

Human-Computer Interaction. Web Portal Services

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Abstract

Internet as constantly growing area presents more and more information available for users.

Aim of this paper is to present general and most important and popular information about human-to-human and human-to-internet interaction ideas, partially how to handle huge amount of various net-data in the most optimal, convenient and efficient way, what services and technics exist and what attempts were lately advanced to optimize work of single-users, communities and companies.

It is necessary to point out the fact that this field is in progress constantly and more and more new technologies are expected to appear in the nearest future.

Key words: Portal, portlet, web-service, J2EE, Blog, Wiki.

1 Web-portal

Here we are going to speak about what web-portal presents itself, how can we distinguish it from common web pages, about its specific features and benefits of usage.

DEFINITION.

A **portal** is a term for a World Wide Web site whose purpose is to be a major starting point for users when they connect to the Web.

HOW DOES TYPICAL PORTAL LOOK LIKE?

It is lightweight text-based page that loads quickly and offered typically such services as a directory of Web sites, a facility to search for other sites, news, weather information, e-mail, stock quotes, phone and map information, (sometimes) a community forum.

Typical example is www.Yahoo.com as most portals have adopted the its style of content categories. Portals can access any Web services and provide a unique opportunity to leverage the functionality of nascent technologies as well as mature, well-established software systems. A number of large access providers offer web portals for their own users.

Figure 1. A page from the Yahoo public portal. The portals pages feature user-specific information offered through customized portal components.

WHAT KINDS OF PORTALS EXIST?

Portals vary according to the users they serve and the services they offer can be divided into several groups.

- *Public* and *Private*
- *General* and *Specialized*

Some major general portals include Yahoo, CNET, AOL, and MSN. Examples of other portals that are accessible to the public include Garden.com (for gardeners), Fool.com (for investors), and DPReview.com (for photographers). Private portals are those that are used by employees of a company. Companies such as IBM and MasterCard use portals to help disseminate information to their employees in a timely and efficient manner.

It is possible to consider the following types of web portals:

- *Public portals*, such as Yahoo, are generally available and bring together information from various sources, applications, and people, offering personalized Web sites for arbitrary users (see Figure 1, next page).
- Private portals often include access to payroll information, internal phone directories, company news, and employee documentation.
Enterprise portals (or "corporate desktops") give employees access to organization-specific information and applications. Companies with portal sites have attracted much stock market investor interest because portals are viewed as able to command large audiences, which in turn translates to a large number of advertising viewers.
- *Marketplace portals*, such as eBay and ChemWeb, are trading hubs that connect sellers and buyers.
- *Specialized portals*, such as the SAP portal, offer an access path to specific applications.

Analysts have predicted that portals will become the next generation for the desktop environment. Even basic sites are becoming more like traditional portals - a single, integrated

point of access to information, applications, and people. Portals integrate diverse interaction channels at a central point, providing a comprehensive context and an aggregated view across all information.

PORTALS ARE DIFFERENT BUT HAVE SOMETHING IN COMMON.

Despite the different usage scenarios, all portal types share a few common features. Portal server technology aims to provide portal implementation with a common set of services:

- *Customization.*
It recognizes different users and offers them specific content configured to their needs. The service is based on gathering information about users and user communities and delivering the right content at the right time.
- *Content aggregation.*
It prepares content from different sources for different users. It considers the user-specific context through the security service's authentication call, and the customization service's personalization call.
- *Content syndication.*
It gathers content from different sources. Generally, the syndication service talks to every attached back-end system via the appropriate protocol. Professional content providers often make content available in standardized formats, such as rich site summary (RSS), news industry text format (NITF), and NewsML, an XML-based standard used to represent and manage news through its life cycle. Often, the quickest solution is to "clip" content from existing Web sites by copying HTML content into the portal. An employee portal, for example, might clip content from the corporate intranet.
- *Multi-device support.*
It prepares content for different interaction channels, such as those for wired and wireless phones, pagers, and faxes, by considering their characteristic capabilities. This typically requires a transcoding service to filter content by, for example, removing all images for a wireless phone and translating the HTML to wireless markup language (WML).
- *Single sign-on.*
This service lets the syndication service access back-end systems and retrieve user specific information without requiring user authentication each time. The number of systems that require authentication and want to become accessible via a portal is growing rapidly; for example - applications for corporate human resource.
- *Portal administration.*
It determines how users see the portal. This is more than look-and-feel; administrators must define user groups, interaction channels, and authorization information as well, depending on the portal's nature.

- *Portal user management* depends on
 - the portal's audience: users can typically subscribe themselves to public Web portals, for example, but not to enterprise portals;
 - the portal type, the number of users can vary from several dozen to tens of thousands to millions. In some cases, administrators must categorize portal users into groups, so that the portal can present content specific to a user's role, interests, location, function, or position.

As you see now web-portals have once come in our every-day Internet lives as a single, integrated point of access to information, applications and people.

The next paragraph will

- let us get an insight into portals' architecture;
- make it clear how various remote information that we see and operate with is integrated into;
- tell us about portal standardization efforts.

2 Portal-Specific components and architecture

Enterprise portal presents itself a set of program technologies that defines enterprise platform. Platform is a core of process of integrating corporate data. That is why choosing of platform is a task of high importance as it effects all following program solutions.

Portals are composed of program modules that lie in-between portal and integrating application; they are supposed to integrate program application into the portal. Such modules are called *portlets*. Technically, a portlet is a piece of code that runs on the portal server and provides content to be embedded into portal pages.

Portlets' properties:

- it generates content in the form appropriate for integration;
- is able to interact with content generated by him.

A portlet is a specialized content area that occupies a small window of a portal page. Portlets from different sources (Portlet Providers) can be integrated into the portal framework. Example portlets: weather info, news flashes, stock tickers, etc.

According the location of portlet:

- *local* (if it is executed in portal area),
- *remote* (a. it is executed on the remote server and portal recognize it as *Web-service*; b. *remote program*),
- several types of application integration into the portal are possible.

Web-service — is web-available program component. It must support the following standards: UDDI — is to find a web-service, WSDL — is to characterize, SOAP — is to

interact with this web-service.

In Internet there exists various available components: HTML-pages, CGI-interfaced programs, ASP/PHP/JSP-programs, servlets are not web-services because they do not supports standards mentioned above.

HOW CAN APPLICATIONS BE INTEGRATED INTO PORTALS?

Lets get acquainted with integration variants used today:

- First consider the case when local portlet. According to such integration 4 components are used:
 - application;
 - application adaptor on the portal side;
 - portlet;
 - portal (as aggregation module).

Figure 2. Integration of remote application via local portlet.

Here application supplies information. Generally speaking there are no difference and formal restrictions on what kind of data presentation application provides and how this data gets from the source to the user. That is why application demands for adaptor: application adaptor is to deal with application. As basic protocol TCP/IP is used and upper-level protocol can be any: DCOM, RMI or special application protocol. Portlet deals strait with adaptor. Then via portlet Application Programming Interface (portlet API) portlet gets and processes data on the logic level of task, forms data to "present" and sends the result to the portal. Portal joins results from numerous portlets and sends the final result to the user. Here portlet is responsible for task logic and way of representing results. (It was the application integration via *local* portlet.)

- Now let's consider application integration via *remote* portlets.

Figure 3. Integration of remote application via remote portlet.

The basic idea is to take portlet functions out to remote server. On the scheme above one can see two types of integration:

- a. remote portlet as Web-service;
- b. remote portlet as remote program.

The first variant implies a module (portlet 1) on portal side that deals with web-service. Web-service provides module with data processed on level of logic level. Module forms

”presentation” level and direct it to the portal.

The second variant (the same as in case of local portlet) portlet (portlet 2) is responsible for task logic and way of representing results. It is attained by portal adapter. It provides access to portal users’ settings (stored in portal database) and reception of current user data via HTTP.

*WE’VE CONSIDERED CLASSICAL INTEGRATION TECHNICS.
WHAT CONCLUSION CAN BE DONE?*

- a. Such integration demands for creating a portlet (that will contact to application adapter).
- b. Application adapter must be installed on the portal or on the remote server.
- c. If you have N application then the one and the same procedure will be repeated N times.
- d. Items from a to c are possible only if portal platform and application allow this.

— *CONVENIENT? — NOT VERY MUCH.*

So what can be the way out? Since 2002 a technical committee from the Organization for the Advancement of Structured Information Standards (shortly OASIS) started developing a standard for Web-services for remote portlets. *Web-service for remote portlets (WSRP)* allows: plug-and-play inter-operation of visual, user-facing Web services with portals and other intermediary Web applications, providers implement remote portlets in any technology, whether it is J2EE, .NET or any SOAP-accessible service.

As a result, WSRP becomes the mean for content and application providers to provide their services to organizations running portals in a very easily consumable form.

WHAT IS WSRP?

WSRP specification defines the Web-services interfaces and semantics for interactive, presentation-oriented content services. This allows the content consumers, such as portals, to access conformant services without requiring service-specific code.

HOW DOES IT WORK?

Portals with WSRP own an integrated module that provides functions of searching and integrating of WSRP-services. As a result of the work of the module, ”agent” of WSRP-service is automatically generated on the portal — WSRP-portlet (portlet-proxy). So application integration is implemented only by portal administrative techniques.

Figure 4. Integration based on WSRP-standard.

HOW DOES WSRP BENEFIT CONTENT AGGREGATORS SUCH AS PORTALS?

WSRP eliminates the need for content aggregators to choose between locally hosting a content source and writing code specific to each remote content source. WSRP allows content to be hosted in the environment most sensible for its execution while still being easily accessed by content aggregators.

HOW DOES WSRP BENEFIT CONTENT PRODUCERS?

WSRP enables content producers to maintain control over the code that formats the presentation of their content. This reduces the distribution of updates problem frequently faced today. In addition, by reducing the cost for content aggregators to access their content, WSRP increases the rate at which content sources may be easily integrated into pages for end-users.

HOW DOES WSRP RELATE TO OTHER WEB-SERVICES STANDARDS?

WSRP seeks to leverage Web services standards as they are widely available in Web stacks. WSRP v1 uses WSDL to describe the interfaces, requires at least SOAP bindings be provided to all conformant services, defines the passed message structures using XML Schema and uses XML to carry the messages between the services and their clients. Future versions are exploring emerging standards in the areas of attachments and security, among others.

HOW DOES WSRP RELATE TO OTHER PORTAL-ORIENTED WORK?

WSRP was developed in parallel with the effort by the Java community to standardize a portlet API and care has been taken to align these two new standards with each other. In addition, care has been taken to ensure WSRP can be easily supported on a .NET platform. One example of how these efforts relate to developers is that vendors have indicated that portlets developed to the new Java Portlet API will not need to be aware that they may be accessed remotely using the WSRP protocol, but rather it is a feature of the hosting container to provide such access as if it had occurred locally. (The container is the environment of server-side components run-time; it calls the component and provides component-specific services, such as user information and persistence service.)

3 Enterprise edition portals (examples)

Portals are largely based on existing Web application technology, such as Web servers and Java 2 Platform Enterprise Edition (J2EE) (Sun).

In recent years, many organizations have implemented an enterprise portal to host internal and external applications. There are numerous J2EE portal vendors offering products in this lucrative market. In the past, each of these portal offerings defined their own

proprietary APIs for building portlets, application components that run inside portals. Unfortunately, coding to these various APIs translated into vendor lock-in for portlet developers. The *Java Portlet Specification (JSR 168)* changes this.

This specification was developed by a committee of J2EE portal vendors. It aims to achieve interoperability between portals and portlets. This standardization will help to simplify portlet development and enable developers to create pluggable components that run on any compliant, J2EE portal server.

There are several *Enterprise Portal Implementations*:

Open Source: Liferay, eXo, (Apache) Jetspeed, uPortal.

Commercial portals: (IBM) WebSphere, (BEA) Weblogic, Oracle, (MS) Sharepoint, Vignette Builder.

Now portal server vendors are coming up with their own portlet and portal development toolkits. Every portal vendor is betting high on their portals / portlet creation tools. For example - BEA Weblogic Workshop, Vignette Portlet Builder, IBM WebSphere Application Developer based on Eclipse.

Weblogic Workshop gained popularity due to its Microsoft style of development. IBM has betted on open source eclipse and this proved quite successful strategy especially due to plug-in support and extendible nature. Vignette announced *Vignette Builder* for quick and easy portlet creation. *Jetspeed* creators insist on that their products allow users easily and quickly to build portal and syndicate their own content. It is likely that more and more portal and portlet creation tools specifically for portal development will appear in near future. Now it is hard to say what implementation is more preferable though there are some predictions based on contemporary sales results that 80 % of the deployments will be either IBM or MSFT within 3 years.

4 Blog

Figure 5. Blog example.

Portal is not the only instrument that makes people feel comfortable in the Internet as at home. Since such tool as blog appeared it opened a new communication horizon up.

Blog has less complicated technical and logical structure than portals just because its functions don't demand for such, can get along with simplicity and be considered sometimes as additional service.

Definition.

Blog is a web site which content can be considered as a user's on-line diary. It's a place

to collect and share things that you find interesting. For example, political commentary, a personal diary or links to web sites you want to remember. Many people use a blog just to organize their own thoughts, while others command influential, worldwide audiences of thousands. Professional and amateur journalists use blogs to publish breaking news, while personal journalers reveal inner thoughts.

HOW DOES TYPICAL BLOG LOOK LIKE?
HOW TO RECOGNIZE IT?

There is no defined or widely accepted blog format or style. Usually it presents • user’s profile (let you find people and blogs and being found by other people who share your interests),

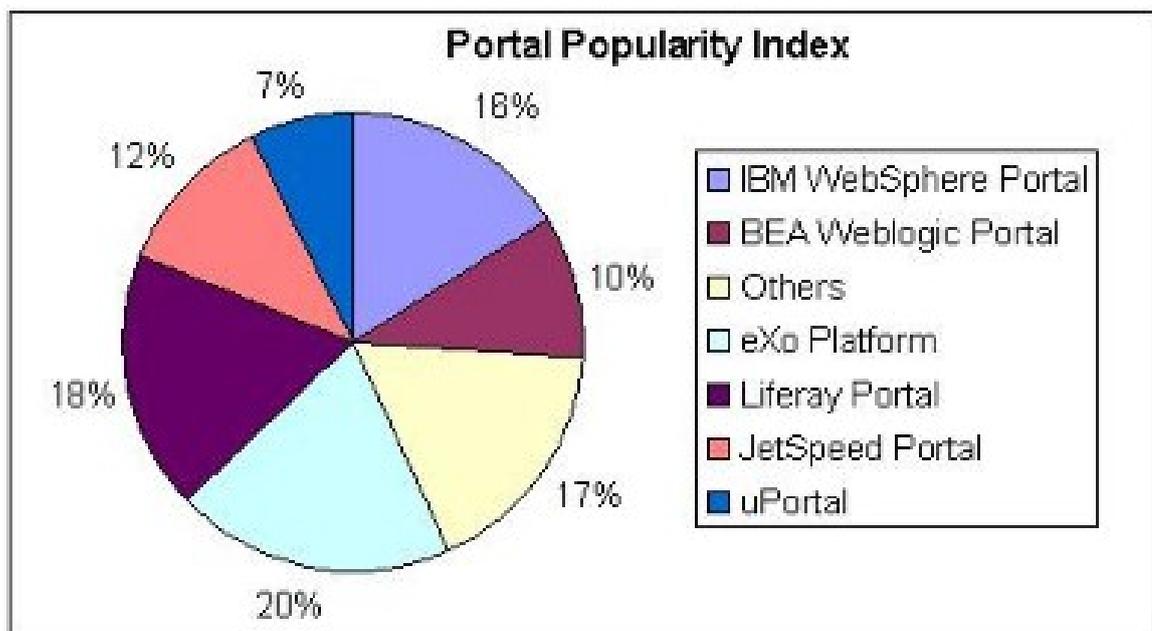
- last (new stuff shows up at the top and visitors can read what’s new and comment),
- archive of previous posts,
- useful web-links.

WHAT CAN BLOG DO?

Blog gives to its owner voice on the web. As a mean of communication it affords to

- publish thoughts and get feedback; find people;
- carry out community support (share of news, links, and ideas);
- subscribe (users that are interested in a particular blog can subscribe to the blog and then he will receive updates automatically through the use of an RSS feed aggregator also known as a news aggregator)).

As an example web-site www.blogger.com for creating blogs can be considered. At <http://portlets.blogspot.com/> an experimental opinion poll can be found. Subscribers of this blog could vote for one or another Portal Enterprise System and as a result the Portal popularity ranking was presented.



Here I should point out that this poll does not reflect the market.

5 Wiki

The word "wiki" came from Hawaii. "Wiki wiki" means "quick".

From the previous paragraph it is clear that blogs can be used with the aim for group communication. Though it is important that it provide a very narrow list of interaction means like comments making. For organizations demanding for proper, various and technologically more advanced means of communication Wiki can be used.

DEFINITION:

Wiki - technically, is server software database that

- is on-line available,
- supports hyperlinks and has simple text syntax for creating new pages and cross-links between internal pages on the fly,
- allows users (anybody registered as member of the working group) to freely create and edit content of database web-page using any Web browser.

WHAT IS "OPEN EDITING" CONCEPT?

As has already been said Wiki has one specific feature that makes it different from other group communication mechanisms: it is "open editing": allowing everyday users to create and edit any page in a Web site. Like many simple concepts, "open editing" has some profound and subtle effects on Wiki usage and is exciting in that it encourages democratic use of the Web and promotes content composition by non-technical users.

Examples:

- <http://wiki.wordpress.org/>,
- <http://wiki.wordpress.org/?pagename=HowToUseWiki&action=BackLinks>
- Both chairs of Computer Science at SpbSU and TUM have their Wiki.

6 Conclusion

Now the reader has become familiar with possibilities to handle Internet as growing area of data and information, with services and technics optimizing work, with interaction rules between users and internet.

This papers presents only general and most important and popular information about human-to-human and human-to-internet interaction ideas. It is necessary to point out the fact that progress in this field constantly moves and we should expect forthcoming of new technologies in the nearest future.

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