Right-Sizing Content Management

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More than 7,000 organizations saved time and money, enhanced operations, and eliminated redundancy with Ektron's software...

Author's note: This paper explains Web content management (WCM), outlines the criteria for a productive WCM system and helps clarify that content management can be affordable and understandable for any size organization.

Introduction

"My colleagues and I like the price, the ease with which we could extend the content management system, and the stability of the product. We are well pleased."—Raj Anatharaman, Cerner Corporation

The Web benefits organizations of all kinds. It opens the marketplace, and offers them the opportunities for a wider customer base, simpler service, faster order fulfillment, and a gamut of possibilities not yet imagined by Internet technicians.

With these benefits come challenges. To remain competitive, an organization must constantly renew its Web presence. Authorized users should be able to change information in real-time-meaning a site change goes into effect immediately, rather than hours or days later. Coordinating approvals becomes an important part of day-to-day work processes.

Some organizations retain in-house technical experts to create a content management solution. Others hire outside consultants. Whether an organization has built, bought or not yet addressed content management needs, most have not gained full value from a content management system. Many organizations, including e-business and Web development consultants them-

selves, do not fully understand that high cost and radical complexity are not prerequisites for content management projects - even for projects requiring rich functionality for sophisticated needs. Practical options for quick, flexible, scalable integration are available, and do not have to cost an arm and a leg.

Many organizations struggle with the question of buying an out-of-the-box system or building a custom application. For most, the challenge of exploring vendor options becomes overwhelming.

Today, more than 600 companies deliver products to help firms keep their information fresh. They range from systems such as:

- Software that manages highly technical change orders for manufacturing projects in government, engineering, construction, etc.

- Integrated voice / data customer relationship management systems for finance, telecommunications, pharmaceutical companies, etc.

- Document management systems for in-depth catalog creation

- Software for specific vertical segments such as real estate, health care, associations, schools, restaurants, small business, etc.

- Hosted and application service provider options

- Desktop publishing systems for a one- or two-person department

- Web site development tools deployed for non-technical end users

- Open source alternatives.

What Is Content Management?

Managing information, especially Web site content, can be difficult. Finding an easy solution for WCM is challenging, because of the great diversity of information businesses wish to generate. A WCM system that works may not work in the future.

Definitions of content management abound. The phrase content management is over-used. The problem with the term "content management" is that it is too broad.

Some large organizations have pursued multi-year strategies for enterprise content management, document or records management, and knowledge management. Leading vendors of the highest-end solutions offer solid options for these needs.

However, for most businesses, enterprise-wide content, document and knowledge management initiatives are unnecessary. In most organizations, the primary focus for managing content is rooted in the Web. When evaluating content management systems, one should understand the semantics of the term "content management." Carefully consider the options and determine if the best choice for a project is, in fact, a "Web content management" solution.

WCM software is designed specifically for the creation, publication and management of content used on a Web site or shared via the Internet. These systems enable non-technical users (content contributors) to publish new information onto a site without HTML or programming knowledge. WCM software offers a system of checks and balances to ensure that changes are authorized. With some WCM products, Web masters or others with limited technical skills can manage the system, its users and workflow.

Many CM vendors claim to offer "Web content management." In reality, some higher-end applications deliver far more than core Web CM functionality. This can result in over-purchase. Businesses often pay for features they do not need or use. A recent study by Jupiter showed that 27 percent of content management system owners surveyed were so unhappy with their implementation they were considering replacement.

Some so-called "Web content management" products:

- Are not designed first and foremost for the Web, resulting in limitations, complexity or confusion when used primarily for managing Web content

- Require months of planning and expense by staff members or consultants before and during implementation.

Conversely, some businesses purchase low-end solutions, or attempt to retrofit a publishing or editing tool for use as a "Web content management" system. These options can cost more than anticipated, and may still not meet the core needs of true "Web content management." Often, they:

- Lack approval process before content is published, resulting in errors or misinformation appearing on a Web site

- Are created for static Web sites or as client-based systems, and lack many of the benefits achieved with a dynamic Web environment or browser-based system

- Do not offer customization options or scalability to handle the type of growth that accompanies most Web sites.

Regardless of pricing for off-the-shelf or custom solutions, most of today's options for WCM:

- Disregard the business end-users' need for an easy-to-use interface

- Do not offer options for selectively enabling end-users with more robust editing or publishing capabilities

- Do not address the needs of integrators and developers seeking the convenience of a quick, easy, standards-based deployment along with assurance of scalability for high-volume sites

- Lack flexibility to easily extend or customize for specific needs.

Buy, Build or Both?

As with any information technology project, organizations must carefully consider the option to buy or build a system. Custom-developed content management applications are abundant, perhaps because the industry has lacked out-of-the-box products

that combine the key values of affordability, rapid deployment and ease of use.

Solutions such as Ektron's offer the cost-effectiveness of buying core CM functionality and the flexibility to easily add custom code to meet specific requirements.

For a complete analysis of the build vs. buy decision, including financial data, see *Annex A: Buy CMS or Build a CMS*.

Ektron... A WCMS Leader

Ektron Inc., based in Amherst, New Hampshire, leads the industry in creating a new niche of solutions aimed at pure Web content management.

With Ektron, organizations can save a minimum of $3,000 to $15,000 over 12 months, if evaluating against the $40,000 average price for a built-from-scratch solution. Another important Ektron benefit is that the site is quickly operational and online. Add unknown costs and complexities associated with custom development and savings can exceed $100,000 or more over a number of years.

Ektron offers a CMS family of solutions for quick and easy deployment in ASP, ASP.Net, ColdFusion or PHP environments using industry-standard database products. Ektron has different products to choose from, based on business needs:

- Ektron CMS100 delivers basic WCM functionality for about $500.

- Ektron CMS200, base priced at $3,000, is a flexible, scalable WCMS for deployments in sites ranging from small to large, from basic to complex.

- Ektron CMS300 helps organizations quickly deploy a full-scale, enterprise Web content management solution for less than $20,000. Ektron CMS300 is the industry's first easy-to-use, XML-enabled WCM solution that is also Web services-enabled.[1] Advanced functions include XSLT support, XML validation through DTDs (document type definitions) and

schemas, multi-step workflow and an open API for extendability. Developers can enable users with little technical knowledge to create XML content in a friendly, familiar environment.

Additional information about Ektron and its products is available in *Annex B: About Ektron, Inc.*

The CMS Spectrum

Consider the content management spectrum. At each end of the spectrum are products designed to support useful content-related operations.

Figure 1. The Content Management Spectrum

| LOW | Web Log | Open Source | Web Content Management | Enterprise Content/ Document Management | Knowledge Management | HIGH |

Low End On the less expensive end, businesses can take advantage of freeware that enables an individual to publish a Web log (or *blog*). These sites appear like a threaded discussion or journal, of sorts. Blogs are becoming more popular in Web publishing, with recent corporate strategies that enable employees to share ideas and opinions, especially in support of the company's own offerings. Blogs are inexpensive and easy to establish. Blogs can offer fresh content, but are not designed to manage content on a corporate or departmental Web site.

Content authoring tools, such as those included with popular word processing software, are often used to create content. These and other free or low-cost programs do not typically allow a person to submit content for approval, roll back a change, or display a previous version of content. Products such as Macromedia Dreamweaver and Microsoft FrontPage are designed for Web development or site creation. They lack capabilities to notify another person in the organization to review a change before the information is displayed on a site. With these systems, non-technical end-users may have access to templates

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[1.] XML is an acronym for Extensible Markup Language.

or scripting and, without even knowing it, could make changes that jeopardize a site's integrity.

With many lower-cost Web publishing and WCM packages, the opportunity to extend or customize the solution can be difficult or impossible. These inflexible products do not allow organizations to meet unique content requirements or needs that arise over time.

Open source options for content management are abundant. As with any type of open source option, one must weigh the "free" offering against the true cost to maintain the solution within less commonly used and supported environments, as well as the overall integrity of the code.

High End At the other end of the spectrum is knowledge management. This concept means that an enterprise consciously and comprehensively gathers, organizes, shares, and analyzes its knowledge in terms of resources, documents, content and people skills. Also at the higher-priced end of the spectrum are products rooted in records, document, and enterprise content management. These products typically focus on businesses with strict compliance or other unique requirements, such as those in the financial, pharmaceutical industries.

These products have typically commanded six or seven-figure license fees. They often involve long-winded, high-priced deployments requiring technical, business, and compliance professionals from both the vendor and site owner's organizations. These systems handle information on an enterprise-wide basis. Within the last two years, some of these systems have been adapted, scaled down or modularized to support Web site content. In general, the systems tend to be cumbersome and costly when deployed for the primary purpose of WCM.

High-priced solutions are overkill for most businesses or portals—whether deployed for the Internet (the public), Extranet (customer, suppliers, etc.), or Intranet (employees, partners, contractors, etc.). Systems designed for knowledge management, document management, and enterprise content manage-

ment are ill-suited to all but the largest and most complex businesses.

Just the Right Size

Today, more than 12 million small- and mid-sized businesses exist in the United States. Millions thrive overseas. Volumes of organizations in government, finance, health care, education, and the like—including the Fortune 1000—have a multitude of public, departmental or project-specific Web sites. The majority does not use freeware. They also avoid software that is largely unsupported by their own developers, local consultants, resellers and integrators. Nor do they choose to spend money unnecessarily. They look to companies like Ektron that deliver solid, proven, out-of-the-box solutions. Ektron can address most WCM needs for between $500 and $20,000.

Which End: Low or High?

"Web content management systems" fall in the middle of the spectrum. And, this is precisely what most businesses need.

In attempting to clarify requirements and budget, potential purchasers of a WCM solution should ask:

- What functionality do I need beyond core WCM?

- How long will it take to train my content contributors?

- How long will it take to integrate the system?

- What options exist for adapting the system as the site or number of users grows?

- What options exist for adding functions in the future - both out-of-the-box features and custom development options?

- How flexible is the system for me today and into the future?

Figure 2. The Differences
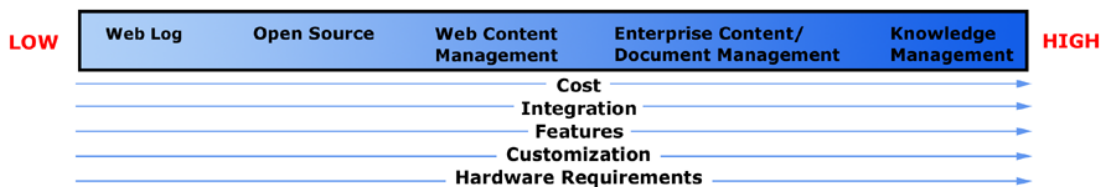
A Web content management system must meet two fundamental requirements. First, it should be as easy to use as commonly

used office computer systems (such as Microsoft Word, Windows Explorer, etc.)   This is essential for both end users and integrators. The more comfortable the software is to use, the more willing employees will be to learn it. Secondly, it must provide five pivotal business safeguards:

- **Workflow tools that allow quick, easy approval sequences.** The "sneaker net" of the Web's earliest days must be replaced by automatic notification that a page or content must be reviewed. Once reviewed, that content is automatically posted to the site. Without workflow controls, errors become legal and financial liabilities, not simple missteps. Content check-in and check-out features are necessary to ensure that changes are not being made simultaneously to the same piece of content.

- **Templates that allow people working with the Web to create a page or a "content container" with a specific look.** A Web master or developer can create templates for each site section once, thereby saving time previously spent with creating and managing individual pages. NOTE: A WCM solution doesn't necessarily need to come bundled with a template creation or management tool. In fact, many developers prefer tools such as Macromedia Dreamweaver. The WCM system should allow a developer to use a familiar templating tool or other plug-ins (electronic commerce, Web tracking, search, etc.,) while ensuring a simple process for the use of such products in conjunction with the WCM system.

- **Version control, whereby the system automatically keeps track of who made changes.** With version controls, rolling back to a previous version can happen with little hassle. And, an archive of the content is readily available if needed for clarification around legal or government compliance issues.

- **"Hooks" on which to hang specialized actions.** Web sites and technologies are dynamic. When a special function is required, the WCM system must accommodate these functions. For example, a multimedia feature such as a Flash animation might be needed to spice up a product launch. The formal name for these types of "hooks" is an Application Programming Interface. An API consists of one or more instructions that allow the WCMS to be customized.

- **Support for XML and future Web technologies, even if not used immediately by an organization.** XML is not an end in itself. XML provides the lubricant which makes sliding content from one form to another frictionless. A Web page can be personalized for a large supplier on an organization's extranet and automatically revised in real time so it is seen on a salesperson's personal digital assistant, allowing a new order to be placed with the most current data for that customer. Such reuse of content, also called repurposing, is now a must-have service, particularly as mobile handheld devices and print versions of Web content are needed anytime, anywhere. Also the ability to utilize and prepare for future technologies is essential in today's marketplace.

The key differences between various CM products are cost, complexity, hardware requirements, and engineering features that are essential to meet specific organizational requirements (regulatory compliance, legal needs, enterprise-wide integration, systems compatibility, etc.). The Web is one part of an organization's overall information technology strategy. A WCM system is one of many components that make up the company's full-scale information management system. Given the prominence of the Web and the way it continues to change business, WCM may be the most important component of the organization's content strategy and overall information technology strategy.

Ektron: Hitting the Sweet Spot

Many businesses need to create and manage Web content, seek to automate costly manual processes, and strive to use accurate and fresh content to support key business objectives.

The Ektron family of Web content management solutions is designed specifically to meet the needs of these entities. Ektron delivers core Web content management capabilities, offers a convenient "grow-as-you-go" approach, and delivers an easy "pay-as-you-add" strategy.

"Our Web content management systems are more than editing a page or updating a site. Ektron CMS100, 200, and 300 are tools that save time and money. Costly programming is essentially not needed when moving data to an from an Ektron system... Integration is almost as easy as a snapping Lego blocks together."—*Bill Rogers, Chief Executive Office, Ektron*

Figure 3. Ektron's Functionality Reach
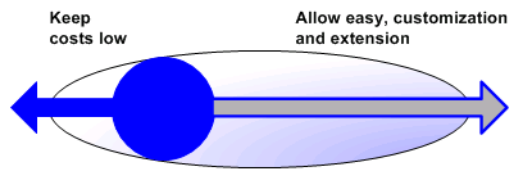
While other vendors are prominent in document management, enterprise content management, and the like, Ektron is today's dominant player in the WCM space. More than 7,000 organizations use Ektron's products. They recognize the value Ektron delivers by keeping costs low, and at the same time, delivering robust features and flexible options. Organizations are learning Web site content can be managed more cost-effectively, and are doing so with Ektron. They are opting for a Nissan 350Z rather than a Ferrari.

Ektron offers the industry-leading eWebEditPro, the first editor delivering full-featured word processing in the browser. Many developers have used this tool as the core foundation for custom-development of their own content management systems. Major players in the content management space, including Documentum, Vignette, Interwoven, Microsoft and others, bundle this tool via OEM relationships with Ektron, or recommend it to their customers.

Since delivering its first content management application in the late 1990s, Ektron has become known as a leading provider of browser-based WCM systems for smaller scale deployments. With the recent addition of features that enhance scalability and flexibility, a first-of-a-kind approach with XML, and a new focus on Web Services, Ektron's reach extends to serve the needs of mid- and large-sized sites-even sites that exceed a million pages. With its highest-end solution, CMS300, Ektron delivers solid capabilities for "enterprise Web content management" at a very affordable price--around $20,000.

Competing Vendors

To better understand Ektron's solution, compare it to two other products: Microsoft's system and Red Dot. Both Microsoft and Red Dot are categorized by their systems as "enterprise content management solutions." Microsoft offers a product built upon technology from nCompass Labs, which it acquired more than two years ago. Red Dot, a German-headquartered company with offices in the U.S., is a relative newcomer to the content management market. It lacks Microsoft's depth of financial and technical resources.

Table 1: Head-to-Head Product Comparison

Attribute	Ektron CMS	Microsoft	Red Dot
1 Platform	MS Windows, NT / 2000 (NT server MUST be running service pack 6), Windows 98 (with PWS). *Note: Ektron's eMPower for Cold Fusion supports Windows NT or 2000, Sun Solaris, Linux, or HP-UX*	Product is nCompass Resolution with Microsoft-coded changes. Runs on Windows 2000 servers. Windows-centric. Integrates with Office XP. Installation requires these products installed in this order: Microsoft Windows 2000 Server and SP2+; Microsoft Visual.Net; Microsoft SQL Server 2000 and SP2; Microsoft Internet Information; Services (IIS) 5.0; Microsoft Internet Explorer 5.5+; and Internet Explorer Web Controls v.1.0.	Microsoft Windows® 2000 (Server or Advanced Server) and Windows Service Pack 2 Microsoft SQL 2000 server is recommended although, if unavailable, the Microsoft MSDE 2000 will suffice Internet Explorer 5x with Service Pak 1. The application runs from a server. No client software is needed.
2 Permissions	An advanced permission model that uses layered authentication methods and follows the NT / 2000 permission model, meaning permissions can be set for users and for groups. The Administrator can define groups as required by the workflow. The APIs allow extension of the permission model as required by the application. Note: the API architecture of CMS200 and CMS300 are comparable to those in enterprise CMS.[a]	The Administrator creates users and assigns them to groups. There are six groups: Administrator, Subscriber, Editor, Author, Moderator, Channel Manager, Resource Manager and Template Designer. XP security. Specialized security functions called "placeholders" provided.	Administrator, Template Editor, zEditor, Author, Translator Editor and Visitor. Global - permission to edit the entire project Standard - permission to edit all pages or links Detailed - permission to edit a given element
3 Template Editing	Supports Macromedia Dreamweaver and other commercial editors. The templates, once created in a tool such as Dreamweaver, can then be managed. No additional template editing skills need to be learned. *Note: Enforces sitewide standards* (fonts, styles, layout, file upload format). Macromedia extension support for Dreamweaver and Dreamweaver Ultradev Web developers.[b]	Templates must be created in Visual Studio.Net. Templates are created in ASP.Net and managed with Microsoft Visual SourceSafe. Placeholder server controls are applied to allow authorized users to create and modify content in authoring mode. The template designer's tasks are facilitated through the integration of Microsoft Visual Studio.NET such that the designers are able to drag and drop placeholder server controls into their template code.	Editor provided. Third-party editors may be used. Templates saved in template editor become available for the application. HTML, XML, and other languages are supported.

Attribute	Ektron CMS	Microsoft	Red Dot
4 Content Editing	Browser-based, WYSIWYG editing capabilities, including support for all forms of content formatting (fonts, images, tables, hyperlinks, etc.) via market leading eWebEditPro and eWebEditPro XML.[c]	Using "connectors" Word XP and Front Page may be used for editing.[d]	Editing application runs in a browser. Red dots mark text that the user can modify. Red dots are a visual cue based on permissions.
5 Multilingual Support	Supports 14 language including double-byte languages and for any language offered in Microsoft Unicode. An Ektron language software development kit may be used to extend support.[e]	Separate techniques are provided to handle multilanguage pages. The Dot Net framework allows parallel sites to be created via templates, connected pages, or subordinate sites.	Six languages and automatic translation are supported. The translation function becomes available once the author has released the page.
6 Workflow	Workflows can be very granular, as permission model is built on NT / 2000 framework. Users or groups can exist in workflow. Collaboration is available through XML commenting. Scheduling of content (with Start and End date / time). Change / update notification via e-mail.	Three levels of approval supported: Author, Moderator and Editor. An Author submits a pages for approval using a workflow. Moderators then use the Approval wizard to approve the pages that need approval and the Editors for editing and publishing. Using the Dot Net event model, the workflow can be customized. Notification included.	Workflows can be created for any level of a project activity. There is no limit on the number of rules in a workflow. Workflows include notifications.
7 Version Control	Version control is supported. Previous versions can go back into workflow.	Version control not supported. Previous versions of a Web page can be viewed. Programming required for version control and roll back functions.	The SQL Server database stores the versions of the pages. Pages may be rolled back. Version control includes date stamp and who created a page.
8 Import	Support for scripts. Import application to be released June 2003	Import of Microsoft objects and support for VisualStudio.net scripts	Two options are available for linking existing documents and content with import and reference.
9 Caching and load balancing	Supported	Supported on Windows servers	Supported
10 Deployment	JavaScript syndication allows dynamically created and managed content to be displayed on any Web site (HTML or dynamic) with one line of code. Web services support breaks down server barriers.	Deployment tools provided. Synchronization is not automatic.	Supports migrating a site page-by-page.
11 Professional Services	Available on request	A full range of professional services available from Microsoft Consulting and Microsoft-certified integrators.	Available upon request.
12 Published APIs	More than 14 documented APIs	APIs are accessible to some degree via VisualStudio.Net.	APIs provided.
13 Price	$500 to about $20,000 per installation.	About $45,000 per CPU.	$30,000 for one server. $20,000 for each additional server. Maintenance available. User licenses are priced by the roles required for each user.

a. Library item overwrite permission: The administrator can now give "super users" library overwrite permissions. This will allow designated contributors the ability to update images or files on the server. Extended folder permissions let administrators give "super users" (or groups) rights including adding, editing, or deleting options. Active Directory - centrally manage users and user groups (Included with Enterprise)

b. Ektron eWebEditPro+XML—lets developers hide XML tags from content contributors and provides an easy-to-use WYSIWYG editing interface.

c. Ektron's Web editors are integrated into many built and bought solutions (OEM or other strategic partnerships with Documentum, Microsoft, Interwoven, Vignette, Percussion, Stellent, and others.)

d. Ektron is a Microsoft CMS partner. Microsoft recommends Ektron editors if advanced functionality is required.

e. Languages for the application menus and dialog can be set on per user basis. Application languages available include English, German, and French. Additional languages can added through the use of a developer SDK.

Ektron's Unique Design and Key Features

"Software consists of many invisible engineering and design decisions," says Bill Rogers, founder and CEO of Ektron. "Successful software hides many of the functions that make it powerful. The best software sells because thousands of customers can quickly and easily deploy and use it. At Ektron, we've removed as many barriers to entry as possible. We strive to make things as easy as possible for the majority of Web developers, as well as our system's end-users."

Rogers explains that Ektron has pursued a radically different approach than other vendors in the CMS space and, as such, has positioned itself to deliver volumes of products to large numbers of organizations. Ektron's CMS solutions are designed for use in the industry's most popular Web application server environments, ASP, ASP.Net, ColdFusion and PHP. Ektron provides developers with a small number of functions, eliminating the time and expense required to assimilate the features of more complex systems.

Unlike other vendors, Ektron offers a unique component-based approach, whereby content management is deployed as a function in a page. With this unique architecture, Ektron's Web content management solution does not take over the entire site. Developers are free to work within and around the content management component.[2]

"Web content management can be up and running on a site in a matter of hours," says Rogers. "And, because of our component-

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[2.] For more information about this, read Ektron's white paper at: http://www.ektron.com/whitepaper/Ektron-unique-component-based-approach-to-CM.pdf

based approach, the developer is not nearly as confined as he or she may be in other systems that are more proprietary or more complicated. This saves money both in the short term and over the long haul."

Rogers concedes that Web development often follows the 80-20 rule. Some developers pursue projects to achieve 100 percent of the functionality that they "think they need." Yet, Rogers asks, "If an organization can get 80 percent of the functionality it seeks using 20 percent of its budget, why spend an additional 80 percent of budget dollars to yield only 20 percent more in terms of functionality?"

Obviously, one must consider the actual "need" for the 20 percent, as well as the ROI associated with pursuing the extra 20 percent versus letting it go (and giving up a small—perhaps unneeded—level of functionality or flexibility).

Figure 4. The Ektron 80: 20 Advantage
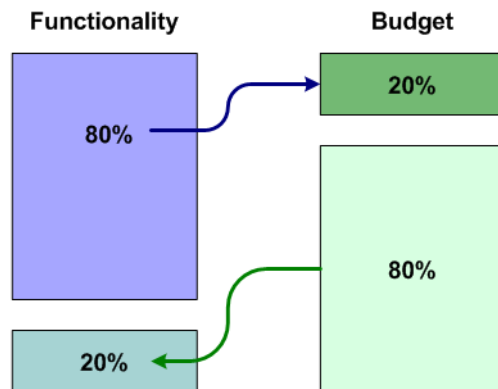
Enterprise content management systems add features that boost the cost of an installation. Ektron delivers more than 80 percent of the functionality of the most expensive packages at 20 percent of the cost.

"Our success is evidence that we develop Web content management software that solves problems well, within a quick timeframe and without breaking the bank," Rogers says.

Ektron's technical features are extensive. Key highlights include integrated workflow functions, a mature Application Program-

ming Interface, and support for Extensible Markup Language (XML.)

Workflow One reason for Ektron's wide use is that business process management (workflow) is built into the framework. Ektron's core software supports the concept of approvals and automatic notification when content changes are made.

Insiders like one of the General Services Administration's senior technology officers commented, "Business process and workflow is where the action is. The jargon about enterprise this, and content that, blows smoke around making core business processes work faster and better. IBM, Oracle, and a few other companies get it. Others don't...yet."

"The Holy Grail that everyone has been looking for the past 15 years is to model the business process using some tool and have the underlying implementation product automatically configure to align with that," says Thomas Gulledge, professor of enterprise engineering at George Mason University and president of Enterprise Integration Inc., both in Fairfax, Virginia. "If we could ever get there, that would be a major, major breakthrough."[3]

With an Ektron's WCM system, organizations can knit together specific business procedures to accomplish tasks, automate processes, and save time and money.

For a Web site containing pricing information, the decision to change the price of a product or group of products may involve the work of marketing, accounting, and purchasing professionals. When an important change such as pricing is made on a Web site, the change needs to be approved before it is published. Ektron built-in tools allow:

- The price to be changed only by an authorized person
- The page with the change can be sent to an unlimited amount of users and user groups for approval

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[3.] http://www.fairdene.com/processes/ on February 27, 2003. This is a site dedicated to business process management

- Making a record of the approval or recording a modification

- Updating the database

- Releasing the data for use on Web pages or notifying the process owner that the change has not been released.

The notification process is handled by electronic mail. Changes are made by opening automatically generated views of the data. The approval process can be adapted by the system administrator.

Simple scripts can be used to assemble processes running in different technology platforms that are simply too complex and too costly to reengineer from the ground up. These silos include back-office systems such as accounting or manufacturing's enterprise resource planning, customer support systems, and other highly-specialized software necessary for a specific organization's competitive advantage.

Ektron's family of solutions offers varying levels of workflow, depending upon organization's needs:

- **Ektron CMS 100.** This entry level system implements a single approval level. A content contributor creates and submits content, and one approver is notified that changes are pending for publication.

- **Ektron CMS200.** This system (along with CMS300) delivers an unlimited level of approval, and provides additional authentication, notification, storage, and other features necessary to handle Web sites scaling up to a million pages or more.

- **Ektron CMS300.** This premier product takes the Ektron family one step further by offering XML capabilities, which can ensure that content is validated before the approval process. It supports unlimited levels of approval and fully supports Extensible Markup Language. The approval process can propagate from a user or a group.

Each of Ektron's WCM solutions dovetail. A client can begin with a $500 solution and migrate to CMS200 or CMS300 solution without recoding. With each change in business require-

ment, Ektron provides software that can adapt without costly incompatibilities.

APIs An Application Programming Interface (API) allows the developer to access managed information or extend the product beyond "out of the box" functionality. It allows a developer to talk directly to the WCM system and get what he or she really wants.

Ektron's APIs enable custom applications to be constructed. Other APIs allow developers to integrate search, metadata manipulation, dynamic XML content functions, and more. Ektron's CMS100 and CMS200 also include APIs. In addition, API "hooks" are included to allow advanced features, such as:

- Automatic routing and updating of multiple Web sites

- Dynamic page generation using XML itself or other programming techniques

- Comprehensive personalization

- Detailed workflow and metrics to make fine-tuning the steps used to produce content.

Ektron's component-based approach ensures ease of use for developers. The API that integrates the Ektron Web CMS into pages is accomplished through a set of functions. Ektron's Web CMS works on a number of dynamic Web application servers (ASP.NET, ASP, Cold Fusion, and PHP Hypertext Processor.) The syntax of the functions for each server is standardized.

There are only a small number of CMS functions-fewer than 20 for each of the server frameworks. These are easy for a beginning programmer to learn, and also very powerful. Ektron took this approach to ensure that the CMS can be running in two or three hours, and at the same time, grow to handle larger needs.

Ektron's functions tie the Web site to the Web CMS application. The functions detect if the user is logged in, and how to display the user interface depending on a number of conditions. The functions do the "heavy lifting" for developers.

Examples of some of common CMS functions inserted into a Web page include:

- Portal functions. A set of functions to deliver content to a Web portal such as Plumtree Software's portal tools

- Web Services functions. These interact with Ektron CMS and access any of its functions through the Web or from different operating systems.

Extending APIs. The Ektron CMS functions have a well-defined interface that hides their implementation details, so they are easy to integrate. And, because they are written with the appropriate server framework (ASP, Cold Fusion, etc.), developers can extend them as needed.

Table 2: Selected Ektron APIs

Function	Comment
ecmLogin	Displays button allowing users to log in, or showing that they are already logged in.
ecmMetaData	Displays metadata for one or more content blocks.
ecmContentBlock	Displays a content block. If the user is logged in, then the function displays a user interface to manage the content block, with a border around the content that can be managed, abilities depending on the user's privileges.
ecmJsyndication	Syndicates content to a remote site.
ecmSingleSummary	Retrieves attributes from one content block.
ecmListSummary and ecmCollection	Displays attributes from all documents in a folder or subfolder. Can be used to build navigation, or display teaser / summary information of all documents in folder(s), and automatically build links to the main document.
ecmSearch	Inserts a search button.
ecmSearchDisplay	Displays results of a search.
ecmContentBlockEx	Displays and manages a content block, and applies XSLT to the content.

XML The Extensible Markup Language is a standard way of describing content. XML is the way to move data between and among different computer systems. XML makes it easier to move, reform, and reuse data.

Ektron CMS300 supports XML as part of the software's framework. The system can serve content across various presentation devices in real time. Different users can access the same Web content from such devices as PDAs, mobile phones, or a wire-

less notebook computer at the same time. Each user views content in a format appropriate for that user's computing device.

Ektron's innovative use of XML and XML style sheets saves CMS300 customers from the tedious task of creating duplicate content. Review and revision work is reduced because the accuracy and format of Web content is managed using error checking called XML validation.

The payoff is time and cost savings with greater content accuracy.

Ektron's XML framework makes it easy to maintain consistent Web pages across sites with a handful of pages to sites with a million or more pages. Complex material for job postings, press releases, knowledge base articles, and FAQs (Frequently Asked Question data) for customer self-service can be published in a consistent manner as changes are made to the Web CMS database. This is all done through XML-based Smart Web forms that are created using built-in XSLT support for content editing and saving.

Ektron provides an easy-to-use, graphical interface to a business user who enters information for a Web site. Ektron eWebEdit-Pro+XML-which has a familiar interface somewhat similar to that for Microsoft Word or Corel WordPerfect-requires no special training to use.

A content-contributing end-user of an Ektron CMS system (a marketing staff member, for example) can open a file that displays the content exactly as it appears on the site. (Ektron's approach with using the Web site itself as the user interface is also unique and valuable.) Sections of that content are highlighted for the user to change. The new information is filled in and a click writes the change to the database. If approvals are required, the system automatically notifies the individual who must review the change. The user finds it easier to author in this environment. "Vanilla" text boxes offer no functionality, such as spell checking, format options, hyperlink capabilities, etc. The

Ektron editor allows an authorized user to produce content without having to enter any tags or commands.

In Ektron's framework, the XML that is stored does not contain information about the size of the headline or which size logo to include.

XML's Extensible Stylesheet Language Transformations or XSLT allows precise control of Web page layout and content features. Ektron's support for XML / XSLT allows Ektron Web CMS customers to have dynamic content within dynamic content. For example, a product price may be used on multiple pages of a Web site. The price information resides in a database. With the data in one location, a single update appears in on all Web pages where the price appears.

Presentation information is contained in the XSLT file associated with the content. One XSLT file is used for jobs postings, another for product specifications, and another for news releases. Ektron makes it possible for a Web master to make a global change across a few or thousands of pages. To do this, just the XSLT file needs to be altered. None of the data needs to be re-edited.

Ektron uses XML to allow "smart" interfaces to be included easily and quickly. Schemas can be used to generate drop-down lists and check boxes in the editing environment to ensure only approved data is selected or used. Schemas also enable validation of content.

XML documents are indexed so that powerful, intuitive search can be provided to anyone using an Ektron-based system.

Ektron offers full support for Web services, allowing CMS300 to serve managed content to a variety of heterogeneous systems. This functionality breaks down many barriers associated with the Web. Using this widely accepted technology, content can be consumed by a variety of clients-independent of operating system, programming language, or Web server environment.

Wrapping Up

"Ektron pays off at the bottom line by delivering a range of options from basic to high-end that are easily used by Web developers, site owners, administrators, and non-technical end-users," Rogers says.

Any developer can solve WCM problems with Ektron's solutions. In many organizations, content contributors begin hands-on use of Ektron technology in a matter of days-not weeks or months. For developers with more sophisticated needs and abilities, Ektron offers limitless opportunities to extend or customize its products. This allows for enterprise-level WCM at a fraction of the cost of other systems.

With Ektron's unique component-based approach, developers have the flexibility to use tools and systems that are familiar to them.

"Ektron integrates around a developer's environment; it doesn't become the environment," says Rogers.

Total cost of ownership must be considered—and here, Ektron excels. When factoring out-of-pocket costs for software, along with the cost to implement, support and update a system over time, Ektron's pricing model cannot easily be beat.

"We strive to deliver a Web content management foundation to support our customer's current and future business and content needs," says Rogers. "Ektron is leading the way in redefining Web content management."

Annex A: Buy CMS or Build a CMS

A team working on a Web site may combine packaged software with custom programming to meet their needs. Many large organizations build their own solutions in order to achieve the breadth and depth of functionality they believe is necessary at the time.

Custom development of a WCM system can seem deceptively simple, particularly when compared to other types of software jobs. With existing information technology staff or consultants and contractors, it may make sense, on the surface, to build a WCM system using bits and pieces already available.

The costs of the home-grown or "built from scratch" solution are usually miscalculated for several reasons.

First, those working on an existing or newly created Web site often focus on solving a specific problem and do not develop for additional capabilities.

Second, in-house teams often begin "home brew" solutions during a lull in ordinarily hectic work loads. As other priorities place demands on the development team's time, shortcuts may be taken. Getting from A to B quickly is important-but not at the cost of sound engineering practices.

Third, some consultants or contractors advocate a custom solution because they have built their own proprietary system and simply repackage it for a single customer. Some lead businesses to believe that doing anything on their own, without assistance from a consultant, will be too complex.

Each of these reasons is valid in certain situations. Home-grown vegetables can be less costly than those purchased at a supermarket. But add the costs of land, time, and tools, and the savings can quickly evaporate.

Table 1 provides a best-case scenario for building a WCM solution for a site with the following characteristics. (This type of

site is found in more than two-thirds of commercial and not-for-profit organizations worldwide.):

- Most of the 50-page site is static with nine pages created dynamically.

- Four people create the information for the site, and one vice president and one lawyer must review content before is published.

- The site is hosted at a remote location and the Web master is a programmer who has worked at the company for two years. When that person is out, a contractor provides basic Web support.

- There is minimal graphic content on the site, and it is important to reuse certain logos and other art at various times during the year.

- The site makes use of some custom programming which the Web master or consultant use when a special feature is needed.

Table 3: Cost Analysis of an In-House WCM Solution

Start Up over Two Months					
Task	Person Days	Person Hours	Best Case	Average Case[a]	Comments
Requirements	5.0	40.0	$693	$4,158[b]	No consultant involved. Internal staff identify accurately the requirements.
Editor Selection / Test[c]	1.0	8.0	$139	$832	No consultant involved. Selection includes deployment to content creators machines.
Templates	3.5	28.0	$485	$2,911	Six templates, 4 hrs per template. Templates are assumed to have two ActiveX or equivalent controls and two custom subroutines.
Data model	1.5	12.0	$208	$1,248	No consultant involved. No new data are required. The data model normalizes existing content repositories.
Database set up[d]	3.5	28.0	$485	$2,911	No consultant involved. In-house staff set up a SQL Server or equivalent database. Database resides on a production server. Master copy of database on a secure server.
Additional scripting[e]	2.5	20.0	$347	$2,079	These scripts add security, basic cookie, or simple on-the-fly content generation in a portlet architecture.

XML coding / set up	3.5	28.0	$485	$2,911	3 DTDs or schemas, 4 hrs per DTD or schema. Existing templates are modified.[f]
Workflow script	2.5	20.0	$347	$2,079	One approval level only. Script for changed content to trigger a message to approval editor.
Validation scripts (four)	2.5	20.0	$347	$2,079	No consultant involved. These scripts create a CRC and validate sending and receiving of data to key points in the CMS.
Posting script	0.5	4.0	$69	$416	No consultant involved. Automates upload of only changed pages.
Log file / usage tracking script	2.5	20.0	$347	$2,079	No consultant involved. Open source metrics used and modified.
Debug	2.0	16.0	$277	$1,663	No consultant involved. Manual process by systems professionals.
Training	1.0	8.0	$139	$832	Off site two-day session. Train-the-trainer model for content and support training.
Operating Costs for 10 Months					
Maintenance	15.0	120.0	$2,079	$12,475	Assume 10 months. Baseline estimate.
One new feature / month	1.0	8.0	$139	$832	Assume 10 months. Baseline estimate.
Total First Year	33.0	264.0	**$6,584**	**$39,505**	

a. An average case assumes that more in-house staff are required. For purposes of this example, an average of the amount of time required to code basic content management functions has been derived from Arnold Information Technology's cost estimating model. This model is updated on a quarterly basis with data from on-going projects for which the firm's professionals are performing systems engineering and technical assistance and / or independent verification and validation work. The estimates have a confidence factor of 99 percent.

b. For simplicity, we have assumed that technical professionals earn $35,000 per year or $17.33 per hour including benefits. Although low, the depressed economic climate is putting downward pressure on most information technology salaries.

c. We have assumed that the organization has valid licenses for an HTML editor.

d. We have assumed that the organization has a valid SQL Server or equivalent database license.

e. We have assumed that the organization has a valid license for Visual Studio.net or its equivalent.

f. We have assumed that the organization has information technology professionals able to create valid XML schema and perform necessary coding / scripting functions.

It may sound simple, to develop a handful of templates, scripts, and check-in and check-out features for this situation. Yet what does this analysis reveal?

- For organizations with modest Web sites and a skilled, experienced information technology department, the cost for a "built from scratch" system can be as low as $7,000. Taking short

cuts and recycling existing code from freeware or Open Source repositories can drive the cost down to as little as $4,000.

- Most variables in the custom-developed approach are associated with time. When additional time is needed, costs can rise. Should an outside consultant be required to solve a specific problem, there is no easy way to estimate that financial impact.

- The analysis does not highlight ongoing costs. It is difficult to estimate the cost over time to support, update and enhance a home-brewed Web content management solution.

A mid-range estimate suggests that the average "built from scratch" system approaches $40,000. If consulting services are required, it is easy to see why many custom WCM systems hit six and seven figures in the first year of deployment.

What's the answer? Rather than reinventing the wheel, organizations should identify off-the-shelf software designed specifically to address Web content management needs. Solutions are now emerging within the broader content management landscape.

Annex B: About Ektron, Inc.

Ektron develops and distributes flexible solutions for content authoring, publishing and management.

Figure 5. Ektron Benefit Snapshot
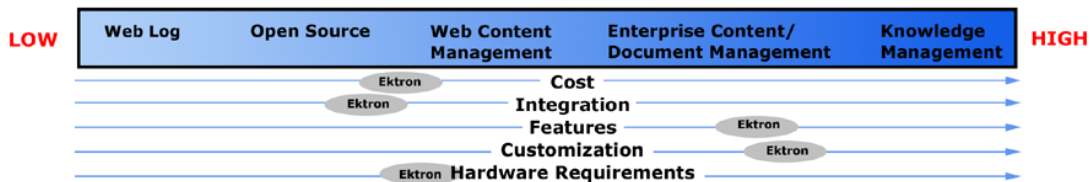
Ektron's browser-based solutions meet the needs of Web and information technology professionals and non-technical end-users-with products including some the industry's most afford-able, yet fully scalable, Web content management systems, the first "word processor on the Web," and an XML editor designed for business end-users.

Since its founding in 1998, Ektron has worked with thousands of Web developers worldwide in organizations large and small. Ektron has also partnered with leading content management vendors. This unique perspective has shown Ektron that Web developers want flexibility and options. Many developers want to exploit their creative potential in deploying Web content solu-tions. Ektron has responded with a continually expanding prod-uct line and new feature sets.

At the same time, Ektron continues a strong tradition of ensur-ing its products are business-end-user-friendly, affordable, and built on standards-based technology-making them attractive for organizations seeking a convenient, "grow-as-you-go, pay-as-you-grow" approach to content management.

Ektron is the only company offering a family of CMS solutions for today's popular Web application server environments (ASP, ASP.Net, CF and PHP). Organizations choose Ektron's solutions because they deliver both short-and long-term ROI, as well as the opportunity to easily migrate to more robust capabilities over time. Ektron's core CMS strengths include:

- A rich feature set offering breadth and depth of CM functionality

- A unique component-based approach to integration ensuring flexibility for developers and cost-effectiveness for site owners

- Easy-to-understand, intuitive environments—for end users, site administrators and integrating developers

- Radical affordability.

Ektron's award-winning browser-based editors contain an interface with toolbars, context menus, dialogs, and other user features. Developers can easily customize the editor by defining the user interface or by controlling the environment in the Web page. Ektron eWebEditPro and eWebEditPro+XML are considered the "best of breed" and are used by many of the major content management solution providers.

Worldwide, more than 7,000 organizations in nearly all industries rely on Ektron to solve real-world Web content management and authoring problems-including Johnson & Johnson, Fisher Price, AT&T, JP Morgan, KPMG, Palm, National Science Foundation, Wachovia, Cerner, GMAC, Glaxo SmithKline, Cracker Barrel, the Weather Channel, Duke University, Morningstar, Evanston Northwestern Healthcare, Merrill Lynch, and Penn National Insurance.

Ektron's products are used in all types of public Web site, intranet, and extranet environments. They are available from more than 300 worldwide VAR partners (Web development firms, interactive agencies, e-business consulting firms, etc.) and through international distribution partners. Thousands of Web developers have deployed Ektron technologies in content management, e-mail, online learning, CRM and other applications, including custom-built and off-the-shelf solutions. Ektron products are OEMed by Vignette, Interwoven, divine, Percussion, RightNow Technologies and others, and recommended via technology partnerships with Microsoft, Documentum, Mediasurface, and Stellent, among others.

Ektron, Inc., has operations in the United Kingdom. For more, visit www.ektron.com.

Ektron's browser-based products include:

- **Ektron CMS300:** An enterprise solution, this is the industry's first easy-to-use, browser-based CMS for managing both XML and HTML

- **Ektron CMS200:** A robust, scalable CMS for mid- to high-end deployment

- **Ektron CMS100:** An entry-level CMS for a limited number of end-users

- **eMPower:** Ektron's pure Cold Fusion-based content management system (CMS)eWebEditPro: the market-leading browser-based HTML/ XHTML editor offering full-featured word processor-like capabilities

- **eWebEditPro+XML:** The first browser-based XML editor designed primarily for business end-users. By combining this tool with XSLT and XML schemas, developers create "Smart Web Form" authoring environments

- **eWebWP:** This Macromedia Flash MX-based technology delivers browser-based text formatting to users on virtually any client platform.

About the Author. Stephen E. Arnold, president of Arnold Information Technology, provides professional services to organizations worldwide, specializing in electronic publishing, system design, development, and testing, strategic and tactical information planning, and database design. He has more than 30 years' experience in tracking publishing technologies, and is author of five books and more than 40 journal articles. Mr. Arnold has been involved with a number of large-scale online systems for such organizations as US West, the Thomson Corporation, John Wiley & Sons, and the White House, among others. He may be reached at sa@arnoldit.com. More information may be found at www.arnoldit.com