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**IBM Information Management software**

# "Green" Information Management: the role of Enterprise Content Management in reducing reliance on paper

**In Brief**

***Enterprise Content Management technologies address the ability to reduce silos of information and to make end users work more productively. But more importantly they can have a drastic reduction in the use and the costs associated with physical paper, documents and case files, thereby supporting a more "green" government.***

**Executive Summary**

Governments must find a way to be more environmentally aware while trying to make the most of their already limited funds. At the same time, they are under increasing pressure to make their growing volume of data more accessible – to the public, within individual departments and across state agencies.

The costs associated with paper impact: the environment, workers productivity and the bottom line of government budgets.

Government programs are still highly siloed and use too much paper or physical documents in order to provide services. There are many costs to the environment and the government that arise from manual processes and physical documentation.

To reduce or eliminate paper use, governments turn to integrated Business Process Management (BPM) and Enterprise Content Management (ECM) systems. BPM/ECM systems not only manage many forms of content – for example, electronic documents, email, rich media and records – but also they "activate" content by integrating it with process management. This allows for analysis and decision cycles to occur more rapidly and across several agencies and departments. BPM/ECM systems also automate the discovery and movement of information, thereby freeing state employees from the time-consuming tasks of "content management" and allowing them to focus on complex issues that require human intervention. Considering limited government budgets and the ever-expanding population, state governments should seek an enterprise system that addresses today's needs, while providing the scalability to accommodate future requirements.

IBM ECM solutions answer this challenge. With an integrated suite of BPM and ECM solutions, IBM ECM enables governments to streamline and automate business processes, share information from agency to agency, as well as access and manage content enterprise wide. By standardizing on an ECM platform process and documents are electronic, thereby drastically reducing the environmental impact of paper production and use.

**Endless Demands, Limited Resources Still Effecting Government Getting to "Green"**

The dependence and use of paper in government is extremely high; many governments are attempting to minimize the use and reliance on paper for two reasons: the effect on the environment and the shear costs associated with handling physical documents.

Two major issues within government lead to the use and misuse of paper: first, siloed operations of varying agencies and departments, and secondly, the cultural or lifestyle habits of workers — in that they still print everything from e-mail to actual case files.

As more demands are being placed on government workers to do more work with fewer resources, and the unmanaged arena of end users, the reliance on paper is still growing.

Besides internal education and training on how to reduce paper and other energy consuming factors of work — lighting, car-pooling, tele-work — the underlying processes and procedures of government programs still support the lifestyle of workers and the siloed operation between government organizations.

Enterprise Content Management technologies address the ability to reduce silos of information and to make end users work more productively. But more importantly they can have a drastic reduction in the use and the costs associated with physical paper, documents and case files, thereby supporting a more "green" government.

In order to understand the ramifications that paper use has on the environment organizations need to understand the costs to the environment and government by looking at the how paper is handled, stored and also what it causes in time and money to find and act upon information.

**The Real Cost of Paper for Government and the Environment**

*Handling Paper*

The hard costs associated with paper have direct impact on a government agency's ability to be more environmentally aware. If processes and work is done in a highly labor intensive fashion with minimal reliance on technology to help make the workers more productive, then the use and sharing of information will be done on physical forms and case files. If we take a government office of about 50 workers over one year that deals with case files, they will use roughly 25 tons of paper in that year. The actual costs associated with those 50 government workers providing government services have specific labor costs, etc. But let's look at the cost of handling physical paper to provide government service.

*The Cost of Handling Paper*

| | Costs |
|---|---|
| Paper | **$14,000** |
| Photocopying | **$60,000** |
| Printing | **$55,000** |
| Faxing | **$9,000** |
| Mailing | **$11,000** |
| Courier (Not including Environmental Impact) | **$24,000** |
| Short-Term Storage | **$9,000** |
| Long-Term Storage (Physical Records Management) | **$25,000** |
| Disposal Costs (Not including Environmental Impact) | **$6,000** |
| Total Cost of Handling Paper (50 Employees) | **$213,000** |

We are well aware that to produce paper has environmental costs that cannot be quickly dealt with. As governments become more stringent in environmental compliance to the private sector, they too will have to address the need to reduce the environmental cost of the use of paper. So, if an office of 50 government workers uses on average about 25 tons of paper a year to do their job, we need to understand the environmental cost of the 25 tons of paper.

*The True Environmental Cost of 25 tons of copy paper*

| | Baseline Paper | Equivalents |
|---|---|---|
| Wood Use | **78 tons** | **540 trees** |
| Total Energy | **917 million BTU's** | **10 homes/year** |
| Purchased Energy | **464 million BTU's** | **5 homes/year** |
| Sulfur dioxide (SO2) | **651 pounds** | **118 18-wheelers/year** |
| Greenhouse Gases | **136,985 lbs CO2 equiv.** | **12 cars/year** |
| Nitrogen oxides (NOx) | **450 pounds** | **2 18-wheelers/year** |
| Particulates | **298 pounds** | **27 buses/year** |
| Hazardous Air Pollutants (HAP) | **49 pounds** | |
| Volatile Organic Compounds (VOCs) | **130 pounds** | |
| Total Reduced Sulfur (TRS) | **8 pounds** | |
| Wastewater | **455,004 gallons** | **<1 swimming pools** |
| Biochemical Oxygen Demand (BOD) | **157 pounds** | **<1 homes/year** |
| Total Suspended Solids (TSS) | **245 pounds** | **1 homes/year** |
| Chemical Oxygen Demand (COD) | **2,133 pounds** | **5 homes/year** |
| Absorbable organic halogens (AOX) | **21 pounds** | |
| Solid Waste | **54,150 pounds** | **2 garbage trucks** |

*Source: The Environmental Defense Fund, Paper Calculator*

*The Cost of Storing Paper*

The physical storage of paper again has environmental impacts; as more paper records are created the need for long-term storage facilities increases. These facilities consume energy; they take up environmental space, and they generate waste and use resources like water. The cost of the work done at these facilities adds up in the form of workers having to drive to the location, transport vehicles coming to and from the facility. These facilities have to maintain internal environmental controls that also consume electricity.

Even in a government office, as filing cabinets continue to take up physical space, the need to acquire or build new facilities puts a burden on the environment. If technology were used to store and manage electronic forms of information and records, there would be a reduction in the need for more work space, which would reduce electricity, building costs and environmental expansion.

The resource cost and time having to find and access records increases as governments become more accountable with public discovery requests. Therefore, the need for governments to focus on electronic storage of electronic documents reduces the need for physical storage costs.

*Finding Paper*

As governments continue to support siloed operations and are slow to modify or adopt automation of underlying business processes, government workers will continue to struggle with finding information and documents without incurring resource costs and time. The amount of electricity and other related costs associated with a government employee finding information adds to the cost of dealing with physical documents. Anytime electronic information exists in physical form there are physical and environmental costs. However, if effective content management or search technologies are not used, the cost to the government program in productivity and effectiveness adds up.

The costs associated with finding information in the physical world or a poorly managed technical world can be substantial:

*The Cost to Find Information Effects Productivity and Effectiveness of Government Program:*

| | |
|---|---|
| Number of Employees | **50,000** |
| Average Labor Cost per Employee | **$100,000** |
| Government Workers Searching Intensively for Information or Documentation | **50%** |
| Time Spent Searching | **20%** |
| Cost of Searching for Information or Documentation | **$500,000,000** |

**ECM the Solution to Reducing Paper**

*Population Increases*

The current U.S. population is slightly below 300 million people – up nearly 31 percent in just the past two decades. Further, the U.S. Census Bureau predicts the population growth trend will continue to increase from immigration and birth rates, with the number of residents expected to exceed 335 million by 2020. Notably, states along the border of Mexico have seen an even more dramatic increase in population; California alone adds 400,000 new residents annually. As the nation's population continues to rise, the quantity of citizen information, records and files increases accordingly – presenting yet another information management challenge for state government agencies. The broadening diversity of the population also adds pressure on state agencies to incorporate changing demographic and cultural requirements into the policies and processes by which they provide service to the citizens.

What this means is that service delivery and government programs will continue to be burdened, and if they rely on paper the environmental impact that governments will have will continue to worsen by consuming more resources and causing more environmental damage.

**The Government Operating Environment: The Need to Change for the Environment**

Individual agencies have unique requirements that dictate how they manage information, provide service and execute operations. As a result, for years agencies worked independently in silos, with each agency managing its own specific requirements, information and files. As information management requirements for single agencies presented themselves, the agency would work to address a "quick fix" that met its immediate needs and requirements. However, the model failed to address broader, government wide issues, thereby minimizing economies of scale and reducing collaboration capabilities. This perpetuates the use of physical paper and natural resources to provide government programs.

Despite the benefits of consolidation and collaboration, moving to a more centralized operating model can intimidate employees accustomed to the old environment. The adoption of enterprise-wide systems requires agencies with existing software and solutions to migrate to new platforms – relinquishing a certain level of autonomy and leading some to favor inefficient, non-interoperable systems. While system standardization across government departments can present adoption challenges, the ability to share information at the click of a button and other significant benefits far outweigh the cultural challenges. With standardization and consolidation the impact of paper is drastically reduced even when regional offices need to participate in the implementation.

Without question, standardization is a clear priority for government leadership globally. A survey by the National Association of State Chief Information Officers (NASCIO) found that state consolidation and shared services as a "high priority" for 2006.[1] Further, a study on managing the Information Technology (IT) investment conducted by the National Governor's Association found that "development of an effective IT management structure begins with consolidation and standardization of IT infrastructure functions that are common to, and shared by, agencies across state government (such as purchasing, payroll, email systems, data and voice networks, as well as data centers) and moves toward, as one official put it, "creating a bridge between technology and the business of state government" that allows the CIO to influence and coordinate the development of policy that affects the use of IT to support state agency business processes."[2] These findings also have a tertiary effect in reducing paper use and reducing environmental impact of government programs.

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*[1] National Association of State Chief Information Officers, "NASCIO's Survey on IT Consolidation and Shared Services in the States: A National Assessment," page 2. (2006)*

*[2] National Governors Association, "Issue Brief: Managing the IT Investment: Experiences from State CIOs," page 6. (2005)*

**Business Process Management and ECM – The Information Integrators**

Integrated BPM and ECM solutions offer government opportunities to achieve these key priority areas – unifying content and processes, automating information management, integrating data and delivering information to the right individuals at the right time in order to minimize the impact on the environment and become a "green" government.

By standardizing on a single integrated BPM/ECM platform, all agencies operate in a common information management environment that enables easier sharing and exchange of electronic information – critical in today's government operating environment characterized by inter-agency collaboration and electronic records. Electronic files and content can be shared across departments and agencies without the requirement for additional systems integration and physical documents. Furthermore, ECM enables agencies to provide authorized users with immediate access to information and records across departments and to disparate locations – limiting information management costs and increasing operating efficiencies. This will have a large environmental conservation impact for governments.

Moving to electronic files reduces the likelihood of lost or misfiled documents and allows for simultaneous access to a single document by more than one designated user. With files available at the click of a button for designated staff, agencies can dramatically reduce the amount of time a citizen waits for document processing. Governments can store archived files electronically, creating a Web database of any important document in the government program's history. As the population continues to grow, electronic capture and storage offers states the opportunity to save millions of dollars in printing, mail and storage costs. There are many aspects to ECM that drastically reduce the impact on the environment.

By managing and containing information while allowing all relevant stakeholders across governments to access vital information – present and archived – governments can reap a number of noteworthy benefits that include:

***Green Government:*** With all agencies leveraging a single platform, government and the respective agencies can capitalize on economies of scale and reduce use and cost of physical paper and documents. State IT departments can manage enterprise systems for the entire departments, allowing smaller agencies with smaller budgets to "buy-in" – securing access to technology otherwise cost prohibitive for a smaller organization, which reduces storage and handling issues associated with paper.

***Seamless Collaboration:*** As state governments look to develop consolidated, shared ECM infrastructures, many are driven by the requirement to effectively share information within agencies, as well as across departments and between levels of government. While most individual agencies maintain some level of imaging and/or electronic capture solution for filing, these disparate systems do not allow cross-agency access often required to collaborate. For example, a department of justice may have case files on a child support case that a human services department will need to enforce support payments or childcare. By enabling these two separate – but complementary – agencies to share information, each agency (and the state as a whole) saves considerable time and money. Electronic collaboration greatly reduces the need for physical meetings, which drastically reduces green house gas emissions from automobiles and planes needed to transport government workers between offices.

***Efficient Records Management:*** The requirement to manage an increasing quantity of citizen, business and internal records with limited storage space presents another key driver for ECM. All state agencies must comply with federal and state requirements for records management and duration of file retention, with some requirements insisting on hundreds of years of archival material. ECM permits electronic archiving of files, significantly reducing physical storage requirements while enabling regulatory compliance. With the move to electronic records management, information can be found more quickly but also the reliance on short- and long-term storage issues are reduced or eliminated.

***Orders of Magnitude in Value to the Environment:*** Technology has a dependency upon electricity, but we know that software and hardware do not "care" if the electricity comes from "green" sources or "non-renewable" sources. So as governments move to develop and use "green" information management systems, sources of electricity such as wind, solar and even nuclear will have no effect on the technology and the programs it supports. If governments continue to support siloed operations and physical paper use, their ability to deal with environmental impact issues and use of non-renewable energy sources will mean service and operations costs will increase, limiting their ability to function.

**The BPM/ECM Toolkit a rapid method to getting to Green Government**

A robust, fully integrated ECM architecture provides governments with a solid foundation to reap the benefits associated with electronic document and record management. This increases operational efficiency by reducing the number of vendors required to support government, while providing a common, unified foundation for the government. A complete BPM and ECM architecture allows the public sector to develop and maintain one compatible system with all the necessary and integrated components to allow for faster electronic communication, document capture and management.

Specific components of a comprehensive ECM suite that provides the tools required for green deployment include:

*Business Process Management*

BPM creates, manages and enforces a unified process management infrastructure that connects state agency employees, the governor's office and decision-makers to one another and to applications. BPM controls the flow of work throughout an organization by streamlining, automating and optimizing processes. These refinements create the opportunity to save millions of work-hours and free staff to focus on higher-value tasks.

Beyond its individual benefits, BPM works hand-in-hand with ECM solutions to activate content in the state environment. For example, documents can be scanned at one agency site, and then the images can be automatically routed to additional offices via secure communication. Specifically, a department of motor vehicles office in one county can scan identity verification documents as required by the Real ID Act of 2005 and immediately cross-check these materials against the statewide database – and make the documentation immediately available to other DMV offices around the state. Further, state agencies can automatically generate alerts to notify state employees that new material requires attention in their inboxes or case folders. With these documents in hand, workers fuse the new information with data from other sources (also automatically routed to them) to produce targeted recommendations. Once routing and approvals are complete, finished work is then sent to pre-determined recipients in the appropriate offices, based on individual roles – dramatically reducing turnaround time from data input to actionable information.

BPM automates the underlying processes of a government program and eliminates the need for the use, production and handling of physical documentation, either centrally or in regional offices.

*Enterprise Content Management*

ECM improves a state's ability to manage, find and share information. Content management allows all relevant departments and agencies to share and access information from numerous repositories. Further, it federates critical information to provide a single source for content – providing state employees with visibility and access to all the available information, thereby allowing for more accurate and timely management of state activities. With ECM solutions, for example, departments of corrections can share information with the state courts, allowing for improved and rapid response time to prisoners' files and court hearings.

Government systems architects should seek out ECM products that deliver active content – content and documents that actively drive process automation to completion without human intervention. This greatly reduces the need to print or "offload" content into another form. With active content, architects can ensure that processes continue to progress toward task resolution, thereby reducing time, cost and risk. With an integrated content and process foundation, states can respond immediately to events – setting critical processes automatically in motion upon arrival of new data or other parameters, increasing organizational responsiveness and agility.

By being able to scan physical documents and manage information flow in an electronic form, paper can be recycled more quickly and the total use of paper is greatly reduced.

*Records Management*

Records Management (RM) for state governments is critical for information management and mitigating risk associated with the potential for lost or misplaced information. A robust RM capability is a key component of any ECM suite. RM ensures compliance with regulatory, legislative and organizational policies by easily capturing, archiving and retrieving designated records. RM not only allows state organizations to meet records retention requirements, but also provides a means to quickly respond to inquiries, requests from the press and other similar events.

To be truly effective, an RM solution should enforce RM policies at the technology layer, eliminating user-related error by removing the burden of records declaration from the individual. By letting the software system manage creation, storage, usage and eventual destruction of records, states can reduce risk, lower operational costs and improve productivity. State governments should seek RM systems that scale to meet the records management and regulatory compliance needs of the entire state.

Electronic Records Management also minimizes the reliance upon long-term storage facilities, which has benefits to the environment: less electricity and fossil fuels are used.

*Email Management*

Governments increasingly rely on email as the communications tool of choice for rapid information sharing. However, government workers still print e-mail. Without effective management, however, email can quickly become a liability or security issue.

The Email Management (EM) component of an ECM suite automatically indexes and archives email and attachments to a repository – removing any need for the end-user to allocate time and energy to email filing, and therefore, reducing the chance of error along with reducing the end-user workload. Further, states can schedule this action to occur during off-hours or maintenance periods as appropriate to support the states' needs.

An EM system for governments should automate the process of capturing email messages as official records, simplify the retrieval of messages and effectively solve email storage issues. At the same time, it should offer significant opportunities for improving business processes and access to information. Organizational managers must be able to set up rules so that email messages are kept for required periods destroyed when no longer needed and available when it counts.

*Forms Management*

Electronic forms should replace the physical form and do so in a way that end users are comfortable to ensure they do not print e-forms, thereby reducing use of paper.

Forms Management (FM) technologies reduce an organization's paperwork burden by facilitating the design and deployment of electronic forms (e-forms). E-forms speed operations and compress decision-making cycles by transforming cumbersome paperwork into fully interactive documents. E-forms let users view any form, anytime, at any given point in a process. In addition, e-forms support digital signatures and tracking for audit trails to meet regulatory compliance requirements. With e-forms, states can quickly produce formatted messages, reports and other such documents without losing the flexibility of being able to change templates as needed. To a large degree, states can automate tasks such as licensing applications, land records requests, and compensation and benefits requests.

A robust FM solution for state governments must provide data validation that ensures that users fill out forms with the proper data, in the proper format. In addition, lookups must minimize errors by reducing the amount of data that must be entered manually.

**ECM at Work: IBM ECM Streamlines Operations and Improves Information Sharing**

Like many state government departments and agencies across the country, one state government in the Midwest used paper and microfilm-based document management and recordkeeping systems. As a result, the states' agencies faced challenges securing access to state records and other documentation in a timely fashion, as the same documents were often required for use at the same time, by multiple parties, in varying departments and offices. In addition, public access to these materials was nearly impossible considering the difficult-to-view document formats. Environmental concerns such as handling, movement and storage of documents needed to be dealt with.

Rather than implement new systems in each department and agency, the state sought to deploy a single enterprise-wide system to provide access across state departments in the capital and remote facilities. The state desired an imaging and content management solution capable of providing enterprise-wide access on a common infrastructure. Additionally, the agency responsible for the delivery of IT services to all state agencies wanted to leverage the combined purchasing power of all state departments and agencies to make the solution more affordable for smaller agencies with lower budgets.

Today, the IBM ECM solutions operate at many state agencies, including the Office of Public Instruction, Boards of Housing and Investments, as well as the Departments of Labor, Corrections, Justice and Natural Resources. The system enables state agencies to streamline internal processes, efficiently manage content and improve citizen service – automating previously tedious, time-consuming, paper-based processes using business process management. For example, IBM FileNet electronic forms and business process management solutions helped improve the Department of Corrections Inmate Grievance Program by putting business processes in place to automate grievance routing to appropriate personnel for resolution.

Additionally, a Midwest state's IT department is working to extend the availability of its IBM ECM platform to county and municipal government agencies across the entire state. As these organizations come online, document sharing across all levels of government will significantly improve, increasing efficiencies for collaborating agencies such as the state Department of Justice and local police jurisdictions.

**Why IBM ECM for Green Government? No Paper!**

Today, more than 1,300 government organizations at all levels, in more than 80 countries worldwide, use IBM ECM solutions to streamline and automate business processes, connect with information systems, as well as access and manage content enterprise-wide – and eliminate paper.

IBM's BPM and ECM solutions are built on a reliable, scalable and highly-available enterprise platform that integrates content and business processes across individual organizations and inter-connected communities. Key benefits include:

***Improved Foundation to Manage Risk and Ensure Compliance:*** Controlling the use of, and access to, information, IBM ECM enables state agencies to protect and authorize content access as dictated by authorization level, individual identity or role. Further, by utilizing the advanced security, comprehensive auditing, events, lifecycle management and workflow capabilities of IBM ECM, agencies can comply with federal and state recordkeeping requirements, at the same time reducing the cost of paper use and consumption.

***Increased Agility and Responsiveness:*** IBM's content technologies manage a full range of structured and unstructured data, processes and information securely and reliably. An object-oriented metadata repository provides maximum flexibility in setting up document and folder classes, as well as content storage options. This service provides state agencies with the agility they need to adapt to a constantly evolving operating environment in real time, offering the tools necessary to manage the continuous influx of large amounts of citizen data. As environmental concerns increase governments will better able to continue to comply and effect the environment less.

***Broad Range of Integration Options:*** The IBM ECM platform provides a powerful set of capabilities for integrating with desktop and packaged applications, content repositories and legacy systems – enabling state agencies to communicate with one another, regardless of installed platforms or individual application requirements.

***Unparalleled Support for Storage Media Types and Vendors:*** IBM ECM supports the leading storage vendors in the industry and a comprehensive range of both hardware and software offerings over all popular media types. This allows maximum flexibility when choosing the best-fit storage solution and lowered data storage costs – regardless of the quantity or type of data. Both rewritable and write-once technologies are supported for magnetic disk, optical and magnetic tape media and overall relevant storage networking topologies, including SAN, NAS and iSCSI. The intelligent use of storage means less electricity and floor space is used within a government program

## Conclusion

An enterprise-wide integrated BPM/ECM system offers governments an opportunity to become more effective, efficient and collaborative – while eliminating processes and paper that will have negative effects upon the environment. By arming themselves with best available knowledge and leveraging leading-edge BPM/ECM solutions, analysts, operators and policy-makers will gain a more holistic view of the decision-making environment – a first step to success in becoming more environmentally friendly.

## About IBM ECM

IBM's Enterprise Content Management software operation enables the world's top companies to make better decisions, faster. As the market leader in content, process and compliance software, IBM ECM delivers a broad set of mission-critical solutions that help solve today's most difficult business challenges: managing unstructured content, optimizing business processes and helping satisfy complex compliance requirements through an integrated information infrastructure. More than 13,000 global companies, organizations and governments rely on IBM ECM to improve performance and remain competitive through innovation.



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