# *WebSphere Personalization Overview*

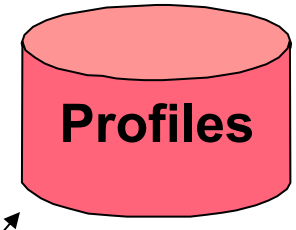
# What is WebSphere Personalization?

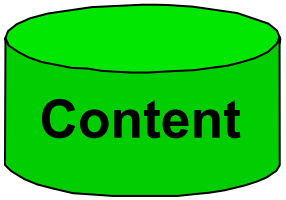
- Provides specific content to specific users based on:
  - Roles, classifications, preferences, profiles, recommendations, etc.
- Primarily web content
  - Browser, e-mail, etc.
- Complements portals and content management

# WebSphere Personalization Components

- Personalization Runtime
  - Resource Engine
    - Defines user and content objects to the rules engine
  - Rules Engine
    - Allows business users to define how content should be matched to site visitors
  - Recommendation Engine
    - Matches content to site visitors using collaborative filtering
- Personalization Workspace
  - Business user, browser based tooling for managing rules and campaigns and previewing their effect on your web site
- Development Wizards within WebSphere Studio
  - Wizards for create resource classes and content spots

# Personalization Runtime Process



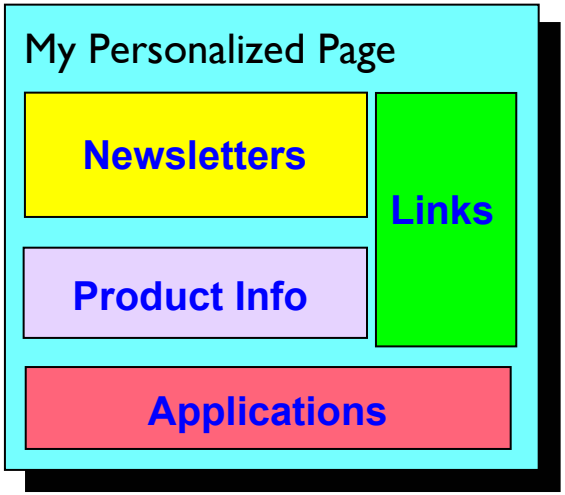




A. Identify Site Visitor

B. Retrieve Their Profile

C. Rule/Recommendation Selects Content Which Matches User's Interest, Needs or Role

D. Serve JSP Page To Site Visitor

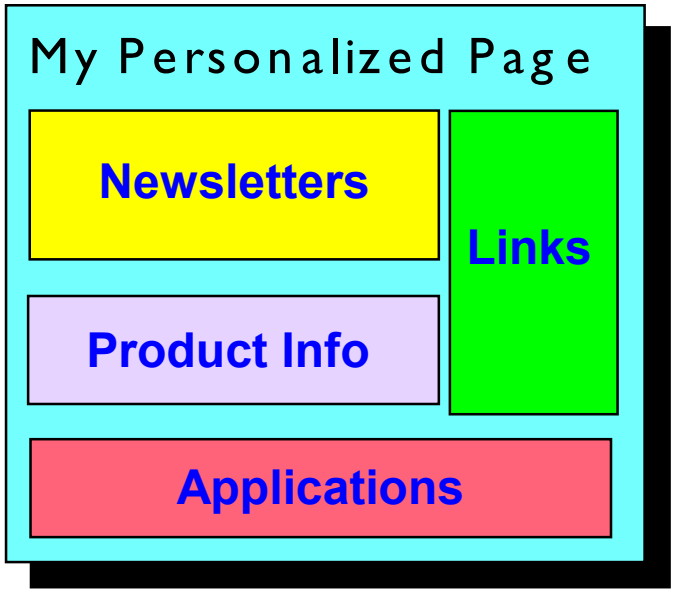


# A. Identify Site Visitor

- Cookie, Explicit Application Login

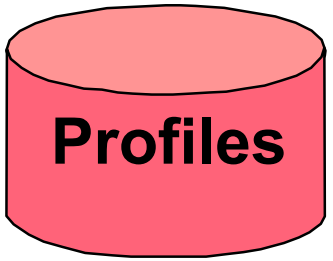
  OR

- WebSphere Security (LDAP, OS, etc.)



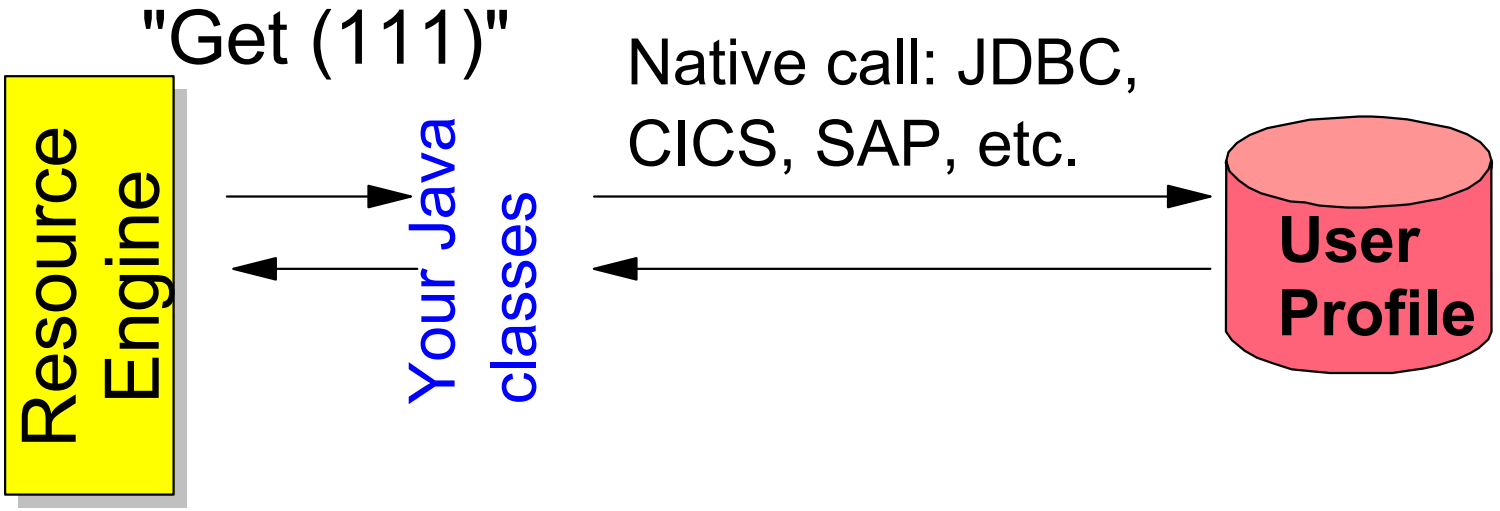
# B. Retrieve Their Profile

- Where is the user data?
  - Relational DB
  - Mainframe (CICS, IMS, etc.)
  - ERP System (SAP)
  - LDAP
  - Other
- How does personalization access this data?
  - Through the resource engine and specified Java interfaces



# B. Retrieve Their Profile

- Resource Engine allows rules to "speak only one language"
- You provide the translation for your source(s) of data




WebSphere Studio Advanced Edition V4 can build this code for JDBC, LDAP, and EIP!

Java tooling can be used for other data sources.

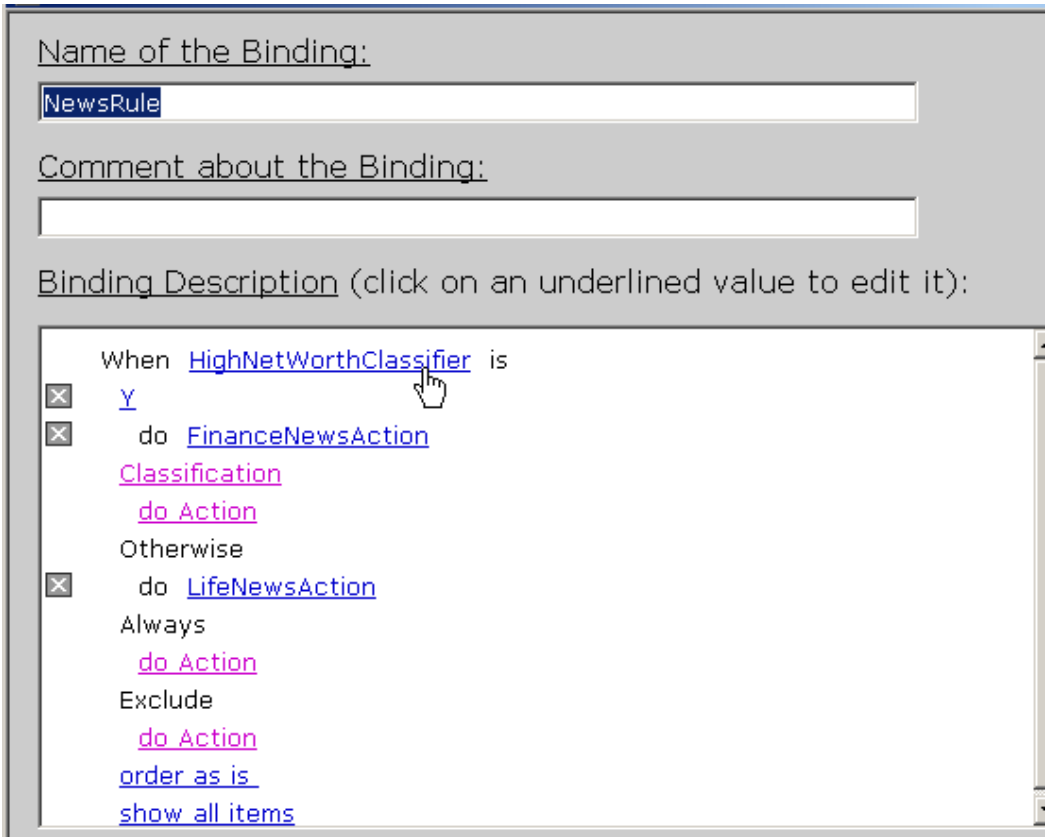
# C. Rules

Example:

If user has high net worth...

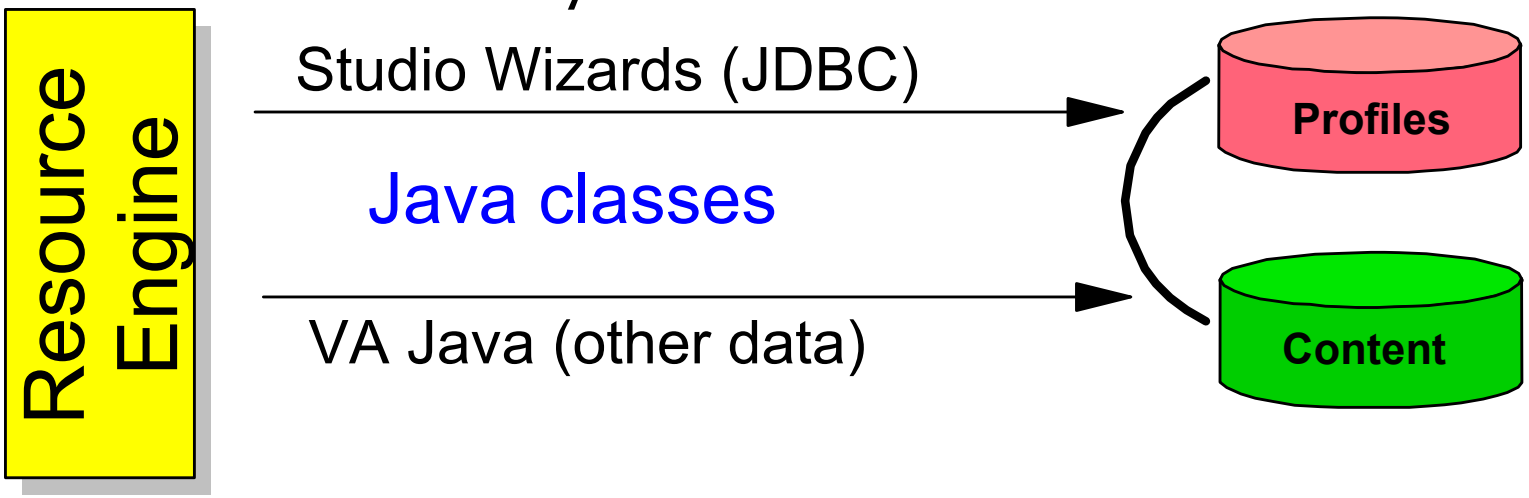
Then show finance news

Else show life news



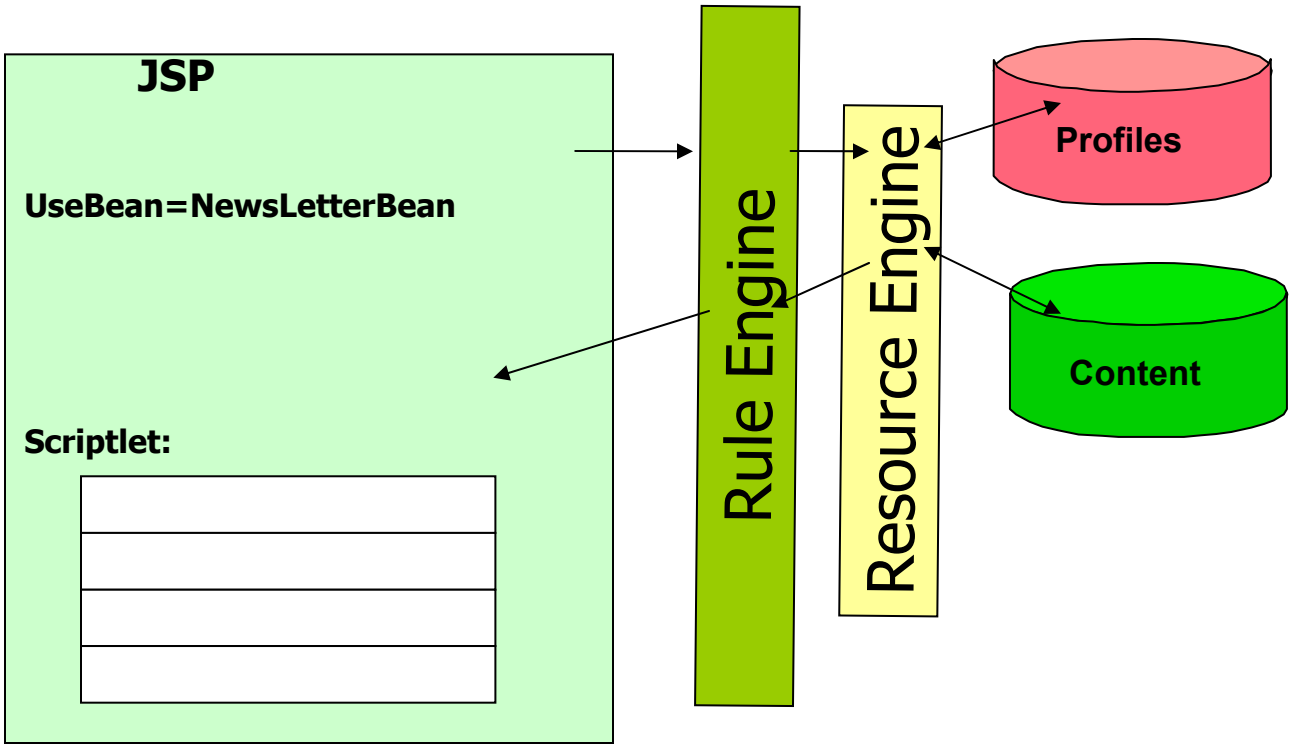
# C. Rules

- Content can be stored almost anywhere
  - Database
  - Mainframe
  - Content Manager
  - XML, other...
- The Resource Engine provides access to content and user data the same way!

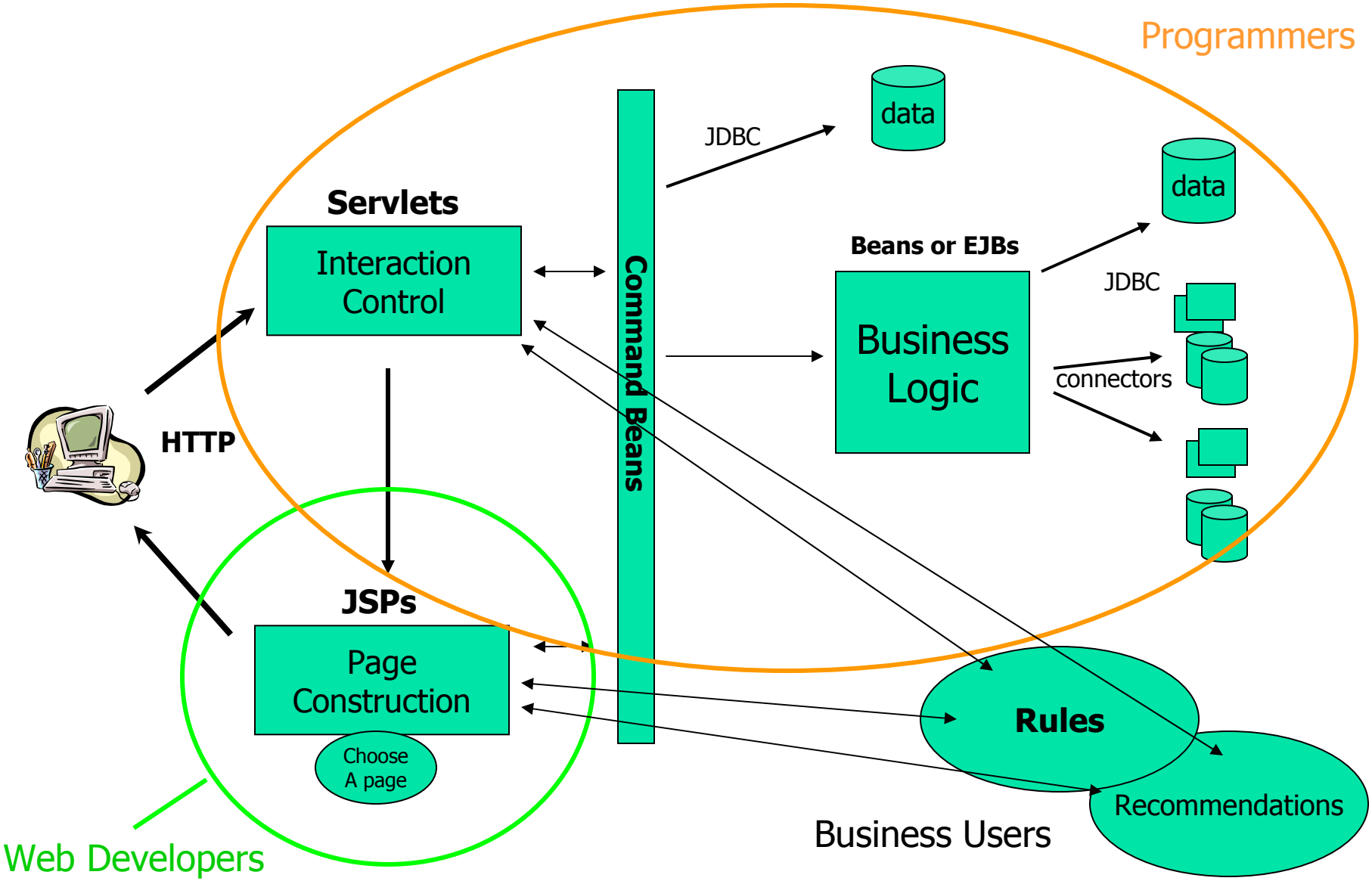


# D. Server JSP Page to visitor

Content Spot Bean provides a result set as JavaBean properties!



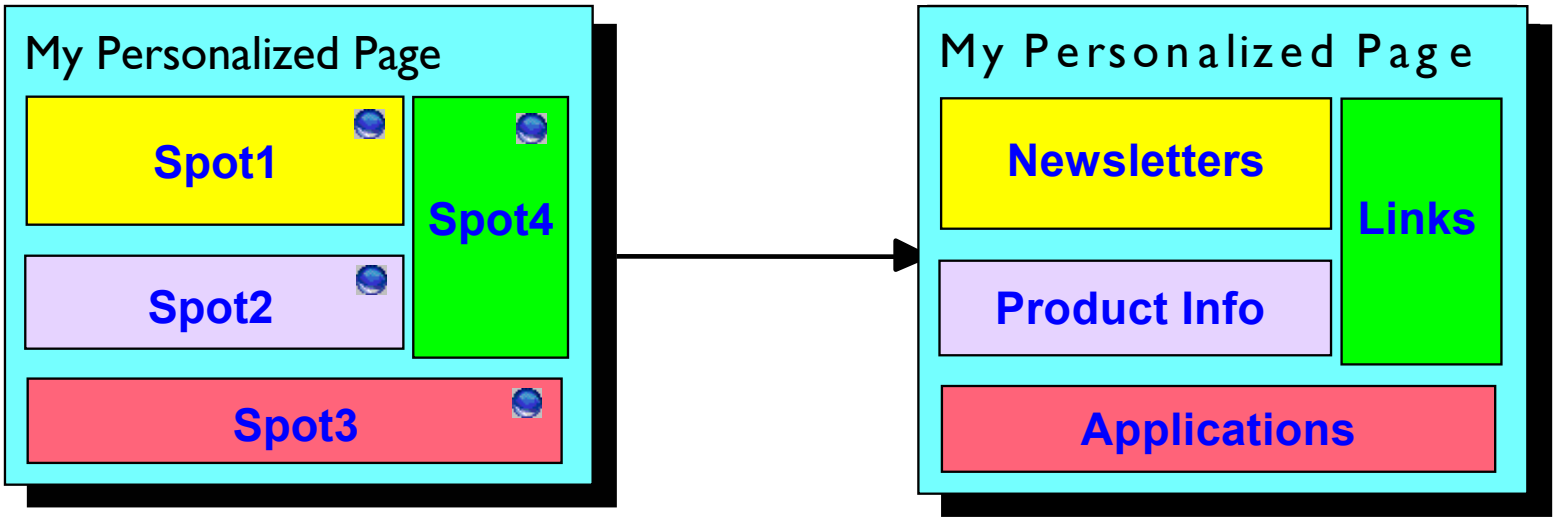
# WebSphere HTTP Application Profile



# Linking Rules with Content Spots

Personalized pages are built as standard JSPs using WebSphere Studio PageDesigner or any JSP editor.

- Spots for personalized content are reserved using standard JavaBeans called content spots.




Developer View

"Content Spots" reserved for personalized content

Live Web Site

Visitors see just the content

# Rule Development Process

Start by creating a Content Spot

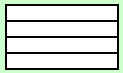
1 Page Designer runs content spot wizard to create a content spot (a Java bean)

2 Page Designer drops rule wrapper bean on page and creates scriptlet to display results.

**JSP**

UseBean = NewsLetterBean

Scriptlet:



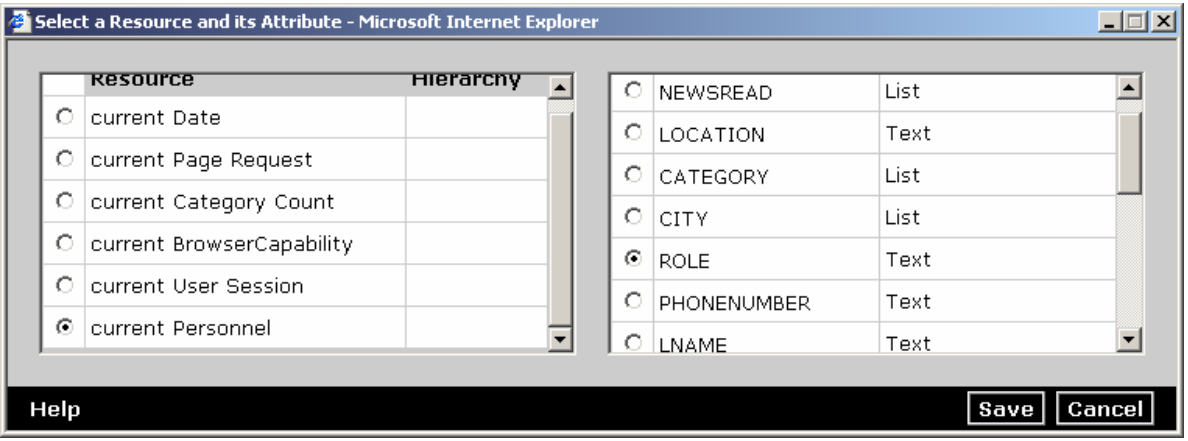
3 **Rule Editor**

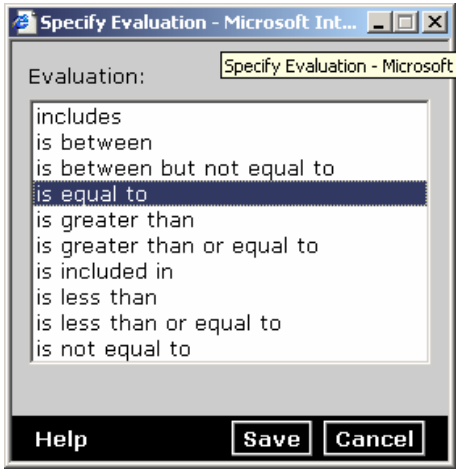
Select Content
Whose Newsletter.Industry equals User.Industry

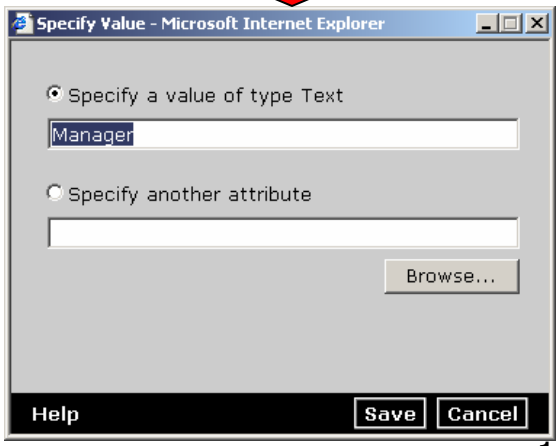
Note: while rules often fill spaces within JSPs, it is useful to think of content spots as trigger points within servlets or JSPs which invoke logic that is changed by business users.

# Rules are Created Using Point & Select Menus

UserClearance is
Confidential
when Resource.Attribute is equal to Value

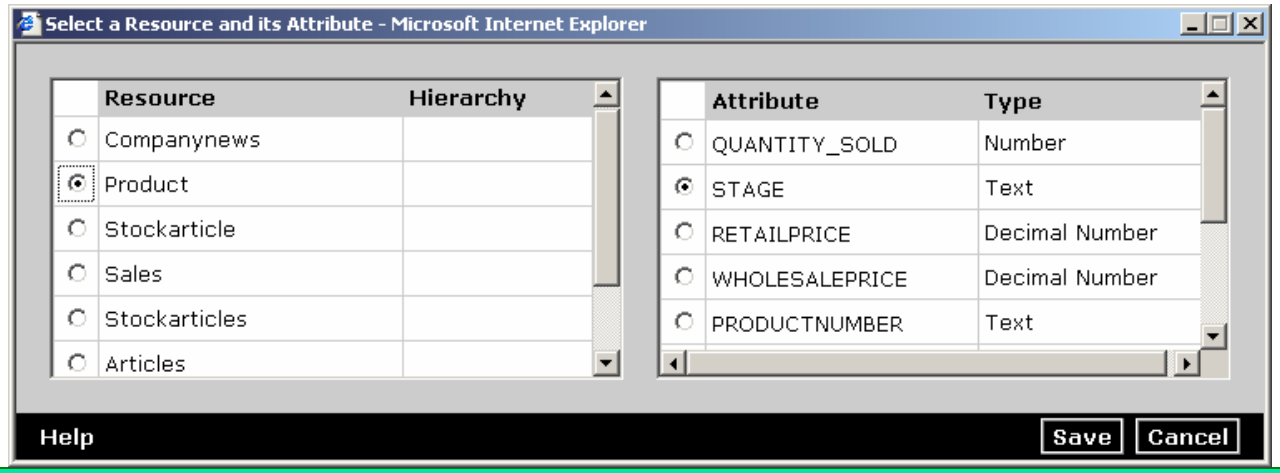



UserClearance is
Confidential
when Personnel.ROLE is equal to Manager

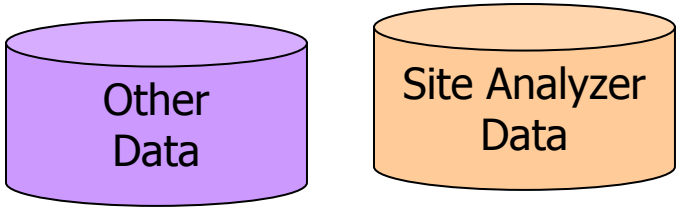
# Where The Data Comes From




## Resource Engine

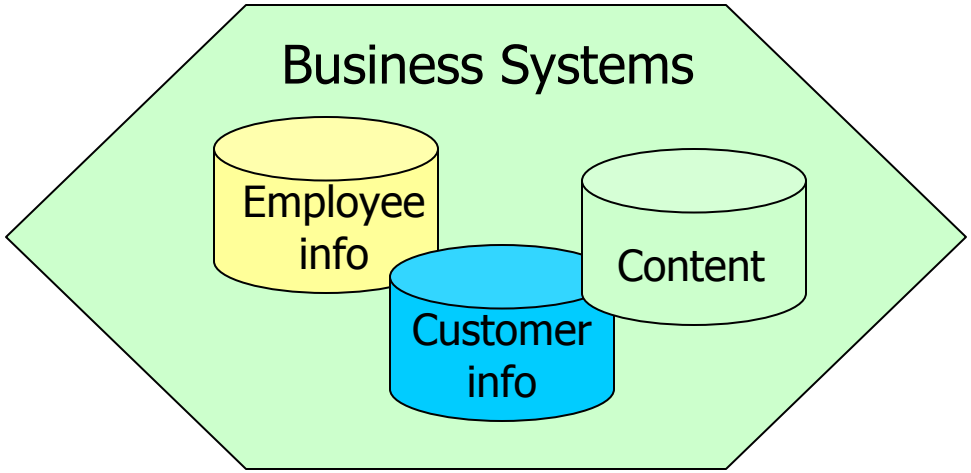
Surfaces/Normalizes Profiles/Content For Usage By WebSphere Personalization
Adapter classes are written in Java (Java Beans or EJBs)

Application Objects
- Shopping carts
- Topics of interest
- Statistics from previous visits









# WebSphere Personalization Rule Concepts

- Classify a site visitor or the situation
  - What service level are they entitled to - gold, platinum
  - What interests them – active vacations, educational vacations .....
  - What organization are they in HR, engineering, marketing
  - .... or whatever is important to your site's goals
- Action to be taken
  - Select specific content based on user profile, application objects, session variables, request parameters or constants
  - Update user profile, application objects, or session variables
- Binding combines a classification and action
  - e.g.
    - If Customer is active vacationer select white water rafting specials
    - If Customer is educational vacationer select Autumn in Europe specials

# *WebSphere Personalization Functions*

# Personalization Overview

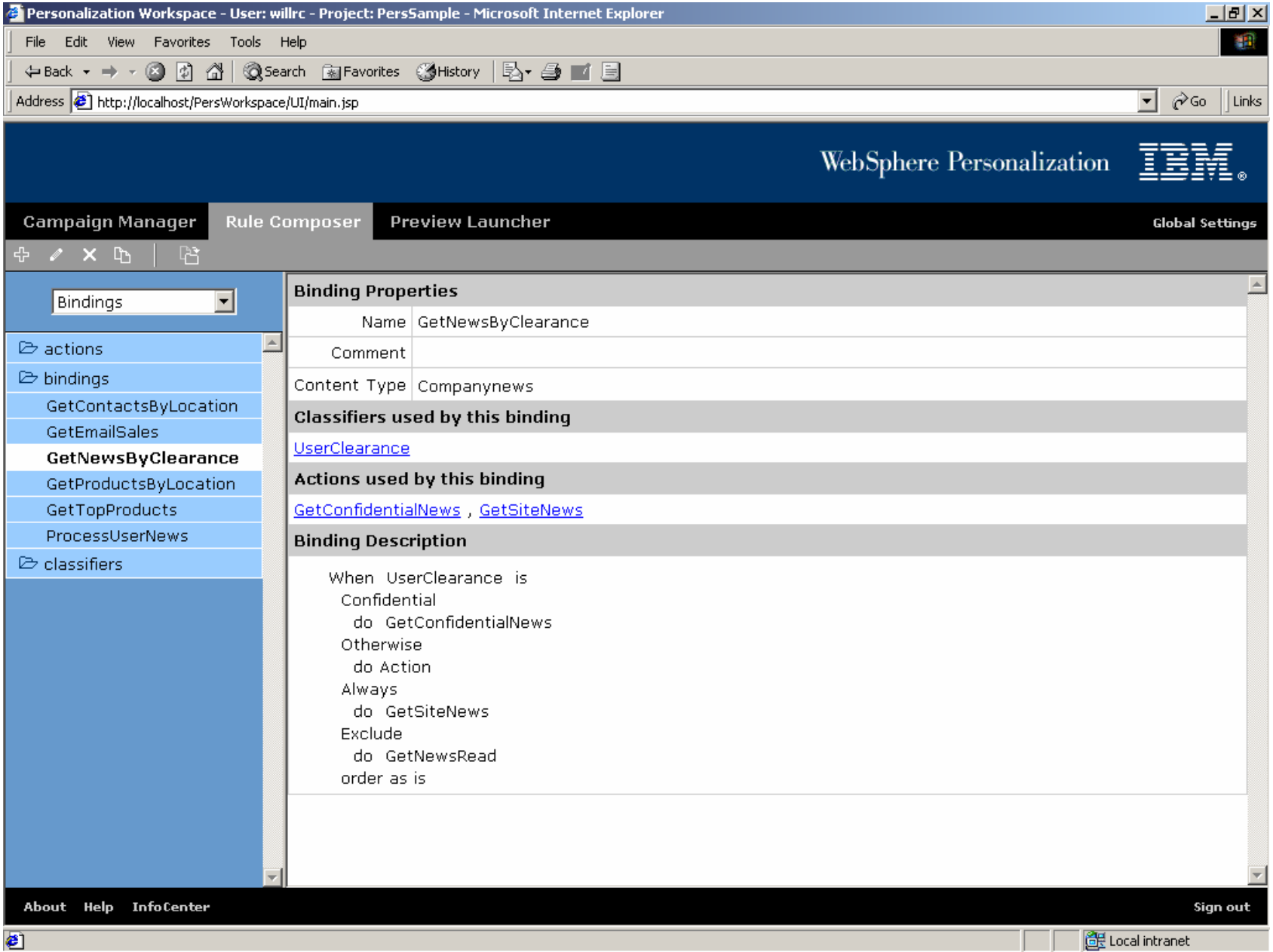
- Personalization Workspace
  - An easy to use interface that business users use to build business rules, manage campaigns and preview personalized pages with different profiles.
- Simple to use, browser based, point and choose rule editor
- Campaign management
  - Business user tool which simplifies the coordination and scheduling of personalized web and e-mail based campaigns
- Powerful “how would my site look if…” preview capability
- Rule Based and Collaborative Filtering Based Personalization
- Implicit profiling
  - Collect real time information on site visitor actions and construct personalization business rules around this data
- Reporting on campaign and rule effectiveness
  - Provide reports for the site's business owner on the effectiveness of the business rules and campaigns in achieving their objectives
- Use existing user profile and content repositories
  - User and Content Wizards support for DB (including joins), LDAP and IBM EIP
- Make use of rule and recommendation results easily within JSP pages using WebSphere Studio Page Designer or any JSP editor.
- Wide platform coverage
  - Resource Engine, Rule Engine and Recommendation APIs run on AIX, Solaris, HP-UX, Windows NT, Windows 2000, and Linux, with iSeries (AS/400) and zOS in 1Q2002.
  - Collaborative Filtering server runs on AIX, Solaris and Windows.

# Personalization Workspace

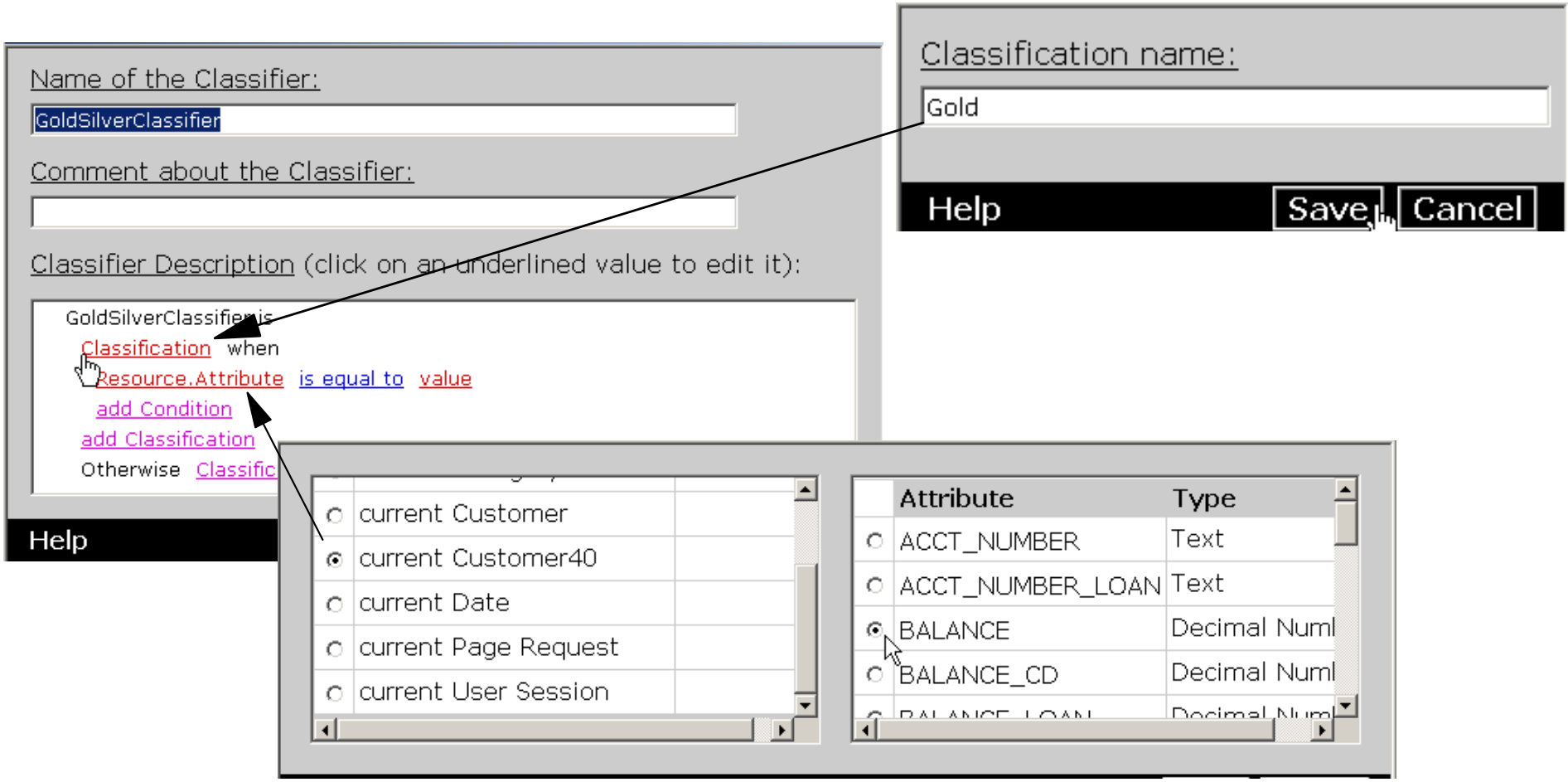
Provides integrated, browser based access to the tasks that business users perform most often in their jobs

- Edit Rules
- Manage Campaigns
- Preview/Verify Rule Execution
  - Invoke any page with a pseudo user profile
    - Copy/Edit pseudo user profiles
  - Preview mode shows what rules executed with links back to the campaign mappings and rule editor

# Browser-based Rule Editor

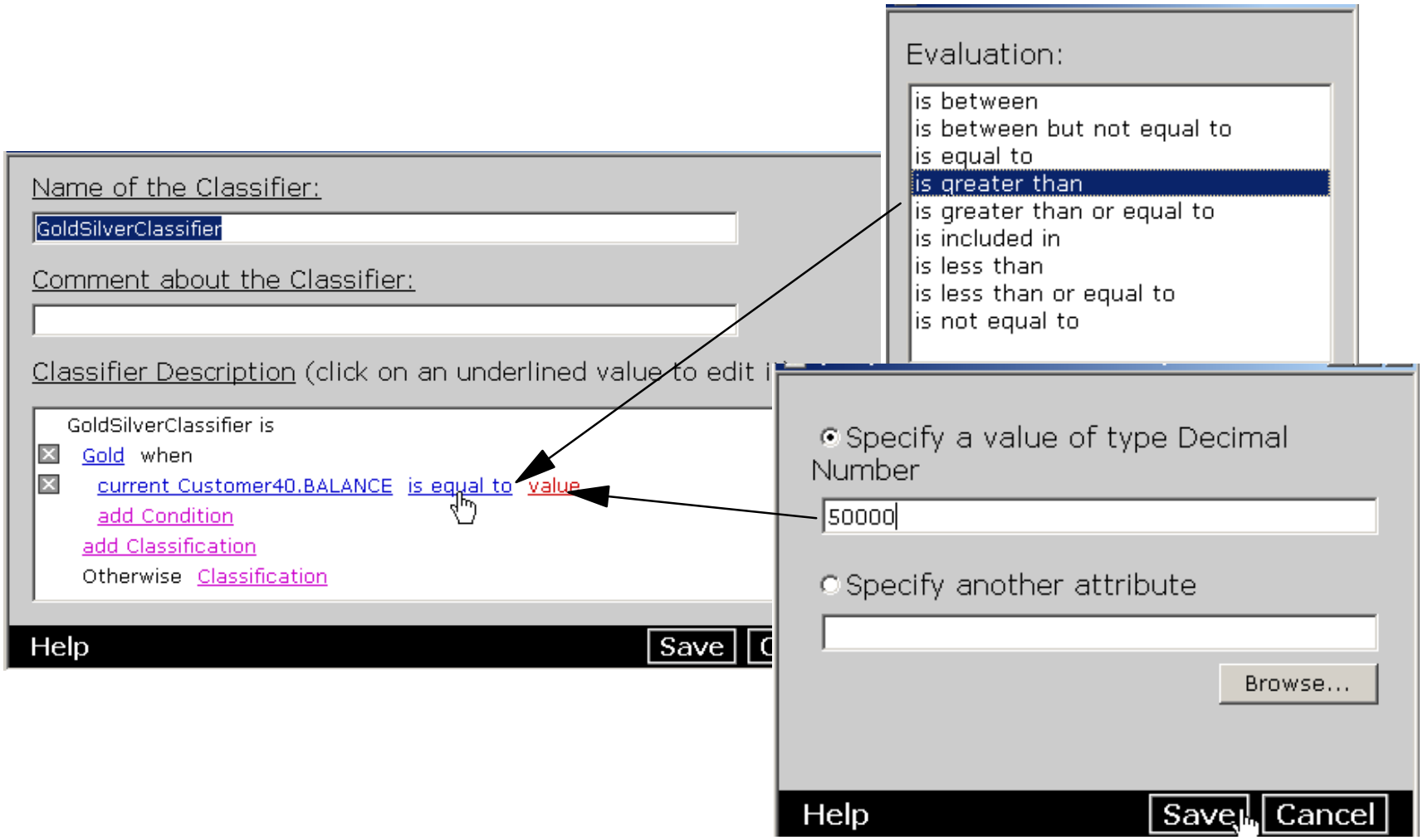


# Creating Rules




Building a Classifier Rule

# Creating Rules

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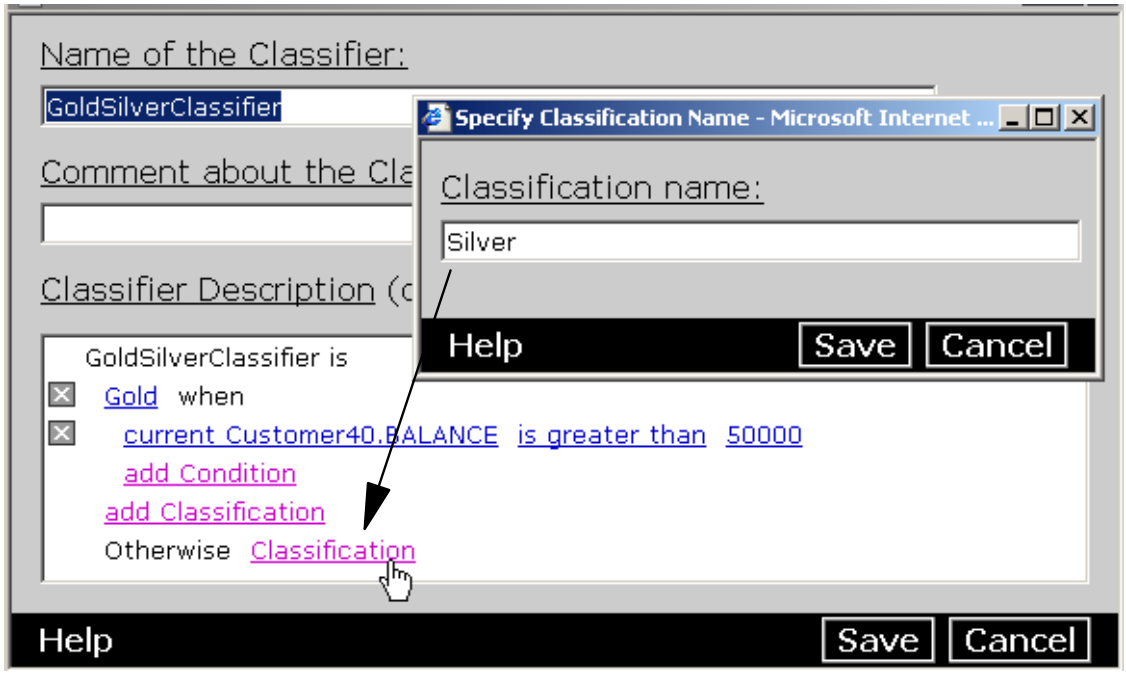


Building a Classifier Rule

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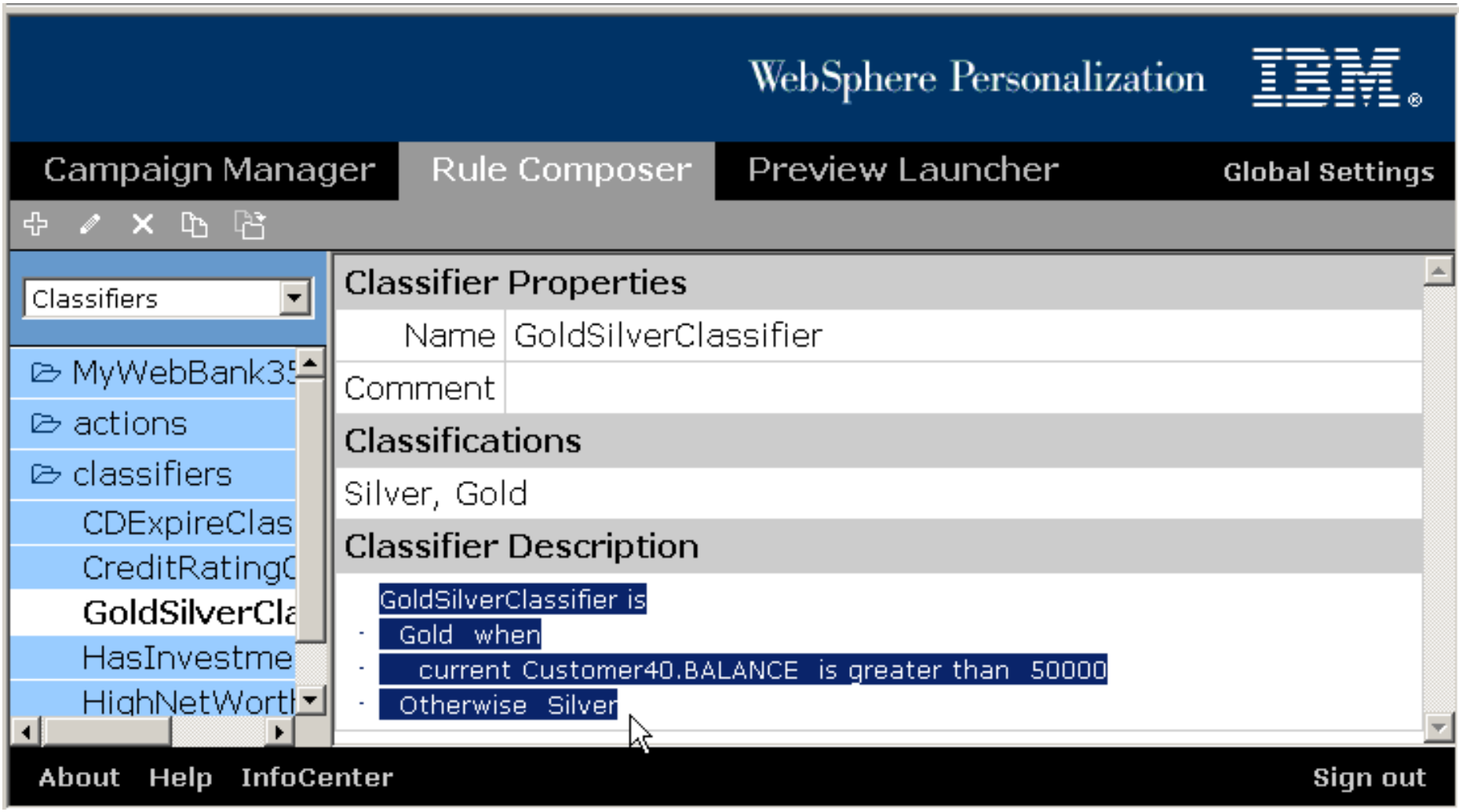
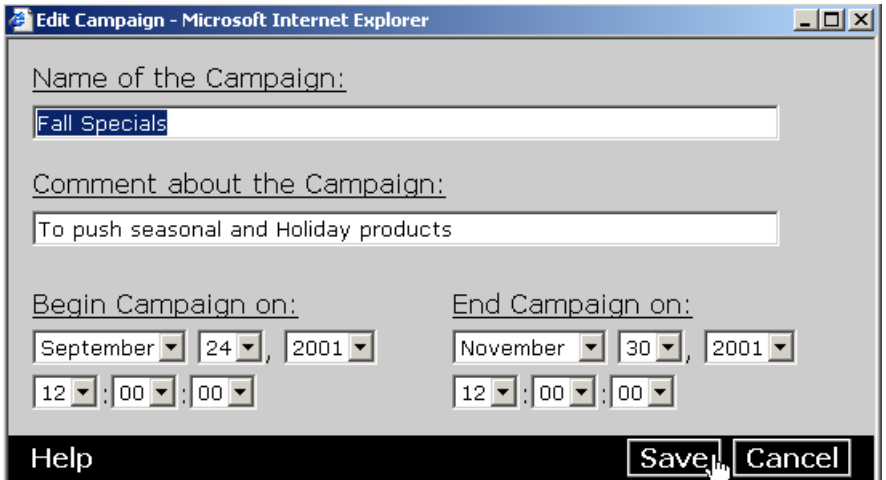
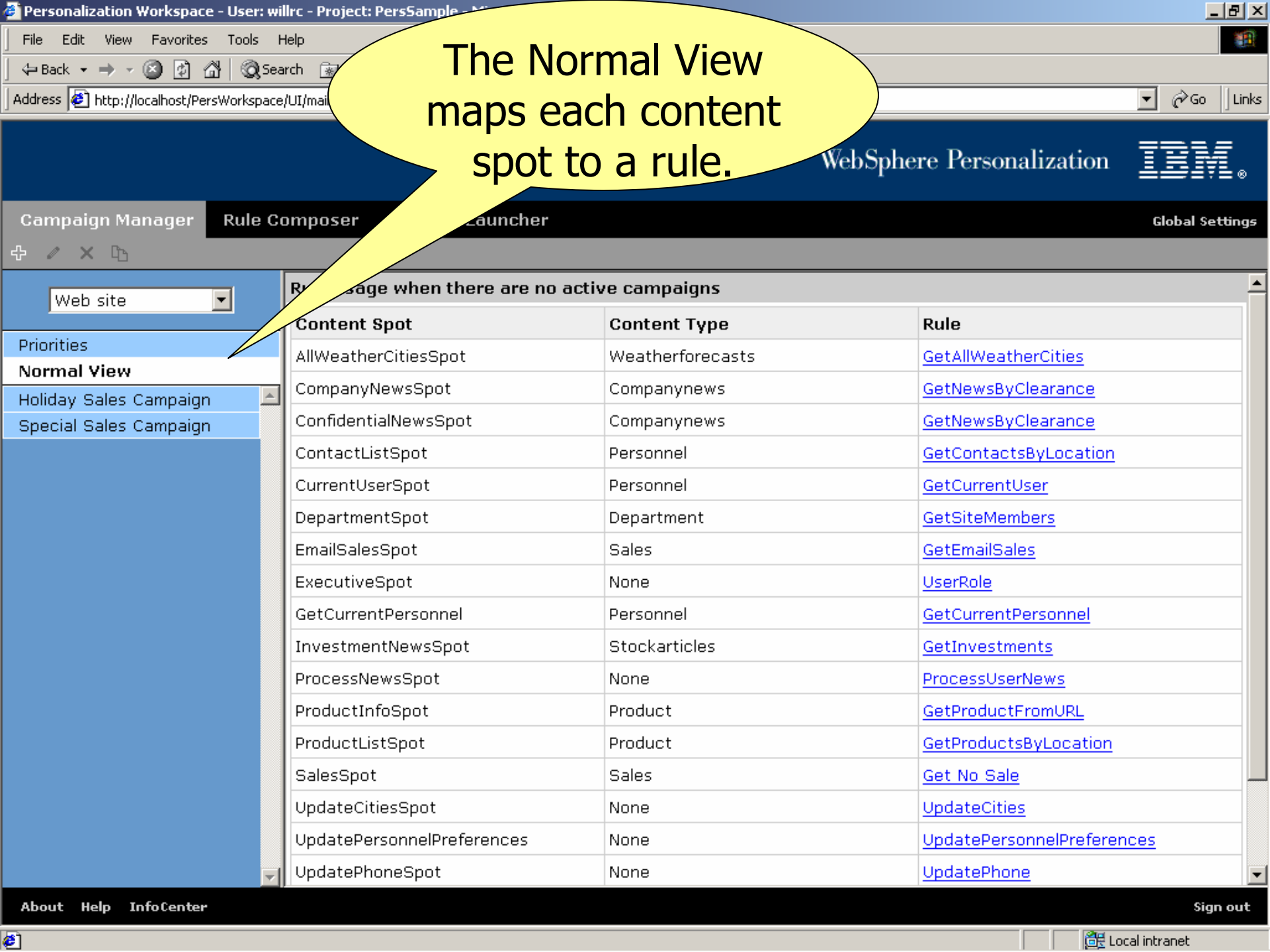



The Rule is Ready to Use

# Campaign Management

- Allow management of rules as collections which work together in order to accomplish a specific goal
  - Example: A "Back to School" campaign which includes a set of rules coordinated across the site to provide content related to going back to school
  - Campaigns override existing rules and replace them temporarily with new rules
- Includes ability to send personalized e-mail, coordinated with rules in force at the web site, as part of the campaign

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Address http://localhost/PersWorkspace/UI/mai
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The Normal View maps each content spot to a rule.
WebSphere Personalization
IBM
Campaign Manager
Rule Composer
Launcher
Global Settings
Web site
Priorities
Normal View
Holiday Sales Campaign
Special Sales Campaign
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CompanyNewsSpot
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GetNewsByClearance
ConfidentialNewsSpot
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ContactListSpot
Personnel
GetContactsByLocation
CurrentUserSpot
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ProductListSpot
Product
GetProductsByLocation
SalesSpot
Sales
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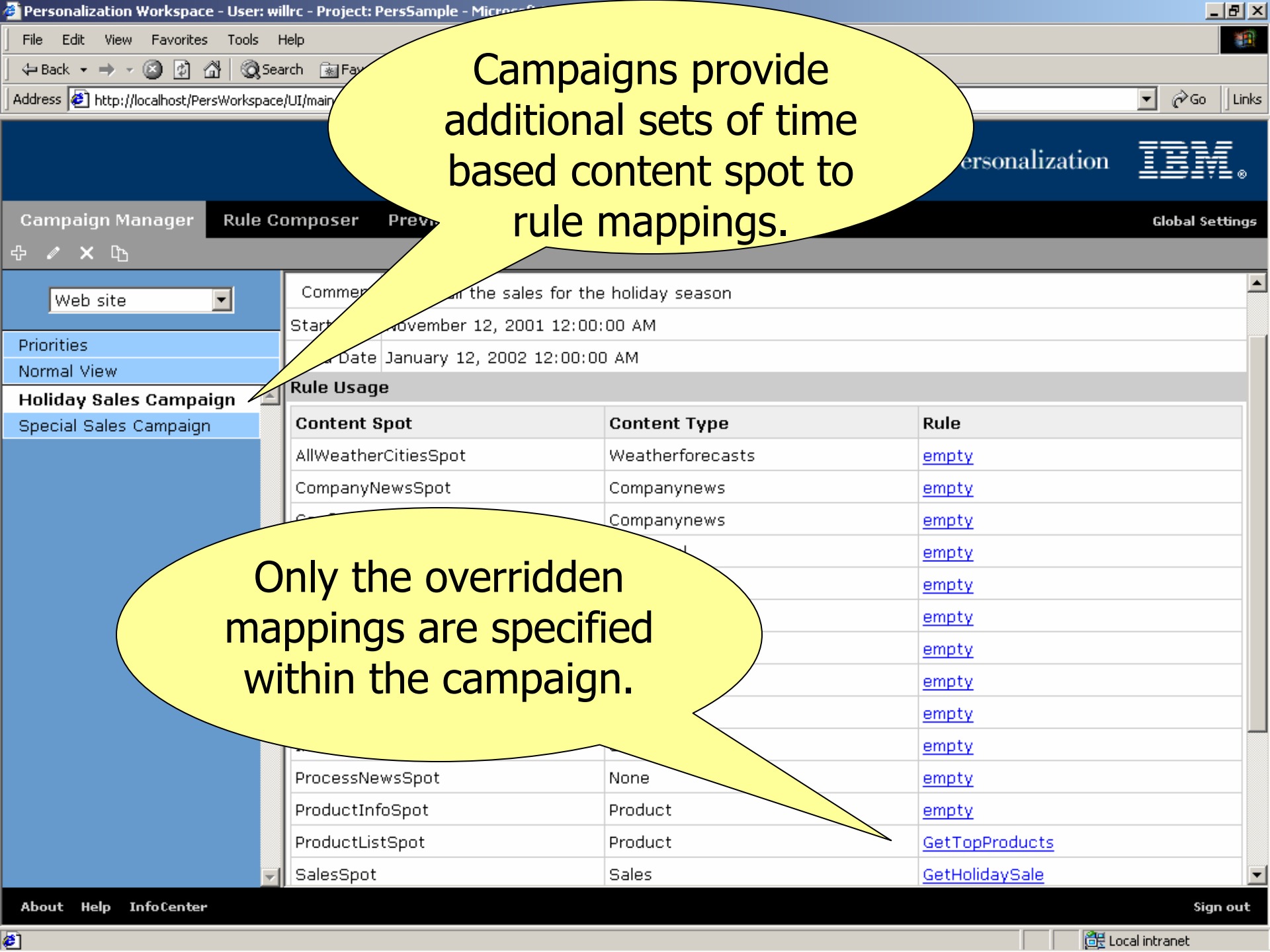
UpdatePersonnelPreferences
UpdatePhoneSpot
None
UpdatePhone
About Help InfoCenter
Sign out
Local intranet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IBM
Campaign Manager
Rule Composer
Previ
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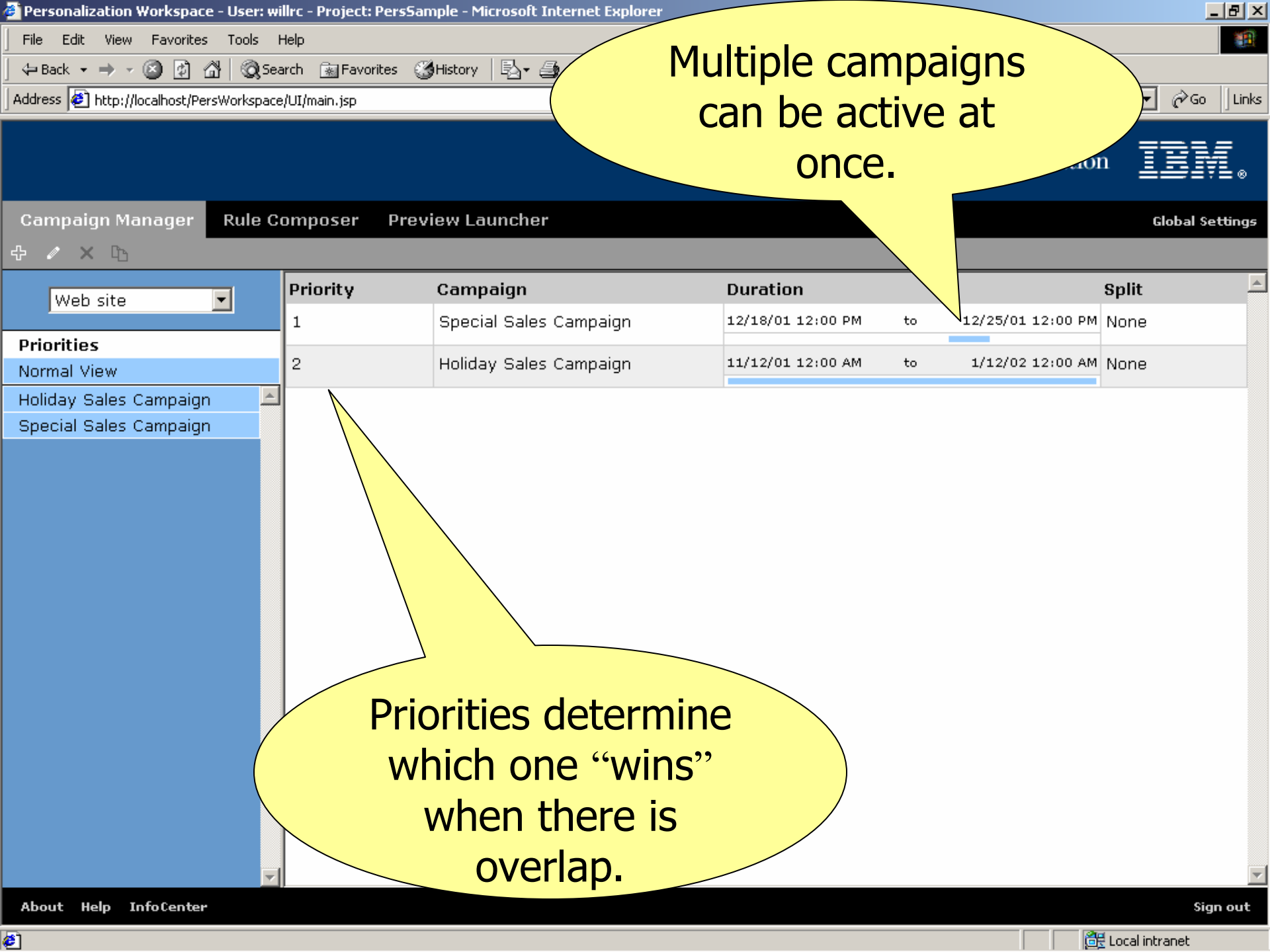
Web site
Priorities
Normal View
Holiday Sales Campaign
Special Sales Campaign
Comme
the sales for the holiday season
Start
November 12, 2001 12:00:00 AM
Date
January 12, 2002 12:00:00 AM
Rule Usage
Content Spot
Content Type
Rule
AllWeatherCitiesSpot
Weatherforecasts
empty
CompanyNewsSpot
Companynews
empty
Companynews
empty
empty
empty
empty
empty
empty
empty
empty
ProcessNewsSpot
None
empty
ProductInfoSpot
Product
empty
ProductListSpot
Product
GetTopProducts
SalesSpot
Sales
GetHolidaySale
About
Help
InfoCenter
Sign out
Local intranet
Campaigns provide additional sets of time based content spot to rule mappings.
Only the overridden mappings are specified within the campaign.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Normal View
Holiday Sales Campaign
Special Sales Campaign
Priority
Campaign
Duration
Split
1
Special Sales Campaign
12/18/01 12:00 PM to 12/25/01 12:00 PM
None
2
Holiday Sales Campaign
11/12/01 12:00 AM to 1/12/02 12:00 AM
None
About Help InfoCenter
Sign out
Local intranet
Multiple campaigns can be active at once.
Priorities determine which one “wins” when there is overlap.

# Campaign Priorities and Splits

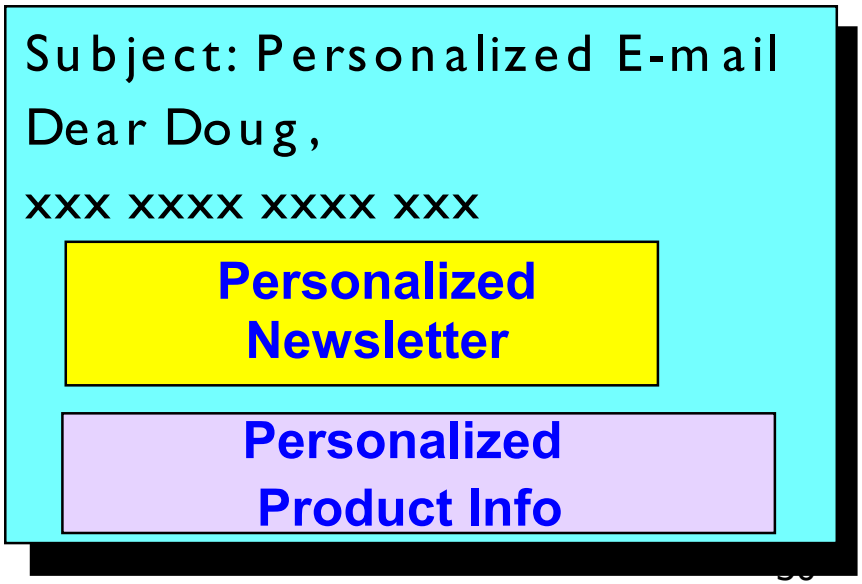
| Priority | Campaign | Duration | Split |
|---|---|---|---|
| 1 | Fall Specials | 9/25/01 12:00 PM to 11/1/01 12:00 PM | None |
| 2 | Pen Campaign | 9/25/01 12:00 PM to 12/25/01 12:00 PM | 60% |
| 2 | Pencil Campaign | 9/25/01 12:00 PM to 12/12/01 12:00 PM | 40% |

Campaigns can have same priority

- Split allows mix
- i.e., 60% pen content, 40% pencil content

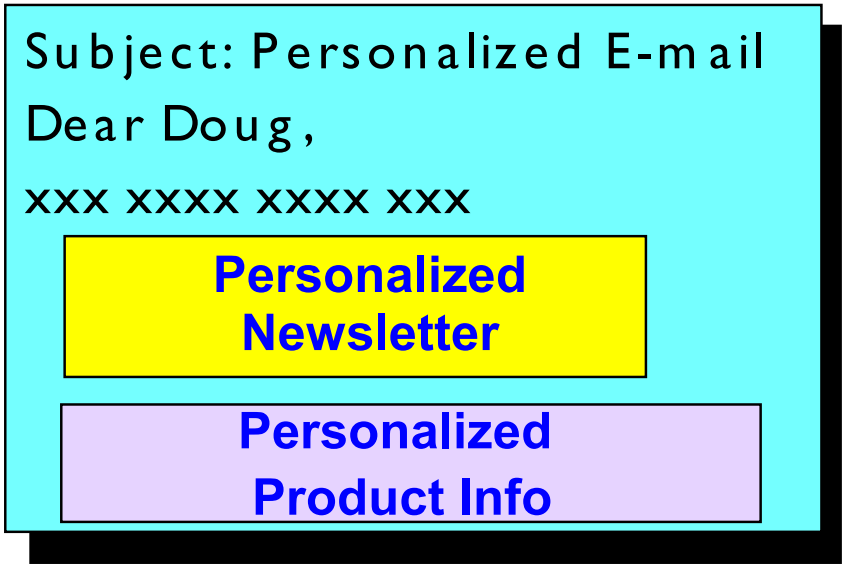
# E-mail Campaigns

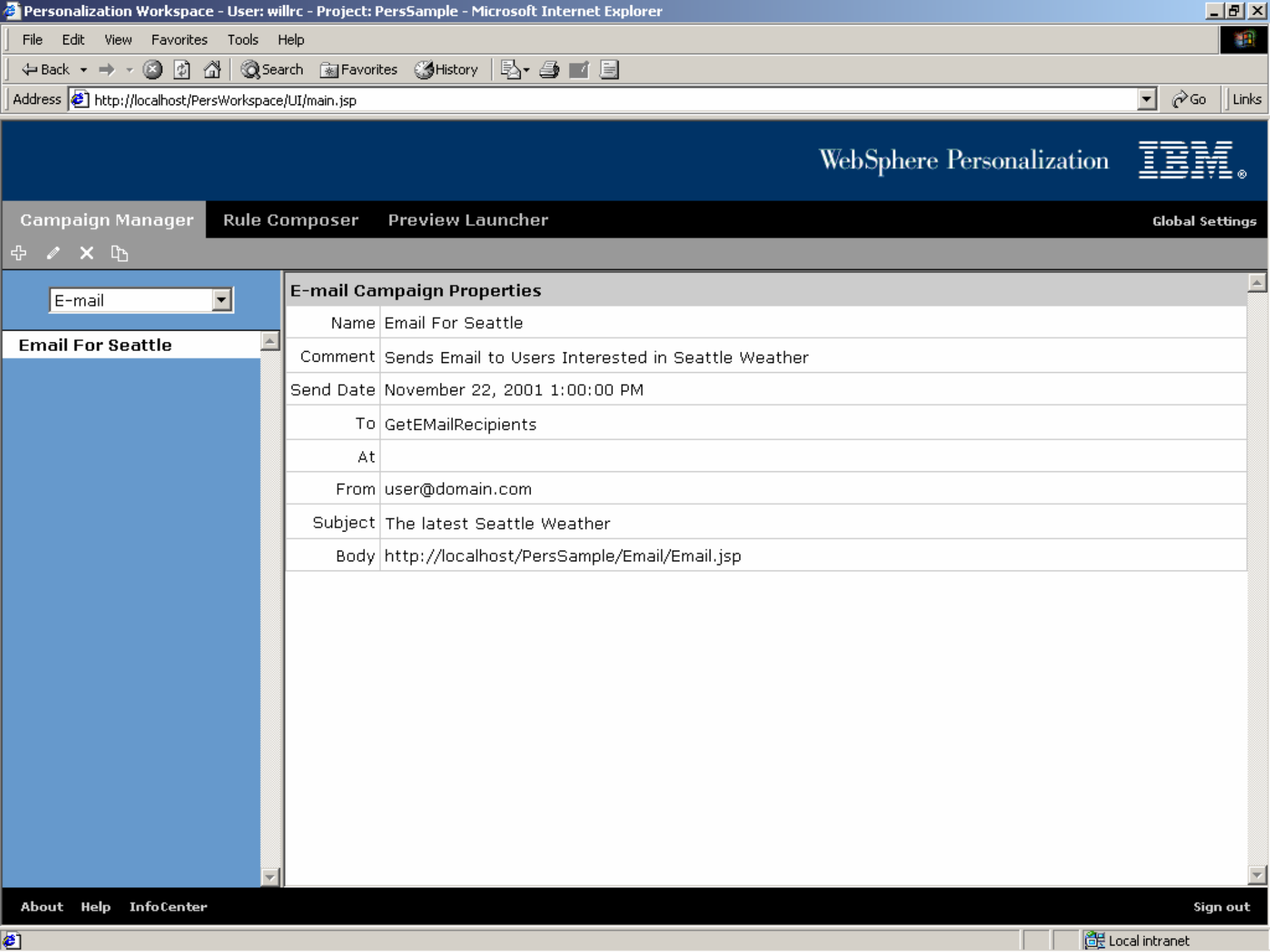
- Schedule e-mail delivery at date/time
  - with personalized content
  - to any number of recipients
  - recipient list dynamically determined via rules
- JSP file is the body of the e-mail message
- JavaMail 1.1 is used on the WebSphere Application Server



# Personalized E-mail

- Benefits
  - Highly-targeted recipient list
  - Recipient list always up-to-date
  - Automated background generation
  - Redundancy and failover support

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E-mail
Email For Seattle
E-mail Campaign Properties
Name Email For Seattle
Comment Sends Email to Users Interested in Seattle Weather
Send Date November 22, 2001 1:00:00 PM
To GetEMailRecipients
At
From user@domain.com
Subject The latest Seattle Weather
Body http://localhost/PersSample/Email/Email.jsp
About Help InfoCenter
Sign out
Local intranet

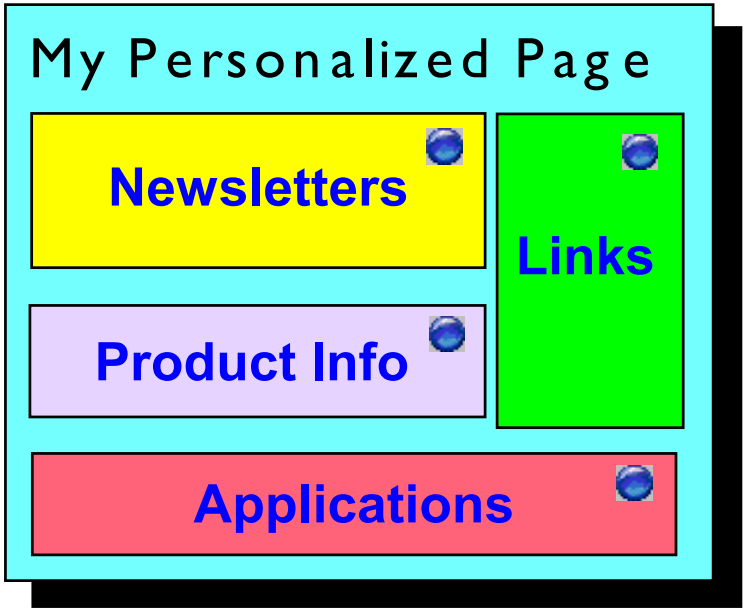
# Preview/Verify Rule Execution

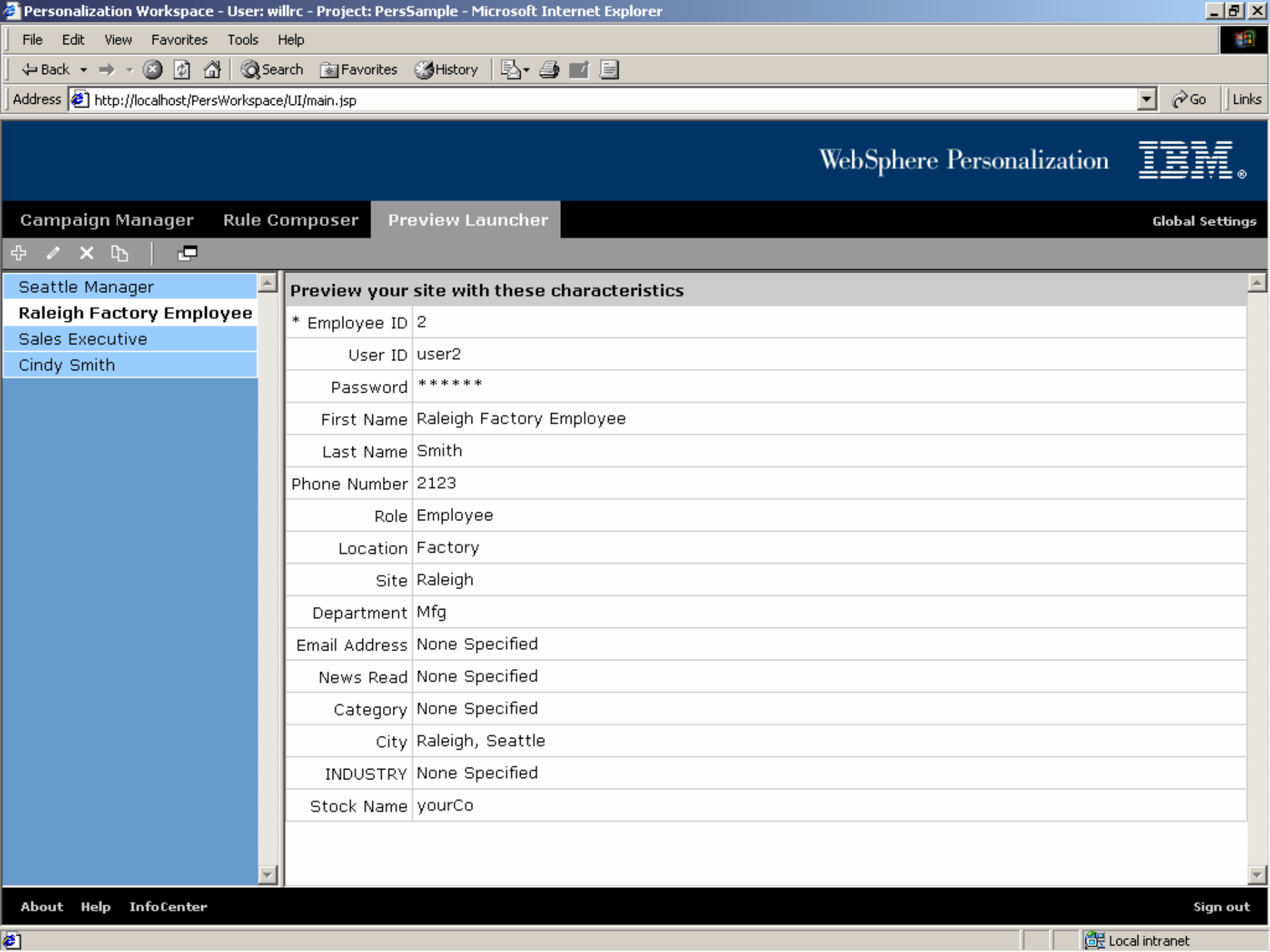
- Invoke any page with a pseudo user profile
  - For example, what would my site look like for a male driver under 25 years of age? … ok… how about a female driver under 25 years of age? … hmm… what about…
- Create, Edit or Copy then Edit pseudo user profiles
- Preview mode shows what rules executed with links back to the campaign mappings and rule editor

# Preview Personalized Pages

Simple, two-step process:

1. Build preview profile(s)
2. Press preview button

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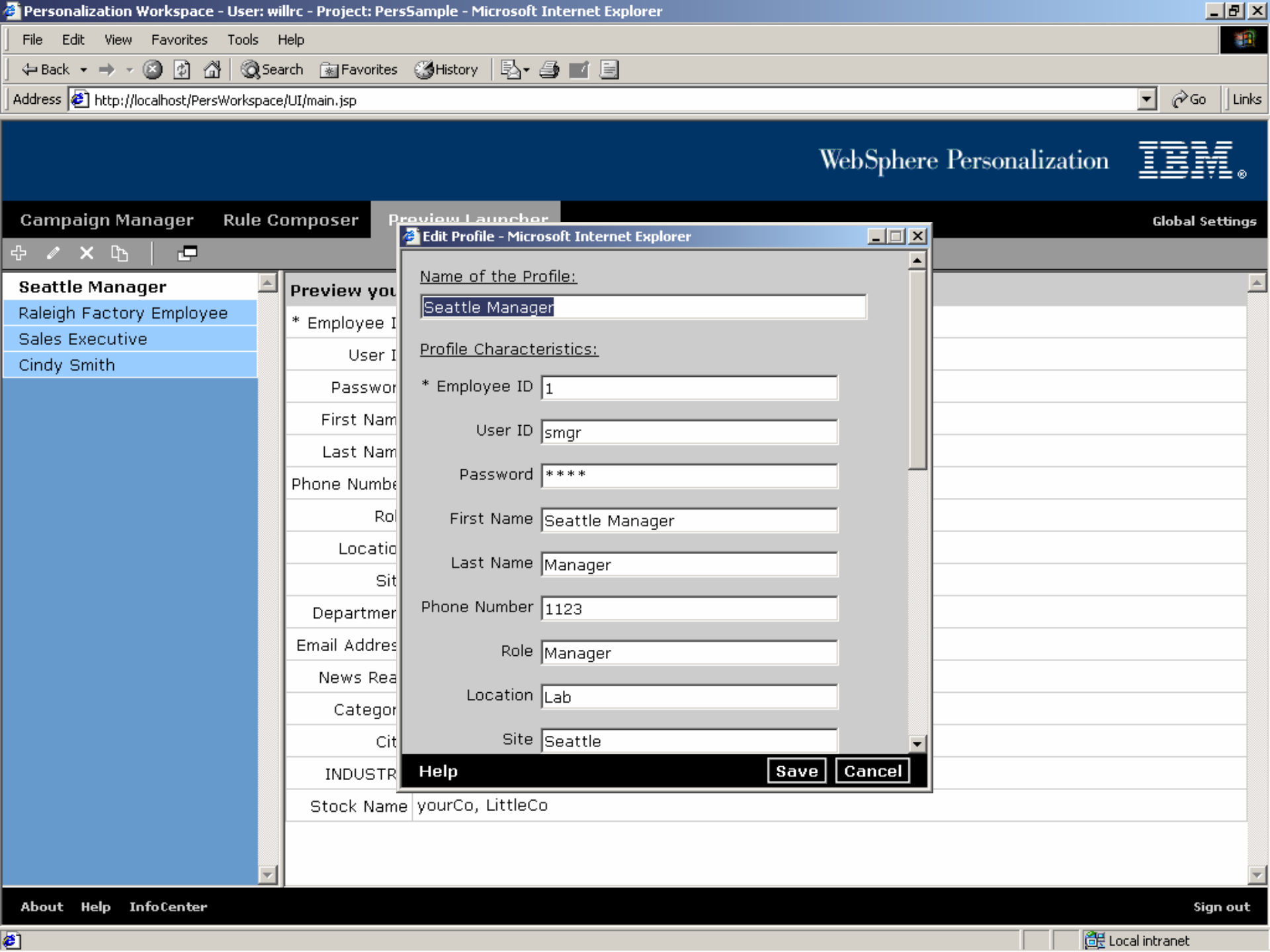
Seattle Manager
Raleigh Factory Employee
Sales Executive
Cindy Smith
Preview your site with these characteristics
* Employee ID 2
User ID user2
Password ******
First Name Raleigh Factory Employee
Last Name Smith
Phone Number 2123
Role Employee
Location Factory
Site Raleigh
Department Mfg
Email Address None Specified
News Read None Specified
Category None Specified
City Raleigh, Seattle
INDUSTRY None Specified
Stock Name yourCo
About Help InfoCenter
Sign out
Local intranet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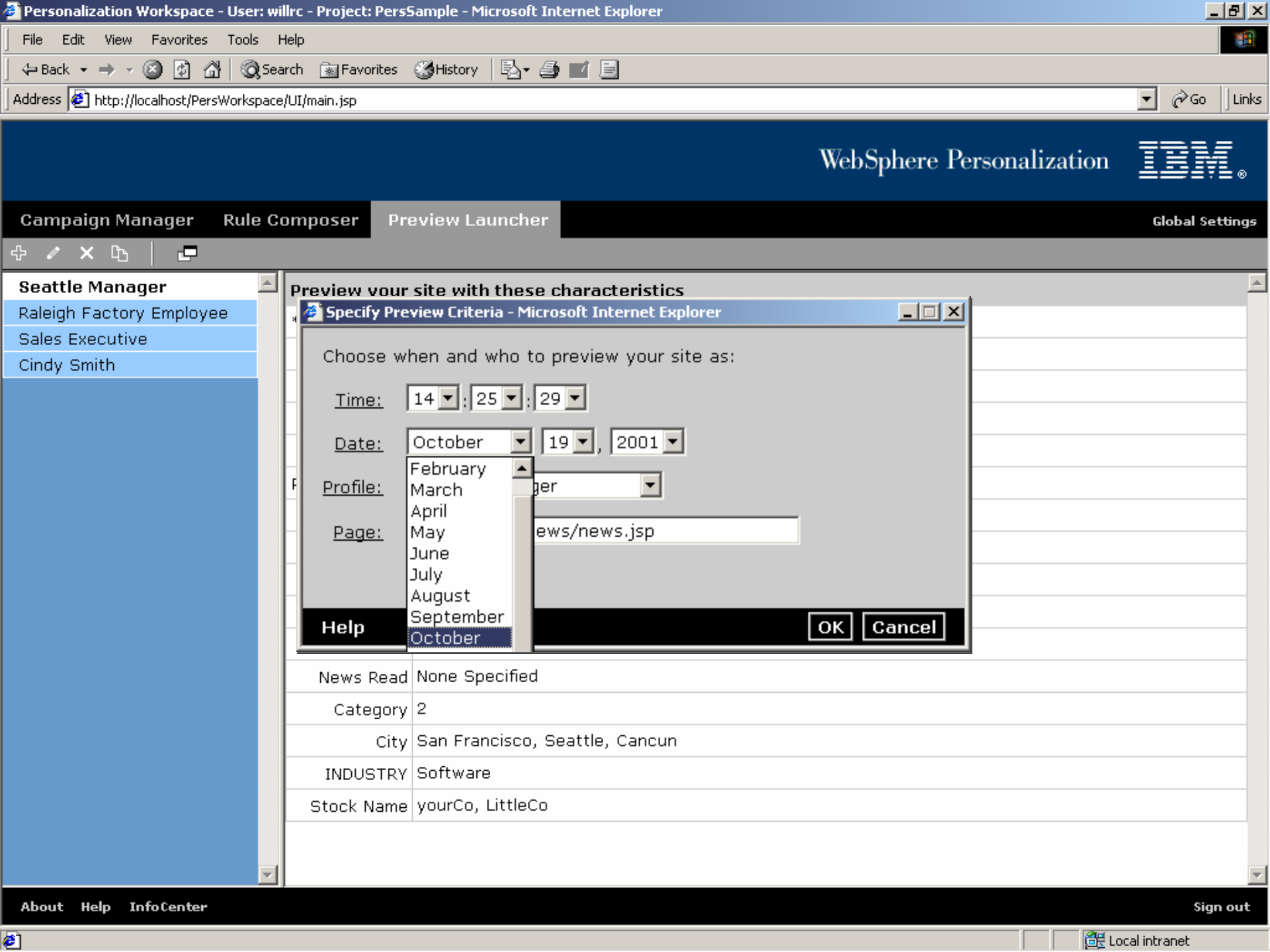
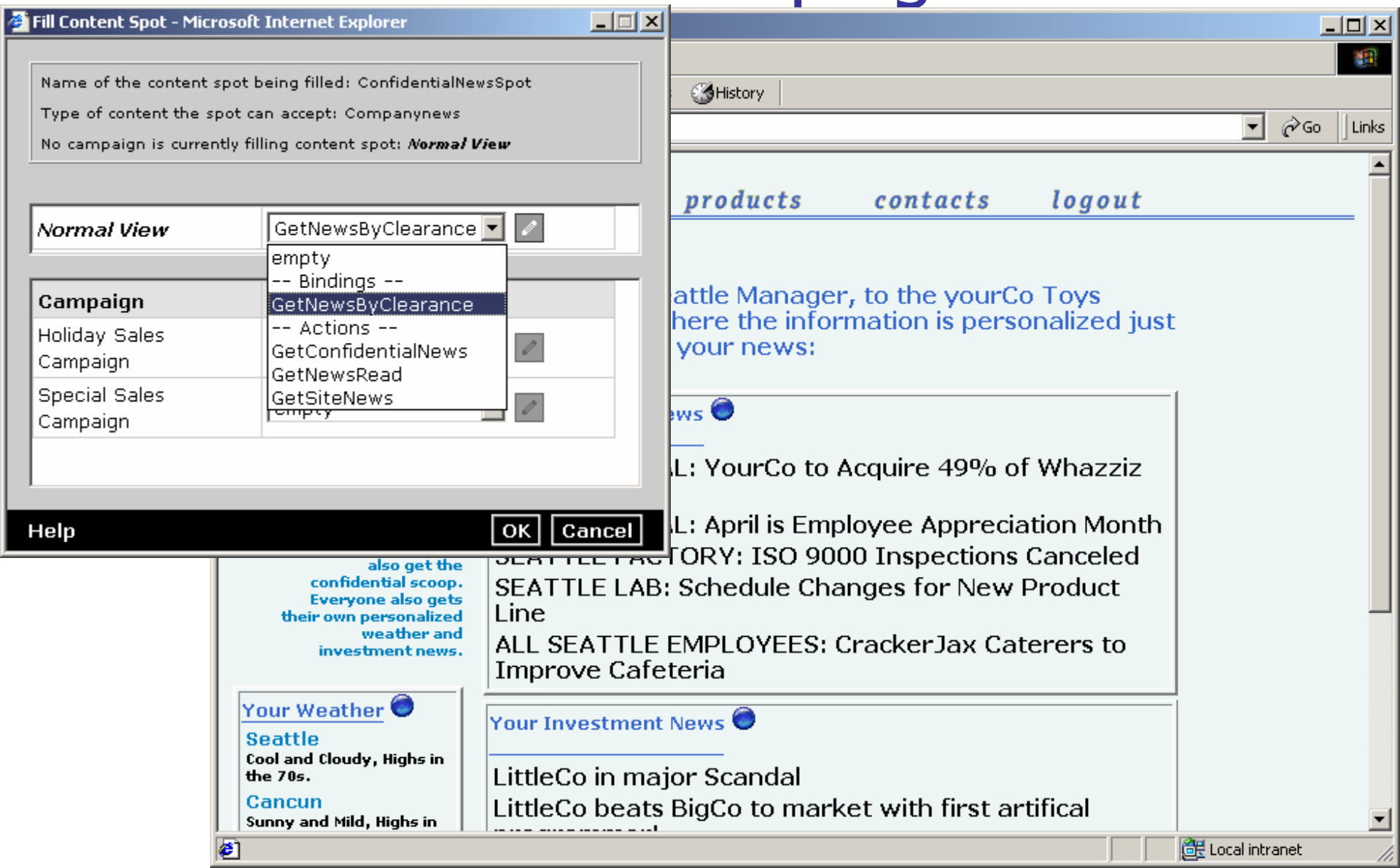
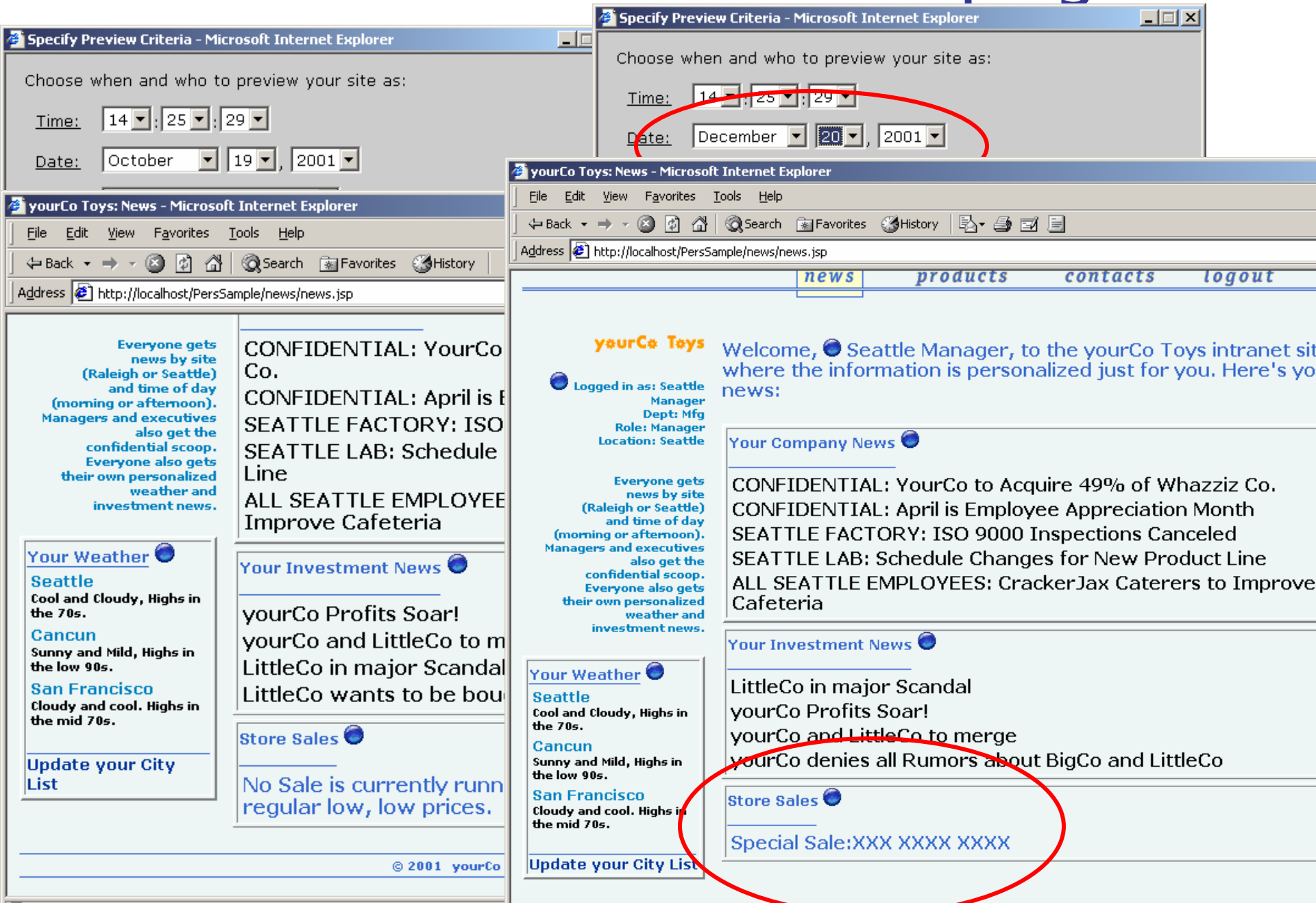
WebSphere Personalization
IBM
Campaign Manager
Rule Composer
Preview Launcher
Global Settings
Seattle Manager
Raleigh Factory Employee
Sales Executive
Cindy Smith
Preview you
* Employee I
User I
Passwor
First Nam
Last Nam
Phone Numbe
Rol
Locatio
Sit
Departmer
Email Addres
News Rea
Categor
Cit
INDUSTR
Stock Name
yourCo, LittleCo
About
Help
InfoCenter
Sign out
Edit Profile - Microsoft Internet Explorer
Name of the Profile:
Seattle Manager
Profile Characteristics:
* Employee ID
1
User ID
smgr
Password
****
First Name
Seattle Manager
Last Name
Manager
Phone Number
1123
Role
Manager
Location
Lab
Site
Seattle
Help
Save
Cancel
Local intranet


Personalization Workspace - User: willrc - Project: PersSample - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address http://localhost/PersWorkspace/UI/main.jsp
Go Links
WebSphere Personalization
IBM
Campaign Manager
Rule Composer
Preview Launcher
Global Settings
Seattle Manager
Raleigh Factory Employee
Sales Executive
Cindy Smith
Preview your site with these characteristics
Specify Preview Criteria - Microsoft Internet Explorer
Choose when and who to preview your site as:
Time: 14 : 25 : 29
Date: October 19 , 2001
February
March
April
May
June
July
August
September
October
Profile:
Page:
ews/news.jsp
Help
OK
Cancel
News Read None Specified
Category 2
City San Francisco, Seattle, Cancun
INDUSTRY Software
Stock Name yourCo, LittleCo
About Help InfoCenter
Sign out
Local intranet

# Preview links back to Rule Editing and Campaigns



# Preview works with Campaigns

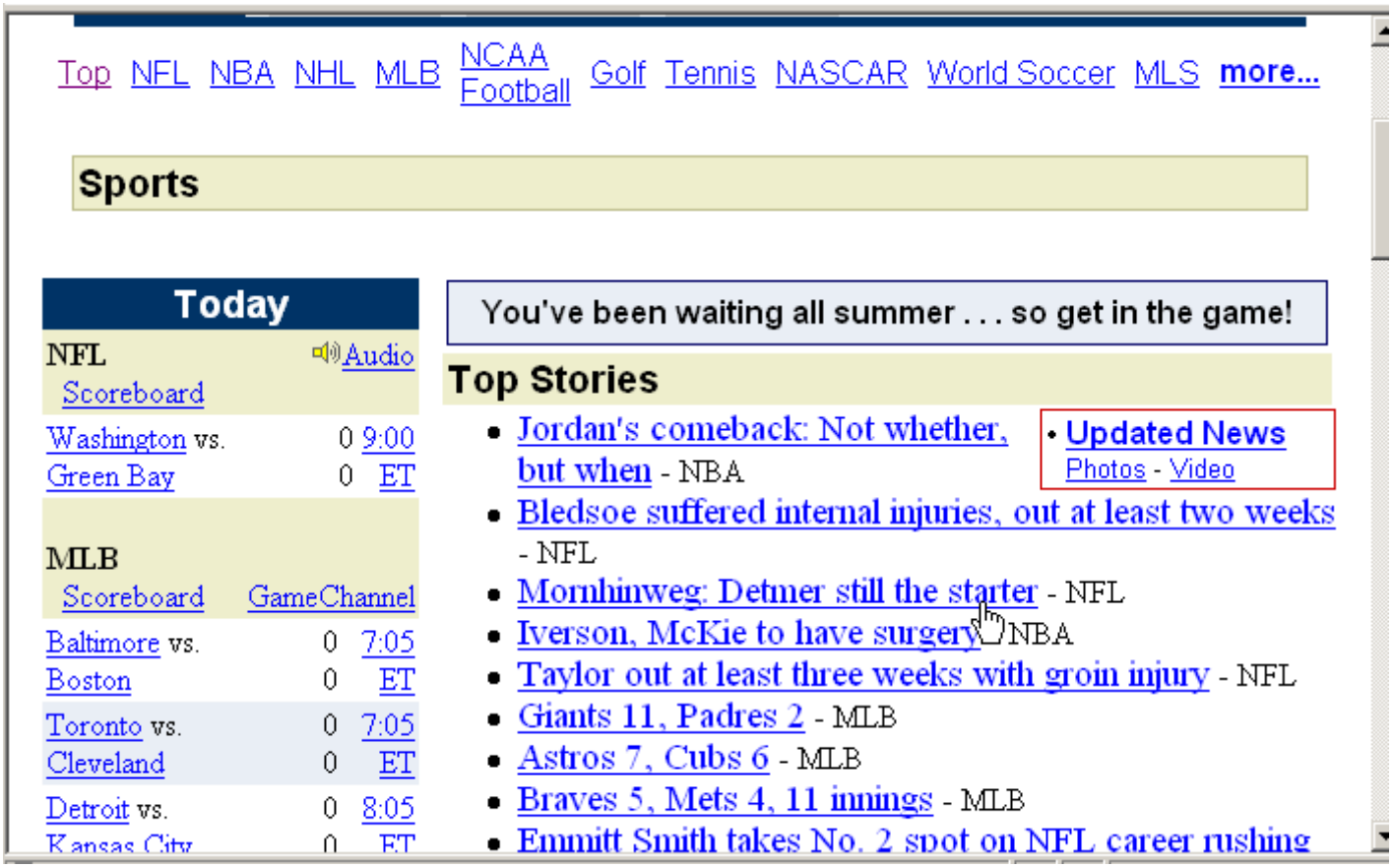


# Implicit Profiling

- Category is a new implicit Application Object used within Rules, JSPs and servlets
  - Category.log("Football") or Category.log(Article.getTopic())
- Hierarchical category naming
  - Football/National/Giants, Baseball/National/Giants, etc.
- Counts are maintained per user, per hierarchical topic
  - Football, Football/National, Football/National/Giants, etc.
- Rules can be written to test counts, and take actions, including updating the user profile
- WebSphere Application Server V4.0 provides an application data capture API called by JSPs or servlets
  - name, value pairs such as "category=football" or "action=viewed details"
  - Category bean logs
    - Log Type - IP (Implicit Profiling)
    - User - User id for the session (String)
    - Topic - String indicating current topic
- Site Analyzer can report on
  - Favorite topics among all users
  - Favorite topics for each user and groups of users

# Implicit Profiling Example

- "Sport/Football", "Sport/Soccer", etc., logged with page views



# Implicit Profiling Example

- Personalize following pages based on
  - current session, OR
  - user profile attribute (transcends session)

# Campaign and Rule Effectiveness

- Enables site owners to determine the effectiveness of a campaign or rule.
- When a Rule executes, the following is optionally logged
  - Campaign and Rule name
  - The list of item ids shown
- Subsequently, JSPs or servlets can log
  - Item id and result
  - Result is –10 to 10
    - -10 is complete failure and 10 is complete success
    - Multiple results can be logged
      - Viewed product information might be a 3, put product in shopping cart might be a 7, and purchased the product might be a 10.
- Reports
  - Site Analyzer V4 provides a set of reports on Rule Effectiveness with the ability to create your own.

# WebSphere Site Analyzer Pre-defined Reports

- For the site:
  - Top 10 fired rules
  - Least 10 fired rules
  - Most successful campaigns
  - Least successful campaigns
- For each rule:
  - Number of times fired
  - Percentage of time at least one item was selected
  - Percentage of time some amount of success
  - Average number of items recommended
- For each campaign:
  - Number of successes
  - Number of failures

# User and Content Wizards

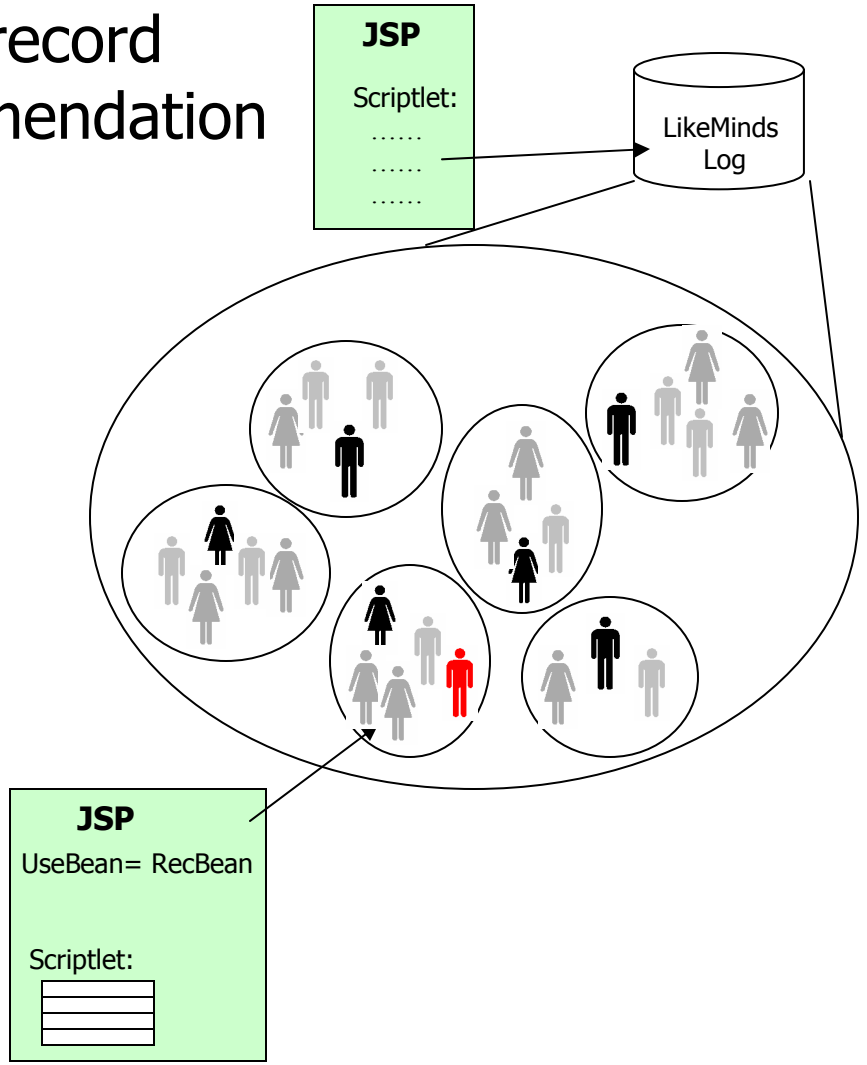
- User Definition Wizard Enhancements
  - Use of LDAP for User Profile
  - DB Join support
  - User preference pages for user profile being created
- Content Definition Wizard Enhancements
  - TeamSite/TeamXpress Integration
  - IBM EIP Integration
  - DB Join support

# Recommendation Engine

- Recommendation Engine delivers recommendations based on
  - Purchase engine
  - Clickstream engine
  - Preference engine
  - Product Matching engine
  - Product Affinity engine
- Complementary to business rules
  - Uses Collaborative Filtering to uncover new buying patterns that may not be captured in business rules
  - Adapts to changes in buying patterns without the need to create new business rules
  - Can be used within the same application or on the same page as rule based personalization
- Uses LikeMinds Personalization Server V5.0 developed by Macromedia
  - IBM now has a perpetual source license enabling IBM to more tightly integrate Recommendations and Rules.

# Recommendation Engine Overview

- Answers: "What might Joe be interested in?"
- Application is instrumented to record events with one of the Recommendation Engines.
- Reaper task chooses mentors
- Reaper task then assigns everyone else to a mentor.
- Application requests recommendations and display the results.



# Personalization and Portal Integration

- Portals are about customization and aggregation.
- Personalization is about targeting content.
- Personalization is shipped with WebSphere Portal
- Personalization integrates with and compliments the customization provided within the WebSphere Portal Server
  - WebSphere Portal user profile is a Personalization Resource
    - That means that rules can be written using the same user profile that portal is using.
  - JSP portlets and other portlets can invoke rules
    - That means that portlet content can be personalized.

# Migration from WS Personalization V3.5

- Rules created in Version 3.5 will work unchanged in Version 4
- Resources (user and content adapter classes) will work unchanged in Version 4
  - although you probably want to take advantage of the improved data source and connection pooling in Version 4 WebSphere Application Server
- The browser based business user interface, campaigns and integrated preview are Version 4 enhancements.

# Summary

- Easy-to-use, powerful web browser interface
  - Accessible by anyone, anywhere
  - Flexible preview features
- Business users can leverage personalized content to achieve business goals via
  - Flexible rules
  - Campaigns
  - Email
  - Implicit profiling
  - Site Analytics

# Summary

- Choice of business rules and collaborative filtering technology
- Choose the mix of personalization strategies that are optimum for your site's business objectives
- Flexible integration with multiple sources of users and content

# Summary

- Built on and benefits from the WebSphere architecture
  - Integrates tightly with WebSphere environment, including security
  - Scalable to meet your needs - utilizes Java and EJB architecture - models, clones, failover
  - Choice of platform - AIX, Solaris, NT, W2000, and other V4 platforms coming
- WebSphere Application Server "market share nearly doubled during 2000... at the expense of smaller software vendors" (Giga, May 4, 2001)
- IBM WebSphere will be one of 3-5 surviving application servers

# *WebSphere Personalization Demo*

# *WebSphere Personalization Architecture*

# Elements of a Personalization Solution

- User Profile
  - Users of the site
  - Contains attributes about the user
- Content Model
  - Products, articles, programs, etc
  - Defines attributes about the content
- Matching Technology
  - Filtering, Rules or Recommendation Engines or combinations of all three
  - Matches user to the "right" content
- Populating the User and Content Repositories
  - User Information
    - Registration
    - Web Analytics
    - Data Mining of Web and Legacy data
  - Content Information
    - Content Contribution Solutions
    - Syndication
    - Content Categorization solutions
- Feedback on Personalization Effectiveness

# Resources

- WebSphere interacts with user information and content through an object abstraction called a Resource.
- A Resource is a Java class with a set of properties representing parts of the content. For example,
  - a Press Release has a Title, an Author, an Abstract, a Body, and a TargetIndustry.
  - The corresponding PressRelease resource class (PressRelease.java) would have properties for Title, Author, Abstract, Body and TargetIndustry.
- Resources can be most easily thought of as adapters that hide the details of how the user information and content is stored from the applications that make use of the user information and content.

# Resource Concepts

- Resource
  - a Java class that defines the properties of the user or content object.
  - analogous to the database schema that defines the column names and types for a database table.
- Resource Instance
  - an instance of the resource class.
  - Analogous to the row of a database. That is, it contains actual values for each property defined by the resource.
- Resource Collection
  - a collection of resource instances.
  - analogous to a database table (with a fixed schema and a number of rows).
- While resource concepts are easy to map to familiar database concepts, it is important to note that the actual content store that resources wrapper doesn't have to be a database table.
  - It can be a file system, an LDAP repository, an XML store, or virtually any content store accessible by Java.

# Resource Classes

- Resource Collections are defined with
  - A Resource Collection name
  - Two or three Java classes that together implement the Resource, ResourceDomain and ResourceManager Java interfaces and are registered with the Resource Engine
- Resource interface
  - Implemented by the Resource class that has the specific set of properties that represent the user information or content.
  - Properties can be fixed (have corresponding get/set methods) or dynamic (have string names and are accessed via put, get, and remove methods)
  - Resource interface specifies that the resource class must implement
    - getID which returns a String ID that is unique within the resource collection
    - put(), get(), and remove() methods for dynamic properties
  - Fixed properties can be any of the common primitive Java types (string, int, float, date, etc.) or an array of one of the primitive types.
  - Fixed properties can be searched on, while dynamic properties cannot

# Resource Classes

(continued)

- ResourceDomain interface defines a set of "findby" methods
  - findByID – finds the one resource instance with the specified id
  - findByProperty – finds all the resource instances with the matching property value
  - findByQueryString – finds all the resource instances whose property matches the Query where clause
- ResourceManager interface defines a set of life cycle methods
  - add
  - delete
  - getForUpdate
  - sync (save after obtaining for update)
- The ResourceDomain and ResourceManager interfaces are often implemented in one Java class, while the Resource is generally a separate class.

# Resource Classes

(continued)

- WebSphere Studio generates the required resource classes for
  - One or more tables within JDBC Databases
  - LDAP user stores
  - IBM EIP Entities
    - EIP Entities are conceptually similar to DB tables
    - They are created using EIP administration and are an EIP abstraction of one or a set of content stores.
- Resource classes can also be hand crafted in VA Java or any Java IDE

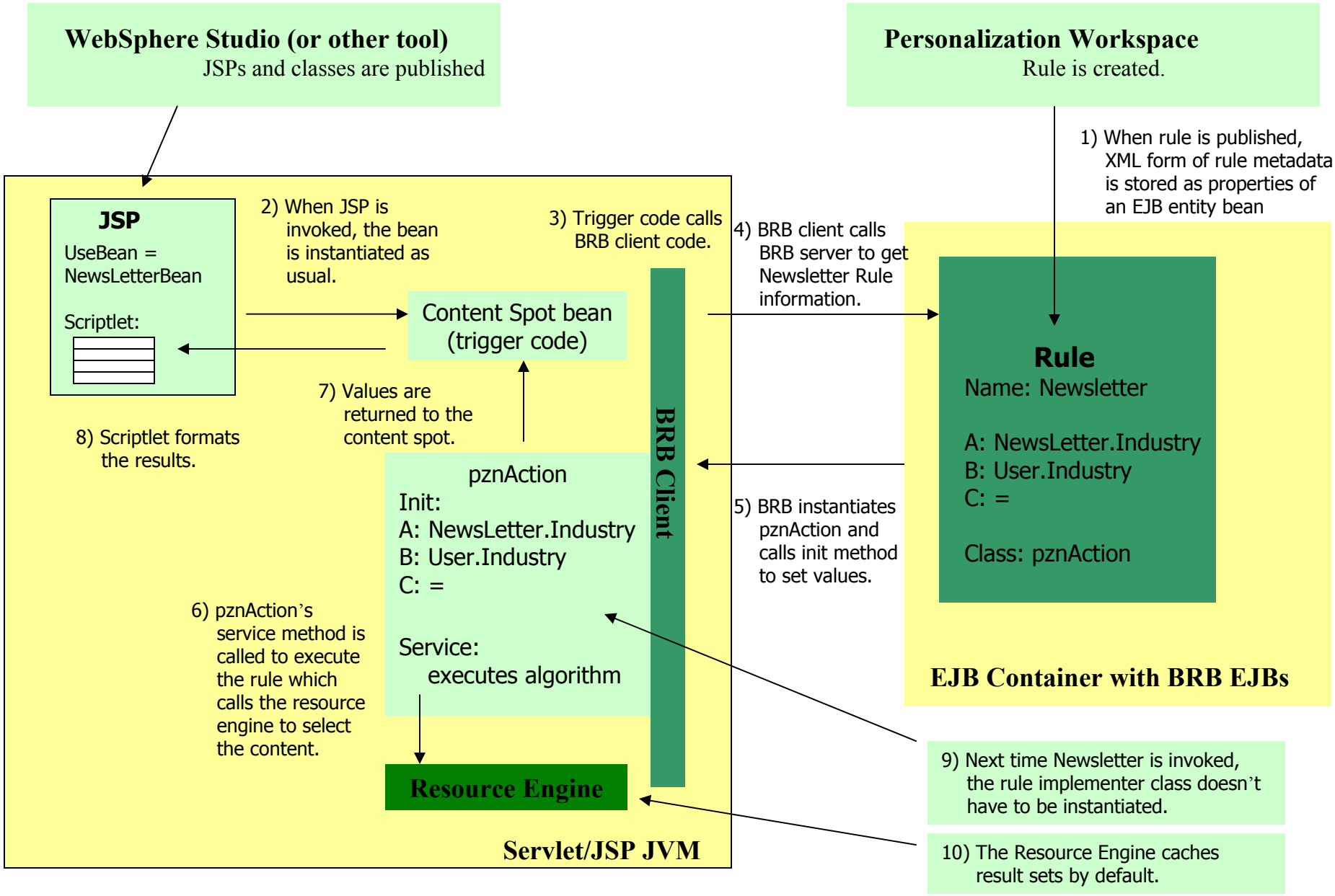
# Personalization Context

- There are really two distinct collections of objects which rules deal with.
  - The Personalization Context are the objects associated with the current user
    - "current" user, session, request parameters, application objects, category counts, browser capabilities, date and time
  - Searchable objects
    - All the resources (users and content)
- Objects in the personalization context don't have to implement the resource interfaces
- Only objects in the personalization context can be updated by rules

# Rule Engine

- WebSphere's Rule Engine is provided by a component known as Business Rule Beans (BRB)
- BRB's purpose is to allow customers to separate their business rules from your application logic.
- There are two key BRB Concepts
  - A RuleImplementor is a Java class that implements the algorithm of the rule.
  - A Rule is the metadata that tells the RuleImplementor what to do in order to implement a given Rule.
- WebSphere Personalization provides the required RuleImplementors
- For example, WebSphere Personalization Classifier Rules
  - A single RuleImplementor
    - that sequentially compares two values
    - ANDs or ORs the results
    - returns the list of valid classifications
  - A specific Classification Rule just specifies
    - the set of values to compare and
    - the classification names that should result

  for this usage (Rule Use) of the classification rule implementor.




11) Rules execute as Java classes (not EJBs) within the web container. Rules are managed as scale just like everything in the web container. The BRB rule container is managed and scales just like everything in the EJB container.

# Back Up

# Personalization V3.5 Function Summary

- Resources
  - Support for virtually any data store accessible via Java
  - WebSphere Studio wizards for creating resource classes for database user information and content
    - Including multi-value properties
- Rules
  - Simple to use, point and choose rule editor
  - Define customer segments via Classifier Rules
  - Select content via Action rules
  - Update user profile, application objects and session values via Action rules
  - Create conditional logic via Binding Rules
- Recommendations
  - Exploit advanced collaborative filtering algorithms for matching content to visitor's needs and interests
- Make use of rule and recommendation results easily within JSP pages using WebSphere Studio Page Designer or any JSP editor.
- Resource Engine, Rule Engine and Recommendation APIs run on AIX, Solaris, HP-UX, Windows NT, Windows 2000, Linux, and iSeries (AS/400). Collaborative Filtering server runs on AIX, Solaris and Windows.

# Personalization V4 New Function Summary

- Personalization Workspace
  - An easy to use interface that business users use to build business rules, manage campaigns and preview personalized pages with different profiles.
- Campaign management
  - Business user tool which simplifies the coordination and scheduling of personalized web and e-mail based campaigns
- Expanded facilities for implicit profiling
  - Collect real time information on site visitor actions and construct personalization business rules around this data
- Reporting on rule effectiveness
  - Provide reports for the site's business owner on the effectiveness of the business rules and campaigns in achieving their objectives
- User and Content Wizard Enhancements
  - Support for DB Joins, LDAP and IBM EIP
- zOS support

# Additional Rule Functions in V4

- Filtering (Exclude) Capability within a Binding Rule
- Sorting Capability within a Binding Rule
- Limits within Action Rules and Binding Rules
- Nested Properties
  - Support for department.user.jobtitle like properties

# Top 10 New Functions

- Web Browser User Interface
- WebSphere Application Server V4 support
- Implicit Profiling
- Analytics
- Campaigns
- Personalized E-mail
- Client Browser based personalization
- LDAP integration
- Enterprise Information Portal (EIP) integration
- WebSphere Studio Advanced Edition V4 Enhancements

# Client Browser Type

- Target different content to users based on client browser attributes
  - Type (deliver different formats for IE and Netscape)
  - Version (support older versions)
  - JavaEnabled (load applets)
  - Plugins (media support)
  - Referer
  - Platform
  - etc.
- Benefit: Browser content controlled via server-side rules instead of JavaScript/VBScript