Java Server Pages Design

Jeff Offutt

http://www.cs.gmu.edu/~offutt/

SWE 642
Software Engineering for the World Wide Web

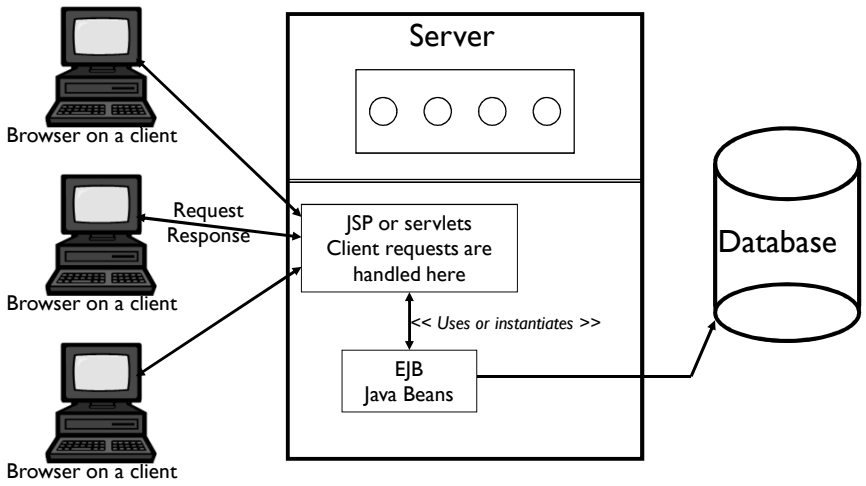
sources: ***Professional Java Server Programming*****, Patzer, Wrox, Ch 11**

Design Strategies

- Many dozens of design strategies have been developed for web applications
- This lecture introduces two :
  1. Page-centric : Requests are made to JSPs, and the JSPs respond to clients
  2. Dispatcher : Requests are sent to JSPs or servlets that then forward the requests to another JSP or servlet

In both cases, the goal is to separate logic from presentation and to separate as many concerns in the logic as possible

(1) Page-Centric Design

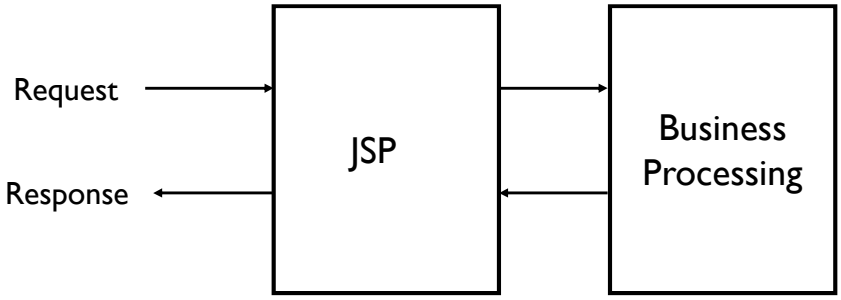


(1) Page-Centric Design – *cont*.

- This is a simple design to implement
- The JSP author can generate pages easily
- Two variants :
  - *Page-View*
  - Page-View with a *Bean*
- Does not scale up very well to large web sites
- Often results in a lot of Java code in the JSP
  - JSP authors must be Java programmers
  - Design is hard to see
  - Hard to maintain

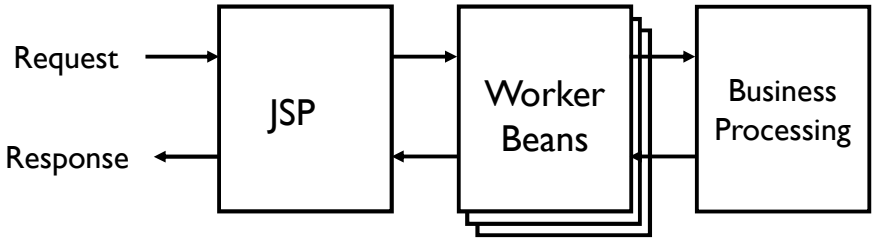
(1-A) Page-View Design

- A JSP page and some back-end business processing
- Simple but not sophisticated or scalable



(1-B) Page-View with Bean Design

- When more business processing and data access is needed
- Let Java Beans handle the data
- Separates programming (Bean) from presentation (JSP)

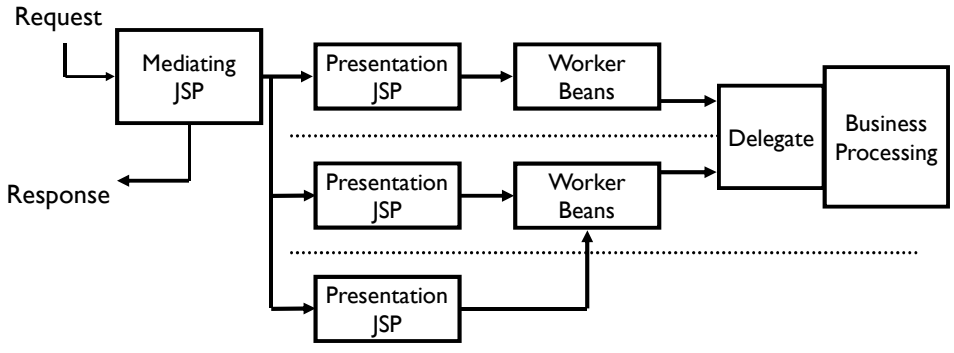


(2) Dispatcher Design

- A "dispatcher" accepts requests and routes them to the correct place
- Front-end JSP (or servlet) looks at a portion of the request, and then chooses the correct place to forward it
- This is more sophisticated than the page-centric :
  - More flexible and scalable
  - More overhead that is wasted with small applications
- Three versions
  - *Mediator-View*
  - *Mediator-Composite View*
  - *Service to Workers*

(2-A) Mediator-View Design

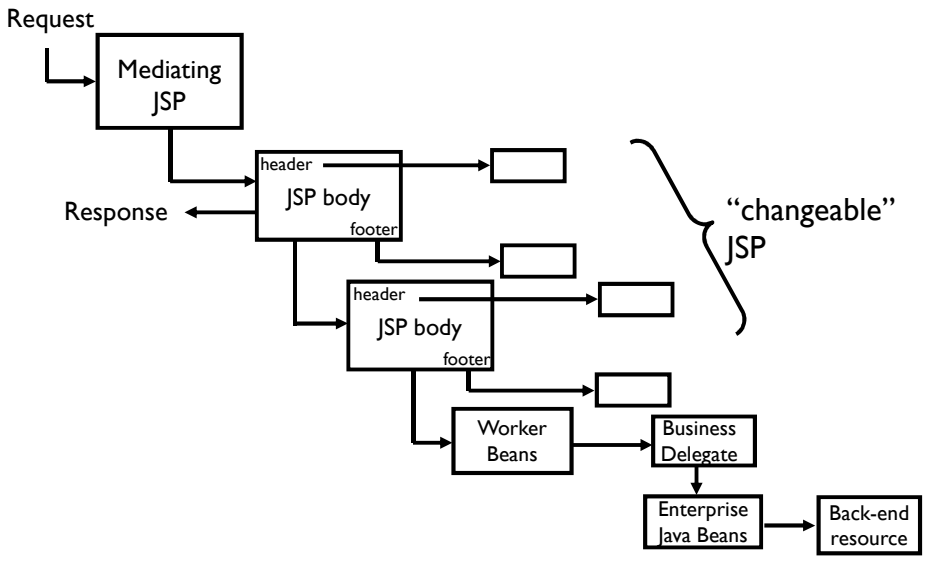
- The Mediating JSP sends requests to a JSP
- The JSP sets and gets beans and creates a response page



(2-B) Mediator-Composite Design

- The mediator-view helps with dynamically changing data, but sometimes the structure around the data changes
- Consider a web site that sells books, CDs, and videos
  - The title, author and price form the data
  - The structure will be different with each type of item
- With a mediator-view, the JSP has to be changed to introduce new types of products
- The mediator-composite architecture allows nesting of JSPs and HTML …

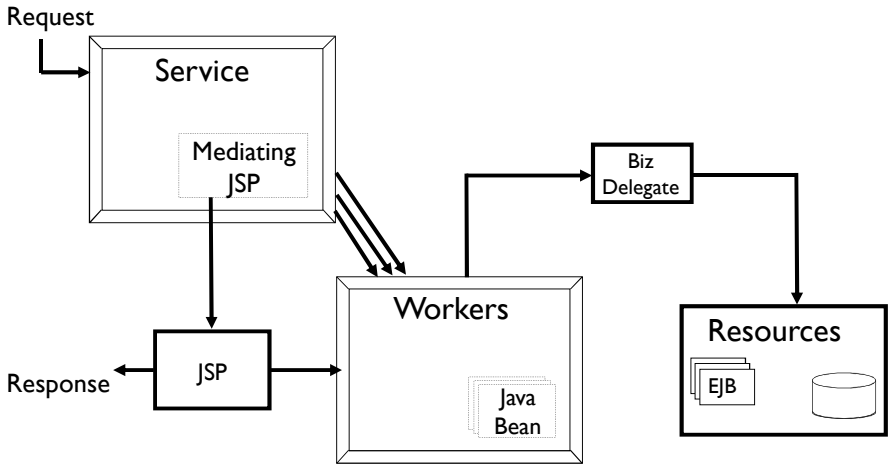
(2-B) Mediator-Composite Design



(2-B) Mediator-Composite Design

- In this architecture, the JSP makes direct calls to the business logic modules
- This creates a tight coupling between the JSP and the execution or business logic
- In the next architecture, the JSP is separated further from the business logic modules

(2-C) Service to Workers Design



(2-C) Service to Workers Design

- The mediator sends requests to "worker beans"
- The worker beans use the back-end software to populate the beans with data
- The JSPs then take the data and create output pages

- This method breaks up the "view" and the "controller"
- Useful when many methods are needed to generate the data

Summary
Web App Design Strategies

- Many design patterns and design strategies exist
  - And new patterns are created all the time
- Each pattern helps make certain parts of the web app easier to change, at the expense of others
- They are designed to support one or more engineering goals :
  - Reliability
  - Usability
  - Security
  - Availability
  - Maintainability
  - Performance