

CLOUD COMPUTING IN BANKING AND FINANCIAL SERVICES – VALUES AND RESTRICTIONS

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Abstract: Cloud computing is one of the rapid developed technologies which expanded enormously with lots of grasp. Many CTOs, CIOs and CFOs are using this in order to withstand in the market. Cloud is an instrument which helps in other technologies such as big data, IoT, AI etc. For the core banking problems such as interoperability, 24x7, storage etc., cloud computing provides solution. As per the survey by Forbes cloud computing is expected to grow to \$162B in 2020 with the annual growth rate of 19%. Some of the benefits of cloud computing in banking and financial services are reduction in cost, business process improvement, waste minimization, auto scalability, efficient client service, continuity of business, improvement in flexibility etc., The following restrictions such as access, privacy, culture, standards of service providers, uncertainties about emerging technologies, integration with existing infrastructure, regularity compliance and support for the clients are to be checked before implementing cloud in the banking and finance sector. The proposed study analyses the benefits which can be enjoyed and challenges to be faced by the banks and the financial institutions.

Index Terms- Cloud Computing, SaaS, PaaS, IaaS, Public Cloud, Private Cloud, Community Cloud, Hybrid Cloud

I. INTRODUCTION

Storing and accessing data and programs over the Internet as a substitute of computer's hard drive is called as cloud computing. The word cloud is used as an image/symbol for the Internet.

1.1 Various Definitions of Cloud Computing

Internet definition of Cloud computing is that the practice of using a network of remote servers hosted on the internet to store, manage and process data rather than a local server or a personal computer.

Wikipedia says Cloud computing is computing term or an image/symbol that developed in 2000s based on utility and consumption of computing resources. It involves deployment of group of remote servers and software networks that helps in centralised data storage and online access to computer services and resources.

As per Whatis Cloud computing is a common term for anything that engages in delivering hosted services over the internet. The three categories of these services are (i) Infrastructure-as-a-Service (IaaS), (ii) Platform-as-a-Service (PaaS) and (iii) Software-as-a-Service (SaaS).

Gartner group defines cloud computing as a style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service using Internet technologies.

1.1.2 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.

1.1.3 IEEE Standards Association (IEEE-SA) defines cloud computing in two ways (i.e.) P 2301 as Cloud Profiles highlighting different ecosystem of cloud such as cloud vendors, service providers, and users. P 2302 as Intercloud providing definitions on topology, functions and governance for cloud-to-cloud interoperability and federation.

1.1.4 Vaishnavi Kulkarni defines Cloud computing as a computing paradigm with virtual network of remote servers allowing users to store, process and access data, providing on-demand computational services with features like elasticity, scalability, security and redundancy

Since Security and privacy are very important in the banking and financial services sector they are hesitating to use cloud based services. If the privacy and security measures are contravened the effect would be shocking for the customers, officials and employees. Cloud security Alliance in their study found out that 61 percent of the respondents from financial service industry were of the view that use of cloud computing for their industry was just a formality. 40 percent of them were of the opinion that hybrid mix and in-house computing

Things to be kept away from by the financial service providers when adopting a cloud strategy are

1. The cloud service providers who are using the third party data centres since the providers won't have total control over what is happening in the cloud.
2. The providers who are unwilling to furnish up-to-date security, compliance and audits.
3. The cloud providers who are lacking financial services expertise which is a major requirement.

1.2 Cloud options that may entreaty to banking and financial firms

Banks and financial institutions prefer to keep their data and systems in – house. Still the following are the budding opportunities for cloud providers

- **Card and mobile payment processing -- Visa, MasterCard, and trusted third parties:** Large banks are processing their own debit, credit and ATM transactions. However many banks use the services of Visa, Mastercard or a third party processor to process their card and mobile transactions. The card payment processors are operating in the cloud and provide expertise in all the activities.

1.3 Customer relationship management and Marketing: Most of the banks and financial institutions are putting maximum effort in marketing of their services. They develop and launch campaigns but with meagre research and failed in their efforts because of lesser understanding about the customers and their needs. Some of the cloud providers such as OMI with market research and analytics help the financial services and banking to design proper products with segmentation. For sales and customer relationship management the cloud provider such as Sales force can be used to have a 360 degree view of the customers.

- **Core Banking:** Own core banking systems are maintained by the large banks and financial institutions, But the small and medium sized concerns have to identify trusted cloud service provider for online banking, electronic bill paying, and teller line and for back office.
- **Human resource and talent management:** For core HR software like payroll and benefits, talent management for recruiting better and to develop employees and manage succession plans banks and financial institutions can use cloud services. Some of the popular cloud services are Oracle HCM and SAP/Success Factors.
- **Infrastructure as a Service:** Banks and financial institutions are also concerned about increase in the cost of running data centres. In order to have costly hardware and software upgrades cloud based infrastructure as a service (LaaS) can be opted. Cloud services can also be used to offload risk management processing of large portfolios. To run portfolio credit risk simulations in as 20 minutes Amazon Web Services can be used. For application development, testing, disaster recovery, failover, and data storage First National Technology Solutions is offering LaaS.

1.4 Points to be considered when adopting Cloud

Due to the developments in the technology and increase in the competition banks and financial institutions while adopting to the cloud should consider the following

- Adopt to the cloud only from cloud provider with SaaS
- Trial or try and buy arrangements should be there before entering into the services contract
- Claim to test disaster recovery and failover to ensure the vendor's system will run during crisis.
- Insist on a single point contact from the cloud provider.

II BENEFITS OF ADOPTION TO CLOUD

There is a constant increase in the adoption rate to cloud all over the world. This may shake the banks and financial services which have traditionally been hesitant to adopt the cloud due to the security norms. This hesitant attitude is no longer an option in today's digital world where cloud is central to digital innovation. Banking and financial services are most dynamic and innovative industries. If the banking and financial institutions fail to meet the customers' expectations may lose the business to the better equipped competitors who are satisfying the needs of the digitally savvy customers.

1. **Cost Cutting:** For banking and financial services business effective data centres and servers had to be constructed, staff to be recruited and trained. These costs are high for the new entrants and even for the existing ones. When we are using the cloud computing banks need not invest heavily in dedicated hardware and software or man power to maintain it, instead can buy it from secure dedicated cloud service provider and focus on their business. The real life example is the ME bank reduced the cost of delivering development and test environments for new services and applications by 75%

2. **Flexibility and Scalability:** Banks and financial institutions which are using the cloud are having the ability to rapidly scale processing capability based on the ever changing market developments and the customer demands. Customer centric digital banks with the ability to act quickly are very much needed in the fast paced world to remain competitive. In a survey 65% of the organisations stated that scalability as their main reason for adopting cloud services. Many of the financial institutions are realising the benefit and acting accordingly. Auka is a Norwegian mobile payments startup by delegating the business's server – side infrastructure to cloud delivered impressive scaling capabilities. **Daniel Döderlein, Founder and CEO, Auka,** said: *'With App Engine, we can go from ten transactions a second to thousands a second without a hiccup. Expanding across borders into new markets becomes vastly more tractable. It scales beautifully.'*

3. **Boost Efficiency:** In order to streamline the operations for the improved efficiency and operating leverage the financial institutions can use cloud particularly for businesses which are operating in multiple markets with enormous demographics for retaining high level of efficiency. In order to gain an advantage over their competitors by seamlessly negotiating new innovations and developments from a particular market cloud services can be utilised. For example FIS, a global leader in financial services technology and a strategic partner of PCT, runs US market analysis using the cloud. FIS' Market Reconstruction Platform can collect and process data, and produce feedback reports within a few hours, with the ability to adjust to fluctuating market activity and support complex analytics.

4. **Faster customer service:** For the financial institutions which are traditionally slow in responding to the growing customer requirements cloud computing helps in developing and launching new products and services. Without cloud usually it takes to bring a proto type itself more than one year. But with cloud it is possible to deploy new features within three months. For instant Unisys, a global information technology company, worked with PCT to leverage the Microsoft Azure cloud as a key component of Elevate™ by Unisys, an omnichannel digital banking platform that enables startups and established financial institutions to deliver secure banking services anytime, anywhere.

5. **Better Customer Relationships:** With help of big data and unlimited computing power cloud helps the banks and financial institutions to have a better insight into their clients than before. The banks which are ignoring the opportunity of customising the customers 'expectations may lose the crucial demographics. Tangerine in 2013, it adopted an entirely new business model to ensure that it could access customer feedback more easily, and deliver services based on that feedback effectively by using Microsoft's Analytics Platform System (APS) and Azure Hindsight. After transitioning 45 business intelligence (BI) end users to a Microsoft BI environment, Tangerine was able to convert customer data into tangible insights faster and more easily than was previously possible. This deep understanding of Tangerine's customers has allowed it to deliver the incentives and services required to retain and grow its customer base. Further, using the Microsoft cloud, Tangerine has been able to adjust new product rollouts based on customer reactions in real-time, keeping the bank one step ahead of its competitors.

6. **Green IT**– Transferring banking services to the cloud reduces carbon footprint and energy consumption, and there is minimized idle time with more efficient utilization of computing power.

III CHALLENGES IN ADOPTING CLOUD:

In spite of many benefits such as lowered costs, scalability, flexibility, efficiency etc., many banks are still hesitant to adopt cloud technology. In fact, **survey of financial executives** found that 61 percent of them believed their cloud strategy was still stuck in the formative stage.

- **Security:** Keeping data secure is the first and foremost activity of the financial institutions. Banking information is extremely sensitive, valuable and vulnerable. The average data breach is about \$145 -\$154 for each comprised account. Handing off such information to cloud is an important one and the executives should think more than once.
- **Regulation and Compliance:** Data protection laws often dictate exactly what your options are in regards to storing and managing your information. By placing this all in the cloud, executives are concerned that key pieces could be missed, resulting in hefty fines and negative publicity.
- **Control:** Since the data is handed over to the cloud service provider the financial institutions need to reach out them putting themselves at their mercy. Not having total control over the activities stop the institutions from moving to cloud at all.

IV CLOUD SERVICE MODELS

Cloud computing offers more flexible business models to the financial institutions which lowers operational costs. However, it is essential to select the cloud service model that best matches the core business requirements. These models are:

4.1 PaaS– (Business Process-as-a-service) - Used for general processes such as payroll, billing, human resources etc.

4.2 SaaS– (Software-as-a-service) – Users can access the software and data from their browser, and business software and related data are housed by the cloud service provider. Accounting, enterprise resource planning (ERP), customer relation management (CRM), human resource management, invoicing, and service desk management and content management software can be delivered using this model.

4.3 IaaS (Infrastructure-as-a-service) – Rather than purchasing software, servers, network equipment or data centre space, the businesses can buy these resources as fully outsourced services.

4.4 PaaS(Platform-as-a-service) – In this model, the cloud service provider offers a complete platform to the businesses to develop , run and manage their applications without engaging in the infrastructure complexities associated with application development and launch.

There are three types of commonly deployed clouds. Private cloud is operated specifically for a given company and is most secure of all options. The company may exist on or off the premises, and can be managed either by the company, or by a third party. Public clouds are for a large industry group or for the general public, and ownership lies with the cloud service seller. Hybrid infrastructure consists of two or more public or private clouds that are linked but remain unique entities. For banks depending upon the services and data we can choose the one of the deployed cloud.

V CONCLUSION

More than 65% of the banks and financial institutions have begun to work with various organisations to start putting applications on to the cloud. With the increase in the adoption rate financial services organisations big and small must ensure that they do not disappear into obscurity by failing to keep pace with this key trend. Due to the digitalisation the benefits of cloud become too important to ignore. It is very much important to the businesses to act now with the capricious and constant changing financial service landscape.

Banks are offering a plethora of services, and hence they have different requirements regarding the movement of applications to the cloud. Cloud computing can help banks create more agile and flexible business offerings for the competitive and growing markets, and help them to transform their business processes. Banks and financial institutions can explore and grow into the new markets and sectors, and improve their services to the customers across different geographic locations, and integrate customer information and analytics.

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