INTEGRATING SPRING, STRUTS AND HIBERNATE

IN

DEVELOPING WEB APPLICATIONS

An Independent Study

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By

Keyfe Christian L. Ang

SCHOOL OF ARTS AND SCIENCES

ATENEO DE DAVAO UNIVERSITY

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ABSTRACT

This study discusses a methodology in developing web application with java EE technologies, specifically spring, struts and hibernate. Struts, an MVC framework that handles the 3 web application concerns: business logic (model), the input logic (controller), and user interface logic (view). The view manages the graphical and/or textual output to the portion of the bitmapped display that is allocated to its application. The controller interprets the mouse and keyboard inputs from the user, commanding the model and/or the view to change as appropriate. Finally, the model manages the behavior and data of the application domain, responds to requests for information about its state (usually from the view), and responds to instructions to change state (usually from the controller). Spring, provides comprehensive infrastructure support for developing Java applications. Hibernate, an Object-Relational Mapping framework that significantly reduces development time with SQL and JDBC.

Keywords:

Web frameworks, spring, struts, hibernate, model, view, controller, object-relational mapping

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Web applications is one of the biggest and widely used channels through which people uses your application, and a web application is the natural extension point to link mobile or rich clients to your application. Web applications can create dynamic responses unlike the conventional websites that render only static pages. A web application interacts with databases and business rules, logic and function to render a dynamic response. A web application that uses any technology like Java Server Pages (JSP) sometimes interacts with database function, page design, and control flow code on a single code base. Practically, when these concerns aren't separated, any large applications become difficult to maintain.

A Web application framework is a web framework designed for any web applications, dynamic websites, web services and web resources. Frameworks then aims to lessen the overhead with common tasks performed in web developments. For example, frameworks provide libraries for database management, session management and often frameworks promote code reuse that results to provide a platform in which web applications can be more quickly built. And a framework promotes two things. First, it tries to automate all the tedious work and tasks with regards to web development. Second, the framework introduces an elegant architectural solution to common workflows with regards to web development concerns.

1.2 Technology Application Context

Software application frameworks play a special role in developing any web application. It promotes a universal, reusable software platform, products and solutions.

This project aims to give developers a discussion on the benefits and features of using open source framework like Struts, Spring and Hibernate.

Integration of these frameworks will improve developer productivity and code maintainability. By separating the three main concerns with regards to developing web application (Web-View-Controller), supporting to solved the dependency issue between classes through Spring Inversion-of-control and lastly, help developers to save time from manually handcrafting SQL statements with Hibernate.

1.3 Objective of the Study

The general objective of this research is to integrate the 3 frameworks in developing a web application.

The Specific objectives are:

i. To introduce on how to integrate spring struts and hibernate framework

ii. To separate the three web application concerns (Business logics, model, user interface).

iii. To used Spring dependency injection framework in resolving object dependency issues.

iv. To used hibernate framework in data-processing

v. To develop a web application prototype integrating the 3 frameworks.

1.4 Significance of the Study

The study is significant for all J2EE web application developers. Spring, Struts and Hibernate frameworks are used to solve common web application problems like maintenance overhead, dependency issues with java classes and manual handcrafting of SQL statements for database transactions. In overall, the study aims in improving application scalability, code readability, maintainability, code reusability, and improve developers who are considered to be a "cowboy coders" to a more structured developer.

Struts MVC separates the three main concerns with web application development; namely database functions, page design code, and control code. Separating these concerns lessen the overhead during maintenance.

Why is this?

With MVC it is easier to debug, modify specific function, and look for errors because of the abstraction between view, model and controller. The Model represents the business code, function, logic and it has only access to the database. The View represents the design representation itself, and the Controller represents the navigation code and it has only access to Model to change state.

Hibernate eliminates learning and manual handcrafting of SQL. Hibernate also takes care of mapping Java classes to database entities and also provide data querying.

Spring can effectively organize the web application middle tier objects. Spring takes care of wiring objects that defines their dependencies that is only through constructor arguments, in which is set on the object instance after it is instantiated or constructed from a factory method. Spring perhaps is most valuable in the middle tier; spring's configuration management service can be used in any architectural layer. Spring

promotes good programming practice by reducing the cost of programming to interfaces, rather than classes.

Generally, it's hard to imagine creating twenty-first century web application without using any frameworks. Basically you can, if you do have lot a lot of budget to spend for developing your own framework. Instead of that, why not use existing frameworks that is widely accepted and tested. Perhaps it's not a question of whether to use a framework or not, but of which framework offers the solutions you need.

1.5 Scope and Limitation

This study will generally focus on integrating the three frameworks to improve the development of a web application. And a web application prototype will be developed.

1.6 Definition of Terms

Database – is an organized collection of data. Database management systems (DBMSs) are specially designed applications that interact with the user, other applications, and the database itself to capture and analyze data.

Website – is a set of related web pages served from a single web domain. A website is hosted on at least one web server, accessible via a network such as the Internet or a private local area network through an Internet address known as a Uniform Resource Locator. All publicly accessible websites collectively constitute the World Wide Web.

Web services - is a method of communication between two electronic devices over the World Wide Web.

Prototype – refers to the activity of creating prototypes of software applications, i.e., incomplete versions of the software program being developed.

Java Interface – in the Java programming language is an abstract type that is used to specify an interface that classes must implement. Interfaces are declared using the interface keyword, and may only contain method signature and constant declarations

Java classes – is the blueprint from which individual objects are created.

Java annotations – is a form of syntactic metadata that can be added to Java source code.

Extensible Markup Language (XML) - is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.

Delegate – is a design pattern in object-oriented programming where an object, instead of performing one of its stated tasks, delegates that task to an associated helper object.