

APPLICATION OF CLOUD COMPUTING IN MICROFINANCE

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ABSTRACT

Microfinance sector has seen exponential growth over the past few decades. Nobel Laureate Muhammad Yunus is credited with laying the foundation of the modern MFIs (Microfinance Institutions) with establishment of Grameen Bank, Bangladesh in 1976.

Microfinance industry is globally experiencing major growth, fuelled by recognition of the need for financial inclusion of larger population in most countries. Spread of Microfinance business will be greatly assisted by adequate technology.

Microfinance enabled cloud software solutions help small micro institutions to integrate with the networks of national level players and thus enable flow of investments, donations, disbursements, collections etc.

This objective requires MFIs to implement automation of services delivery network, business processes & workflow and above all, building of automated controls, compliance & risk management across growing enterprises.

Smaller size MFIs do not want to invest on technical skills and infrastructure that they can avoid. Hence, such MFIs need cloud solutions that are available on Pay as you Use Models. This paper is an attempt to integrate cloud computing with Microfinance and thereby bridging the gap between MFI and technology.

Keywords: *Microfinance, MFI, Cloud, Cloud Computing, SaaS, IaaS, PaaS.*

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1. INTRODUCTION

The micro finance sector in India has experienced tremendous growth in the last decade due to the efforts of various agencies including government, international donor agencies and development banks. There is now a reasonably good supply of loan funds in the microfinance sector. Lately there have also been positive changes in the policies affecting the microfinance sector. In spite of all these efforts the outreach of microfinance service in India is still considerably small in comparison to the demand for such service. Millions of people still live in abject poverty with limited prospects for social and economic development. It was in recognition of this imbalance that the United Nations adopted the Millennium Development Goals (MDGs) at the U.N. Millennium Summit in 2000. (By Kenneth I. Juster)

In the recent session of the UN General assembly in New York in September 2008, it is found that there is a substantial gap between the aspiration and reality. When the progress against goals (whether reducing extreme poverty, providing universal primary education, or advancing the quality of healthcare) is realized it continues to be uneven at best.

The worldwide economic recession has exacerbated this situation, as there will be even fewer resources available to close the development gap. A promising technology of IT “Cloud Computing” offers the strong possibility of accelerating social and economic development, even in this time of limited resources. This approach requires a low upfront investment and is thus ideal for Microfinance industry.

1.1 Overview of Microfinance Industry

“Microfinance is the provision of financial services to low-income clients or solidarity lending groups including consumers and the self-employed, who traditionally lack access to banking and related services.”

Microfinance is not just about giving micro credit to the poor rather it is an economic development tool whose objective is to assist poor to work their way out of poverty. It covers a wide range of services like credit, savings, insurance, remittance and also non-financial services like training, counseling etc.

Salient features of Microfinance:

- Borrowers are from the low income group
- Loans are of small amount – micro loans
- Short duration loans
- Loans are offered without collaterals
- High frequency of repayment

- Loans are generally taken for income generation purpose

Today, it is believed that there are over 10,000 Microfinance Institutions (MFIs) serving well over 150 million families, or about 750 million people (with an average family size of five) (Daley-Harris, 2008). However, it is considered that there are over 4 billion poor people who are unbanked and therefore a large gap exists.

A key question posed in the microfinance literature is why MF service providers have been able to succeed in ventures where bankers feared to tread (Armendariz & Morduch, 2005; Ashta, 2009). Bankers were unable to offer financial services to the poor because of high transaction costs linked to smaller loan sizes which could be as low as twenty dollars. This was coupled with asymmetric information problems owing to absence of credit history with poor borrowers, leading to increased risk. As a result, bankers were unable to lend but at very high rates, which were way above not only commercial rates for the rich but beyond the ability of the poor borrowers to use such high priced credit. To overcome these problems, Microfinance service providers (MFI) came up with innovative incentives and contracts, such as group lending or SHG lending. In this, a bank lends to two women in a group of five with the understanding that the other three would get a loan only if the first two paid back their loans, thus using information available with the group and exerting social pressure. This was combined with repayment in public to exert even more social pressure as well as to reduce collections costs. Weekly repayments of small amounts help reinforce discipline (Yunus, 2003). With time, as credit histories were built, it was possible to progress to individual lending of progressively larger amounts, which also helped in ensuring the previous smaller loan would be repaid (Armendariz & Morduch, 2005). Thus, microfinance came to offer many different models of group lending, with or without collateral, and individual lending. The group lending models may also include savings of the members and the group size could be much larger, in what could be termed village banking, but operating on the same principles of social collateral and cross-guarantees. Many of the models are similar since they are basic success models in one region duplicated with suitable modifications in other countries. Examples are models based on Accion, ASA, BRAC, FINCA, Grameen, Opportunity, and Women's Word Banking.

From the initial focus on microcredit to help build microenterprises, today it is considered that other financial services are even more valuable to poor people including savings, insurance, remittances and payments. To be able to get these from one source could reduce costs to the consumer. Thus, many MFIs are converting themselves into banks or finding loopholes to be able to accept deposits, if not from the public, at least from their own

borrowers/clients. Thus, like financial service providers, they need an information system which can provide diverse needs (Barua, Kriebel & Mukhopadhyay, 1991).

Of the 10,000 MFIs that exist today, less than 200 are profitable. Most are very small. The transaction size of the loan is so small that transaction costs are a big percentage and interest rates are high, squeezing out room for profits (Ashta, 2009; Rosenberg, Gonzalez & Narain, 2009). Resulting, difficulty in growth. It is hoped that technology can help reduce the high transaction costs and create the up-scaling required for greater outreach as well as financial sustainability (Rosenberg et al., 2009). These technologies include, notably, mobile banking, online lending and Management Information Systems (Ashta, In Press) and cloud computing. This paper is an attempt to explore the potential of cloud computing in Microfinance sector.

Challenges/Issues

- High operating cost
- High functional Cost
- High Investment Cost
- Poor Electricity
- Poor Internet Connectivity

1.2 Overview of Cloud Computing

There is major shift in the way companies obtain software and computing capacity is under way as more companies tap into web based applications.

According to report of Merrill Lynch (2012) the annual global market for cloud computing will surge to \$95 billion (Microsoft =\$51 billion, Google =\$16 billion, Amazon =\$14billion and Yahoo= \$7 billion)

What is cloud computing? According to Gartner “Cloud Computing is a style of computing where massively scalable (and elastic) IT-related capabilities are provided “as a service” to external customers using Internet technologies”.

From an Engineering perspective cloud computing is providing services on virtual machines allocated on lap of large physical machine. While in business terms it is a method to address the scalability for large scale applications.

Structure of Cloud

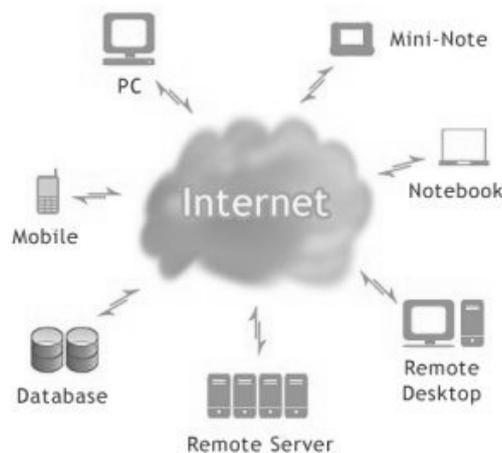


Fig 1.1: Cloud structure

Components

1. **Client:** A cloud client consists of computer hardware and/or computer software which relies on the cloud for application delivery
2. **Application:** Cloud application services or "Software as a Service (SaaS)" deliver software as a service over the Internet, eliminating the need to install and run the application on the customer's own computers and simplifying maintenance and support.
3. **Platform :** Cloud platform services or "Platform as a Service(PaaS)" deliver a computing platform and/or solution stack as a service, often consuming cloud infrastructure and sustaining cloud applications .It facilitates deployment of applications without the cost and complexity of buying and managing the underlying hardware and software layers.
4. **Server:** The servers layer consist of computer hardware and computer software products that are specifically designed for the delivery of cloud services, including multicore processors, cloud specific operating systems and combined offerings.
5. **Infrastructure:** Cloud infrastructure services or "Infrastructure as a Service (IaaS)" delivers computer infrastructure, typically a platform virtualization environment as service. Rather than purchasing servers, software, data centre space or network equipment, clients instead buy those resources as a fully outsourced service. The service is typically billed on a utility computing basis and amount of resources consumed will typically reflect the level of activity. It is an evolution of virtual private server offerings.

2. MOTIVATION

This objective behind this study is to find the following factors:

- What factors influence the development of the cloud computing in Microfinance Industry.
- What are the potential impacts of cloud computing technology in the Microfinance Industry.

3. MICROFINANCE COMPUTING IN THE CLOUD

The internet has changed the way software solutions for businesses will be owned and used. Instead of having to invest in Ownership Model (the servers, the storage devices, the networking, the software, and the databases) business can tap into Internet Technologies, simply by logging in to a website.

In Cloud Computing the actual work is done remotely on servers that can be far away, in large server farms that process and hold data for several companies or millions of users. This model lowers the cost of IT, outsources maintenance hassles and ensures best technical expertise. On account of economies of scale and a large customer base, not only costs are low, but technologies too remain current. The user MFIs do not have to understand the complexities of planning, implementing and day-to-day running of IT systems unlike in Ownership model.

In Cloud Computing Model, service provider provides a platform where MFI can come and create an account for their organization and start using their systems, just like we use an email or facebook account. Service Providers are trying to propagate the same platform for microfinance organization with no registration fee. They are only charged for whatever transactions they do in the system. That comes out to be cheaper for the organization in terms of saving the cost of installing their systems as in ownership model.

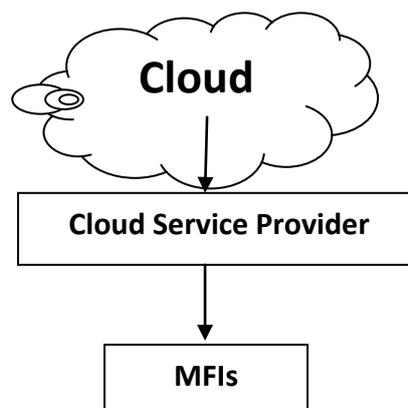


Fig 1.2: Integration of Cloud and MFI

4. HOW DOES CLOUD COMPUTING BRIDGE THE DEVELOPMENT GAP?

Cloud computing solutions help micro institutions in far flung areas to integrate with the networks of national level players and thus enable flow of investments, donations, disbursements, collections etc. which requires MFIs to implement automation of services delivery network, business processes and workflow and building of automated controls, compliance & risk management across growing enterprises. Smaller size MFIs do not want to invest on technical skills and infrastructure OWNERSHIP MODEL that they can avoid through cloud computing. Hence, such MFIs need solutions that are available on Pay as you Use Models.

The various advantages of Cloud Computing to MFI are as follows:

- **Low start-up cost** makes Cloud computing especially attractive for rural India.
- **Ease of management** make no concerns about procuring licenses, or for that matter, power and air-conditioning
- **Scalability** makes rapid rural penetration a reality; one can easily expand the number of users and locations at a modest cost.
- **Device and location independence** - The way you access a Cloud, could be your desktop. It could be someone else's computer. It could be a smart phone. It could be a solar powered touch pad.

A beneficial software solution helps develop strong business processes in MFIs while providing flexibility to incorporate changing processes as per the changing dynamics of the industry. A business-friendly solution also ensures that it accommodates changes to the evolving regulatory environment.

Other Social Benefits of Cloud Computing in MFI are:

- The Cloud supports to drive down costs of education, medical care, e-Governance, and other Government computerization social initiatives.
- The Cloud supports in changing the inertia (poor's as social and charitable society) between rich urban India and poor rural India, and gives the same level-playing field to all Indians.
- Lastly, the Cloud enables non English speaking literate Indians to join the information revolution and participate in governance and the future of the country by allowing them to transact on the web in the Indian language of their choice.

CONCLUSION

While the advent of cloud services has created opportunities for new companies, it has also created new opportunities for established organizations in the microfinance industry. Utilizing this type of model a traditional microfinance association, is able to offer sophisticated back office software that would otherwise be unaffordable to those institutions on an individual basis.

Hence, Microfinance institutions (MFIs) around the globe who predominantly operate in the poor-developing countries, and who already suffer from lack of access to good software, IT expertise, and the burden of operating their own little data center in the broom closet.

The Cloud and SaaS providers and the MFIs both stand to benefit, and both can achieve scale and be able to do so with a lower operating cost.

Cloud computing is changing the value chain in information technology, as different providers of individual components are brought together to create a complete service offering. The flexibility of these arrangements lowers the cost of entry for new providers and allows for innovative new services to emerge quickly yet deliver high quality offerings based on best-of-breed components.

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