

Role of Cloud Computing in Financial Institutions

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Abstract: Global financial industry has undergone tremendous transformation owing to business and financial innovations, intense competition, and rapid technological innovations. One such sector which has undergone a sea change is the banking sector. This growth of the banking industry is catalyzed greatly by technological advancements which have made banking services easily accessible and customer driven. Banks have been constantly working on developing new business models that take advantage of latest technology for the benefit of the customer.

Banks need to react to this new customer-driven environment with innovation in business models, operations and IT. One such technology that has transformed banking is cloud computing. For banks, the value proposition for cloud computing affects the entire business. Cloud technology offers a new model for delivering innovative client experiences, effective collaboration, improved speed to market and increased IT efficiency. Cloud deployments are increasing and the technology is proving to be secure. More businesses are adopting cloud computing. Today, cloud technology is not just a tool being used in IT, but a paradigm shift to an entirely new business model. The present paper discusses the way cloud computing is used in banking, the different business models associated with cloud computing and the benefits and challenges faced by the banking industry in implementing this technology.

Keywords: Cloud Computing, cloud, banking, business model, hybrid cloud

Introduction

Cloud Computing is one of the most influential technology innovations of the modern world. Significant investments have been made in the start-up world, major technology players as well as business institutions. All participants and stakeholders in the Technology and IT Services industry are keenly involved in understanding what it can offer, how it can change the information technology landscape, its impact on their businesses, benefits it can provide as well as the challenges associated in leveraging the concept.

Cloud computing is the convergence of several concepts - from virtualization, distributed applications, grid, maturity of enterprise software applications and enterprise IT management - to enable a dynamic, flexible and economic approach for deploying and scaling enterprise IT.

Cloud computing has the potential to transform the IT industry, by transforming the way software and hardware is designed, purchased, provisioned and managed. With the universal adoption of Internet as a global platform for business it is becoming apparent that computing as Utility is now a distinct possibility. Businesses have now moved beyond the control-and-manage arrangement for both hardware and domain intensive software applications.

Businesses have become more cautious in the wake of the recent economic downturn and there is a significant shift in the way IT investments are planned and implemented today. Cloud computing is tremendously attractive to businesses as it enables them to fundamentally shift their capital intensive focus to a flexible operational management model. In this flexible model, businesses need not be concerned about over-investing for services which are not profitable, thus wasting expensive resources, or under-investing for services that deliver outstanding results, thus missing potential customers and revenue.

In simple terms cloud computing is a style of computing where massively scalable IT-enabled capabilities are provided as a service over the network. A Cloud is a set of IT infrastructure optimization techniques rolled into one and offered as a shared service to its users. A Cloud Computing model is generally characterized by:

- A true on-demand computing paradigm
- Decoupling of application design and development from deployment
- Automated system deployment and scaling
- A pay-per-use pricing model
- Flexible access models

Cloud computing delivery models can be distinguished based on the level of abstractions they export to the Cloud users (or programmers) and the level of computing resource management (flexibility) they offer. Based on this characterization, today's Cloud delivery models can be broadly classified into three categories:

1. Infrastructure as a Service (IaaS): These Cloud service providers offer computational resources such as servers, network, and storage from a shared facility managed by the provider to Cloud users on an on-demand basis.

2. Platform as a Service (PaaS): The Cloud service providers export application development platforms that broadly fall into two categories - Those that export application development platforms for certain domains or class of applications and those that export general purpose application development platforms.

3. Software as a service (SaaS): The Software as a Service Cloud service providers offer specific application services delivered over the Internet on some form of on-demand payment system.

Cloud computing deployment model is characterized into four categories:

- **Public Cloud** - Public cloud services are characterized as being available to clients from a third party service provider via the Internet. This does not mean that a user's data is publically visible; public cloud vendors typically provide an access control mechanism for their users. Public clouds provide an elastic, cost effective means to deploy solutions.
- **Private Cloud** - A private cloud offers many of the benefits of a public cloud computing environment, such as being elastic and service based. In addition, data and processes are managed within the organization without the restrictions of network bandwidth, security exposures and legal requirements that using public cloud services might entail. This offers greater control of the cloud infrastructure, improving security and resiliency.
- **Community Cloud** - A community cloud is controlled and used by a group of organizations that have shared interests, such as specific security requirements or a common mission. The members of the community share access to the data and applications in the cloud.
- **Hybrid Cloud** - A hybrid cloud is a combination of a public and private cloud that interoperates. In this model users typically outsource non-business-critical information and processing to the public cloud, while keeping business-critical services and data in their control.

There are significant unknowns and challenges associated with Cloud Computing; while the concept has been existing for multiple years, core capabilities to enable enterprise adoption is still in nascent state.

Cloud Computing in Banking & Financial Services

Banking & Financial Service Institutions are possibly the most advanced in terms of technology adoption to run their business, to the extent that business is impacted significantly even with millisecond response time variations. Most of these institutions use technology as a key differentiator and almost all their products and services realize their core value proposition through technology. In addition, financial institutions are the most impacted in terms of Compliance and Regulatory expectations, which gets further complicated due to their expansive products and geography coverage. Technology is therefore critical for existence of these institutions. IT budgets are significant – ranging between of 3.2% to 4.5% of the revenue – and the IT organization is large, well defined, integrated closely with business service delivery and has significant influencing power in terms of business strategy and organizational growth.

Financial Institutions are typically classified based on total assets they manage, service lines they cover as well as geographies they are present in. The characteristics of the IT portfolio for these institutions are closely dependent on the product & service lines, customer segments addressed and geography presence. Retail Banking organizations have different requirements as compared to Capital Market institutions. Over the last few decades, Financial Institutions have been at the forefront of technology adoption and are seen as the biggest drivers and consumers of technology innovation. Due to the nature of the business, dependency on technology, quantum of IT investments and their exposure to market variations, most organizations exhibit the following from an IT perspective.

- **Business processes are highly automated and digitized** – STP is a common characteristic of many functions. Every business functionality, change or enhancement has significant technology component.
- **IT portfolio is complex** with diverse platforms, infrastructure, technologies, development languages, applications and tools. In any large institution, it is not uncommon to find instances of everything that technology offered in the last 50 years.
- While the portfolio is complex, **it is also mature**; in terms of the overall organization structure, skill & expertise, SDLC methodologies, integration with business process, measurement and metrics, governance, funding & investments, technology & service partnerships, IT value measurements and overall alignment with business.
- **Change Management process is well defined** and established influenced by multiple factors – mergers & acquisitions, continuous adaptation to changing market requirements and more importantly continuous adoption to changing technologies.
- **Outsourcing is proven and considered as a foundation for Efficiency and Agility**– across business functions, technology and service delivery; as well as to deliver unique capabilities by leveraging core competencies from partners.
- **Products, Pricing and Business models use IT in a highly innovative manner** – as a means for growth, differentiation and innovation.

- **Business pressures force the need for dynamic and highly optimized, IT driven operations** – as a means to manage economic variations, business fluctuations and customer behaviors.

Banks today are looking at Cloud based solutions with the following set of distinct expectations:

- Dynamic and flexible Technology model to fully align with the changing needs of the business –enabling businesses to provision technology resources based on demand and usage at the right level and at the right time, rather than having to plan upfront for capacity.
- Highly optimized and virtualized Infrastructure enabling Scale and Cost Efficiency – enabling businesses to leverage the right hardware components and manage computing needs as a function of real time usage, rather than design and run with maximum capacity, redundancy and resiliency upfront.
- Fully automated Service provision, monitoring and management for achieving Agility – enabling service providers to focus on managing hardware, software, services as well as end usage outcome, rather than for businesses to set up extensive and expensive operations organizations.
- Shared Services delivered across trusted domains delivering Security of data, transaction & operations – enabling integrated treatment of security across all the operating platforms (self and partner) for all the services rendered to the end users.
- Internet or Intranet based Access model using high capacity bandwidth and ubiquitous connectivity – enabling businesses to deliver business applications to their customers and associates on multiple devices with round the clock.
- Service based Acquisition model providing functionally rich capabilities on demand – enabling businesses and end customers to seek, evaluate, integrate and consume services that are most appropriate to their context, rather than build for scenarios and variations upfront.
- Significantly low start up costs and rapidly expandable capabilities that shifts Capital Expenses – enabling organizations to focus on business outcomes rather than planning technology, capacity, service development and deployment; IT services investments moves significantly into Operational expenses domain.
- Ability to deliver tailored products and services across the business value chain and customer segments by composition of advanced capabilities provided by businesses and their partners.
- Usage based Business model that enables businesses to spend based on consumption – allowing businesses to provision their technology investments with full alignment to business needs at a granular level.
- Economies of Scale and Core Competency of the Service Providers – enabling businesses to outsource full spectrum of IT capabilities more effectively, efficiently and to manage scale in an elastic manner.
- Rapid Innovation in services, features and operating models leveraging the capabilities of service provider(s) – as compared to the need for internal and isolated investments and enabling the full impact of Innovation to reach all consumers rapidly.

These expectations have evolved over the years as the scale and complexity of the portfolio grew exponentially. There have been successful adoption of other technology innovations like Grid computing, Virtualization and SoA, which have delivered some of these expectations; Cloud solutions are seen as the grand convergence of all these innovations to deliver holistic, outcome based business capabilities.

Challenges in Cloud Computing

Financial institutions operate within a highly competitive and finely regulated environment. Therefore all of the service aspects are influenced not only by business considerations but also by the compliance requirements. Innovations, so far, have been evaluated, customized, adopted, deployed and managed inside the enterprise – security, control, reliability & governance have always been managed internally. Since, Cloud based solutions attempt to take the functional, technology and operational aspects of the business out of the enterprise, these considerations significantly influence the adoption. The following provides a summary of challenges and risks associated with Cloud solutions from the perspective of financial institutions:

- Legal aspects related to data, visibility, access and information management; especially in the BFS industry that is heavily regulated globally.
- Security of data, applications and process and the overall management of the solution platforms, with ability to support customer, business and compliance specific requirements.

- Performance of the service provided, especially the ability to support volume / transaction / user heavy requirements without diluting the user / business experience and outcomes.
- Availability and Reliability of the services provided and ability to provide consistent quality of service to support peak business requirements.
- Pain of Integration into the enterprise which is overtly complex, global, diverse and heterogeneous consisting of significant (>60%) custom built applications within the portfolio.
- Complexity of Governance, Audit & Compliance associated with service models as compared with the relatively easy model of Buy / License and use that is prevalent today.
- Commoditization and reduced ability to Customize, Extend and Differentiate with the external services provided.
- Dilution of Operating Control within the enterprise that can lead to business, regulatory and reputational impact if service provision is hampered.
- Not convinced of the benefits of the solutions especially in large financial institutions, who have developed an efficient business and technology operations, including lean Data Centers, shared service models, standardized platforms and embedded innovation investments; perception that cloud would provide more of scale economics than service innovation.
- Unknown long term cost impact especially considering the scale and criticality of services to the financial business; in addition, moving to cloud based models is a strategic shift and difficult to backup once the institutions has gone down this path.
- Potential Lock In and difficulties in bringing back in-house if needed – this is directly linked to the need to have absolute control on not just the service output but also on the mechanics of delivering the service.
- Increased probability of risk & exposure to potential issues related to business operations, confidentiality and compliance which are critical in the financial service industry.
- Lack of Solution maturity across technical, functional, operational, commercial and partnership models at a level that can support the financial institution.
- Insufficient proof of success of the Service Providers – enabling businesses to outsource full spectrum of service capabilities more effectively, efficiently and to manage scale in an elastic manner.
- Not enough Major trusted players delivering to the level of expectations that have established in the current environment.
- Change in mindset needed within the financial institutions to move from an operations & technology outcome related view to a business service delivery model.

However, in spite of the above mentioned challenges, the benefits of cloud computing outweigh the challenges. To conclude, Cloud Computing will prove very attractive to Financial Institutions, primarily due the fact that it provides the next generation value in IT with innovative and flexible business models.

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