Journal on Banking Financial Services & Insurance Research
Vol. 10, Issue 4, April 2020, Impact Factor: 6.596 ISSN: (2231-4288)
www.skirec.org Email Id: skirec.org@gmail.com

Benefits and Challenges of Cloud Computing for Financial Sector

[1]PARVIZ HAJIZADEH, Department of Accounting, Payame Noor University, Iran
[2]Azra Hajizadeh, Research Scholar, DOS in Commerce, University of Mysore, Mysuru

Abstract

As the concept of cloud computing has gained importance in recent years, it is important for financial sector to adopt cloud computing to meet their business demands. Banks must enter the cloud computing arena cautiously as cloud computing can offer financial institutions a number of advantages. As adoption of cloud computing for financial sectors looks beneficial for the business and economy, financial sector must consider issues around data confidentiality, security, regulatory compliance, interoperability of standards, and quality of services. The study therefore attempted to assess the benefits and challenges of cloud computing for financial sector.

Keywords: Benefits for adoption of Cloud Computing, Challenges for adoption of Cloud Computing, Cloud Computing and Financial Sector

Introduction

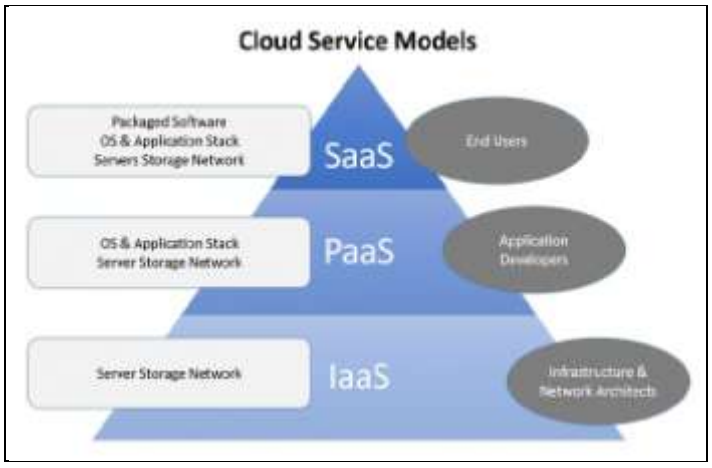
Cloud computing has been in the market for quite some time. With the concept slowly settling in the world, the emergence or recognition of new cloud resources is making it much more viable as compared to that in the past. With the evolvement of the market, it is imminent to properly identify the available resources, and categorize the components of cloud computing according to the newly discovered patterns. Cloud computing when used, does not only have a higher impact on the technology; it greatly affects the people also. Cloud computing describes the development of many existing technologies and approaches to computing into something different. Cloud separates application and information resources from the underlying infrastructure, and the mechanisms used to deliver them.

Traditionally, the financial service industries have been reluctant to adapt to the cloud computing platform citing various reasons. There were few glitches as financial services industry is a highly regulated industry which requires strict IT security measures and privacy norms. These organizations were unable to provide the assurances on time and to the scale which the organizations were demanding.

The *definition* of cloud computing provided by National Institute of Standard and Technology (NIST) has gained significant traction within the IT industry. According to this definition: "*Cloud computing is a model for enabling 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. This cloud model is composed of five essential characteristics, three service models, and four deployment models*".

Cloud computing services are grouped into three areas:

Figure 1: *Types of Cloud Computing Structures*



Source: Arron Fu, (2017). Different Types of Cloud Computing Structures

- **Infrastructure-as-a-Service (IaaS):** This service provides available storage, servers, networking, management and support components for organizations, on demand, making use of virtual servers. These servers and storage infrastructures are accessed through the internet, thereby, enabling businesses to move their data to cloud and dissolve their in house data centers. Examples of this include Go grid, layered technology and joyent. Organizations or individuals can deploy each of these services either as a private cloud, public cloud, hybrid cloud and community cloud, such as networks, processors and storage (e.g., Amazon Web Services, Go Grid, IBM Cloud and Rackspace)
- **Platform-as-a-Service (PaaS):** It consists of operating systems and application development platform which can be accessed and utilized through the Internet. Developers use this platform to develop, test, deploy and host web application as a service via the Internet. For example: Google Application Engine, Microsoft

Windows Azure and International Business Machine (IBM) are providers of such platforms as a service , such as languages, operating systems, optimized middleware and tools (e.g., Force.Com, Google App Engine and Microsoft Windows Azure)

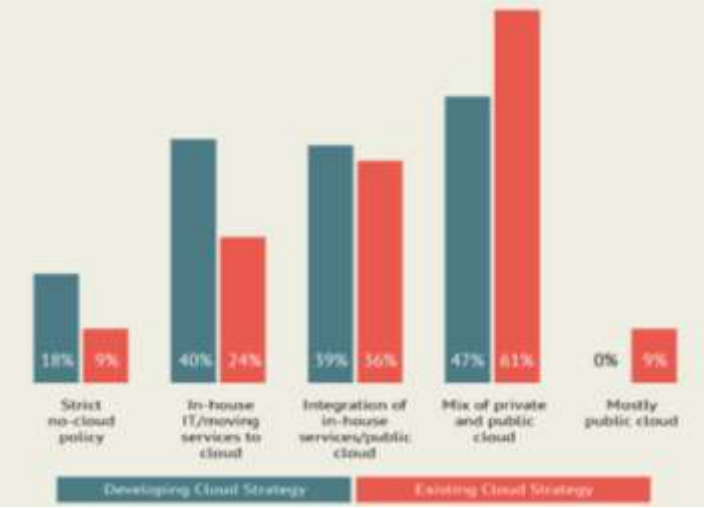
- **Software-as-a-Service (SaaS):** This layer involves applications such as word processors, video editors and databases to be hosted by cloud service provider and is made readily available to the customers on demand or pay as you go, through the internet. Examples of software as a service include Customer Relation Management (CRM) online applications for managing customers, email messaging, Google Document (Doc) (e.g., Cisco WebEx, Intuit QuickBooks OnLine, Sage and SalesForce.Com)

Need for cloud computing in Financial Sector

Financial sector is faced with a unique challenge as on one end it has the opportunity to provide banking access to millions of unbanked people and on the other end it is being disrupted by cloud-native fintech companies. To make the most of this opportunity, financial sector is adopting Digital transformation and ensuring their continued viability in a new competitive and collaborative landscape.

Financial sector needs to manage & extract data, often in collaboration with cloud-native start-ups, while ensuring their long term operational resilience. Cloud adoption supports these goals, making it necessary to the operations of any modern digital businesses, and bringing benefits not only to incumbents but also to newcomers, customers & economy as a whole. It provides infrastructure and advanced analytics in the speed required by digital transformation, and to a level that financial sector cannot match with their own in-house IT support.

Figure 2: Cloud strategy – Companies approaching their cloud strategy



Source: Cyber Security Alliance

The financial industry is still in the early stages of cloud adoption. A majority, 61 percent of financial institutions, is developing a cloud strategy within their organization. The most common strategies use a mix of private, public, or hybrid cloud environments. The exact deployment models companies took are correlated to the maturity of their cloud strategies. Only nine percent of respondents with existing cloud policies reported predominate usage of private clouds. Financial companies utilizing cloud are using public clouds, while many other companies are utilizing both private and public clouds, with a large percentage actively taking on integration of in-house services with public cloud environments. Companies developing their cloud strategies do not plan on relying as heavily on public clouds. The main reasons of concern for companies was security, compliance, privacy, data retention and destruction and data residency.

Review of Literature

Kiran Bala Nayar and Vikas Kumar (2014) in the article "Benefits of Cloud for Banking Sector" stated that with the passage of time the working of banks has been changed. Now the controlling hand is customer rather than bank. This new business model changes the traditional business transformation. For this banking needs cloud computing offers a business model that delivers innovative customers experiences, effective collaboration, enhanced the speed to market. It is a platform for optimizing the banking operations while delivering the

innovative services to the customer. Many banks are adopting this technology for the growth. In the study, the researchers discussed the benefits of cloud in banking sector over the traditional tedious process of banking. The researchers also discussed the challenges associated with the current banking system and provide cloud as solution with the various benefits of it. The researchers explore the various applications that can increase the performance of banking industry and gain the agility

Sanagavarapu, Lalit et al. (2014) in the article "The Indian Banking Community Cloud" stated that cloud computing provides flexibility and agility to meet growing business needs in a dynamic and competitive landscape. Banking, financial services, and insurance sector organizations are interested in exploring cloud services as a technology, provided that security and privacy are ensured. One solution is a community cloud, in which cloud services are targeted for organizations with common objectives and security controls. The Indian Banking Community Cloud (IBCC) initiative of the Institute for Development and Research in Banking Technology in Hyderabad, India, provides cloud-based services exclusively for Indian banks. In this article, the authors describe the IBCC architecture, along with its implementation details, cloud services offered, security and disaster-recovery aspects, deployment challenges, and future work. This article is part of a special issue on advancing cloud computing.

Bejju, Anurag (2014) in the article "Cloud Computing for Banking and Investment Services" stated that the more the things change the more they stay the same. That can be true in some aspects of life, but not in the banking industry. In today's business and economic climate, financial institutions are looking out for better solutions to cope up with their customer needs as well as get a competitive edge over other banks. Cloud computing is touted as a way to deliver software in the future, can help banking sector react to this new customer-driven environment with innovation in business models, operations and IT. It can offer unconventional business models for delivering innovative client experiences, better data security, high service quality, enhanced IT efficiency and reduced operating cost. Cloud computing is a type of disruptive innovation that is likely to change the demographics of banking industry. Using cloud computing, banks can create a flexible and agile banking environment that can quickly respond to new business needs. Though cloud banking can face few problems like security, data confidentiality and quality of services, they can be sorted by

building a good application model. This paper aims to give an overview of cloud computing and proposes a business model to eliminate the negative perception related to cloud based technologies. It also elaborates the defects of current banking systems, and explores the innovative applications of cloud computing in banks.

Objectives of the study:

- To understand the concept of cloud computing in financial sector
- To determine benefits and challenges posed by adoption of cloud computing in financial sector

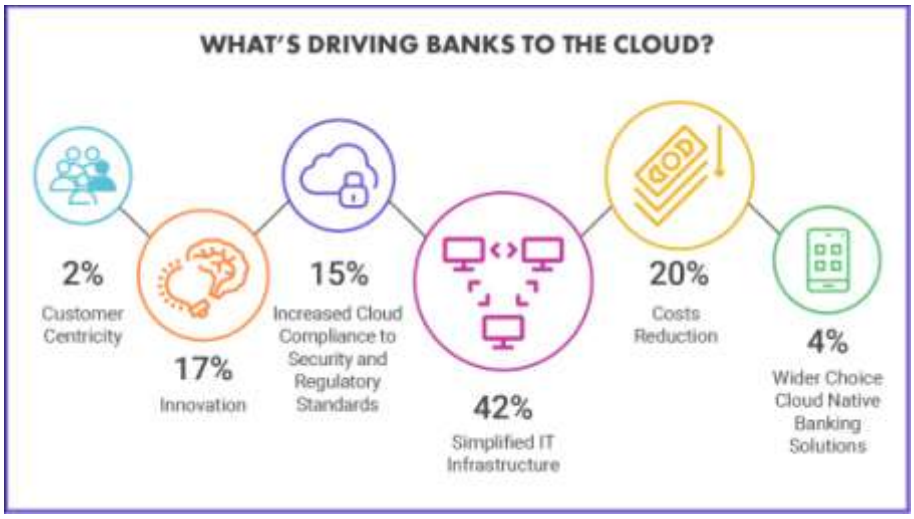
Features that make cloud computing appeal to business:

- Low up-front investment: Cloud computing uses a pay-as-you-go pricing model.
- Lowering operating cost: Resources in a cloud environment can be rapidly allocated and de-allocated on demand.
- Highly scalable: Infrastructure providers pool large amount of resources from data centers and make them easily accessible. A service provider can easily expand its service to large scales in order to handle rapid increase in service demand.
- Easy access: Services hosted in the cloud are generally web-based to be easily accessible through various devices with internet connection.
- Reducing business risks and maintenance expenses: By outsourcing the service infrastructure to the cloud, the organization shifts its business risks to the providers, who often have better expertise and equipped for managing these risks.

Figure 3: Cloud in financial sector

Source: https://www.bobsguide.com/guide/news/2019/Nov/25/banking-on-the-cloud-the-new-normal-in-financial-services/

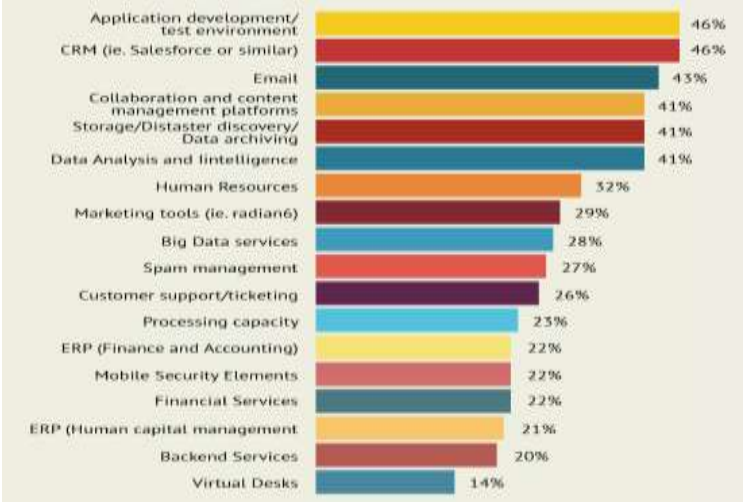
Figure 4: What is driving banks to the cloud?



Source: https://www.bobsguide.com/guide/news/2019/Nov/25/banking-on-the-cloud-the-new-normal-in-financial-services/

Cloud also simplifies, speeds up and minimises risks during the product development cycle. Product testing is an excellent example of a computing process which is best delivered in the cloud. It places a heavy burden on computing resources and can take unpredictable amounts of time. It substantially increases the peak capacity a bank needs to hold in-house, while also driving down the utilisation rate.

Figure 5: Top Cloud applications adopted



Source: Cyber Security Alliance

The top cloud services/applications that are being adopted provide a snapshot into what organizations are leveraging from current cloud providers. As observed, cloud applications for financial services (22%) have been adopted by the companies. Collaboration platforms (41%) and data intelligence (41%) are some of the popular cloud applications. Users are still not using cloud applications to its optimum capacity and hence there persists a scope for substantial growth ahead.

Barriers to cloud computing

Organizations which consider adopting cloud based services must also understand the many major problems of information policy, including issues of privacy, security, reliability, access, and regulation. The major security challenge with clouds is that the owner of the data may not have control of where the data is placed. Some of the challenges are explained below.

- **Misunderstanding of responsibilities**: In a traditional environment the security of data is entirely the burden of the company owning data. In the cloud computing environment, the responsibilities are divided between the two actors: the cloud provider and the client. There is a tremendous potential for misguided risk management decisions if cloud providers do not disclose the extent to which the security controls are implemented and the consumer knows which controls are further needed to be adopted. Further, different kinds of cloud services adopted mean different responsibilities for the service provider and the customer. If an IaaS service model is adopted, then the provider is responsible for physical security, environment security and the virtualization software security, whereas the consumer is responsible for securing everything else above this layer including operating system, applications and data.
- **Data security and confidentiality issues:** One of the biggest security concerns people have when moving to the cloud is related to the problem of keeping data secure and confidential. In this respect, some particular problems arise: who can create data, where the data is stored, who can access and modify data, what happens when data is deleted, how the back- up is done, how the data transfer occurs, etc.
- **Lack of standards:** The immaturity of this technology makes it difficult to develop a

comprehensive and commonly accepted set of standards. Interoperability issues: Additionally, at one time one company may have multiple cloud providers for different services which have to be interoperable. In time, for different reasons, companies may decide to move their services to another cloud and in such a case the lack of interoperability can block or raise heavy obstacles to such a process. Cloud providers may find the customer lock-in system attractive,but for the customers interoperability issues mean that they are vulnerable to price increases, quality of services not meeting their needs, closure of one or more cloud services, provider going out of business, disputes between with the cloud provider.

- **Reliability breakdowns:** Another important aspect of the cloud computing is the reliability or availability of services. The breakdown of an essential service operating in a cloud has an impact on many clients. For example, in April 2012 there was a Gmail disruption that made Gmail services unavailable for almost 1 hour. These incidents are not rare and evidence the customer lack of control over their data. The irony is that, in terms of reliability, cloud providers have set high standards which are rarely achieved in an internal environment.
- **Malicious insider:** A malicious insider is a person motivated to create a bad impact on the organization's mission by taking action that compromises information confidentiality, integrity, and/or availability. When sensitive data is processed outside the enterprise the organizational managers are less immediately aware of the nature and level of risk and they do not possess quick and direct capability to control and counter these risks.

Areas of adoption of Cloud computing

Segment	Avenues
Banking	Core Banking cloud service, Lending & Leasing Cloud Service
Insurance	Policy Administration for Life and Annuity Cloud Service, Health Insurance Cloud Service
Analytics	Financial Crime and Compliance Management Cloud Service, Risk Management Cloud Service

Risks associated With Cloud Computing:

Information security risks, like cyber security disclosure is ranked among the major concerns of the surveys across the world.

The key considerations for financial sectors and their regulators, are

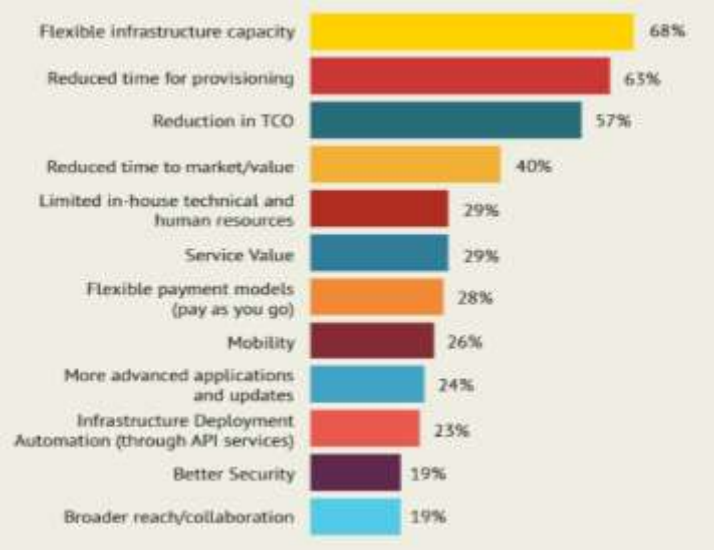
(i) Practical hurdles (regulatory issues) in migrating to cloud, and

(ii) Specific problems associated with cloud service providers, including concentration and dependency

Solution

Due to the constant decline in the absolute cost of IT equipment, many financial institutions have changed other production factors with IT. It further led to increase in the relative importance of IT, compared to other production factors such as human labor (Casolaro, L. and Gobbi, G., 2005). As a result, IT constitutes a major expense post for most financial institutions today. cloud computing has arrived as a novel IT paradigm that promises to "revolutionize" the way IT services are provisioned and consumed (Leymann, F., 2009). The essential idea of cloud computing is to deliver IT services – such as compute infrastructure or storage in a utility like manner (R. Buyya, et al. 2009), thus making these services ultimately more flexible and cost-efficient. Given the role of IT in the financial services sector, as an essential production factor, but also a major expense post, cloud computing may seem as a "perfect match" for this industry. Cloud computing is fastest growing technology of this era. Cloud can be a great help for the business application like CRM (customer relationship management) and ERP(enterprise resource planning). A number of infrastructure operations, such as data centre management, data storage and disaster recovery, should also move to a cloud after a thorough evaluation of different vendors offerings and based on the flexibility of cloud vendors in documenting contracts. SaaS as a delivery model has picked up pace in recent years and banks have started to appreciate its benefits. It can help corporate treasuries to efficiently reduce their total cost of ownership and at the same time gain in agility.

Figure 7: Reasons for adopting cloud computing



Source: Cyber Security Alliance

Adoption of cloud computing on a large scale by the banking sector could enhance greater productivity, improve performance and boost profitability. This can help create numerous new jobs too which can be great news for the economy. It can be innovatively utilized to bring in greater efficiency across all operations and to deliver superior customer service. At a time when banks are facing intense competition from non-bank payment providers and there is high pressure to deliver results, using cloud computing technology can be the best solution to overcome current setbacks and surge ahead.

Conclusion

Even though the cloud adoption is imminent for financial sector, there are still some functions or applications which cannot be moved to the cloud such as payment or core banking software. But the most important thing is many financial services companies have moved to the cloud and the most of the companies are on the verge of making the switch towards the cloud. There are still few difficulties which need to be sorted out but we feel that the step towards moving to the cloud will be necessary for all the organizations. Importance of data and data management in the digital economy can be seen clearly in the financial services industry. Cloud computing is a key enabler in the management of massive datasets, and it presents numerous benefits and opportunities in meeting evolving customer expectations.

Like any new technology, it invariably has risks – but the most prominent risk may, in fact, be the risk of not moving. Top management is right to expand cloud services as part of their digital business initiatives, but they need to ensure their cloud security strategy keeps up with the growth. The financial institutions that don't pursue migration to cloud computing will need to support older infrastructures, and suffer significant business constraints in their ability to service customers.

References:

- Bejju, Anurag (2014), Cloud Computing for Banking and Investment Services.
- Buyya, R., C. S. Yeo, S. Venugopal, J. Broberg, I. Brandic (2009), Cloud Computing and Emerging IT Platforms: Vision, Hype, and Reality for Delivering Computing as the 5th Utility, Future Generation Computer Systems, Vol. 25, No. 6, pp. 599-616, Elsevier Science, Amsterdam, The Netherlands, June 2009.acces
- Burke, Brian. (2019). How Cloud Computing Is Transforming and Benefiting Financial Institutions. 10.13140/RG.2.2.17262.46404.
- Casolaro, L. and Gobbi, G. (2005), "Information Technology and Productivity Changes in the Banking Industry", Economic Notes, 36, 1, pp. 43-76, 2005
- Cyber Security Alliance Report, https://cloudsecurityalliance.org/research/surveys/
- Kiran Bala Nayar and Vikas Kumar (2014), Benefits of Cloud for Banking Sector, IJCST Vol. 5, Issue 4, Spl-1 Oct - Dec 2014, ISSN : 0976-8491 (Online), ISSN : 2229-4333 (Print)
- Leymann, F. (2009),"Cloud Computing: The Next Revolution in IT, In: Dieter Fritsch (Ed.), Proceedings of the Photogrammetric Week '09, September 7-11, Stuttgart, Germany, Wichmann Verlag, 3-12, 2009
- Research from Vanson Bourne. "The Business Impact of the Cloud" – report compiles insights from interviews of 460 senior decision-makers within the finance functions of various enterprises
- Sanagavarapu, Lalit & Mishra, Shivakant & Williams, Albert & Gangadharan, G R. (2014). The Indian Banking Community Cloud. IT Professional. 16. 25-32. 10.1109/MITP.2014.97.