

CPET 499/ITC 250 Web Systems

Chapter 14 Web Application Design

Text Book:

* Fundamentals of Web Development, 2015, by Randy Connolly and Ricardo Hoar, published by Pearson

Paul I-Hai Lin, Professor of Electrical and Computer Engr. Tech

<http://www.etcs.ipfw.edu/~lin>

Topics

- About **software design principles** specific to web applications
- How **design patterns** provide modular solutions to common problems
- Key web application design patterns

Topics

- 14.1 Real-World Web Software Design
 - Challenges in Designing Web Applications
- 14.2 Principle of Layering
 - Data layer, Application Layer, and Presentation layer
 - Common Layer Schemes
- 14.3 Software Design Patterns in the Web Context
 - Adapter Pattern, Simple Factory Pattern, Template Method Pattern
- 14.4 Data and Domain Patterns
 - Table Data Gateway Pattern, Domain Model Pattern, Active Record Pattern
- 14.5 Presentation Patterns
 - Model-View-Controller (MVC) Pattern, Front Controller Pattern

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3

14.1 Real-World Web Software Design

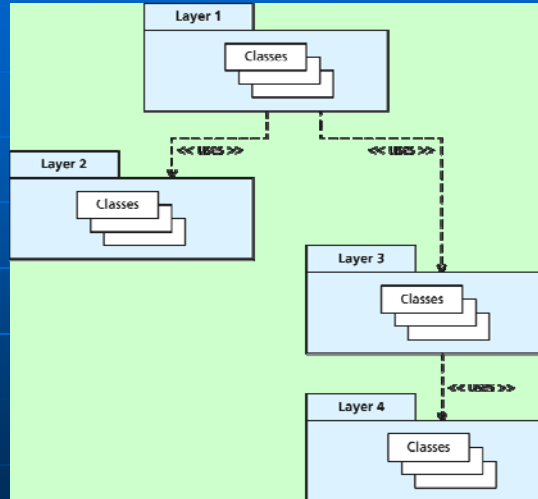
- Software Requirements, Software Requirement Specifications, Software Design
- IEEE Recommended Practice for Software Requirements, 2010,
<http://www.cse.msu.edu/~cse870/IEEEExplore-SRS-template.pdf>
- IEEE Draft Standard for Software Design Descriptions, 2005,
<http://www.san.uri.br/~pbetencourt/engsoftII/IEEE-P1016-d50.PDF>
- Software Design Document (SSD) template (summarized from STD 1016),
<http://www.zeynepaltan.info/SDD-Template.pdf>

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4

Visualizing Layers

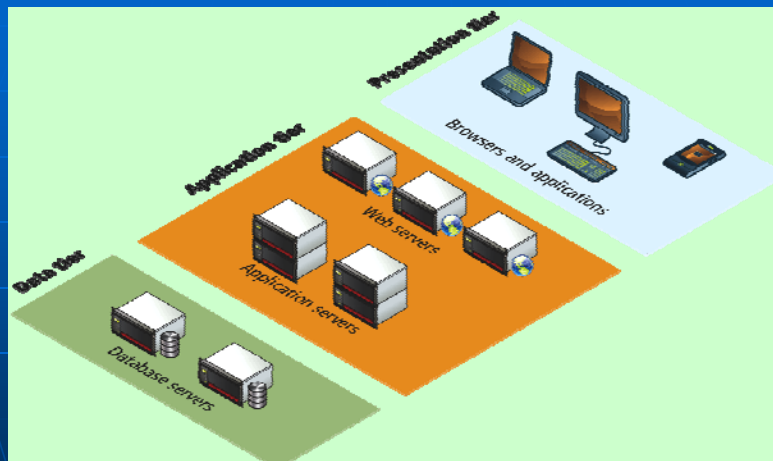
UML - uses
Relationship,
Dependency



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5

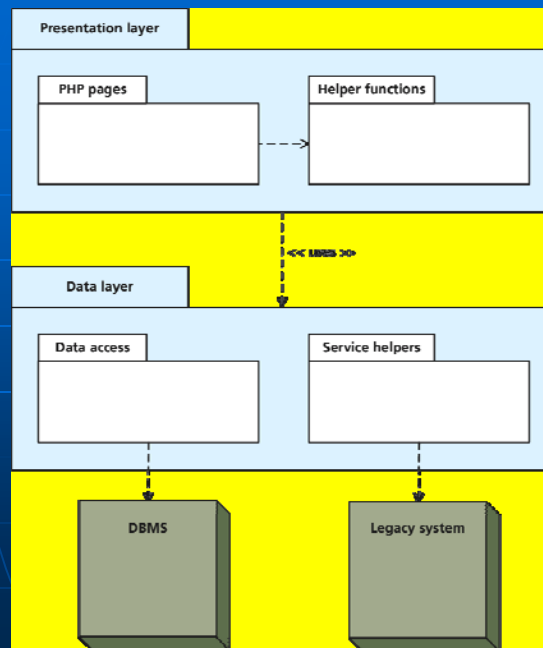
Visualizing Tiers



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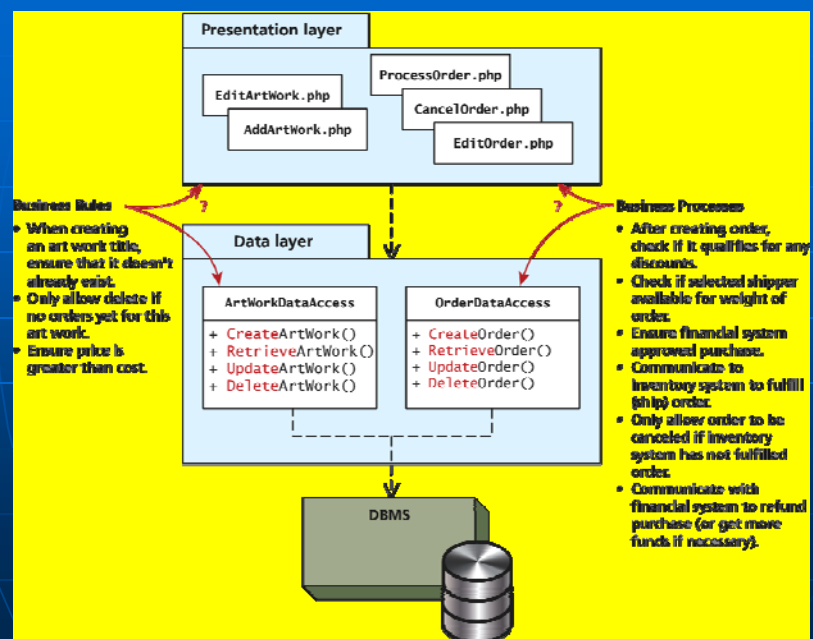
6

Two-Layer Model

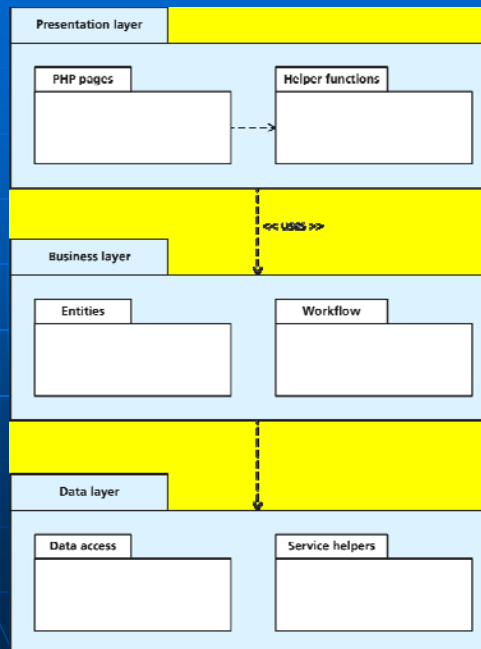


7

Business Rules and Processes

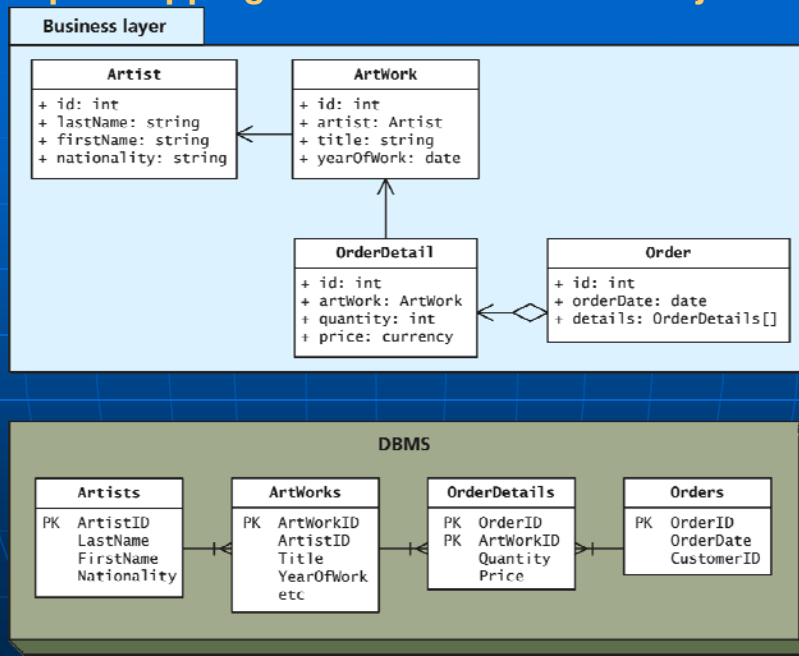


Three-Layer Model

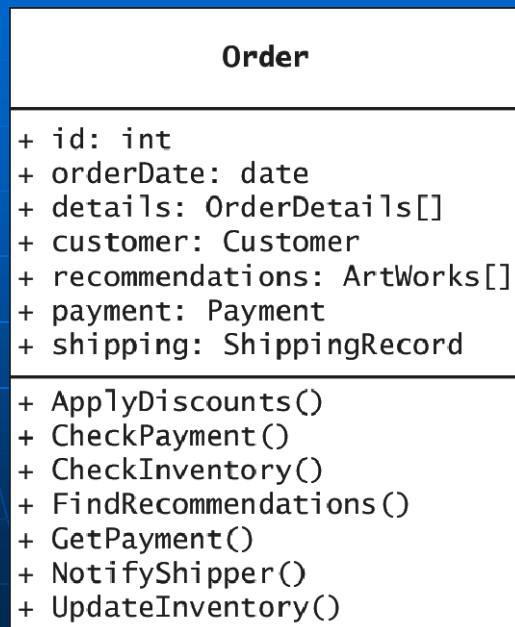


9

Simple Mapping of Tables to Domain Objects

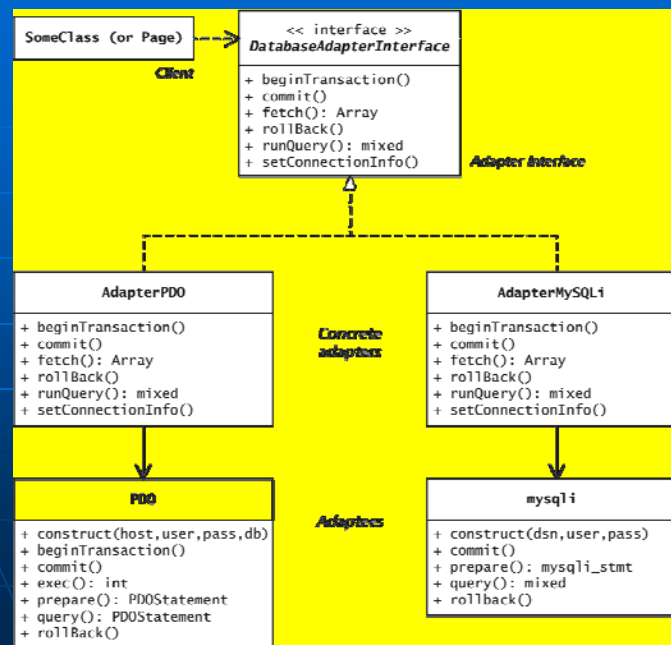


Complex Domain Objects



11

A Database API Adapter



12

Template Method Pattern

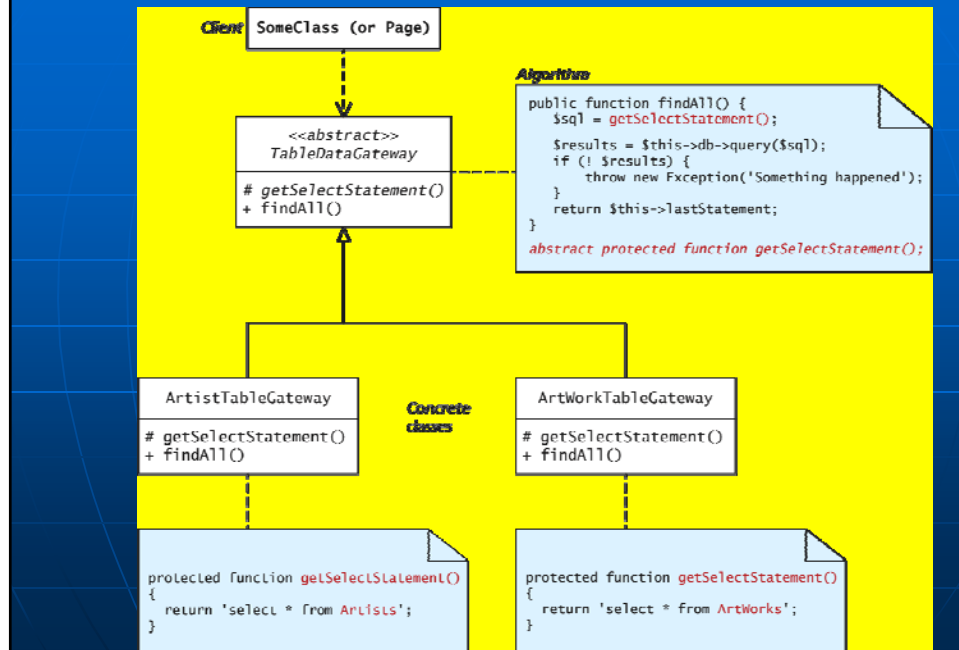
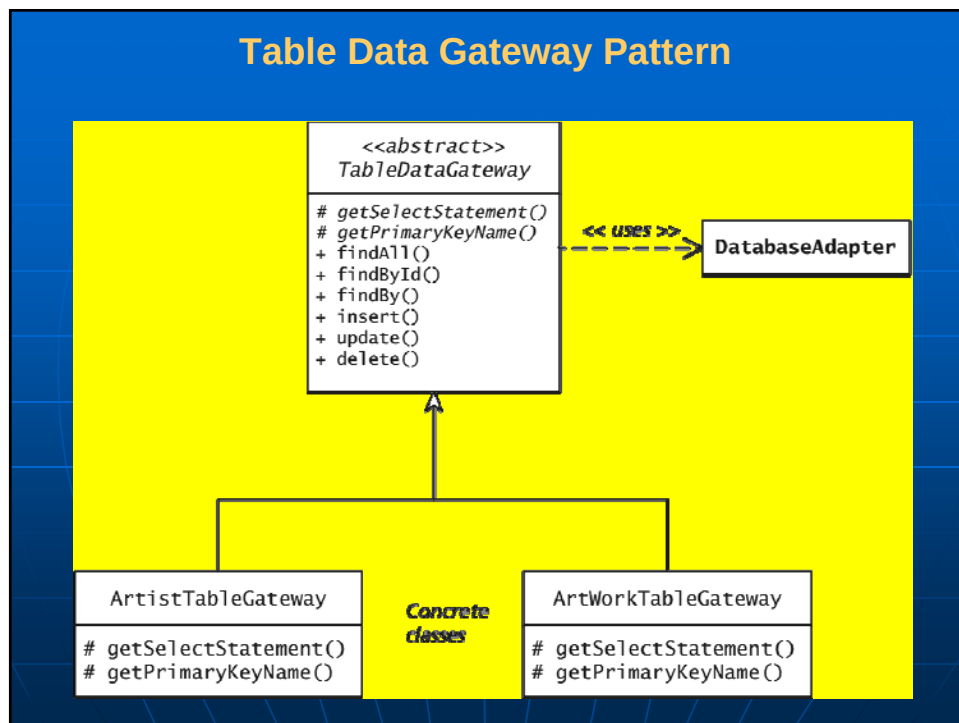
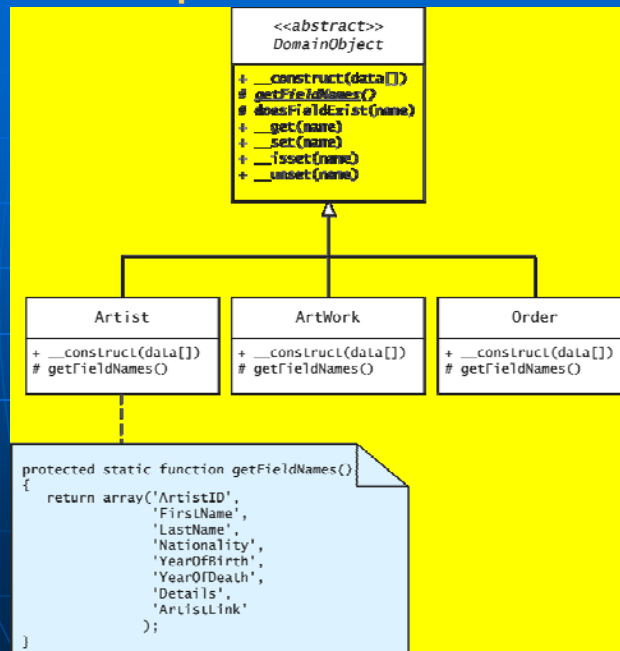


Table Data Gateway Pattern

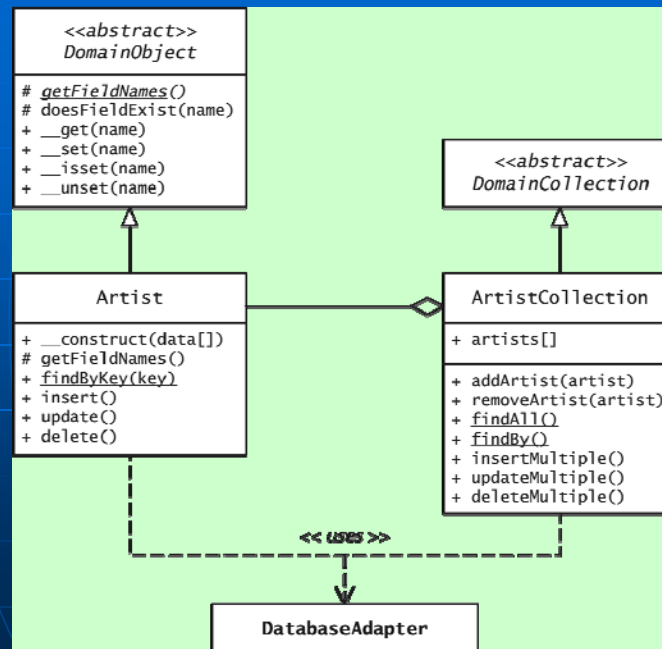


Example Domain Model



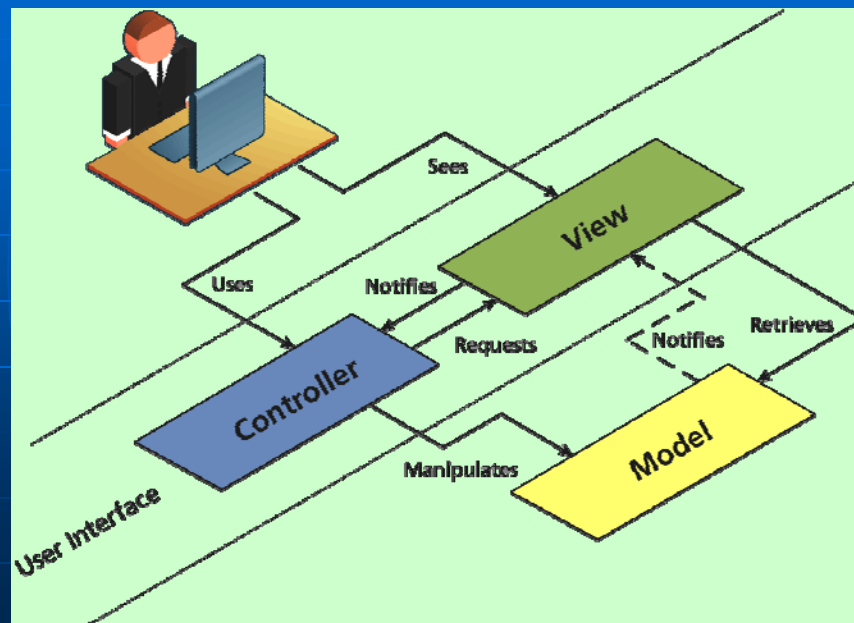
15

Active Record version of the Artist and ArtistCollection Classes

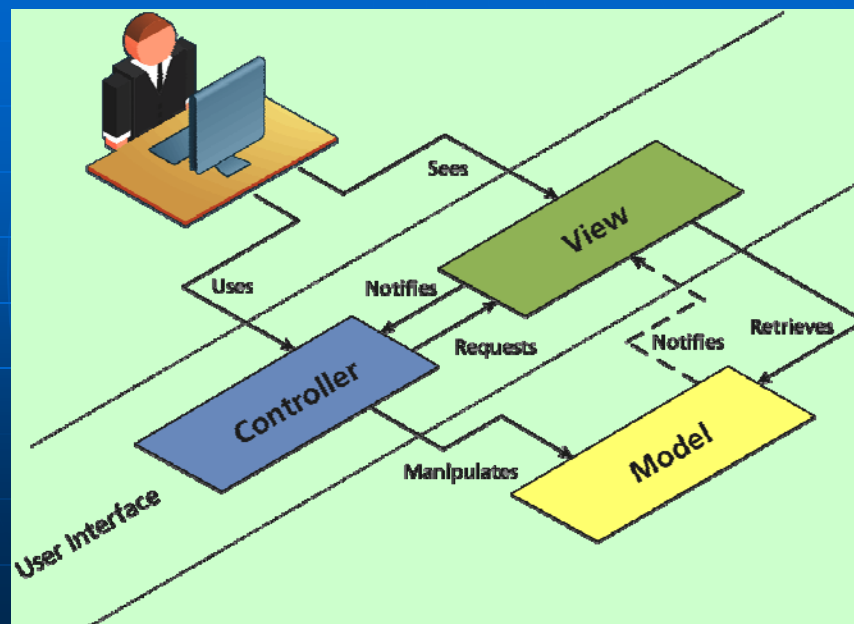


16

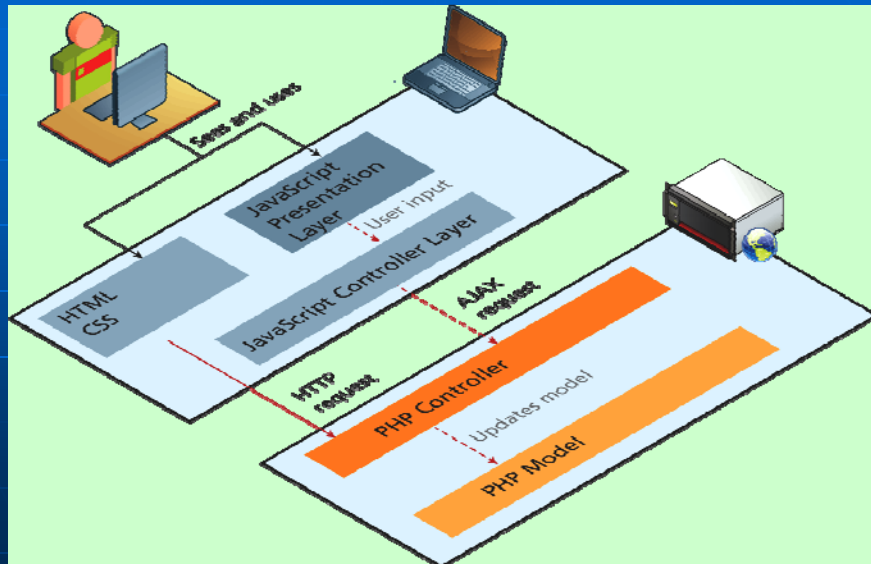
Classic Model-View Control (MVC) Pattern



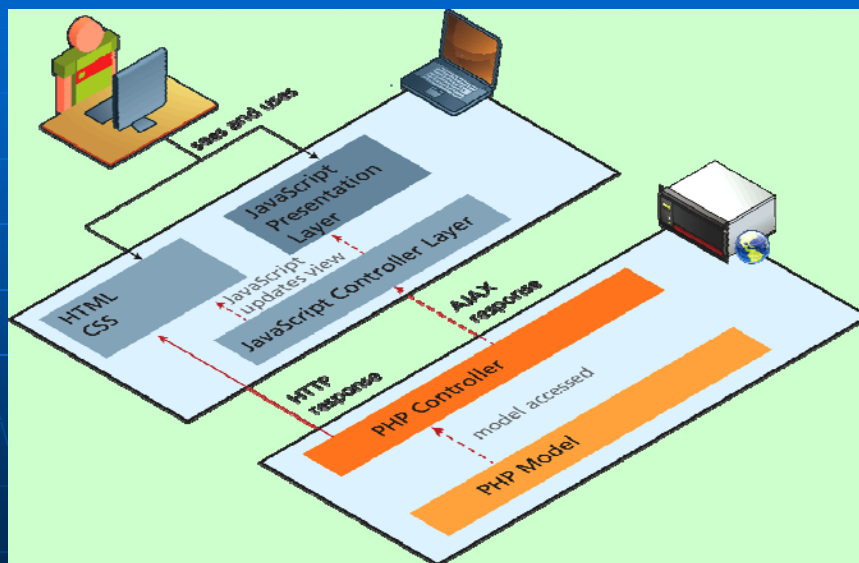
Classic Model-View Control (MVC) Pattern



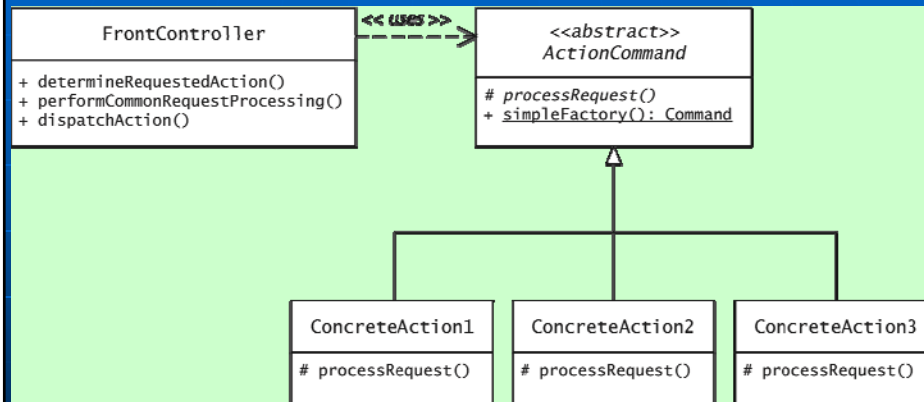
MVC Split Between the Client and the Server



Response in the MVC Between Client and Server



Front Controller Pattern

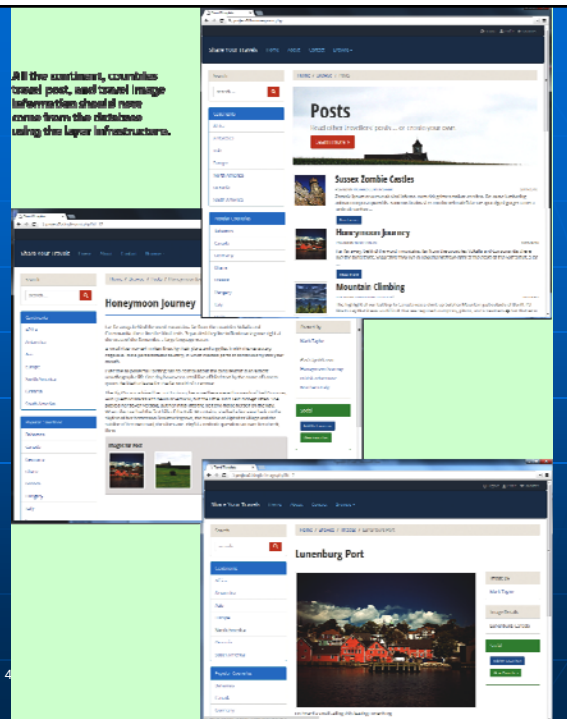


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21

Completed Project 2

All the content, including content post, and image information should be retrieved from the database using the layer infrastructure.



CPET 4

Completed Project 3

The screenshot displays the 'Book Rep CRM' application. The top section shows a table of customers with columns for Name, Email, Industry, and City. A red arrow points from the 'Edit' button in the table to the 'Edit Customer' form below. The form contains fields for Name, Email, Address, City, State, and Phone, with a 'Save' button. A red arrow points from the 'Save' button to a note about the active record approach.

My Customers

Name	Email	Industry	City
John Doe	john.doe@example.com	Technology	New York
Jane Smith	jane.smith@example.com	Healthcare	Los Angeles
Bob Johnson	bob.johnson@example.com	Finance	Chicago
Alice Brown	alice.brown@example.com	Education	San Francisco
Charlie Davis	charlie.davis@example.com	Manufacturing	Houston
Diana White	diana.white@example.com	Retail	Phoenix
Frank Green	frank.green@example.com	Energy	Philadelphia
Grace Black	grace.black@example.com	Telecommunications	San Diego
Henry Gold	henry.gold@example.com	Transportation	Seattle
Ivy Silver	ivy.silver@example.com	Food & Beverage	Portland
Jack Copper	jack.copper@example.com	Construction	Denver
Karen Zinc	karen.zinc@example.com	Media	San Jose
Leo Nickel	leo.nickel@example.com	Chemicals	San Antonio
Mia Tin	mia.tin@example.com	Pharmaceuticals	San Jose
Noah Lead	noah.lead@example.com	Automotive	San Jose
Olivia Platinum	olivia.platinum@example.com	Real Estate	San Jose
Peter Silver	peter.silver@example.com	Insurance	San Jose
Quinn Gold	quinn.gold@example.com	Consulting	San Jose
Rachel Zinc	rachel.zinc@example.com	Marketing	San Jose
Samuel Tin	samuel.tin@example.com	IT Services	San Jose
Tina Lead	tina.lead@example.com	Legal	San Jose
Uma Platinum	uma.platinum@example.com	Architecture	San Jose
Victor Silver	victor.silver@example.com	Engineering	San Jose
Wendy Gold	wendy.gold@example.com	Design	San Jose
Xavier Zinc	xavier.zinc@example.com	Development	San Jose
Yara Tin	yara.tin@example.com	Operations	San Jose
Zoe Lead	zoe.lead@example.com	Product Management	San Jose

Edit Customer

Name:

Email:

Address:

City:

State:

Phone:

Annotations:

- All the category, imprint, and customer information should have come from the new active record objects.
- The customer record should link to edit customer page.
- The form should be populated with the requested customer data.
- Should use the active record approach to saving.
- After saving redisplay form with new record data.

23

Summary and Conclusion

Q/A ?