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Agile Software Development Technological Implementation: Apache Struts Suitability

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ABSTRACT
Agile methodologies can be classified up into two parallel ways of implementation. One is the functional approach, which relates to the organizational behavior towards the project and the team, other is the technological implementation of the agile methodologies. This article focus on how those technological implementations are achievable with apache struts, an open source java web framework.
Keywords:- MVC, Test Case, Rapid, Retrospective, Sprint, User Stories

I. INTRODUCTION

Agile methodologies can be technically classified into the areas like Test driven development, Rapid delivery, Good design, Simplicity, Frequent delivery, Working software, Respond to Change, Continuous integration. Apache Struts support facilitates the mentioned agile characteristics for the web application development.

II. METHODOLOGIES

2.1 Test Driven Development.

Struts Test Case is known as a powerful and easy to use testing framework for Struts actions. Applying Struts with the Struts Test Case together with the conventional JUnit tests, offers a really high level of check test coverage and increase deliverable reliability consequently. Once applying it on Struts, it will give a simple and productive manner for testing the Struts actions of the package. Struts actions typically contain necessary data validation, conversion and flow management code.

2.2 Rapid Delivery.

For the agile characteristic Rapid delivery, Eclipse Struts modeler can be used. It is a multipage custom modeler for Struts files that shows a textual and graphical flow. It has configurable Struts outline viewer to automate development with colorful nodes, resizable and repositionable panes, customizable flow connection routes and auto layout scheme. It provides the facility to create entries for Forms, Actions, Forwards, Modules, Plugins, Resources, Data Sources, Exceptions, etc with special wizard to generate Form, Action, and JSP elements with workflow.

2.3 Good Design.

For the agile characteristic Good design, Struts is a collection of Java classes and JSP tag libraries which use a model-view-controller (MVC) design pattern to present a framework for building web applications.

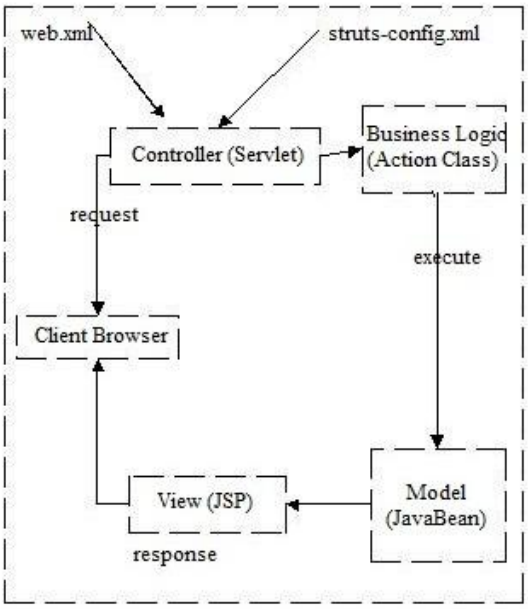

Figure 1. Struts Component Architecture

In the Struts MVC design pattern, the user interface

or view is created with JSP files which do not themselves include any business logic. View component that require business logic to be performed are submitted to a request URL which is mapped to an action servlet. The JavaBean present the model of the MVC architecture. The servlet actions control the state of the application interface with the user by creating or updating Java beans that are kept as request or session attribute.

2.4 Simplicity.

For the agile characteristic Simplicity, Struts maintains the simplicity by building applications merely by managing JSP and servlet supported on HTML format and Java source code. Struts framework is incredibly extensible and well designed for the development of web applications of any extent. Struts request life-cycle is very simple and begins with user giving request for a particular resource, the FilterDispatcher takes the request and establishes the appropriate action for it. For the application workflow Interceptors are constructed, validation is implemented and action is executed to send the generated output to the end user. Struts is simple on its design since struts classes are build up on interfaces and the actions are made decoupled towards the framework and those looks as plain java objects.

2.5 Frequent Delivery.

For the agile characteristic Frequent delivery, a lot of the conventional Java web applications suffer with a large number of architectural issues such as making web applications efficiently with the use of HTML, Javascript, JSP, servlet, javabeans, XML, and having modular approach, improved adaptability towards the changes happening in the configuration, reusability of the provided services, support for the dynamic application workflows, maintenance of the application, mediating application design across developers by standardizing it. Struts is able to help facilitate with a lot of these concerns.

The Struts framework is a type of framework which can be applied in nearly every web application development categories. For frequent delivery reuse of application business logic is encouraged, presentation and logic are divided, actions can be configured, applications are modular. Eclipse is an open source Interactive Development Environment which makes Struts development much straightforward. Struts applications can be customized for the required application behavior by means of method overriding or registered listeners. The application events include application startup, session startup, request processing and session termination. Filters provide additional control over request response cycle. For the reason that Struts builds on a lot of the JSP tag libraries, it provides a rich set for easy write of JSP with HTML, beans and business logic. Actions can be configured and ActionForm subclass is used for performing the Form validation. It also provides standard error handling which can be customized as per the requirement.

2.6 Working Software.

For the agile characteristic Working software, division of the concerns approach can be applied. Application concerns relates to the various level of application functionalities that are required to be covered. There is the particular applicable action logic which is the crux of what is required to be attained during the request-response process. There is the use of for obtaining the business objects which are required to do the action logic and for accessing the other resources like database objects. There are translations, mappings and the conversions which need to happen to take string base values in the HTML form to primitive values or types for converting view filled value objects to business logic value objects or in the database. Provided by the Struts Framework, all of these concerns are separated.

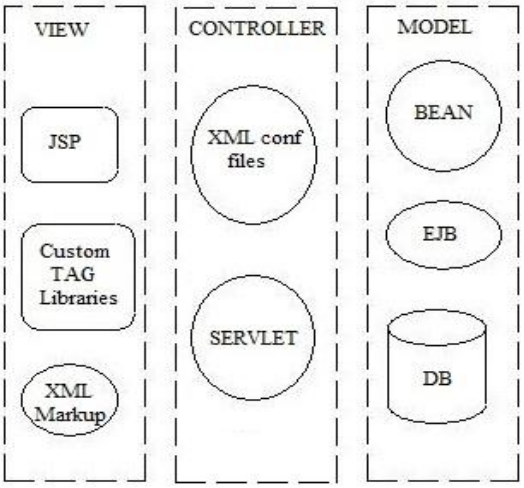

Figure 2. Struts Model Architecture

Action business logic is of the easiest concern, every particular action is itself accountable of the business logic or business functionality it has to provide. To access the available obtained logical objects Struts

acquires benefit of dependency injection and thus the objects which have the responsibility to perform the business logic in the given action are provided. Translations, Mappings, Conversions have the similar drift of design by using the concept of class inheritance applied to the core business logic. Translations and conversions are managed exclusively by the framework. Mappings are taken into account by explicit interceptors. Capability to divide applications into sub-modules proves considerable when applications grow in size. Modularization is the basic component employed by the Struts architecture, permitting developers to develop separately.

2.7 Respond to change.

Struts framework facilitates response towards the change by the applying the concept of the partition of the ActionForm, ActionClass which is delegated with the ActionServlet. ActionForm moderate the model and the view components. ActionClass accepts the user request. Web application deployment descriptor can be updated to reference additional components. ActionServlet requires the information about many things, such that how request has to be mapped to the respective action class. It is achievable but not appropriate to have a java class to implement this. To have this procedure much straightforwardly updatable, an xml configuration description file is parsed by the framework for the required mappings.

2.8 Continuous Integration.

Designing and creating an application is merely half the battle. After the application is completed, it is then to be packaged and deployed in the target environment. Standardizing the packaging and deployment process provide developers to focus on producing a quality application and use a less amount of time worrying about the application will install and run properly after completion. Struts JUnit is a utility library provided to carry out Struts continuous integration testing.

III. CONCLUSION

Struts can surely be utilized for Agile Software Development methodology technological implementations. Struts support facilitates agile methodology based code development and can be adapted in this reiterative and progressive development method of the agility. Struts supports for agile methodology governed web application development.

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