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Market Overview: Document Output Management

by Craig Le Clair

for Information & Knowledge Management Professionals

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Using Software To Help Improve Multichannel Customer Experiences

by Craig Le Clair
with Kyle McNabb and Diana Levitt

EXECUTIVE SUMMARY

Information and knowledge management (I&KM) professionals looking to help line of business owners improve the customer experience increasingly realize the potential that document output management (DOM) has to satisfy their customer experience concerns. While DOM providers rapidly improve their products to help meet output management needs, I&KM professionals find it more and more difficult to segment their structured, interactive, and on-demand requirements and choose supporting products. Document Sciences, Exstream Software, Group 1 Software, and StreamServe, provide proven structured output solutions. Adobe Systems, Exstream, and fast-growing Thunderhead drive innovation in the interactive segment. The emerging on-demand segment includes Adobe, Esker, and Hewlett-Packard (HP). Advances in DOM usability, integration reach, workflow, and enterprise content management (ECM) support will allow information and knowledge mangers to rely on DOM to help improve the customer experience.

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NOTES & RESOURCES

Forrester interviewed several vendor and user companies, including Adobe Systems, Document Sciences, Esker, Exstream Software, GMC Software Technology, Group 1 Software, Hewlett-Packard, Metavante, Skywire Software, StreamServe, and Thunderhead.

Related Research Documents

"Give DOM Its Due"
October 24, 2007

"The Forrester Wave™: Business Process Management For Document Processes, Q3 2007"
July 9, 2007

"Document Processing Services: Options For Information Managers Accelerate And Expand"
March 27, 2007

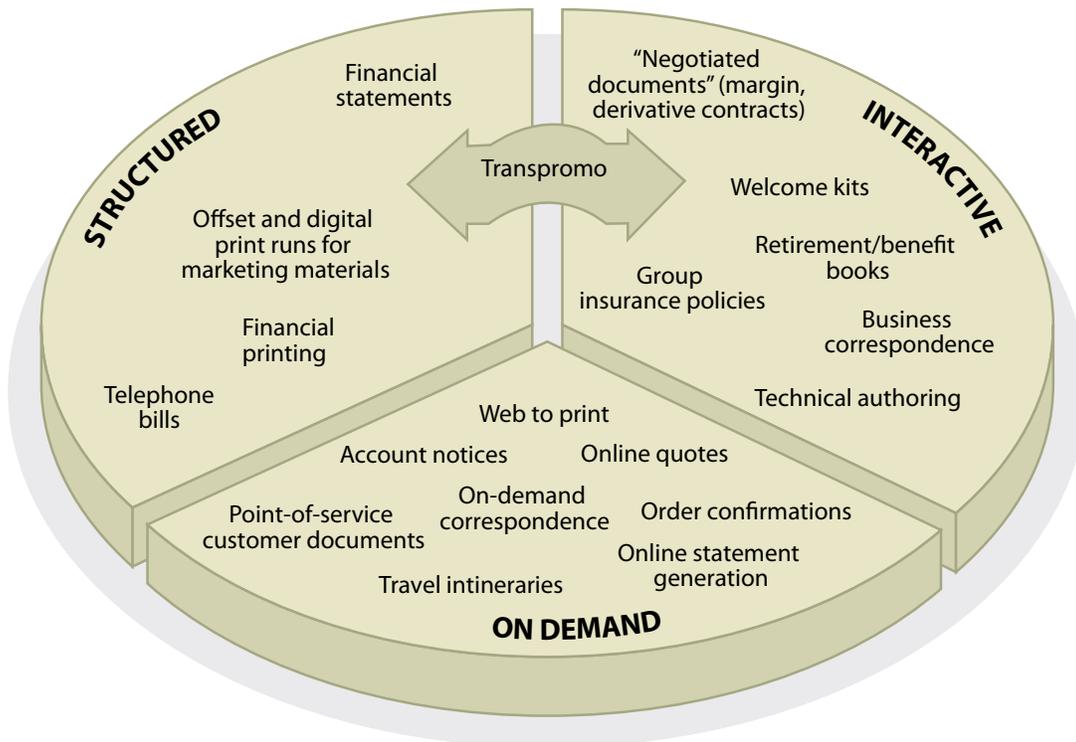## DOM PROVIDERS ENHANCE OFFERINGS TO MEET CUSTOMER EXPERIENCE DEMANDS . . .

Forrester defines DOM as software that creates, formats, personalizes, and distributes content to improve the customer experience. Dividing document output needs into structured, interactive, and on-demand processes can help I&KM professionals get a better handle on their diverse application needs (see Figure 1).[1]

Structured output is scheduled, consistently formatted, and sent as part of a service relationship, much like phone bills and brokerage statements. It also includes batch digital or offset print runs. Interactive output requires the human touch. It often matches variable data about the customer with structured forms or templates, providing a more individualized output — such as customer correspondence and negotiated documents like group insurance policies or derivative and margin contracts.[2] Events from the Web, fax, phone, email, transactional systems, or enterprise applications drive on-demand output. An on-demand event also may be initiated by a human being via a keystroke, as in call center correspondence.

DOM Vendors Shoot For The Enterprise

The DOM vendors Forrester interviewed have enterprise aspirations. Yet enterprise DOM covers a lot of territory, and most enterprises may likely find that they need different technologies to support their interactive needs from what they will put in place to support their structured and on-demand needs. An enterprise DOM software solution must:

Figure 1 DOM Categories And Applications

STRUCTURED
- Financial statements
- Offset and digital print runs for marketing materials
- Financial printing
- Telephone bills

Transpromo

INTERACTIVE
- "Negotiated documents" (margin, derivative contracts)
- Welcome kits
- Retirement/benefit books
- Group insurance policies
- Business correspondence
- Technical authoring

ON DEMAND
- Web to print
- Account notices
- Online quotes
- Point-of-service customer documents
- On-demand correspondence
- Order confirmations
- Online statement generation
- Travel intineraries

43963   Source: Forrester Research, Inc.

- **Support all three document output segments.** Each segment — interactive, on-demand, and structured — has its own unique requirements and use cases. For example, interactive content solutions must support large numbers of users in authoring and production workflows. Structured solutions were built for the print channel, with e-presentment of bills and statements as an afterthought. They must run efficiently in batch mode and have no users. Creating direct marketing material differs greatly from managing the collaboration and workflow for a commercial insurance policy. Platforms comprised of loosely coupled services have a better chance of assembling capabilities for each segment.

- **Start small but grow to meet IT infrastructure requirements.** Ideally, an enterprise product will be acceptable to any IT organization concerned about scalability, application development, security, standards support, and integration with other applications. But any enterprise product must also adapt to meet businesses needs for change control and usability. In addition, DOM applications within a single enterprise will vary in number of users and volume. Any enterprise solution should be able to accommodate both high- and low-volume activity and both a small and large number of users. Structured products today have trouble doing this. For example, implementing a low-volume brokerage statement may cost almost as much as a higher-volume one for some structured solutions. StreamServe, with relatively low implementation cost and incremental pricing models, may be an exception.

- **Handle high-volume structured output needs.** An enterprise solution must support the specialized needs of high-volume structured output production. High-volume print formats like advanced function printing (AFP), integration with back-end systems, post-processing requirements, and tight schedules for mission-critical production will maintain structured output as a specialized area.

. . . BUT ENTERPRISES STRUGGLE TO FOCUS ON THE RIGHT EVALUATION CRITERIA

Forrester has spoken with numerous I&KM professionals at enterprises that collect data based on hundreds of detailed criteria from DOM providers in a RFP process. After months of evaluation, often they still can't tell the main providers apart. Even worse, they struggle to match criteria to their business needs and context.[3]

Approaches Vary For Important Evaluation Criteria

It's not surprising that I&KM professionals — such as business operations managers, general line of business managers, information managers, and information architects — have trouble telling DOM suppliers apart. All claim to be easy to use, to be enterprise-capable, to support XML, and to have strong ECM support. To help I&KM professionals sift through the myriad solutions, we have highlighted criteria in which DOM vendors' approaches differ and that have the most impact on users (see Figure 2):

- **Authoring environments: proprietary or not?** Document design gets done by a diverse range of roles and skills. Structured content — once overseen by IT — now gets input from marketing professionals who, for example, want to insert an image created with Quark into a transpromo statement. Increasingly, line of business staff want to design and update correspondence and negotiated document templates. The wider range of authors argues for standard or de facto authoring environments, such as Microsoft Word or OpenOffice.org for business content, and Adobe InDesign for visual materials.[4] Yet surprisingly, few vendors that Forrester interviewed — Document Sciences and AIA Software — support industry authoring environments from Microsoft or Adobe. Those with proprietary authoring argue that their technology drives greater performance, multichannel presentment, and usability by tailoring authoring to interactive content applications. They argue that working around constraints levied by Microsoft Word leads to decreased productivity while performance and usability suffers. Some providers shoot for the best of both worlds — Exstream and StreamServe, for example. They allow conversion from third-party tools — Microsoft Word or Adobe InDesign — to their platform via plug-ins or conversion scripts.[5] Forrester noted which suppliers were more focused on providing authoring with common third-party tools.

- **Output management print infrastructure support.** Our definition of DOM excludes output management software that is used to improve printer efficiency or that maximizes throughput by balancing document production across printers — such as Solimar System's Print Director Enterprise software. DOM does include post-processing tasks that organize content —for postal efficiency, for example, or grouping documents for print fulfillment. These functions, perhaps the least reviewed by I&KM pros, are critical for structured and interactive DOM applications. In on our assessment of how vendors support these needs, we discovered that some vendors excel in this area. Group 1, for example, has StreamWeaver and a host of other infrastructure DOM tools — not to mention ownership by Pitney Bowes, which provides the print production equipment. StreamServe's Persuasion has a strong post-processing repository that centrally manages output and metadata for efficient production.[6]

- **ECM and business process management (BPM) support.** We expect that DOM — by 2010 — will converge with ECM and leverage vastly improved business process management suites (BPMS) to achieve enterprise-level DOM and meet emerging demands for interactive and on-demand output.[7] EMC, leading this convergence, announced on December 27, 2007, that it had signed a definitive agreement to buy Document Sciences.[8] Interactive applications need ECM integration more than structured applications that generally only integrate with ECM platforms for archival and e-delivery and after the last step in production. Interactive applications require content management — versioning, audit trails, check-in, and checkout — and often needs the use of human-centric BPM to design, execute, monitor, and improve the document process.[9] Vendors take very different approaches to ECM and BPM convergence. Some link with external mature ECM and BPM providers FileNet and EMC; for example, Thunderhead links with IBM and EMC, and Document Sciences partners with EMC.[10] Others, such as Docucorp and Group 1 Software, will improve their own proprietary content repositories. This shift toward convergence will push DOM vendors to link to enterprise-class ECM and BPM offerings.

Figure 2 Evaluation Criteria Explanations

Criterion	Explanation	Structured	Interactive	On-demand
Segment revenue and market share	Relative revenue and market share position of vendor in the structured, interactive, or on-demand segment being evaluated	✕	✕	
Number of high-volume customers	Vendor's installed base of high-volume customers providing structured output	✕		
Output management infrastructure support	Breadth of capabilities that improve printer and fulfillment efficiency such as sorting content for postal savings and preparing content for efficient print production	✕		
Strength in formats and conversions	Breadth and strength of support for converting print streams such as AFP and Metacode, XML content, and other output into XML, HTML, and PDF	✕		
Enterprise DOM potential	The vendor's ability to support all three DOM segments within an enterprise, to start small and grow, and support high-volume structured output	✕	✕	
User empowerment	The product's ability to enable business users make changes to content and information managed by the DOM system	✕		
Ease of application development	The product's capabilities to develop, manage, and integrate structured output by IT and business users	✕	✕	
Breadth of interactive DOM applications	The vendor's range and breadth of solutions (applications, templates, solution guides) to meet an enterprise's interactive content needs		✕	
Multichannel capability	The ability of the DOM system to create and support output for print, email, and Web channels		✕	
Commitment to XML and standards	The vendor's stated and exhibited direction, support, and commitment to XML support		✕	
Strength in ECM/BPM	The product's support for integrating and leveraging content and business processes managed by ECM and BPM systems		✕	
Template management	The ability to store, version, and administer templates		✕	
Marketing services support	The ability to leverage and integrate with marketing automation technologies (e.g., enterprise marketing platforms, customer databases, campaign management, and interaction management)		✕	
Openness/usability of authoring environments	The product's support for industry authoring solutions Microsoft Word and Adobe InDesign		✕	
Inbound/outbound fax, email, e-form support	The product's support for working with inbound and outbound content types to support on-demand applications			✕

43963   Source: Forrester Research, Inc.

Figure 2 Evaluation Criteria Explanations (Cont.)

Breadth of on-demand applications	The range and breadth of solutions (applications, templates, solution guides) to meet an enterprise's interactive content needs			✖
Self-service and rich Internet applications	The product's capabilities to support development of customer self-service Web sites that trigger on-demand events			✖
Message layer, legacy applications, integration support	Openness and ease of integrating with other DOM systems			✖

43963   Source: Forrester Research, Inc.

Interactive And On-Demand Areas Highlight New Evaluation Criteria

Interactive and on-demand content segments introduce several criteria that are important for I&KM professionals to consider. Information and knowledge managers should examine vendors' approach to:

- **Business user empowerment to free scarce, costly IT resources.** Companies Forrester surveyed were very concerned with the ability to allow business users to make changes to the DOM system.[11] Today's DOM products require IT intervention to make key business-driven changes to templates, business rules, authoring workflow, and the insertion of new content into print streams. I&KM professionals want their highly skilled IT development resources to make connections to core systems and maintain the infrastructure. Products like Exstream Dialogue Anywhere provide Web-based design and administration that business analysts — and not IT development resources — can use across all three DOM segments.

- **Starting points and templates to help kick-start interactive apps.** New hire packages, account opening kits, and benefits books are examples of interactive content that can benefit from a tailored front end that interviews the author and pulls in the correct form, product information, marketing message, or compliance language based on the author's responses. Enterprises benefit when the business rules, workflow, collaboration, and forms have been developed by the DOM vendor and can be simply tailored to their specific requirements. Forrester's evaluation of vendors against this criterion reflects each DOM vendor's experience with horizontal or industry-specific front ends.

- **Template management.** Companies use thousands of templates for negotiated documents such as contracts and insurance policies, account notices and correspondence, marketing collateral, and proposals. Each template has prebuilt elements such as a logo, company description, and address block. Templates and individual fragments, such as a compliance backer for a negotiated document or an address block, must be updated, versioned, and tracked — a painful process for enterprises to deal with. Today, in many enterprises, different departments manage templates and fragments, store them in different environments, and have an average of six separate point

solutions used to manage them.[12] Interactive DOM products will make template management easier. Adobe's Live Cycle Designer ES, for example, supports form fragments that can be assembled into document templates.[13]

- **Longevity and interoperability standards support.** Governments and organizations worldwide are concerned about document preservation — making sure that documents last beyond the current generation of technology and kept in a revisable format. For office documents, two open document format standards have traction. Office Open XML (OOXML) is working its way toward becoming an International Organization for Standardization (ISO) standard, while also being the default file format found in Microsoft Office 2007 desktop applications.[14] ISO has already approved Open Document Format (ODF), supported by Microsoft Office alternatives such as OpenOffice.org, as a standard — ISO 26300.[15] Also, Adobe's PDF (UA) specification has been submitted to ISO, while PDF/A is already an ISO standard for preservation.[16] The interactive segment, particularly applications like correspondence management, will provide these outputs to meet preservation and emerging vendor-independent use cases.

- **Strength of format conversions.** Format support, while still a primary DOM discussion point, has shifted from print stream formats — such as IBM's AFP and Xerox Metacode — to XML. Years ago, in the structured- and print-centric world, print stream support for formats like AFP and Xerox Metacode were a key battleground. Today's market finds DOM vendors regularly supporting these formats. Now DOM vendors wage battle around their XML support — how their offerings take content from XML and convert to rich HTML, PDF, and other formats to support multichannel presentment. Not all suppliers that have print-centric DOM applications do HTML conversion well. To compete on this battlefront, Document Science purchased CambridgeDocs, largely to incorporate its XML transformation technology into the Document Science offering.

FINDING THE DOM VENDOR THAT WORKS BEST FOR YOU

Forrester looked at leading solutions in the DOM market to provide guidance to I&KM professionals evaluating their DOM options (see Figure 3). The product landscape includes enterprise-level solutions that can potentially support all three DOM segments, as well as others that provide strong support for one or two of the three segments. The research included vendors with strong market presence and ability to meet a broad set of DOM needs. As a result, several vendors with DOM capabilities — including Compuset and Elixir Technologies; traditional correspondence solutions such as Top Down Systems' Client Letter; and technical authoring tools such as Parametric Technology Corporation's Arbortext and JustSystems' XMetaL — were not included. Finally, I&KM professionals need to consider a multitude of other criteria to fully evaluate these products. Interviews with enterprises helped Forrester identify a select few criteria and priorities to highlight differences among vendor offerings.[17]

Figure 3 DOM Categories And Vendors
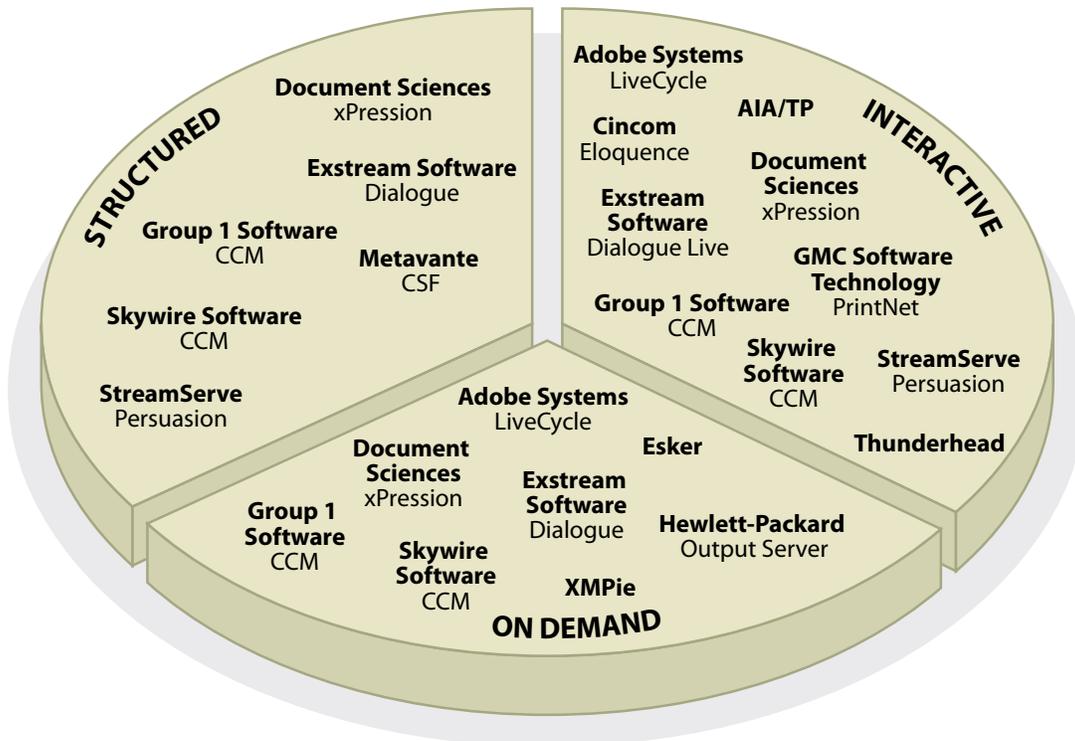
Structured Output: Established Players Will Grow

Most structured output solutions are mature products, originally designed to address output needs for the print channel. Products have evolved by adding support for additional printers and data streams. The breadth of formats and conversions required present substantially more barriers to entry than in other DOM segments, making it difficult for I&KM professionals to wait for new entrants. Vendors like Exstream Software, Document Sciences, Group 1 Software, Metavante, Skywire Software, and StreamServe will continue to serve this market segment — the most technically challenging — and should be considered well-positioned for enterprise deployment. Enterprise viability will be determined by the strength of these vendors' interactive and on-demand solutions (see Figure 4).

- **Document Sciences provides an industry-standard authoring approach**. This vendor released its xPression platform in early 2003 with the vision to connect popular third-party authoring tools with needed DOM functions. DOM tools, in general, do not provide the level of graphic design capabilities available with desktop publishing solutions such as QuarkXPress and Adobe InDesign. Enterprises will need such capabilities to develop visually appealing marketing applications and transpromo documents. Document Sciences understands this need and has developed a suite of plug-ins for Adobe InDesign, Adobe Dreamweaver, and Microsoft Word to anchor its structured, interactive and on-demand offerings. These plug-ins can use existing content and create new content using familiar tools. xPression's publishing infrastructure can
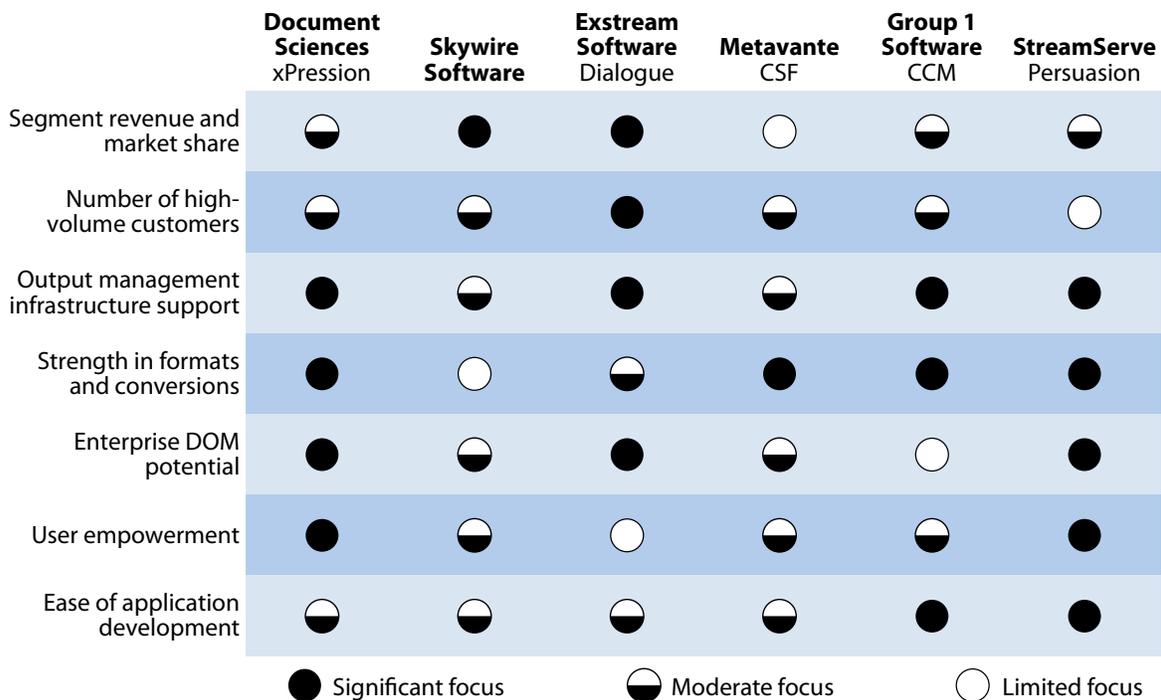
then be used to produce personalized and customized communications in structured, on-demand, or interactive fashion.

- **Exstream Software leads for high-volume structured applications.** Exstream's Dialogue continues to be a leading choice for the high-volume segment of the structured DOM market. Initially targeting service providers — a tough crowd — Exstream followed an object-oriented development model to allow reuse of document components, an important feature for service providers that provide similar services to many customers. Marketing capabilities like campaign management and optimizing white space for direct mail soon followed. Exstream is deployed in financial services, insurance, utility, and public sector verticals to include eight of the top 10 Fortune 500 companies, eight of the top 10 banks in the world, four of the top five healthcare insurance providers, and the top three Fortune 500 telecom providers. Exstream has extended its focus to the interactive and on-demand segments for these same verticals.

- **Group 1 Software provides DOM expertise globally.** Group 1 Software, now part of Pitney Bowes, has extended its solution with ECM technologies to manage the full range of DOM. Group 1's CCM provides customers with document archival and retrieval, electronic bill presentment and payment, workflow management, data access and manipulation, and print stream manipulation and validation. As Group 1 focuses its attention on the interactive and on-demand segments and integration with Pitney's equipment and services, it vows not to forget its heritage in structured output.

- **Metavante brings banking expertise based on its large installed base.** Formerly the banking and payments technology subsidiary of Marshall & Ilsley, Metavante developed Custom Statement Formatter (CSF-MVS), once the pre-eminent mainframe DOM solution. CSF-MVS is still a widely deployed DOM product. The revamped CSF Designer Suite has more than 200 licensed customers, largely found in the banking industry, utilities, and Metavante's own service bureau. Banking strengths range from presenting check images on bank statements to integration with eBilling and payment systems. The CSF Designer Suite supports the structured, interactive, and on-demand segments — with CSF Re@ltime — by providing graphic design functionality, as well. Recent emergence as an independent entity, and continued release of newer capabilities for the interactive and on-demand segments, will allow Metavante to leverage its installed based and growing service bureau business.

- **Skywire Software delivers an industry-focused DOM solution.** This service provider has a DOM arsenal that includes Whitehill Technologies (InSystems) and Docucorp International, both of which the company acquired in 2007. Skywire Software serves more than 2,400 customers worldwide, including 2,000 DOM installations. Most of its DOM customers (1,400 of them) are in insurance, and most others are in financial services. Skywire also manages utility customers through its own service bureau. Skywire Software takes an industry focus and offers deep insurance DOM expertise. For example, the vendor provides document automation for more than 60 policy and administrative systems. Other examples of its industry depth include the integration of its Tracker insurance-compliance product with DOM, or the merging of

rating data with underwriting document production. DOM is at the core of Skywire Software's insurance strategy. The products acquired from Whitehill provide strength in Group Health and Life insurance, while the products acquired from Docucorp offer strong Property and Casual solutions. Whitehill offers strength in Group Health and Life, while Docucorp offers strong Property and Casualty solutions. The combination gives Skywire Software a significant share of the insurance market for DOM. While the majority of Skywire Software installations are in the structured segment, its customers can be found using this interactive product for dynamic correspondence from call centers, summary of benefits books, welcome kits, and negotiated documents for group and commercial insurance policies. Skywire also has an on-demand offering that generates real-time output such as account notices.

- **StreamServe brings European DOM expertise to North America.** Outside the US, StreamServe leads for structured DOM content, particularly invoices and statements generated by enterprise resource planning (ERP) systems. This vendor excels at integrating DOM into interactive and structured business processes. It also supports on-demand applications. Tight integration with business processes grew and matured with StreamServe's partnership with SAP, which transparently wove output management into the ERP workflow. StreamServe has extended the product for easy integration with other systems and applications, and this remains a key strength. The vendor's recent partnership with Adobe — which integrates StreamServe's Persuasion with LiveCycle Designer and repackages it as LiveCycle Print Production ES — will do much to enhance StreamServe's North American presence.

Figure 4 Structured Output Criteria And Vendor Focus

	Document Sciences xPression	Skywire Software	Exstream Software Dialogue	Metavante CSF	Group 1 Software CCM	StreamServe Persuasion
Segment revenue and market share	Moderate	Significant	Significant	Limited	Moderate	Moderate
Number of high-volume customers	Moderate	Moderate	Significant	Moderate	Moderate	Limited
Output management infrastructure support	Significant	Moderate	Significant	Moderate	Significant	Significant
Strength in formats and conversions	Significant	Limited	Moderate	Significant	Significant	Significant
Enterprise DOM potential	Significant	Moderate	Significant	Moderate	Limited	Significant
User empowerment	Significant	Moderate	Limited	Moderate	Moderate	Significant
Ease of application development	Moderate	Moderate	Moderate	Moderate	Significant	Significant

● Significant focus   ◑ Moderate focus   ○ Limited focus

43963   Source: Forrester Research, Inc.
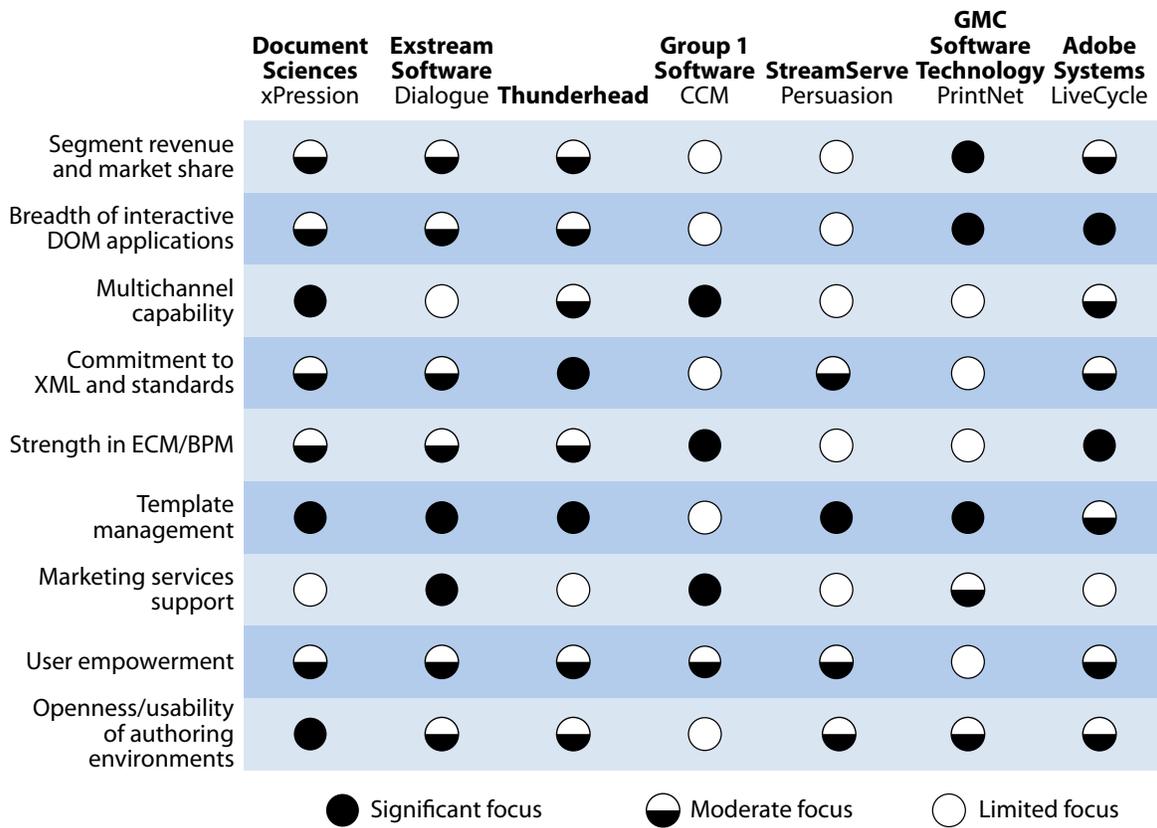
Interactive Output: No Shortage Of Vendors

Exstream Software and StreamServe have new offerings for interactive content. Document Sciences' xPression was released in 2003 and has 120 customers that include interactive correspondence and contracts for negotiation and revision.. But innovation is coming from DOM providers with diverse backgrounds like (see Figure 5):

- **Adobe Systems, which looks to leverage DOM to deliver enterprise software.** Adobe looks well-positioned to repeat its desktop publishing success with DOM technology. DOM is attractive for Adobe and its customers, with the ability to combine well-accepted and pervasive technologies such as PDF, Flash, and LiveCycle Designer with electronic forms, BPM, document security, and document generation capabilities. Adobe's strength starts with the front end — e-forms that provide a guided customer experience — which makes it well-suited to interactive applications such as new account opening. LiveCycle Output ES addresses the back-end delivery of output.[18] Though it has all the pieces, Adobe needs to present its breadth of products in a simpler and more application-focused manner to compete with its smaller DOM competitors.

- **GMC Software Technology, which focuses on direct marketing needs.** GMC focuses on rapid development of interactive applications for promotional material. It has strong support for color. A strong visual design front end with the ability to incorporate complex variable data has, historically, been its sweet spot. Service bureaus use GMC's PrintNet to support data handling, graphical workflow, color management, Web-based content collaboration, approval and proofing, message management for direct mail, statements, bills, policies, catalogs, and correspondence.

- **Thunderhead, which bets on its XML support.** Thunderhead supports structured output but focuses much of its attention on the interactive segment. Tailored authoring for negotiated documents — especially derivative contracts — helped launch the company. Thunderhead emphasizes its XML support.[19] The XML core allows a single template to support different delivery channels, including email, fax, print, SMS, and the Web (HTML). For example, a customer's letter can be delivered as printed correspondence, an email, or via a Web page. Each version of the letter may contain the same content but is formatted differently to align with the channel. With many document DOM solutions, every delivery channel requires its own template with the same content replicated in each.

Figure 5 Interactive Output Criteria And Evaluation

	Document Sciences xPression	Exstream Software Dialogue	Thunderhead	Group 1 Software CCM	StreamServe Persuasion	GMC Software Technology PrintNet	Adobe Systems LiveCycle
Segment revenue and market share	◐	◐	◐	○	○	●	◐
Breadth of interactive DOM applications	◐	◐	◐	○	○	●	●
Multichannel capability	●	○	◐	●	○	○	◐
Commitment to XML and standards	●	◐	●	○	◐	○	◐
Strength in ECM/BPM	◐	◐	◐	●	○	○	●
Template management	●	●	●	○	●	●	◐
Marketing services support	○	●	○	●	○	◐	○
User empowerment	◐	◐	◐	◐	◐	○	◐
Openness/usability of authoring environments	●	◐	◐	○	◐	◐	◐

● Significant focus   ◐ Moderate focus   ○ Limited focus

43963   Source: Forrester Research, Inc.
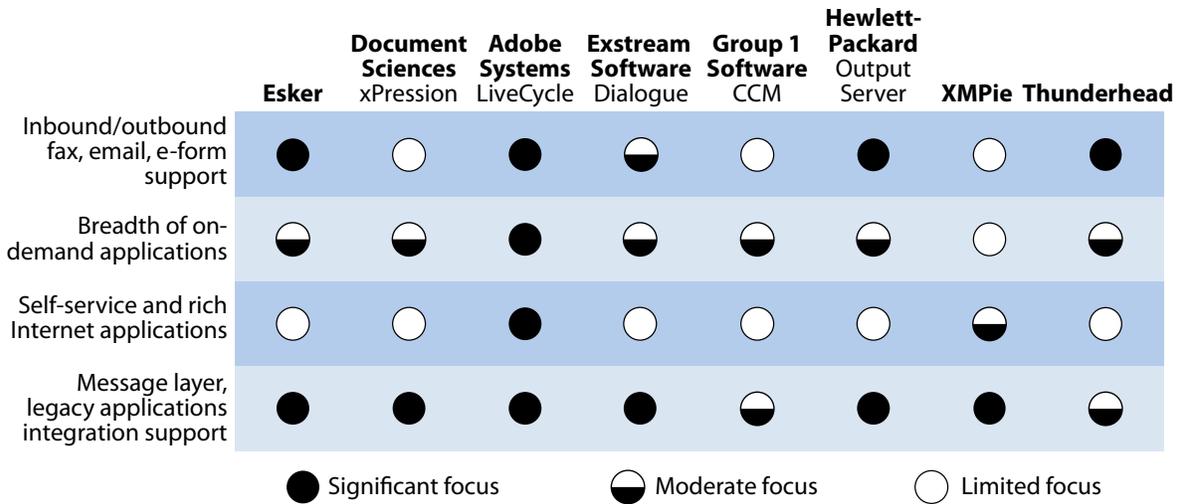
On-Demand Output: Faster And Cheaper

The enterprises Forrester interviewed want to support faster print and electronic delivery while reducing costs. This often means reducing the need for human interaction, a key driver in the on-demand segment. These enterprises want triggering of on-demand correspondence via exceptions from a transaction system or a keystroke from a call center operator. Providers of on-demand output come from diverse backgrounds (see Figure 6).

- **Adobe looks to address customer interaction needs.** Enterprises can use e-forms and rich Internet applications as the front end or window into interactive and on-demand applications. As such, LiveCycle forms (or FLEX) help position Adobe to address customer interaction needs. Increased focus on and experience with server-based solutions and enterprise requirements will make Adobe a top competitor in the on-demand segment. Adobe's strong human-centric BPMS will also serve the on-demand segment well.[20]

- **Esker focuses on sales process automation.** Esker does the best job at linking capture with DOM. It considers capture as important as creation and delivery and brings these together to address pain points in sales order processing and invoice management. Invoices, bills of material,

material safety data sheets, pick lists, and bills of lading all start and end with paper, fax, or email events. Esker has strong support for native conversion to and from these formats at the required step in the transactional workflow to drive on-demand output. Esker will launch a sales order processing and invoice management solution as an outsourced service in the coming year.

- **Exstream offers a strong integration platform for on-demand applications.** Hundreds of Exstream's customers have acquired the ability to run Dialogue in an on-demand fashion. Dialogue's on-demand applications can accept data from a client application via message queues, Web services, or watched directories. Likewise, outputs can be returned to any destination. Applications vary from real-time correspondence systems to travel/leisure itineraries. For example, a large cruise line implemented on-demand DOM to produce boarding passes, excursion itineraries, luggage tags, and guest documentation booklets right in the travel agency.[21]

- **HP has strength in on-demand output.** HP Output Server has its roots in infrastructure output management, derives from the Dazel product, and will focus in the on-demand segment, leaving the structured and interactive segments to others for the moment.[22] The document supply chain in manufacturing is a prime focus and a natural fit for HP, with modules that extend output features of ERP solutions. HP Output Server has also integrated applications for customer relationship management (CRM) and supply chain management (SCM) solutions in telecommunications, financial services, and other industries. HP has the potential to offer a broad range of DOM capability including capture, management, composition, and delivery with strong security and integration with distributed output devices and services.

- **Thunderhead helps complete e-form-based applications.** Thunderhead's on-demand product maintains an out-of-the-box integration with Lotus Forms and other electronic form products. E-form integration allows personalized, on-demand output for online quotes, order confirmations, travel itineraries, and point-of-service customer documents. Many of Thunderhead's current installations provide on-demand confirmations for security trades.

- **XMPie is a hidden jewel within Xerox.** The on-demand segment also includes Web-to-print providers. These solutions provide template-driven solutions for the design and execution of print from Web-based applications. The remote user can add variable information to preconstructed templates to make relevant and targeted communication. Many Web-to-print providers focus on low-value direct mail and have struggled to provide more than simple departmental solutions. Providers such as XMPie extend link-variable data printing to marketing services such as campaign management and add interactive support such as personalized URLs and VIP landing pages to direct mail.

Figure 6 On-Demand Output Criteria And Vendor Focus

	Esker	Document Sciences xPression	Adobe Systems LiveCycle	Exstream Software Dialogue	Group 1 Software CCM	Hewlett-Packard Output Server	XMPie	Thunderhead
Inbound/outbound fax, email, e-form support	●	○	●	◐	○	●	○	●
Breadth of on-demand applications	◐	◐	●	◐	◐	◐	○	◐
Self-service and rich Internet applications	○	○	●	○	○	○	◐	○
Message layer, legacy applications integration support	●	●	●	●	◐	●	●	◐

● Significant focus   ◐ Moderate focus   ○ Limited focus

43963   Source: Forrester Research, Inc.

RECOMMENDATIONS

TAKE DOM SERIOUSLY FOR CUSTOMER EXPERIENCE NEEDS

I&KM pros need to take a serious look at how they can leverage DOM technology to improve customer experiences and business processes. To select the right DOM product, I&KM professionals should:

- **Inventory current output management tools and applications.** Before you select that next DOM solution, figure out what you may already have. Align the applications and tool sets you have with structured, interactive, and on-demand categories to help clearly identify and segment your current inventory.

- **Look for ways DOM can help.** Users can be creative in solving interactive and on-demand DOM problems via macros, workarounds with office applications, or point software solutions. Many of these projects can back you into a corner. Recognize that on-demand or interactive DOM project for what it is, and see if it can benefit long-term from the right DOM solution.

- **Drill down on important criteria for your content type and business context.** I&KM professionals can be quickly overwhelmed by the rich feature sets of DOM products. Match important criteria to business needs and context. Pay attention to user empowerment, template management, content management, and XML management as important interactive criteria.

- **Select vendors with an enterprise DOM vision.** Don't just look for a single DOM product. Segment the DOM needs of your organization and, to reduce the number of point solutions, look to build a DOM infrastructure for interactive and on-demand applications.

- **Balance DOM front ends with DOM architecture.** Interactive front ends look impressive when demonstrated. But make sure other enterprises use these front ends in production environments. Ask prospective DOM vendors for references. Don't let your architecture needs take a back seat to impressive interactive front ends. For DOM to be effective for interactive and on-demand content — which require working with a diverse set of applications — architecture, standards, and integration capability must be paramount.

W H A T   I T   M E A N S

I&KM PROS MUST RAISE THE IMPORTANCE OF DOM SELECTION

Over the next three years, powerful, transformational output management platforms will evolve built on advanced authoring, workflow, business rules, integration with enterprise marketing platforms, and service-oriented architecture (SOA). Enterprises that maintain point solutions without these foundational elements will struggle to meet emerging customer experience expectations for interactive and on-demand output. I&KM professionals can ease their enterprise's transition to these evolving platforms by encouraging their organizations to think of DOM as important software that can help to improve the customer experience.

ENDNOTES

1 While this framework is helpful, it is far from perfect. Documents do not always fall neatly into any one category. For example, a structured document may well become an interactive document due to a triggered exception. Similarly, on-demand documents like online quotes and travel itineraries may, in fact, have an interactive (human) step in the process.

2 Negotiated documents blend an approved document structure with business content added by multiple parties under the control of a secure and managed repository — a workflow process. Examples include tailored contracts in insurance and brokerage.

3 Many enterprises, when purchasing ECM and DOM software, focus too much on the technology features and functions and not enough on understanding the user's business context. For Forrester research on ECM strategy development, see the December 27, 2007, "Business Context: A Better Way To Define An ECM Strategy" report.

4 OpenOffice is an "open source" collection of office applications developed by the Open Office XML technical committee of the Organization for the Advancement of Structured Information Standards (OASIS) consortium.

5 For example, Exstream Dialogue Designer has an XML interface called Dialogue Exchange Format (DXF) based on XSL:FO to allow designs from Microsoft Word or desktop publishing tools to be imported into the Dialogue authoring environment. This approach amounts to a plug-in to Quark Express and Adobe InDesign to bridge from those tools into Designer. This approach allows use of third-party tools for appropriate purposes.

[6]   "Post-processing metadata" defines the criteria for subsequent processing such as sorting by postal codes, splitting logic for enveloping, or grouping into print jobs. Processes can be fully automated, or, for some solutions, operators can query the repository for specific criteria and initiate new jobs and release them to production. Post-processing is critical to managing efficient fulfillment costs . For example, documents can be collected over time and sorted by postal codes to take advantage of bulk postage rates. They can be householded, or can allow ad hoc customer communication to be combined with a regularly scheduled invoice or statement.

[7]   Phase 2 of the evolving DOM market will see convergence with enterprise marketing platforms, ECM suites, and BPMS. For an explanation, see the October 24, 2007, "Give DOM Its Due" report.

[8]   Source: "EMC Announces Plan to Acquire Document Sciences Corp. Leading Provider of Customer Communications Solutions," EMC Press Release, December 27, 2007 (http://www.emc.com/about/news/press/us/2007/122707.htm).

[9]   For an explanation of Forrester's business process management framework. see the July 9, 2007, "The Forrester Wave™: Business Process Management For Document Processes, Q3 2007" report.

[10]   Document Sciences' xPression received the "EMC Designed for Documentum" certification — renamed "Designed for EMC" — and is currently undergoing certification of xPression 3 with Documentum D6. Document Sciences is also IBM FileNet P8 version 4 compatible.

[11]   Our recent DOM survey of customer priorities ranked change by the business user to be very important. For more information on this, see the October 24, 2007, "Give DOM Its Due" report.

[12]   A recent Forrester survey of 25 enterprises found the average number of DOM solutions per company was more then six. See the October 24, 2007, "Give DOM Its Due" report.

[13]   Fragments or component parts of templates are useful when updating large numbers of form templates. An enterprise, for example, might update a logo used on hundreds of forms. Or a financial services firm may need to comply with a new regulation that affects a section on hundreds of different forms. Form fragments or components should be stored in a content repository. When a fragment or component is updated, the templates that reference it are automatically updated, as well.

[14]   Office OpenXML is an XML-based file format specification for electronic documents such as spreadsheets, charts, presentations, and word processing documents. The specification is currently undergoing fast-track standardization within the International Organization for Standardization (ISO). Microsoft submitted Office OpenXML as an ECM industry standard in late 2006. Microsoft Office 2007 desktop applications support Office OpenXML as the default file format. See the July 17, 2007, "A Look At The Improvements And Shortcomings Of Microsoft Office 2007 Desktop Applications" report.

[15]   ODF (Open Document Format for Office Applications) is also a file format for electronic office documents, such as spreadsheets, charts, presentations and word processing documents. The standard was developed by the Open Office XML technical committee of the Organization for the Advancement of Structured Information Standards (OASIS) consortium

[16] For an overview of PDF standards status and ongoing efforts, see http://www.adobe.com/pdf/release_pdf_faq.html. In addition, in 2005, ISO ratified PDF/Archive as the standard for long-term preservation of electronic records. The following organizations have adopted this standard: in the US, National Archives and Records Administration; in Sweden, National Archives of Sweden; and in France, the Ministries of Finance, Health, Equipment, and Nuclear Regulation.

[17] Forrester surveyed 25 DOM users to understand their current needs, where they will invest over the next 12 months, and the criteria they used to differentiate suppliers. For the results of that survey, see the October 24, 2007, "Give DOM Its Due" report.

[18] This partnership was announced on April 17, 2007. Adobe's LiveCycle front end ultimately produces XFA (an X-forms-like templating language). For the partnership, StreamServe can accept XFA and tie it into its post-processing capabilities to meet higher-volume needs.

[19] Vendors take different approaches to XML for DOM. While all have "XML support," this generally means the ability to convert content to an XML format. Thunderhead uses XML templates with XML content maintained throughout the workflow. Vendors with less XML support point to performance issues with XML. Advantages identified by Thunderhead include the separation of content from presentment that creates efficiency for multichannel output. In some systems — those without XML — templates are "channel-specific," creating many more templates to be maintained.

[20] The Forrester Wave™ evaluation rated Adobe's BPM solution a Leader. For more information, see the July 9, 2007, "The Forrester Wave™: Business Process Management For Document Processes, Q3 2007" report.

[21] "Carnival Cruise Lines Uses Exstream's Dialogue Software to Implement Electronic Cruise Document System," Exstream Software press release, September 27, 2007 (http://www.exstream.com/PressReleases/2007/0926_Carnival.asp).

[22] HP is not likely to leave the structured and interactive segment alone for long. HP recently announced capabilities that will allow enterprises to ingest and manage structured and unstructured content to create and manage "composite documents."

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