



How to Choose a Content Management System

Introduction

A Web site is a crucial link between a company and its customers. By providing the right information at the right time, a Web site can be the most effective way to inform, market, and sell.

However, many Web sites are updated behind schedule, have inconsistent information architectures, or have pages that contain obsolete or erroneous information. This is often because a Web site is a difficult combination of new technologies, graphic design, content creation, information architecture, and user interface design. If traditional publishing can be considered to have just two dimensions (height and width), then Web site publishing has four dimensions (height, width, depth, and time).

The challenges of a Web site are also organizational. IT is responsible for managing the servers and applications, and multiple groups have responsibility for Web site content: marketing, sales, support, human resources, customer service, engineering, and more. These groups can clash when the Web site is a bottleneck.

A content management system (CMS) helps solve these problems and challenges. Just as the interoffice mail room has been replaced by email systems, a content management system automates the flow of content into a Web site, while leaving the Web team in complete control over look and feel, information architecture, workflow capabilities, and delegated permissions.

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Do you need a CMS?

Here are a few questions that can indicate the need for a content management system:

- Does it take more than a few hours for a job posting, press release, news story, product page, support note, or other time-sensitive document to be posted to your Web site?
- Do all Web site changes grind to a halt if anyone in your organization goes on vacation or is sick?
- Does any one group in your company always get top priority for content changes, delaying Web site changes for other groups?
- Are groups within your company disenchanted with the Web site because it doesn't serve their needs within their timeframes?
- Does it take weeks or months to make a simple global change to the Web site, such as adding a new navigational element on every page?
- Is your site larger than few hundred pages, or does it need to be updated more than a few times a week?

- Is the information architecture of your Web site slowly decaying, with broken links or broken images found throughout the site?
- Does it take a protracted amount of time to redesign your Web site?
- Are content creators and contributors located at multiple locations?

If you answered yes to a few of these questions, then you need a content management system. Further, if you are about to launch a new Web site or redesign an existing Web site, deploying a content management system now can help the redesign go more smoothly and even launch sooner.

A Process for Choosing a CMS

Choosing a CMS can be difficult because many people in your company have a stake in your Web site. To make best use of your time, your colleagues' time, and your company resources, we recommend establishing a clear process for making your selection. The process you use should be customized to your company and its unique objectives and constraints.



Define the Decision Team

First, put together a team consisting of the necessary constituents and decision makers. These might include:

- Information technologists and strategists
- Web programmers
- Web designers
- Web content writers
- Corporate marketers
- Public relations personnel
- Product marketers
- Journalists
- Editors
- Customer support and service personnel
- Finance personnel

The ease of making a decision decreases if too many people are involved in the decision process, so be sure to keep the team as small as possible, and ask members to represent their constituencies. You should also determine who has the final sign-off. Is it the CIO, the VP of Marketing, or the CFO? Make sure he or she is included early on and that you understand his or her decision process.

Determine Business Objectives and Constraints

The next step is to determine your company's business objectives and constraints. Here are a few questions to consider:

- **What specific and measurable benefits do you expect to gain in the first year and subsequent years?** Will your company achieve more sales because product information is more readily available? Will you lower your support costs because information is better available on your Web site? Will you need less outside resources for managing your Web site? By implementing a CMS, can you take on other applications that will have a benefit?
- **What are your budget constraints in the first year and subsequent years. Do you have a specific maximum you can spend in each year?** Do you need to justify the CMS as an out-of-budget expenditure?
- **What are your headcount constraints?** Can you add programmers and IT personnel to support the CMS, or do you need a CMS that can be implemented with existing staff?
- **What are your company's skill sets?** Do you have an IT team that can take on managing the CMS implementation? Do you have a database administrator (DBA) skilled in installing and managing a database, or do you need to outsource these functions?
- **How risk-averse is your company?** Some high-end CMS implementations never see the light of day for a variety of reasons, including budget overrun. Is taking such a risk acceptable to your company?
- **When do you need the CMS to be deployed?** The time to deploy a CMS can vary by an order of magnitude depending on the CMS chosen.
- **What period of time will you choose when calculating the real costs and benefits of the CMS?** (Choosing 3-5 years is a good suggestion.)

Evaluate Vendors

The next step is to evaluate your vendor choices. There are hundreds of choices to choose from divided into four main categories:

- **Manual Content Management** - Maintain your Web site the old-fashioned way, where every page is created and pushed by hand. Tools such as Macromedia Dreamweaver or Adobe GoLive can help ease the process.
- **Server-based Content Management** - Purchase an installable software solution such as Vignette StoryServer, Interwoven TeamSite, or Microsoft Content Management Server. You are responsible for purchasing and installing all hardware and software, and for maintaining it through the life of the CMS.
- **Internet-based Content Management** - Purchase an Internet-based CMS such as Atomz Publish. The vendor is responsible for hosting and maintaining the software.
- **Homegrown Content Management System** - Use internal programming personnel to build a content management system for your company's purposes.

When you evaluate these vendors, be sure to match them up against your real business objectives and constraints. See "Four CMS Approaches" later in this document for more information on the various approaches. Among the factors you should consider:

- **Features** - Does the CMS have the features you require?
- **Scalability** - Will the CMS scale to exceed your business needs?
- **Deployment time** - Will the deployment time meet your business needs?
- **Entry costs** - Do the first year costs meet your business constraints?
- **Ongoing costs** - Do the ongoing costs meet your business constraints?

Evaluate your Total Cost of Ownership (TCO)

As you evaluate approaches and vendors, it is important to calculate the total cost of ownership. Paying the vendor for their CMS is only one small part of the total cost. You must also consider personnel to maintain the system, ancillary software purchases such as a database, hardware systems required, IT processes such as backup, and much more.

One way to cross check your calculations is to note that a server-based CMS typically has a total cost of ownership that is 3 to 8 times the cost of the actual software. A homegrown CMS is typically much more. An Internet-based CMS is typically much less.

The spreadsheet below can help you add up the total cost of ownership for varying solutions.

Cost Factor	Server-Based CMS (Interwoven, Vignette, Microsoft, etc.)	Internet-Based CMS (Atomz)	Homegrown CMS
CMS Application License	\$\$\$\$	0	0
Database Application License	\$\$\$	0	\$\$-\$\$\$
Yearly Subscription Cost	0	\$\$-\$\$\$	0
Yearly Support Fees	\$	\$	\$
CMS Hardware Server(s)	\$-\$\$\$	0	\$-\$\$\$
Database Hardware Server(s)	\$-\$\$\$	0	\$-\$\$\$
IT Rackspace, Bandwidth, Power, Backup, Monitoring Costs	\$\$	0	\$\$
Installation Costs	\$	0	\$
Programming Personnel Costs	\$\$\$\$ (Java, TCL, XML)	\$\$ (HTML)	\$\$\$\$ (Custom Java, ASP, CFM)
IT Personnel Maintenance Costs	\$\$\$	0	\$\$\$
Application Upgrade Costs (when they go smoothly)	\$	0	\$
Application Upgrade Costs (when they don't go smoothly)	\$\$\$	0	\$\$\$

Evaluate your Return on Investment (ROI)

The investors and shareholders in your company will expect there to be a clear return for any investment made.

One standard measure of a business investment is Return On Investment (ROI). Simply stated, the ROI of a business initiative measures the annual return on that business investment. Mathematically, ROI is represented as:

$$\text{ROI} = \frac{\text{Present Value of Benefits}}{\text{Present Value of Costs}}$$

Since benefits and costs are usually incurred over many years, the "Present Value" of these costs and benefits represent these values in today's dollars.

Determining the denominator of this formula is easy if you have done a TCO analysis, and have taken the present value of the costs over the desired period (say three years).

Determining the numerator is more of a challenge. While costs can often be accurately estimated, the benefits are often hard to directly attribute to the Web site. For example, here are some examples of benefits of a better-run Web site:

- **Sales increase because prospects can more easily find information about products, or how to purchase products.**
- **Sales increase because a better-run Web site leaves a better impression, improving brand awareness.** Web sites are often the leading marketing materials seen by your prospects.
- **Employee productivity improves** because the Web team is no longer a bottleneck.
- **Customer satisfaction increases** because instructional and support materials can be more easily found.

If you can quantify the benefits, then a return on investment analysis can help you justify the investment in a content management system. If you cannot quantify the benefits, then you can still use the TCO as a basis for comparing various solutions, but you should probably place higher emphasis on keeping your costs down.

Gather your Decision Team and Decide

After you have evaluated the features, benefits, and costs, you are prepared to make your decision. Gather the decision team together, and assess each vendor still in the running. Weigh each category with the importance your company ascribes. As you do, consider the following:

- **Does the CMS provide all the features and functionality you need today? Will it continue to provide what you need over the life of the application?**
- **What is the total cost of ownership and return on investment?**
- **What customer references does the vendor provide? Do they provide references within your industry?**
- **What is their reputation for customer support?** (You might try calling or emailing a question to their support team to get a read on this.)

You will make a clear and objective decision by including the right decision makers, and evaluating your decision from both a functionality point of view, and a TCO and ROI point of view.

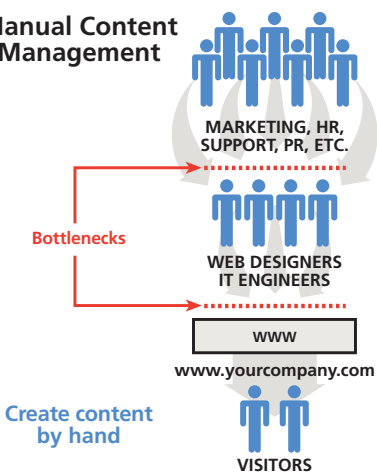
Four CMS Approaches

There are four main approaches for managing Web site content, each with unique advantages and disadvantages, and costs that range from thousands to millions of dollars. This white paper describes the approaches and their tradeoffs:

- **Manual Content Management** - Employing HTML designers and producers to manage every Web page by hand.
- **Server-Based Content Management Systems** - Software products you install and maintain to manage Web content and automate workflow.
- **Internet-Based Content Management Systems** - Software products you purchase by subscription to manage Web content and automate workflow.
- **Homegrown Content Management Systems** - A content management system built by your own programming staff or by consultants.

Manual Content Management

Most Web sites start out being built by hand, and later evolve to use content management and other applications. The following table outlines the approach, costs, advantages, and disadvantages of manual content management.

<p>Manual Content Management</p>  <p>MARKETING, HR, SUPPORT, PR, ETC.</p> <p>WEB DESIGNERS IT ENGINEERS</p> <p>www.yourcompany.com</p> <p>VISITORS</p> <p>Create content by hand</p>	<p>Approach <i>Manual Content Management</i></p> <p>Hire HTML designers and production staff to maintain the site by hand. All requests for changes are trafficked by a manager and are delegated to producers, who code in either raw HTML or using site design tools like Macromedia Dreamweaver or Adobe GoLive. Changes are moved to the Web site by FTP, WebDAV, or other protocols.</p>
<p>Costs <i>Manual Content Management</i></p> <p>People:</p> <ul style="list-style-type: none"> • HTML Designer(s) to create page designs and overall information architecture. • HTML Producer(s) to create pages and assure they are linked into appropriate places in the site. • Project Manager to traffic projects through the designers and producers. • QA Engineer(s) or Editor(s) to review pages hosted. <p>Purchases:</p> <ul style="list-style-type: none"> • Web servers to host site. Can be outsourced to Web hosting or colocation company. • Design tools like Macromedia Dreamweaver or Adobe GoLive, and training. 	
<p>Advantages</p> <ul style="list-style-type: none"> • Low startup costs. Design and HTML production are all that are required to be up and running. • Predictable but significant ongoing costs. Every page produced takes on the order of one or two hours of labor time. Maximum costs limited by staffing hired. 	<p>Disadvantages <i>Manual Content Management</i></p> <ul style="list-style-type: none"> • Information architecture can rapidly get out of hand and become inconsistent. • Ongoing costs are fairly high due to lack of automation. Each page posted can cost hundreds of dollars when all labor costs are included. • Web team is a bottleneck for all changes made to the Web site. • Frequently changing sites can be delayed due to Web site staff vacations, sickness, or turnover. • Updating individual pages is a mundane job, and can lead to employee turnover. • Human error can easily lead to HTML errors, browser-compatibility errors. Lack of automation often requires every page to be individually tested. • Because content is not separated from presentation, Web site redesigns are difficult.

Human-based content management is fine for a small site, or one that is not updated often. If your Web site is important to your business and has more demanding needs, you should choose a content management system.

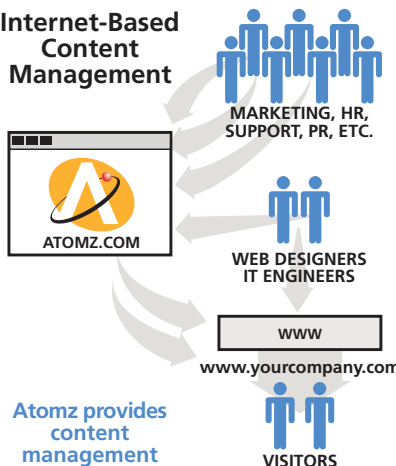
Server-Based Content Management Systems

Server-based content management systems are traditional licensed software you install and maintain on your own servers. Over the past 8 years many server-based CMS solutions have appeared on the market, ranging from low-cost products through high-cost solutions from Vignette, Interwoven, and Documentum. The tradeoffs of a server-based CMS are listed below.

<div><div>Server-Based Content Management</div><div><div><div>CMS</div><div>STAGING</div><div>DATABASE</div><div>BACKUP</div></div><div><div>MARKETING, HR, SUPPORT, PR, ETC.</div><div>WEB DESIGNERS IT ENGINEERS</div><div>www</div><div>www.yourcompany.com</div><div>VISITORS</div></div><div>Purchase & manage servers & software</div></div></div>	<div><div>Approach</div><div>Server-Based Content Management</div><div>Buy a server-based CMS, and a database. Buy hardware servers to host the content management system and provide a place to stage content for testing. Create an extranet so that remote employees can access the CMS. HTML Designers create the page designs and information architecture. Programmers implement page designs and information architecture by creating and debugging programs in TCL, ASP, CFM, or Java. Once implemented, content creators log into the CMS servers to add content, which is then trafficked by an automated workflow system, and posted to the Web site.</div></div>
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<div><div>Advantages</div><div><ul style="list-style-type: none">• Information architecture and page designs remain consistent as content is added.• Workflow mechanisms ensure that only authorized personnel can change their sections of the site, and that reviews and edit passes are completed.• Content responsibility can be delegated to content owners, empowering them to make their own changes.• Content can be changed rapidly, without human error causing broken links or browser incompatibilities.• Server-based solutions can be tightly integrated with back-end systems such as ERP and employee directory systems.</div></div>	<div><div>Disadvantages</div><div>Server-Based Content Management<ul style="list-style-type: none">• High upfront costs due to significant engineering and IT efforts.• High ongoing costs due to IT personnel and support contracts needed to maintain and update server software.• Time to deploy typically 3-6 months or more.• Risk of “shelfware”, where CMS is never deployed or significant functionality not used.• Downtime can occur due to IT staff vacations, sickness, or turnover.</div></div>

Internet-Based Content Management Systems

Internet-based CMS solutions are an innovative approach to how Web site content can be managed. Instead of installing a server-based application, the Internet-based CMS vendor maintains a Web site that itself is a sophisticated application used to maintain your Web site. Your administrators log in to the vendor's Web site, create templates, and define the information architecture of your site. Then, your editors (the people who create and control the content) log in to the vendor's Web site, and follow wizard-like task instructions to interactively update your site. No HTML knowledge is necessary, and the Web team maintains complete control over look and feel, workflow, and authentication. The vendor's site then updates the appropriate pages on your site through protocols such as FTP or WebDAV. The tradeoffs are listed below.

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Homegrown Content Management Systems

Some companies opt to develop their own content management system, or to hire a consulting firm to build one for them. In general, this is usually the riskiest approach of all, and in most cases the least successful. With so many successful CMS vendors available to choose from, it is better to leverage their competency in content management, and stick to the core competencies from which your company thrives.

Approach		Homegrown Content Management
Hire programmers, quality assurance engineers, and engineering management to build and test a custom CMS. Buy a database. Buy hardware servers to host the content management system and provide a place to stage content for testing. Create an extranet so that remote employees can access the CMS. HTML Designers create the page designs and information architecture. Programmers implement page designs and information architecture by creating and debugging programs in TCL, ASP, CFM, or Java. Once implemented, content creators log into the CMS servers to add content, which is then trafficked by an automated workflow system, and posted to the Web site.		
Costs		Homegrown Content Management
People:	<ul style="list-style-type: none"> • Programmers to build the CMS, and be on hand for upgrades and bug fixes. • Quality Assurance engineers to test the CMS, and be on hand for upgrades and bug fixes. • Engineering management to manage the process, and be on hand for upgrades and bug fixes. • HTML Designer(s) to create page designs and overall information architecture. • Programmers to implement page designs in TCL, ASP, CFM, or Java. • QA Engineers to assure quality of the programs, information architecture, and page designs. • IT Engineers to install, monitor, maintain, upgrade, and backup CMS systems, as well as the production Web servers. • Database Administrator to install, maintain, and backup database. 	
Purchases:	<ul style="list-style-type: none"> • A database such as Oracle or Microsoft SQL Server. • One or more hardware servers to host the CMS and database. • One or more Web servers to stage content for testing. • One or more production Web servers. • Rackspace, reliable bandwidth, uninterrupted power to maintain the servers. • Backup devices and procedures for the database, CMS, and other data. 	
Advantages	Disadvantages	Homegrown Content Management
<ul style="list-style-type: none"> • Same advantages as a Server-Based CMS. • Custom features can be tailored to the specific needs of your company. 	<ul style="list-style-type: none"> • Same disadvantages as a Server-Based CMS, plus: • High development costs. • High risks if software development is not a core competency of your company. • Time to deploy typically 9-12 months or more. • Turnover in engineering personnel can risk future CMS upgrades. 	

Other Issues to Consider

- **Will the CMS integrate well with the application development environment of your Web site?** Among your choices are ASP, JSP, PHP, Perl, Macromedia ColdFusion, BEA WebLogic, IBM WebSphere, and Lotus Domino.
- **What site search engine will you be using?** Site search is a crucial way for visitors to find what they are looking for, and your site search engine should integrate well with your CMS. In particular, check to be sure that the CMS can inform the site search engine of changes made to the site so your results are up-to-minute, and also be sure that metatag information can be managed within the CMS to assure relevant search results.
- **Can the CMS be set up so that remote content contributors can access the CMS and make updates at modem speeds?** Often a CMS requires a high-speed connection, but your constituents might not have that luxury.

- **Exactly what skill sets are required of the team managing the CMS?** Some CMS systems require only HTML knowledge, giving more people in your organization the ability to manage the CMS. Some require knowledge of esoteric programming languages such as TCL, or require hard-to-find and expensive skill sets such as database administration.

Conclusions

Choosing a content management system is a crucial decision for any company. To most effectively make the decision, follow the process outlined in this document:

- **Define the Decision Team**
- **Determine Business Objectives and Constraints**
- **Evaluate Your Vendors**
- **Evaluate TCO & ROI**
- **Gather Your Decision Team and Decide**

By providing a process for making your CMS decision, and by outlining the various advantages, disadvantages, and costs, we hope you are able to better decide for yourself which is your best solution.



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