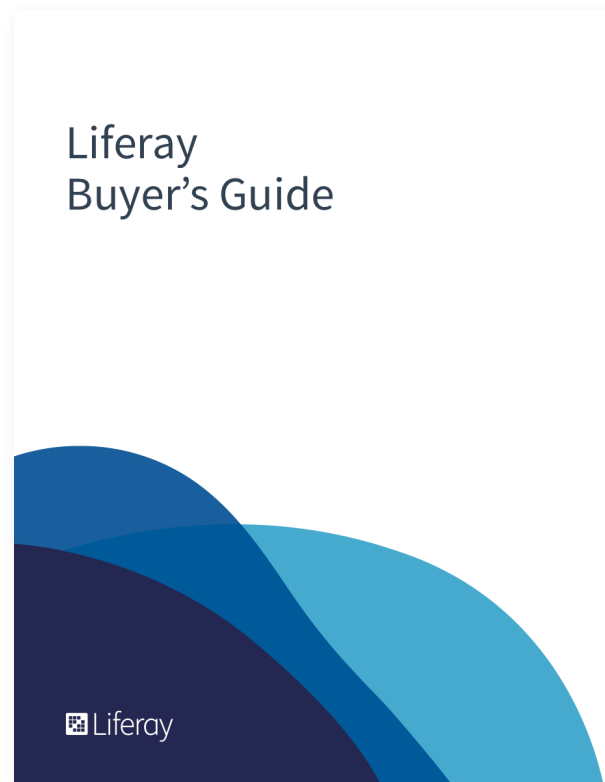


# Liferay Buyer's Guide Checklist



Liferay Buyer's Guide Checklist is a companion piece to Liferay Buyer's Guide.

To download Liferay Buyer's Guide, please visit:  
[liferay.com/get-buyers-guide](https://liferay.com/get-buyers-guide)

# Buying Checklist for Evaluating Portals, Content and Collaboration Solutions

Several criteria must be reviewed during a thorough product evaluation process. Specifically, an organization must understand its corporate strategy for costs, risk, control, end user capability and allowable heterogeneity. This section provides a brief overview of each and includes a sample buyer's checklist for the evaluation of available platforms.

## Buyer Evaluation Criteria

**Costs:** Portal, content and collaboration solutions are available in a wide range of prices. Established stack players such as IBM, Oracle and Microsoft have highly expensive platforms and complex maintenance and support pricing structures, but often compete with a wide network of partners. However, open source platforms offer a much wider network of specialists, thanks to use of open standards and development methodologies. A focus on simplicity and integration has also increased their use within enterprises focusing on cost reduction.

**Risk:** Organizations need to understand their acceptable risk levels for long-term cost sustainability (increased costs over time), integration capabilities (ability to integrate with same vendor and other vendors products using acceptable standards), product chaining risk (one product requiring the use of other products from the same company), as well as end user adoption and satisfaction.

**Control:** Companies often need to strike a balance between centralized and distributed control to streamline decision-making and maintain a level of team responsiveness. Highly complex systems, more acceptable to centralized IT (allowing 1 tool for everything) are often too expensive, too complex

and inflexible for departmental use. New trends in open source, allowing highly scalable, lighter-weight solutions are often more capable of serving both needs.

**End User Capabilities:** Solutions that are difficult to use are not highly successful. Conversely, the solutions that are intuitive and meet basic needs of the enterprise in which they are deployed enjoy adoption. This is especially true for solutions reaching a diverse audience of users such as portals and collaboration tools.

**Heterogeneity:** The need to strike a balance between central and departmental systems has brought forth new enterprise architectures that leverage multiple systems. Corporations with large, expensive and well-established systems are now augmenting these systems with lower cost, open source alternatives at the departmental level. However, even with expanding infrastructures, companies can still reduce maintenance and support costs if they can successfully facilitate the review and enforcement of organizational needs for product and content management at a high level.

## Buyer's Checklist

The following checklist should be used to evaluate various platforms for portal, content and collaboration use cases. Project teams assigned to the evaluation can use the questions directly or add, delete or modify questions depending on specific project requirements. Not all features within the table are required for all implementations. A sample evaluation process is detailed below.

## How to Evaluate

### PREFACE - PER VENDOR EVALUATION

Each vendor should be evaluated separately using the same table of questions. Again, the following table or a customized version can be used.

### STEP 1 - PER QUESTION EVALUATION

For each question, a score of 1 to 5 (5 being the highest) should be made for the specific vendor. Place an X mark under the appropriate score column, then record the absolute value in the corresponding row on the farthest column to the right. This will allow a dual method for evaluation (explained below).

### STEP 2 - PER SECTION SUMMARY

When all questions are evaluated, within each section, place the sum of all the values in the rightmost column in the respective section's "Total" row. For example, if the values in the columns above are 3, 4, 1, 4, 5, the total value would be the sum (3+4+1+4+5). This will indicate a grand total for the section.

Now, add all the X marks under each point column and record the number in the corresponding column in the respective section's Total row. For example, if there are 10 X's under the 1 column, write "10" in the Total row corresponding to the 1 column; if there are 7 X's under the 2 column, write "7" in the Total row corresponding to the 2 column; and so forth. This will allow a second method of evaluation for each section in addition to the grand total, such as score distribution and each section's strengths and weaknesses.

Repeat the same process for each section of the guide or for each vendor as desired.

### STEP 3 - TOTAL SUMMARY

At the bottom of all sections is a "Grand Total" row. Add up the rightmost column values for each section (grand totals) and place that value in the

rightmost column in the Grand Total row. This is the composite score total for the respective vendor.

Now, add all the X mark values under each score column for each respective section, then record the value in the corresponding column in the Grand Total row. For example, if there were 5 X's under the 1 column, 10 X's under the 2 column, the value of the 1 column in the Grand Total row would be the sum of 5 + 10.

### STEP 4 - EVALUATIONS

#### Grand Total vs. Column Strength

1. After all vendors have been reviewed, the rightmost value in the Grand Total column can be used to evaluate the vendor's ability to meet the stated project requirements. In other words, what is the vendor's total score out of a possible 1465 points?
2. An additional step involves looking at the distribution of scores (1 to 5) for each vendor. Compare the distribution of scores in the Grand Total row. Does the vendor have a high distribution of 1's and 2's? It is possible for a vendor to register a high composite score yet possess more 1's than another vendor who registered a lower composite score but recorded more 4's and 5's overall. (This step is to ensure consistency and account for the breakdown of each section and/or question. Project teams should not take the highest score of all vendors at face value.)
3. Now, take some time to review each section, as a project can be broken into several sections. The table below divides into various categories such as Portal, Collaboration, Web Content Management and so forth. For a specific project, keep in mind that a vendor who scored the most overall points may have actually scored lower on the most important section for a given project.

By comparing scores in each section (or the most important ones), you will have further insight to make a value judgment.

### Weighted Score Method

4. (Optional): The weighted score method is an optional step for evaluation. Some questions or requirements are more important than others. While one vendor may score well on three questions but poorly on one, a second vendor may do the opposite. If the vendor scored poorly on the question that is actually one of the most important features, then the final score may misrepresent the vendor. To apply this method, add a weight to each row after the table is completed. (It will be used to calculate the final value in the rightmost column of each row.) Project teams can use a 1 to 5 weight for each row, and then multiply to calculate the value placed in the rightmost column for each row. For example, if the vendor rates “4” for a question given a weight of 5, then the value placed in the rightmost column would be 20.

### STEP 5 - QUALITATIVE EVALUATION

The final step of the evaluation should counterbalance the quantitative scores shown above. There are several methods that can be employed or augmented by the various aforementioned methods. For example, a Q&A demonstration can be requested to drill in on specific questions, sections or areas where the vendor scored low on highly-weighted questions. Additional qualitative evaluation methods can include Proof-of-Concept (POC), trial, workshop demonstrations, reference customer outreach and online evaluations.

# Buyer's Checklist

Portal	1	2	3	4	5	Totals
<b>Site Design</b>						
Site Design: System provides a platform that simplifies the development of web content and sites, especially when aggregating content from multiple sources.						
Navigation: System provides a framework to simplify the development of an entire website of web page content (e.g., tab vs. menu navigation, site map, login).						
Anonymous vs. Authenticated Users: System allows the easy development of web content that can be defined for anonymous and authenticated users (i.e., www.company.com is general information, while myaccount.company.com will give personalized content to end user).						
Printing: Support for printer-friendly versions of pages.						
Mobility: System allows views from multiple client types, including thin and thick clients.						
Account Management: System includes out-of-the-box ability for end users to self-register a new account, manage attributes associated with their account (e.g., picture, phone, email address) and reset a lost password.						
Multiple Language Support: System allows developers, administrators and content owners the ability to support multiple languages within the same site. Users have the ability to select their preferred language and system is able to auto-detect users' preferred language.						
Cloud Deployments: System supports deployment within a cloud infrastructure including deployment, maintenance and monitoring.						

Portal	1	2	3	4	5	Totals
<b>Separation of Presentation Design Components</b>						
Page Construction: System simplifies the development of web pages leveraging themes, access rules and web components.						
Web Components: System supports multiple methods for development of web components (e.g., portlet, widget, gadgets and multiple CMS).						
Site Construction: System supports the development of an entire site based on individual web pages, allowing linking between pages via simplified URLs.						
Web Component Development: System supports multiple user types (e.g., Task Workers, Practitioners, Experts, Developers). System includes support for web component development that can be easily reused by lower-skilled users, including the use of Wizards that allow users to easily configure pre-built web components.						
Themes: System allows the development of multiple themes where a single theme can be used across all pages created or where different themes can be used for different pages (themes include look and feel of site, header, footer, colors, fonts, styles, etc.).						
(A)Synchronous Page Updates: Pages support synchronous and asynchronous updates and content updates.						
Drag and Drop: Pages can be developed that support drag and drop of portlets, widgets, gadgets as well as other design elements.						
<b>Role-Based Content Delivery</b>						
Role-Based Content Delivery: System allows administrators the ability to define web content and assign it to a specific set of users, roles, groups or orgs. Users can be assigned to multiple roles.						

Portal	1	2	3	4	5	Totals
Personalization: System supports attribute-based personalization where the user's display is determined according to administrator-defined rules of attributes set for the user based on activities or profile attributes (i.e., content displayed within an advertising portlet is based on past selections by this user), as well as individual personalization based on actions the users have set themselves to customize their display (e.g., arranging desktop, adding/deleting web components, setting web component attributes).						
User Definable Attributes: Developers are able to build applications (portlets/widgets/gadgets) that can operate on a set of user-defined attributes. Users can add these applications to their pages and then set the attributes that are saved for future sessions (e.g., a weather portlet that is configured to show weather for specific zip code).						
Selectable Content: Administrators, site designers and developers are able to define new content that can be added to a selectable catalog of content available to end users. Once authenticated, end users are able to select various content and add it to the personalized view of their page.						
Web CMS: System includes a built-in web CMS allowing WYSIWYG creation, editing, approval and publishing of content.						
<b>Presentation Layer Integration</b>						
Single Sign-On: Once a user is logged into system, system provides a view of all integrated content and applications and provides single sign-on (or integrate with 3rd party single sign-on applications) to linked content (i.e., a click on an item in a dashboard portlet will handle SSO to external web application).						
Default vs. Personalized Web Content: Administrators and site designers can define content that will be the default view for all users. Users who login can then personalize their web pages by arranging content, selecting new content, deleting content, changing themes and setting attributes for individuals applications (portlets, widgets, gadgets). System allows users to easily update their account, personalizations and communities.						



Portal	1	2	3	4	5	Totals
<b>User and Group Interaction</b>						
Public, Group and Private Information: Users are able to access, create and interact with information shared publically, with a specific group or help private to the user.						
Delegated Administration: System allows administrators to be assigned to various orgs, roles and groups and allows end users to self-delegate authority to their account or specific applications (ability to approve workflow tasks).						
Subscriptions and Alerts: Developers are able to define alerts and allow individuals the ability to subscribe to alerts to various applications (i.e., users can subscribe to a document-sharing portlet to receive alerts whenever a document has been updated). System additionally includes and supports the development of RSS feeds for various applications (i.e., a newsfeed portlet having a subscribable RSS feed).						
Microsites: System supports the development of multiple "websites" from a single system(e.g., www.companyA.com and www.companyB.com are hosted within the same system as different microsites). Each microsite has its own defined themes, content, applications, users and roles.						
Communities: System allows end users the ability to create community pages and add members and content.						
BookMarkable URL: URLs are simple, descriptive and bookmarkable by browsers.						
Friendly URL Alias: System supports the development of human readable friendly URLs for web pages and easily support the development of multiple aliases per web page (e.g., www.company.com/products and www.company.com/solutions pointing to same page).						

Portal	1	2	3	4	5	Totals
Collaborative Services: System includes a set of basic collaboration services for web content, document sharing, blogs, wiki, chat, polls, messaging and calendaring (or integration to external chat server).						
Social Network: System allows end users the ability to create a social network of other users, allowing users to find, connect and collaborate with their chosen group of individuals.						
Social Collaboration: System allows individuals the ability to leverage collaborative services specific to their social network such as tags, forums, wikis, blogs, reservations, ranking, shared bookmarks, presence, chat, Internal Messaging.						
Social Object Control: Users have fine-grained control over social objects contained within the system.						
<b>Total (Portal)</b>						
Collaboration Services: (Blogs/Forum/Wiki/Calendar/Polls/Messaging/Chat)	1	2	3	4	5	Totals
Collaborative Services: System provides several applications that can be configured for use by users depending on the site design. These services include the ability for end users to define and share content, messages, polls and events.						
Collaboration Admin: System allows administrators the ability to configure and control which social media features and functionalities are accessible to individual users.						
Blog: System provides blog post capabilities and features for end users. Users are able to draft, publish and edit blog postings for their account.						
Blog WYSIWYG: Users are able to create/edit blog posts using a rich text editor.						

Collaboration Services: (Blogs/Forum/Wiki/Calendar/Polls/Messaging/Chat)	1	2	3	4	5	Totals
Blog Storage: Users are able to leverage content stored within the CMS and DMS including pictures, text and media into their blog posts.						
Blog Archive: System supports the ability to store and retrieve historical content associated with a blog.						
Blog Edit: Users are able to edit the content of a blog once it has been published to the web.						
Blog Template: System supports the use of templates for layout/theming of blogs.						
Blog Syndication: System allows blog content to be accessed via common syndication method (e.g., XML/RSS).						
Blog Subscription: System allows end users the ability to manage the subscribers who have elected to subscribe to their blog.						
Blog Comment: System allows individuals to post a comment to a blog post.						
Blog Comment View: System allows users to select availability of comments for their postings.						
Blog Ratings: System allows users to select availability of ratings for their postings.						
Blog Comments/Ratings View: System allows users to monitor and remove comments and ratings made by others.						
Blog Pingback: System allows users to link to a blog post via deep links, trackbacks and pingbacks.						
Blog Appropriate Flag: System allows the ability for users to flag or report a blog post/comment that may be viewed as inappropriate, illegal or deemed in violation of communications policies.						

Collaboration Services: (Blogs/Forum/Wiki/Calendar/Polls/Messaging/Chat)	1	2	3	4	5	Totals
Forum(1): System provides ability for users to instantiate a new instance of a discussion thread. System provides ability for users to author a new thread on a discussion forum.						
Forum(2): Users are able to preview a discussion forum thread prior to posting. Users are able to commit changes or updates and publish a thread for all discussion forum members to see.						
Forum History: System stores historical content associated with a discussion forum.						
Forum Moderation: System allows forum moderators to manage postings, comments and threaded discussions. System allows discussion forum moderators to manage individual forum postings.						
Forum Search: Users are able to search content within a central content repository/content library that can be used in a discussion forum.						
Forum Reply: Users are able to author a reply to an existing discussion or forum thread or blog comment.						
Forum Rate: Users are able to rate content that is included in a discussion forum thread.						
Forum Inappropriate Flag: Users are able to flag or report a discussion forum thread/content that may be viewed as inappropriate, illegal or deemed in violation of communications policies.						
Calendar: System provides basic calendar and integration to external calendar to allow individual and group calendars.						
Group Calendars: Support for multiple group calendars–view only and editable by group members.						
Polls: System includes polls and surveys on the site in general or an individual sub-site.						

Collaboration Services: (Blogs/Forum/Wiki/Calendar/Polls/Messaging/Chat)	1	2	3	4	5	Totals
Polls User Creation: Polls are easy to define by end users or site designers.						
Poll Results: Users are able to view the cumulative results for a poll after voting.						
Chat: System includes a chat portlet for inter-system messaging with other users of the system while online.						
Chat External System: System includes the ability to integrate to external instant messaging system. Interface allows user to view and chat with individuals online.						
Wiki: System includes a method for allowing users to publish content online via wiki with all basic functions of a wiki built within a site page.						
<b>Total (Collaboration Services)</b>						
Search	1	2	3	4	5	Totals
Search Feature: System provides a search capability for end users to find any content and application data within the system.						
Search Engine: System supports an included search engine providing search to end users for all content within the system or provides full integration to 3rd party search system.						
Simple and Advanced Search: Users are able to perform simple and advanced searches for content and data. Simple searches include Boolean and natural language; advanced searches include added criteria such as document type, author, date ranges, etc.						
Restricted Search: Users are only able to see search results for content they are authorized to access or to subscribe to access.						

Search	1	2	3	4	5	Totals
Saved Search: Users are able to save previous web queries.						
Search Result Categories: System categorizes search results across multiple content types (e.g., content, blogs, forums, document management system-meta tags as well as document content).						
Contextual Search: System provides support for contextualized search based on information related to where the user has navigated and where the search was performed.						
Search Taxonomy: Administrators are able to create (manually or programmatically) or import an existing taxonomy.						
Search Taxonomy Hierarchical: System provides administrators the ability to create hierarchical taxonomies.						
Search Taxonomy Relevancy: System provides administrators the ability to manage and optimize the ranking and relevancy scores that determine search results for content/data.						
Search Security: System enforces security options on content when providing search results. Users should not see search results for content they are not authorized to view.						
Search Reports: System is able to generate reports and analytics on the use and results from search activity.						
External Search Optimization: All content and application data are available to external search engines.						
SEO Methodology: System allows and administrator documentation details Search Engine Optimization guidelines for browser titles, meta descriptions, keywords, content and images.						
<b>Total (Search)</b>						

CMS	1	2	3	4	5	Totals
Content Creation and Management: System allows the easy development, editing, auditing and deletion of content within the system from a central location by users with assigned roles (e.g., content contributors, content owners and content approvers).						
3rd Party CMS: System provides support for publishing content from existing WCM within pages (e.g., portlet/widget/gadget content, theme elements).						
Site Design: System allows individuals to segregate the management of all aspects within the system, sites, pages and page components.						
Content Templates: System provides development and easy use of templates for sites, pages and components to simplify the development of new content.						
eForms: System allows easy authoring of online forms by content owners (e.g., “contact us” form or “survey form” for collecting data). Data from the forms can be stored in a simple table for later reporting or access by other applications.						
Role-Based Content Editing: Creation, editing, approval, publishing of content must support role-based permissioning. Administrators are able to define multiple role types.						
Multiple Simultaneous Roles: System allows a specific user to hold multiple roles and content permissions.						
In-Page Editing: System provides CMS editing 100% within a browser interface for contributors/users without requiring client software, ActiveX controls or applets.						
WYSIWYG Editing: System includes a WYSIWYG text editor for content. Text editor must have the ability for content contributors to add images, internal and external links to both content and images, apply styles and other standard formatting functionalities.						

CMS	1	2	3	4	5	Totals
Definable Field Requirements: System provides ability to require that a content element must conform to some controls (input required, must be a number).						
Edit Preview: System allows content editors to preview how their content will appear in production without publication.						
Staging: System supports a staging environment where content of entire pages can be viewed in the same way as presented to the visitor.						
Administrator Defined Workflows: Administrators are able to define workflow roles and standard workflows for use by content creators. (Specific steps, transitions, actors.)						
Rule-Based Workflow: System provides rule-based workflow (i.e., the ability to apply other situational criteria such as time of day).						
Conditional Workflow: System supports the ability to do conditional workflows.						
Multi-step Workflow: System is able to have multiple steps in a workflow.						
Metadata: System allows user-defined metadata for content creation.						
Automatic Metadata: System automatically generates metadata or suggestions for Creator, Editor, Owner/publisher, Dates (Create/Update/Published), Version, etc.						
Metadata Restrictions: System allows administrators to restrict metadata selection depending on user roles.						
Delegated Administration Work Reassignment: System allows administrators or content owners to delegate or reassign work from one user to another.						



CMS	1	2	3	4	5	Totals
Delegated Administration Workflow Override: System allows administrators and sub-administrators the ability to publish content with override of the regular workflow.						
Task Email Alerts: System is able to notify authors of task status via e-mail or others methods, such as task work chart, SMS, etc.						
Content Editing Trail Audit: System allows administrators the ability to review an audit trail of content as it moves through the content management workflow.						
Content Timeout Alerts: System allows definition and setting of timed notifications to content owners to review if content is still relevant, required and accurate.						
Automatic Archive Setting: System allows scheduling to automatically remove/archive content.						
Content Reuse: System allows reuse of content in multiple areas of the site without storage duplication. (For example, if a set of pages from a particular department were classified as news information, those pages could appear in a site-wide news area as well.)						
Automatic Publish Date: Support for automatic publishing based on a content owner scheduled date.						
Content Rollback: System supports content rollback.						
Push to Edge Services: System allows content to be pushed to a remote “edge server” for local caching or buffering.						
<b>Total (CMS)</b>						

DMS	1	2	3	4	5	Totals
Document Repository: System provides support for a document repository supporting multiple content types.						
Check-In and Check-Out: System supports the ability to check-in/check-out documents.						
Bulk Load: System allows bulk uploads and downloads of document to/from the document repository.						
Role-Based Doc Management: System restricts access to view, edit and create documents based on user role, org, group or community.						
Document Administration: System allows content owners and administrators the ability to create, manage and remove a document from the document repository.						
Document Change Workflow: System supports document workflows for publishing, editing and deleting documents.						
Document Meta Data: Users are able to define metadata related to a document in the repository.						
Document Delegated Admin: Users and admins are able to delegate access to view, edit and create documents in the repository to another user.						
Document Alerts: System allows users to subscribe to alerts based on activity related to a document (e.g., posting, editing, viewing).						
Document Timeline Alerts: System provides the ability to generate events based on the amount of time that a document has been in the document repository (e.g., <30 days, >90 days).						
Document Meta Revision History: Document shows revision history and provide access to past versions.						

DMS	1	2	3	4	5	Totals
Document Audit Trail: System provides the ability to maintain an audit trail of activity related to documents in the repository (i.e., who, what, when).						
Document History Reports: Administrators are able to generate internal reports showing activity of the document repository.						
<b>Total (DMS)</b>						
Identity Management (IdM)	1	2	3	4	5	Totals
User Identity Management: System provides a web-based user interface for user account creation, management, suspension and deletion.						
Access Modes: System supports both anonymous and authenticated access.						
Self-Registration: System allow users to self-register. Self-registration should leverage methods such as CAPTCHA to reduce fraudulent accounts.						
Password Reset: System provides a mechanism for setting initial passwords and resetting forgotten passwords.						
IdM Administration User Mirroring: System provides the ability for an administrator to impersonate an individual in order to diagnose problems.						
Org/Role/Community Identity Management: System allows the creation, management, suspension and deletion of organizations, roles, communities and the membership of users within each.						
Bulk Identity Management Updates: System supports bulk updates to user, org, role and community data, including bulk moves of individuals from one organization to other.						

Identity Management (IdM)	1	2	3	4	5	Totals
3rd Party Identity Management: System supports integration and real-time authentication against an existing identity management system or enterprise directory (AD/LDAP), including automatic synchronization to external identity management systems.						
Identity Support: System supports NTLM, CAS (Central Authentication Service), JAAS (Java Authorization and Authentication Service).						
PKI and Digital Certificates: System is able to support Public Key Infrastructure (PKI), digital certificates or signatures.						
SAML: System is able to support Security Assertions Markup Language (SAML).						
Existing Authentication: System supports the use of an existing external user repository (e.g., LDAP Directory Service, ActiveDirectory).						
Role-Based Access: System restricts access to system data and functionality based on a user's role.						
Minimal Access Controls: System provides the user with only the minimum necessary authority to access content and applications dependent on login level.						
Multi-Factor Authentication: System has support for multi-factor authentications.						
Multi-Level Access Control: System supports the use of multiple levels of security. A user should be required to submit credentials at the maximum requirement according to a given page view. If a user who is currently authenticated at a lower level (e.g., LDAP username/password) originally accesses a page with content requiring higher levels of access, the system will not present the content, but will present a window for higher credentials (e.g., Radius) and then present the page.						

Identity Management (IdM)	1	2	3	4	5	Totals
Authentication Passing: System is capable of passing user credentials and profile information to other applications.						
Single Sign-On: System supports single sign-on functionality.						
3rd Party Single Sign-On: System supports the integration of popular single sign-on servers like LDAP, NTLM, OpenID, OpenSSO, Josso.						
Federated IdM: System supports FIM (Federated Identity Management), allowing users to leverage multiple identity authorities.						
Authentication Encryption: System encrypts all authentication credentials when transmitting over insecure links.						
Authentication Storage: System does not embed usernames and passwords in plain text within executables, scripts or stored procedures.						
<b>Total (IdM)</b>						
Security	1	2	3	4	5	Totals
System Security: System is able to implement strong security policies and provide systems for monitoring internal and external violations.						
Encrypted DB Password Passing: Username and password information are encrypted when passed from portal to the databases.						
SSL Support: System provides selective or optional SSL (SSL can be applied to specific pages, some or none).						
Cookie Expiration: If cookies are required for authentication, then system should be configurable to delete the cookies after a session has ended.						

Security	1	2	3	4	5	Totals
Cookie Data: System must not place sensitive information in cookies.						
Security Assessment: Vulnerability assessment as well as security best practices toolkit should be available.						
Secure Remote Administration: System provides secure support for remote administration, management and monitoring.						
Naming Convention: Applications avoid using Universal Naming Convention (UNC) paths to access network resource.						
Source Code Security Practices: System assures that source code does not reveal sensitive information through hidden form fields or excessive use of comments. User visible source like HTML should be free of comments or commented code that might reveal internal workings of the server side code and security mechanisms.						
In-Transit Security: System ensures that safeguards are in place that prevent malicious or inadvertent changes to data in-transit or off-line (man in the middle, replay, offline reporting DB, etc.).						
URL Security: System does not place user credentials or session ID information in URLs.						
Application Environment Data: System does not embed or hard-code any application or environment information in unencrypted format.						
Fully-Qualified Path Filenames: System uses only fully-qualified absolute path and filenames.						
POST Method: System uses the POST method when HTML forms are submitted with sensitive information.						
Audit (Point of Access): Each item in the audit log must minimally contain the associated point of physical access.						

Security	1	2	3	4	5	Totals
Audit (Simultaneous Login): Simultaneous login using the same user IDs must be tracked.						
Audit (Sensitive Information Access): Successful access to Sensitive security resources must be tracked.						
External Data: Any externalization of data (e.g., backups and data transports) is encrypted.						
HIPAA (Data Access Notification): System is able to notify the user when personally identifiable information and/or protected health information (as defined by HIPAA) is accessed.						
HIPAA (Encryption): System is able to support encryption as required by HIPAA.						
Secure Communication: System uses encryption (e.g., SSL/TLS) in all communication channels (web, database, backups) and also for the transmission of files and electronic reports to/from clients and other services.						
Encrypted Data Objects: System allows administrators and developers to specify attributes that must be encrypted before they are stored or transmitted.						
Page Cache: System does not cache web pages containing sensitive information.						
New User Security Setup: System provides the ability to initiate procedures and workflow tasks associated with security procedures when a new user is created or updated.						
Audit (Security Activity): System allows audit trails and reports of creation or changes to access controls and data access.						

Security	1	2	3	4	5	Totals
Global Timeout: Individual's logout or timeout (automatic logout after administrator defined time period of inactivity) will force logout from all other systems.						
Real-Time (Session and Activity Monitoring): System allows configuration of tools to allow real-time monitoring of session or activity for individuals.						
Browser/System Cache Deletion: Previous session logins should be hideable for future logins from same system/browser.						
Database Change Security: System ensures that no database changes are made through unapproved mechanisms (no ad hoc SQL updates) that might circumvent business, audit or access control rules (unauthorized users, users in the wrong database, etc.).						
Deployment Security: All parameters supporting the deployment process should be passed either as command line options or retrieved from a secured data source.						
Auth Failure Notifications: Specific authentication failure information should be unavailable to end users.						
<b>Total (Security)</b>						
Integration	1	2	3	4	5	Totals
Existing Infrastructure Integration: System provides easy integration with existing infrastructure (DB, Application Container, Scalability, Security Infrastructure, IdM, etc.).						
Existing Services: System provides easy integration with existing applications through multiple mechanisms, iframe, screen scrape, API, SOAP, REST, etc.						



Integration	1	2	3	4	5	Totals
System APIs: System should provide availability of APIs and Web Service interfaces in all major modules (authoring, templates, workflow, repository and publishing).						
Service Oriented Architectural Guidelines: Application supports a Service Oriented Architecture (SOA) employing rigorously partitioned presentation, business process, business logic, system integration, data access and data storage layers.						
SOAP: Web service interfaces support the SOAP 1.2 or later standard protocol.						
Security: Web service interfaces are secured according to the OASIS WSS 1.1 or later standard.						
REST: System supports the integration with REST services and provides RESTful interfaces to portlet or system features.						
Sharepoint Integration: System supports access to information available in distributed Sharepoint sites. This includes access to tasks, bookmarks and doc repository.						
Google Docs Integration: System integrates with Google Docs such that it has the ability to open and store documents from Google Docs repository. System handles single sign-on to Google for user and allows check-in/check-out of documents within the Google Repository.						
Email/Calendar: Connector to email and calendaring systems is available, including Notes, Exchange, Google, iCal/IMAP.						
Content Management Systems: System provides integrations with leading 3rd party Content Management Systems and supports integration to content repositories using JCR (Java Content Repository, JSR-170) and CMIS.						

Integration	1	2	3	4	5	Totals
Instant Messaging Services: System supports standard integration to leading instant messaging services from AOL, Google, Yahoo, MSM, Lotus Sametime and Jabber.						
Search: System supports integration with multiple external search engines. The integration should allow all content within the system to be indexed by the 3rd party engine and allow the users to enter search queries within the web pages included in the system.						
Data Access Layer: Data Access layer uses open standards such as JDBC and ODBC.						
Complex Datatypes: System supports a Data Access layer to retrieve and store complex data objects and/or complex behavior such as date-relational updates and optimistic locking.						
System Function Documentation: Complete documentation of the system interfaces and methods are available.						
<b>Total (Integration)</b>						
Architecture and Scalability	1	2	3	4	5	Totals
Production Architecture: Basic installation for development and QA testing are easily accomplished.						
System Installation Documentation: System provides documented installation procedures that include all necessary system and application settings.						
Architectural Distribution: System supports the physical distribution of various modules to simplify scalability and failover.						
Clustering: Installation for clustered mission critical support is easily accomplished.						

Architecture and Scalability	1	2	3	4	5	Totals
Geographical Distribution: System is designed to support geographically diverse deployment to multiple sites.						
Availability and Failover: Support for cache replication and failover.						
Cluster Failover: System allows failover of process and session data.						
Database Failure: System attempts to reconnect to the database cluster without user interaction whenever a broken or corrupt connection is detected.						
Human Readable URL: System supports or generates human readable URLs to published contents.						
Database Replacement: System provides flexibility in the data layer to exchange database engines with minimal impact to the application.						
Database Documentation: System includes table and data layout documentation, including data descriptions for all fields in tables and interface files.						
Internationalization: System supports all requirements for accessibility and internationalization including support for double-byte languages.						
Customization: Customization changes do not require database schema changes.						
Database Connection Pooling: System supports the use of database connection pooling.						
Concurrent Localizations: System supports multiple concurrent localizations.						

Architecture and Scalability	1	2	3	4	5	Totals
Access, Administration, Debug Logs: Multiple levels of logs shall be available for access trail, administration and debug.						
Installation Backout: System provides the ability to back out a failed deployment.						
Upgrade in place: System supports migration of data and upgrade of software in place.						
Rolling Upgrades: System supports rolling upgrades, allowing upgrade of components one at a time (e.g., updates of Identity Management Layer, then Portal Instance 1, then Portal Instance 2).						
Automatic Deployment: System supports the ability to automatically deploy without direct intervention from development or testing staff. It should not be necessary to manually create, copy or edit directories or files.						
Automatic Upgrade in Place: System is able to support automated “upgrade in place” migration paths from one version to another. Minor and Revision upgrades fully support automated upgrade in place features. Major revisions support sequential upgrade in place features but do not specifically need to support automated upgrades that skip major versions.						
Network Address Update: System is architected to permit changes to network addresses without impacting the interface configuration.						
Multi-Threading: System takes advantage of multi-threading/ multi-processing where appropriate.						
Abnormal Load: System is able to gracefully handle abnormal load conditions, including accepting and completing all use demands and then return to normal operation.						
System Downtime: Minimum maintenance downtime requirements.						

Architecture and Scalability	1	2	3	4	5	Totals
Backup and Restore: System provides the ability to execute backup and recovery procedures.						
Partial Backup and Restore: System supports both full and partial backup and restore of system applications, application data, themes, user database and system configuration data.						
Unavailable Backend Services: System is able to operate normally if integrated systems are unavailable (e.g., if a calendar server is down and page is accessed with calendar portlet).						
Version Dependency: Content, portlet, widget, gadget data are not system version dependent. (All system upgrades should support existing application data.)						
Business Logic: System does not encode business logic in the database.						
Client Support: System supports a broad range of client browsers and user interfaces.						
<b>Total (Architecture and Scalability)</b>						
Administration	1	2	3	4	5	Totals
System Administration Interface: System provides a browser-based interface to configure and manage system aspects such as start/stop instances, cluster creation, configure/view log files, URL aliases, user/group administration and system management services (e.g., Content Management, Search, Blog, Forums, Wiki, Messaging, Alerts).						
Administration CLI: System provides a command line interface for most administration functions.						
Local and Remote Administration: System provides the ability to manage the system from both local or remote access.						

Administration	1	2	3	4	5	Totals
System Monitoring: System allows system monitoring per instance and for the entire system.						
3rd Party Monitoring: System provides a base set functionality and full integration to 3rd party monitoring tools.						
System Health: System supports the continuous measurement of system and application health, including resource consumption and application access.						
Log, Audit: Every item in the audit log contains the date and time of the event, the name of resource accessed, the success/failure of event and the user ID of the user performing the event.						
Log, Access and Activity: Activity logs are configurable and complete for audit, performance and security requirements.						
Log, Activity Duration: All activities are traceable for the duration of the request or activity and are associated with the user who is performing the activity.						
Log Configuration Change: All changes to identity elements including the addition of users, disabling or deleting of users, assignments to and out of roles are tracked.						
Log, Access Failures: Invalid or unsuccessful user authentication attempts and unsuccessful data or transaction attempts are tracked.						
Log, Security: Audit logs are logically and physically secured to prevent inappropriate and unauthorized access.						
Log, Passwords: Passwords are not captured in audit logs.						

Administration	1	2	3	4	5	Totals
Log, Reports: System provides a mechanism to retrieve and report information on logged events. Log, Max, Average Transaction Times: System supports the tracking of max concurrent transactions and concurrent users, average/max transaction time and transactions per second.						
System Reports: System allows custom reports to be developed for various user-defined roles (e.g., user account administrator).						
Click Stream Analysis: System supports click stream analysis of individual behavior within the system and the ability to provide this behavior data to 3rd party applications.						
User Administration: Administrators and users are able to add, delete, change or suspend: users, organizations, groups, roles and community membership.						
Page Definition and Layout: Administrators are able to define pages, including content, layout, attributes, access requirements and metadata.						
Theme Administration: Administrators are able to define themes per page, community site.						
Template Management: Administrators are able to create, manage and edit templates and their deployment.						
Portlet Intercommunication: Administrators are able to configure portlet-to-portlet interactions. This can include context awareness, content sharing or event handling.						
Version: System allows administrators to validate the version and patch levels installed.						
<b>Total (Administration)</b>						

Development	1	2	3	4	5	Totals
Development Platform Developer Toolkit: System includes a complete developer toolkit for all aspects of development, including documentation and training for leveraging capabilities associated within the system.						
Tooling Support: System includes support, documentation, training and any necessary developer kits supporting popular open source development tools such as Netbeans and Eclipse.						
Content, Application, Page, Authorization, Rules and Theme Separation: System allows modular development of an application as a set of Themes, Pages, Page Behaviors (authorization and interoperability rules within a page), Content and Web Components. System allows easy additions of new Web Components and updates to themes, pages and behaviors.						
Developer Support: System provides features to support development, including tracing, debug and error tracing.						
Development Lifecycle: System allows content, themes and applications to be developed separately and quality tested within one deployment to be easily migrated to a production deployment.						
Accessibility and Internationalization Support: System supports all methods to support the development of themes, content and applications that support all accessibility standards and internationalization.						
Web Component Intercommunication: Web Components are able to intercommunicate when placed on the same page (e.g., clicks within a catalog portlet display results in a larger portlet). Simple methods should be available to wire multiple components together.						
Theme Development: System supports standard web development methods for building rich themes that can be used across multiple web pages.						



Development	1	2	3	4	5	Totals
Multiple Skill Level Development: System provides multiple methods for developing content, behaviors and applications. (For example, Developer tooling [Java/.Net/PHP/Ruby/Ajax/Html] vs. Web-Based Rapid Application Development vs. Command Line Interface.)						
Portlet, Gadget, Widget Support: System provides support for development of themes, pages and web components with multiple application languages and frameworks.						
Mashup Development: System supports and provides tools to develop mashups.						
HTML, CSS and AJAX Support: System should simplify the development of content and applications that leverage HTML, CSS and AJAX.						
Java Support: System supports the development of themes, web components, interactions and behaviors using Java EE components (JSP, Servlet, EJB).						
.Net Support: System allows development with or integration to Microsoft .NET 3.0 technologies, including Windows Communication Foundation and Windows Workflow Foundation.						
PHP/Ruby/Groovy Support: System is able to support the development of web components with PHP/Ruby/Groovy and other rich application development styles.						
Multiple Content Type Support: System supports the use of text, images, dynamic content, audio, video within web components, themes and pages.						
Integration Support: System supports SOAP and RESTful integrations with external systems. System additionally supports WebDAV and ATOM Protocols.						

Development	1	2	3	4	5	Totals
Interface - Application Separation: System includes and allows development of service interfaces that permit the introduction of new interface protocols with little or no impact to the application environment.						
Business Rules Application Development: System includes or integrates with a 3rd party Business Rules Engine that can define the behavior of web components or page behavior. Rules must be editable from online configuration tool without the need to modify application source code.						
SMS Support: Developers are able to develop applications and behaviors that support SMS inbound or outbound messages.						
Device Detection: Device detection supports the development and access to content and applications from multiple device (mobile) types, browsers and languages.						
Mobile Development: Users are able to manage their mobile preferences for content and layout template.						
<b>Total (Development)</b>						
Support	1	2	3	4	5	Totals
Support Options: Multiple support levels are available (e.g., from access to code, access to patches, web support, telephone support and highest level of mission critical support).						
Telephone Support: Telephone support is available with definable support levels of agreement (SLA) with defined response and resolution times.						
Web-Based Support: Support options include access to open, close, edit trouble tickets via web interface or email. Individuals should be able to define issues and receive email support and advice. Web-based support should include a guaranteed response time.						

Support	1	2	3	4	5	Totals
Multiple Customer Contacts: Support options allow multiple individuals from the customer to contact support for technical support and be able to open trouble tickets.						
Emergency Support: Customers are able to have a guaranteed response time for emergency situations.						
Patch Updates: Support includes hot patches, regular patch updates and consolidated patches for each supported version.						
Future Feature Input: Customers have input for the prioritization of features in future versions and have ability to sponsor feature development.						
Customer Portal: Customers have access to a centralized customer portal that allows access to downloads, patches/service packs, product and technical documentation, training schedules, customer reference documentation as well as alerts and product bulletins.						
Diagnostic Tools: System provides documented diagnostic tools, methods and procedures to isolate trouble and simplify support.						
Support Authentication Level: System recovery process does not require support personnel (greater level of operating system or database access) than is standard.						
<b>Total (Support)</b>						
Ecosystem	1	2	3	4	5	Totals
Community Size: Product has a large and growing developer community.						
Partner Network: Product is supported by a Certified SI partner network.						

Ecosystem	1	2	3	4	5	Totals
ISV Network: Product has a growing ISV network delivering applications for the product line.						
Reference Texts: Community is supported by multiple 3rd party reference texts.						
Documentation: Product has extensive documentation and training materials available produced by the product ecosystem.						
Community Collaboration: Community members have access to multiple methods for collaborating and sharing ideas and information (e.g., user groups, user conferences, forums, wikis and social networking site groups/forums).						
<b>Total (Ecosystem)</b>						
Company and Product Pricing	1	2	3	4	5	Totals
Flexible Pricing: Company provides flexible pricing and licensing options such as License plus annual maintenance and upgrade fee, annual subscriptions and Unlimited/Enterprise Wide Licensing Agreement pricing.						
Product Costs: System is available at highly resonable prices. (This includes all modules required for enterprise wide use and reliability.)						
Installation Costs: System can be installed, configured and integrated into existing infrastructure at highly resonable prices.						
Flexible Billing: Company provides simple and flexible billing programs (e.g., annual, semi-annual, quarterly billing, VISA and purchase order payments).						
Integration Availability: Company actively encourages, discovers and promotes to customers; information on integrations and ancillary applications developed to work with the system.						

Company and Product Pricing	1	2	3	4	5	Totals
Product Alerts: Company provides an infrastructure to ensure customers receive ongoing access to product alerts for patch updates, security alerts and general administrative alerts.						
Professional Services: Company provides professional services as well as recommended and certified partners.						
Price Protection Programs: Customers are presented with price protection programs in order to protect from renewal license increases (e.g., multi-year contract, max annual fees, etc.).						
Strong Revenues: Company has strong revenues supporting a mature organization including engineering, support, training and documentation, services, business development and marketing/sales.						
<b>Total (Company and Product Pricing)</b>						
<b>Grand Totals</b>						

# Industry References and Glossary

Term	Definition
Application Tiers	Presentation, business logic, data access and data storage layers supporting the application architecture.
Authentication	The process of attempting to verify the digital identity of the sender of a communication such as a request to log in. The sender being authenticated may be a person using a computer, a computer program or a computer itself.
Authors	Content contributors using WCM backoffice for entering content.
Backoffice	WCM interface used by contributors for managing content.
Beta Testing	A test of a computer product that is done in a real environment (outside of the vendor's control), prior to release of the product commercially. Typically, the client picked for Beta testing is running the product on a smaller scale. Any bugs identified can be resolved prior to final release.
Branding	A name, logo, slogan and/or design scheme associated with a product, service or company. Generally, it is easily recognizable.
Common Network Destination	Central access point for entry into the system. There may be multiple physical devices or locations supporting a Point of Presence, but access must be controlled through a single network identifier that remains consistent for the consumer. The network destination must also remain static regardless of system administration, business continuity or disaster recovery procedures.
Component Object Model	Also known as COM; Microsoft's framework for developing and supporting program component objects.
Concurrent Users	Users executing the same process at the same time.
Configurable	A relative arrangement of parts and elements which together provide a functional process. In software, the application is written to permit modification of different elements, thresholds, components, etc. by the user community.

Term	Definition
Content Type	Model of content, defined by fields to be completed by contributors, independently from how they will be presented.
Cascading Style Sheets (CSS)	A style sheet language used to describe the presentation semantics (i.e., the look and formatting) of a document written in a mark-up language.
DAM	“Digital Asset Management” platform for managing media to be used in various places (document, site, offline advertising).
Data Access Layer	Abstraction layer between the application and data storage leveraged to retrieve and store complex data objects and complex object behavior.
Data Control System	A system that primarily accepts or rejects incoming files, directs “approved” files to the appropriate sub-system and performs a final verification on outgoing files.
Data Log	A database record with a user stamp, time & date stamp when the record is processed.
Data Storage Layer	Provides a shared repository for persistent operational and functional data.
Deployment	Action of migrating a computer application (or application version) from a development or QA environment to a production environment. “Failed Deployment” back out targets the effort and resources required to return to the original application if the installation of the new software fails.
Document Object Model (DOM)	A programming interface specification being developed by the World Wide Web Consortium (W3C); allows programmer to create and modify HTML pages and XML documents as full-fledged program objects.
Down Time Latency	The period of time that a machine, system or application is offline or not functioning, usually as the result of a system failure or routine maintenance.
Electronic Communication	Communication of information via web services, email or fax.
Environmental Pre-requisites	In this RFP, refers to the hardware and software required to run the application efficiently.

Term	Definition
Frontoffice	Websites deployed from WCM backoffice
Installation Procedure Documentation	Provides instructions for installing the product and performing all software and hardware configuration necessary for starting and running the software. Includes information on the product as well as any relevant information and procedures for supported hardware and software platforms.
Integration Testing	The phase of testing where individual software modules are combined and tested as a group. This is typically done after unit testing has occurred. The purpose is to verify functional, performance and reliability requirements.
Least Privileges Approach	The “least privileges approach” security principle requires that a user is granted the minimum privileges needed to perform tasks associated with their job function and responsibilities.
Link	A connection between places, persons, events or things.
Maintain Data	Implies the ability to add new records and modify or delete existing records.
Multi-Lingual Interface	Allows all customer-facing components availability of presentation in multiple languages. The language setting is defined independently by each user accessing the system and is not inherently assumed by other users using the same application.
Performance Testing	Performance testing is performed to determine how fast some aspect of the system performs under a particular workload. It can serve to validate and verify other quality attributes of the system, like scalability and reliability.
Presentation Logic Layer	The interaction point for incoming user requests.
RSS	“Really Simple Syndication”; Internet standard for defining how content should be exchanged (essentially XML format on HTTP channel).
Scalability	A desirable property of a system, network or process, which indicates its ability to handle growing amounts of work in a graceful manner or to be readily enlarged.



Term	Definition
Schedule Management	See Time (Schedule) Management.
Scope Management	Primarily concerned with defining and controlling what is and is not included in the project.
Search Ability (Across Online Help)	Ability to search the online help provided with the software for words and phrases entered by the user.
Searchable Keyword Index	A keyword index, such as in a document or a help file, that includes a search utility or field.
Security Certificates	Information that is used by the Secure Sockets Layer (SSL) protocol to establish a secure connection. A security certificate contains information about its ownership, issuer and valid dates, and an encrypted “fingerprint” that can be used to verify the contents of the certificate. In order for an SSL connection to be created, both sides must have a valid security certificate.
Service Level Agreement (SLA)	<p>A formal negotiated agreement that defines the relationship between two parties, typically a service provider and a recipient. Included components may be:</p> <ul style="list-style-type: none"> <li>• Services to be Delivered</li> <li>• Performance, Tracking and Reporting</li> <li>• Problem Management</li> <li>• Legal Compliance and Dispute Resolution</li> </ul>
Single Sign-On (SSO)	The underlying structure supporting communications between services. In this context, a service is defined as a unit of work to be performed on behalf of some computing entity, such as a human user or another program. SOA defines how two computing entities, such as programs, interact in such a way as to enable one entity to perform a unit of work on behalf of another entity.
Stored Procedure	An access control method that authenticates a user’s credentials once to give the user access to the resources of multiple software systems. SSO eliminates the need for the user to enter further authentications when switching from one application to another.
Structured Content	An operation that is stored with the database server. Typically, stored procedures are written in SQL.

Term	Definition
Sub-Administrator	Content contributed from a content type entry form.
System Testing	A client's employee designated to manage user-access for all of a client's user community.
Systemic Transition	Testing conducted on a complete integrated system to evaluate the system's compliance with specific requirements. System testing should require no knowledge of back-end design or code logic.
Template	Process to systematically and seamlessly move existing components, tables, parameters and other required elements that have been updated at the initial implementation of the software package to any new version of the same package.
Sub-Administrator	Presentation model to be used on content type in order to generate output (HTML page, PDF...).
System Testing	Testing conducted on a complete integrated system to evaluate the system's compliance with specific requirements. System testing should require no knowledge of back-end design or code logic.
Systemic Transition	Process to systematically and seamlessly move existing components, tables, parameters and other required elements that have been updated at the initial implementation of the software package to any new version of the same package.
Template	Presentation model to be used on content type in order to generate output (HTML page, PDF...).
Time (Schedule) Management	The processes required to accomplish timely completion of the project.
Unit Testing	Testing used to validate that the individual units of source code are working properly. A unit is the smallest testable part of the application.
Universal Naming Convention (UNC)	A PC format for specifying the location of resources on a local-area network (LAN). UNC uses the following format: \\server-name\shared-resource-pathname

Term	Definition
Unstructured Content	Any content entered into the WCM backoffice outside from content type entry form (e.g. images, flashes, videos, documents, binary files, etc.).
User Acceptance Testing or Acceptance Testing (UAT)	Testing used to obtain confirmation by a subject matter expert (SME), preferably the owner or client of the object under test, that the modification or addition meets mutually agreed-upon requirements. In software development, UAT is one of the final stages of the project and often occurs before a client accepts a new system.
Visitors	Persons consuming published content on sites (Internet, Intranet, etc.).
WAI	“Web Accessibility Initiative”; Internet standard for designing HTML page to be accessible by people with disability.
Web Component	A portion of a web page, usually a portlet, gadget or widget.
WCM	“Web Content Management”; platform for managing content to be deployed on website (Internet, Intranet, etc.). Actually, Pollen or Broadvision 1-to-1 Content. WCM is excessively replaced by CMS (Content Management System).
World Wide Web Consortium (W3C)	The W3C is an industry consortium that seeks to promote standards for the evolution of the web and interoperability between WWW products by producing specifications and reference software.
XML	Extensible Markup Language; a flexible way to create common information formats and share both the format and the data on the World Wide Web, intranets and elsewhere.

# About Liferay Digital Experience Platform

Liferay Digital Experience Platform is an enterprise-grade platform that enables companies to create and connect personalized digital experiences across web, mobile, social, in store and other touchpoints. It provides the technical foundation (deep integration, security and modularity) for your digital business to orchestrate unique customer experiences, as well as business value features to support a deeper understanding of your customers.

## Moving Forward

### Get a Free Demo

A Liferay team member is available to give you an in-depth look into the Liferay DXP features and solutions that are helping enterprises worldwide realize their goals. Schedule a demo at [liferay.com/request-a-demo](https://liferay.com/request-a-demo).



Liferay makes software that helps companies create digital experiences on web, mobile and connected devices. Our platform is open source, which makes it more reliable, innovative and secure. We try to leave a positive mark on the world through business and technology. Hundreds of organizations in financial services, healthcare, government, insurance, retail, manufacturing and multiple other industries use Liferay. Visit us at [liferay.com](https://liferay.com).

© 2018 Liferay, Inc. All rights reserved.