

INDUSTRY DEVELOPMENTS AND MODELS

The Enterprise Workplace: How It Will Change the Way We Work

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IDC OPINION

IDC believes that a new user work environment will emerge in the next five years that will be supported by a new, unified, modular enterprise software stack. This "enterprise workplace" will dramatically improve interactions across applications and between workers. The change will be driven in equal parts by users who are tired of scrambling to adapt to a multitude of interfaces, formats, and compatibility issues and by vendors that are cognizant of this need and see in the enterprise workplace an opportunity to differentiate their products. According to today's user paradigm, task or role-based requirements — such as searching for information, collaborating, managing projects, and managing customer relationships — commonly require separate interfaces that draw information from isolated repositories, each with its own business logic and workflow. IDC believes that enterprise IT is ripe for change. The enterprise workplace has begun to emerge as an amalgamation of technologies and solutions offered by a variety of vendors from several different functional markets. Solution providers are beginning to produce more intuitive and unified platforms, user interfaces, and applications, although not all of the necessary pieces have been completed or even conceived. Vendors and other solution providers that wish to participate in the enterprise workplace should consider the following:

- Focus on users and task-based computing by hiding complexity, allowing workers to concentrate on tasks rather than on the manipulation of multiple applications to find and use information and functionality.
- Participate in IT ecosystems, actively partnering with other vendors of services, software, and hardware. Partnerships will be critical if the enterprise workplace is to integrate diverse capabilities, information sources, and systems.
- Develop solutions that embrace such standards as open application programming interfaces (APIs) and Web services. Decouple the user interface from the application to enable a single unified view of all applications and information.
- Focus on delivering functional "modules" delivered as part of a Web Services ArchitectureSM, rather than on proprietary platforms or traditional shrink-wrapped applications.

IN THIS STUDY

This IDC study examines the "enterprise workplace," a long-awaited gift to the information worker from the IT community. It provides a first glimpse of what the enterprise workplace is, how it will change the way information work is done, and how IT solutions are designed and implemented. This study also suggests ways in which solution providers should work with customers to participate in the enterprise workplace in the coming years.

SITUATION OVERVIEW

Introduction

The User Experience: The Way We Were

In today's computing environment, the user must adapt to the needs of the computer. While computing was in its infancy, the computing environment was, by necessity, unforgiving. User interaction models developed in parallel with each underlying technology, often as an afterthought (see Figure 1). Even the definition of the "worker" has evolved in the context of enterprise computing, from a simple "end user" at the dawn of the wide-scale enterprise in the 1970s, to what we today call the "information worker." The following major steps in the evolution of the enterprise user experience have led up to what IDC calls the "enterprise workplace":

- ☒ In the 1970s, mainframe-based Customer Information Control System (CICS) solutions were prevalent in the enterprise, and in the early 1980s were followed by line-by-line, menu-based solutions, often running on midrange computers. The "end user" in the enterprise during the 1970s through the mid-1980s mainly used enterprise solutions to record transactions. The related user experience consisted mainly of basic character input and cursor control. There was no rich media, there was virtually no collaboration, there was no cross-business process flow, and there were no tools on which to perform information research, such as "search." One could refer to this as the "green screen" era.
- ☒ From the mid-1980s through the mid-1990s, the graphical user interface (GUI) became commonplace in the enterprise, because of the popularity of Microsoft Windows 3.x. The nature of the applications of the GUI era were additive, and were mainly of the personal productivity variety; they, at least initially, did not replace "green screen" applications. Only toward the mid-1990s did actual transaction enterprise solutions begin to take advantage of the GUI, in the form of "client/server" applications, and they never completely replaced "green screen" solutions. One could refer to this as the "GUI" era. The GUI user experience allowed for textual manipulation (e.g., variable fonts, size, and colors) rather than simple character entry. It also supported first-generation rich media such as charts, graphs, and pictures, although not "active" graphics such as video. Collaboration was primarily limited to first-generation email, and individual applications were never operated in the context of larger business processes. An important addendum to the GUI era was provided by Citrix, which provided

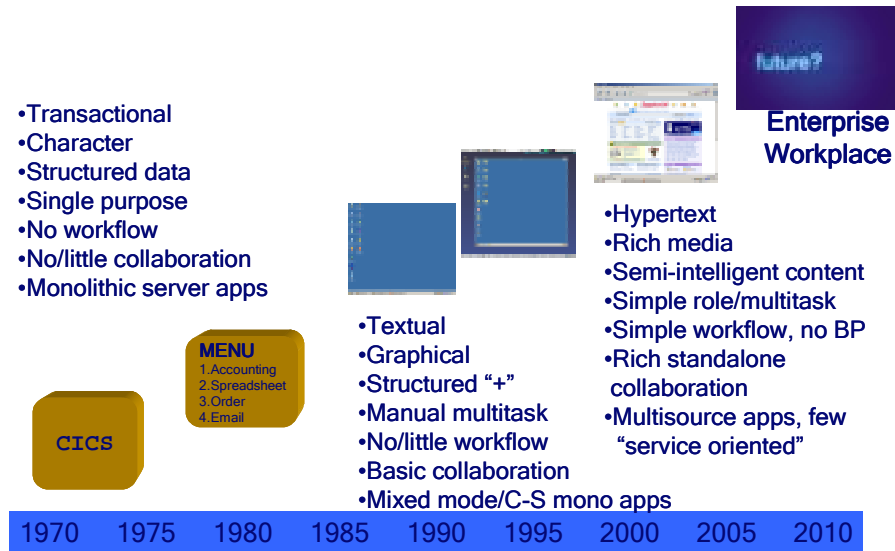
the first virtual enterprise desktop with simple application-interactivity functions and access to applications regardless of technology legacy or user experience. In essence, Citrix pioneered a concept that turned out to represent the first generation of what we today call the "portal."

- ☒ From the mid-1990s until now, applications with Web user experiences supplanted and/or extended GUI-based solutions. The content and media/graphics-rich, collaborative, hypertext-based user experience of the Web, combined with the deployment advantages of "Internet" applications, quickly gave users a new set of applications. It also provided a new way to interact with a previous generation of purely transactional and productivity applications. Since the late 1990s, enterprises have implemented portals that — as Citrix originally did in the client/server era — make applications of all kinds of technology generations available through the Web experience, further enhanced through the wrapping of content management and collaborative services around enterprise application functions ("contextual collaboration"). The enterprise Web experience, despite typical delivery through a portal, still often lacks a wider business process context and suffers from user experience variations, in part because the underlying applications really remain in silos and in part because of the limitations of the page-based Web user experience model. It is as though all the pieces for a highly productive, role-based information, worker-oriented, business process context-sensitive, highly adaptive applications are there. However, nothing has pulled the pieces together into a comprehensive solution.

The enterprise workplace represents the future user experience for information workers and suggests a change in enterprise architectures to meld service-orientation and "contextual collaboration" together for the user. The goal ultimately is productivity and better business decisions: The enterprise workplace promises a means to quickly and efficiently execute business processes by navigating seamlessly across applications and information sources.

FIGURE 1

Progress Toward the Enterprise Workplace: Where Did We Come From?



Source: IDC, 2005

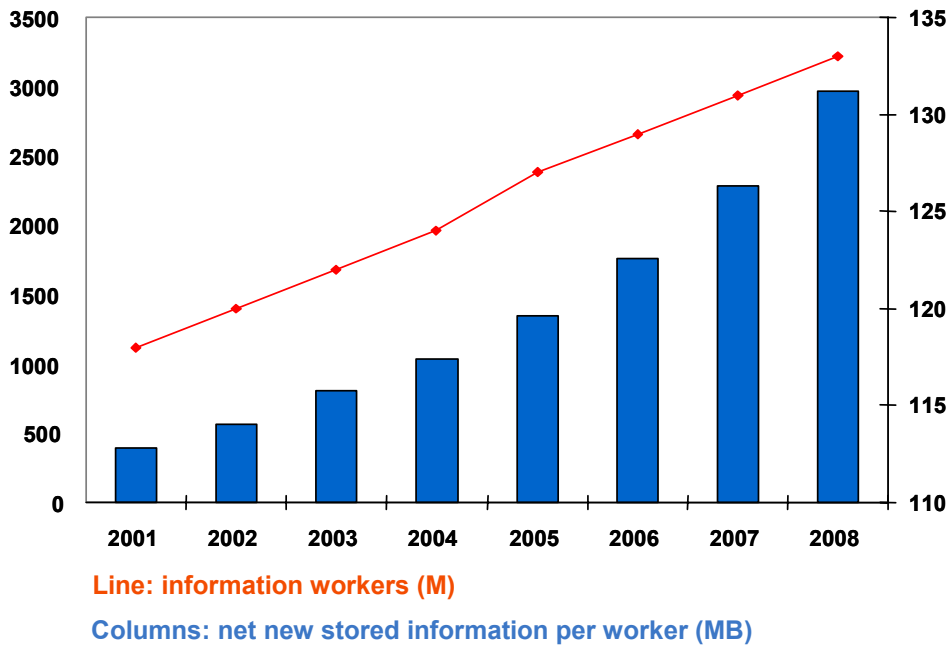
Enterprise Workplace: In the Service of Information Workers

Rapid access to information drives effective business processes, but today's computing environment is still largely composed of standalone, "unaware" collaborative applications and services, for which structured and unstructured data is often spread between several repositories, and it continues its increase in complexity. At the same time, the amount of data and content created by, and available to, information workers is rapidly expanding. As evidence, a UC Berkeley study determined that we produced more than 800MB of new stored content, per person, in 2003, and that volume has risen by approximately 30% each year since 1999 (see Figure 2). This metric does not take into account storage requirements for voice messages, voice records from teleconferences, and audio stored as part of on-demand Web conferences, all of which are rapidly on their way to becoming semistructured in the current transition from time-division multiplexing (TDM) to Internet protocol (IP)-based telephony products in contact centers and enterprises.

Information workers produce content even more rapidly than their non-IW counterparts, and the number of workers filling information worker roles is also expanding. As the U.S. economy continues to move further from its base in manufacturing to one in services, U.S. firms are increasing their dollars spent to outfit their information workers with software to do their jobs — to nearly \$130 billion by 2008. This rise in the number of workers, content, complexity, and resulting dollars spent to "integrate" the people, processes, and information sets the stage for the emergence of the enterprise workplace.

FIGURE 2

North American Information Workers Computing Environment



Source: UC Berkeley "How Much Information?" study, 2003, and IDC, 2005

An information worker's job is complex and varies from role to role, but there is a core set of activities that must be supported by the enterprise workplace. IDC distills the activities of information workers into six categories:

- Researching
- Absorbing
- Communicating
- Creating
- Sharing
- Deciding

Each activity — to a greater or lesser extent — depends upon unfettered access to information, to people, and to processes. Today's workplace is an interactive, process-driven environment that requires applications and an application infrastructure that is natural and adaptive and that aggregates the different applications and repositories the user must touch during the workday.

Information workers have been successful in understanding the nuances of supposedly structured, discrete processes that make the business operate. They further understand the applications and information sources required to navigate these business processes and the work-arounds necessary when documented processes do not suit particular circumstances.

However, purpose-built products such as customer relationship management (CRM), email, and content management require users — really the most important people in the continuum of work's getting done — to jump across the corporate computing environment from application to application, from interface to interface, from database to database, and so forth. This condition of disconnectedness provides another driver for the emergence of the enterprise workplace. The IT market will no longer tolerate vendors' seeking to sustain a sense of schadenfreude gained from watching users of their technologies scramble to adapt to a multitude of interfaces, formats, and compatibility issues.

What Is the Enterprise Workplace?

In a January 2005 IDC telebriefing, the enterprise workplace was introduced as consisting of the following elements:

- ☒ A natural, intuitive, and adaptive user experience
- ☒ An aggregation of interoperable application services determined by user roles and tasks
- ☒ A cohesive server-side platform for resolving multiple interfaces that takes advantage of the convergence of services across the server-side stack and information infrastructure and renders it in new ways
- ☒ An infrastructure and interactive environment to support the intersection of people, processes, and information

Current Industry Dynamics

The enterprise workplace will reduce the need for information workers to jump from application to application. It will do so in a way that enables the information worker to think about what tasks and processes need to be completed, rather than which applications and information sources need to be accessed, to support task completion.

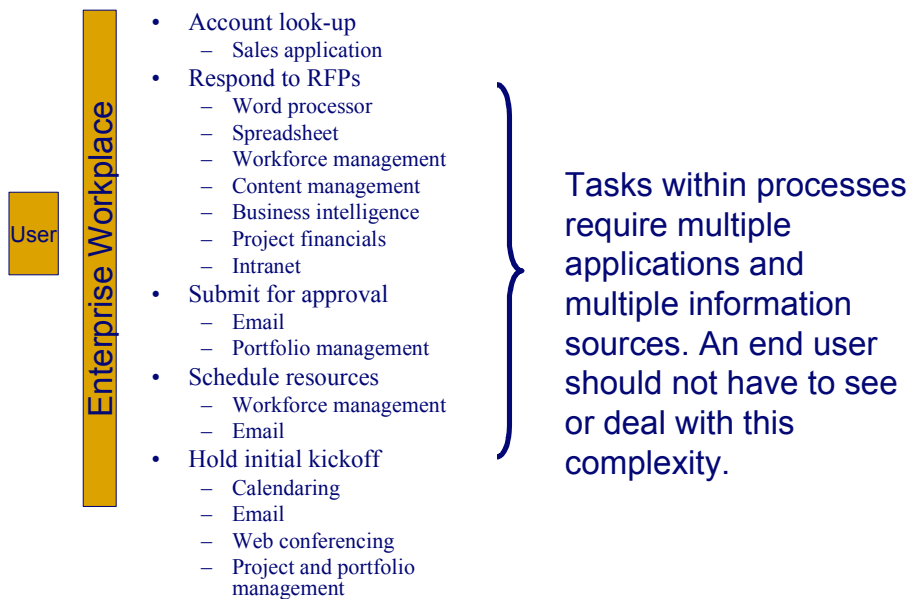
As an example, let's examine an information worker executing hypothetical processes related to three different projects that require his or her attention. In the first step, the information worker queries the enterprise workplace for information on the account status of a company that has sent in a request for proposal (RFP). As the worker moves through the process of responding to the RFP, the enterprise workplace renders services from multiple applications and information sources as needed.

Eventually, a customer support issue arises as a top priority for the information worker. This issue requires a variety of resources before it can be sufficiently resolved — including collaborative applications, various internal information sources, access to

other experts, account information, and transaction capabilities potentially from a variety of enterprise applications, from CRM to order management, and on and on. The enterprise workplace conceals this complexity from the information worker, guiding him or her through the workday using rules that accommodate the project-based, collaborative, and interrupt-driven nature of the job (see Figure 3).

FIGURE 3

Enterprise Workplace Process Execution



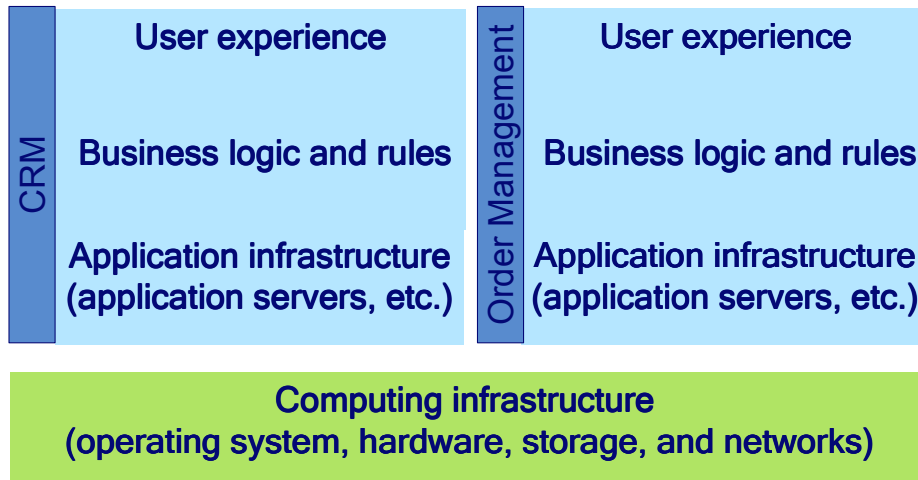
Source: IDC, 2005

Reducing the multitude of applications to a smaller number of tasks that are executed through one interface of interoperable applications and information sources greatly reduces the complexity to the end user. This process masks much complexity from users, allowing them to focus on their core tasks and to be less distracted by technology headaches such as interface switching, searching between multiple stores, and information cut and paste. However, bringing about this process requires software architectures to change to make the enterprise workplace a reality.

Such applications as CRM, order management, supply chain management (SCM), content management, and collaboration are sold as separate packaged applications. Each implements and provides its own user experience or user interface, its own business logic and rules, and its own application infrastructure — although they may share a common application server (see Figure 4).

FIGURE 4

The Common Application Server Architecture



Source: IDC, 2005

In general, they all sit on a common computing infrastructure. The user has to learn and become familiar with each different application's interface, commands, way of working, and so on. The user has to switch context between each user experience, all of which might be quite different from the previous. When performing a task as part of a larger process, the user has to interact with each of these applications and have multiple disjointed experiences. Furthermore, from an IT perspective, little to no code or business logic or rules are shared across the multiple applications, yet similar functionality is being purchased in multiple instances. This increases overall cost for performing a business process and maintaining the applications and increases inefficiencies.

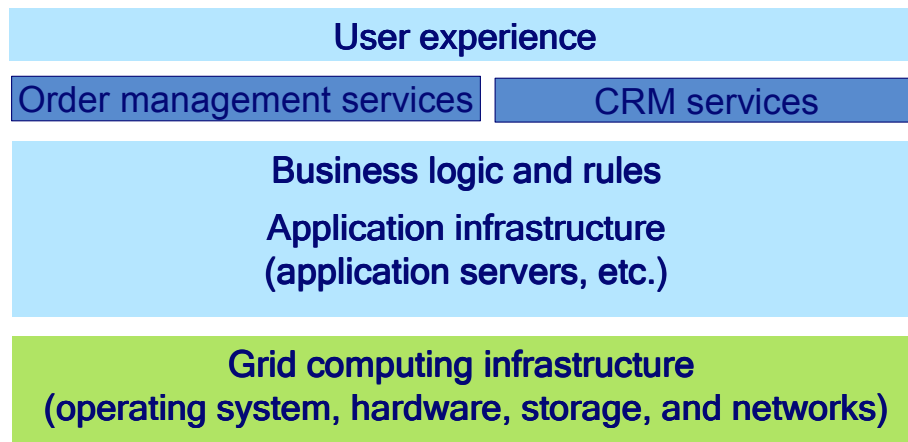
FUTURE OUTLOOK

Industry Impact

With an enterprise workplace solution architecture, the independent and unaware applications are reorganized to provide a common, unified user experience across a series of application services that facilitates role- and task-based processes (see Figure 5). This may include a variety of collaborative, authoring, search, visualization, portal, and presentation technologies.

FIGURE 5

An Enterprise Workplace Solution Architecture



Source: IDC, 2005

An enterprise workplace solution architecture also abstracts the application-specific services and expresses them in a common, more modular way (e.g., Web services). Business logic and rules that existed separately in each application are extracted and abstracted and run on a common application infrastructure that supports the operation and execution of application-specific services. This modular architecture allows extension and customization in the multiple underlying layers, yet it hides this complexity from the information worker. This enterprise workplace solution architecture is envisioned to take advantage of emerging computing infrastructures, such as grid computing.

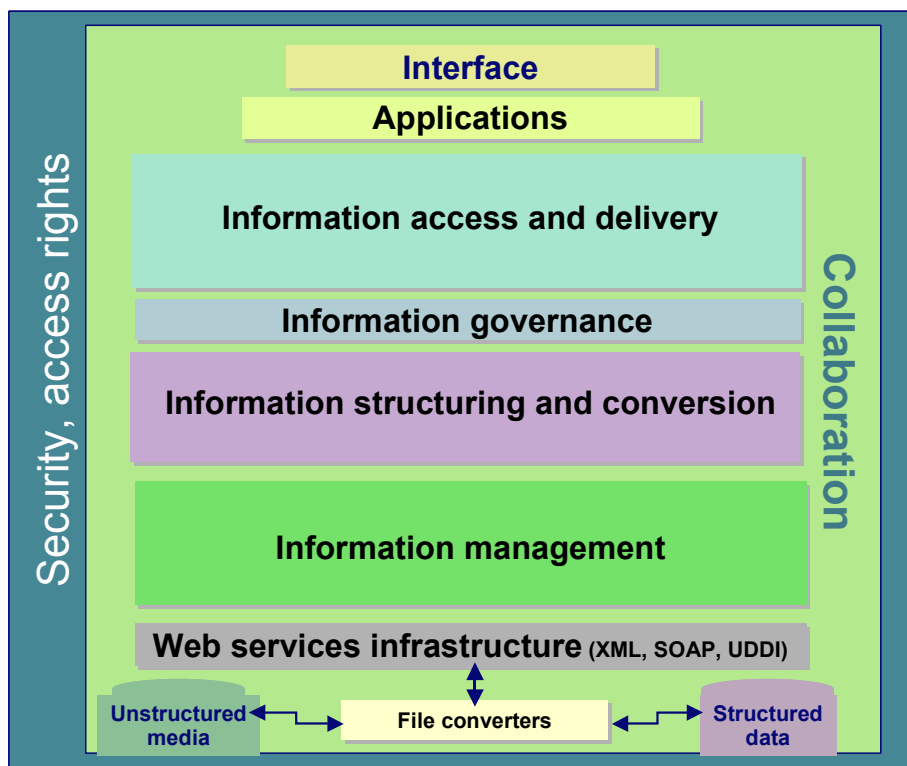
The enterprise workplace delivers a consistent environment for information work. The user experience may be personalized; it may adapt to the specific style and needs of each information worker, his or her role, and the relevant contextual security and access controls conferred to him or her, or it may be formally designed to support a specific task or workflow. Regardless, it is always the same familiar work environment, unifying access to both the supporting applications and the collections of information within the enterprise.

The interface and user experience are not specific to each application, as is the case in today's work environment. This means that the information worker can perform a variety of tasks without having to switch from one context to another. Today, information workers often must perform a single task using several applications. The commands and interface change as users switch from one application to another, cutting and pasting, reformatting, and conforming to the demands of the application. In contrast, the enterprise workplace should conform to the demands of the job, and to the user. Through creation of a single familiar environment, many unproductive, repetitive efforts can be eliminated.

The applications that underlie this user experience make use of an integrated single set of modules that form the supporting infrastructure, as seen in greater detail in Figure 6. Rather than having each application contain a separate workflow or business process engine, search engine, metatagger, or collaborative tool, this unified infrastructure eliminates software duplication and confusion by supplying common functionality that behaves identically across tasks. Because these modules are all standards based, they can be extended or swapped in and out to support the differing demands of each enterprise.

FIGURE 6

Enterprise Workplace Building Blocks



Source: IDC, 2005

In concert with this underlying flexibility, the user experience may also become increasingly configurable both statically and dynamically — enabling the configuration and use of underlying basic and extended capabilities in a consistent manner. It may potentially be configured on multiple levels:

- By the information worker
- By IT

- ☒ According to the information worker's department or function
- ☒ According to his or her security permissions
- ☒ According with the needs of the task

By providing a common configuration framework, the user experience can be further tailored and personalized.

Today's workplace can only function if human interactions are supported consistently, as part of the task. As a result, conferencing, messaging, whiteboards, and team workspaces are all accessible from any point. Finally, security is required to regulate who has access to what information, who can act on this information, and what kinds of actions each person is permitted to take. Web services, part of an underlying enterprise solutions platform, enable the modules of this new infrastructure to interact

As the enterprise workplace becomes an accepted concept, IDC expects vendors to descend on it from all directions. Each vendor will have its own take on what the enterprise workplace should look like and what should be included in the supporting infrastructure. Large vendors can be expected to propose an entire platform and to develop an ecosystem of participating vendors. Smaller vendors may either offer single layers or perhaps plan to integrate with the platforms that are proposed.

The enterprise workplace represents an architectural change in the corporate computing environment. As with any major change, vendors will have to position themselves to provide the platform and/or the interface. Participants will have to decide whether to create the ecosystem or to partner with one or more of the platform vendors.

Scenarios

The enterprise workplace can be seen as a convergence across collaborative, content management, portal, and business process management capabilities. The result is either a suite of packaged software or an integration of functionally independent services based on mandates for interoperability.

Several physical manifestations of the enterprise workplace could emerge because of unique interpretations among vendors of what the enterprise workplace should encompass. However, the key components of an enterprise workplace will remain the same, much as other paradigms for human to application interaction have been defined in the past. Vendors that could lead the march toward an enterprise workplace will approach the problem by exploiting their core strengths and adapting their current offerings.

The Role of Enterprise Portals

Portal vendors have a great start on the marketplace as demand for the enterprise workplace increases. These vendors have already made strides toward integrating disparate functions and offering useful productivity-improving tools for the information worker. Much of the industry is taking steps to improve process integration, but there is still much to do before a portal could be considered an enterprise workplace.

As the portal market evolves and the enterprise workplace emerges, vendors must make appropriate plans to deal with the transition. Ample opportunities exist to market portals as platforms for internally developed and packaged composite applications today and well into the future, so vendors must not abandon development plans for providing this capability.

The Role of Collaborative Applications

Given the central role of interactions between people and information, collaborative application vendors will be key participants in the development and delivery of the enterprise workplace. Both non-real-time tools (e.g., email, unified messaging and communications, calendaring and scheduling, and team virtual workspaces) as well as real-time tools (e.g., instant messaging, presence, and Web, audio, and video conferencing) are critical for information workers to communicate, share ideas, and create content either jointly or with input from others.

Rather than switching between collaborative applications to launch a Web conference or post content to a team workplace, collaboration in the enterprise workplace will be provisioned as contextual services available from within any business task or process. Vendors will need to design and package collaborative functionality to share common user interfaces, information repositories, and other building blocks of the enterprise workplace.

The Role of Content Management and Retrieval Software

Several developments in the content management and retrieval software markets have supplied products that will act as stepping stones to the enterprise workplace. Such technologies as Active Documents (in their various manifestations, such as Active Forms, Active Narratives, and Active Graphics) provide an alternative approach to multiple interfaces. They hide the underlying complexity, workflow, and business processes behind the particular document instance. Furthermore, active documents may be able to support process execution offline as well as online, offering an alternative mechanism to the portal.

Using natural language processing technologies, we expect the new interface to evolve closer to a conversational system. This interactive model provides human-like generation of questions and answers in the context of the task at hand. Domain knowledge, rules and inferencing engines, taxonomies, behavior models, and personalization lie behind these new systems.

Dynamic user interfaces or user experience generators such as Macromedia's Flex, Laszlo Systems and Blast Radius' XMetaL Central and technologies such as Microsoft's XAML (which may be more initially suited for mobile solutions than the desktop, but could evolve) and other Microsoft Longhorn initiatives are also well suited for this new interactive model. Applications from small companies such as Vizible, EasyAsk, iPhrase, ClearForest, and Nexidia offer new interactive user experiences that may be suitable for certain kinds of workflows, information presentations, and tasks. The user experience hides the complexity, orchestrates the services, and enables the user to perform his task in a more adaptive and user-centric manner than is possible in today's computing environment.

The Role of Infrastructure Software

Entrants from computing infrastructure markets, including those offering application servers or various middleware products as well as database and operating environments, will further the progress toward delivery of the enterprise workplace. The enterprise workplace "server" has two basic functions in theory:

- Interact with service repositories and rendering agents of all types, including the following:
 - Application services (data, content, schema, logic, and rules)
 - Middleware services (which some might consider application services, but are such things as process integration and event management)
 - Intelligence services
 - Information governance services (hubs, MDM, and the concomitant processes of management)

- Render flexible user experiences supporting the following characteristics:
 - Elimination or reduction of user experience context switching
 - Role based
 - Location based
 - Language based
 - Form factor based
 - Business process based (Workflow is a subset.)
 - Rendering agent based (Is it Windows, Linux, HTML, DHTML, XML, browser, or other?)
 - User preference based
 - Network peripheral sensitive
 - Richly collaborative in the solution context

ESSENTIAL GUIDANCE

IDC has identified several points for vendors and end-user organizations seeking to be successful in the emerging enterprise workplace:

- Develop and embrace standards such as open APIs and Web services.** True plug-and-play interoperability is critical for platforms, applications, and user interfaces to come together to create the enterprise workplace.

- ☒ **Develop applications with decoupled user interfaces.** For a single unified user experience to emerge, there cannot be a different user interface for each application or tool. Vendors need to set aside user interface developers' egos and accept that theirs may not provide the generalized functionality that the new enterprise workplace environment will require. This new work environment will require novel design. IDC to date has seen no work environment that will satisfy the demands that an enterprise workplace will place on such an interface. Flexibility in design for the needs of a particular task or enterprise will be required. At the same time, this new work environment must remain familiar, with consistent use of icons, features, and functions across all tasks. It may prove to be the case that corporations do not permit a particular vendor to own the desktop or user interface; they will want vendors to provide solutions offering application functionality that interacts with the new workspace.

- ☒ **Focus on users and task-based computing.** Too often, enterprise solutions are still focused on technology and on providing the maximum range of functionality for power users. Instead of forcing users to learn about and adapt to the solutions, the solutions must more deeply take into account or even learn about and adapt to users' roles and tasks. This is no easy task. IDC believes that research and understanding of human-computer interactions remains in its infancy, and no generally accepted models exist yet that make these interactions easy and intuitive.

- ☒ **Think about ecosystems and the value of partnerships.** No one vendor can deliver all of the building blocks required to create an enterprise workplace. Vendors that attempt to do so will put themselves at a competitive disadvantage. Customers may insist on multisourced, comprehensive business solutions. Competition will be at the building block or module level. This will challenge current pricing, sales, and distribution models to adapt. Vendors must understand their role in the marketplace and participate as leaders that provide platforms or user interfaces or as complementary providers that provide applications, tools, and other plug-ins for the enterprise workplace.

- ☒ **Hide complexity.** The complexity of underlying application and information sources should be hidden from the end user by enabling him or her to follow a process without interruption from beginning to end. The enterprise workplace should invisibly do the work of adapting to and interacting with multiple applications. IT solutions can be as complex as necessary under the hood, but they must remain simple and intuitive for users.

- ☒ **Standardize through information governance and rules.** The growing volume of all kinds of information that workers must sift through today cries out for common knowledge bases and rules. IDC does not believe that it will be possible to create a single schema, set of terminology, or taxonomy that will serve the needs of separate groups within the enterprise, at least not in the near future. However, today's technology should make it possible to create a single reference information architecture to which the divergent existing architectures can be mapped. This is an unmet need and an opportunity for vendors with semantically based technologies.

- ☒ **Develop a service orientation.** Interoperability and seamless integration requires applications and infrastructure to embrace a services model. Resisting this move is both futile and bad for customers.

LEARN MORE

IDC has been providing coverage of the key technologies and paradigm shifts for information workers for several years. Beginning with our findings regarding CyberSmart computing, the first step in addressing the growing complexity crisis, we have identified in our research how enterprise portals, contextual collaboration, conversational systems, interactive data visualization tools, active documents, and the unified information infrastructure have built a series of steps improving IT solutions for the information worker, logically leading up to the enterprise workplace.

For more details on the research leading up to the enterprise workplace, please refer to the related research section that follows.

Related Research

- ☒ *Portals in the Enterprise Workplace: Key Building Blocks or Aging Stepping Stones?* (IDC #32818, January 2005)
- ☒ *The Enterprise Workplace: Will It Change the Way We Work?* (IDC #TB20050120, January 2005)
- ☒ *Build, Buy, or Workplace* (IDC #32617, December 2004)
- ☒ *Knowledge Management, Integration, and Business Processes: Strategies for Solution Sales* (IDC #32462, December 2004)
- ☒ *Sustainable Corporate Governance: The Role of the Enterprise Portal* (IDC #31990, October 2004)
- ☒ *Enterprise Portal Survey, 2004: An Examination of Business Processes Driving Adoption* (IDC #31829, September 2004)
- ☒ *Changing the Face of Enterprise Computing: The Emerging Information Infrastructure* (IDC #30704, January 2004)
- ☒ *Active Documents: Changing How the Enterprise Works* (IDC #30405, November 2003)
- ☒ *Worldwide Interactive Data Visualization Tools Forecast, 2002–2007* (IDC #30215, September 2003)
- ☒ *Conversational Systems* (IDC #26216, February 2002)
- ☒ *Contextual Collaboration: On Tap, Targeted, and Inside Web Sites and Applications Near You* (IDC #24573, April 2001)

- ☒ *Enterprise Portals: From Mania Toward a Mature Ecosystem* (IDC #23724, December 2000)
- ☒ *The Next Paradigm Shift: CyberSmart Computing* (IDC #20295, October 1999)

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