

White paper

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**Lotus** software

## **Putting the power of Web 2.0 into practice.**

*How rich Internet applications can deliver tangible  
business benefits*

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**Introduction**

With Web sites such as Facebook and YouTube drawing more and more Internet traffic each day, Web 2.0 is rapidly emerging as the next big wave in Web site design. Often defined as “Web as a platform,” collective intelligence or rich user experiences, Web 2.0 technology has transformed traditional application development principles by making it possible to write applications that run on the Web, rather than on a desktop. As a result, companies can now offer more users a richer, more interactive user experience than ever before.

The new class of Web applications providing this rich, interactive user experience are called rich Internet applications (RIAs). Simply stated, RIAs deliver a rich client experience, typically through a lightweight browser. And RIAs are helping to drive Web 2.0 technology. RIAs enable the creation of applications that respond to user input. For example, you could create a feature that provides a list of possible terms as users type into a field. The list of terms instantly changes as users type in more letters. Essentially, RIAs merge the rich interfaces of client/server applications with the centralization advantages of Web applications. RIAs are changing the way people interact with one another and with businesses, allowing users to interact with Web pages in the same way they would a desktop application. And they’re becoming so mainstream that companies failing to embrace them run the risk of losing customers to competitors that offer a more robust and intuitive user experience. Although RIAs are not imperative for every organization, they offer tangible business and user benefits that are worth considering if you want to give your users a richer experience than traditional Web applications allow.

This paper looks at a few compelling reasons you should pay attention to RIAs, presents a deeper dive into the technology behind them and then looks at the various capabilities of RIAs and the benefits you could potentially gain from them.

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Highlights

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***RIAs allow you to present information more effectively and guide your users through the application interface.***

***Using RIAs, users only need a standard Web browser to access your applications.***

**What Web 2.0 technology can do for you—and, more importantly, your users**

By shifting from a traditional client/server desktop application to a Web-based RIA, you can gain a number of compelling benefits—for your users and for your business operations—that can lead to a competitive advantage.

Whether your users include your employees, your customers or a combination of both, RIAs can help you make information more readily available, offering benefits such as:

- ***Richer, more intuitive interfaces.*** *Simply put, RIAs can allow you to present information more effectively. You can provide immediate visual feedback to your users and help guide them through your application interface, generating potential opportunities for up- and cross-selling. For example, you might create an RIA for ordering products from your Web site and connect the RIA in realtime to your back-office system via a simple Web services interface. Then, if a user enters a quantity of 10 for an item, you could immediately display a message such as, “Next price break at 15,” to entice the user to increase the size of the order to get a better price.*
- ***Greater ease of use for your customers or end users.*** *With RIAs, your customers and end users only need a standard Web browser to access your application. This can give you a key advantage over competitors whose applications require users to install a desktop client. For example, to update an application that requires a desktop client, you need to update every single user’s client, which is time consuming and labor intensive. With an RIA, you simply need to update the application on your server, which means you can quickly and easily implement updates to existing applications—either to address bugs or to introduce new features.*

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### Highlights

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*RIAs offer a number of compelling benefits, including faster time to market, reduced maintenance, greater application responsiveness and increased marketplace reach.*

*Essentially lightweight applications, RIAs provide desktop-like GUI features and advanced interactivity.*

For your business, better Web interactions can lead to a host of opportunities to streamline operations and drive more value from existing processes or applications, helping you realize benefits such as:

- ***Faster time to market.*** *Because releasing a new RIA is as easy as posting it to your Web site, you can release new products and applications to the marketplace faster than with traditional client/server applications.*
- ***Easier maintenance.*** *Because the RIA resides on your application server and there is no client component, you can fix bugs once on your server, and users can quickly see the changes.*
- ***Improved application responsiveness.*** *RIAs can deliver subsecond response times over the Internet, making them more usable than traditional applications.*
- ***Greater marketplace reach.*** *Using the Web as a platform can help provide your application with near ubiquitous availability—so almost anyone you permit can access your application from almost anywhere.*

#### **Beyond the friendly interface: a closer look at RIAs**

RIAs are essentially lightweight applications that deliver advanced capabilities to your users, such as desktop-like graphical user interface (GUI) features and advanced interactivity. Because RIAs reside on an application server, users can easily access them using a Web browser, eliminating the need to support and manage a traditional desktop client. RIAs also enable you to compose and integrate local and remote sources of data and business logic. Therefore, you can give your users access to data that was unavailable to them in the past. This can include realtime data, which is provided through integration with your back-end data sources, or even live data, which is uploaded into a grid or table as it's retrieved from your back-end data sources. Using the live-data model enables you to load large sets of data in the background and therefore improve the performance of the application from the user's perspective.

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Highlights

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***You can develop RIAs using a number of different frameworks and integrated UI format definition frameworks.***

***An enterprise level platform, such as a portal solution, allows you to address issues such as security, authorization, authentication and integration.***

To be considered a true RIA, the application must:

- *Be accessible to the user without a separate installation process.*
- *Support robust, local application processing on the client side.*
- *Support a full, event-driven user interface model.*
- *Provide a rich, full-featured user interface that closely matches the look and feel of a native desktop GUI.*

You can develop RIAs using a number of different frameworks, including a browser plug-in such as Adobe® Flex software or open browser Asynchronous JavaScript and XML (AJAX) frameworks such as Dojo and jQuery – as well as a number of integrated user interface (UI) format definition frameworks such as ZK, Backbone and Nexaweb. If leveraging existing infrastructure investments is a consideration, choose a development platform that will enable you to use the skills that you already have in-house.

However, while you can use a lightweight UI framework for RIA development, you need to make sure that you address issues such as security, authorization, authentication and integration. One way to do this is to use an enterprise level platform, such as a portal solution, that handles all of these enterprise issues. Not every platform has these features built in, which is important to consider when choosing a platform for your RIAs.

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### Highlights

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***RIAs contain three types of logic: business logic, presentation logic and application logic.***

***The application logic in an RIA interacts with the business logic and your data, while the presentation logic interacts with the application logic.***

### Understanding the different types of RIA logic

- **Business logic.** The business logic in an RIA interfaces with your enterprise's business systems, such as customer relationship management (CRM) or enterprise resource planning (ERP) systems, and with your business data and databases. Ideally, this interface is accomplished through a set of business and data services in a service-oriented architecture (SOA) layer, or through application programming interfaces (APIs).
- **Presentation logic.** Within the context of an RIA, the presentation logic refers to the UI event-handling logic that interacts directly with the rich UI controls. For example, when a user presses the tab key in the UI, an event is triggered and handled by the presentation logic, or the event handler. The presentation logic can perform validations directly, as in validating a date field; interact directly with application logic, as in retrieving data; and also interact with the UI, as in moving the cursor to the next input field.
- **Application logic.** The application logic typically maintains the application context or state and interacts with the presentation logic, but not with the UI. The application logic may also transform data from the business logic into a form that is easier to handle in the UI. For example, business logic through a business service interface may provide the customer's address as a single field, but the UI may require the name, address, city, state and zip code as separate fields. This mapping from single field to multiple fields can be performed in the application logic.

The application logic interacts with the business logic and data, and the presentation layer interacts with the application logic. RIAs loosely couple presentation logic and business logic. A best practice for RIA development is to use a model view controller (MVC) architecture pattern. In this approach, the RIA view is made up of rich UI controls. The controller provides the presentation logic that interacts with the UI controls in the view and also interacts with the model that provides the application logic.

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Highlights

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***By enabling users to interact more easily with your applications, RIAs help users make better-informed decisions, faster.***

***An effective RIA allows you to leverage existing information and systems, which can help extend the value of your SOA.***

**Tipping points: how RIAs can make a difference**

The following sections take a closer look at the capabilities RIAs can deliver and how they can help add value to your business.

Facilitate a rich user experience

RIAs can support a rich user experience – one that engages users more effectively than traditional desktop applications with a simplified, more intuitive and enjoyable Web experience. Users can navigate easily to find what they need, engaging in self-service where appropriate. They can personalize their experience more easily, filtering the environment according to their own preferences and needs. And, ultimately, they can make better-informed decisions, faster.

For your business, empowered users can mean better results – for everything from customer loyalty to your bottom line. With an intuitive, easy-to-navigate RIA, you can potentially increase revenue using applications that enable self-service and help reduce process abandonment. Plus, RIAs allow you to create composite applications, also known as mashups, that pull together a group of widgets and present them simultaneously in a single user interface. What's more, users can personalize and configure RIA mashups according to their own preferences.

Help extend the value of existing technologies and information

RIAs let you use the best of the IT you have today, while giving you unprecedented choice in the technologies you adopt tomorrow. By basing your RIA on technology that uses open standards, you can free yourself from reliance on proprietary clients and use your existing technologies. Plus, an effective RIA can help you extend the value of SOA and the information you have in your existing systems. You can surface data – from any system – quickly and easily using only a Web browser. And you can pull data and logic from multiple places and present it together, allowing you to deliver information in a way that's more contextual and relevant to your end user.

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Highlights

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***By allowing you to reuse existing components and services, RIAs can help reduce development and administration costs.***

***Because RIAs reside on your application server, it's easy to roll out applications incrementally as well as add new features.***

Help reduce development and administration costs

Despite what you might think, RIAs can actually help reduce development costs. Specifically, they enable you to reuse components and services more easily to create efficiencies in development activities over time. On the deployment end, RIAs can help reduce complexity, maintenance costs and total cost of ownership (TCO) by limiting the number of program installs, plug-ins and distributed updates required. Because you aren't tied to proprietary clients, you don't have to upgrade all of your users' desktops each time you introduce a new application or feature. What's more, RIAs enable you to utilize industry-standard programming languages and design patterns, which means you won't have to hire new developers or retrain your existing staff. And, finally, RIAs can ease the burden of fixing code bugs: Fix them once on the server and your users can experience the results of the improved application almost immediately.

Help facilitate faster time to market for new, innovative solutions

Once you have laid the foundation for Web 2.0 solutions, it's easy to roll out new solutions quickly. Because RIAs reside on the application server, you can roll out applications incrementally, easily adding features as they are developed. And, unlike compiled products, RIAs are extremely flexible and can be configured to meet your unique requirements. You can even customize the look and feel of your applications—using a skinning and styling model based on cascading style sheets (CSSs)—to match your company's Web site.



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### Highlights

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***RIAs can help give your users access to online discussions, blogs and team workspaces, helping boost collaboration and access to community knowledge.***

***When choosing an RIA solution, establish evaluation criteria, create a proof-of-concept application, select frameworks to evaluate and then build the proof-of-concept applications in several different frameworks.***

Enable your employees to leverage community knowledge

Online discussions, blogs and team workspaces can help users gain access to information that was previously unavailable. RIAs can help you implement and better leverage the interactive, dynamic and engaging Internet activities that bring communities of people together. When employees have easy access to such resources, they can leverage the collective knowledge of your company, your partners and even your customers. Plus, RIAs can facilitate team collaboration by enabling people to access information and project materials and interact with one another—even across multiple office locations and time zones.

#### **Choosing an RIA solution**

To choose the right framework for your business needs, it can be helpful to walk through the following steps:

- 1. Establish your evaluation criteria.*** Look at your business requirements, weighing the needs of IT and other departments in the company, to determine what you should look for in an RIA framework.
- 2. Create a simple proof-of-concept application.*** Start with one that can be used to test the items in your evaluation criteria. For example, if creating up-selling opportunities via your Web site is a priority, you should test frameworks that enable you to provide messages to your users on the fly.
- 3. Select frameworks to evaluate.*** Choose an RIA technology framework—either a Flash-based framework, such as Adobe Flex or OpenLaszlo, or an AJAX framework, such as Backbase, Nexaweb, ZK, Dojo or JQuery. You also need to consider a platform, such as a portal solution like IBM WebSphere® Portal software, to handle more complex functionality, including application aggregation, single sign-on, authorization and authentication.
- 4. Build your proof-of-concept application in several frameworks and deploy them to the platform you've chosen.*** Schedule time for your developers to evaluate the different implementations and work with each framework vendor to work out any issues.

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### Highlights

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*An RIA solution based on open standards can help protect your investment and allow you to better leverage existing investments.*

After you've identified the technology framework that best meets your needs, create a rollout plan that gives your staff adequate time to adjust to the new technology.

### When choosing an RIA solution, make sure to ask your vendor the following questions:

- Is the solution based on open standards?
- How does the solution handle security?
- Does the solution provide tools that can help make my developers more productive?
- Can the solution help me integrate RIAs with my existing business logic and data? And does the solution provide the comprehensive tools I need to create RIAs that easily integrate with my existing business logic and data?
- Since UI technology changes so frequently, how can I protect my development investment from future changes in UI technology?

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**Highlights**

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***IBM offers solutions that can help you develop RIAs, including IBM WebSphere Portal, IBM WebSphere Portlet Factory and IBM Lotus Expeditor software.***

**Solutions from IBM**

IBM offers a number of solutions that can help you develop RIAs to meet your business needs. IBM WebSphere Portal software can help you create rich, desktop-like application interfaces, leverage existing assets and rapidly assemble composite applications by providing built-in content and document management solutions and composite application templates. Plus, the IBM WebSphere Application Server Feature Pack for Web 2.0—which is available for WebSphere Application Server, Version 6.0 and Version 6.1, and WebSphere Application Server Community Edition, Version 2.0—provides an enterprise-ready toolkit and extends industry-standard Java™ Platform, Enterprise Edition (Java EE) technology with Web 2.0 and RIA benefits.

Featuring built-in support for Dojo, a JavaScript toolkit, IBM WebSphere Portlet Factory software can help you create complex RIAs that integrate with your existing data and business logic. In addition, WebSphere Portlet Factory software can help you future-proof your applications because it includes automated building tools that facilitate RIA creation.

IBM Lotus® Expeditor software is a client-side SOA product built on the Eclipse Rich Client Platform. Lotus Expeditor software is a universal client platform that supports a number of operating environments, including Microsoft® Windows®, Apple Macintosh, Microsoft Windows Mobile, Linux® and more. It allows users to access rich client applications—including applications based on WebSphere Portal software—from a variety of mobile devices. Users can even access these applications offline. Lotus Expeditor software features a composite application infrastructure that supports the interoperation of new components based on virtually any kind of technology. And by mapping from WebSphere Portal pages to Eclipse perspectives and portlets, you can also use Java Specification Request (JSR) 186 portlets within composite applications.



Lastly, with IBM WebSphere Commerce software, you can create compelling, rich, highly interactive and productive shopping experiences by using the AJAX framework (Dojo) and the online AJAX-based RIA store.

**For more information**

To learn more about how IBM can help you implement an effective Web 2.0 solution, contact your IBM representative or IBM Business Partner, or visit:

[ibm.com/web20](http://ibm.com/web20)

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