

# A review on viability of Cloud applications services for CRM - An analytical approach

Saurabh Kumar  
Associate Manager  
Accenture India, Bangalore, India

*Abstract:* Cloud computing is one of the emerging technologies in recent years. The primary aim of the cloud computing is allowing the end user to access computation resources through the internet. The principle advantage is that cloud offers administrations like SaaS, PaaS and IaaS with little venture cost in wording Project's foundation and talented asset management. This paper reviews different models of cloud computing and the feasibility of the same in today's world.

## 1. INTRODUCTION

Cloud computing is one of the emerging technologies in recent years. The definition of the cloud computing is service provided by the internet network which is used by the subjects for running their information technologies (IT). This is a kind of new model of information technology services where the services are provided on demand to customers through the network independently[14-18]. The primary aim of the cloud computing is allowing the end user to access computation resources through the internet [1]. The client is evolving. The present Customer is socially and digitally associated, learned, result situated, and empowered. CRM on cloud enables organizations to experience and increment esteem from the Customer information. The principle advantage is that cloud offers administrations like SaaS, PaaS and IaaS with little venture cost in wording Project's foundation and talented asset management[2]. Prevalent pattern to move the CRM to cloud computing, where the undertaking arranges a few or its whole application set up on the cloud, a kind of Internet based processing, where administrations are conveyed to client's users through the Internet as an on-demand benefit. A few undertakings may likewise pick a crossover arrangement where cloud applications are coordinated with on start frameworks. The information is enormous and advancing. The one ideal host to cater these propelled IT administrations is executing CRM on cloud.

The CRM stage is associated with extensive variety of clients in any business or specialized territory[3]. The Sales Manager, VP of showcasing, Director and the Customer Service Agents - all are associated with one another through standard dashboard and view information indexed on that client. Client Retention, Obtaining the customers, Relationship Growth are basic capacities for each level of the Cloud CRM applications. Mainstream Cloud based CRM apparatuses, for example, Salesforce.com, Oracle, Zoho gives visual and time-tried expository stages which creates proficient, powerful information that engage associations to obtain, hold, and strategically pitch or up-off

Cloud allows CRM professionals [4] to query data with data mashup, dimension-Free Data Exploration, Contextual Collaboration. The reasons why this Cloud-based CRM Architecture [5] companies consider is because: Hassle-free Installation, Seamless Access, Affordable Product, High Security Levels, Enhanced Compatibility. The Success of an IT application requests coordination adaptability. Particularly in a private venture condition, data trade between different applications is foremost. Cloud CRM then again can be effectively incorporated with different applications. It is this upgraded and effective similarity that makes Cloud-based CRM a much more fitting decision for organizations.

## 2. LITERATURE REVIEW:

In [6] cloud computing models plans Customer Relationships Management through CRM frameworks. The CRM are straightforwardly installed to the servers or PC and available on the web in which the full usefulness of CRM can be accomplished through the internet browser [25][28]. The CRM programming are either accessible on the web in the cloud or on the servers. Clients who utilize CRM programming through web do not possess the product, however just approach it by means of the web or the cloud. The cloud can be gotten to through the servers or the web. CRM utilized by organizations pay just for the processing limit and capacity that is really utilized. Actually, Cloud Computing by and large enables associations to deal with their information and data all the more successfully and empowers it to give better client administrations. The preferred standpoint is likewise simple and snappy choice to empower CRM. Certain research is being carried out to find as to how effective is the cloud applications services for CRM services.

Data is always valuable. A wide range of business ought to have data frameworks for business development. Software is utilized for business administration and enterprise asset arranging worldwide[7]. Notwithstanding, its deficiencies end up being increasingly clear as of late. Software as a Service (SaaS) is accordingly viewed as one genuine option for software[17-19]. Client Relationship Management (CRM) is of crucial significance in the present business. SaaS reception for CRM at that point turns into a pattern in Small and Medium Businesses. Home conveyance business task in a little eatery calls for such selection. The motivation behind this examination was to exhibit a CRM based SaaS model for home delivery business task in a small restaurant.

In [8] cloud computing has been broadly utilized, including venture CRM frameworks[20]. To lessen the cloud CRM venture hazard, that enhances authoritative execution, so it has turned into an essential issue. In this investigation, an exploration structure is built by the Stimulus-Organism-Response (S-O-R) system, that through DANP (DEMATEL based ANP) and VIKOR examine techniques investigate the relationship in venture chance, venture administration and authoritative execution. The discoveries of this exploration can give a profitable reference to limiting undertaking administration chance and improving authoritative execution through viable task administration in cloud CRM venture.

Customer Relationship Management (CRM) framework enhances organizations' gainfulness by helping organizations center around the associations with clients, partners or providers[9][22][26][29]. By having solid activity to move applications to cloud, ventures are thwarted by cloud security and dependability issues [6], particularly with regards to money related enterprises. To give a down to earth and secure answer for these endeavors, this venture expects to construct a cloud CRM framework that empowers completely homomorphic encryption. The outcome demonstrates Stealthy CRM has 14%-28% throughput overhead for the vast majority of the CRM questions, contrasted and unmodified My SQL server. For complex TPC-H questions including increase and arrangement of calculation, Stealthy CRM can execute the inquiry between 1.75 min to 11.7 min. In spite of the fact that the time takes to finish a completely homomorphic question in CRM framework is still long, Stealthy CRM gave a model to scientists and different business application engineers to investigate the potential.

## 2.1 Cloud computing models for CRM:

Most of the CRM models are based on SaaS models of cloud computing. As the most far reaching and the most developed model of Cloud Computing is viewed as the SaaS model. This model gives finish usefulness to address particular needs of organizations[6]. Despite the fact that the most applications utilizing a model of Cloud Computing incorporate email or other specialized apparatuses, for example, web, video or office suite, this SaaS show is right now the best way to deal with computerization for Customer Relationships Management through CRM frameworks[28][29]. Given that CRM is attached specifically to servers or PCs and is accessible on the Internet clients require just an internet browser to have the capacity to use the full usefulness. This implies clients of CRM can accomplish full efficiency notwithstanding when they are going at business way and business forms turn out to be more versatile.

[10]Compared to customary CRMs, SaaS based CRMs gives customized UI i.e the fundamental capacity modules of the SaaS-based CRM including client administration, contact administration, time administration case, the potential client administration, deals administration, telemarketing and so on. The SaaS-based CRM additionally gives the administration that diverse business rationale exists together and use in a similar module[23][27], clients can setup and alter the business rationale in the customer. Give an online improvement stage. The innovation of on-line improvement stage is a characteristic expansion of modified innovation, regularly coordinated into the SaaS-based CRM.

## 2.2 Architecture:

Restrictive CRM application [11] is outlined by third- party application service providers and leased to business as an on-premise benefit. It is referred to as SaaS in the terms of Cloud computing terms. SaaS is effective Cloud CRM show. A portion of the more typical sorts of CRM applications incorporate the accompanying Automated Billing Systems, Payment Processing, Email Marketing Systems, Content Management, Call Center and Customer Support, Enterprise Resource Planning (ERP), Business Intelligence Apps and so on. A Cloud CRM programming [13]offers a simple execution to coordinate specialized devices, cooperation programming and other in-house applications. It produces same information which can be useful for deals groups and for deals directors to run and suit their jobs of business. CRM programming enables clients to assemble prized information in the strategy of reports that assistance groups to break down the wins and misfortunes and determine a pattern with business. Cloud-based capacity makes it helpful for clients to safely get to the information from any area either from home or from a customer's site. Following the undertakings on a spreadsheet isn't so powerful as cloud-based device offers.

A cloud-based CRM has the following basic component in its architecture:

**Trusted Multitenant Cloud:** Trust is the need at any CRM or, in other words multitenant cloud is a premise of each plan engineers expand upon the stage and framework. Here the inquiry is What do we mean by multitenant cloud? It implies that every single authorized client either from independent companies or from big business organizations, are given same level of administrations and all get a similar usefulness, highlights and updates.

**Scalable, Metadata Platform:** The fundamental essential element of this stage is its metadata driven design. All customization[8] in the CRMs pattern, including code, setup, and applications are made and pronounced as metadata. In this proposed engineering, we have kept metadata layer (Data rationale layer) from the administrations layer (business rationale layer), which enables designers to give clients consistent experience and simple overhauls.

**Fast App Dev & Customization:** The Cloud metadata layer is scalable what helps developers to go faster to get easy production deployments.

**Complete CRM:** Complete CRM usefulness which in best term implies deals, benefit, investigation, showcasing, network, all are getting served and esteemed from this confided in stage and proposed design.

**API:** API is basically an agreement between two different types of systems, allowing them to connect, exchange and transact. Application program interface (API) is an arrangement of schedules, conventions, and devices for building programming applications

Utilizing standard usefulness in CRM, just approved client can oversee question cloud articles and information, generally through authoritative consents to the information access and sharing model. Another vital element is about the programmed redesigns. "Venture programming redesigns" normally have a terrible notoriety because of post arrangement influences made by bugs, deformity and other synchronization issues. Be that as it may, Cloud CRM, seamlessly upgrades automatically.

### 2.3 Challenges of cloud computing-based CRM models:

Most of the CRM based cloud applications used as SaaS. SaaS providers operate in public domain and cannot always be relied upon for control of such an important functionality like customer relationship, much lesser for managing the organization's applications and data. Also, some vertical chains require modification to their software applications & usage, which is again a bottleneck for the general SaaS platforms, so the security dangers will be far higher than the conventional model[25][28].

**Access clients' database:** The confidential client information transferring to provider of cloud computing database which mean a greater possibility to be illegally accessed due to the accessibility controlling over the internet. As clients' information is usually stored in the cloud for long years the threat of illegal accessibility is higher. So the cloud CRM provider should be secure database through coherent security policy and techniques [10][17-19].

**Secure information transfer over the cloud:** All data between the enterprise network and any service providers must pass Internet. Enterprise must sure that clients database is continuously moved on 'https' protocol and secure browser data also should be constantly encrypted and authentic [10][17-19].

**Trust:** Trust between enterprise and cloud service provider services supports the continuity relationship and commitment to encompass an inter-organizational relationship. Trust occurs when the enterprise certain degree of cloud service provider readiness and ability to deliver their responsibilities [10][17-19].

**CIA TRIAD:** Three requirements should establish to protect cloud CRM called CIA. Confidentiality, integrity, and availability, these pyramids are needed for authorized users. Confidentiality associated with privacy, that means the sender and its receiver should only share information, it is not able to secure data confidentiality while it flows in the system [10][17-19].

### 2.4 CRM tools:

**Salesforce CRM:** For each business to succeed it ought to have strong work constrain administration and furthermore a dynamic client relationship administration instrument which will assist the business with evaluating and address the prompt needs of the clients. So Salesforce has concocted this apparatus SFA, salesforce administration frameworks which is a mix of Information Systems and Customer Relationship Management frameworks [30]. Utilizing these instruments, organizations can center around Marketing and deals exercises. These exercises are viewed as the center in any of the CRM frameworks. Salesforce is likewise in-line with a similar plan of action of giving on-request administrations to its clients dependent on the prerequisite. As a base form, they give a chance to the organizations to use their CRM models and furthermore give an approach to them to modify as indicated by their necessities. The center advantages of utilizing Salesforce CRM instrument are recorded beneath:

- Be organized and keep a track of what has been done vs what needs to be done:
- No need of Single Point of Contact:
- Response time is tracked and worked accordingly to resolve the task:
- Automation of Tasks:
- Improvised data utilization

The products and services that are offered by Salesforce are listed below:

**Salesforce Application:** Inside Salesforce Applications, predefined or pre-manufactured applications are accessible, i.e. Client relationship administration where the business officials can monitor their entire movement, i.e. from showcasing, deals, and client administration or support.

**Lightning Platform:** This is part of Platform as an administration (PaaS) offering from Salesforce. Utilizing this stage, clients can construct any sort of use without having any programming projects introduced or any foundation setup. The majority of the administrations are characterized and given inside the PaaS stage. The stage has an ability to incorporate with third part instruments where customization should be possible to address the special business prerequisites

**App Exchange:** This is more kind of a network where a great deal of uses are accessible that are worked by free merchants or accomplices. A large portion of these applications are free and can be firmly coordinated with Salesforce stage

**Salesforce.com:** Salesforce gives a functioning network to every one of the people who are occupied with salesforce stage. With on- going preparing projects and conference occasions, best practices sessions and discourse sheets, the whole network is dynamic and as of now serving a ton of enthusiast.

#### **Oracle CRM:**

Oracle CRM is one of the main players of the present CRM advertise which can gloat with a strong and natural interface, and an assortment of product offerings and arrangement models [31]. As different as it seems to be, Oracle CRM makes client relationship administration simple for organizations all things considered and businesses, enabling them to upgrade their business procedures, and lift deals efficiency. The instrument is empowered to direct and oversee client relationship the distance from lead capability and order to circumstance following/administration, incorporating into the interim estimating improvement, investigation and revealing, and an arrangement of great chronicled examination for more brilliant business choices. Data is appropriately sorted out, and effectively open by everybody in the group, from any gadget. Over that, Oracle CRM is engaged with solid, coordinated showcasing effort administration highlights, lead supporting, and ROI estimation devices. This sold instrument can enable you to emerge from the present focused CRM advertise, and build outstanding and critical associations with your clients. Because of the instinctive and easy to use innovation used to create Oracle CRM, you will have the capacity to address even most complex CRM issues in a quick and compelling route, and to help efficiency more than you would with some other CRM program. The best side of Oracle CRM is presumably that it doesn't expect you to experience complex establishment strategy, or to buy extra programming with the end goal to utilize it. The item perceives your improvement condition and uses its far-reaching set of APIs to get to your business rationale and administration related information, and to synchronize everything for you to get to it and alter it effectively.

At last, Oracle CRM is a solitary merchant arrangement. Because of its great incorporations, you won't require some other CRM to react to mission-basic business forms. The instrument will bolster the majority of your essential business streams, for example, prompt request and chance to-cite, and will along these lines increment your adequacy and efficiency.

#### **ZOHO CRM:**

Zoho CRM is an online CRM intended to draw in, hold, and fulfill clients to develop your business [32]. The center of Zoho CRM's usefulness is lead and contact administration, yet additionally deals pipeline administration and buy control. You would already be able to expect what these highlights can do when packaged together, particularly when put on a redid and simple to-utilize interface that is so run of the mill about Zoho. The home screen currently incorporates 10 distinct parts, with the fundamental module route board still put on top for simpler seeking. All things considered, the client is constantly invited to redo the dashboard and make it look more business-particular.

It functions admirably in any case in case you're a private venture, a business person, or a huge undertaking. Zoho CRM can robotize day by day business exercises, track deals, and draw in clients in various stages. Similarly, its versatile stage gives you a chance to take CRM on area so can get refreshes quick and continuous and finalize more negotiations notwithstanding when in a hurry. Zoho CRM offers an extensive variety of advantages, the vast majority of which identified with bringing more deals to a close and drawing in more clients. It has the following benefits.

- It automates vital sales operations
- Gives access to important data in real time
- Makes maximal use of social media
- Allows you to go mobile
- It is integrated with Google Apps

### **3. COMPARATIVE ANALYSIS:**

Cloud based customer relationship management (CRM) software is becoming a popular option for organizations looking to implement CRM software [21-26]. This deployment model is gaining traction because the upfront investment can be lower than traditional on-premise software installations. Additionally, as the name implies, cloud- based systems can be accessed over the Web, from virtually any browser, making it easy to use from any location. The following are the difference between cloud-based CRM vs on-premise CRMs [15-27].

	Cloud CRM	On-premise CRM
Cost	Pay as per usage, per users, per month, per contacts etc.	Up front capital cost for hardware, software, licenses, server space etc.

Customization	APP store- publicly available and easy to customize	Depends on software vendor. Takes long time for deployment
Hardware	Responsibility of the vendors	Responsibility of the customer
Integration	Depends on the capability of the APIs provided by the vendor	Depends on the vendor and also may incur additional costs and manpower
Control	SaaS providers controls the data and is governed over the entrusted agreement	Complete control of systems and data
Security	Standard security with cloud standards	On premise security
Access	On the go- accessibility from any location via browsers and internet	Controlled access
Mobile Access	Readily available	Depends on the vendor and software
Upgrades	Responsibility of the vendor	Hardware and software responsibility is of the vendor while CRM upgrades is the responsibility of the vendor

In a cloud CRM conveyance demonstrate, your seller houses the application and you get to your information by means of the web. A CRM merchant gives every one of the updates, support and capacity of the CRM application[25-30]. Since the merchant will give facilitating, cloud arrangements are otherwise called facilitated arrangements.

#### 4. CONCLUSION:

With the expanded advancement and improvement in CRM methodologies in associations and the tremendous increment in individuals and items to execute them, it is clear that cloud innovation will be the center factor in organizations to work and grow long haul plan of action[23]. Be that as it may, there is a major contrast between burning through cash on asset preparing, staff advancement and items that are making everything work: execution of CRM hones in cloud can't be looked as perfect framework. We ought to expect more developments in innovations and strategies to execute effective CRM framework[27]. Organizations are perceiving the significance of making dynamic databases with proficient information extraction and recovery frameworks and philosophy to catch the client data with creatives of conduct examination and insightful perceptions. So far, to have CRM executed in the Cloud innovation is the best arrangement. Cloud CRM is fundamental to contend successfully in the realm of evolving advancements[14][17][19]. The more viably Cloud can utilize the data about CRM's clients to address their issues the more gainful the business is. In any case, operational CRM needs systematic CRM with prescient information mining models. The course to a fruitful business requires a promoting chief that comprehends its clients and their necessities and executes information mining with a decent extraordinary model.

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