

# EMC Documentum CenterStage and the Future of Knowledge Work

*Applied Technology*

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**Abstract**

The future of knowledge work revolves around attention management. EMC<sup>®</sup> Documentum<sup>®</sup> CenterStage, an innovative Web 2.0 environment from EMC that is a part of the Documentum platform, provides the smart workspaces for ad hoc information sharing that support business teams and communities of interests. CenterStage delivers the interactive experiences, together with the associated systems' resources and web services, for accessing and managing collaborative content within the framework of an enterprise information infrastructure. As a result, knowledge workers can focus their attention on the shared information that matters most, while collaborating with colleagues and business partners across the extended enterprise.

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## Executive summary

The future of knowledge work revolves around attention management. Beyond being able to easily share information with others over the network, knowledge workers need to stay abreast of activities and events within their continuously changing business environments. It is important to bring modern information experiences from the public Web (capabilities such as contextual collaboration, easy linking to information and people, blogging, and social networking) – what are popularly termed Web 2.0 experiences – into the enterprise and turn them into powerful business resources. It is important to help knowledge workers build effective teams and communities around shared tasks and mutual interests.

EMC<sup>®</sup> Documentum<sup>®</sup> CenterStage, an innovative Web 2.0 environment from EMC that is a part of the Documentum platform, provides the smart workspaces for ad hoc information sharing to support business teams and communities of interests. CenterStage delivers interactive experiences, together with the associated systems resources and web services, for accessing and managing collaborative content within the framework of an enterprise information infrastructure. CenterStage provides guided navigation, syndication services, social networking, and intelligent search of disparate information sources, while also maintaining the security and compliance policies of the enterprise.

As a result, knowledge workers can access a wide range of shared content, delivered in a contextual framework that adapts to their own personal work styles. They can focus their attention on the information and resources that matter most, while securely sharing content with colleagues and business partners across the extended enterprise.

## Introduction

This white paper begins by explaining how knowledge workers face the challenge of attention management. It then describes how Web 2.0 can help the enterprise with these challenges and how EMC Documentum CenterStage provides an integrated experience for collaborative content and knowledge work.

### ***Audience***

This white paper is intended for business leaders, line-of-business managers, information architects, and IT managers who want to understand how Web 2.0 capabilities can enhance collaboration and develop effective teams across an extended enterprise.

## Facing the challenge of attention management

### ***Beyond information overload***

Today as knowledge workers doing business online, we face the challenge of attention management. Not only must we share information with others over the network, but we also need to stay abreast of activities and events within our continuously changing work environments.

Information overload is just the tip of the iceberg. All too frequently, we must contend with multiple information silos, where content is stored among disparate repositories. To be sure, we need to find the right information regardless of where it is located or how it is managed.

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Moreover, we need to be able to “connect the dots” and quickly determine the relationships among the relevant sources. We need to focus our attention on actionable information – the content that adds value to our tasks, provides critical insights for analysis and decision-making, and helps us influence events.

### ***Juggling tasks and activities***

Multi-tasking is just another part of doing our jobs. We are accustomed to juggling multiple projects, managing lots of different content, and interacting with many different people. We routinely exchange project-related information — including documents, images, sound clips, plans, and schedules — to accomplish specific activities. We rely on network connections to collaborate with colleagues and partners, both in adjacent offices and around the world.

We value teamwork and collaboration, and yet we must contend with content-related chaos. All too frequently, we need to make sure that we are working with the most up-to-date documents, and not the prior versions that we previously received. We routinely coordinate the flow of information among colleagues, and track the additions and modifications they make to documents along the way. Managing schedules and keeping projects on track is a proverbial challenge. Invariably, we need some flexibility to accommodate unanticipated events.

Often we need to find the right people who have the expertise to help us on specific tasks. It’s not only a question of what information and insights we have, but also who we know, how quickly we can find what we need, and how best we can collaborate with other team members, to develop the competitive business processes that get the job done. We need to build and sustain business teams – groups of people who are working together, often across disparate business units and spanning organizational boundaries, to support common interests.

### ***The case for contextual collaboration***

To focus our attention on our immediate tasks at hand, we need personalized views into our shared information resources. To begin with, we utilize our own suite of personal productivity tools – adapted to when we are tethered to a desktop, roaming on a laptop, or connecting remotely through a mobile device – to be integrated with and to manage these disparate sources. Although we are collaborating with multiple groups on various tasks, we expect to leverage content from our own perspective and coordinate information flows in ways that meet our personal needs.

There is business value to this contextual collaboration – being able to access, organize, and manage information and events as we see fit, within the context of our tasks, roles, and responsibilities. Yet our business context is continually changing. It depends on what we are trying to accomplish, where we are located, what else we are doing, and who else needs to contribute to our efforts to get the job done.

Underlying this steady stream of content (delivered in context) is our ability to link information with people and processes to build an intelligent enterprise. We need to forge connections rapidly, to stay abreast of changing business events. We need to rely on an interactive work environment that facilitates ad hoc information sharing and collaboration, while also ensuring security and adhering to our company’s requirements for governance, risk management, and compliance.

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## Bringing Web 2.0 into the enterprise

### *Expectations from the public Web*

How can we best meet the challenge of attention management? Our current experiences with the public Web – always connected, pervasive media, rich communications — help drive our expectations for possibilities within the enterprise. Most of us are familiar with blogging, wikis, photo sharing, community building, social networking, and other types of Web-wide social media. Few of us are strangers to such popular websites and services as Facebook, LinkedIn, Wikipedia, YouTube, Flickr, and Delicious. In our personal lives, we rely on social media to participate in communities, share ideas, and voice opinions.

Ideally, we expect to incorporate these kinds of engaging experiences into our interactive business environment. We want to take these innovative approaches for communicating personally and interacting socially over the public Web, and apply them, appropriately, to our enterprise information infrastructure. It's all about increasing our productivity, enhancing transparency, expediting business processes, and eliminating knowledge gaps, by focusing on the information, tasks, and events that matter.

Through the influence of these modern information experiences — what is popularly termed Web 2.0 — we can assemble a rich set of knowledge resources around personalized and contextualized communities of interest. We can turn information about people, what they know, and what they do into powerful business resources. Through the sensing and alerting capabilities within our information infrastructure, our collaborative capabilities get smarter and become ever more valuable for enabling us to work together effectively, to solve business problems.

### *Supporting relationships between information and people*

It is important to support the dynamic relationships between information and people when collaborating across the extended enterprise. These include:

- Being able to find relevant content in context, organized by familiar tasks and activities
- Supporting user-generated content and publishing
- Integrating collaborative content with disparate enterprise resources

Let's consider how adapting Web 2.0 to the enterprise can help us leverage content over the network, improve attention management, and connect people, processes, and information together to reinforce effective business teams.

### Smart workspaces and building communities

From one perspective, we expect a self-organizing and self-managing work environment, one that blends personal productivity tools with access to shared resources. Shared workspaces — locations on the network where groups can connect securely and interact with information and resources — provide the collaborative framework for our content infrastructure. With Web 2.0 tools and experiences, it is now possible to extend and enhance the underlying capabilities and make them smarter.

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These shared resources need not be limited to predefined business teams. We can build communities of interest by assembling ad hoc groups that share common purposes and passions. We can access and exchange content over the Web by connecting to predefined locations to support our mutual interests. Through continued updates and participation by interested parties, these resources become part of the fabric of the broader community.

We can personalize how we view content within these workspaces. We can organize content from multiple groups and manage it by the topics and tasks that make sense to each of us. There are business benefits to predefined categories, ad hoc tagging, social bookmarking, and smart indexing capabilities. We expect to leverage each wherever appropriate.

In addition, we can dynamically categorize content based on our own criteria. Guided navigation provides the underlying mechanism for organizing content. Our personalized views are context sensitive. We can rely on a smart environment to sense what we are doing and what content we are most likely to need — leveraging such factors as our locations, our schedules, the kinds of information we have requested in the past, the content we need to assemble to accomplish predefined tasks, and other factors.

As a result, our views into the workspaces are more than shared locations on the network. With the help of these smart views, we can focus our attention on the important topics and tasks. We can sense what other members are doing, and alert them to potentially relevant information. We can control the business experience, and personally manage the flow of content that we access online by adapting Web 2.0 capabilities to the enterprise.

### Authoring and publishing

From another perspective, authoring and publishing are both easy and self-evident. In addition to capturing and managing the files from our personal productivity applications (such as Word, Excel, and PowerPoint), our shared workspaces support both blogging and wiki-style contributions.

We are able to add content as part of an ongoing conversation or blog. We can continuously revise and annotate contributions to a topic through a wiki. We can categorize content on the fly and automatically syndicate our contributions to others, using the syndication criteria that they, in turn, have specified. With Web 2.0, we have options and can choose the methods for authoring and publishing content that best suit how we want to do our work.

### A flexible infrastructure

Moreover, our smart workspaces leverage the enterprise content management (ECM) capabilities so essential to doing business in a dynamic digital economy. Each workspace maintains its own security and permissions, ensuring that only members with the appropriate privileges can access and edit the content. With the enterprise-scale authentication and access controls in place, authoring and publishing are secure – we can manage who changes what items. Through these workspaces, we can take advantage of a protected yet shared set of distributed resources where we can seamlessly collaborate with colleagues and community members regardless of our network locations.

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The underlying ECM platform and associated content services thus deliver Web 2.0 without risk. Shared content accessed through the predefined workspaces is not only managed securely but also meets IT requirements for governance, risk management, and retention.

By relying on an ECM platform and content services, we are working effectively within the framework of our familiar enterprise infrastructure. We can easily integrate the shared content with disparate business applications. Fueling our focus on people, processes, and information, we leverage a rich set of content components that encapsulate industry expertise, application know-how, and best practices. Transparent to our experience as business users, we are using mash-ups, semantic maps, and other composite Internet application technologies to drive powerful content-centric applications.

We seamlessly yet systematically access and consume a wide range of web-based resources – many of which we procure when needed through software services in the cloud and pervasive information appliances. We are no longer constrained by a predefined platform or have to make substantial upfront technology investments. We have the flexibility to connect to services as needed, and continually evolve the capabilities of our content infrastructure.

### ***Prospects for collaboration***

Thus, by adapting Web 2.0 to the enterprise, we introduce new possibilities for collaborating and sharing information over the network. As knowledge workers, we can be more productive. We can connect — as needed, when needed, and on our own terms. We can focus our attention on the content that matters.

Moreover, we can form, sustain, and manage our business relationships across an extended enterprise. By exploiting the capabilities of an enterprise-savvy workspace, we can work with colleagues as intimately as we would like — whether we are connecting within the boundaries of our corporate intranet or interacting across the public Internet.

## **Focusing attention with EMC Documentum CenterStage**

### ***An integrated experience for collaborative content***

EMC Documentum CenterStage, an innovative Web 2.0 environment from EMC that is a part of the Documentum platform, provides an integrated experience for collaborative content and knowledge work. CenterStage is optimized for how we, as knowledge workers, routinely work. Thus we might be:

- Mobile workers, frequently on the road and needing to coordinate projects and schedules
- Office workers, usually tethered to desktop devices and spending much our workdays creating, filing, finding, and reusing business documents
- Business analysts, intent on defining, implementing, and monitoring operational activities and processes
- Managers and executives, tasked with initiating and coordinating projects across the enterprise

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We need to communicate, coordinate, and collaborate with colleagues and business partners across the extended enterprise, each in our own way. CenterStage accommodates our different working styles. It is designed to help us capture the relevant information and focus our attention on our essential tasks and events.

Specifically, CenterStage delivers the interactive experiences, together with the associated systems resources and web services, for accessing and managing smart workspaces within the framework of an enterprise information infrastructure. It supports the personalized views of the various types of content that are maintained within these workspaces and managed through the Documentum platform.

We are relying on a template-driven, component-based user experience. Application developers and IT managers have tailored the CenterStage tools and resources we access to the capabilities of our browsers. CenterStage is part of our overall enterprise information infrastructure.

Let's consider the business benefits of CenterStage, first from our perspective as knowledge workers, and then from the perspective of the application developers and IT managers who support us.

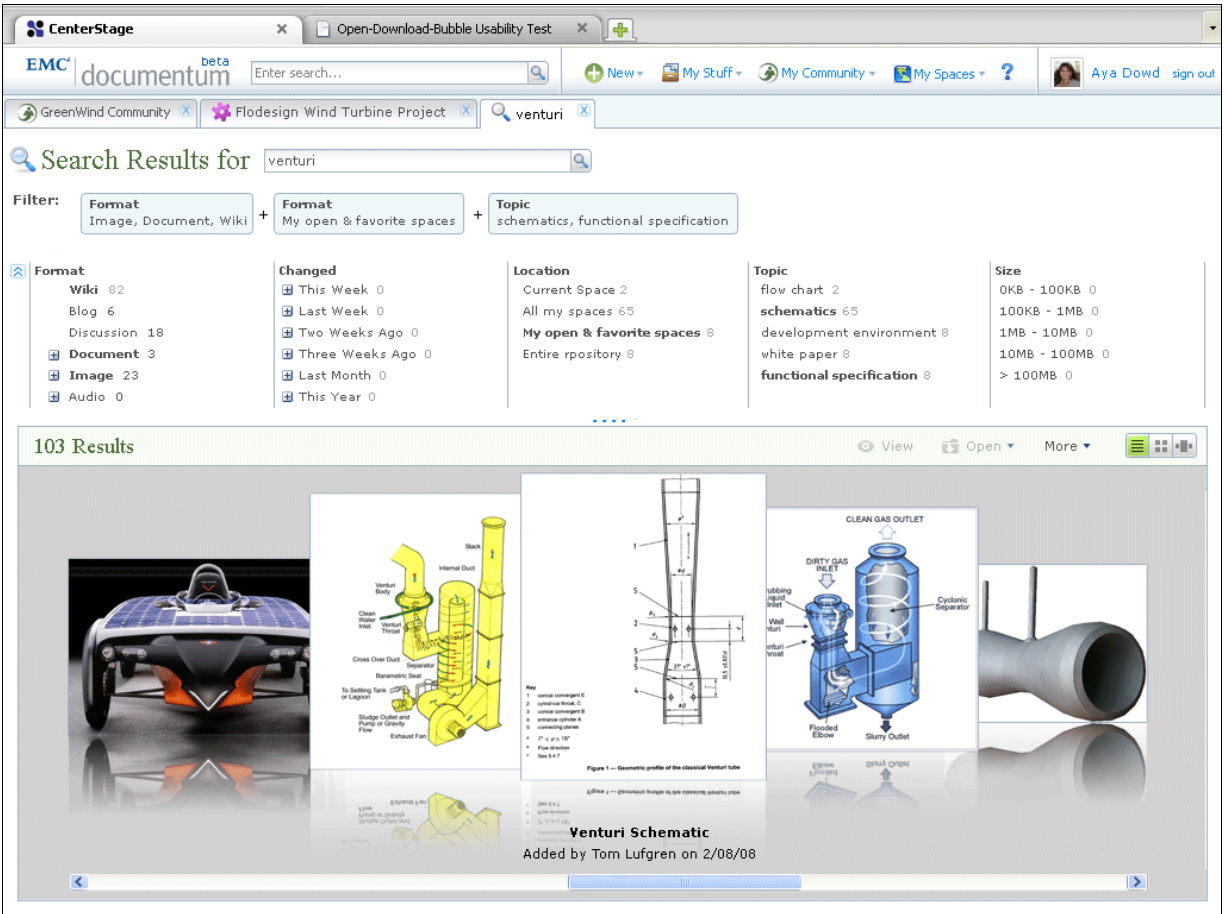
### ***A unified yet adaptive experience***

To begin with, CenterStage is a Web 2.0 experience for coordinating content, people, and processes. Designed as a rich Internet application, it exploits asynchronous JavaScript and XML (AJAX) for running within the browser, and connecting through a desktop, laptop, or mobile device. It provides a flexible and responsive interactive environment.

#### **Guided navigation**

With CenterStage, we can visually organize all of our personal and shared information within our multiple workspaces. No longer do we have to take the time to look for various types of information in different contexts. CenterStage features guided navigation to make finding information easier. As shown in Figure 1, this is a set of capabilities where we can quickly browse through and interact with various shared content resources in a consistent and intuitive fashion. Thus we can:

- Rapidly view our shared content in context, organized by tasks and teams
- Hover over thumbnails to find additional summary information
- Rotate through a carousel display to preview items in a folder
- Search for files and apply predefined filters, enabling us to quickly drill down through ad hoc collections to identify and select relevant items



**Figure 1. EMC Documentum CenterStage provides guided navigation to quickly browse through and interact with a variety of shared content resources in a consistent and intuitive fashion.**

Embedded within the infrastructure, the smart workspaces manage authentication and access controls. We can only view or modify the items for which we have the appropriate predefined privileges.

Leveraging the capabilities of the Documentum platform, each workspace supports such basic content management capabilities as:

- Check-in/check-out
- Managing shared access to prevent overwriting
- Versioning
- Tracking documents and other work items through their content lifecycles

Thus when we connect to a shared environment, we can immediately find the current information and locate prior versions of documents as needed. The workspace tracks and manages our access to team-oriented and community-related content.

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## Workspace administration

As workspace administrators and team leaders, we can easily manage who has access to the shared resources and what participants are entitled to do once they view or fetch the content. Our IT group does not have to be involved in the day-to-day administration.

Rather, CenterStage provides us with the essential administrative tools and capabilities to sustain the workgroup. Managing membership is self-evident. We simply identify the new members from an enterprise directory or authenticated list, and designate their roles. CenterStage maintains the mapping between the access rights within the workspace, and how they are defined within the Documentum platform. As a result, the granular access rights and permissions, security policies, and archiving policies that are part of Documentum can be automatically applied to workspaces.

## Personal resources

CenterStage provides a customized environment, one that adapts to the ways we work as well as to the processes and activities of our business team or community of interest. With CenterStage, each of us has a personal space, where we can:

- Connect with colleagues
- Organize personal information and content
- Manage favorites and subscriptions
- Manage profile and personal information

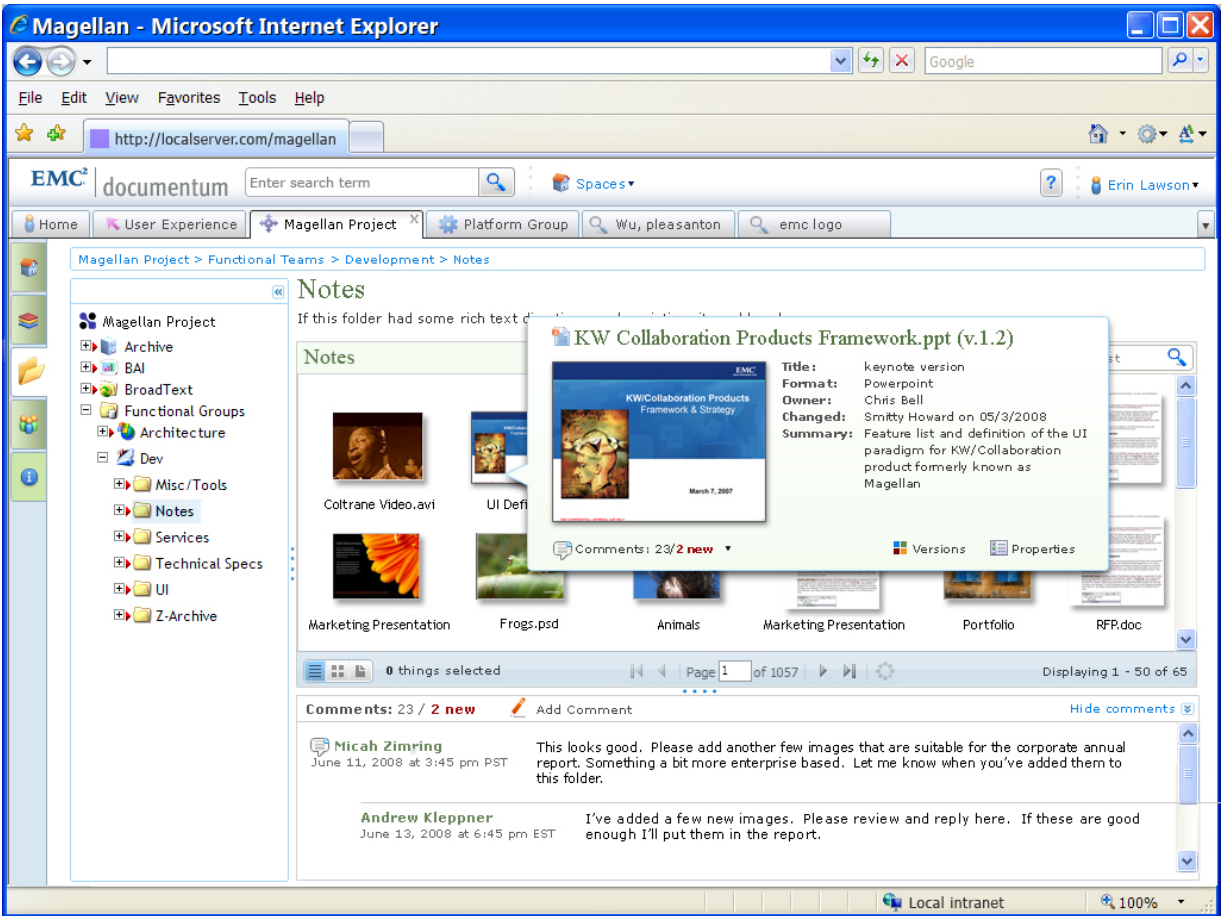
From this personal space, we control how we want to organize our browser-based experience and maintain links to our colleagues. Moreover, other members can now find us and learn about our areas of experience and expertise.

## Shared resources

On a group level, we can rely on CenterStage to coordinate the flow of information, activities, and events with other colleagues across the network. CenterStage provides:

- Customized page layouts
- Support for wikis, blogs, and dashboards
- Self-organization of information to create personalized, composite, and mash-up views
- Visual information displays that quickly determine relevancy

Thus we have a consistent, integrated view of our team-oriented and community-related resources, as shown in Figure 2.



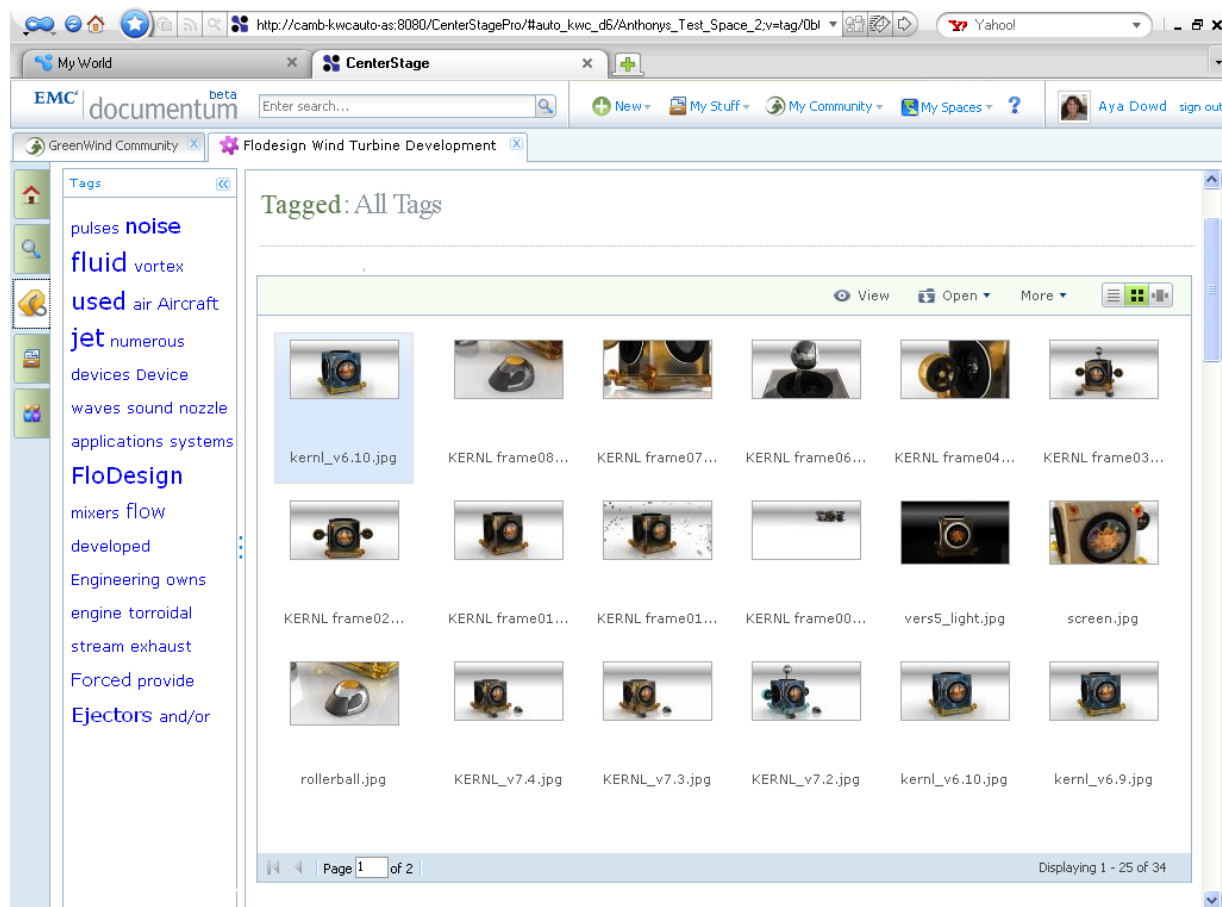
**Figure 2. CenterStage organizes content around our work activities and ensures that the items we need are readily at hand.**

Using CenterStage, we can manage shared tasks and activities. For example, suppose we are responsible for managing licensing agreements with a team of sales representatives in multiple countries around the world. We can maintain a workspace for managing the relevant content. CenterStage can include the approved business documents, organized by familiar categories, together with a blog that provides guidance about how to use them. CenterStage can also track news feeds from multiple sources and provide the integrated (or mashed-up) views, arranged by relevant categories. We can track workgroup activities, alert other members to potential issues and opportunities, and take action before problems arise.

**Organizing and locating collaborative content**

CenterStage includes such Web 2.0 capabilities as social tagging, syndication, visualization, and social networking. These capabilities help to organize and manage shared content, and enable colleagues to keep up with the flow of information and events. Let’s look at how each contributes to attention management for team members and community participants.

CenterStage supports social tagging. As shown in Figure 3, we can tag content on the fly in meaningful ways, using both our own personal terms as well as those used by others.



**Figure 3. CenterStage supports group-oriented and personal tags, enabling us to categorize content by a variety of terms.**

Over time and through ongoing use, the more relevant terms become more popular and more frequently used. Through the power of teaming, building community, and social tagging, we can not only label content on our own but also discover and track what is important to our colleagues.

CenterStage helps us syndicate (and track) relevant information and events. Using really simple syndication (RSS), we can subscribe to information feeds maintained within the workspace, and receive automatic alerts when content is updated or changed. Again we can save time by having all of the relevant information displayed in context, in a flexible and responsive interactive environment.

CenterStage combines federated search with guided navigation. We can search for content stored in multiple repositories and retrieve results within a workspace, where we can organize them by familiar categories. To return to our example, as part of our responsibilities for managing licensing agreements around the world, we might connect to and search through disparate document collections. With a federated search capability, a single query can access various repositories (each of which organizes content in its own way) and can then return a consistent, integrated set of results. Once we are authenticated to access the repositories, we do not need to know or understand how they work.

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As part of CenterStage, we can organize our search results as we see fit. We can visualize the results in an intuitive fashion, and graphically probe the connections among various items. Rather than scrolling through lists of results, we can map the interrelationships among terms. Often we can spot patterns faster through a map.

Finally, CenterStage includes enterprise social networking capabilities where we can create and maintain networks of references about information and people. With appropriate access rights and permissions, we can follow the activities of other members, and keep up to date on their interests and activities. Thus if we are part of a group of sales support specialists, we might automatically alert one another to the important documents we read or to the online resources we find relevant over the Web. CenterStage automatically manages the links, so that we can easily see what other members are doing. We can “work smarter” through sharing our expertise with our colleagues. CenterStage helps to foster our collective intelligence as a workgroup of support specialists.

### ***A framework for collaborative work***

CenterStage has an impact on the business and IT professionals responsible for maintaining our overall enterprise information infrastructure. For these business experts, system managers, and application developers, CenterStage provides a framework for developing and maintaining the collaborative experiences that support teams and communities across the extended enterprise.

In particular, CenterStage leverages the underlying application development and web services capabilities within the Documentum platform. CenterStage adds the workgroup-oriented resources, customization frameworks, and application development tools for building and deploying a flexible collaborative environment within the enterprise.

#### **Business experts**

Business experts have the line-of-business expertise to develop and maintain reusable business processes. They need to be able to adapt an enterprise application to the operational requirements of a business unit.

With CenterStage, business experts define and update the smart workspaces deployed within the enterprise. They rely on reusable templates to organize the group-oriented environments. They can define the fields, values, and components for these templates, and thus structure the activities that workgroup members need to follow. These templates can incorporate redefined and corporately sanctioned business processes as well as best practices for performing tasks.

Business experts also define and maintain the roles and permissions for group membership. They manage the mappings between the workgroup-level roles within CenterStage and the access privileges specified by the Documentum platform. However, CenterStage supports distributed administration. Once they have defined the roles, the experts then turn over the day-to-day administration of these roles to the workgroup leaders.

Finally, business experts can monitor the workspaces to ensure that they meet business objectives. CenterStage can generate the management reports that track who is accessing what items, and what they are doing. These reports help to determine how the shared resources are being used.

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## IT system managers

IT system managers have different concerns about smart workspaces – the fewer management challenges, the better. They are responsible for maintaining multiple enterprise applications within production environments. They focus on the security of the content they manage, and the threats of inadvertent information disclosures.

IT system managers thus focus on the quality of service within their overall enterprise information infrastructure. Often they must fulfill predefined service level agreements and contractually mandated uptime requirements. They are concerned about reducing operational risks to their enterprise systems environment, and lowering the cost of operations while also preserving the overall quality of service and maintaining security. For IT managers, adding new services must have compelling benefits and few upfront costs to be worth the risks.

CenterStage adds Web 2.0 capabilities to an enterprise information infrastructure without the risk of introducing yet another enterprise application. CenterStage is part of the Documentum platform. Thus team-related/community-oriented content and services are maintained as part of an overall enterprise information infrastructure. Security, governance, and information retention policies that a firm has painstakingly developed to manage risks and ensure compliance with regulatory mandates can be easily applied to the shared content and resources.

From the perspective of IT systems managers, all business information is securely managed in one enterprise-ready platform, and governance policies can be applied. CenterStage minimizes the risks of adopting Web 2.0 to the enterprise, while optimizing the business benefits for improving team collaboration and building community across an extended enterprise.

## Application developers

Application developers are often challenged to build content-centric applications. They seek to leverage the underlying infrastructure of the Internet and the Web, and develop the compelling experiences within the enterprise that are available on the public Web. From an application development perspective, adapting Web 2.0 to the enterprise is both a challenge and an opportunity.

By adopting CenterStage and relying on it for developing workspaces and communities, application developers can finally keep up with the speed of business. They exploit a consistent yet ever-expanding set of components and services, based on the Documentum platform and including web services for collaboration. Developers can rapidly construct innovative content applications, delivered with only a modest investment of time and resources.

With CenterStage as a part of Documentum, innovative Web 2.0 components and resources are an integral part of the application development environment. By relying on the Documentum platform, a company finally has the agile and cost-effective enterprise information infrastructure to adapt to its continually changing business environment. Application developers can exploit the power of the Web while continuing to manage content securely and in a company-compliant manner. Across a flexible enterprise information infrastructure, there is a single-point policy management model coupled with every-point policy enforcement capabilities.

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## Conclusion

### *Managing attention across the intelligent enterprise*

What then are the consequences of deploying CenterStage across an enterprise? What is the impact of CenterStage on the future of knowledge work? We need to focus both on our experiences as knowledge workers and also on the breadth and scope of the content resources we utilize.

#### Connecting browser experiences to networked resources

From one perspective, CenterStage provides us with smart ways to communicate, coordinate, and collaborate with one another over the network. It provides innovative, browser-based experiences – guided navigation, syndication services, social networking, and intelligent search to highlight just a few capabilities. With CenterStage, we have access to a wide range of shared content, delivered in a contextual framework that adapts to our own personal work styles. Thus the information we need as knowledge workers is available and readily at hand.

From another perspective, CenterStage ensures that we can access, fetch, create, and use the wide range of content that supports our team-oriented and community-related activities. The power of CenterStage is not only our Web 2.0 experiences but also our easy connections to workspaces and online communities. We are leveraging the enterprise information infrastructure of the Documentum platform. We are able to share content within the context of our overall work environment whether working within the confines of a corporate intranet or connecting securely over the Internet.

#### Keeping our eyes on the prize

In short, with CenterStage as part of the Documentum platform, we can easily develop and sustain critical relationships not only with colleagues and co-workers, but also with business partners and customers. We can build connections to and share information with many different parties, leveraging our networked connections for our business benefits. We can rely on smart workspaces to manage our business activities, and help us to focus our attention on the tasks and activities that matter. We can develop new patterns of collaboration and build communities, based on critical tasks and common interests.

The impact on the future of knowledge work is clear. With Web 2.0 and smart workspaces, we can effectively adapt to changing business events. We can focus our attention on what matters most while sharing information with others, as needed, over the network. We can also maintain security, ensure compliance, and manage the risks of doing business online. We are immersed in this next generation collaborative work environment, and can create radically new methods for doing business across the intelligent enterprise.