

Application of Service Oriented Architecture by Microfinance Institutions: A Digital Divide

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Abstract. Information Communication technology is considered to be the back bone of inter - process communication of the records of the Microfinance Institutions who are the key players of distribution of the funds to the poor and to the people who are not eligible for standard financial services. In spite of the latest techniques used, MFIs face challenges in implementing the technology in respect to the high operational cost, un-regulatory framework or lack of integration among the diversified technology platforms. This paper highlights the regulation of processes in Microfinance using a potential technology called Service oriented Architecture which would help to monitor any activity of Microfinance Institutions and gives MFIs greater sustainability and interoperability. SOA implementation in MFI's helps in optimizing business performance amidst change, competition, and increase in regulatory reporting. Binding the loosely coupled functionalities is one of the important features of SOA which directly helps MFIs, whose functions work under silo organization. An architectural model using SOA for a particular module of MFI (Loan Officer and MFI) and the various transactions between them has been proposed through this paper.

Keywords: Microfinance, Challenges of Technology, Service Oriented Architecture.

1. Introduction

Microfinance is generally understood as the provision of basic financial services, including savings, credit, money-transfer and even insurance, to the poor. Microfinance began during the years 1960s and 1970s as a humanitarian activity directed at the poor. At the very beginning Microfinance was associated with providing poor families with very small loans called microcredit, to help them engage in productive activities or to enable them to grow their tiny businesses and to shape them as micro entrepreneurs. These small credits are offered to the poor by special Financial Institutions called Micro Finance Institutions. MFIs basically concentrate on social welfare of the poor with slight inclination of profit.[1]

Microfinance Institutions involve more people than any other traditional banking Organizations. Information Communication Technology (ICT) has emerged has a powerful solution to address the outreach such as sustainability and maintainability of MFI's. But how far is the technology implemented, if implemented can there be an enhancement with the latest technology like Service Oriented Architecture is the orientation of this paper.

2. Findings

As it was discussed previously Microfinance (MF) initiatives involve more people than traditional banking and thus have to gather, store and analyse more data. It is not possible for a single loan officer to

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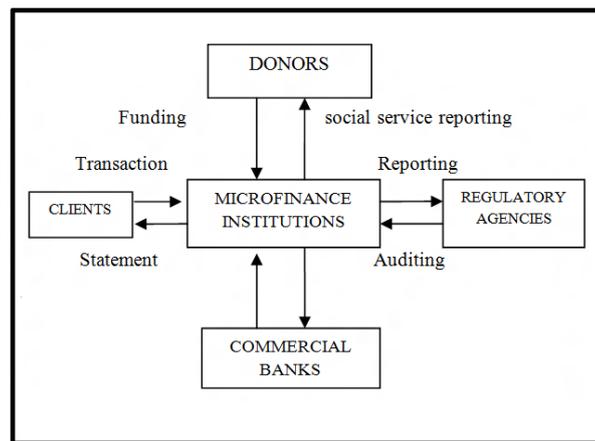
manage this alone. There is a real need to support at least some of the operations with technology. The primary aspect in this regard is that the solutions provided to MFIs by Technology

- Should be affordable as it is necessary to have operating costs as low as possible.
- Should improve the customer’s convenience.
- Reach greater areas and generate more revenues.
- Technology implementation by MFI’s also need to reduce the fraud.
- Should help them to control and improve quality of financial information.

If we categorize the Information Exchange Requirements in Microfinance according to Jordane Rollin, Grameen Foundation USA, it is categorized as below Table-1.

(Information exchange requirements in microfinance (source: Jordane Rollin, Grameen foundation USA)

Table-1



2.1 Information Communication Technology (ICT) in Microfinance :

A host of ICT applications are already in use by few well established MFI’s, while some are in the pilot stage. The application ranges from basic MIS solution to the Mobile phones, Personal Digital Assistants (PDA’s), Point-of-Sale (POS) technologies and Automatic Teller Machines (ATM’s), Internet, Database Management Systems.

Table 2 shows the usage of innovative ICT techniques used by few MFI’s around the world. (Source: Microfinance –Exploring the Role of Technology, S.Rajagopalan)

2.2 Challenges facing by microfinance institutions in technology implementation :

Despite the numerous developments, microfinance institutions still face numerous challenges in various forms like:

- High Operations Cost:
- Un-regulatory Framework
- Weak Management
- No trained Staff
- MIS not efficient to collaborate the data and analyse the data.
- The group based business methodology that works behind MF concepts is one of the main reason it achieves high repayment rates and this should be preserved by the technology where some ICT tools like ATM’s or Credit Cards does not allow clients to work in groups.
- MFIs may find it difficult to do business with those who haven't embraced any electronic technology at all.[2]

From the above points it is clear that Challenges for MFI’s in adopting Technology would be from two perspectives.

- 1. Managerial Capacities

- 2. Technology implementation according to the change in the business processes, which MFI's will be required to adapt.

An encouraging sign from MFI's point of view is the growing interest among donor agencies, technology developers and academia to collaborate in the effort to develop appropriate and affordable technology solutions to serve the poor MFIs presently are working as silos. There is no way to integrate the various activities of MFI's. There are web portals like:

- Mix Market portal - which provides key information of MFI's worldwide. [3]
- E-promoting - sharing information across all interested parties ,
- E- Chou pal - providing certain services to Indian rural population

But all these resources lack certain aspects like:-

- Reporting based Architecture
- Dynamic and Interactive form that would facilitate faster interactions between stakeholders and catalyze partnership.
- Technology framework for Multiple Services Delivery.
- Microfinance Client Database with in-built statistical features to analyse and present records in an easy accessible manner.[4]

Therefore, there is a need to provide robust, sustainable business model mechanism to capture information at every level .This model should ensure standardized records tracking system reduce the cost of data capture from distributed areas and should help for quick information transfer- integrating the silos.

This paper focus on solutions built on potential technology model like Service Oriented Architecture (SOA) that can help MFIs work effectively, while minimizing costs and improving profitability. The paper portrays the architecture of SOA-MFI for one section of MFI's processes, among the various sections available in the value chain of MFI .This Model can help MFI's to evaluate their information systems to get a faster accurate and better solution and can resolve some of the issues like dynamic and Interactive form for faster interactions, Multiple Services Delivery, Microfinance Client Database with in-built statistical features etc.

3. Proposal

3.1 Microfinance Operations Implementing SOA :

A service-oriented architecture is essentially a collection of services. These services communicate with each other. The communication can involve either simple data passing or it could involve two or more services coordinating some activity.

Hence, Service oriented architecture (SOA) is an architecture where independent systems and applications communicate with each other by exposing and using services. Services are defined using open standards, making inter-communication much easier to implement, and less dependent on proprietary communication protocols. [5]

Web Services (WSDL, UDDI, SOAP, and XML) refers to the technologies that allow for making these connections. Services are what we connect together using Web Services. The combination of services-internal and external to an organization - make up a service-oriented architecture.

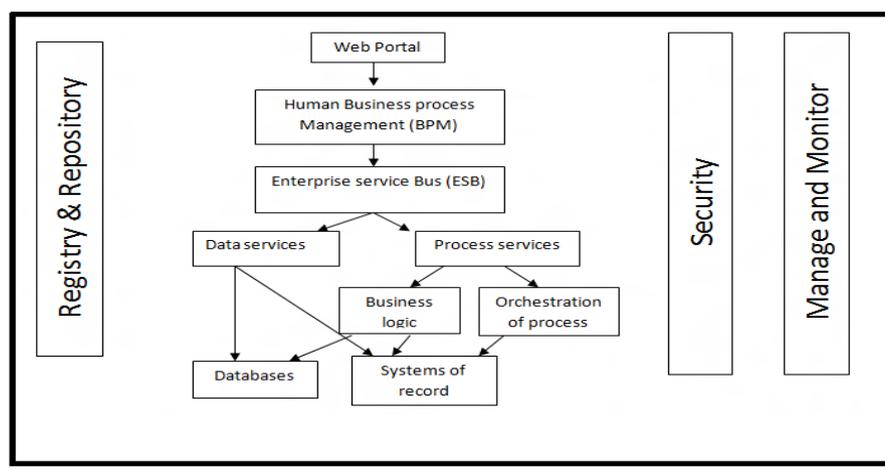


Fig. 1.1: A Map of SOA Component

3.2 Implementing SOA to One Process Module of MFI between MFI and Loan Officer:

The Microfinance Institutions are expanding their operations by doing high volume of transaction in poor rural locations. Loan Officers, employees of MFI’s need to travel to different rural areas to interact with the clients and update the day’s or week’s transactions in the MIS. He also needs to prepare the weekly, monthly report of the transactions. The outreach work of MFI is conducted by Loan Officers. The business model is highly distributed with many points of presence across geographies. The efficiency and profitability of each transaction is in the hands of Loan Officer and therefore his productivity is the key factor in the sustainability or profitability of any MFI.

The Facilitating Technologies needed for him are stated in the Table-2

Table-2

Sl. No	TECHNOLOGY TOOL	DESCRIPTION
1.	MIS	Efficient MIS to give updated reports
2.	DATABASE	Database to maintain the records of all the clients in that rural area
3.	BUSSINESS PROCESS MODELLING TOOLS	BPM tools which accurately describes each process of the transactions between the Loan Officer and the Clients
4.	PDA’s/MOBILE PHONES	To fasten the transactions ,reduce the paper records and time saving from data entry at the branch offices.
5.	WEB PORTALS USING WEB SERVICES	Web portals of the MFI to register the transactions
6.	NETWORK TECHNOLOGIES –INTERNET	To update the information on institution wide Intranet.

- Integrating all these facilities stated in the table -3 and orchestration of different processes could be done using SOA because SOA enables efficient messaging and business processes management from the front end channels. The below figure 1.2 shows an example of Service Oriented Architecture between MFIs and LOAN OFFICERS.

The Figure 1.2 shows a clear integration of Different Business Process activities of Loan Officer with Clients or with MFI. The SOA paves way for a smooth working of different activities of Loan Officer with his single hand set PDA/Mobile. Web Services with its different techniques takes the challenge of integrating the processes and updating the records which reduces the burden of

- Updating the Records in the MIS at MFI Office only.
- Reduces Fault Record tracking because Business Processes are aligned through BPM under SOA.
- Integration of several MFI areas Databases .This can be at low cost since SOA supports interoperability of loosely coupled Distributed Environment.
- Makes Multiple Service Delivery.
- Movement of Loan Officer to each area can be reduced.

- The MFIs can track their territory transactions easily within their office using Web Services of SOA.

4. Conclusion

“The day we can marry the power of the Microprocessor with the power of Microfinance, we will have developed a terrific solution to provide microfinance transactions to poor people in a low-cost, user-friendly way” (Vijay Mahajan Chairman, BASIX)

Many such Microfinance Practitioners too believe that Technology as a potential driver for the growth of the Microfinance Sector. Microfinance organisations in recent years have gained international recognition and they are now recognised as a strategy to fight poverty. This paper highlights to briefly picture the concept of microfinance and confront it with the predominant technology like SOA. SOA implementation in MFI’s helps in optimizing business performance amidst change, competition, and increase in regulatory reporting.

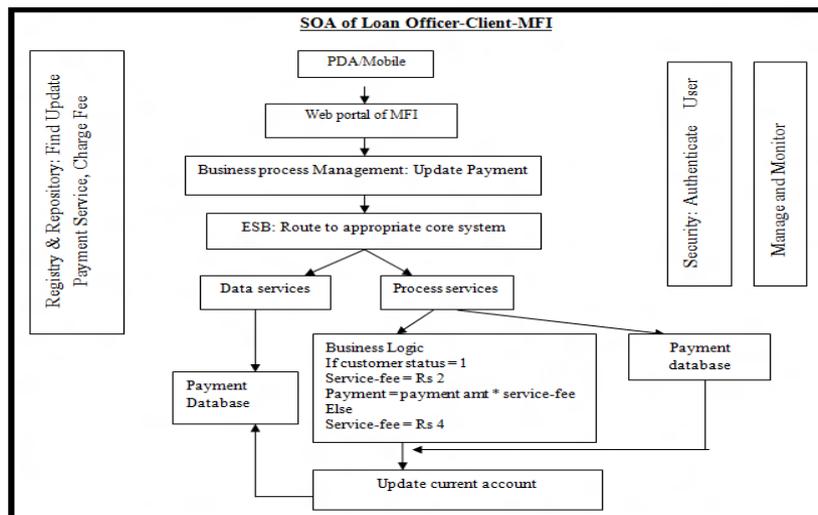


Fig. 1.2: Shows the Map of the various SOA components of MFI-Loan Officer

Binding the loosely coupled functionalities is one of the important features of SOA which directly helps MFIs because MFIs functions work under silos. SOA works effectively with Business Process Management Implementation which is the priority for any MFI s as they need to have a formal and efficient structure to record complex transactions and take intelligent business decisions. SOA helps to meet the growing demand of MFIs to provide timely and quality information at the place of operation to the customers, to their Stake Holders and its employees on field, while minimizing operational costs –The Primary criteria of Micro Finance Institutions.

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