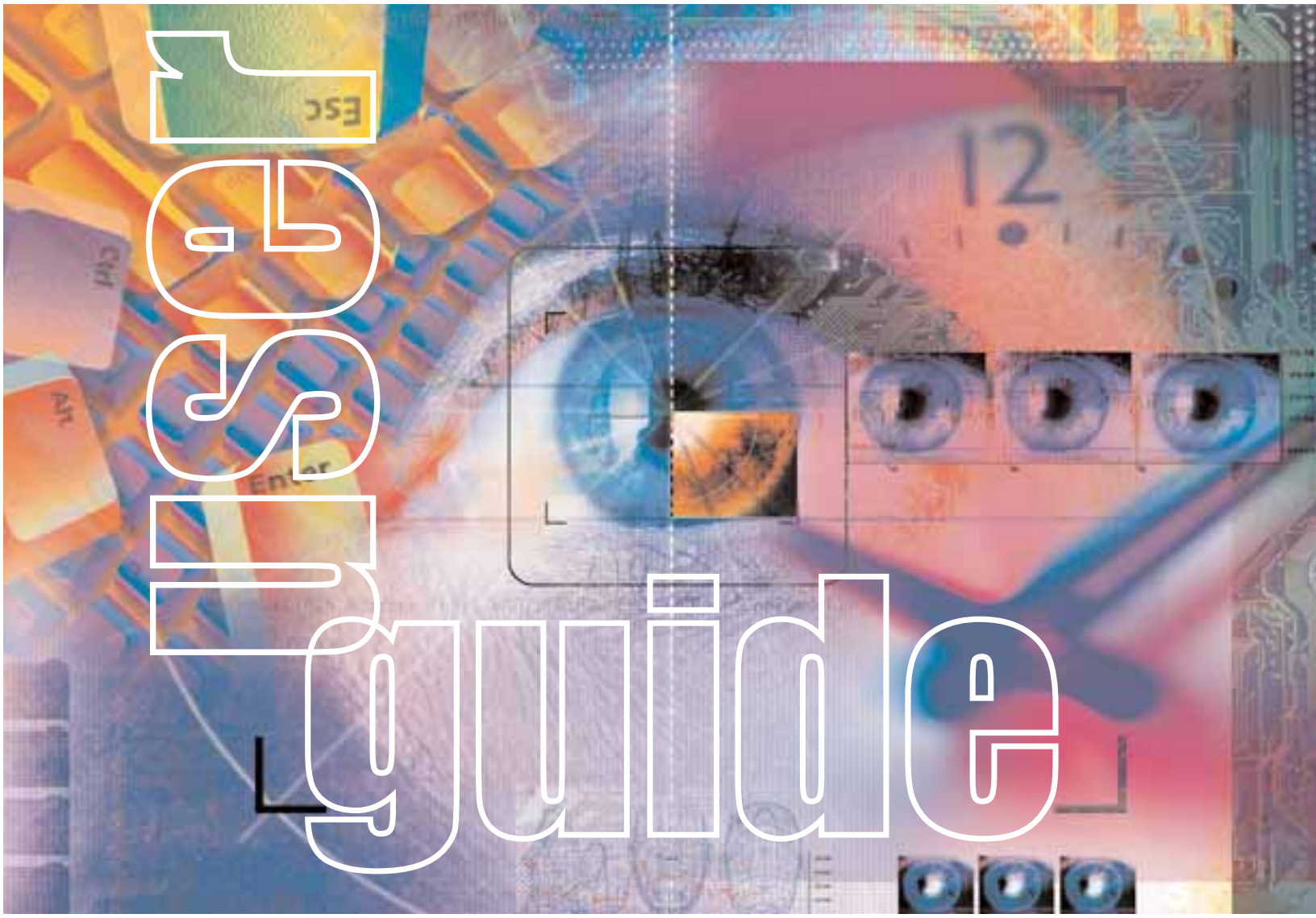
AIIM User Guide

Document and Content Output and Presentation



Authored by Strategy Partners

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The Enterprise Content Management Association

Document and Content Output and Presentation

An AIIM User Guide
By Strategy Partners

This is one in a series of User Guides from AIIM International. They are intended to educate and inform readers on a variety of enterprise content management topics.

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Document and Content Output and Presentation

Document and Content Output and Presentation systems are fundamental to Information Technology. They provide a cost-effective, accurate, and operationally simple mechanism to deliver structured and unstructured documents from data processing and document and content repositories to people in the most appropriate format. They offer the capability to improve the presentation of the content, format it for the particular viewing device, and present the brand image of the sender.

Without effective output and presentation of documents and/or their content, information-based processes starve and die. Although many data and document systems are functionally capable, most focus on information creation and management and tend to overlook the capabilities to print, display, format, and present their output—the features that enable the usability of the stored information. How user organizations transfer business information makes a key contribution to the overall success of the organization.

Document and Content Output and Presentation has come of age. The core technologies have developed from printers, microfilm, optical disks, indexing and viewing software and hardware, Web delivery mechanisms, and advanced print spool formats, such as AFP, Metacode, PCL, Postscript, and others. They are mature and the understanding of how to deploy them effectively is well developed. Systems utilizing these technologies have developed a strong reputation for delivering operational value and a pragmatic return on investment, as well as for equipping the organization to face the vision of e-commerce.

This User Guide sets out to explain in straightforward terms how Document and Content Output and Presentation works, where and how it delivers real benefit to organizations, and the key current and emerging applications and technologies that make it an investment for the future as well as for the present.

Applications outside the scope of Document and Content Output and Presentation as discussed in this User Guide are:

- Paper printing of low volume, unstructured documents, e.g., personal printing
- Graphic arts and high volume magazine or newspaper production
- Storage systems and systems management components such as file compression and back up

Document and Content Output and Presentation: What Is It?

Origins

Document and Content Output and Presentation (Document Output, for short) can trace its origins to printers and the software to control them. Early data processing and accounting systems tended to deploy batch programs that produced large amounts of printed paper output as a way of reporting the results of their calculations and presenting it to human users. Usability of the information depended on having access to the latest copy of the printout, being able to find the relevant page, and being able to understand and interpret it.

Early Document Output systems simply replaced the output from printers with a better archive medium, either film (called Computer Output to Microfilm, or COM, in the 1980s) or optical disk based archives (Computer Output to Laser Disk, or COLD, in the 1990s). Both approaches were configured to accept the data streams written for printers and decode them so that the information could be saved to the new storage medium, such as microfilm or optical disk, often without having to make any changes to the host application.

The major advantages of this approach were:

- Improved speed and ease of access. A printout can only be viewed by one person at a time, is physically bulky, and users can have difficulty locating the right page for the required data.
- Ability to make a query at any time without having to wait for the host system to run a new report.
- Cost savings on paper and storage space.
- Increased availability of the information to unconnected users from storing the information on a system other than the originating or host system.
- Ability to extract and manipulate the information without altering the host application.
- Back-up and security. Microfilm lasts for hundreds of years and can be read by humans using a light and a lens, unlike floppy disks that last only 10 years which require a computing infrastructure that is already obsolete and rarely available.
- Ability to query data from numerous disparate systems at the same time, such as from an accounting system and a payroll system, and comparing and collating the results.

As the early Document Output systems became more mature, additional capabilities evolved:

- Extracting the variable content from the fixed form and reconstructing it at viewing time. Storage costs are further reduced as fixed form data is only saved once.
- Indexing the information to allow querying and selective output of query results. By using metadata or indexing fields, invoices, for example, could be retrieved by invoice number, date, amount, author, supplier name, location, or product code. Previously, this would have required multiple outputs or copious manual searching of paper printouts.
- Generating pre-formatted management reports without laborious data extraction and reformatting.
- Providing real-time access across networks to numerous geographic locations.
- Increasing security and backup of the key data in readily retrievable, low volume storage.
- Viewing data on PC screens, not just systems-specific terminals.
- Delivering output across new viewing mechanisms such as Internet browsers, PDAs, and mobile phones.

Today's Document Output systems can be seen as direct developments of the need to minimize the costs of storing, printing, and viewing large volumes of paper. They now comprise functions that go beyond the original paper replacement goals to extract only the relevant information, store it in the most appropriate and economical format, formatted for user understanding and readability, and available for access via multiple touch-points—paper, desktop computer, mobile phone, PDA, Web, etc.

Functional Overview

The Document Output value chain (see Figure 1 below) commences with the data, transactions, and documents held in corporate information systems. This data and these documents can be exploited if the parts relevant to specific types of users are made available securely and cost-effectively in the most appropriate format. In practice, the success and value of Document Output depends on:

- the format of the information,
- the way the information is stored,
- the value of the information to the users and their roles,
- the way the information is presented and displayed, and
- the management of the process of Document Output, including the economics of each stage, optimized to exploit economies of scale, new technologies, and devices.

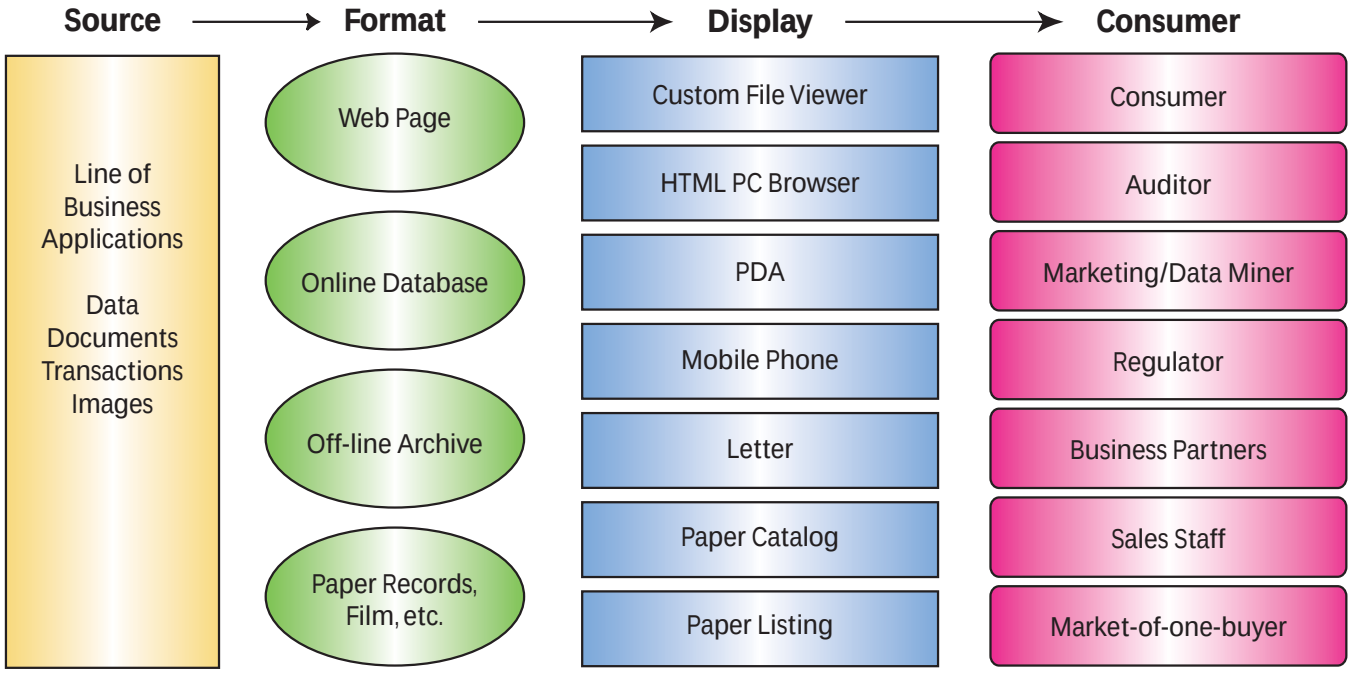

Figure 1: Document Output Value Chain

The Format and Storage of the Information

Document Output systems were originally developed to manage large volumes of structured repetitive documents such as bank statements, utility bills, and invoices. The content of these usually can be divided into a fixed data stream and some variable fields.

The fixed data stream consists of the basic form and fixed fields, such as name of the originating company, logos, and location details, which change rarely. The variable fields, such as customer details and transactions, are usually listed by event or by day, and by amount and item description, which change for each unique document or data set.

By storing and handling the fixed parts of the form and the variable parts separately, the system can compress the information into smaller files, and still recreate the complete document when required by merging the fixed and variable parts, which can then be printed and viewed as if they were a single file.

Examples of formats that lend themselves to the separation of fixed and variable data include:

- Bank statements, credit card statements, utility bills, telephone calls, and bills.
- Invoices, bills of sale, human resources and payroll records, attendance and contribution records.
- Tax records, immigration records, social security and sickness benefits, insurance claim details, and pension contributions.
- Customer correspondence taken from back office processing systems for insurance, banking, government, utilities, telecommunications, manufacturing, or accounting systems.

The format of stored information impacts factors other than file size. Examples include:

- **Security and backup.** Online access via networks or the Internet can provide better security controls and data backup can be an automated process not dependent on individual users. Paper can be a temporary medium for users who prefer to read and assimilate information in print.
- **Retrieval speed.** Storage economics are usually inverse to retrieval speed. Optical disks can provide a highly compact storage medium for very high volumes; magnetic storage can provide very high speed access for online queries; and microfilm can provide ageless, secure, and economical archiving for rarely retrieved files.
- **Off-line accessibility.** Properly stored and indexed, the data stream can be exported or downloaded for offline viewing analysis, and manipulation, which provides commercial separation and saves clogging up on lone disk space.

Although early document systems tended to be optimized for highly structured and repetitive information, Document Output has been extended to include:

- Email archiving and retrieval, including attachments.
- Manufacturing data, such as batch records, configuration,

and parts lists.

- Stock transactions and trading records.
- Call center telephone calls.
- Customer correspondence systems of outgoing letters, emails, faxes, and telephone calls.
- Online commercial trades and transactions, on Internet B2B and B2C market places, routinely stored and mined to ensure regulatory compliance and enable fraud detection.
- Complex financial documents such as pension plans, investment plans, and regulatory submissions in financial, pharmaceutical, and manufacturing applications.

The Value to the Users and Their Roles

The value of Document Output is increased significantly if the role of the user is taken into consideration. Users have different levels of skill in understanding documents and different preferences as to language, paper size, viewing method, and levels of security. These can and should be taken into account so that the same information can be presented in ways to suit each audience.

For example, different users could have these different output requirements for a credit card statement:

- For the consumer, or the owner of the credit card, the preferred statement might be paper. The statement data can be presented as a list and also sorted by transaction type, such as travel, restaurants, and car expenses. The owner and bill payer might also like to know what special offers or discounts or loyalty points are available, be informed about other banking products, or receive information on extending the available loan amount. The format of the printed statement might be generated by a mainframe application in AFP format and printed on special paper at a contract printing business local to the consumer to minimize postage costs. Lastly, the consumer may prefer the content to be on a different size of paper if based overseas, or even a different language, so the same content would need to be reformatted to reflect those preferences.
- Some consumers do not want to store all their old credit card statements in the metaphorical "shoe box" and want easy access to historical information. They prefer to see their balances on a secure online website, and welcome trending information supplied to help them track their expenditures. This content would also come from a mainframe or large UNIX or Windows server and would need to be output to a browser in HTML. It would be sent out via secure Web servers and presented in colorful formats to make it easy to understand, with buttons and advertisements inserted into the HTML stream to explain how to request other services and products.
- For the bank tellers who need to respond immediately to a consumer standing at the branch counter, the best format would be an online request from a terminal connected directly to the host to provide up-to-the-minute account information.
- Call center service personnel also need to retrieve the information quickly so that a real-time response can be made to a customer on the phone. In addition to account data, records of previous contact or correspondence with the customer also need to be easily viewed so the query can be resolved without delay or passing the customer to another party.
- The bank product development staff want to have detailed account data aggregated in a way that would could help determine if the consumer might be better suited to another sort of card or be a good prospect for other banking products, which can be advertised on future statements. For example, if it can be ascertained from transactions that the consumer likes to go skiing every January, it might be valuable to offer travel and accident insurance in November.
- To the bank security staff, the contents might be mined to detect unusual spending patterns that might indicate some sort of fraudulent use of the card.
- The banking financial regulator might want to see data by branch to confirm that processing and selling procedures are being correctly followed.
- To the printing and shipping staff, the statement might be part of a collection of information to be sent to the consumer; automated collation of all the documents into one package would avoid the sending of separate mailings that all need envelopes, address labels, stamps, sorting, and handling. Savings in printing and shipping could be also be made by directing output electronically to a printer local to the consumer, rather than mailing from a central location.

The Way Information Is Presented and Displayed

Early systems basically replaced the "green bar" paper listings of accounts and invoices. Now, Document Output can be configured to present information in multiple formats and to match the user's preferences, display device, and connection

bandwidth. Examples include:

- **Browser access.** The ubiquitous Internet browser, run on a PC, is so readily available that most systems can take information presented in proprietary formats and convert it into HTML so that the browser can display structured data, photographs, print streams, and multi-lingual character sets.
- **Proprietary viewers.** The best-known proprietary document-viewing format is Adobe Acrobat®. It has achieved widespread use because it is hardware independent, secure in most applications, provides a very high quality of reproduction, and the viewer is free from Adobe Systems Inc.
- **Specialist viewers.** Although text and basic images are straightforward, more advanced formats, such as x-ray images, engineering drawings, geophysical maps, and three dimensional models, require special viewers.
- **Mobile phones** are increasingly capable, with richer displays and faster connections. Information previously stuck in head offices can be made available to roaming workers. In most cases, though a query result must be short and simple, and sending several pages of complex images would not be suitable even on the latest phone technology.
- **Personal Digital Assistants (PDAs)** are becoming as powerful as laptop computers, although their display size means that documents need to be re-formatted from full size originals.
- **Most paper catalogs** have "stickiness" that website managers only dream of, so many companies are seeking to put their catalog online and make it even more rich and robust than the paper version. Online catalogs are not just for retail consumer products; they are rapidly being used for B2B goods like chemicals and equipment.
- **Paper**, though much maligned as a format, is still the preferred medium of many business customers and is unlikely to be substituted in many physical transactions such as receipts, order notes, shipping documents, etc. Yet while customers prefer to receive and read documents on paper, the businesses need to store the information electronically to lower physical storage size, increase security, and enable faster location, access, and communication.
- **Long-term media**, including optical disks, tapes, and microfilm, can be connected to receive automatic copies of key documents for storage and archival purposes. It will be years, however, before significant legal documents such as house deeds, wills, and some government papers are entirely acceptable at all stages of their lifecycle in just digital formats.

Managing the Process of Document Output

At each stage of the process described above, the management challenge is to be able to maximize effectiveness, ensure predictability, increase value, and lower costs. In practice, this can occur through a variety of methods, including:

- Controlling print and document handling costs.
- Controlling postage costs, so that all items to be sent to a single location can be collated into the same package, or printed at remote sites to minimize physical transport costs.
- Adding value at display, such as presenting trending information that makes it easy for the bill payer to see how much they spent last year or just on one area (e.g., clothes, holidays etc.).
- Reformatting to enable presentation on a different display device, such as a mobile phone or PDA.
- Maintaining security and user profiles of access to information and results of queries.
- Optimizing for storage, so that information most likely to be used is stored on accessible media and rarely retrieved information is stored off-line.
- Providing tools to extract and query data (e.g., cut and paste into a spreadsheet to enable further analysis to be carried out).
- Adding variable data depending on the profile of the user or the market—called personalization—e.g., special offers, cross-selling, etc.

Why/Where Is Output and Presentation Important?

Document and Content Output and Presentation are critical in paper or content intensive applications. These include such diverse areas as Customer Relationship Management (CRM), employee payroll, and travel reservations. Some of the most common examples are described below.

Horizontal Applications

- **Accounts Payable** is a notorious paper chase for both bill payers and invoicing companies due especially to volume and need for timeliness. Document Output systems that can deliver the invoice to the correct parties, manage the process of it being signed off and approved, and connect to electronic funds transfer systems can reduce the overall transaction times to minutes. In the old days, purchasers

of raw materials and services that asked for lower product prices in return for prompt payment were often greeted with the statement that "It takes weeks to get the invoice processed in our company." Companies that can actually pay bills in days gain major advantages in purchase costs.

- **Purchasing systems** in the old days consisted of a short order and a long purchasing contract with numerous caveats and conditions, which was written by lawyers for lawyers, and "caveat emptor" (buyer beware) was the watchword. Modern approaches integrate purchase requirements and select the most appropriate legal contract clauses that apply, reflecting the goods purchased, liabilities, geographic jurisdiction, and aim to inform. Word processing macros that many companies used to drive template and boilerplate documents are becoming increasingly obsolete as output systems increase their capabilities.
- **Customer communications** used to be boring and routine and about printing, but Document Output systems can integrate paper correspondence with electronic communications, advertisements, and personalized call center campaigns. Simple metrics such as the number of phone calls it takes to make a travel booking or query an invoice can be reflected in cost savings and customer churn. Although many IT departments have been distracted by CRM components that do wonders for the sales force and little for customers, Document Output applications add value where it matters most—in the customer's face.
- **Human resources** are another back-office function involving a paper chase where secure, correct, and readable output is critical. Few organizations can afford days of delay or errors in informing employees about their benefits and terms and conditions, and paper-based approaches are slow and can be costly. Modern Document Output approaches collate stored documents containing procedures and can merge them with actuarial and payroll systems to calculate benefits. These can form complete automatically generated secure correspondence, which can be transferred and recorded through the most appropriate medium.

Vertical Applications

- **Banks** were the earliest and are still the largest users of Document Output systems, generating statements for checking and savings accounts, credit cards, stock brokerage accounts, and investment portfolios, all of which combine structured data with personal information.
- **Insurance** companies are using Document Output systems to generate and distribute insurance policy proposals, certificates, and customer information to sales channels, consumers, and regulators. If consumers can "read the envelope without opening it," insurance companies are unlikely to be able to cross-sell products or sell advanced products.
- **Telecommunication** companies make extensive use of Document Output systems for telephone bill statement generation, in both paper and online. Often the only way to brand a commodity service such as telephone rental is by differentiating the customer service aspect, so the presentation of bills and their ease of use is a critical component.
- **Utility** companies have realized that the costs of billing and revenue collection are their core competencies, so they use Document Output systems to combine bills for telephone, gas, water, cable television, etc. Such multi-payment approaches lower costs by aggregating collection, enabling promotional offers, and exploiting credit histories.
- **Governments** in North America and Europe are embracing the opportunities that the Internet can bring to provide more relevant and easier access to information. Good progress is being made in taxation and immigration systems in terms of making information available, but much of the outgoing communication for Government to Citizen (G2C) is still paper-based, and rarely stands in comparison with its commercial equivalent in terms of ease of reading or appearance. Many techniques developed by phone companies and consumer products could be copied to make citizen benefits and services more attractive and to make citizens aware of their rights, responsibilities, and the value of their contributions to the tax revenue. Government tax statements look like any other bill, but more boring. Document Output systems can make them easier to understand and pay, even if they are unlikable. More recent applications include the need to keep track of large financial regulations to defeat accountancy fraud.
- **Manufacturing** companies are required by increasing product liability laws to keep large amounts of data concerning the configuration parameters and ingredients of products, especially high volume consumer products including food, drugs, electronic devices, and transportation systems. Document Output systems can store this data long after the host systems have become obsolete and present it for later analysis.

- **Retail** companies are driving new approaches to Document Output as they seek to combine paper and electronic catalogs and merchandizing. The Internet provides a cheap, accessible way to provide information on thousands of products to potentially millions of new purchasers. In practice, simply managing product information of hundreds of fast-changing products is non-trivial, and too much price transparency is not always a good thing. Few websites have the stickiness of a good thick holiday brochure or catalog, but Document Output systems are making major strides in producing the most up to date and relevant "market-of-one" catalog, even if the objective is to make sure the customer never pays the lowest price.
- **Travel and transportation** sectors produce large volumes of traffic and ticketing data that need to be sorted, analyzed, consolidated, and output to numerous users. Although airline tickets are increasingly electronic, paper-based approaches are still dominant and the resulting trends provide the basis for most transportation systems, whose core competence is matching resources to passengers.

How Document Output and Presentation Relates to ERP Applications

Applications such as SAP, Baan, Oracle Financials, and others generate huge amounts of data records, and consume large storage volumes—which make disk manufacturers and their sales staff very happy about 12 months after system implementation, because many need to buy more disks at around that time.

Document Output systems offer the capability to transfer large amounts of historical operational data off the host online system to the Document Output system. This stops the host system disks from getting filled and provides additional commercial and security separation. The data can then be accessed, queried, extracted for further analysis, put into tables, and merged with other data to increase understanding of the transactions, identify trends, and increase business intelligence.

Many large commercial systems have specific output formats that Document Output systems are optimized to handle. All printers receive streams of data, which can be interpreted by the receiving device to control hardware settings, particularly where to place ink. These same data streams can be used by other applications, including Document Output systems, to recreate the content and structure of the information for purposes other than printing. Some of the most common formats are:

- **AFP** (Advanced Function Printing, now Presentation), a family of IBM-defined protocols in use since the 1980s to structure the print streams used by all its computers, including mainframe, AS/400, UNIX and other servers, workstations, and printers. As mainframes were widely adopted by large banks and utility companies, the AFP formats have been also been widely used in other environments, and form the basis of many Document Output systems.
- **Xerox Metacode**, the generic name given to point stream for large high volume Xerox printers, which many billing systems use for streaming output.
- **Postscript**, a proprietary format developed by Adobe Systems Inc, which is a page of description language that is widely used in the graphics arts industries and for office computing.
- **PCL** (Print Control Language), the format defined by Hewlett Packard to drive its printers which is widely used for office documents.
- **SAP**, an ERP and enterprise software company that has defined and certified Document Output formats, e.g., BC-XOM and OMS, that users can use to print and store SAP output files.

How Document Output and Presentation Relates to Document Capture Applications

The synergy between systems that capture document content, and those that generate it, is rarely exploited. (For more on the features and benefits of capture systems, see *Document and Content Capture: An AIIM User Guide*.) Much of the correspondence received by companies is in response to paper and other communications that it sent out itself. Companies that understand a significant amount of their incoming communications is a version of what they sent out can gain many benefits by ensuring that Document Output systems generate content that is easy to capture when it is received back.

Controlling the structure and much of the content of both outgoing and incoming communications, allows techniques to be incorporated that enable faster capture, indexing, routing, and collation. These techniques include:

- **Bar codes**, which can be placed on forms sent out so that they can be scanned upon return receipt, quickly capturing key indexing information without costly character recognition or scanning of the entire paper form.
- **Forms systems** that can generate structured and easy to read statements incorporating such features as character and mark recognition, forms removal, field parameter

checking, date fields, and tick boxes, can be used to ensure that capture systems only scan variable fields and use other fields, such as repeated name and address fields, to train handwriting recognition engines. Specific variable fields such as zip or postal codes, invoice amounts, or supplier codes can be easily located and read, increasing indexing accuracy, and avoiding the scanning of all the variable fields.

Best Practices

Strategy Partners research has identified two best practices for Document Output.

- Although Document Output systems can often be justified simply by savings from unnecessary printing and reduced use of paper, the biggest benefits are not in back office costs savings, archiving, or security but are best expressed in terms of customer service.
- Many users start Document Output by purchasing a kit of parts—printers, archiving and viewing systems, and mail sorters—to extend their mailrooms, because that automates what they have always done. A more viable approach for many is not to buy hardware and write a program, but to purchase output services from specialists who can buy and operate more modern equipment more effectively and at lower cost. The business can then focus on their key customers, rather than printers, optical disks, print stream indexing, and Web measurements, which are usually not core activities.

Return on Investment/Total Cost of Ownership

The Value of Output and Presentation

Unlike many IT systems, the value of Document Output systems is often far more in the operational aspects of the system than in the build phase. In conventional IT systems, application development and system building costs are generally greater than ongoing maintenance and consumables costs, yet the reverse is often true for most Document Output systems. Likewise, the benefits for Document Output systems revolves around the value of documents and the operational processes they support. Return on investment evaluations should consider:

Operational ongoing cost savings including:

- Paper saving and related reduction of consumables, particularly if online access is granted to documents that were previously printed.
- Postage and other transportation costs that can be directly reduced by providing access to online systems or by collating correspondence into single instead of multiple shipments.
- Quantifiable facilities and space cost savings, such as reduced city-center office space used for paper filing cabinets when documents are stored on microfilm, optical, or magnetic disks.
- Indirect savings can occur by increasing the speed of the business cycle—or "business velocity"—such as giving customer service staff access to customer correspondence on call center screens, so that requests can be handled in minutes while the customer is on the telephone.
- Branding can be emphasized. Many holders of bank accounts rarely visit their banks so the only contact they have is with written correspondence. Old fashioned typed form letters may have been the norm years ago, but a personalized look and feel using modern color printing makes even the most boring document easier to read, and provides an opportunity to up-sell and cross-sell other products.
- Customer fulfillment can be enhanced, such as shipping the product as well as the receipt or other documentation, in one transaction rather than a series.
- Business survival is supported in the areas of compliance and in customer service. For example, providing timely evidence concerning safety certificates, tickets used, financial assets transferred, and other mission critical documentation can make the difference between continuing in business, being shut down by the regulator, or as some are finding out, spending time in the penitentiary.

What Is Changing Now and Over the Next 12-24 Months?

The current IT recession is promoting an attitude to investment that is more about reducing costs and less about an e-commerce vision. Document Output systems have come of age, because they are more about lowering easily-measured operational costs than building a new Internet ivory tower that cannot be easily quantified and rarely impacts operations quickly (if ever). Market and technical features of Document Output that are changing in the next one to two years include:

- Integrated components so that output systems can handle multiple print stream formats, provide process management capabilities for adding personalization, and deliver output to multiple devices. Single function components are becoming increasingly difficult to justify, as their integration costs can be too great over the lifetime of a system.

- Many service providers originated by being good at doing one thing, e.g., high volume printing. Most providers now offer integrated services that include scanning, data entry, paper archiving, secure payment, and call centers, combined.
- Paying bills by mobile phones is not theory; it is becoming commonplace. Most users can call up and find out the status of their phone bill, and increasingly other bills can be inquired about and paid by the same mechanism. The marketplace barriers are largely limited to user familiarity and trust, not the technology. Substitute a mobile phone with the storage display and processing capabilities of PDAs and hand held accounts are a reality, not a dream.
- Junk mail is the curse of modern mailboxes, and the amount of paper mail sent to "Resident" or not even addressed to an individual is still astronomical. Personalization techniques not only identify the location of bill payers and buyers, they optimize the contents of the Document Output.
- Electronic Document Output brings new formats and ideas, including sound branding. Just as all companies have a letterhead and logos, digital documents present new options and the potential for innovation in sound and displays to encourage familiarity and branding. Everyone knows the sound of "Intel Inside" and the theme from ET®. Your best clients know your logo on your letters and website. What does your company sound like?

How Do You Buy It?

Software vs. Solutions vs. Process Outsourcing

As discussed above, the value of Document Output can vary based on the user's goals. Is the primary goal printing cost savings, improved customer service, or personalized marketing? This variety in potential benefits makes the choice of partners and solutions channels take on a particular importance. Strategy Partners' research indicates that suppliers for Document Output split into five major types:

Software Vendors

Many Document Output component vendors sell directly to IT departments and end-users as well as through a combination of delivery channels (see below). When selling components directly, they rarely take responsibility for the final system, including associated hardware, software, and support. Many component vendors sell one of the following three types of output systems:

- **Format-centric**, i.e., optimized to manage the data stream output from an IBM mainframe or from SAP R/3 or other accounting packages.
- **Process-centric**, which generate value by enabling systems to add business logic at the output stage, such as special offers, discounts, or personalized presentation.
- **Application-centric** and optimized for specific sectors, e.g., generating insurance proposals, electronic bill presentment for utilities, or printing regulatory submission for pharmaceuticals companies.

In the next three years, software vendors are expected to combine components to make sales more cost-effective; so expect to see document capture, process, storage, format transfer, output, personalization, and multi-viewing systems combined and pre-integrated.

Generalist Integrators

All systems require Document Output, but paradoxically few generalist system integrators specialize in these functions. Generalists tend to focus on bid dynamics and change management in very large project deployments. In general, they lead and prime major government and/or international contracts and tend to bring in specialists to carry out the specific Document Output aspects.

Specialist Integrators/Solutions Providers

Specialist solutions providers operate in specific applications, vertical market areas, or geographic regions. They seek to deliver whole solutions to their core market. Such solutions tend to have Document Output as an important, but not overriding component within the overall solutions offered. Examples include retail marketing, print and direct mail (mailshot) optimization, and brokerage or insurance contract generation.

Value Added Resellers

These resellers take component products and build and configure them into specific applications.

Specialist Outsourcers and Application Service Providers

These exist at three main levels:

- **Document Print Bureaus**
  These offer functional services that are sold on price, speed/reliability, and geographic location and reach.
- **Managed Services Providers (MSP)**
  MSPs set out to deliver documents, data, and processes into some part(s) of a business process. As an example, they may handle all the credit card statements or utility

bills. Other examples include document hosting and electronic bill printing and presentment services. This business model works best where there are replicable services solutions that drive down the cost through economies of scale and where there is an opportunity to implement an annuity or "pay per click" pricing model.

- **Business Process Outsourcers (BPO)**

  The key difference between BPO providers and MSPs is their emphasis on business outcome rather than technical or functional output. For example, sending out an invoice is a functional output typically performed by an MSP. Handling the accounts receivable process on behalf of a client is a business outcome that a BPO would take on. The information systems approach is largely the same; the difference lies in the level of understanding the provider has of its client's business and the value of the outcome to the client.

  Emerging areas for this level of service are to be found in utility bill presentment and payment—with the provider being compensated on revenue gained rather than numbers of claims processed—and in campaign management and direct mail (mail-shot) production, where the business metric might be based around levels of sales generated, rather than pieces of paper printed and shipped or replies garnered.

How to Plan for the Future

Some key guidelines:

- Do not forget to plan for Document Output when planning and purchasing new systems. Just like printers, output rarely appears on IT strategy documents, but consumes considerable resources. Operationally, it is where most of the money goes over the lifetime of a major customer service system and can far exceed the cost of systems development.
- Investigate services as well as products. Unless you have existing systems, skilled staff, and the regular throughput to justify the cost of major capital items, purchased services can offer greater flexibility and return on investment.

Summary

Document and Content Output and Presentation is a critical set of technologies and disciplines that:

- Brings the value of your enterprise content management systems into the face of the user.
- Presents the brand and capability of your company to suppliers and clients.
- Provides an opportunity to inform and impress in ways that back-office systems never will.
- Delivers explicit measurable bottom line benefits in a wide variety of business cases.

Document and Content Output is not just about print stream formats and archiving. Today, the technologies and the business environment have reached the point where Document and Content Output can play a real role in front line mission-critical business processes and lowered operational costs.

Precisely how users source implementation and fulfillment services depends on their goals and organizational culture. As the technologies mature and become commodities, many users prefer to purchase an ongoing service that enables them to focus on core business functions and still take advantage of the increasingly capable Document and Content Output and Presentation systems.

Glossary of Terms

AFP

Advanced Function Printing (later used for Advanced Function Presentation) An IBM-defined print stream format.

B2B/B2C/G2C

Business to Business / Business to Consumer / Government to Citizen Segments of Internet-inspired markets.

Browser

A program that allows you to receive HTML stream and thus access the Web.

COLD

Computer Output to Laser Disk. A set of technologies that take the output from mainframe and other systems, originally designed for printers, and store, index, and compress it on optical laser disks so that it can extracted and viewed electronically.

COM

Computer Output to Microfilm. A document output technology developed in the 1960s that enables print streams to be written directly to microfilm, offering high integrity, low cost, and low space long term storage.

CRM

Customer Relationship Management. The processes by which an organization attracts and retains prospective customers, leveraging an initial transaction via knowledge of their requirements into a long-term, ongoing transactional relationship to the financial good of the organization.

DMS

Document Management System. Term often used to refer to a document repository system (see below). In this report we are using the more precise term of document repository.

Document Repository

Software system to manage sets of electronic documents with specific functionality to control the check-in and check-out of material, provide look-up against defined attributes, and control versions of the documents.

EBP(P)

Electronic Bill Presentment (and Payment). The processes around delivering invoice information to customers in digital format and providing facilities for electronic payment of the same.

PCL

Print Control Language. A print stream protocol developed by Hewlett Packard.

Portable Document format (PDF)

A proprietary file format owned and defined by Adobe Systems Inc, which is optimized for viewing, securing, and printing files.

Rendition

A version of a file that maintains the same information content as the original but is in a different format, e.g., different file type, language, or appearance.

Renditioning

Delivering the output in the format demanded by the user, the application, or the delivery technology, e.g., printer, PDA, website, etc.

Viewer

A software program that runs on a PC that enables files to be viewed on screen without the need for the original generating application to be present or connected.

Xerox Metacode

The format of a print stream intended for Xerox printers.

XML

eXtensible Mark-up Language

An established standard, based on the Standard Generalized Mark-up Language, and designed to facilitate document construction from standard data items. Now being used as a generic data exchange mechanism.

About the Sponsors

Documentum, Inc.

Documentum provides enterprise content management (ECM) solutions that enable organizations to unite the information, tools and teams needed to manage business processes and the various types of content associated with them. With a single platform, Documentum enables people to collaboratively create, manage, deliver and archive the content that drives business operations, from documents and discussions to email, Web pages, records and rich media. Documentum's integrated set of content, compliance and collaboration solutions support the way people work, from initial discussion and planning through design, production, marketing, sales, service and corporate administration.

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The Enterprise Content Management Association

AIIM International is the global authority on enterprise content management (ECM)—the technologies, tools and methods used to capture, manage, store, preserve, and deliver information to support business processes.

AIIM promotes the understanding, adoption, and use of ECM technologies through education, networking, marketing, research, standards, and advocacy programs.

As a neutral and unbiased source of information, AIIM is a non-profit association dedicated to growing the Enterprise Content Management Industry through its:

- **Market Education:** Expand the global market for ECM solutions. Provide educational programs and information services that help users make informed and effective technology decisions and help suppliers better understand user needs and requirements.
- **Networking:** Through chapters, programs, and the Web, create opportunities that expand the global base of users seeking ECM solutions and allow our user, supplier, and channel members to engage and connect with one another.
- **Industry Advocacy:** Through our own efforts and strategic partnerships, become the global voice of the ECM industry in key standards organizations, with the media, and with government decision-makers.

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To become part of the AIIM community by becoming a Professional Member, visit www.aiim.org/join.

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Strategy Partners is an established professional retainer and project-based IT advice business. We deliver independent advice and original market analysis in the key areas of Content Management, Electronic Document Management (EDM), Customer Relationship Management (CRM), Application Integration, Enterprise Resource Planning (ERP) Outsourcing, and Knowledge Management (KM).

As users make investments, we empower them against the vendors to make the technologies 'safe to buy.' We measure, analyze, and understand the purchasing process and know how to speed it up, not slow it down.

In addition, Strategy Partners delivers expert advice to help vendors in formulating and improving their marketing strategies. For the investment community Strategy Partners provides market diligence and acts for organizations seeking Venture Capital. We also work for buyers and sellers in mergers and acquisitions by providing market knowledge and a process to assist in the valuation of businesses.

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Document and Content Output and Presentation

Document and Content Output and Presentation systems are fundamental to Information Technology. They provide a cost-effective, accurate, and operationally simple mechanism to deliver structured and unstructured documents from data processing and document and content repositories to people in the most appropriate format. They offer the capability to improve the presentation of the content, format it for the particular viewing device, and present the brand image of the sender.

This User Guide sets out to explain in straightforward terms how Document and Content Output and Presentation works, where and how it delivers real benefit to organizations, and the key current and emerging applications and technologies that make it an investment for the future as well as for the present.

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