

# Cloud Computing for Rural Banking

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**Abstract:** *The Rural Banking introduced in villages to give good and better services to the people for the development of their agriculture sector or to help for their small-scale business. The banking sector in India has witnessed a complete transformation both in its functioning and delivery of services to their customers. The banking services in rural areas helps in developing economic factor that changed the profile of the village and the life of its residents. The rural banking plays a major role in the economic development of a country cannot be overlooked. The main goal is based on Cloud computing to help rural banking. Today technology being the main driving force for businesses has made banking customers to sit back at home and run their accounts without walking into the banks for anything and everything. As the advancement of technology has taken place with immense use of internet, mobile phones and online bill payments banking sector in India has a new facet altogether. The cloud computing is one of the developing technology which is being use by all industrial domain in the IT field. In this paper, I proposed the concept of using cloud computing to develop a banking system for rural areas. It considers various factors such as lack of devices and amenities in rural areas and provides efficient functionality to fulfil those gaps. It uses the latest variations of cloud computing technology for filling in the various technological gaps in village areas. The new technologies had made banks to offer new services and products to its customers, which would help improve economic activities.*

**Keywords:** Cloud Computing, Economy development, Technological gap

## 1. Introduction

India has become a major center in the world market known for its ability in the IT field due to its intellectual prowess in this field. But, there is also a part of India which is very far away from technology and its advantages that is the rural side of India. The farmers mostly lives in the rural population and need credit for agricultural activities which has the following problems related to banks. Usually, the problem in the villages is, either there is an ATM of a particular bank or there is no ATM. In the first case, if there is an ATM, people using it will have to pay the ATM usage charges if they are non-members of the bank and in the second case they will have to travel long distances and then the scenario might be same as the first case. So, the majority of funding is provided by private money lenders that exploit the farmers. Recent, attempts by government to help the farmers by letting off their loans taken from banks was a failure as most of the poor farmers didn't even have their bank account and rich farmers got benefit from it. Now the focus has been shifted to rural banking as most of the banks have become technology enabled and it has been made compulsory for all Indian banks to open at least span of their incremental branches in the rural areas. As the working expenses of the public sector banks have shot up extensively, it has become a huge problem for the public sector banks to open up and run them, making the rural banking profitable. To overcome these problems and make a profitable outcome to run a bank in rural areas, cloud technology helps to do in a well suitable manner to all people and in the banking sector.

## 2. Existing System

The Existing system uses Client/server Application. Client/server is a program relationship in which the client requests a service or resource from the server. It is a distributed application environment that distributes tasks or workloads between the providers of a resource or service, called servers, and service requesters, called clients. The client establishes a connection to the server over a local area network or wide-area network, such as the Internet. . A server machine is a host that is running one or more server programs which share their resources with clients. A client does not share any of its resources, but requests a server's for a data. Clients therefore initiate communication sessions with servers which await incoming requests. An Automatic Teller Machine is essentially a client-server system. The bank's central computer is the server, and maintains information about the accounts of all the customers. The ATM is the client. When you check your bank account from your computer, a client program in your computer forwards a request to a server program at the bank. That program may in turn forward a request to its own client program, which then sends a request to a database server at another bank computer. Once your account balance had been retrieved from the database, it is returned back to the bank data client, which in turn serves it back to the client in your personal computer displays the information to you. The server must handle three commands

**Withdrawal:** subtract an amount from the account (and return the new balance)

**Query:** return the account balance to the client be a simple iterative server that is it handles only one connected client at a time.

The client must connect to the server when it is started allow the user to perform any of these functions and consequently disconnect from the server.



Fig 1 Rural Banking in India using Cloud Computing

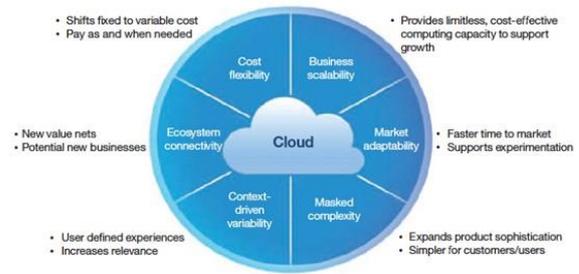


Fig 2 Cloud Computing Business Models

### 3. Proposed System

The cloud plays a key role in the bank's efforts to transform its business and operating model. From a technical viewpoint, the cloud automatically assembles, integrates and configures technology resources to meet business goals. In business terms, it eliminates the need for a physical infrastructure to be present at each location from where the bank operates, thus making it easier for the bank to deploy services rapidly and at a lesser cost.

Owing to its enhanced computing power and capacity, the cloud can store information and real time data about customer preferences that can help a bank in product and/or service customization. Using this stored information, the banks can personalize customer interactions and offer their customers a unique experience.

The cloud can also help banks to streamline operations. By aligning business, operations and technology, it enables banks to drive higher growth and profit margins and increased flexibility. The cloud also helps banks to scale up IT resources on-demand for expanding its business operations. Banks can also respond to customer and market demands much faster and rapidly adjust processes, products and services to suit the changing needs. This creates an environment of innovation, competitive differentiation and also speeds up time to market.

Banks are offering Internet banking and moving the payment function to the cloud, simply because of the great promise of cost savings, efficiency and reliability. By moving the payment function to cloud, banks can fend off the threat of disintermediation from Telco's and other mobile payment service providers. Payments are a huge source of revenue for the banks and banks will not let it go off that easily. Moving payments to the cloud not only eases the pressures on the bank from the point of view of managing an entirely IT setup for this but also benefits their customers.

Area of Operation	Benefit(s)
<b>Analytics</b>	Integrating customer data across banking platforms to enable near real-time insights
<b>Business Services</b>	Extending and incorporating third-party services to extend the banking ecosystem to support customer's everyday buying and paying needs
<b>Collaboration</b>	Enabling employees across distributed branches to access trading and banking systems through a security-rich cloud infrastructure
<b>Desktop and Devices</b>	Deploying a private cloud to centralize management of desktops allows for greater remote flexibility without sacrificing control, while enabling banking employees to access the applications and data they need
<b>Development and Testing</b>	Enabling a bank's development teams to quickly and easily create virtual environments thus increasing the agility of development and testing
<b>Industry Applications</b>	Enabling payment providers to standardize and modernize transaction processing
<b>Infrastructure Compute</b>	Allowing capacity to be allocated, expanded and reallocated efficiently gives banks flexibility and agility while resolving the issues of complexity and cost increases related to scaling up traditional network models to accommodate future growth
<b>Infrastructure Storage</b>	Providing scalable storage solutions to ensure that the real-time demands of today's trading and analytics

processes are maintainable

#### Managed Backup

Backing up a bank's critical business data to ensure that in the event of a disaster a bank can bounce back rapidly and easily

#### Security

Enforcing active security and endpoint management to ensure corporate governance and banking IT policies are maintained

Many banks face high costs for technology and hardware that is under-utilized over time. When a bank is ready to make changes to their service offerings or scale-up their overall operations, it tends to increase costs drastically in terms of hardware, software, and manpower needed to make it happen. Smaller banks struggle to remain competitive if a core banking solution requires an upfront investment in technology to make it happen, but if banks were relying on cloud computing, they could more efficiently make upgrades, access hardware and software on demand, and add licenses for what is actually being used rather than having a huge physical equipment investment before they can make changes to their use of technology.

Banks that make the switch to cloud computing could get into a subscription model which allows them to pay per branch or per use for accessing certain software and hardware solutions. Also, rather than needing a team of skilled IT workers on site at each branch location, the entire bank can share their talent across the cloud.

### 4. Six big benefits of the cloud:

**4.1 Less Cost:** Cloud computing means banks will not have to invest heavily in dedicated hardware, software and related manpower. It is much easier for them to update their IT infrastructure and the cloud's modular, pay-on-demand model means they pay only for the hardware and software they need.

**4.2 Improve flexibility and scalability:** 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.

**4.3 Increase efficiency:** Banks will enjoy improved efficiency ratios and operating leverage. The standardisation inherent in the cloud could make 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.

**4.4 Serve clients faster:** Cloud computing makes new and bundled products and services easier to develop and launch, either on a stand-alone basis or in partnership. It eliminates procurement delays for hardware and software. Banks will be able to boost computing power to meet demand peaks and provide the latest treasury solutions without needing to

worry about whether the technology is up to date. Corporates will be able to access bank systems using web browsers from anywhere at any time.

**4.5 Good client relationships:** The combination of big data and potentially unlimited computing power will allow banks to develop systems capable of providing better insight into clients and make better decisions on their behalf. Services could become more customised.

### 5. The five main challenges:

**5.1 Security and compliance:** Maintain at all times the security of data. Banks need to demand stringent safety measures from suppliers and ensure new applications meet the latest and most rigorous security standards. Service Level Agreements (SLAs) are a must.

**5.2 Reliability:** It ensure that applications and data are always available in the event of a natural disaster or an unpredictable event. Banks need to have stringent SLAs in place, complete with guarantees, end-game scenarios and remedies if a provider fails to meet service levels.

**5.3 Cloud management:** To achieving visibility and measuring performance are harder to do, especially if, as seems likely, large banks will source cloud services from several providers and to use them for both internal – or private – and external, or public, services. This could result in a bank having to handle multiple security systems, and the need to ensure all parts of their business can communicate with each other and where necessary with clients.

Increased use of various technology infrastructures and a mix of different cloud environments internally and externally mean banks will need to develop fully-fledged cloud management platforms. They will be a necessity to ensure banks can fully realise the cost savings and flexibility benefits of cloud computing.

**5.4 Interoperability:** Banks will need to ensure data and applications can be moved across cloud environments from a number of providers. They should look to develop a single interface and management layer that can work across different platforms internally and externally.

**5.5 Regulation:** The rules governing the cloud vary from country to country. Many countries' data protection laws impose constraints on where data is kept, limiting take-up. This is why the EC's move to regulate the cloud is welcome.

### 6. Conclusion

In future, Cloud technologies along with analytics, mobile technologies and big data will enable banks to unlock value from existing data and processes to address risk management and drive customer engagement. By advantage on standard development processes, scalability and collaboration enabled by the cloud, the banks will be able to

create new and Innovative product and service offerings for their customers. The cloud architecture also offers flexibility in deployment models, thereby; enabling banks to become more agile and respond to market changes must faster and transform their businesses. As far as security in the cloud is concerned, in many cases, the security mechanisms put in place by global cloud providers may actually be stronger than those in many banks' internal systems. The future of banking in the cloud holds great promise. Already banks in emerging markets are using the cloud to reach the unbanked population by offering mobile and electronic banking services. No doubt, possibilities of expansion using the cloud are endless for banks in the upcoming years.

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**Karthigainathan** doing my final year CSE in SRM University. My innovative and interest towards my computer science engineering has made me to do my third research paper in cloud computing as my domain.