

# Designing Conceptual Model for Banking Customer Relationship Management Systems Based on Cloud Computing

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**Abstract-** nowadays customer requirements and customer behavior have changed considerably. To support these needs, and to gain competitive advantages, customer-centric strategies must be used. Customer relationship management is one of these strategies. In This Study by considering the importance of customer relationship management and its positive effects in banks, a banking CRM model has been designed based on cloud computing to improve the quality of services in banks and to increase the customer trust. The presented banking CRM model which is based on cloud computing is a good starting point for the banks which are looking for designing and implementing CRM systems. Implementing this model in banks will enhance organizational competitiveness, In addition to increasing revenues and reducing operational costs.

**Keywords-** Customer Relationship Management; Cloud Computing; Banking CRM; Conceptual Model

## I. INTRODUCTION

Nowadays, customers are reflected as an organization's asset; Organizations by maintaining old customers and by attracting new customers can gain competitive advantages. Banks also face the same tasks or challenges. Customer relationship management (CRM) is a strategy which bases stronger relationship between organizations and their customers by analyzing customers' requirements. In fact, Customer relationship management is the philosophy, strategy and technology for identifying, attracting and growing customer and it is positively a matter for Expansion of banking. In banks, every work is done to absorb and satisfy the customers. Therefore, in competitive surroundings, those banks are successful which obtain more customers' loyalty. On the other hand, due to extreme Sensitivity of customers about Services provided by Banks, customers demand better and required services constantly. Therefore, effective and efficient relationship management with customers is the major issue for Organizations and especially for banks. In this study, we aim to definite and

model the requirements of a banking CRM system by using cloud computing. Cloud computing is discussed as a model for Communication between IT service suppliers and their customers. Since providing services in short time with the lowest price is the main task of Banks and cloud computing meets these objectives, implementing CRM based on cloud computing Will cause numerous benefits for banks.

## II. CUSTOMER RELATIONSHIP MANAGEMENT AND CLOUD COMPUTING

### A. CRM

CRM is Abbreviation of "Customer relationship management" .It is a systematic solution that plays a significant role in the organization by integrating the principles of customer relationship to acquire develop and maintain customer satisfaction increase profitability and create value added Economic. CRM is collected of three main parts: Customer, Relationship and management. "Customer" can be defined as the critical consumer who plays supporting role. "Relation" can be defined as an movement which Attract customer's loyalty and profitability by initiate communications. "Management" can be defined as an activity which Conduct a Customer based business process and locating the customer at the center of organization's developments and performs. In other words, customer relationship customer relationship management (CRM) is a word that describes how your business can interact with customers. Most people think CRM is a system that stores and maintains the information of customers; while this is only part of the work is done by CRM; CRM also help to meet customers' needs and identify new customers by using these collected information.

### B. Banking CRM

In recent years, in the areas such as Banking Industry that there is strong competition, gain Customer satisfaction is very important. Banks should use customer relationship

management to increase customer satisfaction . Some of the advantages that banks will obtain by using CRM are as follows:

- Determining the main bank's customers and helping to make effective relationship with them
- Reconfiguring the bank's sales and marketing campaigns
- Providing competitive advantage
- Increasing productivity
- Increasing the customer loyalty
- Increasing the speed of bank's operations
- Reducing the waiting time for customers to get the service

The main goal of CRM is to help banking business obtain Customer-Oriented approach about human resources and technology. If this system works well, the business can:

- Provide better services for customers,
- Make efficiently call centers,
- Attract more customers and
- Increase bank earnings

Cloud computing technology is an IT service delivery model that presents computing services to Customers based on their requests through network. Resources can be shared dynamically in any scale by using cloud computing. In general, some general Features of this technology are dynamic resource scalability, independence of location or device, automatically recourse delivery and pay per use model . Cloud computing helps organizations manage their data better and enable them to provide better services for their customers .

### C. Cloud computing in banks

Some advantages of using cloud computing in banks are:

- A significant reduction in the costs of information technology.
- Speed and flexibility in providing hardware resources.
- Better performance of IT experts.
- Increased efficiency and reduced hardware resources waste.
- The rapid development of software requirements at lower costs
- Reduced repetitive operations and Increased focus on key operations
- Cash flow and Better financial transparency

### D. Cloud-based CRM

Cloud-based CRM provide valuable flexibility for business, in addition to perform all the functions of traditional CRM systems. All hardware and software required to support cloud based CRM, are out place and are monitored by third-party service providers. Service providers are responsible for tasks related to the establishment and management such as installation, integration, testing and maintenance; they also store and manage all application data. In general, the benefits of cloud-based CRM can be stated as follow .

- Access to the latest versions of CRM, services and innovations
- Easily remote access
- Easily deployment
- Frequently updates
- Affordability

### E. Cloud-based Banking CRM

The bank which use cloud-based banking CRM systems, don't need to buy a CRM program and install it on every computer in bank and also they don't need to update them; instead of all these, bank only must Connect to the cloud and use user interface easily. In fact, by using cloud-based banking CRM, banks can manage their data more efficiently and thus they will be able to offer friendlier customer services to their customers. This property leads to easier and faster customer relationship management.

### Benefits of CRM for Banking

A CRM system is a sound business strategy for banks to help create brand value and identify and understand their customers' needs by providing targeted, timely and related information that can add value to their customers. CRM systems provide tools that can division, and deliver the right service, at the right time, by acting on active customer information. Permits the ability to track and form strong relationships with gainful customers and Identify particular products and services that can benefit customers. Results of all activities can be traced and measured; CRM control panel acting as business decision support systems are the perfect place to present capacities and outcomes.

Figure 1 shows banking in the cloud basis

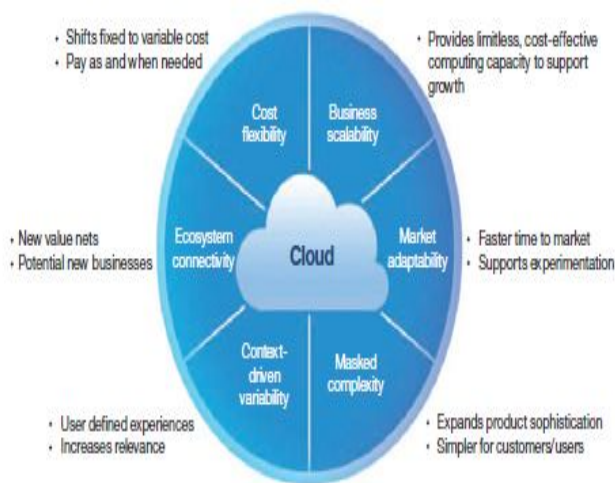


Figure 1. Banking in the Cloud

### III. CLOUD COMPUTING

Cloud computing is a method for delivering information technology (IT) services in which resources are retrieved from the Internet through web-based tools and applications, as opposed to a direct connection to a server. Rather than keeping files on a proprietary hard drive or local storage device, cloud-based storage makes it possible to save them to a remote database. As long as an electronic device has access to the web, it has access to the data and the software programs to run it.

It's called cloud computing because the information being accessed is found in "the cloud" and does not require a user to be in a specific place to gain access to it. This type of system allows employees to work remotely. Companies providing cloud services enable users to store files and applications on remote servers, and then access all the data via the internet.

Reasons that Cloud Computing is transforming Banking Sector

- **Reduced costs:** No additional investments in management of resources required in banking for carrying data. Cloud makes it easy to invest in required resources by eliminating the cost attached with dedicated hardware and software. eNlight Cloud's Pay-as-you-go model makes out more results with less investment, it also provides shared application services on demand.
- **Improved flexibility:** In order to sustain in the changing market, it is must to shape technology usage according to the changes and create room in changing demands to

sustain in market. Cloud provides this flexibility to survive and respond quickly with customer needs and market changes.

- **Auto scalability:** On demand cloud services enables the scaling of resources as per requirement. Resources can scale up and down according to the requirements. eNlight Cloud is the world's first auto-scalable smart cloud that makes out this in most efficient way to provide with maximum benefits to the customers.
- **Improved operational efficiency and Business agility:** Cloud enabled increased centralized management of data and reduced complexities allied with changes and increase in data. It facilitates with maximum scope for the future technological evolution in business, being flexible. eNlight cloud for banking provides a maximum productivity of Banking operations. Businesses can focus more on services than on IT with Cloud adoption, this will make a ground for Business agility with improved operational efficiencies.
- **Efficient client service:** Cloud will ease the activities related to banking for clients, customized and efficient solutions can be provided with faster access. Clients can leverage centralized approach with cloud that would disable the loophole of technologies for banks and clients, transactions will be made smoother and risk free.
- **Business Continuity:** Cloud computing services will make it possible to gain higher securities in data critical sector like BFSI, providing Disaster recovery solutions and complete fault tolerant system. It will facilitate the high level of redundancy in lower prices than it is provided with traditional dedicated Disaster Recovery services.

#### Cloud Service Models:

- **Business Process-as-a-Service (BPaaS).** The cloud is used for standard business Processes such as billing, payroll, or human resources. It combines all the other service models with process expertise.
- **Software-as-a-Service (SaaS).** A cloud service provider houses the business Software and related data, and users access the software and data via their web Browser. Types of software that can be delivered this way include accounting, Customer relationship management, enterprise resource planning, invoicing, human Resource management, content management, and service desk management.
- **Platform-as-a-Service (PaaS).** A cloud service provider offers a complete platform for application, interface, and database development, storage, and testing. This allows businesses to streamline the development, maintenance and support of custom applications, lowering IT costs and

minimizing the need for hardware, software, and hosting environments. Infrastructure-as-a-service

- **Infrastructure-as-a-Service (IaaS).** Rather than purchasing servers, software, datacenter space or network equipment, this cloud model allows businesses to buy those resources as a fully outsourced service.

#### Cloud deployment model:

There are three ways service providers most commonly deploy clouds. The cloud infrastructure is operated solely for a specific company.

- **Private clouds:** It may be managed by the company or a third party and may exist on or off the premises. This is the most secure of all cloud options.
- **Public clouds:** The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization that sells cloud services.
- **Hybrid clouds:** The cloud infrastructure is composed of two or more clouds (private or public) that remain unique entities but are linked in order to provide services.

## IV. CONCEPTUAL MODEL

Due to the numerous benefits of CRM and cloud computing model in banks, we projected to present a conceptual model of cloud-based banking CRM. This Conceptual model determines services which provide by system and states the components of system and their interconnected. By this conceptual model, physical objects can be tested and simulated before execution therefore implementing of cloud-based banking CRM system will be easier. This conceptual model presents system which is understandable to the bank managers and includes all the Benefits listed above. In this model, the essential components and their communications for implementing cloud-based banking CRM are illustrated. We will describe each use case and actor of this conceptual model in next sections.

### 1) Actors

In this conceptual model, banking customer, CRM analyst, banking CRM employee, Owner of banking CRM, banking CRM admin and cloud provider are actors of system who impact on the system or affected by system. In general, duty of each actor in this proposed system is as follow:

- **Banking customer:** a person who uses banking services.
- **CRM analyst:** a team that analyzes the data collected through the system, then identifies and categorizes requirement based on analysis results.

- **Banking CRM employee:** a bank employee who works with banking CRM system.
- **Owner of banking CRM:** a team that is responsible for developing banking CRM system.
- **Banking CRM admin:** a person who is responsible for managing and leading banking CRM system.
- **Cloud provider:** a company that delivers cloud services to the bank.

### 2) Use cases

Use cases indicate services which must be provided for actors to realize their needs. In this section we will describe each of use cases and their goals: “Customer accounts Management”

- Register customer,
- Remove customer,
- Edit customer information,
- Search customer,
- Create group,
- Delete group,
- Add customer to the group,
- Remove customer from group,
- Edit customer information in group,
- Search group.

### Communication channels management

It is the purpose of this is networking with customers in different ways and obtaining their satisfaction. This use case include following modules: Fax, Telephone/mobile, SMS, E-mail ,Chat, Call center, IVR.

### Knowledge management

The purpose of this use case is managing different data in the way that data can convert in to valuable knowledge for banks. Based on this acquired knowledge, Processes can perform more efficiently, new opportunity will identify and ultimately banks will be able to accept itself to new condition by on time reaction.

### Login to cloud

The purpose of this use case is directing the user’s access to cloud based system. This use case includes these modules:

- Login
- Password and user name recovery

- Change password and user name.

#### Service order

The purpose of this use case is delivering banking services to customers. This use case include following modules:

- Transfer money
- Observe last flow of accounts
- Pay bills and apply an account balance
- Become a member in customer club
- Chang password and user name.

#### Banking CRM service management:

The purpose of this use case is helping banking CRM staff to deliver banking services by participating facility.

#### Task management:

the purpose of this use case is helping users of banking CRM systems to manage their daily works.

#### Customer verification:

The purpose of this use case is customer authentication and Customer authorization. In other words, in this use case the customer credentials is evaluated to allow customer to access to the system.

#### Creating log:

The purpose of this use case is creating log from all the tasks performed by users. In this way history of user's action stored in system and can be referred if necessary.

#### Customer Requirements Analysis:

the purpose of this use case is identifying customers' requirements by data mining in customer information.

#### Bank's Service Need management via cloud Service Provider's Service:

As the name implies, the purpose of this use case is managing Bank's Service Need management via cloud Service Provider's Service.

The general discussion can be said that the bank is yet to grow an integrative approach which focuses on the customer needs. By various studies it is established that, the bank is far from developing a customer favouring approach both for the customer as well as for the employees. Therefore for customer relationship management to deliver to its needs, it should show an important role within the bank and ensure that all processes are integrated in the banking strategy, which is far from reality in the study above. It is very clear from the foregoing analysis that the approach of CRM in nationalized are to some range same and one but the reach is quite different. Due to this, their capability and the strategy of CRM in making it and reaching down to customers. However, it can also be asserted that the background of both banks also found as a big cause for reaching the top CRM. Hence, CRM is a predictable tool of marketing that can be measured as Critical Responsibility of Market with regard to Banks in today's situation. Studies show the respondents either agree or strongly agree on majority of the statements in the context used. This study is valuable to banks as they get information on what are items that are important to customers so as to maintain the relationship.

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#### V. CONCLUSION

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