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E-COMMERCE APPLICATION BASED ON THE MVC ARCHITECTURE ON MULTI-CLOUD SYSTEM

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ABSTRACT

Cloud computing preeminently impelling the business models. Along-with the alluring features cloud computing provides a platform for businesses to work efficiently and different types of model based system which can help business application, in improvising them. Model based systems provide a different approach for e-commerce applications which are suitable for testing and upgrading the application. We propose a MVC based architecture for e-commerce application that runs on the multi-cloud service platform that can suitably solve the problems of testing and upgrading the application.Lastly, a web application example is shown to entice the research work.

Keywords: ***Cloud Computing, E-Commerce, Multi-Cloud Computing, MVC, Testing, Web-Application.***

I. INTRODUCTION

It is an inarguable fact that internet has changed the world and provided a new way of peoples existence. With advancement in internet and development of cloud computing lead it to a different dimension which provided a new way of communication and transaction. So, as the transaction is concerned Internet changed the way of businesses to be done. Transaction between businesses is e-commerce that opens a era for the companies to get into the business. E-commerce include shopping, banking, real estate transaction, air line booking, transportation of goods, stock and bonds trading and anything one can imagine.

An e-commerce application is nothing but a lucid website that can be created or edited on various platforms. Traditionally platforms architecture comprised of client-server architecture. With advancement of technologies several architectures preluded multi-tier architectures such as two-tier and three-tier architecture, and Model View Controller (MVC) architecture.

MVC architecture separates the core functionality from presentation and control logic that uses this functionality. It allows multiple views to share the same data model. This architecture supports multiple client's implementation, testing and maintenance.

An e-commerce application can be contrived on the basis of MVC architecture which separates the core functionality from the presentation and logic unit and can efficiently work on cloud. Multiple companies can work on the same application unaware of the data of other company on the single cloud based application. This application can be maintained and upgraded with out any hitch to the other files and data.

II. RELATED WORK

2.1 E-commerce, Cloud Computing, MVC

2.1.1 E-Commerce

E-commerce is communication or transaction of the businesses. E-commerce is the exchange of the product and the services [6]. E-commerce provides nearly everything one can imagine in a 'website' form unlike traditional cases where it required expensive interfaces and personal security certificate [8]. Electronic commerce allows companies to combine their internal and external businesses through information and communication technology. Which can be accomplished using intranet, extranet and the Internet [4].

2.1.2 Influence of Cloud Computing on E-commerce

Cloud computing is a revolutionary idea which led the Internet to a new direction and radically changed the business models. Merging of cloud computing and e-commerce is very influential to the enterprise in all aspect [8]. Cloud computing best described as the technology that moves the data away from desktop or portable PCs to large data centres [4]. The cloud computing allows us to access the pool of the configurable computing resources like servers, storage application and services. Computing resources (services) can be accessed from cloud service provider on minimum effort. Cloud computing provides us Quality of Services (QoS) guaranteed infrastructure [3]. A consumer can purchase various services like infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), or software-as-a-service (SaaS) and sell value added services to the user like utility services. These services can be purchased from the cloud service provider [4]. The main idea of cloud computing is to abstract the implementation logic from service provider and efficiently virtualize the services [3].

2.1.3 MVC Architecture and Cloud based E-commerce application:

E-commerce applications basically use client server architecture where data is stored on the data repository and client access and manipulate the data in the given repository. The client might consist of model and view where model is client side business logic and view is the representation of the model. If several hundred thousands of users are in consideration than this model fails to exhibit editing and other operation in the given application [5]. Provision of the framework efficiently reduces the amount of the time required and is convenient for the editing and the upgrading the web application [2]. MVC framework has widespread use in contriving the web-based application. MVC stands for model view and controller fig. 1 shows the MVC architecture.

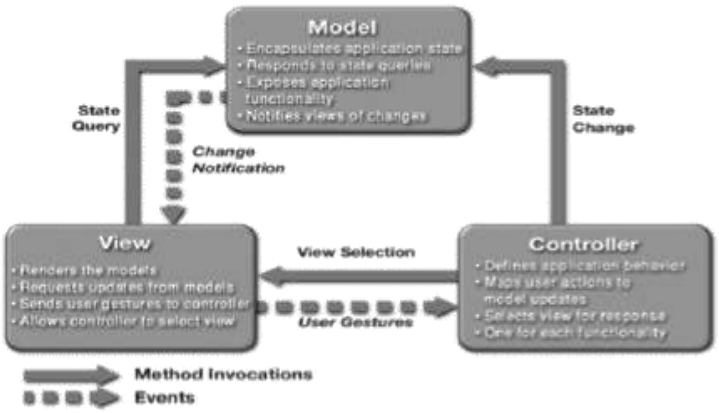

Fig.1 MVC Architecture

- Controller used for sending the command to model to update the model state or commands view to update the representation of model [9].
- Model notifies the associated view and the controller to update them for the occurred change and hence change the representation of the model in the view [9].
- View requests the information via controller to generate the output representation for the user [9].

Model View Controller (MVC) design is main source of the motivation that led to architect the domain module and interconnection. The controller and view modules are separated on distributed cloud. Different cloud offers different services depending on there type View cloud offers graphic user interface (GUI), where as Controller cloud offers task-as-a-service (TaaS) [3].

Each of the module in the MVC model are provided with certain classes. Model module contain the classes for the SQL syntax whose instances are used for manipulating the databases and is advantageous for reducing the syntax error in SQL commands. Controller module is created to handle the user events and the view module for representation of the model. Decoupling of the module reduces the complexity and hence provides the flexibility to reuse the code [2].

2.2 Testing and Security of the E-commerce Application based on the MVC model

2.2.1 Testing

With the increasing demand for the e-commerce the no of web applications are increasing. With implementation of the MVC architecture (model driven architecture), the model based testing approach is applied to the application to the application to check the flaw and incompetency in the application for more prominent use. Testing technique include checking of the model used to drive the code and testing the transformation that are made.

2.2.2 Security

Cloud service provider (CSP) provides the online storage for storing the data of the user. The data is stored in the encrypted form on the cloud which is not accessible to the lower authority member, but a higher authority member of CSP can access the user's information. The best approach to protect the unauthorized access of CSP member authentication, encryption and storage of the data can be done by different CSPs [7]. Different cloud provides different services depending on the there type [3]. Different CSPs can be used to authenticate, encrypt, and store the data so as the a single CSP can access to the particular information [7]. On the other hand security against the network attack can be done using a device security kernel wrapper. This wrapper makes a shield around the cloud securing the cloud from the malicious attacks of the network and other malicious user. The security kernel is provisioned for basic standard security measure so as to check the flow of the data and various security events [3].

III. PROPOSED WORK

Testing, Security and Modification are not an easier task in client server based e-commerce application [5]. To implement features of testing, security and modification we propose the E-commerce Application based on MVC architecture which runs on the cloud platform provided from multi cloud service provider. The application

based on this system can be used by number of users. Modifications can be done according the requirement of the user. Views can be set accordingly using the controller commands that are given in an user event. Improvised security feature can be used for securing the user data and the information from malicious attack and the other unauthorized malicious user, which is implemented using multiple cloud and forming a security kernel wrapper.

IV. THE EXAMPLE OF WEB APPLICATION

In this section we take an example of the web application created in PHP. The database relates the user data that is shown in the table below. A view of database is created in the table format as the output. The complete procedure is completed using MVC architecture as follows:

4.1 Model

The process starts by accessing the database and retrieving the data. The model notifies controller changes occurred in the database

```
class User_Model extends CI_Model {

    function __construct() {
    }

    function list_users($user_id=NULL){
            $session_data = $this->session->userdata('logged_user');
            //print_r($session_data);
            if($user_id==""){

                $sql="SELECT * FROM users where companyid='" . $session_data['companyid'] . "'";

            }
            else {
                $sql="SELECT * FROM users where uid=" . $user_id;
            }

                $rs = $this->db->query($sql);
                return $rs;

            }
```

Fig. 2 Model Module Code

The following table shows the existing entries in the database:

Fig. 3 Database table Entries

4.2 Controller

At the very next step controller commands the view to show the present data in the user table on the reception of the user event.

Fig. 4 Controller Module Code

4.3 View

At this step the view module is used to generate the view for representation to the user. Controller commands the view module to show the data in the requested manner.

```
<section>
    <div class="box">
                <div class="box-header">
                    <h3 class="box-title">List of Users</h3>
                </div><!-- /.box-header -->
                <div class="box-body table-responsive">
                    <table name="tbl" id="tbl" class="table table-bordered table-striped">
                        <thead>
                            <tr>
                                <th>Name</th>
                                <th>Email</th>
                            </tr>
                        </thead>
                        <tbody>
                          <?php echo $tableHtml;?>
                        </tbody>
                     </table>
            </div>
        </div>
</section><!-- /.content -->
```

Fig. 5 View Module Code

The output generated using model view and controller module is the data from the model module in the requested manner.

Fig. 6 Output of the View Module

V. CONCLUSION AND FUTURE RESEARCH

Client-server architecture have the drawbacks, it restricted the further development and enhancement of the web application. MVC architecture in place proven as a useful architecture for the development and enhancement of the web application. It supports maximum security and hence keep user data at safer place. Model based testing approach can be used for testing the flaw in the code. Modification can be provided according to the requirement of the user. The programmer can take full advantage of this architecture because of reusability of the code.

With the implementation of this research client will able to use multiple cloud service providers and can store data and run the web application from the multiple cloud platform.

Our future work is to develop a single web based tool for same type of enterprises and provide them a secure interface according to there requirement.

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