Integrating SharePoint with External Content Repositories

SharePoint

Search
Access
Analysis

DM System
HR System
ERP System
Imaging System
About the White Paper

As the non-profit association dedicated to nurturing, growing and supporting the user and supplier communities of ECM (Enterprise Content Management) and Social Business Systems (or Enterprise 2.0), AIIM is proud to provide this research at no charge. In this way the education, the entire community can leverage the thought-leadership and direction provided by our work. Our objective is to present the “wisdom of the crowds” based on our 70,000-strong community.

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Process Used

This report references previous AIIM survey findings, each of which is referenced within the document.

About AIIM

AIIM has been an advocate and supporter of information professionals for nearly 70 years. The association mission is to ensure that information professionals understand the current and future challenges of managing information assets in an era of social, mobile, cloud and big data. AIIM builds on a strong heritage of research and member service. Today, AIIM is a global, non-profit organization that provides independent research, education and certification programs to information professionals. AIIM represents the entire information management community: practitioners, technology suppliers, integrators and consultants. AIIM runs a series of training programs, including the Certified Information Professional (CIP) course. http://www.aiim.org/Training/Certification

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Introduction

Providing employees across the enterprise with a single point of access to documents and content has and will continue to be the goal for Enterprise Content Management (ECM), but for many organizations, a single wall-to-wall ECM system is not a practical solution. Their strategies will involve the choice of a primary access portal, with connections to existing repositories, extended search, and perhaps migration of content from retired legacy systems.

Microsoft’s ECM and collaboration portal, SharePoint, is everywhere – and with it now deployed in 70% of larger organizations its growth shows no signs of stopping. AIIM SharePoint-related industry research shows three things: many large organizations deploy it, users like it, and there appear to be no plans to stop deploying or using it. Despite the wide range of portal offerings available, the penetration of SharePoint into corporate infrastructure makes it an obvious choice of primary portal. It provides a very accessible user-interface as well as useful functionality for project teams and collaboration. Licenses can be extended across the organization for relatively low cost.

SharePoint has a built-in capability to connect to other, CMIS-compatible content systems via a simple web part. However, the success of a combined ECM infrastructure will depend greatly on the enhanced functionality of these inter-connections and the application of a universal, or unified, search facility across all of this content - much more than can be provided by the standard SharePoint web part.

While there is a temptation in most organizations to develop connectors in-house, they will likely be much better served by adopting a 3rd-party provided connector set. In addition to meeting content connection standards such as CMIS (see Appendix 1), productized connectors will have functionality to accurately maintain permissions and security, to smoothly extend search functions, to map metadata, and to integrate to workflow processes. They will also be better placed to match future upgrades within both SharePoint and the connected repositories.

In this report, we will look at the choices for ECM Connectivity strategies, the different positioning options for SharePoint, and the requirements for content connectors. We will discuss potential issues and make recommendations for good practice. We will also take a quick look at connectivity to cloud-based content systems.

SharePoint Connectivity Checklist

Before identifying the best way in which to connect SharePoint to external content stores, there are a number of key questions that need to be asked. These questions are detailed below and will provide a useful checklist throughout your journey to SharePoint Inter-connectivity.

<table>
<thead>
<tr>
<th>How Many?</th>
<th>Are you looking to integrate to one, or more than one external content repository?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud Based</td>
<td>Do you need to connect to data that is located in public or private clouds?</td>
</tr>
<tr>
<td>SharePoint version</td>
<td>Which version(s) of SharePoint does your connector need to work with?</td>
</tr>
<tr>
<td>Unified Search</td>
<td>Does the proposed connector integrate to SharePoint Search?</td>
</tr>
<tr>
<td>Workflow Integration</td>
<td>Do you need to manage documents and content from both SharePoint AND other repositories as part of your business processes?</td>
</tr>
<tr>
<td>Security</td>
<td>Does the proposed connector allow mapping of security and access roles in both systems?</td>
</tr>
<tr>
<td>CMIS Support</td>
<td>Is the proposed connector CMIS compliant?</td>
</tr>
<tr>
<td>Two Way Synchronisation</td>
<td>Do you require synchronisation between the external store and SharePoint? Do you need to read and write content between the stores?</td>
</tr>
<tr>
<td>In-house Skills</td>
<td>What level of in-house skills do you have available to:</td>
</tr>
<tr>
<td></td>
<td>• Specify a connector</td>
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<tr>
<td></td>
<td>• Develop a connector</td>
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<tr>
<td></td>
<td>• Configure a connector</td>
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<tr>
<td></td>
<td>• Manage a connector</td>
</tr>
<tr>
<td>Vendor Longevity</td>
<td>How long has the vendor of your proposed connector been in business? Do they have a track record and an established client base?</td>
</tr>
</tbody>
</table>
Strategies for Universal Content Access

Organizations have always had many data, document, and content repositories, and an overriding goal of IT has been to combine and migrate those data stores into one single silo of ECM information. However, a tipping point has now been reached where many organizations are opting against this wholesale agglomeration and deciding instead to keep information in separate, possibly more suitable, repositories but to provide consistent and manageable links and synchronisation between them.

A recent AIIM survey¹ confirms that fewer organizations are migrating towards a centralized ECM system, whilst more are moving towards a multi-repository approach with SharePoint as the portal of choice, albeit not necessarily the only one.

Figure 1: “Which of the following would best describe your main strategy to provide employees across the organization with a single point of access for information”

This multi-repository approach has a number of benefits.

Firstly, running a single ECM system means that the various nuances of each and every one of an organization’s specific content types need to be managed within one central pot, massively increasing the complexity of the taxonomy and the functional requirements of the ECM system itself. Whilst this is certainly not an impossible task, it is one of the reasons cited by many companies for not making more progress with their ECM projects.

Working with multiple repositories, such as Finance, ERP, CRM, HR, CAD, and Project Management allows specialist departments with specific requirements to operate using specialist tools, albeit still accessing and sharing this information via SharePoint. For example a legal department can make use of a repository that affords them a full spectrum of case management specific features such as the linking of documents into virtual case folders, the inclusion of electronic case notes, collaboration with multiple external bodies and ad-hoc workflow capabilities which would not be required in a department such as HR. However, being able to access and manage this information from a central portal has obvious advantages.

A secondary benefit of using repository inter-connection is that integration can be done between any of these repositories in any direction, with SharePoint acting as the processing pivot as can be seen in Fig 2. The payroll department software may not have any native way of passing documents into a central records management repository. However, by using SharePoint, almost like a virtual air-traffic controller, content can be routed from one system into the other. This provides massive benefits to all concerned, with enterprise applications such as ERP, ECM and records management being obvious places to start.
A final more pressing concern for many organizations is how to connect to cloud-based data repositories. Users’ adoption of applications and technologies such as Box and Salesforce has to a certain extent forced corporate IT to follow suit, bringing with it the need to enforce security and compliance on these remote data silos. From an ECM perspective, being able to access these cloud-based repositories seamlessly from the business portal is useful: being able to classify and govern such content is invaluable.

**Figure 2: Inter-connection using SharePoint**

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**Challenges with Universal Content Access**

There are issues behind the scenes in SharePoint also. SharePoint stores its metadata and content as Binary Large Object files (BLOBs) in the SQL Server database itself. As content volumes grow, the impact of storing all of this data in one place begins to take its toll; increased SQL Server capacity, RAM, storage and built-in fail over capabilities are required – all at additional cost. When this happens it becomes prudent to split out the content into separate data stores, either by using the built-in Microsoft API, or by locating the data in a completely separate content store.

From an IT management and performance perspective, running multiple repositories means IT can spread the load with respect to processing power, with each repository, or subsystem, being able to run on its own dedicated hardware and software platform. Not only does this deliver increased scalability and improved disaster recovery, it also allows multi-platform software to be deployed: for example MAC, Linux or even mainframe based repositories can be deployed side by side with Windows repositories, particularly useful in manufacturing and design focused industries. Many organizations will also have built up large scanned image repositories, and these can be linked in rather than migrated to SharePoint.

However, there are challenges to be faced when working with a multi-repository content-based approach. Connections need to be made between SharePoint and each of the repositories to allow searching and retrieval of content. SharePoint provides a wide variety of options regarding federated or unified search, allowing multiple repositories to be searched from within its search server. However, this can be difficult to setup and requires in-depth knowledge of the search functionality of the separate repositories.

Any connections made also need to ensure the security and validity of content is managed as it would be in the original application. Each separate content system will also likely have its own methods, or schemas, for describing the data it stores, and mappings will need to be made and managed between the content system and SharePoint. This becomes particularly challenging when encountering a content type or concept that is not natively managed in SharePoint. For example, many document management systems have the concept of a compound document, that is, a collection of linked documents that make up a single, referenced object – SharePoint does not. The simplest example of a compound document is a web page, which would typically have an html element, but will also have images and maybe associated php or javascript files. The page is the compound object with the various php, html, jpg, etc. files being the components. Mapping between systems that natively manage these styles of documents and SharePoint can be challenging. Case management is another good example, where the case file or claim file will contain multiple documents and reports, possibly pictures, etc., but the case file needs to be managed as a compound object.
SharePoint as a Portal

As discussed above, SharePoint has become the ECM and collaboration portal of choice for the majority of business users – its ease of use and large number of quickly deployable, function-focused templates being primary drivers for this.

The use of SharePoint as the primary portal also provides a business user with a central place to perform cross repository searches, so called federated or unified searches. SharePoint has a number of advanced tools to deliver search functionality including Search Server and FAST. This set of facilities allows compatible external repositories (discussed in detail later) to be searched directly from within SharePoint, and the results to be displayed, accessed and used from within the SharePoint environment.

Unified search is fast becoming an essential business tool, and a much needed one with 70% of users in the AIIM Big Data Industry Watch survey\(^2\) claiming that it is harder for them to find data within their own organization than externally on the web. Successfully deploying unified search within a central portal, whilst not being an easy project, is one that will deliver significant benefits, allowing users to find all relevant content from one place. Again, given its unique levels of deployment across a wide number of business units, SharePoint is ideally placed as the obvious choice within which IT teams can base their company-wide search portal.

However, that said, SharePoint is not the only portal that could be used – for example, Salesforce.com is the preferred CRM application in a number of organizations and there will be a number of sales-focused staff who will still want to use a web-based CRM system as their primary usage portal. However, it is also likely that whilst domain and application-specific portals (such as those for CRM, HR, Accounts, etc) will be used in day-to-day processing, none will be able to match the wide deployment of SharePoint, and as such they will lack the levels of adoption required to make them the organizational choice for any centralized function like unified search.

A multi-repository based approach works best if search facilities are presented across all of the content stores, and if the results and mechanisms for search are consistent.

However, one of SharePoint’s limitations is that out-of-the-box it does not provide native connections to other content repositories. This provides both users and IT departments with significant challenges when looking to locate and view content from other sources. A number of simplistic, typically web-part based, solutions are available for viewing content such as RSS feeds, webpages and social network updates. Whilst being simple to install and use these tend to be completely isolated and not in any way integrated with SharePoint search. They are also limited in terms of functionality, especially two-way, read/write communications.

Security and Licensing

There are a number of licensing challenges with respect to using SharePoint as a portal to multiple repositories. Some vendors, and indeed many in-house projects, will look to provide a single point of connection from SharePoint to external repositories in order to reduce the number of licences required for the secondary system.

This approach will have a detrimental effect on the operation and security of the inter-connection given that all user connections from SharePoint will be at the same permission level. Therefore a situation develops whereby users and roles will either gain permissions, or lose permissions. In either case, this is not ideal and can lead to search results displaying content that should not be shown. Badly designed connectors may also unwittingly display content that the user does not even have access to, but which the system can access the meta-data for. Such concerns should ensure that any organization purchasing a connector absolutely requires a tool that provides users, roles and permission mapping capabilities.

This approach has a licence held in both systems for each user, and user roles are mapped between the systems as required. This can be straightforward in certain circumstances, for example if the role of marketing department document administrator exists in both SharePoint and the external repository, or slightly more complex when a role exists in one system but not the other, in which case a business decision is required to determine the appropriate mapping.

The organization can then decide how the user authenticates within SharePoint and the external repository, with a number of possible options:

- **Session based authentication:** The first time a user needs to connect to an external repository he will be asked to authenticate. That authentication will then remain in place for the remainder of that session.

- **Single sign on:** The user can be authenticated once (via Kerberos or similar) and this authentication used “behind the scenes” to automatically verify the user and their associated privilege levels.

The chosen approach may well vary based on the external repository being connected to, the technical capacity of the system to automate authentication, the level of operation being performed and the security level of the content being accessed.
Inter-connection Choices

For those who decide to integrate SharePoint to external content source(s), three main options present themselves:

- To create a custom, “in-house” solution by using the SharePoint Software Development Kit
- To make use of a vendor supplied connector (either packaged or custom built)
- To purchase a productized connector suite.

Each of these is explored in detail below. Whichever solution is chosen, it would be wise to ensure that it provides a reliable and uniform implementation of CMIS (see Appendix 1) ensuring basic capabilities such as data read and write scalability and robustness. Ideally any solution built using CMIS should deliver value above the CMIS layer with functionality such as schema and user mapping, content processing automation (see additional considerations section below) and cloud based capabilities.

Custom Developments

Creating a custom-developed inter-connection, either developed in-house or by the vendor, would appear at first sight to be a sensible option and indeed recent AIIM research\(^1\) shows that 53% have done just that (“in-house developed” and “vendor custom developed”).

*Figure 3: “If you have integrated or connected multiple ECM/DM/RM systems or portals which of the following approaches have you used?”*

The obvious benefits are that end user can define exactly what they want from a connector and have a connector built to their specific needs. On closer analysis, however, this approach has its drawbacks:

- User interface design for custom builds tends not to be as rigorous or well thought out as packaged software products.
- Future updates to SharePoint or the secondary application will likely require changes to be made to the inter-connection, at the end user’s cost.
- Custom developed software is inherently more risky than packaged software and may well be more expensive.
- The performance of custom inter-connections tends not to be as strong as packaged software products.
- Functionality will be limited to the end-user specific requirements, and not necessarily as wide as a vendor or 3rd party product.
- The API and specific configuration of items such as metadata mapping will be proprietary to the specific combination of product 1 and product 2, for example, SharePoint and ContentStore1. Should you wish to connect SharePoint to ContentStore2 then the whole process of creating a connector will need to be repeated.

Vendor-supplied Connectors

A second approach would be to purchase a vendor-supplied connector. This would seem to be logical – the vendor has developed the original product, therefore they are in the ideal situation to create the connector. If your organization has a requirement to connect to a single external repository and the vendor of that repository has a suitable connector, then perfect. However, the majority of organizations are not just connecting to a single non-SharePoint repository, but in fact multiple, non-SharePoint repositories, so this approach has its downsides.

Consider the process of deploying a new connector; there is a purchase cycle with an associated licensing model, the installation, mapping and configuration between SharePoint and the repository, also a new interface and set of capabilities for the users to be trained on, and last, but by no means least, the need to include the external content in federated search results. This process is complex enough in itself but by purchasing individual connectors for the inter-connection to each different content repository, the process is repeated - all adding to the already complex task of integrating multiple content repositories.

Productized Connector Suites

A final option is to purchase a productized connector suite. Consider the requirements of integrating SharePoint and separate content repositories. The end user is looking for simplicity of use, consistency of user interface, unified search and the ability to do as much as possible from one, SharePoint driven, portal. The IT department is looking to reduce complexity, standardize/minimize interfaces between systems and provide the best mechanism for federated search across content.

A connector suite provides a number of connectors from SharePoint to external systems, and may encompass older legacy systems as well as the latest cloud-based systems. Most importantly it provides this access in a normalized manner, with a common user interface to files, and a standard set of read and write functions, irrelevant of which content store they are being accessed from. This normalization provides users with the consistency they need in order to be able to access content from any system, without additional training in the end-store tool. From an organizational perspective, training can now be performed on SharePoint, including general content management and governance, not on each individual content store.

In addition to making user access more straightforward via a normalized connector suite, access to all content is now entirely consistent, therefore allowing unified search to be applied across all of an organizations’ content stores. Whereas integrating multiple content stores into SharePoint Search Server would be a massive challenge, integrating one single normalized connector into SharePoint becomes a very manageable project, especially with a small degree of expert external consultancy, typically from the suite vendor.

Additional Considerations

Content Processing (CP) and Inter-connection to Workflows

Most SharePoint users will be familiar with workflow – a series of related steps that flow from a start to finish, each step being triggered by an event, such as the previous step being marked as completed. Workflows are a standard part of SharePoint and ECM systems in general, and are widely used in a number of situations from document approval to full blown business process management. This concept also extends to content. Tools exist that allow the processing of multi-repository based content in workflow style environments. Such tools are best explained by way of example uses.

Example 1: Content Publishing

You may wish to automate the publication of a press release to a number of repositories, such as your web site - so that potential customers can see the release, records management system - from a compliance perspective, and your online CRM system - so that the sales and marketing teams have access to the information. As opposed to publishing each of these individually, CP would allow you to define a series of steps to publish the content (essentially migrate copies of the content to multiple stores) upon either manual execution (a user pressing a button) or an automated trigger (a user meta-tagging a document as “Press Release”).

This form of content process automation can deliver significant time savings and ensure consistency of content across a number of channels.
Example 2: B2B Document Exchange

Your business development team needs to work closely with several partner organizations in order to produce sales proposals. The cross-company team needs to create and collaborate on documents from their remote sites and to ensure that any changes made are carefully synchronized, recorded and maintained for completeness.

Your organization is the project lead so creates the project proposal using your project management system that is linked to SharePoint using a custom connector. As part of the process the user defines the meta-data associated with the document such as the potential client, which external companies and users will need to access the document and the type of proposal being pitched. A CP process has been setup that not only informs the external users that the document has been created, but sends automated work tasks to those users in their preferred systems requesting their input and includes a link to the latest version of the newly created project proposal document. That document now sits in a cloud based document repository allowing the external users to edit it without requiring access (and the associated licences) to the SharePoint system.

Of course, once that document has been edited and saved, the process operates in reverse, synchronizing the latest version with SharePoint and alerting the relevant internal users.

Content automation and processing of this type allows secure collaboration beyond the firewall whilst still maintaining corporate essentials such as version control and custom alerting.

Cloud-based Content

As discussed briefly above, cloud-based content is increasingly becoming a standard piece of the corporate IT jigsaw. The explosion of cloud-based storage applications does not seem to be slowing down and with the re-launch of Microsoft’s SkyDrive, and Google Drive providing ever larger amounts of free online storage it becomes a compelling argument for individual users and IT departments to look to make use of these facilities.

The inter-connection of SharePoint and cloud-based data may at first sight seem to provide major issues: how do you connect to the data, can meta-data be accessed, what security protocols exist? However, on closer inspection cloud based inter-connection is not that different from connecting to any other content repository. All good cloud content providers expose an Application Programmers Interface (API), albeit it typically as a web-service, which can be accessed by in-house developers and productized connector vendors alike, and as such the decisions and processes followed in selecting the best option for any given organization are the same as for non-cloud based content. Again this API should be CMIS compatible.

That said, those vendors with experience in connecting to cloud-based content tools do have the benefit of previous experience in developing connectors using web-services, and those providing productized connector suites again have the obvious added benefit of a normalized connection and interface irrespective of where the content sits, together with consistent and proven security options.
Conclusion and Recommendations

In an ideal world, content systems would simply plug together, SharePoint included. The reality is somewhat different.

Content inter-connection in SharePoint is a complex and challenging exercise that comes with a range of solutions ranging from in-house development to purchasing a productized connector suite, all of which have validity in certain situations. The SharePoint Connectivity Checklist at the start of this document details the major considerations when looking at content inter-connection, and only when these have all been addressed is an organization ready to begin assessing the correct solution.

For those with a single inter-connection to perform, it may prove cost effective to build their own custom connector. This of course requires development skills and time, along with which come inherent risks. As such, building custom-developed connectors on an ad-hoc basis is not to be recommended. It can easily result in limited functionality, clumsy user-interfaces, poor search performance, and future issues with upgrades.

Single productized connectors from the vendor of the linked system may well provide the solution, especially if it is CMIS compliant, but the purchaser needs to ensure on-going support and supplier longevity from any potential provider.

For those with multiple inter-connections the disadvantages compound as each different API and interface is brought into play. The productized connector suites have a significant advantage here, providing a number of connectors and the benefits of a standardized interface across these, as well as a single point of support and reference. In fact, these make compelling arguments in favour of the suite approach and there would need to be very strong reasons for organizations in this situation to not go down this road.

CMIS support, inter-connection to various legacy systems, and the ability to either use Content Processing (CP) and/or workflow to automate publishing and synchronisation all need to be taken into consideration where relevant, as does the choice of primary portal, although SharePoint’s market dominance largely precludes serious competition here. Choosing SharePoint as the primary portal also delivers an advantage in that there is a much wider range of available connector sets to the most popular content and enterprise systems, than other portals.

In our view, choosing a productized set of connectors, based on CMIS structures, is likely to be more cost-effective option in the long run, especially one with workflow or CP links. This choice will bring with it a degree of expertise and experience that will avoid content-related issues as well as purely technical ones, and a level of consistency and normalization for technical staff and end-users that will deliver the best return on investment in this area.

References

1. AIIM Industry Watch “Using SharePoint for ECM” June 2011

2. AIIM Industry Watch “State of the ECM Industry 2011” March 2011

3. AIIM Industry Watch “Big Data- extracting value from your digital landfills” May 2012
   http://www.aiim.org/Research/Industry-Watch/Big-Data-2012
Appendix 1: Content Management Interoperability Services (CMIS)

In the later part of 2008, a committee was formed to standardize a web services interface specification to enable interoperability of Enterprise Content Management (ECM) systems. EMC, IBM and Microsoft lead the way by developing the initial draft for the standard with other ECM vendors such as Alfresco, Open Text, Oracle, and SAP providing input through the standardization process.

The resulting CMIS (Content Management Interoperability Services) standard makes use of web services and the widely used, protocols of SOAP, (Simple Object Access Protocol) and REST, (Representational State Transfer). Its focus is on the basic content functions such as creating, reading, writing, deleting and searching for content across repositories. CMIS makes sure content repositories and solutions are able to interoperate by being independent of operating systems and architectures.

The significance of CMIS is that it provides a standards-based foundation to allow different ECM systems and components to communicate. Vendors developing new ECM systems, connectors or components will need to ensure that they support the CMIS specification to ensure maximum interoperability and usefulness to end users.
EntropySoft

Nicolas Maquaire and Raphael Jean founded EntropySoft in 2005. Experienced content management software professionals, they set out to solve a serious ECM industry challenge and developed a product that’s become the standard in enterprise content integration.

Unstructured data – like documents, images and video – are growing exponentially. It currently accounts for 85% of all corporate “big data”, doubling every two years. To cope, companies increase the number of content silos they hold only to face increased fragmentation and management complexity as a result. For example, how can IT enable users to search or collaborate on all the documents, emails, and videos residing in different systems across the organization? How are archiving, migration and compliance handled? And how do content-centric software vendors make their products work with ECM systems, or the cloud?

This data explosion and resulting fragmentation is one of the biggest challenges companies face today. EntropySoft pioneered the enterprise content integration (ECI) segment with innovative Content Connector technology and Content Hub products, making it easy to connect, search and act on unstructured data - wherever it is.

Making ECM Work Better

EntropySoft helps organizations access and manage their unstructured data with content federation, process automation, and Cloud and SharePoint integration solutions. It allows SaaS and enterprise software companies to bridge the gap between their products and enterprise content management (ECM) systems. The technology is also used to enhance offerings in a number of markets including enterprise search, business process management, e-discovery, records management, collaboration, and data loss prevention.

Broad Reach

The company’s product offerings put them on the radar of leading software companies. EntropySoft is the connectivity of choice for search companies (Google, Microsoft, Endeca), for eDiscovery companies (EMC Kazeon, Clearwell), for business process management companies (IDS Scheer, Image Integration System, W4), and for data loss prevention companies (Symantec). For more information, go to www.entropysoft.com to learn more.
AIIM (www.aiim.org) is the global community of information professionals. We provide the education, research and certification that information professionals need to manage and share information assets in an era of mobile, social, cloud and big data.

Founded in 1943, AIIM builds on a strong heritage of research and member service. Today, AIIM is a global, non-profit organization that provides independent research, education and certification programs to information professionals. AIIM represents the entire information management community, with programs and content for practitioners, technology suppliers, integrators and consultants.