

# ONLINE BANKING PARADIGM AND APPLICATION OF CLOUD ENVIRONMENT

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## ABSTRACT

*Cloud environment based paradigm is likely to be one of the fastest-growing technologies in the recent years. Most of business organizations and their applications will be the leading market for cloud environment based services waiting, with an ongoing shift from the existing location as well as the services to cloud environment based services particularly for day to day business operations and applications i.e., customer relationship management (CRM) for customer satisfaction and enterprise resource planning (ERP) for planning the resources of the organization. Banking sector especially online banking are likely to go into the cloud environment based services carefully, with no solitary cloud environment based services delivery paradigm being a silver bullet for the fulfillment of need and requirements of the business. Cloud environment based services computing can provide financial sectors especially banks a number of advantages.*

***Keywords: Online Banking, Cloud Paradigm, internet banking, Security, Scalability, Cloud Environment, Banking in Clouds.***

## I. INTRODUCTION

The quick appearance of cloud environment based paradigm is transforming the approach of financial organizations to think regarding how different types of business organizations use their Information Technology assets [1]. In past, technology has usually been an expensive obstacle for financial organizations, mainly those in rising areas were mounting tailored solutions or investing in advanced banking applications has also been impractical or the result has been too many failures, too many assets used and too much time exhausted [2]. Cloud environment based services, which offers the most fundamental of conditions, offers limitless cloud resource as a service on a pay-per-use basis, is established to straight convert to less open wealth expenditure and condensed Information Technology expenses, contributing a cost effective, straightforward choice to access organization level Information Technology without the connected expenses [3]. Recognizing the worth of cloud environment based services, most of the organizations have completed considerable investments in its banking (core banking) platform. Banking sector are likely to go into the cloud environment based services field carefully, with no solitary cloud environment based services deliverance paradigm being a silver bullet for finest assembly their demanding business requirements and needs [4]. Cloud environment based services and paradigm can provide business organizations a number of benefits and advantages as shown in Table 1.

**Table 1 Advantages**

<b>ADVANTAGES</b>
Cost savings
Business agility
Usage-based billing
Green Information Technology
Business continuity

But before migrating to the cloud environment based services, banking industry has to address the security issues i.e., confidentiality of the data, security of the data, matter related to regulatory compliance, operational interoperability of procedures and standards, and finally the quality of services [5].

## II. WHAT IS THE NEED FOR USING CLOUD ENVIRONMENT BASED PARADIGM IN BANKING SECTOR

Cloud environment based services can fulfill the requirements of financial organizations and improve their performance in a number of different ways [6] is give in Table 2.

**Table 2 Performance Criteria**

<b>Performance Criteria</b>	<b>Description</b>
Cost savings due to cloud environment and billing based on usage	Using cloud environment based paradigm, financial organizations can rotate a huge up-front wealth expenses into a lesser, continuing operational cost. No need for huge investments in new type of hardware, software and technology. The exclusive nature of cloud environment based paradigm is to allow financial firms to select and decide the services on pay use basis [3].
Business process and operations continuity	Using cloud environment based paradigm, the service provider is accountable for running the cloud technology. Financial organizations can achieve an advanced level of data security, protection; minimize fault tolerance, and achieve disaster recovery. Cloud environment based paradigm also includes redundancy and backup features at low cost as compared to old system [7].
Business agility support and focused approach	The elasticity of cloud environment based operating paradigm provides financial organizations skill to shorter the development life cycles for the implementation of new products. This fulfills a quicker and additional efficient reply to the requirements and needs of banking industry customers [1].
Green Information Technology	Banking industry can use cloud environment based paradigm to migrate their services and operations to a virtual infrastructure that minimize the energy use and to keep clean natural environment [8].

## III. SELECTING THE RIGHT PARADIGM

Cloud environment based service paradigm provides financial organizations the way to carry forward from a wealth concentrated approach to a flexible business oriented paradigm that minimizes the operational costs. The cloud environment based paradigm success depends in choosing the right cloud environment based services

paradigm to fulfill business requirements. In this section, the review of different types of cloud environment based paradigm for services, operations as well as deployment as described in Table 3.

**Table 3 Cloud Environment Based Service Paradigm**

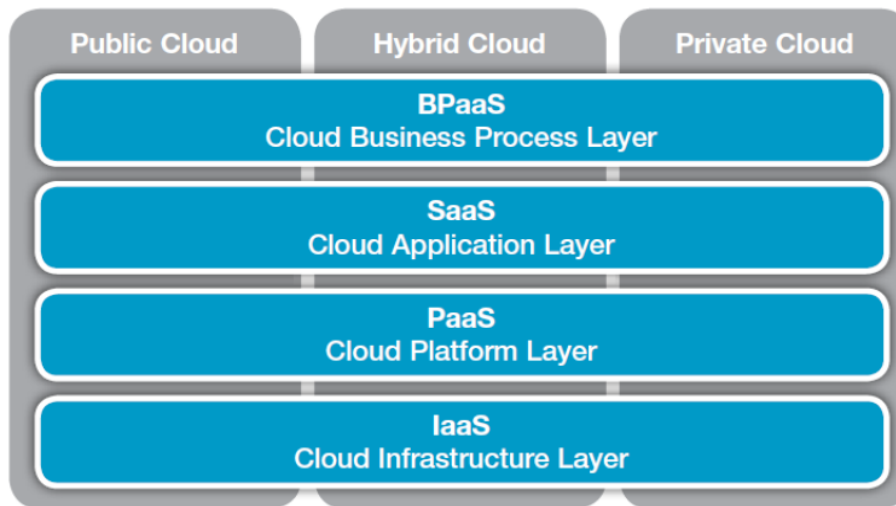
Cloud environment based service paradigm	
<b>Business Process-as-a-Service (BPaaS)</b>	Cloud environment is deployed for regular business activities such as billing process, payroll management and human resources management.
<b>Software-as-a-Service (SaaS).</b>	Cloud environment based service supplier provides the business application software and data, and access the services as software and data via their client/web browser. Different types of services and software that can be provided this way are as follows: accounting, CRM, ERP, invoice management, human resource and service desk related management.
<b>Platform-as-a-Service (PaaS)</b>	Cloud environment based service provider provides a whole platform for different application, interface for access, and database management and development, data storage, and application testing.
<b>Infrastructure-as-a-Service (IaaS)</b>	In spite of purchasing different types of servers, applications software, data center for space and network related equipment, this type cloud paradigm support organizations to purchase those assets as a complete outsourced paradigm.

#### IV. CLOUD ENVIRONMENT BASED DEPLOYMENT PARADIGM

The deployment can be made in 3 ways for the service providers to clouds environment. These 3 ways are given in Table 4 and Figure 1.

**Table 4 Different Types of Cloud Environment**

Types of cloud environment	Description
<b>Public clouds environment</b>	Cloud environment infrastructure and services is available to the common public or a huge industry cluster and is kept by an industry that sells and provides cloud environment services.
<b>Hybrid clouds environment</b>	Cloud environment infrastructure is made by collecting two or more clouds environment i.e., private cloud environment or public cloud environment. It remains a single entity but managed in this way to provide cloud environment services.
<b>Private clouds environment</b>	Cloud environment infrastructure is managed exclusively for a particular organization. It can be handled by the organization or and may situated on or off location of the organization. These types of cloud environment provide maximum security.



**Figure 1: Different Types of Cloud Environment**

## V. MOVING AND MIGRATING TO CLOUD ENVIRONMENT

In this section we will elaborate two aspects i.e., challenges and starting point for bank to move into cloud environment.

### 5.1 Challenges in Migrating into to the Cloud Environment

When a banking industry wants to moves into cloud environment, the three important challenges that have to be considered as shown in Table 5.

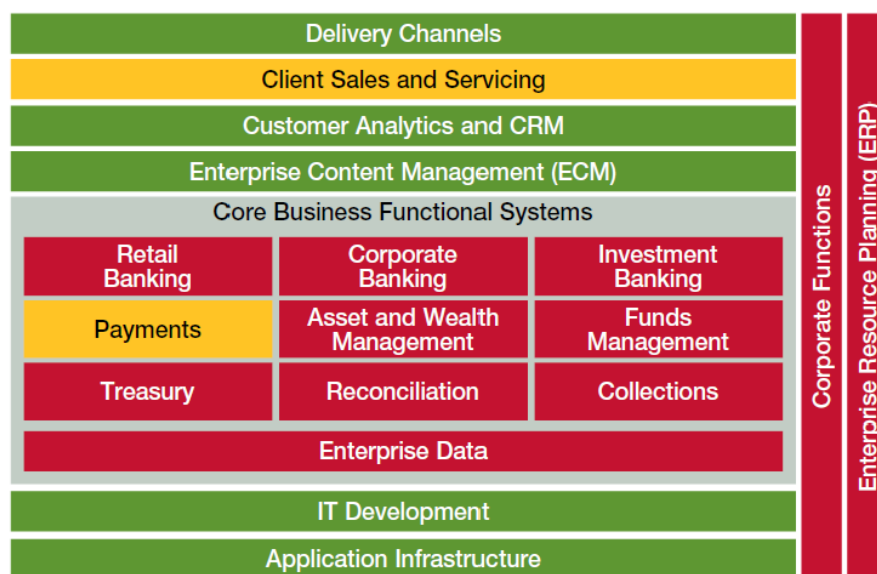
**Table 5 Challenges**

Challenges	Description
<b>Security</b>	The confidentiality as well as security of banking and personal level data and protection of critical applications is vital. Banking industry cannot take the risk of a security violation [9].
<b>Improve flexibility and scalability</b>	The cloud environment gives banks the ability to respond quickly to changing market, customer and technological needs. They can scale up and scale down technology according to requirement. The ability to respond quickly will be an important competitive edge [10].
<b>Regulatory and compliance</b>	Lots of banking regulators have need of the financial data of bank's customers resides in the same geographic boundary. Definite fulfillment regulations needs that these data not with other types of data i.e., on shared servers or on databases. So, there should be clear understanding to the banks regarding these data stored in the cloud environment [11].

### 5.2 STARTING POINT

A bank can have numerous factors for shifting to the cloud environment, but the basic reason will probable to be applications oriented. A major hesitant chunk for main investments in the new technologies always was the money spending needed for new shifting and infrastructure. Due to the cloud environment technology, a financial organization needs to have budget requirements for operational cost and expenses & only pay for the

used services. This is easy for the banks to test the feasibility of the new applications in the cloud environment versus present established resources and infrastructures. None of sole cloud environment based services paradigm is probable to fulfill all the resources technology requirements of a financial institution i.e., bank. As an alternative, banking industry should build up and uphold an application based collection, which consisting of together cloud based environment as well as its own applications. Even as investments and maintenance activities in the existing systems are likely to be continue, but cloud environment based operations and services are perfect for newer business expansions for example online banking. Cloud environment dependent services are likely to give the benefit of both i.e., lesser investments for the implementing business related policies and quicker turnaround ratio in terms of time for banking product and services offered by banks, particularly those services delivered through online manner i.e. through handheld devices/Apps as well as the use of Internet. Figure 2 represents the architecture for cloud environment.



**Figure 2 Architecture for Cloud Environment**

## VI. CONCLUSION

When a bank migrated to cloud environment in the coming time, bank should select right cloud environment service methods and delivery paradigms that should be match needs of operational flexibility, major cost savings, and pay as per use paradigm. We consider that banks be supposed to take on a measured evolutionary direction for the selection of cloud environment services. The evaluation of every project based upon the application criteria as well as the characteristic of the data. Lower risk or non risky banking projects might consider CRM and ERP. Higher risk or most risky banking projects should have to consider core business activities i.e., wealth management activities and core banking activities. We anticipate that banks will have to adopt application based portfolio that contains the mixing of on-boundary and cloud environment based services (off-boundary) delivery requires a mixing of private environment, hybrid environment, and public environment based cloud environment delivery and deployment paradigms and the ratio of cloud environment based services should be step by step rising in the mix service. Private clouds environment are likely to be more and more become the operational paradigm for cloud environment based services amongst different banks. This gives

banking organizations complete control over the rights and ownership for the operations of their cloud environment systems.

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