MULTITENANT EFFECTIVE CRM APPLICATION USING SALESFORCE

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Abstract— **Salesforce is very famous cloud computing technology available in IT sector. Now a day there is no need to install the hardware and software. All things are available on the cloud. SDFC (Salesforce.com) is one of the top on demand CRM software which runs on the force.com with CRM. CRM is a managing model used for managing the organization interaction like Emails, calls, social Media meeting with the users (uses the services) and Meetings. It also expects to penetrating to Sales, support and Marketing. In this paper we are discussing about Introduction to Cloud Computing, types of service models in Cloud Computing, Types of Cloud Computing, Architecture of Cloud Computing and Introduction to MVC as well as SFDC MVC. In addition, we discuss about Introduction to Salesforce, SOQL and Its Comparison Operators and Force.com IDE and CRM. The aim of this paper is to show mainly importance of Salesforce.com which is a software giant that manages to give the customer, an easy to use as well as multitenant effective CRM solution.**

Keywords—SDFC, MVC, SOQL, CRM

I. INTRODUCTION

We are living in an information age. Systems are designed to create, store, manage and distribute data and information. Traditionally, organizations have relied on physical infrastructures to manage data and information. With the explosion of information and related data, the physical footprint required to manage the information base has grown tremendously. With an increase in the number of physical servers, storage and networking equipment, the time required to manage has gone up exponentially increase. This causes traditional business application becomes expensive, complicated and for installing, configuration, testing, security etc. We need to eliminate all the problems using cloud computing because we can manage only software; hardware is the responsibility of an experienced vendor. Now these days trend changed in IT industry that is Cloud computing, all the Businesses are running all kinds of apps, web servers in the cloud, such as customer relationship management (CRM), accounting and HR, and with a cloud app or website we can open a browser, log in, customize app, and start using it whenever we want Cloud provides tangible business benefits to business. It saves cost to the business thus improving the bottom line. It also adds value to the existing business processes by incorporating new functions for increasing efficiency, flexibility, manageability and improved transparency. Cloud connects a business requirement to technology and can be used to map and fulfil a business requirement.

II. CLOUD COMPUTING

CLOUD COMPUTING

Cloud defines a framework to deliver IT as a service in the most efficient and the fastest way possible without a need to actually own the resources required to achieve the same, all along providing a level of transparency and monitoring not feasible in earlier paradigms.

Cloud is composed of seven major components:-

1. Provisioning and Configuration Module
2. Monitoring and Optimization
3. Metering and Chargeback
4. Orchestration
5. CMDB (Configuration Management Database)
6. Cloud Lifecycle Management Layer
7. Service Catalog

The function of each module or components of Cloud is as follows

Provisioning and Configuration

Provisioning and Configuration layer forms the lowest layer of cloud and typically reside on bare hardware (as firmware) or on the top of the hypervisor layer. The function of this layer is to abstract the underlying hardware and provide a standard mechanism to spawn instance of virtual machines on demand. The layer also handles the post-configuration of the operating systems and applications residing on the VM.

Monitoring and Optimization

This layer handles all the monitoring of all server, storage, networking and application components in Cloud. Based on this statistics, it could perform routine functions that optimize the behavior of the infrastructure components and provide relevant data to the cloud administrator to further optimize the configuration for maximum utilization and performance.

Metering and Chargeback

This layer provides functions to measure the usage of resources in Cloud. The metering module collects all the utilization data per domain per user. The module gives the Cloud administrator enough data to measure ongoing utilization of resources and to create invoices based on the usage on a periodic basis.

Orchestration

Orchestration is central to Cloud operations. Orchestration converts requests from the Service

Management layer and the monitoring, chargeback modules to appropriate action items which are then submitted to provisioning and configuration module for final closure. Orchestration updates the CMDB (Configuration Management Database) in the process.

Configuration Management Database (CMDB)

CMDB is a central configuration repository wherein all the meta-data and configuration of different modules, resources is kept and updated on a real-time basis. The repository can then be accessed using standard protocols like SOAP by third party software and integration components. All updates

to CMDB happen in real-time as requests get processed in Cloud.

Cloud Lifecycle Management Layer (CLM)

The Layer handles the coordination of all other layers in Cloud. All requests internal and external are addressed to the CLM layer first. CLM may internally route requests and actions to other layers for further processing.

Service Catalog (SC)

Service Catalog is central to the definition of Cloud. SC defines what kind of services the cloud is capable of providing and at what cost to the end-user. SC is the first thing that is drafted before a Cloud is architected. The Service Management Layer consults SC before it processes any request for a new resource.

Cloud computing is simply a model for enabling convenient, ubiquitous, on-demand network access to a shared pool of configurable computing resources like networks, servers, storage, applications, and services that can be rapidly provisioned as well as released with minimal management effort. This cloud model is composed of some essential characteristics (On-demand self-service, Broad network access, Resource pooling, Rapid elasticity, Measured service, Multi Tenacity), service models (Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS)), and deployment models (Private cloud, Community cloud, Public cloud, Hybrid cloud).

III. CLOUD COMPUTING ARCHITECTURE

Cloud Computing architecture comprises of many cloud components, as well as each of them are loosely coupled. We can divide cloud architecture into mainly two parts like Front End and Back End, and also each of ends are connected through a network, usually via Internet.

A. **Front End:** It refers to client part of cloud computing system, as well as consists of interfaces and applications that are mainly required to access cloud computing platforms.

B. **Back End:** It refers to cloud itself, as well as consists of all resources required to provide cloud computing services. Back end comprises of huge data storage, virtual machines, services, security mechanism, servers, deployment models, etc.

IV. MODEL VIEW CONTROLLER (MVC)

Model view controller is a software architecture pattern that separates representation of information from user's interaction with it. Model notifies its associated views as well as controllers when there has been a change in its state, view requests from model the information which it needs to generate an output representation, and controller can send commands to its associated view to change the view's presentation of the model.

V. SFDC MVC

We can write our VIEW pages using SFDC visual force (VF pages), that is similar to JSP pages, as well as each VF page is associated with a Controller. You can write your own controller and Model Classes using Apex language. In SFDC, Page Layouts, Visual Force pages, Tabs comes under View Layer, Fields, Objects, Relationships comes under Model Layer, and Apex Classes, Workflows, Triggers comes under Controller part in MVC.

SFDC MVC pattern contains basically three modules like Model, View and Controller.

A. **Model:** What schema as well as data does salesforce uses to represent system, and subjects are model as every entity in salesforce is mapped to some subject.

B. **View:** How schema as well as data is represented, and visual force is used to present data to users.

C. **Controller:** How interface actions, and Controllers are used to perform actions whenever users interact with visual force.

VI. SALESFORCE

Salesforce is a modern cloud computing technology, which is available on cloud, no need install any software as well as no hardware required. You can develop our own applications as well as need any application on demand, and then you can buy from app exchange. App Exchange is a market place to sell our custom applications as well as to buy applications from app exchange easily. Advantage of SFDC is upgrading features three times per year. Each year salesforce provide three releases such as winter, spring and summer.

VII. REASON FOR USING SFDC

Salesforce.com (SFDC) is a number one on demand CRM, which runs on force.com platform, as well as it, reduces development cost and deliver application in short time. SFDC was officially launched in 1999 and Founded by Mark Benioff. Here, I am discussing some reason for using SFDC such as:

- It is a Number one on demand Customer Relationship Management.
- It uses Force.com platform that reduce development cost.
- It is good market place to sell our custom applications and also to buy applications from App Exchange.
- It is available on cloud, so no need to install software and also no hardware required.
- Salesforce Improves Customer Data Quality & Management as well as Customer Service and Support.
- Salesforce helps acquire New Customers and increases efficacy of Marketing Campaigns.
- Salesforce reduces Costs Associated with Sales, Services, and Marketing.
- Salesforce increases Customer Satisfaction, Retention, and Loyalty as well as Profit Margins.
- Salesforce improves Mobility of Business.

VIII. FORCE.COM IDE

Force.com IDE is a client application for creating, modifying as well as deploying Force.com applications.

Force.com IDE is mainly based on Eclipse platform and built on Tooling API, which provides a comfortable environment for programmers familiar with integrated development environments, letting you code, compile, test, package, and deploy all from within IDE. Force.com IDE has also features an embedded schema explorer for a live view of your database as well as metadata components. Using synchronization features of IDE, you can also create a project which lets multiple team members develop against a shared source code repository.

IX. CRM

Salesforce is hot technology in IT industry and with CRM; you can easily store customer and prospect contact information, accounts, leads and sales opportunities in one central location, ideally in cloud so information is accessible by many, in real time. Customer relationship management (CRM) is a system for managing a company's interactions with current as well as future customers. CRM often involves using technology to organize, automate and synchronize sales, marketing, customer service, and technical support. CRM cloud apps need to be easy to use for sales, marketing, and service professionals in industry. An effective CRM infrastructure is based on multitenancy, and with multitenancy, you don't have to worry about application or infrastructure upgrades because they happen automatically.

X. SALESFORCE OBJECT QUERY LANGUAGE (SOQL)

I'll assume for a moment that we are familiar with basic SQL for the purposes of this tutorial. If we are not, there are plenty of great resources on the web to brush up with. As a developer looking to extend Salesforce.com, SOQL is a pretty important and powerful aspect of coding. We can use SOQL to build our own custom query stings. These query strings can be used in the following places:

1. Apex statements
2. Visualforce getter methods and controllers
3. In the query StringPARAM passed in the query() call
4. Finally, you can use the Schema Explorer in the Eclipse Toolkit (this one is pretty slick)

For those of we familiar with SQL, we will find some differences but for the most part SOQL does just about everything we will need it to do.

SOQL uses the "SELECT" statement combined with any filter statements to bring back sets of data. The data sets returned may be optionally ordered as well (just like in SQL). Here is a basic example:

SELECT *field1, field2, field3*

FROM *an object*

WHERE *filter statement(s) and (optionally) order the results*

So, if we want to get all the Leads from our Salesforce.com account where the email address equals = "john.doe@somecompany.com" they would use the following SOQL statement:

SELECT ID, Name from Lead WHERE email = 'john.doe@somecompany.com'

SOQL - COUNT ()-Getting the "Count" of results being returned in a SOQL data set is pretty simple as well. For example, if I wanted to know how many Leads were going to be returned in my SELECT statement above, I can use the COUNT () function below:

SELECT COUNT () from Lead WHERE email = 'john.doe@somecompany.com'

SOQL Comparison Operators

Operator	Common name
=	Equals
!=	Not equals
<	Less than
<=	Less than or equal
>	Greater than
>=	Greater than or equal
IN	In
NOT IN	Not in (WHERE clause)
INCLUDES EXCLUDES	Applies to multi-select picklists
LIKE	Like (see section below)

SOQL - Like Operator-The LIKE operator provides a way to match partial text strings and includes support for wildcards. Let's say for a moment we want to find all the Leads where the email domain is the same. For this, we can use a "LIKE" operator. He is an example of a LIKE statement with the % wildcard.

SELECT Id, Name from Lead WHERE email LIKE '%somecompany.com'

The placement of the percent sign '%' is key here. I am basically saying, bring me back all the Leads where the email ends with "somecompany.com". Therefore I place the '%' at the beginning of whatever I am looking for." Anything to the left of the % sign is ignored in the search. If I didn't know the full domain I could use the following statement:

SELECT Id, Name from Lead WHERE email LIKE '%somecomp%'

This is going to return all the leads where the email contains "somecomp".

Other wildcard is the underscore "_". Thing is used to match exactly one character.

Note: Unlike with SQL, the LIKE operator in SOQL performs a case-insensitive match.

SOQL - WHERE/OR- If we want to extend the WHERE clause to include multiple values, we can OR. See the example statement below:

SELECT ProductCode FROM PricebookEntry WHERE CurrencyIsoCode = 'USD' or CurrencyIsoCode = 'GBP'

Taking it a step further, you can evaluate multiple things in the WHERE clause:

```
SELECT ProductCode,UnitPrice FROM
PricebookEntry
WHERE (UnitPrice >= 10 and
CurrencyIsoCode='USD')
OR (UnitPrice >= 5.47 and CurrencyIsoCode='EUR')
```

CONCLUSION

Salesforce is a great platform and, easy to use, powerful, quick as well as have good community. This paper showed in the above text, what concept of cloud computing and Salesforce is all about. After reading this paper you easily know, that Salesforce offers a conclusive concept to deliver an easy to use CRM Software as a service using a dynamic, scale free cloud computing approach. Success of Salesforce is based on an excellent management, a clear company strategy as well as a business model, which uses cutting edge technology combined with a developer community and an easy to use platform, which is delivered in a very cost effective manner, So Salesforce.com is an excellent example for an eCommerce company.

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