

Design: Methodology & Technology

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Topics Covered in this Session

- Introduction To Portals
- Different Types Of Portal
- Functional Components of Portal
- Technical Components of Portals
- Development Standards and Protocols
- Portals & Security
- Strategy and Implementation



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Introduction To Portals

Evolution Of Portals

- Most of 1st portals were search engines trying hold visitors so that they could show them ads.
- To keep users interested, these sites added
 - » Content,
 - » Services, (E-mail, Web hosting, etc) and
 - » Personalization (local weather, sports, news).

Evolution Of Portals

- The aim was to attract visitors, understand who they were and interact with them.
- The evolution continues with portals transforming themselves into e-commerce sites.

Portal Definition

- A web based application that enable users to access content areas, external web sites, applications, news feeds, other useful information.
- A place where people congregate, view, interact and behave in observable ways.
- In simple terms, portal makes chunks of info, usually from disparate data sources, accessible from single point.

Advantages Of Portals

- Portals make users life simpler by
 - » Structuring and netting-out the information,
 - » Providing one stop shopping,
 - » Providing & Personalizing services,
 - » Fostering communities.

Advantages Of Portals

- Portals ability to attract users provide
 - » Access to group of people (presence)
 - Presence creates opportunities to persuade, advertise, influence behavior & opinion, and enable transactions..
 - » A means to profile people (from surveys, records, monitoring)
 - Profiling allows testing of concepts & facilitates product development.

Portals Mean To E-commerce

- For E-commerce, portals are becoming a requirement.
- Provide users with a comfort zone for shopping.
- Provides features such as,
 - » Price comparisons, independent reviews, etc



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Different Types Of Portal

Types of Portal

- The portal concept and technology is rapidly emerging and changing...
- Making it increasingly important to understand and focus on the various types of portals and their appropriate role and application.
- But these different types of portals can be integrated.

Types of Portal

- Portals can be divided into four major categories.
 1. Corporate or enterprise (intranet) portals
 2. E-business (extranet) portals
 3. Personal (WAP) portals
 4. Public or mega (internet) portals

Enterprise Information Portals (EIP)

- Enable companies to UNLOCK internally stored information, and provide users with a single gateway to PERSONALIZED information and knowledge to make informed business DECISIONS

Enterprise Information Portals (EIP)

- For B2E processes, activities and communities.
 - » Improves the access, processing and sharing of structured and unstructured information within the enterprise.
 - » Provides employee access to other types of portals.
 - » Examples of EIPs.
 - Business intelligence portals.
 - Business area portals.
 - Horizontal portals.
 - Role portals.

E-business (Extranet) Portals

- It has 3 sub categories
 1. Extended enterprise portals
 2. E-marketplace portals
 3. ASP portals

E-business (Extranet) Portals

- Extended Enterprise Portals.
 - » Business to Customer (B2C) Portal.
 - which extend the enterprise to its customers for the purpose of ordering, billing, customer service, self-service, etc.
 - » Business to business (B2B) Portal.
 - which extends the enterprise to its suppliers and partners.

E-business (Extranet) Portals

- E-marketplace Portals
 - » Provides a common place for buyers & sellers
 - » Examples
 - CommerceOne.net
 - VeticalNet
 - GlobalNetXchange

E-business (Extranet) Portals

- ASP Portals.
 - » B2B portals to allow business customers the ability to rent both products and services.
 - » Examples.
 - Portera's ServicePort.
 - Salesforce.com.
 - SAP's MySAP.com.
 - Oracle's oraclesmallbusiness.com.

Personal (WAP) Portals

- There are 2 types of portal
 1. Pervasive portals or mobility portals
 - These are portals that are embedded in web phones, cellular phones, wireless PDAs, pagers, etc
 2. Appliance portals
 - These are portals that are embedded in TVs (WebTV), automobiles (OnStar), etc

or Mega (Internet) Portals

- There are two major types of public portals:
 - » General public portals or mega portals.
 - Address the entire Internet versus a specific community of interest and include: Yahoo, Google, Overture, AltraVista, AOL, MSN, Excite, etc.
 - » Industrial portals, vertical portals or vortals.
 - Focused on specific narrow audiences or communities such as consumer goods, computers, retail, banking, insurance, etc. Examples of vertical portals include: iVillage, Bitpipe, etc.



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Functional Components of Portal

Functional Components of Portal

- Portals provide a combination of "out of the box" and custom functionality to allow users to find, manage, categorize, and use content and applications.
- The following features describe a good high-level view of the elements that can make up a portal solution.

onal Components of Portal

- Taxonomy

- » Content directory for an enterprise's unstructured information. it can be populated with content and presented to the user in many different ways.
- » It gives us a way to organize content into a structure that is easily browsed by the portal user.
 - For Example: Indented lists, classification trees, hierarchies, folders and sub-folders, topics and sub-topics, categories and sub-categories.

onal Components of Portal

- Directory
 - » Directory is the implementation within the portal of the enterprise's taxonomy.
- Browse / Navigate Documents
 - » Enables portal users to manually locate content by navigating the directory.

onal Components of Portal

- Search
 - » which indexes enterprise content from multiple storage systems and allows users to browse and retrieve content based on selection criteria.
 - » Searching across multiple portals and their integrated applications is referred to as "federated" or network search.

onal Components of Portal

- Content management
 - » The process of authoring, contributing, reviewing, approving, publishing, delivering, and maintaining content integrated with or accessed from a portal or other web site.
 - » Content management usually refers to text and graphical content that is viewed in a web browser.

Functional Components of Portal

- Document management
 - » Similar to content management
 - » Refers to the control and management of an enterprise's documents (other than web pages) stored in electronic files, including scanned images of paper documents.
 - » It also often includes check in and check out of documents to ensure version control.

onal Components of Portal

- End User Customization
 - » Customization refers to the capability of portals to allow users to specify their own preferences for the user interface look-and-feel attributes.
 - » Customization typically accommodates preferences for color schemes, modules that appear, and the layout of the modules and content on a page of the portal.

Personal Components of Portal

- Personalization.
 - » It can occur at multiple levels.
 - » Each individual user can have settings for each of the portal functions that they use.
 - » A portal provides the framework for users to store the settings and tailor the content that they are interested in seeing.

Functional Components of Portal

- Collaboration

- » Collaboration functions enable a group of users to work together to share ideas and complete work as a team.
- » Collaboration includes electronic interactions among users in different physical locations in real time (synchronous) and at different times (asynchronous).
- » Forms of collaboration are instant messaging (chat) systems, team workspace, and discussion forums, document sharing, electronic white boarding, virtual conferencing, and video conferencing.

onal Components of Portal

- Business Intelligence.
 - » Most enterprise portals can act as a universal front end to the different components of a BI solution, helping its users make better business decisions.
 - » BI includes enterprise reporting, ad hoc reporting, multidimensional analysis, and exception reporting.

onal Components of Portal

- Alerts

- » An alert is a notification of an event or change based on one or more conditions involving single or multiple information or application sources.
- » Notifications can be delivered within a portal as well as by other mechanisms.
- » Alerts usually accommodate individual user preferences, such as the delivery mechanism and format, the conditions that should trigger an alert, and the frequency of notification.

onal Components of Portal

- Subscribe / What's new
 - » Many portals allow individuals to register an interest in or "subscribe" to a particular component or category of content.
 - » Portals will then notify the subscribers when the content changes or new content is added.

Functional Components of Portal

- Single sign-on
 - » Since the different systems that make up a page within a portal may be secured with different user login credentials, single sign-on solutions facilitate the navigation among the systems through a single authentication scheme.



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Technical Components of Portals

ical Components of Portals

- A comprehensive portal solution incorporates a variety of internet and application-related technology components.
- Because the goal of the portal is to provide a single view to the end user of information coming from multiple sources, the possible technologies utilized within portals are endless.
- In the following slides some important technologies are described.

Application Server

- Typically J2EE compliant and provide the underlying development and run-time infrastructure for the portal.
- Examples of application servers include iPlanet, BEA WebLogic, IBM Websphere, Oracle 9iAS and Sybase Application Server.

Application Server

- Many of the application server vendors are incorporating "portals" as add-ons to their base product.
- Several of the stand-alone portal products, such as Plumtree, Epicentric and Corechange have Java components or are Java-based and take advantage of an application server.

Web Server

- The Web Server works in conjunction with the application server to provide the run-time environment for client requests.
- The web servers used with portals are standard HTTP web servers, such as Microsoft Internet Information Server (IIS), apache, etc.

Web Server

- When an end user brings up the portal page, the web browser makes a request of the web server.
- The web server then passes the request to the application server.
- The portal (and its associated Portlets) runs on top of the application server.

Database

- Most portals have an underlying database that they use to keep track of information specific to the portal
 - » such as users, personalization settings, available web services/Portlets and security.
- This use of the database is in addition to a transactional system's database that a portal might query to present application specific data to end users.

Crawler

- A crawler is an automated process that reads, indexes and classifies documents at a pre-determined interval.
- A web crawler, for instance, would crawl target web pages periodically to determine if the content has changed.

Crawler

- The content is then indexed into the taxonomy so that end users can easily find it.
- The crawler doesn't necessarily make another copy of the crawled document; rather it indexes it by creating a virtual card that describes the document. The card then lives in the portal index.

Metadata Repository

- Contains metadata about the content within the portal and about the structure of that content.
- This includes the metadata about the taxonomy, as well as the metadata for the individual documents.

Metadata Repository

- For example, each of the documents placed in a folder called Clients might have a metadata field called "Client" which would have one or more values. The value of the Client field for a particular document is metadata about that document.

Portlet

- A Portlet can be thought of as a "building block" of a portal.
- It is a user-interface for presenting data and functionality from multiple applications on a single web page.

Portlet

- Portlets encompass the presentation layer and the business logic.
- They also tie into the back end data sources.
- Called by different names
 - » Portlets, Gadgets, Blocks, Web Modules, Web Parts.

Categorization Engine

- A categorization engine is used for sorting documents into the folders of a taxonomy.
- The categorization engine may do this based on
 - » The metadata in the documents,
 - » The business rules,
 - » The content of the document,
 - » The search criteria or filters, or some other scheme.

Filter

- A filter is generally available in a taxonomy to restrict the documents that are admitted into a particular folder, or that are returned as part of a search.
- A filter can be
 - » word based (if a document has the word 'CCSE'),
 - » concept based (if the document is like this other document),
 - » or rule based (if the field called CLIENT has a value of 'CCSE').

Index

- An index is a collection of information that allows for fast query and retrieval.
- Within the context of a portal, an Index is usually a combination of
 - » a full-text index and
 - » a meta-data repository for the documents/content that is included within the portal.

Virtual Card

- Virtual card is a description of a single document or piece of content within the portal.
- The card usually contains information about where the content physically resides, and contains the values of one or more metadata fields about that document.
- The card is the "placeholder" for the document within the portal

Web Service

- A web service is a program that accepts and responds to requests over the Internet.
- Typically, a web service accepts requests in an XML-based format.
- The actual format of the request and the response depends on the XML standards that are being used.
- One such standard is SOAP.

Web Service

- There are public registries and languages - such as UDDI, WSDL - which are used to catalog the different available web services.
- A calling program can query the registry (UDDI) to find an appropriate web service, then use WSDL to figure out which parameters the service needs, and finally use a calling protocol and XML standard like SOAP to actually make the call to the Web Service.

User Profiles

- Portal contains a profile for each user.
- It is used for customization & personalization
- Portlets in a portal has access to this user profile and can use it to store preference information about a user or a class of users.
- Profile is also how the user "configures" the home page of a portal and chooses which Portlets show up and what information they should show.

Content Management System

- It allows approved end users to submit information into the portal.
- There is typically an approval process that eventually results in the content becoming available in the correct part of the portal's taxonomy.
- It can deal with documents in their original formats (Microsoft Word, PDF, etc.) or might contain Web Editing features to allow end users to author web pages.

Enterprise Application Integration

- EAI serves as the umbrella term for all software and services meant to integrate enterprise applications with one another.
- Given the complexities of each type of application (sales, manufacturing, service, HR, purchasing, etc.) this can be a difficult and expensive proposition.

Enterprise Application Integration

- A number of vendors have released software that makes integration much simpler - including Crossworlds, WebMethods, Tibco, NEON, and MQ Series, etc.
- EAI impacts the portal because the portal ideally will show consolidated information from multiple back end systems.
- An EAI layer is needed so that the queries can be coordinated and the results consolidated.



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Development Standards and Protocols

Development Standards and Protocols

- A very important component of any development project is to understand the current industry standards for developing Portal Solutions and how they relate to each other.
- A brief summary of the most common is discussed in the next slides.

Extensible Markup Language

- XML is a language used to represent almost any type of data.
- XML is similar to HTML.
- HTML is used to tell Web browsers how to show information to the end user
- XML is more typically used to send information between programs.

Extensible Markup Language

- The XML files usually do not have information about the display of the information.
- Display is often handled by using an XSL style sheet and XSLT.
- The structure of an XML file is usually defined by its DTD or XSD.

XSL, XSLT

- Extensible Stylesheet Language (Transformation)
- While XML documents contain data, XSL or XSLT documents contain rules for "transforming that data" into a presentation that the user can understand.
- This presentation format might be
 - » HTML for web browsers
 - » WML for wireless devices
 - » PDF for printing out the information

DTD and XSD

- Document Type Definition and XML Schema Definition.
- Both are ways to define the structure and layout of XML documents.
- Important for validating that an XML document is in the right format for passing information between different systems, or for passing information from a back end system to the portal.

XML - Web Services Description Language

- Allows a Web Service to describe what actions it supports.
- For example
 - » A "stock quote" web service, might have two actions that other programs can call - `getStockQuote`, which takes a ticker symbol and returns the closing stock price, and `getTickerSymbol` which takes a company name and returns one or more ticker symbols.

WSDL - Web Services Description Language

- WSDL is an XML based language that allows both calling programs and Web Services to describe legal ways to invoke the program.
- WSDL is important for portals because portals will typically aggregate information from multiple web services onto a single screen and so need to communicate with each one in the appropriate format.

Simple Object Access Protocol

- SOAP is an XML based standard for making function calls across the Internet to another application.
- SOAP provides
 - » Underlying calling protocol (which can be used as an alternative to HTTP GET/POST),
 - » A wrapper so that the calling application can send parameters to the program it is calling, and
 - » A method for getting results back from that program.

Simple Object Access Protocol

- Because SOAP is XML based, it is completely platform independent.
- SOAP is quickly becoming a leading protocol for invoking and getting results from Web Services.

Universal Description Discovery and Integration

- A specification for finding web services and a public registry where Web Services can publish information about themselves.
- Used to get back XML based "descriptive information" about Web Services.
- This descriptive information might be in an XML format such as WSDL.
- UDDI has broad support from all segments of the Internet industry.

Web Services User Interface

- A specification for standardizing the display of Web Services to end-users.
- Extends the traditional web services model, which is used to get and retrieve XML data, by providing a framework for how that data will be displayed to end users.

Web Services User Interface

- WSUI is akin to a standard way to describe Portlets.
- In the WSUI model,
 - » a Portlet makes a call to a web service, gets back XML, and then uses XSLT to transform that XML into HTML, which can then be displayed within the portal.



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Portals & Security

Security Is Integral Part of E-business
Portals.

Single Sign On (SSO) Technology

- A portal may need to coordinate information from
 - » several web sites,
 - » Data Stores,
 - » XML Feeds, and
 - » other transactional systems.
 - » All of these have different security paradigms that single-sign-on solutions will address.
- Examples of vendors in this arena are Netegrity, Oblix, IBM, and Entrust.

Delegated Management

- An evolution of single-sign-on technologies.
- Delegated Management Systems attempt to act as a single point for managing all application and OS level security issues.
- Delegate Management systems will eventually replace SSO systems as they mature.
- Examples of vendors in this arena are Netegrity and IBM.

Firewalls

- Firewalls can be software based or hardware based or mixed.
- They analyze and filter network packets and makes security decisions based upon some criterion.
- It can be configured to accept/reject or partially traffic from different hosts.

Intrusion Detection

- Intrusion Detection software also analyzes patterns of activity within a network to determine if it is under "attack".
- One way is through scanning through all files & checking for changes.

Cryptography

- The science of Cryptography provides for a mathematically rigorous means of authentication, encryption, and non-repudiation.
- Highly secure portals all implement cryptography for all of these capabilities.

Access Controls

- Access control systems enforce rules upon lists of identity to determine whether an identity, which is part of a role or a group, may have an appropriate level of access to perform an operation against a resource.
- The science of Computer Security is a combination of access control and cryptographic technologies. All portals use Access Controls.

Authentication

- Authentication has both a cryptographic form and an access control form.
- Cryptographic forms of authentication use a certificate-based schema for ensuring identity.
- Access control forms are simpler; they generally use credentials such as user-id & password.

Non-Repudiation

- The act of proving that the data has not been tampered with is called non-repudiation.
- The science of cryptography provides an elegant and efficient means of non-repudiation through the use of public key technologies and cryptographic hash functions.
- Financial Portals, Health Care Portals will benefit most from this technology.

Authorization

- This is essentially an access control function.
- A portal will maintain an authorization list, (access control list,) to determine the appropriate level of access that each identity will have to a resource.
- Such a system will determine if a user is authorized to act upon that resource.

Policy

- Prior to implementing a security paradigm, a security policy needs to be established for any organization.
- This security policy outlines the business needs for security and the organizational procedures for meeting these business needs.
- Such a policy is used to define access control and certificate policies.

Certificates

- Digital Certificates are part of the X.509 standard.
- They are public documents, based upon Public Key Infrastructures that provide security services such as authentication, encryption, and non-repudiation.

Certificates

- Portals can use these to secure transaction and provide non-repudiations.
- A Digital Certificate contains identity information, at least one public key from a Certificate Authority, and a public key representing the identity in questions.

Groups

- Groups are organized collections of identities.
- They are configured by administrative personnel and maintained on a day-to-day basis.
- Portals always need to manage groups as an economic convenience to manage the privacy, integrity, and appropriate accessibility of the data.

Roles

- Roles are organized collections of capabilities.
- The collections of capabilities tend to be maintained by developers.
- Roles may have groups and/or users as members who have access to the capabilities defined by the developers.
- The memberships of the roles tend to be maintained by administrators.

- The Lightweight Directory Access Protocol

- A common directory structure accepted through most of the industry.
- Portals use these to maintain user information, organizational information, as well as access control and cryptographic certificate information.

Certificate Authorities

- Certificate Authorities are arbitrators of proofs of digital identity, although they tend not to stand liable for their work.
- Due to this, and the broadly based Digital Signatures Act, they have not been widely adopted. Certificate Authorities can generate certificates.
- While there are public CA's, such as Valicert and Verisign, companies are generating their own certificates.

Certificate Authorities

- CA's are useful to Portals which provide high-value trade services or health care services, however, as they provide a third party mechanism for validating identity. Smaller portal applications may generate their own certificates.
- The Digital Signature Act allows for Self-Certification.
- These Self-Certified certificates are legally valid for transactions.

Validation Authorities

- The X.509 standard is vague, and not all certificates generated from all vendors are alike.
- In addition, when companies exchange certificates prior to performing e-Business, the "source" company generating the certificate would be in control of the certificate maintenance.
- In other words, if a source user "goes-bad", the source user's company would need to revoke the certificate.

Validation Authorities

- A validation authority allows a destination company to perform a "local certificate revocation" operation,
 - » thus alleviating the need for strong organization communication between two companies performing cryptographically certified transactions.
 - » In addition, VA's have real-time validation capabilities, making them suited for extremely high-end, highly secure environments. Validation Authorities will be highly useful to portals that wish to provide cryptographic protections to their customers, yet maintain the highest levels of both interoperability and control over their certificates.

Public Key Infrastructure

- Public Key Cryptography provides elegant implementations of Encryption, Non-Repudiation, and Authentication that require a minimum of key management activity.
- This makes Public Key Infrastructures more efficient to manage than traditional Symmetric Key Infrastructures.
- Portals needing cryptographic security will use PKI's.

Secure Sockets Layer

- A standard for securing transactions through the use of public key cryptography and X.509.
- It specifically provides for Authentication (two-way) and encryption of information sent over a TCP/IP socket.
- Portals that require financial or Health-Care transactions will all use SSL.

re Access Markup Language

- Inspired by Netegrity, this language has been developed to facilitate a Delegated Management strategy.
- It contains non-reputable transactions for managing access controls.

Simple Access Markup Language

- It is expected that software vendors will embrace SAML to facilitate their own SSO (soon to be known as Delegate Management) strategies.
- Portals will reduce their costs in the mid-term by adopting SAML, as their integration with other security paradigms will be simpler.

Digital Signatures

- Digital Signatures exploit the non-repudiation capabilities of PKI's to provide a cryptographic means of ensuring that data has maintained its integrity.



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Strategy and Implementation

Important To Planning & Implementing

- The following are few important topics related to planning & implementing.
 - » Strategy
 - » Trends
 - » Planning and Investigating
 - » Feasibility Study
 - » Critical Success Factors
 - » Return on Investment (ROI)

Important To Planning & Implementing

- » Information Requirements
- » Business Process/Workflow Enterprise Architecture
- » Implementation and Deployment



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Metadot Portal Demo



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Portal Exercise