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; e-Banking.

I. INTRODUCTION

By advancement of science and technology and with regard to deployment of communication world, all organizations look for delivering better services to their customers to gain competitive advantages. Nowadays, customers are considered as an organization's asset; Organizations by preserving old customers and by attracting new customers can gain competitive advantages. Banks also face the same challenges. In banks, every work is done to absorb and satisfy the customers. Therefore in competitive environment, those banks are successful which acquire more customers' loyalty. On the other hand, due to extreme sensitivity of customers about Services provided by Banks, customers demand better and desirable services constantly [1]. Therefore, effective and efficient relationship management with customers is the major issue for organizations and especially for banks.

Customer relationship management (CRM) is a strategy which causes 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 expanding customer and it is certainly a matter for development of banking.

In this study, we intend to express and model the requirements of a banking CRM[1] system by using cloud computing. Cloud computing is discussed as a model for interaction between IT service providers and their customers. Since providing services in short time with the lowest price is the main mission 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. What is CRM?

CRM is Abbreviation of Customer relationship management. "Customer relationship management" is a comprehensive and systematic solution that plays a significant role in organizations by integrating the principles of customer relationship to acquire, develop and maintain customer satisfaction, increase profitability and create value-added economic.

In other words, customer relationship management (CRM) is a term 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.

CRM is composed of three main parts: Customer, Relationship and management. "Customer" can be defined as the ultimate consumer who plays supporting role. "Relation" can be defined as an activity which Attract customer's loyalty and profitability by learner communications. "Management" can be defined as an activity which Conduct a Customer-based business process and putting the customer at the center of organization's processes and practices [3].

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[1] Customer relationship Management

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 [2]. 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[2,3]

The main goal of CRM is to help banking business obtain Customer-Oriented approach about human resources and technology [4, 5]. If this system works well, the business can [4]:

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

C. Cloud computing

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 [6].

Cloud computing helps organizations manage their data better and enable them to provide better services for their customers [7].

D. Cloud computing in banks

Some advantages of using cloud computing in banks are:

- A significant reduction in the costs of information technology [8,9,10]
- Speed and flexibility in providing hardware resources [8,10,11,12]
- Better performance of IT experts [8,9,11]
- Increased efficiency and reduced hardware resources waste
- The rapid development of software requirements at lower costs [9,10,11,12]

- Reduced repetitive operations and Increased focus on key operations [8,11]
- Cash flow and Better financial transparency [11]

E. 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 mange all application data [13].

In general, the benefits of cloud-based CRM can be stated as follow [13]:

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

F. 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 [14, 15].

III. PROPOSED CONCEPTUAL MODEL

Due to the numerous benefits of CRM and cloud computing model in banks, we intended to present a conceptual model of cloud-based banking CRM. This conceptual model demonstrates services which provide by system and states the components of system and their interconnected. By this conceptual model, physical entities can be tested and simulated before implementation, 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. Proposed conceptual model is illustrated in figure1.
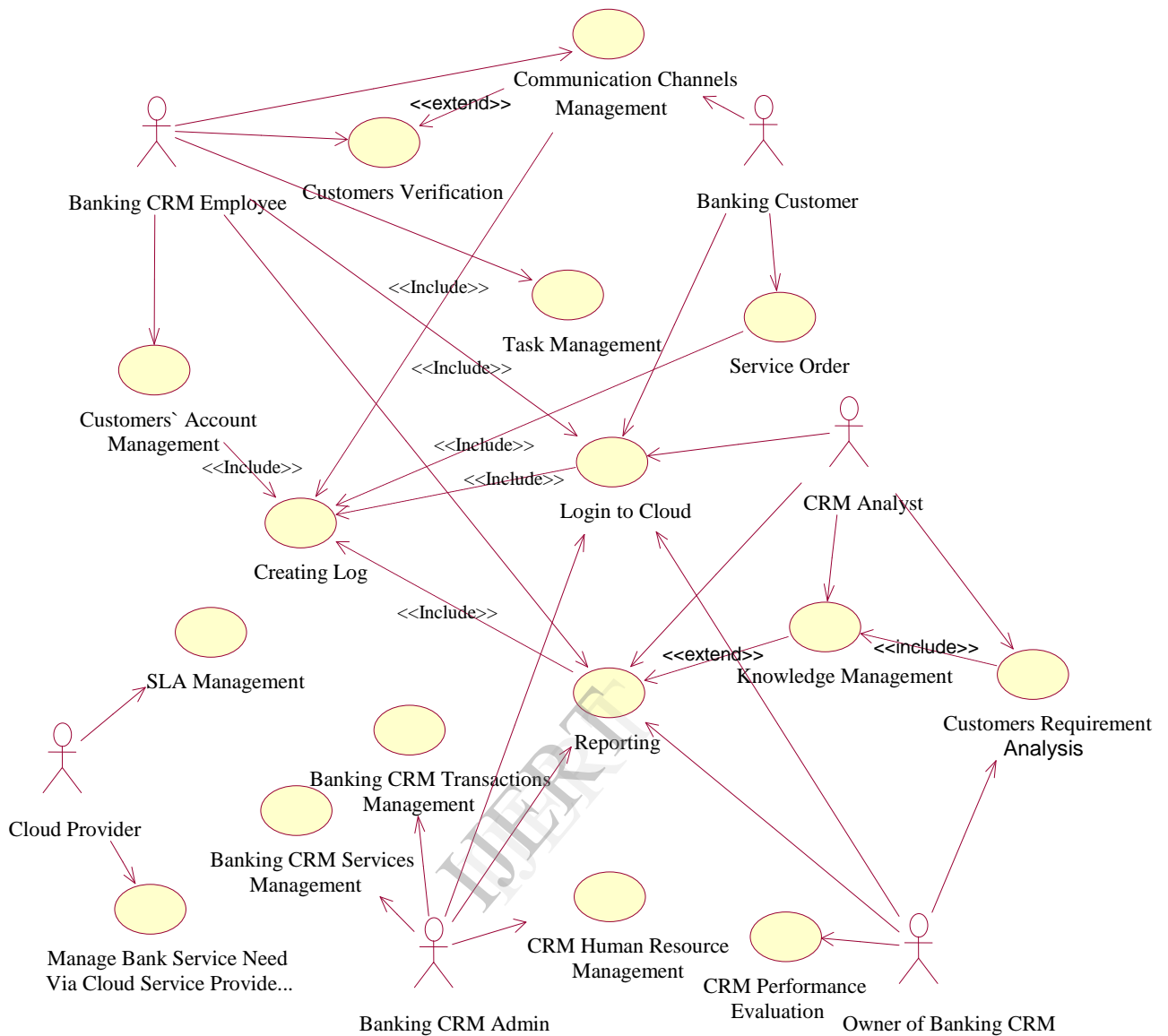
Figure 1: Conceptual Model of Banking CRM Systems based on Cloud Computing

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.

A. 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: is a person who uses banking services.

- CRM analyst: is a team that analyzes the data collected through the system, then identifies and categorizes requirement based on analysis results.
- Banking CRM employee: is a bank employee who works with banking CRM system.
- Owner of banking CRM: is a team that is responsible for developing banking CRM system.
- Banking CRM admin: is a person who is responsible for managing and leading banking CRM system.
- Cloud provider: is a company that delivers cloud services to the bank.

B. 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" use case: the purpose of this use case is managing banking customer accounts. This use case include following modules:

    • 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.

For better perception, these modules are considered as one use case called Customer accounts' Management; so actor by choosing this use case can implement each of these modules.

- "Communication channels management" use case: the purpose of this use case is interacting 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.

For better perception, these modules are considered as one use case called Communication channels management; so actor by choosing this use case can implement each of these modules.

- "Knowledge management" use case: 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 adopt itself to new condition by on time reaction.

- "Login to cloud" use case: the purpose of this use case is controlling the user's access to cloud based system. This use case include these modules:

    • Login
    • Password and user name recovery
    • Change password and user name.

For better perception, these modules are considered as one use case called Login to cloud; so actor by choosing this use case can implement each of these modules.

- "CRM performance evaluation" use case: the purpose of this use case is evaluating performance of CRM system and suggesting solutions for improving its performance; in this way success probability will increase considerably.

- "Reporting" use case: the purpose of this use case is providing different and required reports for CRM users. These reports are used for different aims.

- "Banking CRM transactions management" use case: the purpose of this use case is managing and categorizing transactions. A distinctive feature of the banking CRM system (in comparison with other CRM systems) is that the number of banking transactions is much more than other businesses. Hence, these transactions should be managed and categorized to help CRM admin making better business decisions. Transactions can categorized based on transaction's run time (short life transaction- long life transaction), not finalized Transactions due to disruption of system, financial transactions performed by each customer and etc.

- "Service order" use case: 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.

For better perception, these modules are considered as one use case called service order; so actor by choosing this use case can implement each of these modules.

- "Banking CRM service management" use case: the purpose of this use case is helping banking CRM staff to deliver banking services by integrating facility.

- "Task management" use case: the purpose of this use case is helping users of banking CRM systems to manage their daily works.

- "Customer verification" use case: 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" use case: 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.

- "SLA management" use case: the purpose of this use case is managing service level agreements to realize system needs.

- "Customer Requirements Analysis" use case: the purpose of this use case is identifying customers' requirements by data mining in customer information.

- "CRM Human Resource Management" use case: the purpose of this use case is managing persons who use this system to increase their efficiency.

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

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