

Cloud Computing in Banking Sector – A Case Study

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Abstract-The advent of cloud computing has changed the way it meets the requirements of IT. Cloud Computing has emerged as a new era in IT and is high on the agenda of all CIOs. Many banks now use cloud technology to achieve their various goals. Cloud technology provides business models that deliver new customer experience, efficient collaboration, improved marketing speed and improved IT efficiency. Using cloud computing banks can create a flexible and fast banking environment that can respond quickly to the needs of a new business. This article provides a useful insight into how cloud computing can be used in the banking industry, the various business models associated with it, and the challenges the banking industry faces in adopting this technology.

Keywords- Cloud computing, Banking, Business model, Hybrid cloud.

I. INTRODUCTION

Cloud computing is computing that uses data stored on an external server, accessed via the Internet. It's defined as ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

It is an evolutionary result of the improvements in digital networks and computing speed over the last decades.

Banks are already widely using cloud computing for non-core and non-critical uses, such as human resources, e-mail, customer analytics, customer relationship management, and development and testing (88% of surveyed EU-based financial institutions were already using cloud based services), while a few smaller banks either have transferred or are in the process of transferring entire core services (treasury, payments, retail banking, enterprise data etc.) to the cloud.

This brief looks into the relationship between banks and technology; presents an overview of the cloud model; outlines the model's benefits, costs and risks; discusses risk management strategies; and predicts what the near future holds for cloud computing in banking.

1. Importance of the study:

One of the most widely growing phenomenon on the internet Cloud computing a revolutionary concept that is being considered by many banks and financial industries.

The interesting concept of Cloud computing involves several computers that are connected to the internet or through any other real time communication network.

This concept allows for a program to run on all of the connected computers simultaneously. With Cloud computing large banks as well as many other financial industries can expect many enormous benefits. Here are some of the great benefits of Cloud computing for banks and financial industries.

2. Statement of the problem:

By providing near-unlimited hardware and software resources on an off-the-peg, pay-as-you-go basis over the internet, cloud computing drives down costs, enables innovation and creates the flexibility to respond to change. Traditionally banks were reluctant to embrace such technologies, especially on security grounds.

There are other challenges too, such as regulation and the potential complexity involved in managing many different suppliers spread all over the world. But the past year has seen them taking a closer look as they start to fully understand the benefits it can bring and in response to growing use of the cloud by clients. Most companies believe it will play a central role in their future strategies, according to a survey from IBM. They are also demanding greater connectivity with their banks, a process eased by the cloud's use of standard technologies.

The EC is also waking up to the possibilities. In a recent policy paper, the EC's European Cloud Partnership spelt out the need to tackle issues around data, privacy security and legal differences across national boundaries. Its vision is to create a secure environment in which private and public sector organizations can use, buy and sell cloud services.

3. Objective of the study:

The main objective of the study is to given the detailed information regarding the cloud computing in banking.

II. OVERVIEW

Banks may have various reasons for migrating to the cloud, but the main reason applications. A pivotal stumbling block for huge investments in new technologies has always been the capital expenditure needed for advance infrastructure. With cloud computing, various financial institutions only have to budget for functional expenses and wage for the services they use.

This makes it effortless and more cost effective to test new applications on the cloud versus prevailing conventional infrastructures. No cloud computing services model is customary to meet all the technology requirements for every financial organization. Banks should develop and preserve an application portfolio consisting of both cloud and on- ground applications.

While endorsements in legacy systems are supposed to continue, cloud based services are ideal for recent business fields. Cloud-based services are expected to provide the edge of both minimum investments in enforcing business strategies and faster turnaround time for product and service contribution.

III. MODELS

Cloud service models offer financial organization the option to move from a capital-intensive way to a more malleable business model that minimize operational wage.

The key to achievement lies in choosing the right cloud services model to meet business needs. In this section we review various models for cloud computing services, functions and deployment.

1. Cloud Service Models:

- 1.1 Business Process-as-a-Service (BPaaS)** The cloud is used for standard business processes such as billing, payroll, or human resources. BPaaS combines all the other service models with process expertise.
- 1.2 Software-as-a-Service (SaaS)** A cloud service provider manage the business software and related data and users access the services and data via their web browser. Number of software that can be delivered this way include accounting ,CRM ,ERP, invoicing, human resource management, content management, and service desk management.
- 1.3 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.
- 1.4 Infrastructure-as-a-Service (IaaS)** This cloud model allows businesses to buy those resources as a fully

outsourced service rather than purchasing servers, software, data center space or network equipment.

2. Cloud Deployment Models:

There are three ways service providers most commonly deploy clouds:

- 2.1 Private clouds:** The cloud infrastructure is operated uniquely for a specific organization. It may be governed by the company or a third party and may prevail inside or outside the premises. This is the most impregnable of all cloud choice.
- 2.2 Public clouds:** The cloud infrastructure is made attainable to the common public or a large industry group and is governed by an organization that trades cloud services.
- 2.3 Hybrid clouds:** The cloud infrastructure is consist of two or more clouds (private or public) that remain sole entities but are associated in order to administer services.

IV. CLOUD OPERATING MODELS

The third aspect of choosing the right cloud services delivery model is determining the appropriate operating model for the required mix of resources and assets. We have identified three operating models for cloud services:

1. Staff augmentation:

Financial firms can gain cloud expertise by hiring people with the right skill sets from service vendors. The additional staff can be housed in the firm's existing offshore captive center. This operating model allows for flexibility and lets firms choose the best resource for each specific requirement.

2. Virtual captives:

Virtual captives have a dedicated pool of resources or centers to help with cloud operations and meet demand. This operating model is a good alternative to a complete outsourcing approach.

3. Outsourcing vendors:

This approach uses offshore centers, facilities, and people from a third party vendor to handle cloud operations. The model combines resources and investments to cater to cloud services for multiple banks.

V.SCOPE OF CLOUD COMPUTING ON BANKING & FINTECH

Cloud computing creates an opportunity for bankers to connect with their users directly. Digital services maintain the customer relations anywhere and anytime through cloud computing. With the help of the internet, many services like storing, managing and accessing the information have become easier for both the bankers and the consumers.

Cloud computing is an easy technique to deploy and integrate with all the services of the bank system which decreases the time and effort of the user.

The evolution of cloud computing enabled the banks to focus more on the customer-centric model and digitalizing the trading & wealth. Cloud computing creates a multi-channel relationship with the customers at every aspect of the service. It helps in storing, backup and recovering huge data of the company. Not only the storing of the data, various other services like delivering the software, transferring the data, Updating and recovering of data is very easy through cloud computing technology. Cloud computing also increases the turnover of the banks by integrating cost-effective cloud solutions.

The banking industry needs to address the ever-growing data input demands. There is a need to explore the systems that do not rely on like-system migration so that infrastructure can be modified without any disruption. Banks have been slow in adopting cloud computing as there are apprehensions regarding reliability, regulatory and security risks. But slowly, cloud computing is changing the way consumers interact with banks.

FinTech maintains the substantial growth and sustains the growth constantly, courtesy cloud technology. FinTech reduces the CAPEX and OPEX budgets, increase the service portfolio and the user experience. The most important aspect of cloud computing is reducing the risk factors related to the data center and its infrastructure. The confidential data will be completely secured. It also helps in risk analysis of the business so that the main focus will be on business rather than securing the crucial information.

Some of the big names in the FinTech cloud computing sector are:

- Amazon Web Services
- Google Virtual Cloud
- Microsoft Azure
- Aliyun
- IBM Bluemix

1. Applications of Cloud Technology in Banking & FinTech:

- Cloud computing increases the efficiency in the industry. Usage of cloud technology is an added advantage in banking and finance sector. Digitalizing the services will allow the banks and financial institutions to build up an infrastructure to provide the best and appropriate service to the customers.
- Data centers generally go through many attacks from the hackers which corrupt and led to the loss of very crucial information in the bank. Such attacks can be eliminated by authenticating the data centers which are very easy through cloud computing. Every data

stored is safe with hybrid cloud computing technology.

- Amazon web services and Microsoft's Azure are cloud providers who provide hybrid cloud computing servers to the companies. Getting the hybrid cloud computing servers provides end-end protection to the information stored in the cloud. Cloud computing ensures Confidentiality, Integrity, and Availability of the information over the internet.
- Cloud computing ensures secure transactions and smooth customer experience in banks. Hosting over the internet with the help of web apps ensures better speed and service to the users.
- Payment Gateways, digital wallets, online fund transfer, and secure online payments are among the best examples of the cloud computing service. Cloud ensures the secure and unified customer experience. Updating the payments is quite very easy through cloud computing.

2. Advantages and disadvantages of cloud banking

The following are the various advantages/benefits and disadvantages/limitations from the cloud computing practices in banking sector.

2.1 Benefits of Cloud Computing in Banking & FinTech:

- 2.1.1 Cost-effective:** Cloud computing reduces all the capital expense of buying and setting up hardware and software at data centers. This makes the banks to focus more on banking functions.
- 2.1.2 Feasibility:** Cloud computing services enable easy use of the data. A large amount of data in banks is feasible to use. Cloud computing helps the banking and financial services to manage the different demands in the banking world.
- 2.1.3 Reliability:** Cloud infrastructure is highly reliable. Cloud computing gives a complete data backup to information. Data can also be accessed at multiple redundant sites with utmost ease. Hybrid cloud models give the utmost security to the data. The data saved in the cloud is encrypted well to eliminate all kinds of security threats in banks.
- 2.1.4 Productivity:** Cloud computing eliminates all the unnecessary time of racking and stacking of data in the banks, hence increases the productivity. Every task in the bank related to the information will be taken care of by the software through cloud computing.
- 2.1.5 Advantage in Regulatory and Compliance:** Cloud computing has an advantage in regulation. The vendor can completely secure the data or give partial access to selected data. This ensures the regulations in the database. Since it is presumed that by 2022 dollar 262 billion worth of business is going get linked up through cloud storage, every bank and every financial institution will completely digitalize through cloud computing.

2.2 Limitations:

Every technology has its own pros and cons, while in case of cloud computing limitations can be considered as precautions. These precautions need to be taken care by the bankers who enable high ended and secure service to the users.

Security in the cloud servers is considered to be the main issue. Maintaining the confidentiality and security of financial information of customers and internal company data is very important in banking and finance institutions. If proper precautions are not taken by the vendors then entire confidential data will get corrupted. This could be avoided by encrypting the cloud service and storage of confidential information in private storage can help in managing the risk.

3. Comparison of cloud banking and traditional banking:

It's news we've heard before: online banks are the way of the future. Online banks seem to have it all: relatively high interest rates, stellar customer service, low fees, and the added bonus of 24/7 access to your finances with the click of a button. Still, online banking isn't for everyone, and the line between the two is becoming blurred as more banks ramp up their web presence to compete. To help you decide, we tapped Richard Barrington, a senior financial analyst at MoneyRates.com, to break down the pros and cons of keeping your cash in a traditional versus online bank.

3.1 Security: This is one issue that scares many people away from taking their banking online, but Barrington said it shouldn't. Even traditional banks have all your financial information stored in a big data center that could be vulnerable to hackers. "Data theft is a very real risk these days, but, unfortunately, as a consumer, it doesn't come down to whether you choose to bank online," he said. If you choose an online bank backed by the FDIC, you'll be covered for losses up to \$250,000 just like any other bank customer (use the FDIC's Bank Find tool to be sure). And, of course, remember to avoid doing any online banking on a public or shared WiFi connection, since that's when your information can be most easily intercepted.

3.2 Fees: Online banks are friendlier to smaller depositors because they typically require lower monthly balances. Barrington said traditional banks require an average of about \$4,700 to be kept in your savings account without charging you a nominal monthly maintenance fee. For online banks, that number is much lower at \$350. In addition, online banks are about twice as likely to offer free checking, he said. "I think (online banking) is a really good option for younger customers — the fees as a whole are lower, the balance requirements are also lower, and young people as a rule are more comfortable with technology," Barrington said.

3.3 ATMs: Banking is all about getting cash when you need it, and Barrington said people should look at the locations of a bank's ATMs before they open an account. "You want to make sure you choose a bank where the geographic footprint of their ATM network is similar to your regular movements," Barrington said. Traditional banks, like Chase and Bank of America, have ATMs all over in many major cities. Online banks, like Simple, often have agreements with ATM networks like all point for surcharge-free withdrawals. And most others offer to reimburse customers up to a certain sum for using out-of-network ATMs.

3.4 Deposits: Web-based banks offer a few different options to deposit physical checks. You can always mail them in, but most online banks also offer "e deposits" in which you can take a picture of the front and back of each check and upload it to your account for deposit. A lot of people still would rather deposit a check with a teller than a text message, but the option's out there. "People are for the most part checking their balances online, getting information online, but when it comes to depositing a check, they'd much rather hand it to a teller," Barrington said.

3.5 Interest rates: Online banks typically have better interest rates than traditional banks because they don't need to take any funds to operate brick-and-mortar buildings. In a recent MoneyRates.com study, online banks were found to have about six times higher interest rates than the nationwide average. Some of the best were found at Ally Bank, American Express Bank and Sallie Mae Bank.

3.6 Customer service: If you like to deal with the people managing your money via email or over the phone, go digital. If you'd rather have someone to talk things through with face-to-face, stick with a regular bank. Nearly all banks also have call centers and online message centers as well. Online banks are rarely, if ever, "closed." But if you'd rather use a traditional bank to complete your transactions or get questions answered in person, you'll need to visit your bank during normal business hours and make sure it's not a bank holiday.

3.7 Personal preference: Having a personal relationship with a banker can be a big benefit for people, especially those who like getting new products or services pitched to them or getting in-person financial advice. But keep in mind that banks have been closing physical branches left and right to cut costs, even installing ATMs that allow tellers to answer questions via web cam. "As time goes on, the comfort level will grow more and more," Barrington said. "If the technology can prove itself, people will use the technology."

3.8 The bottom line: If you're comfortable with technology and don't feel like you need face time with the people handling your cash, keeping your savings

in an online bank is a great option. You'll see your money grow faster than with a big bank, and you'll pay less in fees. As far as checking accounts go, online and traditional banks are pretty much neck in neck. "I think the common denominator is that online banking is cheaper for banks to provide because they're not supporting a physical branch and people to staff that branch," Barrington said. "Even banks that offer both are likely to offer you higher rates and lower fees if choose online options".

VI. CONCLUSION

Cloud computing lets people use the internet to tap into hardware, software and a range of related services on demand from powerful computers usually based in remote locations. Cloud computing can help meet all these challenges. There are few areas of transaction banking it does not touch from cash management, trade and supply chain finance to payments, mobile banking and business analytics. The key to competitive advantage will lie in the know-how brought to bear on behalf of clients.

All this momentum is building at a time when banks are under increasing pressure to use their IT budgets more efficiently, while competition from non-bank payments providers is much tougher and the need to serve clients better is becoming more acute. But it is not a technological Valhalla there are disadvantages too. Cloud computing means banks will not have to invest heavily in dedicated hardware, software and related manpower.

The cloud 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. Banks will enjoy improved efficiency ratios and operating leverage.

The standardization inherent in the cloud could makes it easier to integrate new technologies and applications in the future. Because technology and business operations can be much more closely aligned, the cloud gives banks a golden opportunity to drive out complexity.

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