



Integration of CRM System Based on MVC Framework with Payment Gateway

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Abstract-- CRM (Customer Relationship Management) is a business process in which client relationships, customer loyalty and brand value are built through marketing strategies and activities. A payment gateway is a server that is dedicated to linking websites and banks so that online credit card transactions can be completed in real-time. This paper attempts to introduce that:- There are hundreds of different CRM systems existing in the market but based on MVC pattern, the CRM system model can increase performance, provide high reliability, increase in speed and save time. Integration of CRM with Payment gateways help to protect sensitive information like credit card numbers and other account information by encrypting the data they transmit to merchants and payment processors.

Keywords--CRM; Payment Gateway; payment procedure; MVC framework; E-commerce.

I. INTRODUCTION

CRM (Customer Relationship Management) is a system that manages all of a company's relationships and interactions with the customers including customer information, knowledge of what customers and the general market want along with giving a single view of client across the organisation. CRM's core strength is an ability to glean insight from customer feedback to create enhanced, solid and focused marketing and brand awareness. Many Merchants provide the ease of shopping to the customers all over the world sitting at their home using E-commerce websites. Most of the population is using online payments hence there is need of a secure online payment gateway.

Also with the increasing demands for the online shopping the overhead on the Merchant's side has also increased as it has to maintain its customers details, online transactions made whether successful, unsuccessful or pending along with finding new methods for increasing its customer relationships. So there is a need for a stable, secure, reliable, high performance CRM system model. All of these characteristics can be achieved using a MVC framework.

MVC, abbreviation for "Model-View-Controller" is the name of a methodology or design pattern for successfully and efficiently relating the user interface to underlying data models. The MVC helps to manage complex applications, as the user can focus on one aspect at a time. The model-view-controller pattern proposes three main components or objects to be used in software development:

- *AModel*, which represents the underlying, logical structure of data in a software application and the high-level class associated with it. This object model does not contain any information about the user interface.
- *AView*, which is a collection of classes representing the elements in the user interface
- *AController*, which represents the classes connecting the model and the view, and is used to communicate between classes in the model and view.

MVC is a way to separate the Business code from the presentation code. The Model does all the real business work. The views provide the look and feel, and the controller maps one to the other.

The MVC pattern works in four steps. Firstly, the user sends the HTTP request through the User Interface which is a browser to the controller after analysing the request, the controller sends it to appropriate model. Secondly, the model uses suitable functions and mechanisms handling with the logic of the task according to the request, and returns the data to the controller. Thirdly, the controller calls correct view, sending the results to the browser which is dealt by the model. Finally, the controller send the HTTP response to the user.

II. PAYMENT PROCESS

In the payment process there are five participants:

1. Customer
2. Server (e-payment gateway)
3. Client bank
4. Merchant bank
5. Merchant

1. Customer does the shopping and places the order on the e-commerce website and it is sent to the merchant's web server in the encrypted format using SSL (Secure Socket Layer) encryption.
2. The encrypted transaction details are then forwarded to the concerned payment gateway.
3. The payment gateway then passes the encrypted transaction information to the merchant's acquiring bank.
4. Merchant's acquiring bank then forwards the transaction information to the issuing bank (one that issue the credit card number to the customer).
5. The response is sent to payment gateway by the card issuing bank. The response includes whether the payment has been approved or declined. In case of declination, the reason is also sent to the payment gateway.
6. The payment gateway then forwards the response to the merchant's server where the response is encrypted again and is relayed back to the customer. Through this customer knows whether the order has been placed successfully or not.

III. REQUIREMENTS OF PAYMENT GATEWAY

There are three main requirements for a payment gateway to work:

1. A website that meets the security and eligibility requirements for the bank to issue a merchant account
2. A merchant account from a bank. A merchant account is a special kind of bank account that can be linked directly to a payment gateway. These bank accounts are issued only upon review of a website to ensure it meets privacy and security requirements. Requirements often include an SSL certificate and a privacy policy.
3. A payment gateway provider. Payment gateway providers offer the server that acts as the link between your website and the bank. The server has a very special configuration and a very high level of security due to the sensitive nature of the data being transferred.

Once all three requirements are met, the payment gateway then needs to be integrated to the website and to the merchant account. This will then allow for real-time credit card processing.

IV. FRAMEWORK OF PAYMENT GATEWAY

There are five participants:

1. Customer.
2. Merchant server.
3. Payment gateway.
4. Bank.
5. Merchant.

While online shopping the customer places the order and gets connected to the e-payment gateway through internet. The gateway will then connect to the bank and check whether the customer's bank accounts are enough to purchase the required product. The payment gateway has systems in place to interact with various banks, clearing houses, credit card companies and other financial institutes. From Fig. 1 we see that, once the credit card details of the customer are passed on to the merchant's server it then requests the payment gateway to process the required transaction. The payment gateway then requests the bank to get the confirmation about the customer's account for the successful transaction. Once the transaction is successful the funds are transferred to the merchant's account, also the success/failure bank response is sent back to the customer via payment gateway and merchant's server.

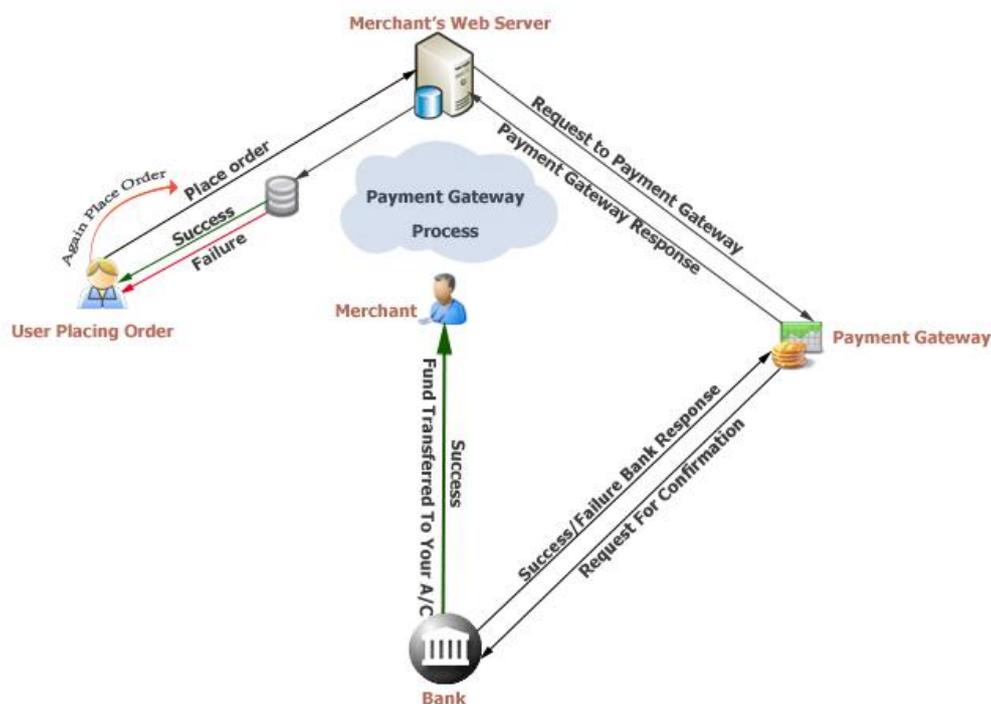


Fig. 1. Working of Payment Gateway.

V. IMPLEMENTATION OF CRM SYSTEM BASED ON MVC FRAMEWORK

As the growth of business in market is increasing, the merchants needs a stable, reliable and efficient CRM system to manage its clients in order to stimulate their future business. Thus, the CRM with MVC is a good solution. MVC keeps the three logic types independency to build the business and data logic oriented business and design the control and display logic oriented application. The changing of business processing does not modify the business and data logic. The changing of business principles and algorithms only modifies Model class. So, MVC separates the data accessing and display and ensure the modules independency.

The CRM system based on MVC framework uses “B/S architecture” where “B/S” stands for “Browser/Servers”. It is easy to maintain and update the system since it only has to do with the servers. It also suffices the expansibility of user’s needs.

The whole system can be divided into several parts: system environment management, user and access control management, fundamental data management, business data management. Each parts function module serves as the business logic layer in MVC, present in different operation based on different information input. Among all the modules mentioned above, the access control module is the key of the system security.

The development platform should be open-source software and with advantages such as less storage room, cross platforms, high performance, low cost, secure and stable.

VI. INTEGRATION OF CRM WITH PAYMENT GATEWAY

The payment gateway provides the data structure, workflow and complex processing logic, support and security necessary to ensure fast, reliable and secure transmission of transaction data. By integration of CRM with payment gateway when the customer places an order, the merchant’s website asks the customer to enter its credit card details such as credit card number, expiry date, the name of the person as it appears on the card. These details are then forwarded to the payment gateway in the encrypted format which then verifies it with the bank and then redirect’s the customer back to the merchant’s webpage.

The main advantage of integrating the CRM system with payment gateway is that the merchant is free from issues of setting up SSL at their website and worrying about the privacy of the customer’s credit card details. Hence, ensuring safe and reliable transactions.

VII. CONCLUSIONS

The MVC is a better design for CRM system model based on MVC framework as the extension and alternation of CRM system functions only reorganize the corresponding business logic without modifying the whole system. The detachment of the Model layer and View layer makes it easier to change the business logic and reduces the maintenance cost. So the system design based on MVC fits the multi-user CRM system that is extensible, high interactive, and easy to maintain.

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