



## Study of different techniques of web application security and web mashup development using AOP

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### Abstract

In recent years, the internet application safety is mostly necessary. To the opposite, if particular moves aren't taken, the solution used maximum likely includes vulnerabilities which may additionally have an effect on the confidentiality, integrity and accessibility of the application and statistics involved. To the contrary, protection weaknesses in internet programs are frequently easy to exploit. A hacker regularly only wishes a primary web browser to perceive and exploit protection weaknesses. Software program as a web Mashup development suffer from diverse problems just like the reduction of modularity/ well-states interfaces that avert developers from easily sharing and rehash code developed by another.

The shortage of flexible security scheme that averts developers from easily and securely downloading and combine source code from many website over the world. The equivalent origin inclusion shortens get admission to various internet websites. So Modularity is a crucial role for social components of a mashup system. Modularity is the consenting aspects for big-scale internet and S/W program growing and reusability of code. If there's most effectual one developer, there could be little or doesn't required for modularity. The modularity makes it likely for huge quantity of developer to work without instructive with another. Without accurately-states interfaces, developing adjustment may be apparent to everyone. The shortage of actual modularity is a main deficiency (at the side of safety problems) that forestalls internet software and mashup development in a simply social fashion.

**Keywords:** modularity / well-defined interfaces, confidentiality, integrity, accessibility

### 1. Introduction

The web application security and web mashup development for providing the security to web applications using new proposed methods. In this research work, the main focus is given on the Aspect-Oriented programming (AOP) that supplied the power to modularize cross-cutting issues and security in a software gadget. The system provided right here, provides the benefits of AOP i.e. Simultaneous parallel decay of orthogonal concerns that is termed as application transparency and another gain is that the software program programmers and designers can consciousness on their respective situation.

One of the maximum common issues is modularity and protection of web software and web mashup which turn out to be one of the most up to date buzzwords in the net applications area, and multiple of agencies and organization are dashing to offer mashup answers The goal attempted in this research work is to use AOP as one of the major tool to design a unique security framework that even if the developer had not considered security as a one of the component of web application in the beginning, at a later stage it should be free (safe) from major vulnerabilities and attacks.

The Separation of worries is a recognized technique for the department of a software program mission's problem domain into numerous different factors known as modules. Latest programming languages like OOP make it hard, and occasionally not possible, to isolate certain worries into conceptual modules for next translation into pc code. Protection is one challenge that cannot be distributed by

traditional methods as it has a tendency to get tangled with the alternative code in a software program device. Aspect - orientated programming <sup>[1]</sup> (AOP) makes it viable to isolate this and different worries that have been previously inseparable into modules. It is crucial to realize the number of the history and motivation behind the usage of thing-oriented programming (AOP) to individual a protection concern <sup>[2]</sup> from the enterprise good judgment in an organization environment.

And also the aims and objectives of the proposed research work in constructing an AOP based software system to develop concrete methodology a way to separate the security aspect from the main logic of the system.

Internet software vulnerabilities are tough to remove due to the fact most web applications a) go through fast development levels with extremely short turnaround time, and b) are developed in-residence by using company MIS engineers, maximum of who have less education and experience in comfy software program development. ultimately, present day technology which includes anti-virus software program and network firewalls offer comparatively at ease safety on the host and network stages, however now not at the application stage whilst network and host-degree access points are distinctly at ease, the public interfaces to internet applications become the focal point or targets of attacks.

Every other popular area associated to web software is web mashup <sup>[3]</sup> that are particularly used for less crucial duties consisting of custom designed queries and map-primarily based visualizations; but they've the potential for use for extra

fundamental, complicated and sophisticated obligations in aggregate with enterprise methods in near destiny due to this state of affairs internet mashup studies is obtain a number of impetus in academic and firms communities.

Web application security <sup>[5]</sup> basically categories in to two types that are, semantic security and Physical security. The first type is, object is to envelope the problems for security thus problem are reliable data trade and secure. These conventions of security focus on advantage by existing scheme and techniques of Web 1.0 to concerning with security and disclose problem. The semantic security concerns <sup>[6]</sup> then again, handle the data partaking in a more elevated amount by misusing the authoritative approaches keeping in mind the end goal to portray the common information in a PC procedure capable way.

AOP was developed to give more concrete and usable methods to accomplish comparative finishes. With the assistance of two systems RESIN and BFlow security system can be authorized into web application. Resin and BFlow utilize information stream administration to help lessen the security dangers of utilizing carriage or vindictive code. Resin presents the possibility of an information stream attestation and shows how to make them utilizing three dialect level instruments, strategy objects, information following, and channel objects. BFlow presents a data stream control display that fits the JavaScript correspondence instruments, and a system that maps that model to JavaScript's current confinement system.

## 2. Literature Survey

In this chapter will lay out the background data is important to understand the basic of the research work One of the object for protecting the application without any knowledge regarding the system source code is by adding security module to the previous system authentication and authorization this is depends on aspect oriented programming and the liberty alliance framework, an upcoming industries standard gives single sign on. This is starting training phase the module is adapted to the application which is to be protect.

Heba A. Kurdi <sup>[1]</sup>, showing the Aspect-oriented programming (AOP) this is explains a promising programming approach for the necessary for nOn0-functional elements attribute, thus as logging, error handling and fault-tolerance. This is used to the alternate concerns and shows the big difficulty that conventional programming model could not modularize really major to an intricate code. In this innovation paper represents the AOP techniques, these are required that led to it, how it provides the better outputs in code quality and S/W developments efficiency, followed by stating difficulty that developers and researchers face when dealing with this techniques.

Jose M. Felix <sup>[2]</sup>, depicted the division of concerns plan guideline enhances programming reutilization, comprehend capacity, extensibility and viability. By utilizing the protest situated worldview, it isn't generally conceivable to isolate into free modules the diverse worries of an application. The result is that source code of intersects focus are scattered and tangled across the whole application. The AOP provide a huge amount of measured quality, giving an answer for the code disturbance and scatter problem. To show how to aspects

managed programming can be used as a moderate model to improve the determine quantity of question situated applications, this divulgate article introduces the usage of atypical outline design following both the protest and perspective situated ideal models.

Cinzia Cappiello <sup>[3]</sup> concentrate on Modern Web 2.0 applications are portrayed by high client association: clients get bolster for making substance and comments and additionally" creating" applications utilizing substance and capacities from outsiders. This last wonder is known as Web concoction and is picking up ubiquity even with clients who have few programming aptitudes, raising an arrangement of impossible to miss data quality issues. Surveying a blend's quality, particularly the data it gives, requires seeing how the concoction has been produced, how its segments resemble the other alike, and how quality spreads from essential segments to the last concoction application.

Brent Ashley <sup>[4]</sup> presenting the current web browsers security issues. The current browsers are not designed for security to get content by the many sources for the web applications pages. They describe the use of available tools by the developers to complete the assigned task and the results of the web applications for the applications security and scalability. To learn about the many current browser improvements for proposed remedy to multiple situation. To become the part of the communication in development beyond to this hurdle to the interoperability.

Jinyu <sup>[5]</sup> introducing the web mashups development. The web applications are developed using the contents and the service. It is available on internet. Despite of increasing interest in mashups developments, comprehensive development tools, frameworks and it is used in large cases for mashing up recent applications to imply the important manual programming difficulty. This research paper represents that reviews of recent tools, approach and the techniques implements to help for mashup developments. The researcher is using a set of attributes dimensions to highlight the strengths and weaknesses of several representative models.

Gerald Bader <sup>[6]</sup>, describing the Evolution of internet 2.0 applications has modified the review of commercial enterprise approach and institution. Industry required considering their advertising, conversation and sale channels and how to their client and employees communicates with externally or internally. The recent scheme, in contributed they desire to undertake their IT infrastructure and rising their on-line presence and offerings as a way to live aggressive of their organizations. Via this methodological conversion to internet 2.0 paradigm current securities and privacy issue increasing which ought to be deliberates to protection the fully RIA (rich internet application).

Jonas Magazinius <sup>[7]</sup> supplying the internet mashup is an internet software that combine content from different providers to make a recent service, no longer supplied through the content vendors. As mashups increase in demanding, the disturbance of secure facts drift among mashup additional turns in growing critically. In this innovation paper provide protection lattice-based whole techniques to mashup safety, in which the origins of the distinctive elements of the mashup are utilized as tiers Distinctive and include the security lattice. Declassification enable handled facts launch among the

elements. The author define a approach of combined define launch scheme and provides for realistic (static as well as runtime) implementation of mashup statistics-glide safety rules in an internet browser.

Kotrappa Sirbi [8], defined an application security has two primary dreams: first, it is meant to save you unauthorised personnel from having access to data at better category than their authorisation. Second, its miles supposed to prevent employees from declassifying data. Using an object oriented technique to implementing application security consequences no longer most effective with the issues of code scattering and code tangling, but also outcomes in weaker enforcement of safety. This weaker enforcement of security might be due to the inherent layout of the gadget or because of programming errors. Aspect orientated Programming (AOP) complements Object Oriented Programming (OOP) by using supplying any other manner of considering program shape. The important thing key unit of modularity in OOP is the magnificence, while in AOP the unit of modularity is the component. The goal of the paper is to present that aspect orientated Programming Aspect J integrated with Spring AOP presents very powerful mechanisms for stronger enforcement of safety. RohitSethi [9], implementing the Aspect -orientated programming (AOP) is a scheme is fast growing grip within the increase international. At least partly prompt with the support of the popularity of the Java Spring framework [1], human are conception to detection the significant advantages that AOP to implementation. At the same time as some others have firm AOP security, the author suggest that, the main objectives of this innovation to detecting among data safety colleagues that AOP could have a substantially useful impact on application safety. The author suggest that, developer are implemented the better application to make the secure programs and perhaps, more significantly add safety in to existing self-consciences applications.

Nicolai Kuntze [10], expressed the identity control is becoming an increasing number of essential in enterprise systems as they're opened for third events consisting of trading companions, purchasers and providers. This paper affords an approach securing a device with none understanding of the gadget source code. The security module provides to the existing device authentication and authorisation primarily based on element oriented programming and the liberty alliance framework, an upcoming industries fashionable imparting single sign on. In a preliminary education segment the module is adapted to the utility that's to be secured. Furthermore the use of hardware tokens and proactive computing is demonstrated. The excessive modularisation is achieved thru use of AspectJ a programming language extension of Java.

### 3. Proposed Approach Framework and Design

#### A) Problem Definition

Design a unique and concert security framework to address a security and modularity problem encountered specially in web Mashup application in that even if the developer had not considered security and modularity as a one of the component of web application in the beginning, at a later stage it should be free (safe) from major vulnerabilities and attacks with the help of new programming paradigm i.e. Aspect oriented

programming (AOP).

#### B) Proposed System Architecture

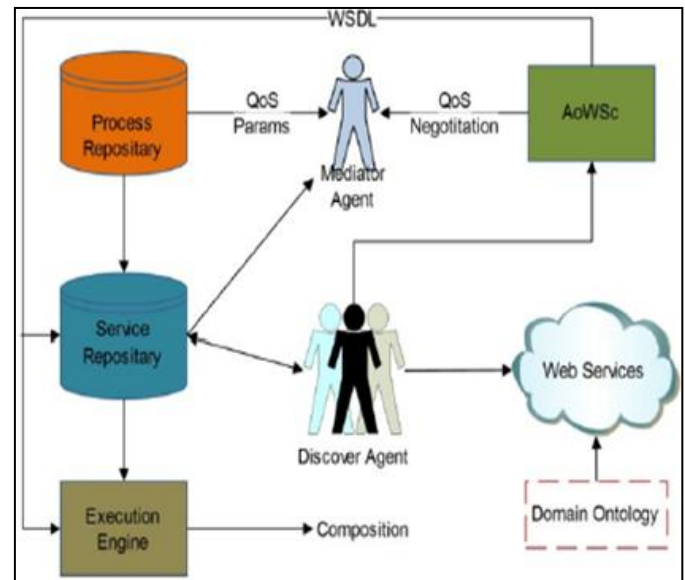


Fig 1

If person wishes to change the invocation of the code associated to crosscutting concerns, he need to should alternate every distinction that includes such an invocation. Doing so breaks the Open/close precept—opens for extension, however closed for changes. The overall outcome is a more price of presenting features and fixing bugs. Now these entire problems can be solved by new programming paradigm like aspect-oriented programming (AOP).

#### 4. Mathematical Module

AOP mathematical model for QoS based Aspect Selection & Petri Net Algebra:

The selection of net services is controlled by means of the option module with the level of QoS necessary as the input. This methods of service selection, entire service which content the measuring QoS level are been selected.

Let  $N = \{WS1, WS2, WS3...WSn\}$  be the set of internet service recorded in the record.

$$\text{Determined QoS} = (\text{Service Req, Expected Res})$$

$$\text{WSSelect} = \text{select} (\text{WS\_Non\_functional\_params, Determined QoS})$$

An attribute is provided in 3 tuple elements thus are provider, role and description. The Role identify whether or not it has to be carried out earlier than, after or around.

Petri Net Algebra

A Petri internet offers modelling technique for specifying formal metrics. Its miles observe as a instruments for recognize the efficiency of the implemented formal semantics. The set of rules (AoWSC) is designed to element – orientated web service Composition.

**Algorithm: AoWSC.**

1) Step 1: Initialize.

- 2) Step 2: Service Req =  $\sum_{i=1}^n \text{Concept}(i)$   
 3) Step 3: Determined QoS = f (Service Req, Expected Res).  
 4) Step 4: For each i in Service Req  
 5) Step 5: Search (Serviceregistry, Concept (i))  
 6) Step 6: Add To Temp Candidate WS List ().  
 7) Step 7: For each j in Temp Candidate WSL ist  
     If (chk Qos (WS (j) > Determined Qos)  
     Add To Candidate Ws List ()  
 8) Step 8: End For  
 9) Step 9: End For

## 1. Hardware and Software Used

### Hardware Configuration

- Processor : Intel Core I3
- RAM : 4GB
- Disk : 320 GB

### Software Configuration

- Operating System : -Windows 7 (onwards)
- Development Languages: - Java, JSP
- Server: - Apache,

## 5. Results

The rising programming scheme, supply to its possibility in the domain of internet service integration. Each and every internet provider is respect as components.

### A) AOP Terminologies

Aspect – states with a Point cut with a direction.

Point cut –the region hole on which the join aspects are put in important files of code.

Join points – personal parts of code to be combining at time to form a direction.

Advice – the entire code wherein the join are join with the point cut. Help could be computed before, after the join point.

### B) QoS based Aspect Selection:

The predicted variety of QoS of the carrier request is distinct with commend to the requestor. The selection of internet services is deals with via the chosen agent with the level of QoS wanted to the input. The innovation technique of service selection, all of the providing which content the resolved QoS degree is been distinct on.

Let  $N = \{WS1, WS2, WS3, \dots, WS_n\}$  be the group of web services recorded in the record.

Determined QoS = (Service Req, Expected Res)

WS Select = select (WS\_Non\_functional\_params, Determined QoS)

An aspect is given in three tuple, aspect (position, description, service). Position specifies whether it has to be applied before, after or around.

### C) Petri Net Algebra

A Petri internet is a procedure modelling approach for States formal metrics. It are also examines as a device for scheme out the efficiency of the new formal semantics. A Petri net is an associated with bipartite graph with nodes introduces an region or a transition. With applaud to AOWSC, the region

and conversion may be comparatively mapped to services and the conversion control flow include services appropriately. There are numerous tactics described for configuration in survey. The table no 1 review the relative observes of those techniques with the proposed technique. The evaluation is primarily depends on the ability like carrier connectivity, the approach utilized for inclusion of QoS, composition, the evaluation techniques and graph demonstration.

## 6. Conclusion and Future Work

Now today In It era the Web application/Mashup is raising the platform of selection for progressive S/W application. The web based application has many numbers of advantages: these applications does not require installation or upgrades instant worldwide deployment without middlemen. This application will desperately modify the way people develop, deploy and use S/W scheme transport. The Web technology required to develop in a helps that enable S/W to make by dynamically. The integration of the best possible elements from whole the world S/W as a “social mashup” But the main hurdle is modularity and security which has been addressed by new programming paradigm shift i.e. Aspect oriented programming.

After examine various web application development codes it has been found that several security-relevant cross-cutting concerns are scattered throughout the application logic:

- Logging
- Access control
- Error handling
- Transaction management
- Session management (in some cases)
- Input/output validation

This leads to insecure web application and raises multiple numbers of security worry the arise from proper coding. The crucial defect or vulnerabilities enable hackers to obtain direct and public access to data in manner to beat sensitive data. Using AOP, it was possible to different a better huge chunk of these cover from the code base and concentrates them. Certain there will be several cases where centralization is not available (for example. Particular error handling), but by and huge, AOP enable to focus on the POJO (plain old java object) class. A POJO (Plain Old Java object) is necessary the code that has been utilized to write from day one; code that only concentrates on business logic and no other concern as logging, complex error handling and input validation. The Cleaner code is less prone to bugs – involves security bugs.

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