

**Rich Internet Applications**

1. "Web 2.0" and Rich Internet Applications





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**In the beginning - "Web 1.0"**

- The WWW was popularised following release of Mosaic browser in 1993
- Focused on a relatively small number of companies and advertisers
  - Producing content for users to access
- Personal web pages
  - Professionals, academics and other individuals
  - Static web pages

Rich Internet Applications 1. Web 2.0 and RIA #2

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**Moving to "Web 2.0"**

- Term coined by Dale Dougherty of O'Reilly Media in 2003
  - <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>
- Architecture of participation
- Design to encourage user interaction and community contributions
- Shift from a powerful few to an empowered many

Rich Internet Applications 1. Web 2.0 and RIA #3

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### Not such a new idea...



- WWW originated at CERN by Berners-Lee
- Vision of the Web was as an interactive, collaborative medium
- Original WorldWideWeb browser (1990) was also an editor
- Users could edit live web pages...
  - ...except that this didn't work at the time
- Technology has now caught up with the vision



Rich Internet Applications

1. Web 2.0 and RIA #4

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### Collective intelligence



- Web 2.0 harnesses collective intelligence
- User-generated content bound in to the structure of the web by other users discovering the content and linking to it
- Web of connections grows organically as an output of the collective activity of all web users
- Personalised information based on other users' activity



Rich Internet Applications

1. Web 2.0 and RIA #5

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### Web 2.0 characteristics



- Rich user experience
- User participation
- Dynamic content
- Metadata
- Web standards
- Scalability



Rich Internet Applications

1. Web 2.0 and RIA #6

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### Web 2.0 features



- User-generated content
- Blogging
- Social networking
- Social media
- Tagging and social bookmarking
- Web services and mashups
- RSS and Atom
- **Rich Internet Applications (RIAs)**



Rich Internet Applications

1. Web 2.0 and RIA #7

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### User generated content



- Website is platform for users
  - e.g. eBay, Monster
- Wikis allow users to edit and add content
  - e.g. Wikipedia
- Collaborative filtering
- Wisdom of crowds
  - e.g. Digg
  - A large diverse group of people can be smarter than a small group of specialists



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1. Web 2.0 and RIA #8

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### Blogging



- Blogs (weblogs) are websites consisting of entries listed in reverse chronological order
- Interest has grown because of easy-to-use blogging software
  - Blogger, WordPress, TypePad
- Empowering new users
- Citizen journalism
- Features of blogs: reader comments, permalinks, trackbacks, blogrolls



Rich Internet Applications

1. Web 2.0 and RIA #9

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### Social Networking



- Allows users to keep track of interpersonal relationships and form new ones
- MySpace, FaceBook, Bebo, LinkedIn, Second Life, etc.
- Network effects
  - The value of a network increases as the number of users grows
- Default is to share
  - Option to disable sharing is an important privacy feature

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### Social media



- Media shared online
- Videos, music, photos, etc.
- YouTube, FlickrR, Podcasting, Internet TV, etc.
- Online video viewing entrenched into habits of web users
- Made possible by increased broadband penetration, webcams, digital cameras and video

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### Tagging and social bookmarking



- A tag is a word or phrase that helps to organise web content
- Folksonomies – classifications based on tags
- Examples:
  - tagging photos in FlickrR
  - tagging bookmarks on del.icio.us
- Tag clouds




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### Web services



- Developers can use existing web services to build feature-rich applications
- Many Web 2.0 companies use APIs to allow the use of their services within other applications
- eBay, Amazon, Google, etc.
- Technologies include Representational State Transfer (REST) and Simple Object Access Protocol (SOAP)

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### Mashups



- Combine content from existing web services, websites, RSS feeds to serve a new purpose
- Example: combining TfL's API with Google Maps gives a live map of London Tube trains  
<http://traintimes.org.uk/map/tube/>




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### RSS and Atom



- XML based newsfeeds
- Users subscribe to websites' feeds
- Receive updates when new content is posted
- Most browsers support RSS and Atom feeds
- Aggregators (or feedreaders) are separate applications which help users organise their subscriptions

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### Rich Internet Applications (RIAs)



- Web applications that offer an experience approaching that of desktop applications
  - responsiveness
  - “rich” features and functionality
- Richer user experience is a key aspect of Web 2.0
- More complex interactions




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### Client and server roles



- Web site (Web 1.0)
  - information stored as static pages on server
  - client requests pages from server and displays them
  - user interaction based on hyperlinks




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### Client and server roles



- Web application
  - data and business logic on server
  - dynamic pages created on server in response to client requests
  - data merged into page templates
  - pages sent to client for display
  - user interaction based on hyperlinks and form input




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### Client and server roles



- Rich Internet Application
  - application sent from server to client as web page with embedded code
  - application running on client provides user with interactive interface
  - data and business logic on server
  - data sent by server in response to client requests
  - client uses data to update interface
  - user interaction based on hyperlinks, form input, GUI controls and direct manipulation

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### Not such a new idea (again)



- Interactivity in web pages is not new:
  - JavaScript introduced in Netscape browser in 1995
  - Java applets introduced in 1995 by Sun
  - Flash released in 1996 by Macromedia
  - ActiveX in MS Internet Explorer in 1996

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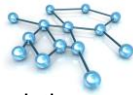
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### So what is new?



- New ideas and new ways of using existing technologies
- More cross-browser compatibility through increased support for web standards
- Capabilities of technologies can be exploited more fully
- Integration with back end servers to create powerful applications
- New tools to facilitate development

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### Web vs. desktop applications



- Web applications (thin clients)
  - run in a browser and do not require software installation
  - updates are transparent to the user
  - user can access application from any computer
- Desktop applications (thick clients)
  - application must be installed and maintained
  - rich user interface
- RIAs combine the advantages of both

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### Typical RIA features



- Example – Google Maps

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### How rich is rich?



- Most current implementations have elements of “traditional” web applications and RIAs
- Can be web applications with a few RIA elements
- Can be applications designed to fully exploit RIA technologies
- Can be anything in between

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### Potential RIA shortcomings



- Client-processing speed
- Script download time
- Loss of visibility to search engines
- Dependence on internet connection
- Accessibility

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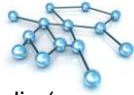
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### RIA technologies



- Term “RIA” introduced by Macromedia (now Adobe) in 2002
- Referred to applications created using their technology
- Widely used now also to refer to applications using other (non-Adobe) technologies and techniques, primarily Ajax

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### RIA technologies



- Native browser technologies
  - HTML 5, CSS, JavaScript
- Frameworks and libraries which support JavaScript development
  - e.g. jQuery, Knockout.js
- Non-native technologies
  - Silverlight, etc.

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## Further Reading



- O'Reilly, T. (2005). *What Is Web 2.0 Design Patterns and Business Models for the Next Generation of Software*, <http://www.oreilynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>
- Best, D., (2006). *Web 2.0 Next Big Thing or Next Big Internet Bubble?* Lecture Web Information Systems. Technische Universiteit Eindhoven.



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