



WebSphere software

IBM content integration for the on demand business

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Executive summary

Most organizations today are saddled with multiple different content management and workflow systems resulting from departmental investments or inherited through mergers and acquisitions. This has trapped content in isolated silos, rendering it inaccessible outside of narrow workgroups, departments or functions. Enterprise content integration (ECI) has emerged as the preferred solution for breaking through these silos and unlocking the value of content across the enterprise. ECI has powerful implications from an infrastructure perspective, helping to eliminate complexity, and from a business point of view, helping to improve customer service, streamline processes, enhance revenues and support compliance-related initiatives. This whitepaper will explore the important role of ECI in the context of these and other business initiatives.

Content is everywhere

It's no secret that enterprise information is growing with tremendous velocity. According to an oft-cited study published by the University of California, Berkeley, the volume of enterprise information has doubled in the last three years alone. And multiple studies suggest that some 80 percent of this information is unstructured in nature, meaning that it is formatted as documents, images, reports, digital media, Web content and e-mail.

Over the past decade, organizations have come to appreciate the value of unstructured content and its importance to business operations. Many companies have invested in enterprise content management (ECM) systems to capture, manage, classify and control this content. But while these systems have enabled companies to solve departmental business problems, they've also created isolated islands of content that can't be readily accessed, shared or leveraged across other areas of the business. In fact, many medium- and large-sized organizations have dozens of isolated repositories where critical content is stored, managed – and trapped.

Approximately 80 percent of enterprise information is unstructured and often trapped in isolated repositories.

Three reasons for fragmentation of enterprise content: Departmental IT spending, best-of-breed purchasing, and mergers and acquisitions.

This isolation can undermine key business initiatives, such as customer service and corporate and regulatory compliance, while also creating tremendous duplications of effort and missed opportunities for leveraging and reusing content. It can also degrade vital enterprise applications such as enterprise resource planning (ERP), customer relationship management (CRM), collaborative applications and portals by starving them of valuable enterprise content, such as documents, images, e-mail, reports, Web content and other unstructured content.

There are three key reasons this fragmentation has occurred:

- **Departmental IT spending.** Until recently, discretionary spending authority has been largely delegated to internal departments and lines of business, enabling each to invest in content management systems to solve their own narrowly defined business problem. While many corporate IT functions have begun to reclaim control, this period of autonomy has left a vast array of content silos in its wake.
- **Best-of-breed purchasing.** Content can take many forms, ranging from traditional files and documents, to rich multimedia formats, images, Web content and archived records. Companies have found that there is no single solution for managing every type of content, and have consequently invested in the specific repositories for each type of content—again, creating content silos.
- **Mergers and acquisitions.** Even when a company attempts to create a single enterprise standard for managing content, that standard is broken by the next merger or acquisition. The dozens of content repositories mentioned above have the potential to double with a merger, which only magnifies the problem of siloed content.

ECI—a powerful solution for integrating content across multiple distributed systems.

Enterprise applications often need a seamless flow of content.

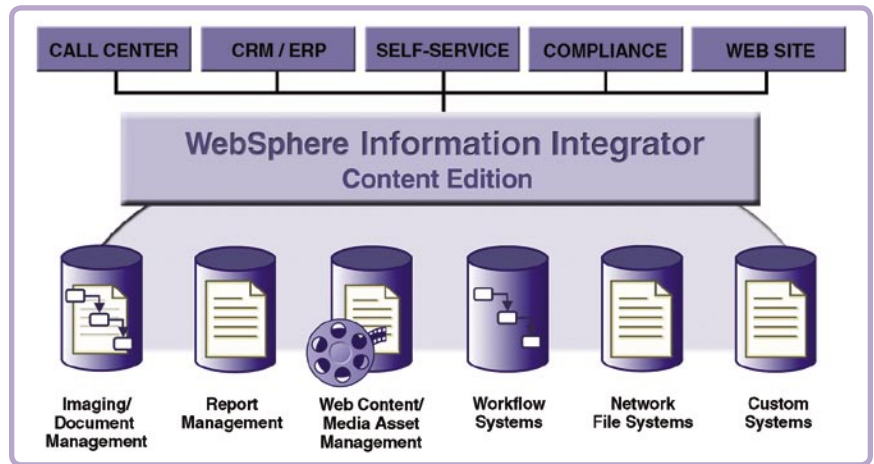
Organizations are seeking access to a single, comprehensive view of their content, plus the ability to distribute content to their business applications.

Breaking down silos and solving today's business problems

Enterprise content integration (ECI), *a technology through which applications can access, work with and distribute content isolated in separate repositories as if they were a single source*, provides a powerful solution for integrating content across multiple distributed systems to make it accessible to and actionable by key business applications. ECI also enables disparate content repositories and workflow systems to act as a single unified platform, eliminating the issue of scattered and isolated content.

Unified access to content is particularly important in specific application areas. For example, to be fully effective, a call center application needs to access scanned application forms, contracts, invoices, e-mail and any other customer-related content stored in multiple different locations across the enterprise. An ERP application must access bills of materials, specification and policy documents, freight claims and bills of lading, invoices and other scattered content related to specific business processes. Within an insurance company, a claims processing workflow needs to access and work with various claims documents, photographs, adjuster and police reports, titles, liens and appraisals. And an electronic records management application must apply critical recordkeeping policies on distributed content to ensure proper compliance.

According to Toby Bell, research director at Gartner Group, "Regulatory compliance, legal discovery and other needs have driven organizations to seek access to and control over content enterprise wide. The typical organization has many separate applications that generate documents and content, each stored in dedicated repositories. To maximize the value of their application investments, organizations need a single, comprehensive view of what's there, simple access, and the ability to distribute the content to various business applications and to incorporate it in workflows."



WebSphere Information Integrator Content Edition enables organizations to federate multiple, disparate content repositories and workflow systems.

ECI frees content for use by enterprise applications, and helps to support compliance management initiatives.

Extend your electronic records management applications to reach content stored in disparate systems.

ECI solves the problems created by disconnected information silos by helping you integrate the information infrastructure. ECI both bypasses the complexity created by multiple disparate data repositories and provides a means for consolidating content in a single repository over time. ECI frees content for use by enterprise applications, and helps to support initiatives to comply with records management regulations. In fact, without overhauling your information infrastructure, implementing new repositories or migrating content and metadata, ECI helps you:

- **Enrich portals and key business applications:** ECI integrates key content scattered across multiple repositories into your portal, workflow processes and line-of-business (LOB) applications, including CRM and ERP applications.
- **Extend the reach of records management initiatives:** Organizations are under extreme pressure to comply with mandates and policies around how they store and manage their records-class content assets. But the reality is that much of this content is often distributed across multiple systems. ECI allows organizations to extend their electronic records management applications to reach content stored in multiple disparate systems.

Reduce the cost and complexity of content infrastructure by migrating content to common infrastructure.

No need to “rip and replace” existing investments to achieve a single-standard platform.

Point-to-point integrations waste investments in code which cannot be reused when underlying data platforms change.

- **Create a migration path toward a common infrastructure:** Beyond providing unified access to distributed content, ECI also provides the means to physically migrate content away from various legacy repositories over time. This allows organizations to reduce the cost and complexity of their content infrastructure as part of a phased migration strategy.
- **Achieve the key benefits of consolidation:** ECI enables companies and public sector agencies to achieve the unification benefits of consolidation without the time, cost and process disruption of a “rip and replace” initiative.

Alternatives to content integration

Traditional approaches for dealing with isolated content have been inherently limited:

- **Migrating to a single ECM platform.** The idea of a single-standard platform is attractive in its simplicity. However, for many organizations, this is not a feasible approach. First, the time, expense and complexity of replacing numerous content-related systems already in place and functional are not easy to justify. Second, applications and customizations that have been implemented with one system are often difficult or even impossible to duplicate in another system with different functionality. Also, for companies expecting merger and acquisition activity, the very concept of a single standard platform is not an option, because the next merger or acquisition can be counted upon to bring another set of incompatible systems.
- **Point-to-point integration of priority applications.** Some companies will attempt to create custom point-to-point integrations between customer-service applications and underlying repositories. There are many risks and problems associated with custom integrations, which include not only the initial cost and time to market, but also the extraordinarily high cost of maintaining these often brittle integrations as a company upgrades to new back-end repositories and front-end applications. In fact, an upgrade to a new application or repository often means that the initial integration becomes little more than throwaway code, and the integrations must be rewritten from the ground up. So, as a company’s IT infrastructure evolves, the cost of these integrations becomes a recurring expense and an ongoing maintenance burden.

ECI solution helps improve results in customer service initiatives, mergers and acquisitions, risk and compliance management and other mission-critical ventures.

Improve profits from self-service, call center and sales force operations.

What does ECI mean for your organization?

Whether you know it or not, content is critical to your organization. When it can't be readily accessed and controlled, this can have real implications for operational efficiency, revenue and growth opportunities and the ability to manage corporate risk. An ECI solution not only simplifies the information infrastructure in which content is stored, and helps you extend the value of existing applications and content, it also helps improve results in vital areas of your company, such as customer service initiatives, mergers and acquisitions, risk and compliance management, enterprise applications and portal initiatives, production workflow applications, and research and intelligence operations. Let's look at some examples of what ECI means to your organization.

Customer service initiatives. An explosion of consumer choice and rising competitive pressure are challenging product and service companies to look beyond design, function and price to create and maintain competitive advantage. Many companies are looking to customer service as a powerful opportunity to drive down costs, while also building brand loyalty and expanding customer relationships. But to do so, companies are quickly realizing that they need comprehensive access to customer information. The problem is that much of this customer information is trapped in multiple isolated repositories in the form of unstructured content.

ECI provides a unified way to access and work with all of this scattered customer-related content from any call center or Web self-service application. This has implications for:

- **Better customer satisfaction and improved retention rates:** In both self-service and call center applications, ECI provides access to customer-related content, which lowers customer service costs and ensures a better experience.
- **Reduced customer service costs:** Traditional inbound call center service can cost \$30 per incident. ECI enables inbound calls to be deflected to a low-cost Web-based self-service application.
- **More effective cross- and up-selling:** ECI provides unified access to this scattered content to ensure customer service reps have the full customer context and texture they need to make effective cross- and up-sell offers.

Isolated information assets can thwart the success of mergers and acquisitions.

Mergers and acquisitions. As the pace of merger and acquisition activity increases, companies are under pressure to find ways to quickly combine technology infrastructures to maximize their potential for growth and synergy. Frequently, companies find that their information assets are completely isolated as a result of a merger, especially the 80 percent of enterprise data that exists in the form of documents, files, images and other similar unstructured content. This can easily undermine a merger or acquisition by degrading the quality of customer service and constraining opportunities for cross-selling products and services. It can also introduce compliance issues by creating isolated processes and silos of information that make financial reporting and public disclosures little more than high-stakes guesswork.

ECI enables organizations to unify their content and workflow infrastructures to ensure uninterrupted processes, proper governance, continued customer loyalty, and full realization of the strategic opportunity presented by mergers and acquisition activity. This can mean:

Ensure full realization of the strategic opportunity presented by mergers and acquisitions.

- **Enhanced customer service and continued loyalty:** On the heels of a merger, companies often find they no longer have a unified view of customers. ECI provides the information access necessary for exceptional service.
- **Improved cross- and up-selling:** ECI enables merged companies to quickly integrate their content infrastructures to ensure sales and service reps have the customer context to make effective cross- and up-sell offers.
- **Faster realizing of synergies:** ECI can help with customer retention, cross-selling success and consolidation of duplicate applications and process—all of which are critical to the success of a deal.
- **Compliance with regulatory requirements:** Publicly traded companies going through a merger need a way to maintain centralized control over critical reporting and governance processes. ECI provides a single interface for content and workflow audit trails to ensure the merged company can confidently report on and publicly disclose financials.
- **Acquisition-readiness:** ECI enables companies to “future-proof” their content management strategy, ensuring they can quickly bring new systems online with subsequent mergers and acquisitions.

Records management initiatives cannot be successful unless organizations include all of their records-class content.

Minimize the risk of noncompliance, reduce litigation and discovery costs, and protect goodwill.

Risk and compliance management. Recent corporate accounting scandals have spurred a raft of new legislation and reform around corporate compliance and governance. For example, the Sarbanes-Oxley Act of 2002 makes corporate officers personally accountable for fraudulent, falsified or erroneous financial disclosures. Healthcare providers are under pressure to conform to patient privacy regulations as defined by HIPAA. And European banks and financial institutions are facing their own disclosure regulations with Basel II. To address these and other regulations, many organizations are investing in electronic records management applications that streamline the recordkeeping in accordance with regulatory policies and mandates. But these records management initiatives cannot be successful unless organizations ensure they include all of the records-class content that exists across the enterprise. Since content is typically distributed, it is critical that organizations ensure that these recordkeeping policies are applied to all relevant content – even when it is stored and managed in multiple disparate repositories.

ECI provides a way to quickly integrate multiple content sources and workflow systems for centralized auditing and for extending records management applications across distributed content sources. This can ensure that organizations:

- **Minimize risk of noncompliance:** ECI ensures physically distributed content sources are all subject to and governed by appropriate recordkeeping policies.
- **Reduce litigation costs and protect goodwill:** Avoiding noncompliance has important implications for both an organization's overall litigation costs, as well as for protecting the enterprise's valuable reputation, goodwill and brand equity.
- **Reduce discovery costs:** ECI ensures that all content that is subject to discovery can be readily located and retrieved.

The success of CRM, ERP, SCM and portal initiatives depends on their integration with unstructured content.

ECI eliminates the need to build custom integrations to multiple backend systems.

Improve end-user adoption, lower maintenance costs and enhance process efficiency.

Enterprise application and portal initiatives. Today's enterprise applications support key functions across the entire value chain – from sourcing, product design, production, sales, marketing and distribution, to aftermarket service and support. While CRM, ERP and supply chain management (SCM) technologies have done a reasonable job of handling the transactional aspects of these functions and accessing the structured data to power these applications, they've largely neglected the 80 percent of enterprise data that exists in the form of unstructured content. Companies are now recognizing that the success of CRM, ERP and SCM initiatives depends on their integration with the systems that manage information such as customer profile documents, invoice images, bills of materials, maintenance records, contracts and even CAD drawings. This is equally true in the case of portal initiatives, for which adoption and ROI have often been constrained by “empty portal syndrome” – the condition that causes a portal to lose relevance and end-user “stickiness” because of stale or incomplete content.

The reality is that this content resides in many different departments and divisions and is typically stored and managed in multiple, disparate content repositories. ECI eliminates the need to build custom integrations to all of these back-end systems, providing a single, consistent API for exposing key content within key enterprise applications. This enables companies to ensure that knowledge and operational workers are armed with all of the information they need to perform their functions: customer content for managing relationships, product content for design and production, and supplier-related content for managing sourcing and procurement processes. This can help organizations:

- **Improve end-user adoption:** By providing complete access to all relevant external content sources and workflows, ECI helps to drive application adoption and usage.
- **Reduce application support and maintenance costs:** A single interface to all underlying content sources dramatically simplifies the implementation, support and maintenance of application integrations.
- **Enhance process efficiency:** Integrating key content assets into an organization's operational processes adds value to work activities and enables end users to access what they need at the “point of process.”

ECI makes relevant content accessible from one production workflow application.

ECI enables companies to achieve higher levels of automation and business process continuity.

Integrated workflows help streamline work processes, improve visibility and coordination, and mitigate risk.

Production workflow applications. Many production workflow applications are heavily dependent on content. This is true for horizontally applicable processes such as contract management, and more vertically oriented applications such as claims processing or loan origination. But the reality is that the dispersion of content makes these applications inefficient. For example, the workflow for a claims case must include documents and images such as the claims form, photographs, estimates and appraisals, e-mail and traditional correspondence. This content is often stored in disparate and incompatible systems, but ECI makes it all accessible within a single workflow application.

Today's workflow applications have eliminated much of the paperwork and human intervention associated with traditional work processes. But because they're often deployed to address a narrow departmental process, workflows have often failed to achieve business continuity or visibility across processes. It's the spaces between these departmental workflows where much of the inefficiency remains trapped. ECI enables companies to integrate multiple, disparate workflow processes to achieve higher levels of automation and business process continuity. ECI takes advantage of event-based business rules to make workflows trigger workflows or other custom behaviors, eliminating the manual steps that typically exist between processes.

For example, for a financial services company, once a loan is approved as part of an origination workflow, a new process may need to be invoked to support loan servicing. Or for a manufacturing firm, once an engineering change order (ECO) workflow is completed, a new workflow may need to be invoked to update bills of materials or procurement processes. Integrated workflows help:

- **Streamline work processes:** Connecting isolated workflows to maximize efficiency and business velocity.
- **Improve visibility and coordination:** Creating a single view into multiple workflow tasks for better visibility, coordination and control of business-critical processes that span multiple workflow systems.
- **Mitigate risk:** Automating, monitoring, auditing and controlling manual work processes to reduce errors and improve compliance with corporate policies and regulatory mandates.

Convergence between structured and unstructured information in a complete information services layer.

Spanning all distributed information domains helps companies accelerate time to market, improve business intelligence and reuse IT investments.

Information services layer. Many organizations are beginning to recognize that the distinction separating the worlds of structured and unstructured content is an artificial one. Today, there is a clear convergence occurring between these previously divided domains. This is because key business initiatives rely upon – not content or data independently – but information collectively. For example, a customer service representative needs a single view of a customer’s account balances, transaction history, up-to-date profile information, alongside unstructured assets such as contracts, check images, invoices, applications, e-mail. This is driving the need for a complete information services layer that provides a single interface to all information assets scattered across the enterprise – structured and unstructured, mainframe and distributed, public and private. When used in conjunction with a data-oriented integration platform, ECI enables organizations to build applications that span all of their distributed and diverse information domains, providing a number of key benefits such as:

- **Acceleration of time to market:** For the developer, an information services layer can dramatically reduce hand coding and can shelter developers from the complexity and variability of underlying content and data sources.
- **Improvement in visibility and intelligence:** Unified access to all of these systems makes business intelligence and reporting far more effective and efficient and it yields new operational and strategic insights by combining content and data in new ways.
- **Improve reusability:** An information bus architecture provides a reusable platform for information access in subsequent projects and application initiatives. This provides organizations significant downstream benefits and opportunities for leveraging this infrastructure.

IBM WebSphere Information Integrator Content Edition is the leading ECI platform.

Fully J2EE-compliant and Web services compatible.

Seamless, real-time, bidirectional access to the native content and meta data stored in many vendors' systems.

The leading ECI platform: IBM WebSphere Information Integrator Content Edition

IBM WebSphere® Information Integrator Content Edition is a key member of the WebSphere Information Integrator product family and a vital part of today's on demand business. WebSphere Information Integrator enables organizations to federate multiple, disparate content repositories and workflow systems. WebSphere Information Integrator Content Edition enables organizations to quickly unify these isolated content silos to improve access, reuse and control distributed content assets. This dramatically reduces the cost and complexity associated with creating content-centric applications.

A proven, enterprise-class approach to content integration

Built around a service-oriented architecture (SOA), WebSphere Information Integrator Content Edition provides rich, standards-based access to disparate content repositories and workflow systems. WebSphere Information Integrator Content Edition is fully Java 2 Platform, Enterprise Edition (J2EE)-compliant, Web services compatible, and is based on three layers of service: integration, federation and developer.

Integration services

WebSphere Information Integrator Content Edition integration services provides bidirectional access to underlying content, workflows and functionality. IBM offers a large library of prebuilt connectors to many commercial systems, and a toolkit for building custom connectors. These connectors normalize the vendor-specific application programmer interface (API) calls of underlying repositories and provide real-time, bidirectional access to the native content and meta data stored in these systems.

Integration services exposes all of the basic library services and the specialized functionality of underlying repositories, and provide repository profiling capabilities that make differences in functionality between repositories completely seamless to the end user.

WebSphere Information Integrator Content Edition prebuilt connectors

- IBM DB2® Content Manager
- IBM DB2 Content Manager OnDemand
- IBM WebSphere MQ Workflow
- IBM Lotus® Notes®
- IBM Lotus Domino® Document Manager
- FileNet Content Services
- FileNet Image Services
- FileNet Image Services Resource Adapter
- FileNet P8 Content Manager
- FileNet P8 Business Process Manager
- EMC Documentum
- Microsoft Index Server/NTFS
- Microsoft Site Server
- Open Text Livelink
- Stellent Content Server
- Interwoven TeamSite
- Hummingbird Enterprise DM

WebSphere Information Integrator Content Edition federation services unify the user experience and provide value-added capabilities for working with content.

Federation services

WebSphere Information Integrator Content Edition federation services deliver a rich set of additive functions that span multiple repositories. These features unify the user experience and provide value-added capabilities for working with content.

Content views allow companies to create a single logical view of content related to a specific process or topic—regardless of where the content is stored and managed. These content views remove barriers imposed by disparate content sources and make content appear as if it were organized in a virtual repository.

Turn disparate content repositories into a single, virtual, searchable system.

Single sign-on enables you to sign on once to multiple underlying systems.

Create custom workflows with subscription event services.

Federated search capabilities enable property-based and full-text queries against multiple repositories, returning an aggregated result set. This feature also allows users to create saved searches for enhanced productivity.

Meta data mapping services normalize index values across multiple systems. This intuitive mapping tool makes it easy to define a common data model for working with content stored in multiple disparate repositories. Single sign-on encrypts and stores repository credentials and allows users to log on to multiple underlying systems through a single authentication process. This capability can also integrate with existing Lightweight Directory Access Protocol (LDAP) infrastructures.

Subscription event services let companies create custom event handlers and other rules-based behaviors that span multiple content and workflow systems. Subscription event services enables two key capabilities:

- **Automatic subscriptions** allow content and workflow objects to be monitored and to automatically trigger e-mail notifications and/or other events when changes occur.
- **Cross-repository synchronization** capabilities enable a range of event-based functions, such as synchronizing content and/or meta data between disparate repositories; declaring a document as a record; or triggering a workflow or another behavior based on a specific event or condition.

View services (optional) enable companies to dynamically convert specialized document and image formats into browser-readable renditions on the fly. View services can convert more than 150 document types into browser-readable formats so they can be displayed natively within a browser, including all standard business formats and specialized formats such as TIFF and MO:DCA. View services also provides a Java™ applet for annotations and image manipulation.

For developers: a rich Java-based federated Web client user interface.

Developer services

WebSphere Information Integrator Content Edition developer services provide several options for making distributed content and functionality accessible within user interfaces and client applications. These services include Web components that snap into any Web-based application, JSR 168-compliant portlets, and a superset Java and Web Services API that provides a common object model and full programmatic access to underlying content and workflow systems. Web components deliver the core library services required within a content-oriented application.

Developer services also include a rich Java-based federated Web client user interface that can be used out of the box or customized to your specifications.

Architectural highlights

- Service-oriented architecture (SOA)
- Fully J2EE compliant and Web services compatible
- Supports application servers such as IBM WebSphere and BEA WebLogic
- Supports component distribution and load balancing
- SOAP interface for Web services applications
- Supports URL-addressable functions

WebSphere Information Integrator Content Edition puts it all together for you.

What makes IBM the right choice for ECI?

- **Standards based.** Built around a fully J2EE architecture and utilizes Web services and other open standards for flexibility and long-term interoperability.
- **Full functionality.** Provides the ability to access and work with isolated content, utilizing the unique functionality of various underlying repositories.
- **Extended functionality.** Delivers superset functionality that can be utilized across multiple disparate content sources to create a unified experience.
- **Developer services.** Quickly content-enables business applications with component-based interfaces and a complete API.
- **Pre-built integrations.** Leverages out-of-the-box adapters to underlying content sources and pre-built interfaces to key business applications.

For more information

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