be broken down into distinct elements of content. These elements can then be edited or processed in their own right, in parallel, and finally merged to produce a composite document, such as a company report.

For mission-critical content and business intelligence, organizations must include within a wider strategy a plan to migrate the content “containers”—the documents used to convey information—away from proprietary word processing formats towards the XML standard. And, they need to assess how and when they can adopt the emerging industry standard dialects of XML.

Suddenly, content looks much more structured than we had imagined, and the boundary between the unstructured (document) world and structured (data) world that once was a chasm now looks very small indeed.

The wider boundaries of ECM

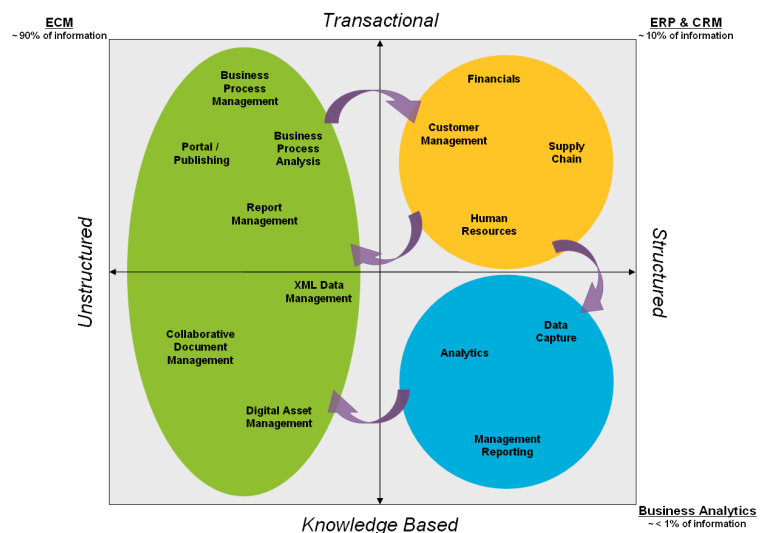
Everyone works with content as creator or user. Content is everywhere, and successful ECM becomes a major part of a wider information management landscape.

We can look at information in two dimensions. One is concerned with the fluidity of the information: at one extreme it is transactional and at the other it is relatively stable, or knowledge-based. The other dimension concerns the level of structure. At one extreme it is unstructured—a typical document—and at the other it is structured—data stored in rows and columns in a database. Most electronic documents today exist in a semi-structured category, and are increasingly structured if created using standards such as XML.

ERP and CRM are systems geared to transactional (structured) data. Business analytics takes this raw transactional data, aggregates it, and analyzes it to create succinct business information.

These data systems create reports that need to be shared. For example, the customer service team may want to access customer invoices, but it makes no sense for them to be SAP® users. Integration with ECM enables all functions to have easier access to information created by these—and other—data systems, on an as needed basis.

ECM itself covers the full range, from knowledge-based to transactional content and also, in the other dimension, between unstructured and semi-structured content.



The differences in the types of information and the direct and indirect role of ECM

Because semi-structured information must exist within this wider landscape, the term ECM has expanded to include not only the static management of content, but the management of the business processes themselves—transactional content management. The field of Business Process Management (BPM) is therefore integral to ECM and supports this holistic approach to the wider information management needs.

Is “Googling” enough?

The short answer is “No”. So, why is the “Googling” we do at the kitchen table not the answer when it comes to the office?

An age old challenge in libraries the world over, from ancient times to today, is the location of relevant information. Libraries solve this by using well-established categorization and indexing techniques, such as the Dewey Decimal System.

Compare this with web search engines. First, we had engines that located content purely on the basis of the frequency of search words contained in documents. This has proven to be a very imprecise method of finding relevant content. It became even worse when some sites deliberately added words designed to attract hits, even when the site had little relevant content. They have since developed increasingly sophisticated ways of sorting large result sets by relevance. Nevertheless, the more subtle the question, the lower the chance of success.

However, within enterprises you are not managing informal content such as that on the Web, but business critical assets within specific disciplines, produced within a single corporate culture, and using a common language—a blend of natural language, industry jargon, and a corporate lexicon.

We cannot rely on search engines, even as good as some now are, to answer mission-critical questions such as: “What is the procedure for shutting down this malfunctioning machinery?” or “What background information do we have on tier one customers in Germany?” The sources of search engine results are often questionable and cannot be trusted to deliver accurate information.

These types of question cannot reliably be “Googled.” They require a more rigorous, deterministic approach. Search engines, of course, retain a role in a research mode, but for business processes they are much less appropriate.

Some organizations are now recognizing that the development or acquisition of classification systems for their businesses is the key element in building an information strategy to support ECM.

Such a classification, which reflects the terms used by the business, may be difficult to acquire or build, but has very high value to the business. It must be supported by processes which ensure its consistent use in the organization and indexing of documents, and it must be maintained. The enhanced ability to find and reuse relevant content is a major benefit, and applies both to internal consumers of content and to suppliers, customers, and consumers.

A business-led classification strategy to support information management is a fundamental building block for ECM.

Assessing and developing your ECM maturity

Organizations in many industries naturally evolve over time. They become more mature as operations change and improve. More specifically, in ECM, there are a number of areas of functional maturity that can be assessed. EMC developed the ECM Maturity Model to establish a methodology for project delivery.

In developing a vision of the future state of the organization, it is useful to use such a model to help define how far the maturity in each area needs to develop, and how quickly.

Many organizations will find themselves at a depressingly low level—1 or 2 in most areas. There is then a temptation to grasp at basic technology to solve these problems. However, it is important to bear in mind that while end users need solutions that present themselves as simple, the underlying capabilities need to be quite sophisticated to ensure that higher maturity levels can be reached over time.

Maturity Level	Creation & Reuse	Filing & Description	Content Lifecycle	Process Support	Publishing & Sharing
7	Dynamic rule-based assembly of content	Rich descriptive metadata (such as ISO2788 or semantic web)	Information lifecycle management and business value	Dynamically configured and rule-based process control	Dynamic exchange of content and data with third parties
6	Granular mark-up and reuse	Controlled vocabularies	Records management policies enforced with system support	Business process integration and monitoring	Assemble and publish content dynamically to third parties
5	Compound document management	Flexible and scalable indexing	Lifecycles defined by document type	Common processes analyzed and managed	Manage and publish granular / trusted content
4	Document templates and basic assembly process	Standard index across enterprise	Check-in and check-out used throughout lifecycle	Some process analysis and use of workflow	Devolve ability to publish documents
3	Use of templates for authoring	Departmental registers of physical and electronic documents	Basic file locking mechanisms used for archiving	Ad hoc workflow	Publish documents to a static site
2	Common authoring tools	Standard file plans	Basic (manual) policies published	Ad hoc processes (such as e-mail plus attachment)	Printed standards; in-house or external publishing function
1	Variable authoring tools	Ad hoc foldering; no consistency	No policies	No integration; no common processes	Multiple sources and silos of content that are recreated or manually copied many times

The analogy with the automobile is useful. The steering wheel, gear shift, and pedals have remained largely unchanged for many years, but the underlying sophistication—engine management, ABS brakes, traction control—are delivered silently to the end user. The sophistication is under the hood.

Everyone needs to find information reliably, archive it safely, and relocate and reuse it confidently in the future. There are no second class citizens in this respect. Yes, some processes and functions within a business will need to exploit more levels of functionality, but it is surprising how much of the ECM Maturity Model needs to be delivered to everyone in the business.

What is the ECM maturity of your organization? Where does it need to get to and how fast? Is there a vision and plan that will help you get there? These questions will help focus the efforts around a common understanding of what is needed.

The roadmap to successful ECM

At first, the challenge of implementing ECM may seem overwhelming, but true enterprise deployment of content management can be achieved. There are success stories that demonstrate the benefits of ECM, for example:

In 1992, a leading global legal practice—recognizing the importance of document management to help grow its global business—established a document management strategy. The firm envisioned that any lawyer could go to any office in any country and see work in progress and collaborate on client matters. A global document management solution was delivered to support several thousand staff. Since the deployment, the firm has added incremental capabilities globally, building on the basic capabilities. Documents are the product of the legal practice, and ECM has become the core global system on which the business runs. It is mission-critical.

We see a common pattern for those who have successfully implemented true enterprise wide content management. They start with the basics, leveraging existing IT infrastructure to deploy solutions in the most crucial areas of the business. The approach is then to expand on their successes—extending ECM capabilities to deliver additional benefits and build the maturity of the organization. This strategy enables organizations to sort out many of the difficult change issues associated with moving to a digital enterprise. For example, understanding how to get better control over digital content, while not necessarily demanding the complete elimination of paper from business, requires considerable care and experience.

It is also clear that to deliver ECM, your business will need more than a project—it will need a program. The structure and management of the program is as essential to success as the identification of benefits and the development of a technical solution. A growing number of organizations are putting in place successful programs for ECM, and many have experienced significant returns from such programs.

Where should you start? To determine the answer, you need to answer the “why?”, “what?”, and “how?” questions upfront:

Why are you implementing ECM?—An analysis of the benefits of ECM is essential to develop a business case for implementation.

What will success look like in 2-3 years time?—Both the business sponsors and IT must agree upon a “solution vision,” an overarching goal with achievable steps along the way.

How will you get there?—You need to define the projects that must be completed as you work towards the vision:

- Setting up the program
- Defining the minimum initial standards and solutions needed
- Defining a strategy for obtaining resources
- Establishing a change management strategy to ensure behavioral change at all levels
- Defining the information management infrastructure

Another success story illustrates this approach:

A major oil and gas company had implemented a number of point solutions over two years using ECM technology, but realized that—despite using common technology—they had created separate applications and information silos. With EMC's help, they analyzed their needs and objectives, which resulted in key deliverables to initiate an ECM program:

- Strategic requirements—business drivers, issues, and a consolidated enterprise view
- Solution vision—what the future looks like and how to follow best practices
- Roadmap—a high-level plan to realize the solution vision
- Change management strategy—how to address organizational change
- Business case—how to sell the plan to business stakeholders

Next, they developed a core solution that offered the basics of content management and a deployment methodology. Other projects offering more specialized applications—such as transmittals in engineering—were added in stages to build upon the core solution.

A similar analysis can identify a number of high value processes across the value chain that would benefit from ECM. Complex processes such as product development may struggle to introduce ECM in a single step. The solution is a phased approach—transforming a few business-critical processes and expanding the system across the enterprise.

Essentially, the roadmap to successful ECM involves thinking big, starting small, and scaling fast.

Conclusion

Information is your competitive advantage. Technology helps you get it.

To stay ahead in a digital world, organizations must be able to effectively manage content—both documents and data—and create new value from it. A repository is no longer enough—content must be searchable, actionable, and available to solve business problems and ensure compliance with the growing number of internal and external regulations.

Implementing ECM is a complex challenge, but with a well developed business case and plan and ongoing executive level sponsorship and leadership, you will be successful. ECM helps you put your valuable information to work, enabling your organization to become more competitive.

Enterprise content management puts the “I” back in IT.



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