



IBM ECM: Delivering interoperability to government programs

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Executive summary

Today's information-centric government organizations face the challenge of offering enhanced services to citizens while improving efficiencies, such as streamlining business processes. Yet agencies must deliver these improvements despite reduced staffing, strapped financial resources and the difficulties of contending with a multitude of complex processes that span disconnected systems.

Public sector agencies typically have large silos of information dispersed across the organization, causing many problems such as inaccessibility to relevant information across the agency. Though technology has enormous potential to add value, heavy investment in underused internal, customized or niche information management products are creating less transparency and increasing the complexity of government programs. The continued disconnects and inefficiencies related to public sector organizations and their information management systems hinder agility and service levels in government programs. So many are searching for a more flexible and scalable framework for managing content – one that will automate, streamline and analyze document-centric business processes while improving collaboration and helping to ensure compliance.

Enormous growth in content generation and replication, along with a drive toward content-centric collaboration within organizations, is resulting in the adoption of agency-wide content management solutions. Enterprise content management (ECM) is helping the world's leading government agencies streamline and automate their business processes, access and manage all forms of content and automate records management to help meet compliance needs. In fact, according to research from Datamonitor, the ECM market will grow from US\$1.6 billion in 2006 to US\$3.5 billion by 2012.¹ The research suggests that this growth will primarily be driven by an increasing demand from organizations as they look to deploy technology solutions to address the information accumulation challenge.

A unified ECM platform that addresses content, process and compliance issues enables agency-wide content integration. At the same time, many government organizations are choosing to simplify their architecture, reduce costs and deploy a shared services platform that offers not only integration, but interoperability of systems and processes. Government agencies can facilitate interoperability through initiatives including service-oriented architecture (SOA), Web services and the adoption of broadly accepted standards for information sharing, such as the National Information Exchange Model (NIEM) in the United States.

IBM offers an integrated suite of ECM, which combines content with business process, and business process management solutions that meet the government sector's unique and diverse content management requirements. IBM solutions for ECM, including IBM FileNet® P8 Platform and IBM FileNet Content Federation Services, support all commonly used documents and forms, and integrate with existing components, legacy systems and critical business applications across agencies. These solutions also interoperate with a wide selection of IT systems and products from suppliers and partners in both the public and private sectors, allowing government organizations to effectively tackle all of their content, process and compliance challenges.

The evolution of government information management

Government information management practices have evolved over time, driven largely by an effort to drive down costs. Initially, government agencies elected to rationalize repositories and databases containing information in its many forms. This approach is sufficient within a specific department or program, but when broader information sharing and collaboration are needed, the costs and complexities associated with accessing many different “buckets” of information remain relatively high.

Governments are deploying more technology solutions in order to increase operational efficiency and reduce overall program costs. These niche technology products and solutions deployed within government departments have created more and more silos of information that can be difficult or even impossible to access by some users and decision makers. The challenge of inter-connecting the various forms of information, such as databases, Web sites, and finance and human resource documents makes it harder to drive value and agility. As varying technologies, such as Microsoft® SharePoint®, are deployed, and custom applications and additional sources of information are created, supporting this viral spread of repositories can significantly raise costs.

Another source of high costs and integration challenges involves a lack of standardized content in the form of actual data exchange standards within government agencies and among those that share information. So in recent years, there has been a trend toward broadly accepted, open source-based standards for information sharing, application development and communication. Importantly, these standards continue to evolve, given their importance in many initiatives, including SOA and Web services.

To try to alleviate the negative impact and costs associated with disparate sources of information, government IT organizations have attempted to develop methods for integrating this distributed information. To do so, they need to code and maintain information links, yet these links can break or require extensive resources to maintain over the life of a technical solution. In addition, middleware technology is often required to maintain the connectivity between all points, and as various components are updated or re-architected, complications can arise, driving up costs.

Integration and interoperability of content and processes

A cost-effective approach to integration is important to address some information management challenges, yet *interoperability* takes integration a step further. Through interoperability, government agencies adopt and enforce standards upon the concept of integration and reusability, which encompasses multiple standards and protocols. Interoperable systems work together because they implement a common standard and use agreed-upon interfaces. Then integration fills in the gap when no common interfaces exist.

Electronics offers a good analogy of integration versus interoperability. If a TV and VCR are designed based on two different broadcast standards, such as National Television System Committee (NTSC) and Phase Alternating Line (PAL), an adapter is required that converts the broadcast signal between the devices. The converter is fairly standard and reusable, and could be considered as more than a strategy for integration yet not quite interoperability.

In many integration projects, systems are not based on particular information exchange standards. So the required “converters” amount to coding that must be uniquely developed and is often not reusable. Also, integration tends to focus on one application’s ability to interface with other disparate sources, so coding and coordination of separate connections to various systems can be costly. Furthermore, these integration or connection points, written in many different forms of programming or coding, or working with a broad area of Application Programmatic Interfaces (APIs), must be maintained and supported. All of this drives up resource requirements and the cost of ownership throughout the lifecycle of the government program.

Interoperability in information management can be achieved through consortiums agreeing on interoperability standards among vendors. They can also reach consensus to move to interoperable platforms that provide broader functionality and are maintained within the architecture, reducing coding and the creation of separate paths to applications. An ECM platform, for instance, allows content to be created, captured, stored, used and maintained across its entire lifecycle without having to develop any integration points.

Interoperability of business processes has come a long way as well with the development of standards such as BPEL and BPMXL. Standardization reduces the work and integration needed to coordinate process and information flow between disparate applications such as ERP, Web and content management systems.

To help lower costs and increase the agility of government programs to effectively support their dynamic political and social environments, IT is opting for information management interoperability rather than pure integration strategies. A primary difference between interoperability and integration is the use of standards and loosely coupled services. By assessing and incorporating SOA, Web 2.0, Web services and other adaptive open architectures, organizations have the capability to “expose” existing data and information sources and processes for improved insight, collaboration and efficiency. Thus, many governments worldwide are embracing initiatives that not only support interoperability, but enhance it, such as Web services and SOA.

Building on interoperability with SOA

In the past, organizations have utilized middleware technology to enable integration and coordination of multiple data sources. Middleware has done a successful job of normalizing data sources as it pertains to data, rather than content. Yet in today’s public sectors, with the explosion of information assets, organizations need to find better ways to coordinate data and content, and then analyze and report on the associated business processes. So importantly, organizations are focusing on optimizing and measuring the effectiveness and efficiencies of underlying processes versus the actual data and content. They are using SOA to remove the roadblocks that exist between middleware and technical applications, and realize far greater operational efficiencies. Government organizations now see the need to bring together content, in the form of unstructured information, and structured data in order to prove value and to justify budgetary investment in technology.

As interoperability of disparate information locations and types continues to evolve, IT organizations are tasked with minimizing any potential complexities associated with interoperability. So they are creating architectural frameworks versus static models. The advantage to this approach is that metadata classification and normalization can be enforced, and provides a more flexible and adaptive approach to developing successful technical architectures that can take advantage of SOA. This strategy can drive down costs associated with development, support and ongoing maintenance.

Together, interoperability and SOA offer a method for greatly reducing information management costs. From the perspective of an ECM platform, interoperability among content, documents and records and having access to other content and databases helps reduce the time, cost and complexity associated with maintaining the technical architecture of a government program.

Content federation as a means to interoperability

As part of the drive to merge structured data and unstructured content together, agencies can also “federate” content to normalize disparate sources of information. By building a metadata layer above existing content repositories. Content federation can provide a means to creating greater interoperability of various information sources. Content federation enables ECM platforms to normalize the information residing in other repositories, allowing more applications and users to access and use information, while at the same time maintaining the investment made in the older technologies.

Though content will continue to persist in local file shares, personal hard drives, and highly distributed IBM Lotus® Quickr™ and SharePoint deployments, organizations may no longer pursue a single repository approach to managing all of their content. Information and knowledge managers have new challenges to address, including managing risk associated with expanding content, and improving business processes and business productivity. Some are leveraging their ECM platforms in innovative ways by adding a federated content management layer that can be plugged into a multitude of applications, tools and existing content repositories.

Consolidating content repositories and bringing unmanaged content under control will remain a top priority for information and knowledge managers. Yet the cost and effort required to bring all content into a secure, managed environment may be too high, and the required products may be too complex for casual content consumers. By employing federated content management as an important element of an ECM strategy, government organizations can make content an active part of business processes and improve decision making by gaining a global view of all content, regardless of where the content physically resides.

Federated content management and interoperability enabled by an ECM platform offers greater decision making. Additionally, these capabilities minimize desktop learning and greatly increase transparency and depth of information. Whether a case worker, government manager or citizen depends on the information, individuals rely on getting timely, accurate and complete information. These decisions must be made in accordance with processes, policies and program mandates. When the entire decision-making process is automated via an ECM platform, as illustrated in Figure 1, the process can be tracked and participants can be held accountable.

Figure 1

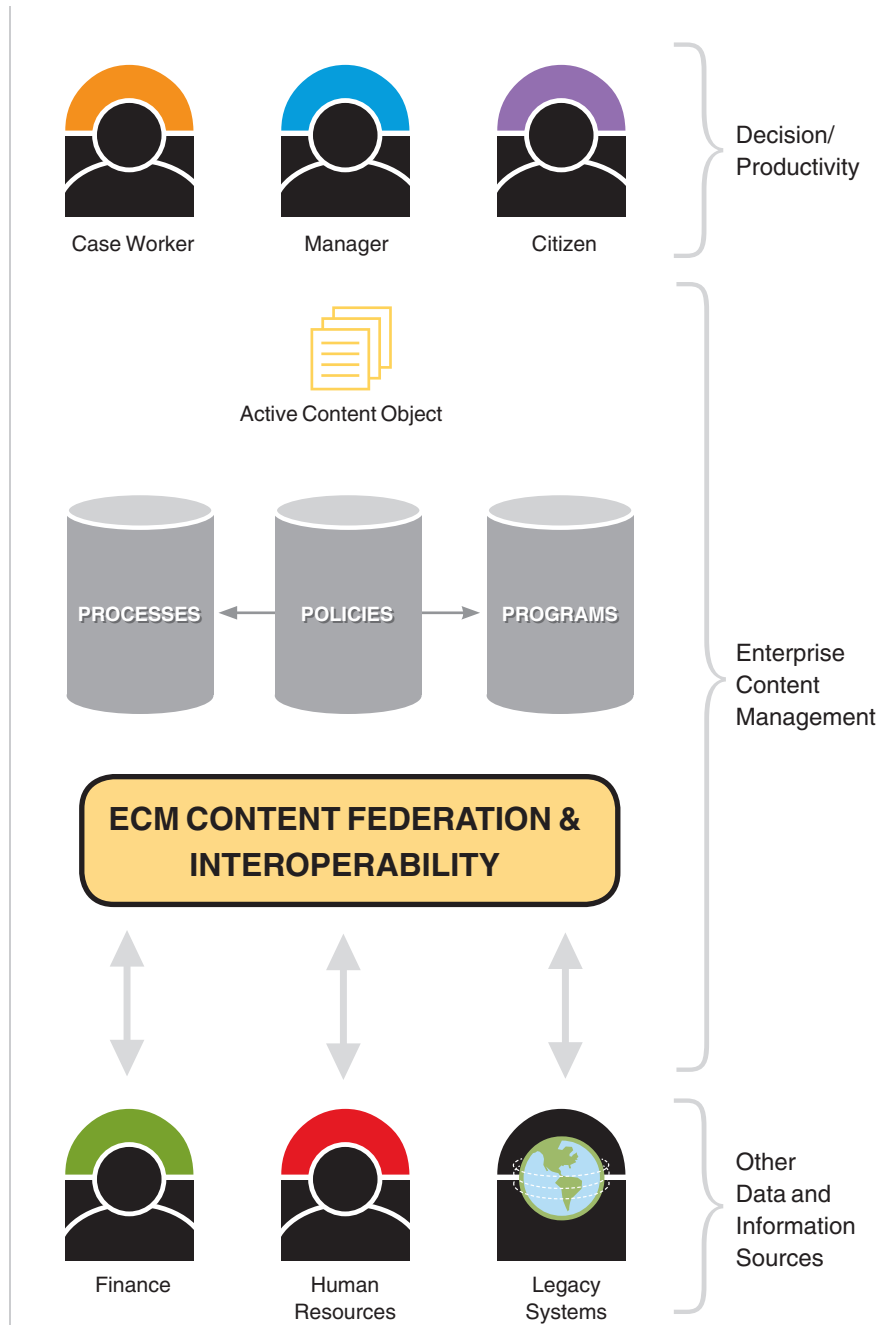


Figure 1: Improved decision making via ECM content federation and interoperability.

Active content: Using ECM and interoperability to energize content

ECM involves integrating workflow and process capabilities to automate and drive content-related tasks and activities. One of these capabilities, *active content*, involves proactively moving content, such as documents, records, e-mail and forms, along with content-related business tasks through an underlying business process without requiring human initiation. In order for active content to maneuver effectively, it must not just move its own information, but also related information that may reside in other systems or departments. This is accomplished through content federation, plus integration and interoperability with other business processes or packets of information, as illustrated in Figure 2. The active content object acts as the interoperability coordinator, allowing government workers to make decisions more quickly, and work more productively and effectively. An active content-based ECM solution adds significant value to ECM and is unique among ECM solution providers.

Figure 2

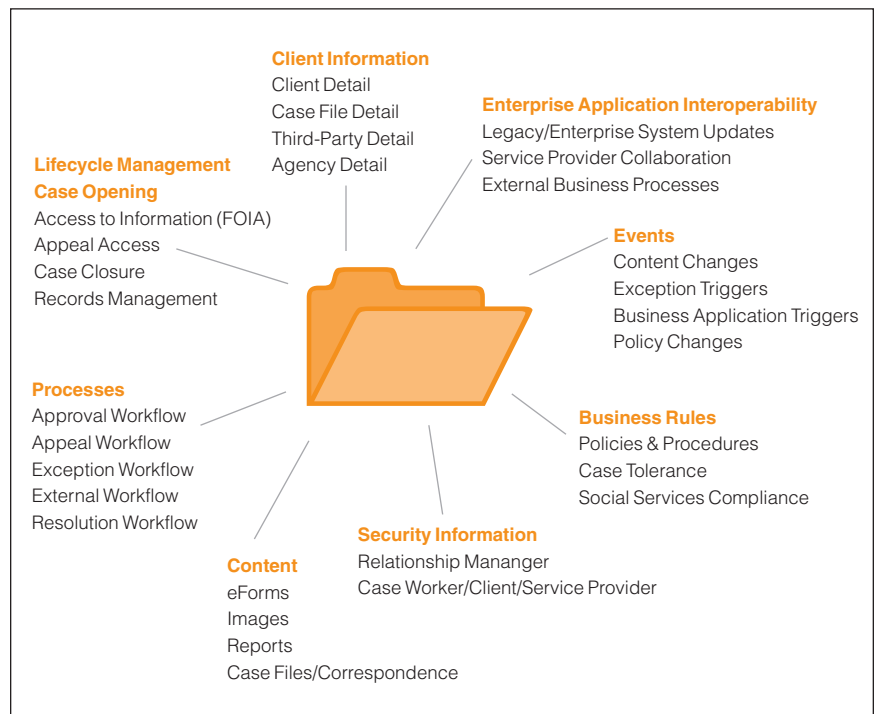


Figure 2: Active content – Moving content and initiating ECM processes proactively.

Information exchange standards and information sharing

As discussed, interoperability acts as a standardized method to manage multiple integration points. More broadly, however, information exchange standards are necessary for information, applications and systems to interrelate. Not only do they support the day-to-day operations of government organizations, but they facilitate critical communications during emergency situations. Sometimes organizations are required to adopt specific exchange standards, while under other circumstances these standards are considered best practices, and agencies have the option to select ECM and other solutions based on certain interoperability standards. Several of these standards include NIEM and CMIS from the United States, and e-GIF from the United Kingdom.

NIEM

NIEM, the National Information Exchange Model, is a partnership of the U.S. Department of Justice and Department of Homeland Security. NIEM is designed to develop, disseminate and support intergovernmental information exchange. This methodology results in a common semantic understanding among participating organizations, along with data formatted in a semantically consistent manner. NIEM offers important value to government organizations, including:

- *Enhancing the quality of governmental decision making by enabling accurate, timely, complete and relevant information to decision makers across the organization and among participating organizations.*
- *Achieving greater efficiency, effectiveness and return on investment in operations by accelerating information exchange design and development.*
- *Reducing the risk in development efforts by having common exchange standards, tools, processes and methodologies.*
- *Improving public safety and homeland security by breaking down stovepipes and enabling real-time, secure, enterprise-wide information sharing.*

e-GIF

The e-Government Interoperability Framework (e-GIF) is an initiative intended to minimize or prevent problems arising from incompatible content among different government systems. Selection of e-GIF specifications is driven by interoperability, scalability, availability and market support. The e-GIF standard is designed to:

- *Support better public services tailored to the needs of the citizen.*
- *Enable the seamless flow of information across public service organizations.*
- *Define the essential prerequisites for integrated and Web-enabled government.*
- *Set practical standards using stable, well-supported products.*
- *Provide support, guidance and toolkits to enable the standards to be met.*

CMIS

The Content Management Interoperability Services (CMIS) standard is a uniform means for applications to work with content repositories. The CMIS standard is currently under development and is supported by IBM, Microsoft, SAP, BEA/Oracle, EMC, OpenText and Alfresco. The CMIS standard offers:

- *Easier integration of participating vendor products within an organization's IT infrastructure.*
- *An integrated approach to manage and control content created by shared workgroups across organizations.*
- *New possibilities for business partners and systems integrators to easily and effectively integrate products.*

IBM participation in CMIS development drives better interoperability among ECM products regardless of vendor, and helps provide clients with more choice and lower costs when it comes to basic ECM needs. Interoperability is primarily about adherence to standards, and IBM is a major participant and advocate for open standards. IBM is a leading member of various organizations defining standards and policies for the interoperability of content and process management systems, such as the Association for Information and Image Management (AIIM) and the Workflow Management Coalition (WfMC). The landscape of interoperability standards is changing dramatically as a result of emerging XML and Java™-based open standards.

IBM's leadership in ECM, however, is founded in its broad offering of ECM solutions that help organizations make better decisions faster by managing content, optimizing business processes and enabling compliance.

IBM ECM: Providing interoperability for government programs

IBM ECM provides improved workforce effectiveness by enabling organizations to transform their business processes, access and manage all forms of content, secure and control information related to compliance needs, and optimize the infrastructure required to deliver content anywhere at anytime. IBM ECM automates and streamlines all records-based activities and eliminates burdensome end-user participation. The portfolio helps to enforce compliance and create business advantage while helping reduce the cost of compliance and risk management through the delivery of an integrated, open platform that provides interoperability with the widest selection of IT systems, thereby reducing costs and improving efficiency.

More than 1,300 government customers in more than 80 countries worldwide use IBM ECM solutions to promote operational efficiency, legislative compliance and increased productivity. IBM ECM solutions help government agencies improve operational efficiencies by linking structured data, unstructured data and processes. The solutions improve workforce effectiveness by aligning people, process and government policy. They additionally help reduce costs, improve service and foster collaboration among departments, agencies and the public. IBM ECM securely and efficiently shares information and processes across silos of information. Through an integrated approach to managing content, IBM ECM helps government organizations ensure compliance with relevant legislation and directives.

IBM FileNet Content Federation Services

IBM FileNet Content Federation Services (CFS) enables organizations to access content from numerous heterogeneous repositories anywhere in the enterprise and federate this information to provide a single source for critical business content. Existing investments in content management can be preserved, while enabling a consolidated enterprise view of content and providing a single, master enterprise catalog. Unlike other enterprise content integration services in which capabilities are limited to searching repositories only, Content Federation Services allows enterprises to search, catalog, classify, secure, retain, activate, update and delete content residing in repositories across the organization. It also makes content an active part of an organization's business processes, helping to streamline processes, improve performance and enable better, faster decisions.

With Content Federation Services deployed, application developers can focus on solving the business problem, rather than worrying about where documents, images or Web content reside. Content Federation Services reduces complexity by enabling applications to easily access content through a single call to the IBM ECM P8 Enterprise Catalog Service. For example, content can be activated to trigger business processes. Records management policies can be transparently enforced by automatically declaring content and documents, including e-mail messages, as corporate records.

IBM FileNet P8 Platform

IBM FileNet P8 Platform is a unified content, process and compliance platform that offers maximum flexibility, accelerates application deployment and help lower total cost of ownership. With the integration of major components such as content, processes and records, as well as the ability to expose Web services to an SOA environment, coding and development costs can be reduced.

Thousands of organizations have deployed FileNet P8 successfully in a broad range of compliance, content and process applications. The FileNet P8 platform and products enable organizations to successfully address their business process, content and compliance needs. IBM FileNet P8 offers a complete, open and secure framework for functional expansion and systems integration.

IBM FileNet Content Manager

Content Manager has robust systems integration capabilities and provides a tiered approach that allows mixing and matching integration methods based on specific needs. Content Manager leverages the IBM FileNet P8 architecture and thus provides numerous integration options and methods, allowing the selection of the right level and method for specific integration needs. As the core content management solution for the IBM FileNet P8 Platform, it combines powerful document management with ready-to-use workflow and process capabilities to automate and drive content-related tasks and activities.

IBM FileNet Business Process Framework, IBM FileNet Business Process Manager

As IT services in governments become mission critical and are incorporated into business processes, there is an ever-growing requirement for higher service levels and faster deployment. IBM FileNet Business Process Framework reduces the time and expense associated with deploying solutions based on IBM ECM Business Process Manager by providing a highly configurable application development framework. Business Process Framework leverages proven, reusable code that forms the foundation for all types of business process management application scenarios. This enables organizations to help accelerate the speed of deploying new business process management applications, while helping minimize development cost and the ongoing total cost of ownership.

IBM FileNet Records Manager

IBM FileNet Records Manager streamlines records-based activities to help enforce compliance without user participation. Organizations can use it to classify, apply retention policies and store electronic records according to fiscal, legal and regulatory requirements. The solution helps reduce the burden and costs associated with proper records management. It also securely manages the declaration, classification, security and access, auditing and monitoring, authenticity, preservation and disposal of electronic and physical records. Plus, it uses business process management and defined business rules for electronic records to classify and apply retention rules automatically to the required corporate documents.

Summary

Government agencies are seeking to reduce the cost of operations and simplify their IT architecture. While at the same time, they are contending with rapidly expanding repositories of content distributed across the organization, often disconnected from one another and managed by unrelated processes. To address multiple business needs and disjointed information and processes, government organizations need a common platform for managing content, business process and compliance issues.

A unified, open J2EE™ architecture for SOA environments simplifies application deployment and lowers total cost of ownership for government agencies, especially those that are geographically distributed. An integrated platform, and one that incorporates broadly accepted standards for information sharing, provides integration and interoperability with the widest selection of database, operating system, storage, security and Web server environments, thereby reducing integration costs and improving efficiency. IBM FileNet P8 addresses the most demanding compliance, content and process management needs for government organizations. IBM FileNet Content Federation Services helps federate content from heterogeneous repositories into IBM FileNet P8, providing a single source for all business content. By implementing an agency-wide strategy for managing information, that offers broad integration and interoperability, government agencies can succeed in reducing costs, improving efficiency and better serving the needs of citizens.



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¹Datamonitor, Economic Outlook: Enterprise Content Management (Market Focus), June 2007:
www.businesswire.com/portal/site/google/index.jsp?ndmViewId=news_view&newsId=20070625005712&newsLang=en

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