

WebE - Design

Source:

Building Web Applications with UML Second Edition By Jim Conallen, 2002

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Design

- Design starts with the analysis model, the user experience model, and the software architecture document as the major inputs
- The principal activity of design is to refine the analysis model such that it can be implemented with the components that obey the rules of the architecture
 - Even though this sounds straightforward, it can be the most complex phase of a development project, especially when significant advances in software technology are happening so quickly

Web Application Extension to UML

- Enables us to represent Web pages and other architecturally significant elements in the model alongside the "normal" classes of the model
- An extension to UML is expressed in terms of stereotypes, tagged values, and constraints
 - These mechanisms enable us to extend the notation of UML, enabling us to create new types of building blocks that we can use in the model

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WAE to UML (2)

- Stereotype, an extension to the vocabulary of the language, allows us to attach a new semantic meaning to a model element
 - Can be applied to nearly every model element and are usually represented as a string between a pair of guillemets: « ». However, they can also be rendered by a new icon
- Tagged value, an extension to a property of a model element, is the definition of a new property that can be associated with a model element
 - Most model elements have properties associated with them
 - Classes, for instance, have names, visibility, persistence, and other attributes associated with them
 - A tagged value is rendered on a diagram as a string enclosed by brackets
- Constraint, an extension to the semantics of the language, specifies the conditions under which the model can be considered well formed
 - A rule that defines how the model can be put together
 - Rendered as strings between a pair of braces: { }

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WAE - Logical View

- The logical view of a UML model consists mostly of classes, their relationships, and their collaborations
- Some stereotyped classes define multiple icons
- For practical reasons, the decoration icon is more manageable for modeling tools like Rose
- The WAE defines three core class stereotypes and various association stereotypes:
 - Server page
 - Client page
 - HTML form

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Server Page

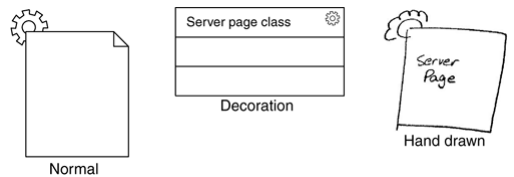
- Represents a dynamic Web page that contains content assembled on the server each time it is requested
- Typically, contains scripts that are executed by the server that interacts with server-side resources:
 - databases,
 - business logic components,
 - external systems,
 - and so on.
- The object's operations represent the functions in the script
- The object's attributes represent the variables that are visible in the page's scope, accessible by all functions in the page
- Constraints:
 - Server pages can have only normal relationships with objects on the server

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Server Page (2)



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Client Page

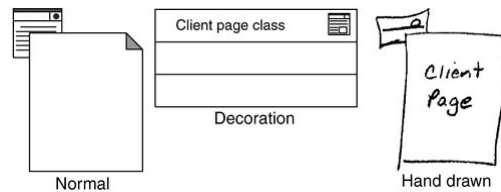
- A client page instance is an HTML-formatted Web page with a mix of data, presentation, and even logic
- Rendered by client browsers and may contain scripts that are interpreted by the browser
- Client page functions map to functions in tags in the page
- Client page attributes map to variables declared in the page's script tags that are accessible by any function in the page, or page scoped
- Client pages can have associations with other client or server pages
- Tagged values:
 - TitleTag, the title of the page as displayed by the browser
 - BaseTag, the base URL for dereferencing relative URLs
 - BodyTag, the set of attributes for the <body> tag, which sets background and default text attributes

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Client Page (2)



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HTML Form

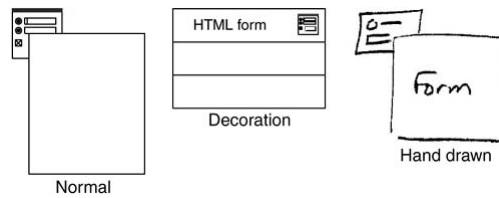
- A class stereotyped as a «form» is a collection of input fields that are part of a client page.
 - This class maps directly to the HTML <form> tag.
 - Its attributes represent the HTML form's input fields: input boxes, text areas, radio buttons, check boxes, and hidden fields.
- A «form» has no operations, as they can't be encapsulated in a form.
 - Any operations that interact with the form would be the property of the page that contains the form
- Tagged values:
 - GET or POST: the method used to submit data to the action URL

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HTML Form (2)

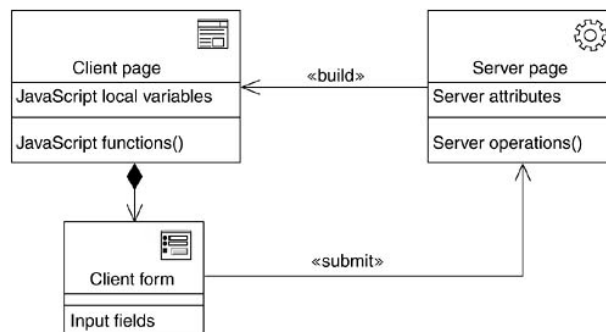


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Basic relationships among WAE stereotyped elements



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Association Stereotypes

- <<link>>
is an abstraction of the HTML anchor element, when the href attribute is defined
- <<build>>
a directional relationship between a server page and a client page
- <<submit>>
a directional relationship between an «HTML form» and a server page
- <<redirect>>
indicates a command to the client to request another resource

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Association Stereotypes (2)

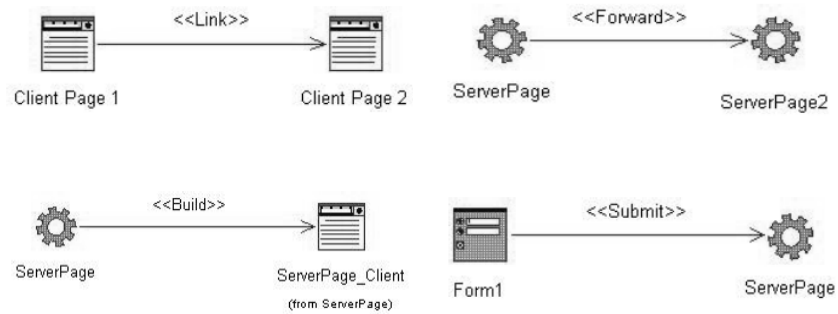
- <<forward>>
represents the delegation of processing a client's request for a resource to another server-side page
- <<object>>
a containment relationship drawn from a client page to another logical class, typically one that represents an applet, ActiveX control, or other embeddable component
- <<include>>
indicates that the included page gets processed, if dynamic, and that its contents or by-products are used by the parent

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Association Stereotypes

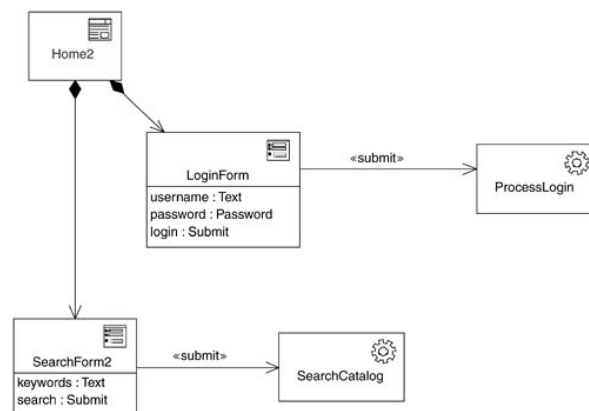


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Multiple forms in client pages



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Simple client page «link» associations

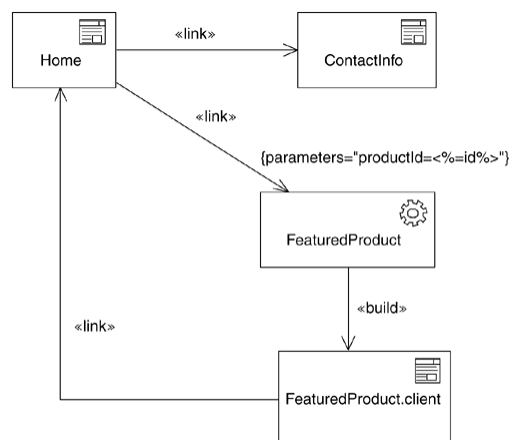


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Stereotyped «link» associations originating from client pages

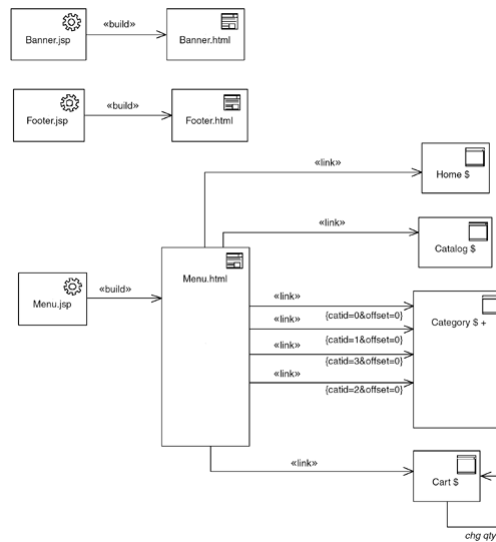


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**The «link»
associations pointing
to «screen» elements
when screens are
compartmentalized**



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