

BENEFITS OF ADOPTING CLOUD COMPUTING SYSTEMS BY INDIAN BANKS

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Abstract : Customer satisfaction and convenience has been one of the major factors forcing banks in India and globally to implement cloud computing methods. Traditionally banks were catering to limited customers and with the explosion of the information technology the demands from the customers has increased manifold and banks are forced to take adopt cloud computing to meet the requirements of the customers. Another important issue is with regard to the huge volumes of data handled by the banks, which necessitates the usage of cloud space for storage of data. Banks undertake different kinds of analysis for improving customer experience and also to retain their customers due to stiff competition from other banks.

Many banks and financial institutions worldwide have implemented cloud and as a result India is emerging as a big market for global giants like Google, Amazon Web Services and Microsoft to invest in local data centers to tap the growing opportunity from Indian firms to host their applications on the cloud.

With this background, the paper will bring out the meaning of cloud computing and discuss the advantages in adopting cloud-based computing with reference to the banking sector in India. It discusses the advantages of such a system, in addition to sharing a few success stories of banks that have adopted this system. The paper will be concluded by briefly mentioning the challenges that the industry is facing as the concept of cloud is in the developing phase in India.

Index Terms – Cloud computing, Banking Sector.

I. INTRODUCTION

Customer satisfaction and convenience is one of the key driving factors in influencing banking industry in India to move towards cloud computing. Customers prefer to retain control over their accounts through use of technology and changes in social and household dynamics, are the driving force for banks to adopt innovative models to enhance the banking experience of its customers. Banking sector is presently experiencing an overload of data and is under pressure to analyze this data using cost effective methods. Traditionally banking has been a conservative industry but the volatility in the current market is forcing banks to introduce innovative products which would provide better market coverage and quick return on investments, and IT infrastructure will assist in meeting this requirement of banks.

Cloud computing is a method that relies on shared computing resources and moving them outside the organization's firewall. Applications are accessed over the web and payment by the cloud customer is based on pay-per-use basis. Earlier, most of the banking infrastructure consisted of Core Banking Solution (CBS) supported by multi-channel platforms. CBS refers to networking of branches, which enables customers to operate their accounts, and avail banking services from any branch of the bank on the CBS network, irrespective of where he maintains his account. The customer is therefore considered as the customer of the bank and not the branch. Since the workload of the bank varies on a day-to-day basis, and banks are involved in additional processing of data which require the use of IT in its regular operations. Cloud services will be a cost-effective tool which will help the bank in meeting the needs of the customer without adding to their cost burden.

National Institute of Standards and Technology (NIST), defines cloud computing as, a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction. In other words, services will be available on demand and different departments in the organization will be using the same servers, storage or other computing resources. Customers can increase or decrease the use of resources based on demand and most importantly pay for the actual amount of services used.

Microsoft Azure defines cloud computing as the delivery of computing services—servers, storage, databases, networking, software, analytics, intelligence and more—over the Internet (“the cloud”) to offer faster innovation, flexible resources and economies of scale. Payment is only for cloud services used, helping lower your operating costs, run your infrastructure more efficiently and scale as your business needs change.

II OBJECTIVES OF THE PAPER:

1. To understand the basics of cloud computing – meaning, models (delivery and service).
2. To assess the advantages of cloud computing to the banking sector and mention few success stories of banks in India that have adopted this model.
3. To mention the challenges relating to cloud computing.

III CLOUD DELIVERY MODELS

Delivery models are based on the physical location of the computing resources and who can access these resources.

3.1. **Public cloud** vendors offer their services to the general public and their customers share access to the large data centers of computing hardware. The infrastructure is owned and managed by an organization selling cloud services. In this model, computing capabilities and services such as standardized business processes, applications and infrastructure services are accessed by multiple subscribing clients on a flexible, pay-per-use basis.

3.2. **Private cloud** on the other hand reserves the cloud environment for the exclusive use of one organization. Usually large enterprises prefer to keep data and applications in private cloud both, for security reasons and to comply with legal regulations. Private cloud can be located in their own data centers or they can use a hosted private cloud service. With a hosted private cloud, a public cloud vendor agrees to set aside certain computing resources and allow only one customer to use those resources. Private clouds help drive efficiency, standardization and best practices in the services it provides and lets a bank retain greater customization and control as compared to public cloud.

3.3. **A hybrid cloud** is a combination of both a public and private cloud with some level of integration between the two. Under this system, web servers may be run in its private cloud and use public cloud service for additional capacity only during peak use. In this model, computing capabilities and resources are owned and maintained by both the bank and the cloud provider. A bank uses public cloud computing capabilities and services for general computing, but stores customer and sensitive data in its private cloud to ensure security.

3.4. **A multi-cloud** environment is similar to a hybrid cloud because the customer is using more than one cloud service. A multi-cloud environment can include only public clouds, only private clouds or a combination of both public and private clouds.

IV CLOUD SERVICE MODELS

Cloud services are installed based on the user needs and the commonly used models include the following services:

4.1. Software as a Service (SaaS)

This is a software delivery method and software can be accessed from any internet-connected device and at any time. The software functions remotely and SaaS customers pay a recurring, monthly or annual fee to subscribe to this service. Examples of this model are Microsoft Office 365, Dropbox, Adobe Creative Cloud etc.

4.2. Platform as a Service (PaaS)

This is a computing platform delivered as a service. Here the platform is outsourced in place of a company or data center purchasing and managing its own hardware and software layers. They are designed mostly for developers and aim to simplify the process of creating and deploying software. The leading PaaS vendors include Amazon Web Services, Microsoft Azure, IBM and Google Cloud Platform.

4.3. Infrastructure as a Service (IaaS)

Here, computer infrastructure, such as servers, storage and networking delivered as a service. It is popular with enterprises that appreciate the convenience of having the cloud vendor manage their IT infrastructure. They also sometimes see cost savings as a result of paying only for the computing resources they use. The leading IaaS vendors include Amazon Web Services, Microsoft Azure, IBM and Google Cloud Platform.

V BENEFITS OF CLOUD ADOPTION FOR THE BANKING SECTOR

Banks and financial services organizations traditionally spent the highest percentage of their operating expenses on IT, as compared to other industries. Cloud adoption has been identified as the highest priority for most industries and banks are transforming towards cloud-based services. The advantages of cloud computing specifically for banks can be grouped under the following categories:

5.1. Time-to-market

When a new product launch is planned, apart from the business analytics and product design, significant readiness is required from IT. The product should be supported by core banking and serviced by all channels. Core banking is a service where customers can access their accounts and perform transactions from any branch of the bank. Sometimes, it could involve changes in the business process, which will necessitate faster development of lifecycle and a faster deployment of lifecycle. Usually, a lot of research is done on the creation of the products, and many times growth is unpredictable and can grow both towards the bank and its infrastructure, and towards customers. If growth is towards the bank and its infrastructure, then return on investment is stretched for the deployed licenses and hardware. If the manages this unexpected growth, cloud services will help achieve this growth without much disruption to the business. If cloud services were not adopted such growth would have warranted additional procurement and delays resulting in impairment of performance.

5.2. Workload optimization

Workloads are unique to the banking sector and there are wide variations in a given business day and more significantly on specific days like year-end and quarter end. The following are the three top workloads in banks:

- Core systems
- Payment systems
- Reporting and analytics.

There are wide swings in the workload and with cloud computing environments the overall workload can be optimized to the extent of 20-30% of capacity. Cloud has an added advantage that it can bring data from a variety of sources, including from customer organizations, and their employees and customers.

One more optimization area is the test and development environment, especially for core systems. Since this caters to almost all business units which are involved in banking operations, there is a need for numerous redundant test and development environments. In a mid-size bank at any point in time there would be at least 10 test environments of the core system. With cloud computing, the compute capacity can be optimized with lower overall cost, as not all business units will be using them at the same point in time.

5.3. Funding

In the banking sector there are unknown business fluctuations and maintaining costly infrastructure with low utilization adds to the operating cost. Hence flexible expansion and contraction of service usage through the cloud, while paying based on usage is financially prudent.

Cost rationalization and savings on CAPEX (capital expenditure), along with just paying based on usage, users, or on any other basis helps in financial planning and reporting of IT related costs. Minimal software tool footprint (a footprint is the amount of space a particular unit of hardware or software occupies) and efficient use of software licenses are also key outputs of cost rationalization.

5.4. Shared services model

The banking business consists of certain key business processes which are important differentiating factors to the organization such as the credit rating process, customer segmentation, and targeted marketing. It will be prudent to outsource non-core processes (like customer on-boarding and outbound mass marketing) as it can reduce the customer acquisition costs, which are important measures of IT spend and efficiency in banks. Also, through cloud computing, these non-core business processes can be outsourced to vendors who operate on shared services delivery models, while still meeting data privacy requirements.

Additional benefits that cloud computing provides and will be helpful to banks and all other organizations using it.

5.4.1. Speed

Most cloud computing services are provided as self-service models and on demand, so even vast amounts of computing resources can be provisioned in minutes, giving businesses a lot of flexibility and taking the pressure off capacity planning.

5.4.2. Productivity

On-site datacenters require a lot of “racking and stacking”—hardware set up, software patching and other time-consuming IT management chores. Cloud computing removes the need for many of these tasks, so IT teams can spend time on achieving more important business goals.

5.4.3. Performance

The biggest cloud computing services run on a worldwide network of secure datacenters, which are regularly upgraded to the latest generation of fast and efficient computing hardware. This offers several benefits over a single corporate datacenter, including reduced network latency for applications and greater economies of scale.

VI INDIA SUCCESS STORIES

Success stories of banks in India adopting cloud computing for optimizing their processes, reducing costs, and building the capability to scale rapidly. Urban Co-operative Banks (UCBs) and Regional Rural Banks (RRBs) have been early adopters of cloud computing and two major software solution providers have outsourced their Core Banking Solutions (CBSs) to UCBs and RRBs and district co-operative banks through their own data centers.

- Four co-operative banks in India – The Co-operative Bank of Rajkot (Gujarat), Shivajirao Bhosale Sahakari Bank (Maharashtra), Goa State Cooperative Bank, and Tumkur Veerashaiva Co-operative Bank (Karnataka) – have adopted hosted solutions to improve their operational efficiency and compete more effectively. As per the company’s media release, this solution will enable these banks to set up a cost-effective and energy efficient data center to offer new services like ATM, mobile banking, and online banking to customers.
- Pondicherry Co-operative Urban Bank uses a cloud computing solution to offer more customer-centric services and to establish a robust banking operation. By implementing this multi-tenant IaaS on the cloud, the bank will be able to offer state-of-the art financial solutions to its customers including Internet banking, online money transfer, ATM, and mobile banking.
- YES, Bank has adopted cloud computing and has been an early adopter of cloud-based services in banking with the first implementation in payments, online account opening, and remittance services. Cloud computing provides the bank flexibility in faster provisioning at a low cost.

It is hopeful that more banks will opt for cloud computing despite the challenges facing them. A few challenges relating to the usage of cloud platform:

❖ Data Residency Requirements

Most central banks (including the RBI) require that core system banking data needs to physically reside within the same geographical area. Because of this requirement, the choice of cloud computing platforms can be limited.

❖ Cloud Compatibility and Availability of Services

Another key challenge faced by the banking industry is the compatibility of applications for cloud computing or options for porting them onto the cloud. The typical implementation and stabilization timeframe for a core banking application is almost five years which makes it difficult for banks to switch to another vendor who offers cloud-based delivery. Only a few vendors in India offer cloud-based core banking which again is targeted for mid-size to smaller banks with a limited set of product features and offerings.

❖ Data Privacy

Data privacy and security is another challenging aspect which hinders the migration of banks onto the public cloud. It becomes very important as any breach of privacy might cost the bank by losing customers, as well as possible reputation damage, legal issues, and fines.

VII CONCLUSION

In conclusion, it can be said that cloud computing services and solutions give banks a cost-effective way to respond to the rapidly changing dynamics of the financial world. Cloud-based applications have advantages over traditional application deployment models. These applications use IT and development resources more efficiently and are less costly to maintain. However, developing cloud-based applications requires new approaches. Cloud based software can be developed by building custom cloud applications from planning to design, development and deployment based on a “need based approach” of the client. India is emerging as a big market for global giants like Google, Amazon Web Services and Microsoft to invest in local data centers to tap the growing opportunity from Indian firms to host their applications on the cloud.

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