

Implementation of a Cloud in Banking Sector

Chitralli Agre

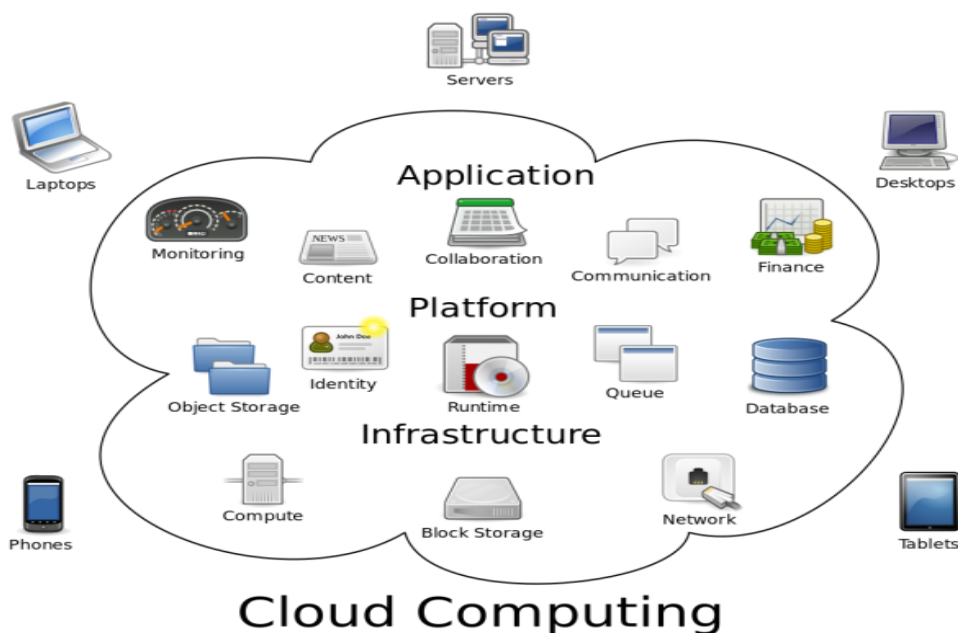
Master of Computer Application, IMCOST, Mumbai University, Mumbai, India

Abstract: A Cloud is a type of parallel and distributed system consisting of a collection of interconnected and virtualized computers that are dynamically provisioned and presented as one or more unified computing resources based on service-level agreements established through negotiation between the service provider and consumers. Cloud Computing has emerged as a new era in IT. A number of banks are now adopting cloud technologies to fulfill their varied purposes. Cloud technology offers business models for delivering innovative client experiences, effective collaboration, upgraded speed to market and enhanced IT efficiency. Using cloud computing banks can create a flexible and agile banking environment that can quickly respond to new business needs. In this research paper, I mainly focus on, how cloud computing can be used in the banking industry, various business models associated with it and the problems faced by the banking industry in adopting this technology.

Keywords: Cloud Computing, Banking, Business Model, Hybrid Cloud.

I. INTRODUCTION

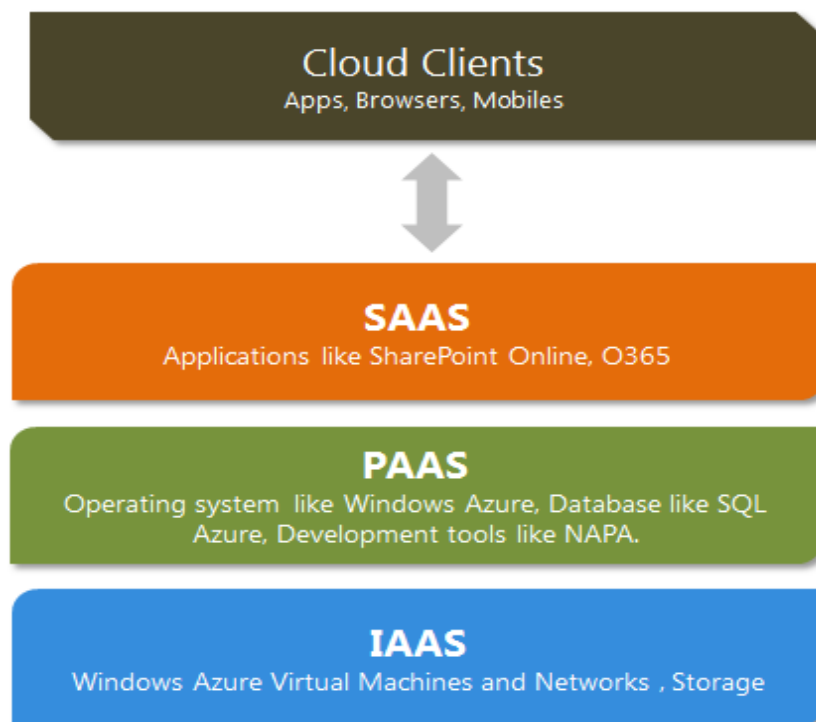
- Cloud computing today encompasses every vertical in the market across sectors. Organizations are adopting innovative cloud apps to support their everyday business operations.
- To drive growth and innovation in banking, it is increasingly necessary to dramatically leapfrog the competition using IT and business model transformation. The dramatic changes taking place in banking require new ways to maximize profitability and returns.



- Cloud technology offers secure deployment options that can help banks develop new customer experiences, enable effective collaboration and improve speed to market all while increasing IT efficiency.
- Banks that take advantage of cloud computing are better positioned to respond to economic uncertainties, interconnected global financial systems and demanding customers.

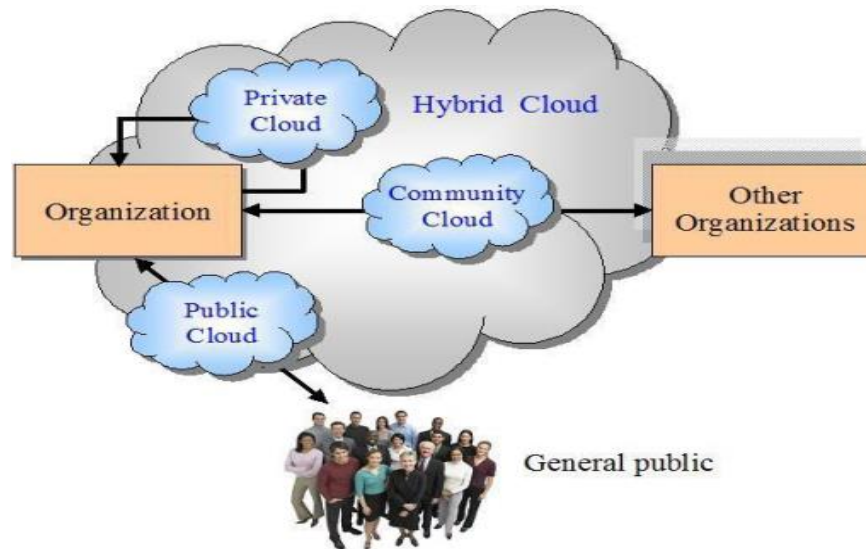
II. MODELS

- 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.



- **Software-as-a-Service (SaaS):** In the [business model](#) using software as a service (SaaS), users are provided access to application software and databases.
- Cloud providers manage the infrastructure and platforms that run the applications. SaaS is sometimes referred to as "on-demand software" and is usually priced on a pay-per-use basis or using a subscription fee
- In the SaaS model, cloud providers install and operate application software in the cloud and cloud users access the software from cloud clients.
- Cloud users do not manage the cloud infrastructure and platform where the application runs. This eliminates the need to install and run the application on the cloud user's own computers, which simplifies maintenance and support
- **Platform-as-a-Service (PaaS):** In the PaaS models, cloud providers deliver a [computing platform](#), typically including operating system, programming language execution environment, database, and web server.
- Application developers can develop and run their software solutions on a cloud platform without the cost and complexity of buying and managing the underlying hardware and software layers.
- With some PaaS offers like [Microsoft Azure](#) and [Google App Engine](#), the underlying computer and storage resources scale automatically to match application demand so that the cloud user does not have to allocate resources manually.

- **Infrastructure-as-a-Service (IaaS):** Infrastructure-as-a-Service is the first layer and foundation of cloud computing.
- Using this service model, you manage your applications, data, operating system, middleware and runtime.
- The service provider manages your virtualization, servers, networking and storage.
- This allows you to avoid expenditure on hardware and human capital; reduce your ROI risk; and streamline and automate scaling.



There are three ways service providers most commonly deploy clouds:

- **Private clouds:** Private cloud is cloud infrastructure dedicated to a particular organization.
- Private clouds allow businesses to host applications in the cloud, while addressing concerns regarding data security and control, which is often lacking in a public cloud environment.
- It is not shared with other organizations, whether managed internally or by a third-party, and it can be hosted internally or externally.
- **Public clouds:** Public clouds are made available to the general public by a service provider who hosts the cloud infrastructure.
- Generally, public cloud providers like Amazon AWS, Microsoft and Google own and operate the infrastructure and offer access over the Internet.
- With this model, customers have no visibility or control over where the infrastructure is located.
- It is important to note that all customers on public clouds share the same infrastructure pool with limited configuration, security protections and availability variances.
- **Hybrid clouds:** A hybrid cloud is a cloud environment comprised of two or more different cloud deployment models.
- For example, a cloud consumer may choose to deploy cloud services processing sensitive data to a private cloud and other, less sensitive cloud services to a public cloud.

III. 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:
- **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.

- **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.
- **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.



IV. ADVANTAGES

- **Cost Savings:**-Business sharpness is determined by the cost an organization incurs.
- There are a few self-service based, and perceptually cost effective public cloud computing solutions.
- Low-cost price plans advertised by public cloud vendors have inspired IT departments to gain an insight into costs, resource allocation models and the variety of cloud models, including public, private and hybrid.
- Billing is a non-core process for banks, and outsourcing it to a less expensive mediator allows them to route their capital into core technology-based functions.
- **Scalability:** If well designed, cloud solutions empower banks to meet customer demands and scale quickly, dynamic provisioning of computing resources, will save business users and IT experts from engineering the systems for peak loads.
- Banks can tackle the challenges of security and data privacy by devising a hybrid cloud where precise data can reside on a private cloud and computing power can be available on a public cloud.
- These private and public clouds can be integrated in a virtual private network to forge a single scalable hybrid cloud.
- **Time to market:** With cloud computing, time to market can be curtailed from months to weeks or days, depending on the size of a bank.
- A self-service based on-demand and real-time monitored cloud helps by
Phasing out procurement delays for computing hardware and software
- Accelerating computing power for when current applications need to deal with peak loads
- Eradicating the capital and time investment for procuring hardware for proof of concept work.

- **Data Virtualization:** Data virtualization is the assimilation of data from multiple and diverse sources across the enterprise or external sources for the on-demand consumption by a wide range of applications in a virtualized manner.
- Many mandates in context with the regulations and performance of banks require a data virtualization strategy. This strategy can be used to provide a single source of reference data, such as security master data.
- Also, risk and analytics calculations rely on many different types and sources of data, including relational and semi-structured XML.
- Combining such discordant data from public and private domains is a test.
- Accordingly, accessing that data from a single virtual source would drive scores of data consolidation within banks.
- **Mobility:** Many of today's corporate world techno savvy workers want to access risk and analytics reports while they are on the move.
- They see the benefits of accessing the Internet on their smart phones and I pad's, instantly even in remote locations.
- Likewise, they want similar interfaces for banking services-specific applications.
- And since a cloud facilitates users to access systems and infrastructure using a web browser or customized clients regardless of location and time, advancement of such interfaces has started taking shape.

V. CHALLENGES

- When a bank moves into cloud computing, there are two prime challenges that must be addressed:
- **Security:** The confidentiality and security of commercial and personal data and mission-critical applications is preeminent.
- Banks cannot allow the danger of a security breach. Despite economic strain for business to cut down charges and fervent assurances from cloud computing technology providers, security remains a top barrier to cloud technology acceptance.
- Ultimately, for cloud computing to gain full acceptance within the banking services sector, cloud services must be harmlessly integrated into existing security platforms and processes.
- **Regulatory and compliance:** Customers are basically responsible for the security and integrity of their own data, even when it is govern by a service provider.
- Conventional service providers are subjected to external audits and security certifications.
- Cloud computing providers who ignore to undergo this evaluation are signaling that customers can only use them for the most superficial activities.
- Many banking mangers require that financial data for banking consumers stay in their native country.
- Certain compliance arrangements require that data not to be mixed with other data such as on shared servers or databases.
- As a result banks must have a fair understanding of where their data is stored in the cloud. Security issues which cloud clients should advert are.
- **Privileged user access:** There dwell sensitive data that is processed outside the organization inherent risk of security of data because outsourced services bypass the physical and logical IT controls.
- **Regulatory compliance:** Customers are responsible for the security of their data. Traditional service providers are subjected to external audits and security certifications.
- **Data location:** When users use the cloud, they have no knowledge about the hosted data. Distributed data storage is a main reason of cloud providers that can cause lack of control and that is risky for customers.

- **Data segregation:** As cloud is typically in a shared environment in that data can be shared. So there is the danger for data loss.
- **Recovery:** It is very essential to recover the data when some problem occurs and creates failure.
- So the main question arises here is that can cloud provider restore data completely or not, this issue can cause a stalemate in security.
- **Investigative support:** Cloud technology services are difficult to investigate, because logging and data for multiple customers may be co-located and may also be spread across an ever-changing set of hosts and data centers.
- **Long-term viability:** Ideally, cloud computing provider will never go broke or get acquired by a larger company with maybe new policies.
- But clients must be sure their data will remain available even after such an event.
- In the early phases of cloud computing adoption, it is expected that banks will own and operate the cloud themselves with service providers playing more vital role in increasing ownership and control of the cloud infrastructure as cloud computing matures and more rigorous controls become available.

VI. CONCLUSION

- Continued advancement of cloud computing within the banking sector will require vendors and banks to overcome its challenges together.
- When planning cloud computing initiatives in the near future, banks should choose service and delivery models that best match requirements for operational flexibility, cost efficiency, and pay-as-you-use models.
- Banks should adopt a progressing evolutionary approach towards cloud computing services, examining each project based on the type of applications and nature of the data.
- Lower risk projects may include customer relationship management and enterprise content management.
- Higher risk projects will involve core business functional systems such as wealth management or core banking.
- In the long term banks will have an application portfolio mix of on-premise and cloud-based services delivered across a combination of private, hybrid, and public cloud based deployment models with the share of cloud services gradually increasing in the service mix.
- Private clouds are expected to increasingly become the deployment model for cloud services among banks, giving financial institutions full control through ownership and operations of their cloud systems.

VII. FUTURE ADVANCEMENT

- In the coming times, Financial Services firms will typically leverage Hybrid Cloud architecture to realize benefits (cost, speed, and efficiency) while balancing requirements (security, compliance, quality of service) across various business functions.
- A hybrid cloud model enables banks to garner the benefits of cloud computing while also maintaining the security and confidentiality of their data.
- Banks need to adopt practical approach to security and data privacy in the cloud. Most banks segment data with different levels of sensitivity, from low level (published widely with no restrictions) to ultra secure (only accessible by top decision makers).
- In the same way, banks will need to implement their cloud to have similar and appropriate security.
- Banking services organizations are starting to adopt cloud computing technologies in a number of fields, in particular for mobile applications, innovation testing and micro banking.

- **Mobile banking:** Banks are now offering mobile applications to online banking customers and partners for checking balance, order new cheque-books or stop payment orders.
- **New service R&D:** Banking services organizations are also increasingly advancing the computing power that cloud services offer for research and development and testing of new services prior to any attempt at going into production.
- **Micro banking:** Another trend emerging in developing countries of cloud services whereby micro banks are running their entire business on cloud computing.

REFERENCES

- [1] Gartner Incorporation, <http://www.gartner.com/>.
- [2] [www.sapient.com/content/dam/sapient/.../GM_Cloud_Computing .pdf](http://www.sapient.com/content/dam/sapient/.../GM_Cloud_Computing.pdf).
- [3] Df.Pollan, Michael et al., *The Omnivore's Dilemma: A Natural History of Four Meals*. New York: Penguin, 2006.
- [4] "Cloud Computing for Programmers" by Daniele Casal
- [5] Constitution. Chicago: University of Chicago Press, Lattimore, Richmond, trans. *The Iliad of Homer*. Chicago: University of Chicago Press, 1951.
- [6] Weinstein, Joshua I. —*The Market in Plato's Republic*
- [7] "The Little Book of Cloud Computing" by Lars Nielsen.
- [8] Northern Song Dynasty. | PhD diss., University of Chicago, 2008.
- [9] García Márquez, Gabriel. *Love in the Time of Cholera*. Translated by Edith Grossman. London: Cape, 1988.