

**Financial Inclusion and Banking Technologies**

*(BANKING OPERATIONS, PRODUCTS & TECHNOLOGIES)*

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**Abstract**

*The most significant development that has taken place in India after independence is liberalizations and resultant free economy. Technology and digital transformation become a part of human life. People and their life style are changing day-by-day. Digital transformation has now become a necessity rather than an option. The banks like financial institutions all over the world forced to cop up with the changing environments. It is very much essential to have such a change to protect our economic stability and development as a whole.*

*A country's economic growth and development depends mainly on the financial soundness of the society. The financial soundness of a society can be achieved only through financial inclusion, because financial inclusion helps to improve the money flow to the economy. But it can be seen that a vast segment of Indian population is still far away from the formal financial system. There is a growing concern about the people being unbanked. This paper discusses optimum level of financial inclusion with the help of modern banking technologies.*

*Keywords: Financial inclusion, financially Excluded, Business correspondents, Pradhan Mantri Jan Dhan Yojana, unbanked, Core banking, Point of Sale (POS), Micro Finance, Ultra small branches (USBs)*

**Introduction**

India is placed at the second highest number of financially excluded households in the world after China. The extent of financial exclusion indicates the inefficiency of the existing financial inclusion models. The huge number of under-served Indians defeats the purpose of the establishment of financial systems, which in turn found affected the economy as a whole.

In this digital era, Technology and digital transformation become a part of human life. Irrespective of caste, creed, age and income, people began to use technology in one way or the other. And the dependence on digital technology is found increasing among the general public.

It is understood that, financial inclusion programs and their efficient management with the help of modern technologies become the major option before the banks to optimize the working results.

**Statement of the Problem**

The traditional system of brick and mortar banking does not satisfy the financial inclusion goal in its full sense. Lack of access by certain segments of the society to suitable, low-cost and safe financial products and services from the main stream providers force them to keep away from the financial system. The public and private sector banks are not at all interested in financial inclusion like programs due to varied reasons. According to banks, it is not cost effective to transact with relatively small amounts of the low income group. The new rules and regulations laid by these commercial banks are against the poor low income groups. Even State Bank of India (SBI), the biggest public sector bank of India, shifted from **“mass banking to margin banking”**. No doubt, the financial needs of the poor and low income groups are met mainly by the co-operative sector. But they are far behind in technology implementation.

We know that, what we have seen in the banking sector during the last decade would not have been possible without technology. Even though the banking sector witnessed tremendous changes in usage of technology, the benefits did not reach the financially excluded low income groups. Lack of technical education and affordability among the target group negatively attracts the target groups. Hence a microscopic approach of fact-finding study regarding technology implementation in co-operative sector is considered very much essential.

### **Objective of the Study**

The major objectives are;

1. To study the factors influencing financial inclusion.
2. To study the financial inclusion products and technology used by the co-operative banks.
3. To find out and suggest measures to develop a new strategy in
  - a) To cut short or reduce the number of factors that adversely affects financial inclusion process.
  - b) To suggest better and workable technical solutions for the co-operatives.

### **Significant Challenges of Financial Inclusion in India**

Even after several measures a sizable portion of the Indian population especially the rural population remains unbanked. During the last two decades, the life style of the people changed a lot. Everybody looks for automated processes in banking activities instead of spending half day in the banking counters. The paper classifies the *Challenges of financial inclusion in India* into **two broad categories** namely;

- **Customer related Factors (Demand Side issues)**
- **and Industry related Factors (Supply side issues)**

A study on this topic discusses the various challenges and the measures to be taken in attaining an optimal level financial inclusion with the help of banking technologies.

### **Customer Related Factors (Demand Side Issues)**

#### **1. Illiteracy and lack of awareness among the poor sections**

Low and middle income people are often unaware of the banking facilities including technological developments and are reluctant to approach the formal financial institutions. They are using their own traditional methods like money lenders to meet their financial needs.

#### **2. Low income, poverty and Life style**

The commercial banks and private sector banks including new gen banks are found reluctant to entertain the poor. State Bank of India, the biggest bank public sector bank of our country also changed their '**mass banking to class (multi-milliner's) banking**'. According to these banks, it is not cost effective to transact with relatively small amounts of the low income group. The new rules and regulations laid by these commercial banks are against the poor low income groups.

#### **3. Tedious documentation processes**

Often the ordinary people need to spend half day or more in bank counters to deposit or withdraw their small savings. Timely and accurate credit for their basic needs only can help the weaker sections and low income groups of people. Due to the cumbersome documentation and procedural hassles, people feel it easier to take money from informal sources like money lenders. We know that, in this century, banking becomes a one second activity and it is possible to take a **selfie and open an account** in any bank from anywhere or transferring funds accounts to accounts by just touching a mobile screen.

It is very interesting to see that, the commercial banks and private sector banks are disbursing a vehicle loan within hours or a few days and at the same time they may take a minimum of 30 days to 60 days to disburse an agri loan other than agricultural gold loan.

#### **4. Lack of tailor made financial products**

The product development in commercial banks and new gen banks are done at the top level. Those products may have safety, security and profitability. But such products may not be suitable for all, especially the low income groups. Financial products must satisfy the needs and wants of the general public. Unsuitable products lead to dissatisfaction and low demand among the poor. Gold loan products are the best examples. There are many NBFCs in Kerala, doing gold loan business. Even when there are many banks in Kerala, 71% of the people prefer NBFCs for Gold Loans.

#### **Industry Related Factors (Supply Side Issues)**

##### **1. Cut throat Competition.**

New market players are coming in the industry like payment Banks, Post office banks, Microfinance Institutions, NBFCs etc. with many offers. The commercial banks are starting more rural branches and Ultra Small branches in village areas. They are engaging BCs (Business Correspondents) in their business. Even Akshaya Centers and Telephone Booths are acting as BCs of banks. The people can approach the BCs and avail basic banking service at any time irrespective of the bank working hours. Even though the Co-operative banks are owned and managed by its members, they are unable to manage the day-to-day activities of the bank with the changing situations due to many reasons. One of the major reasons is the dual control of the Registrar of Co-operative Societies (RCS), because if the banks want to change their business style/traditional method of business, they need the prior approval of RCS. Often it is a tedious and time consuming process. Co-operative banks are unable to compete with commercial/new generation banks due to many reasons.

##### **2. Government Policy Decisions**

The low and middle income people are found shifting their accounts from co-operative banks to other financial institutions like, commercial and private bank branches, Post offices, etc. due to Government policy decisions. Often it may be for availing benefits from the Government like gas subsidy, education grant, pension benefits, or some others.

##### **3. Mind set of banks, their employee skill and attitude**

The employees of co-operative banks are found satisfied in continuing traditional methods. Their skill and knowledge is much lower than the industry average. The co-operative Act and Rule permits a peon or watchmen to become the general manager or chief executive of a co-operative institution. Unhealthy political interference, over trade unionism, over interference of the Registrar of Co-operative Societies etc. adversely affects the effectiveness and efficiency of the workers and organization as a whole.

##### **4. The Traditional method of banking**

Life style of people and their needs, wants etc. changed a lot, but still the co-operative sector is following the same older style of banking, with limited transactional services. Hence, even the young generation of the villages depends on the new gen banks situated far away from their natives. Reluctance to change need to be changed according to the life pattern of the people.

##### **5. Technology**

Technology plays an important role in improving financial inclusion. It helps to improve the quality of the product and reduce product cost. It also helps the customers in choosing the products according to their needs and wants with high flexibility. But such modern banking technologies are not available in RRBs, Gramin banks and co-operative banks, which are termed as the common man's bank.

##### **6. Cost of acquiring modern banking technologies.**

Technology used in co-operative banks is limited to branch automation or bank computerization with local made softwares. These softwares used by them are not at all secured. And also due to cost factors they are maintaining their data and the centre in bank building itself. Acquiring modern banking technologies like, Core Banking Software, Cheque Truncation Scheme, Internet banking, Mobile Banking, ATMs, CDMs, Micro ATM services,

SMS alert system are very costly. It is not cost effective to acquire such softwares for a single co-operative bank alone.

The Challenges of financial inclusion in this sector needs much more attention because the co-operatives plays major role in our economy. An optimal level of mechanization and modernization is inevitable to help the poor low income groups. Therefore the study discusses the various technologies used, its relevance and the future technology need assessment in this sector to have a better financial inclusion in India.

### **Information Technologies for Financial Inclusion through Co-Operative Banks**

#### **Meaning**

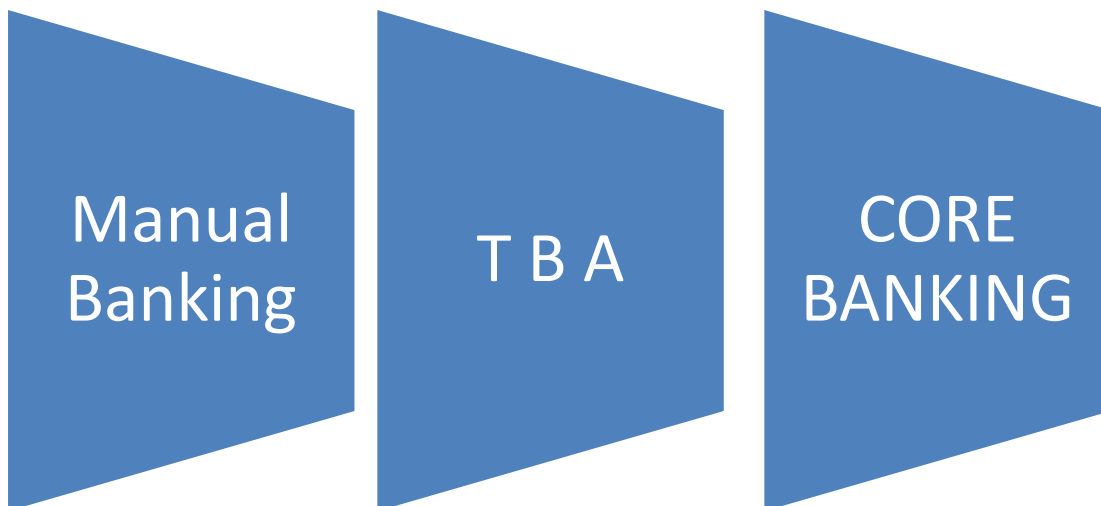
*The process of providing financial products and services needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost in a fair and transparent manner through the mass banking sector (Co-operative banking sector) with the help of modern banking technologies.*

As the co-operative banks are well known for their reach and branch network all over the country, the technology adoption in this sector will attract the financially excluded people as well as the existing customers.

#### **Co-operative Sector and Technology – An overview**

Liberalizations and the resultant free economy forced the co-operative sector to change their traditional method of manual banking. But due to varied reasons (like, financial instability, cost, viability factors, employee attitude, government policy etc.) only a few cooperatives could only cop up with the changing environments. Hence many are still following the brick and mortar, manpower banking.

#### **Transformation of Co-operative Banks - from Manual to CBS**



- A. Manual Banking
- B. Total Bank Automation
- C. Core Banking Solution

#### **A. Manual Banking**

Traditionally co-operative banks are following manual system of banking. Still many of the primary banks are working in manual system. Some banks are using standalone PCs for letter writing and report generation in excel etc.

## B. Total Bank Automation

It is another form of Office Automation System (OAS). Here the branch computers of the branches are interconnects through cables, telephone lines, radio waves, satellites or infrared light beams with a main server computer. It can be said as a collection of computers, terminals servers and hardware components etc. Through this computer network, the banks share information and resources very easily.

Local Area Network (LAN) is a computer network covering a small physical area

## C. Core Banking

**CORE** stands for "Centralized Online Real-time Environment" banking. A centralized branch computerization model in which, branches are connected to a central host. It incorporates branch automation modules and online multiple delivery channels like ATM/CDM, DEBIT/CREDIT CARD, TELE BANKING, INTERNET BANKING, etc. under one roof. In core banking there is a central data base for the bank and transaction done centrally.

A large number of large and medium size co-operative banks are using CBS for their day to day business. But these banks, especially the service co-operative banks and the urban banks are maintaining their data and the data centre in their own bank building itself, that also in their Head Office. The Local made softwares used by them often may not have sufficient safety and security.

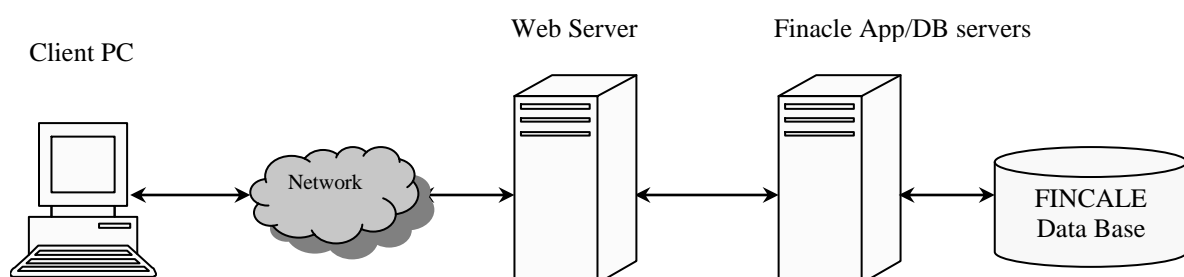
### Data Base and Data Centre

The data of all the branches will be stored at one place called Data Centre (DC). It means that all the operations at the connected branches shall take place at one place i.e., Data Centre although the actual transactions shall take place at the Service Outlets (SOL).

### Centralized Data Base:

A **centralized database** (sometimes abbreviated **CDB**) is a data base that is located, stored, and maintained in a single location. This location is most often a central computer or database system, for example a desktop or server CPU or a mainframe computer. Users access a centralized database through a computer network which is able to give them access to the central CPU, which in turn maintains to the database itself.

### Architecture of CBS Data Base



### CBS Communication Channels

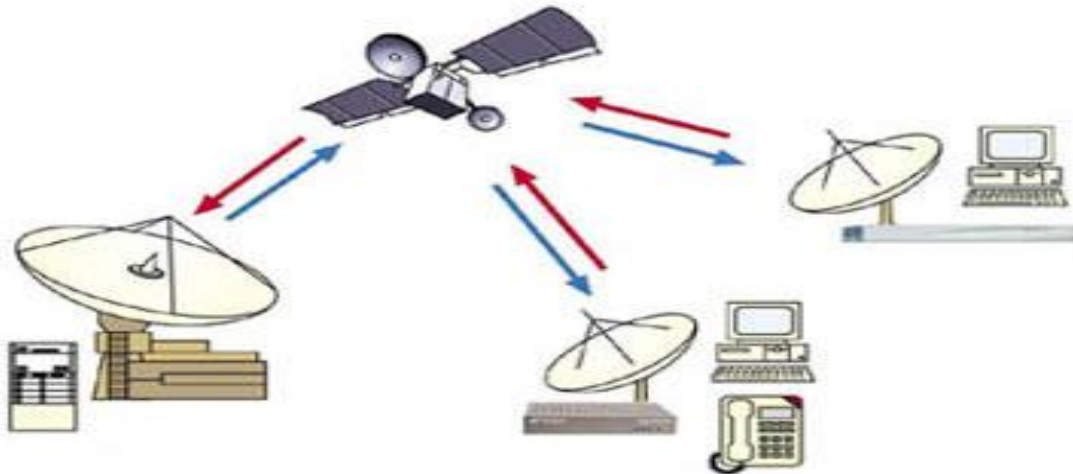
This software is installed at different branches of bank and then interconnected by means of communication lines like telephones, satellite, internet etc. It allows the user (customers) to operate accounts from any branch if it has installed core banking solutions. Leased lines of various service providers are found used by the banks. (*Leased line is a dedicated link between the source (originating) and destination*)

Wide Area Network (WAN) technology is used for connecting devices across the bank related areas and router is a device used to connect different types of networks.

### **VSAT Online Connection**

VSAT: Very Small Aperture Terminal. This is a wireless connection. In this bank's computer systems including ATMs are connected to VSAT. It communicates to the destination via a satellite namely INSAT (Indian National Satellite System).

### **Image of a Satellite Technology**



### **Benefits of CBS**

The CBS technologies have cut down time, working simultaneously on different issues and increasing efficiency. The platform where communication technology and information technology are merged to suit core needs of banking is known as core banking solutions. Here, computer software is developed to perform core operations of banking like recording of transactions, passbook maintenance, and interest calculations on loans and deposits, customer records, balance of payments and withdrawal.

### **Technological Solutions to Meet the Challenges**

#### **1. BC Model**

In order to expand the reach of the Banking Business, the commercial banks began to introduce Business correspondence model in their service area. These banks promoted a bunch of banking products related to deposits and loans through the BCs by providing Point of sale machines (POS) and micro ATMs with network connections.



*Business correspondent with POS/Micro ATM*

Even though the technology used in BC model was simple and not much expensive, they could achieve tremendous progress in their business. But later the commercial banks including State Bank of India (SBI) the biggest public sector bank in India shifted their focus from the “mass banking to margin banking” and began to discourage BCs. It is a very good opportunity for the co-operative sector to appoint BCs in their area of operation and expand business.

Cooperative Banks in Core Banking Software (CBS) platform having network computer system can avail the service of BCs with any of the devices like POS (on line or off line hand held machines), Micro ATMs, Smart phones, etc. As the members can avail banking services from their residential area on a real time basis, many will be attracted. It will expand the reach of business and reduce the operational cost/establishment cost as whole.

#### **Model of POS/Micro ATM Machine**

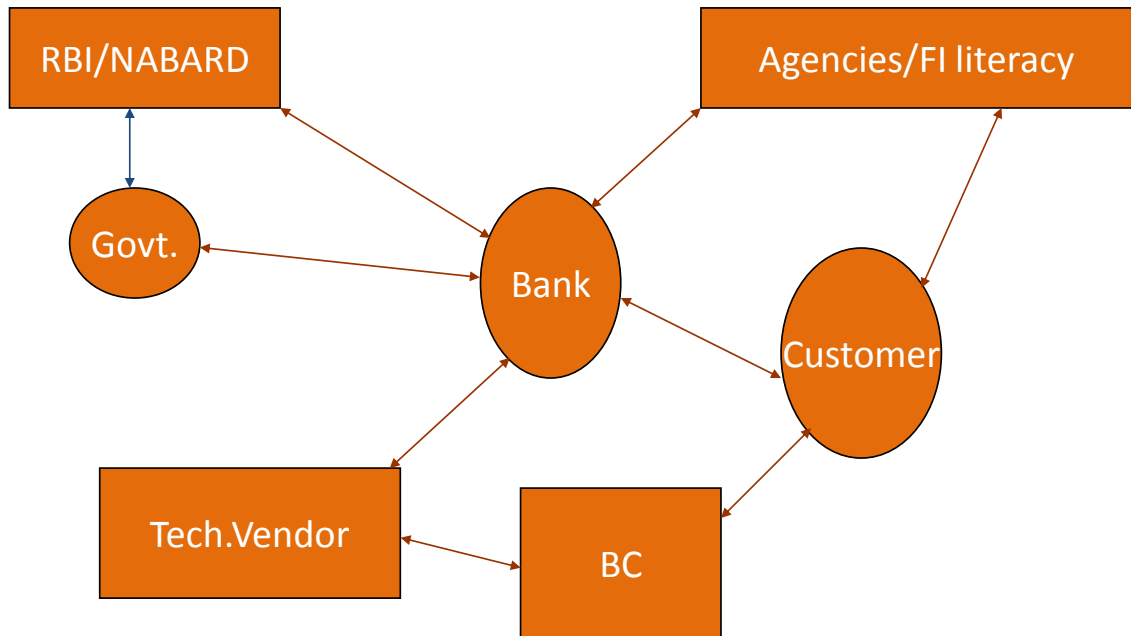


#### **Who can be appointed as BCs.?**

Self Help Groups (SHGs), Kudumbasree units, Other Co-operative societies (other than credit societies), Akshaya Centres, Jan Sevan kendras, Voluntary organizations, Residential Associations, Approved agencies, Milk societies etc. can be appointed as BCs.

## How Business correspondents works?

# Business Correspondent



### The transaction process in Business correspondence model (Credit transaction)

- Customer paying cash to the volunteer of BC.
- CBS debit the cash from BC's account and give credit to Customer
- BC software will mark the credit against agent/CSP
- Real time transaction happening
- Customer will get "sms" alert from the Bank
- BC will collect the money from agent and credit to BC's account.

## 2. ATMs and CDMs

The traditional ATMs are mainly working on card based transaction system. On the basis of type of transaction, the cards are broadly classified into two; viz.,

### (1) Debit Cards and

### (2) Credit Cards.

On the basis of contents and security the cards (both debit and Credit Cards) may be classified into Magnetic Stripe Card and Smart Card/Chip Card.

### Magnetic Stripe Card

A **magnetic stripe card** is a type of card capable of storing data by modifying the magnetism of tiny iron-



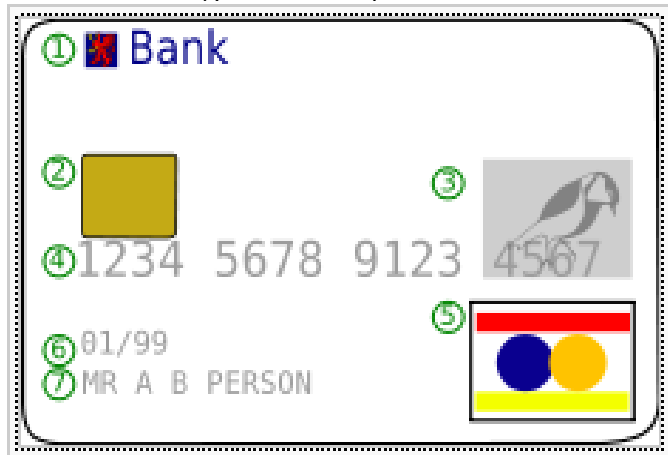


based magnetic particles on a band of magnetic material on the card. The magnetic stripe, sometimes called **swipe card** or **magstripe**, is read by swiping past a magnetic reading head. Magnetic stripe cards are commonly used in credit cards, debit cards, identity cards, pre-paid cards etc.

As we know the magnetic stripe cards are having two sides (front side and back side).

### Front side of a card

1. Issuing bank logo
2. EMV chip
3. Hologram
4. Credit card number
5. Card brand logo
6. Expiry Date
7. Cardholder's name



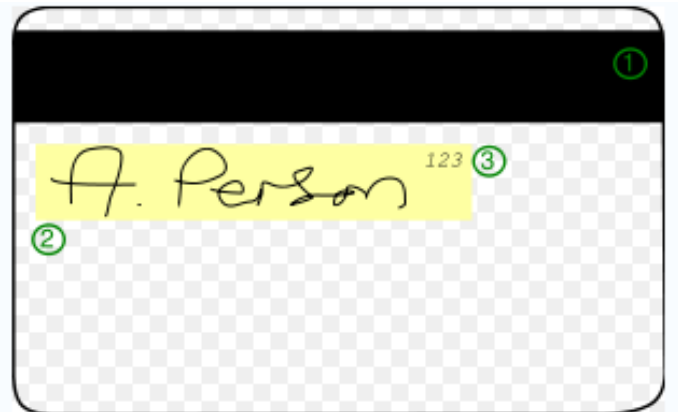
### Back side of a card

1. Magnetic Stripe
2. Signature Strip
3. Card Security Code

### Drawbacks of Magnetic Stripe Cards

The main issues of Magnetic stripe cards are;

1. Low security when compared to smart card
2. Card readers and encoders are available.



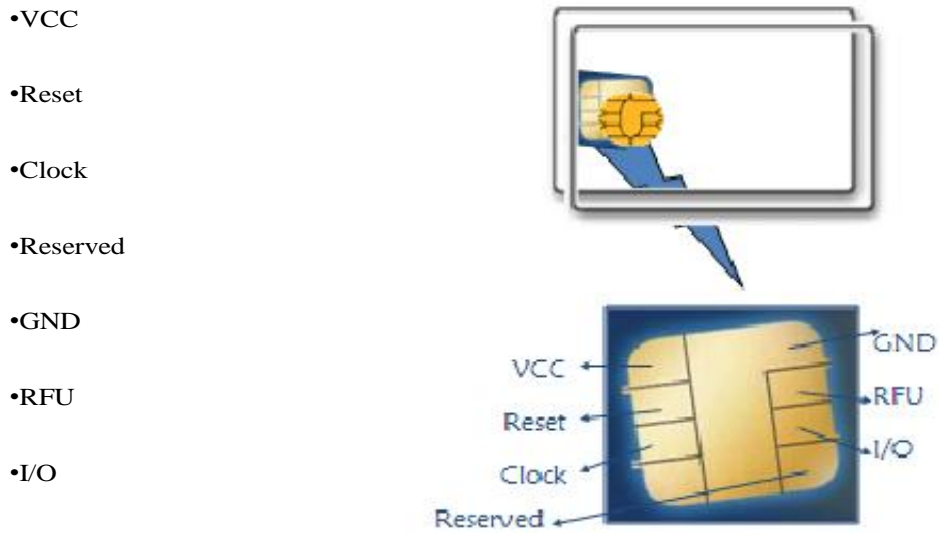
### Smart Cards

A plastic card with a built-in microprocessor, used typically to perform financial transactions. A *smart card*, typically a type of *chip card*, is a plastic *card* that contains an embedded computer chip—either a memory or microprocessor type—that stores and transacts data. This data is usually associated with either value, information, or both and is stored and processed within the *card's* chip.

The smart card embedded computer chip interfaces interacts with the card readers. VCC, Reset, Clock, Reserved, GND, RFU, and Input / Output are the seven most common partitions in a smart card chip.

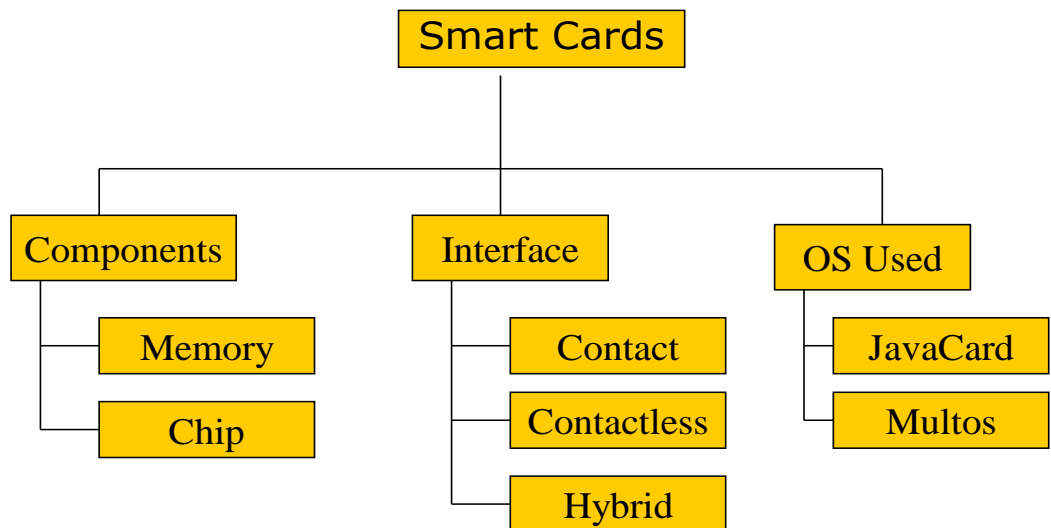
## Smart Card Interfaces

### SMART CARD INTERFACES



### SMART CARD CLASSIFICATION

## Smart Card Classification



#### A. Component Based Classification

Memory Cards

Chip Cards

## B. Interface Based Classification

Contact Cards

Contactless Cards

Hybrid or Combo Cards (Cards which can be used as either Contact Cards or as Contactless Cards)

## C. OS Based Classification

Smart Card Operating Systems (SCOS) are placed on the ROM and usually occupy lesser than 16 KB.

**Authorization** is the practice of verifying electronic transactions initiated with a debit or credit card. Three types of authentications are most commonly used in transactions. They are

- Pin (stored on the card itself)
- OTP (One Time Password)
- Biometrics

**PIN:** A **personal identification number** is a numeric or alphanumeric code or password used in the process of authenticating or identifying a user to a system and system to a user.

A **one-time password (OTP)** is a password that is valid for only one login session or transaction, on a computer system or other digital device. OTPs avoid a number of shortcomings that are associated with traditional password-based authentication.

**Biometrics:** It is the process of identifying an individual by his/her **physiological** or **behavioural characteristics**. The term Biometrics derived a Greek word Bios (life) and metrikos (measure).

### Physiological characteristics

- Fingerprint
- Hand geometry
- Iris
- Face
- Palmprint
- Infrared Thermogram
- Retina
- DNA
- Ear shape
- Skin Reflection

### Behavioral characteristics

- Signature
- Voice
- Key Stroke
- Gait (a person's manner of walking)
- Lip Motion

**Biometric Authentication are usually done in three ways**

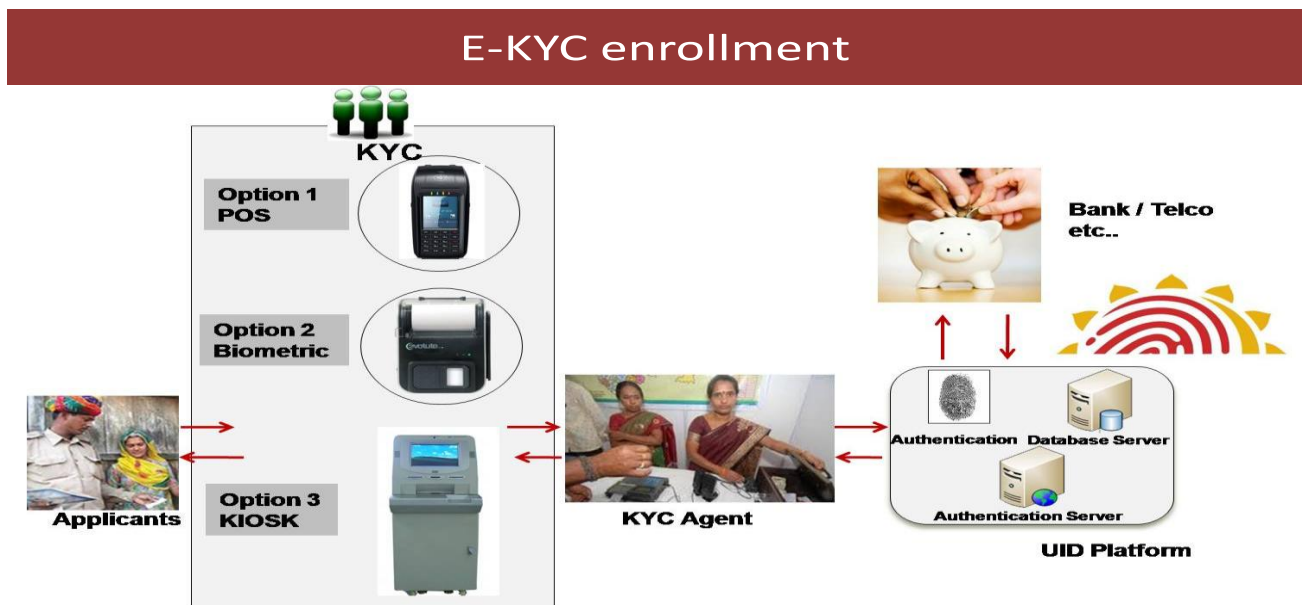
- Within the Card

- Within the Terminal
- Within the Host

### Suggestions and Conclusion

#### Suggestions

1. **National level consortium of co-operative banks:** A National level consortium of co-operative banks to setup in India for providing user friendly technological support and implementation in co-operative sector under the strict monitoring and control of NBARD.
2. **Cost of CBS implementation and its maintenance:** Cost sharing on the basis of number and volume of transactions may be implemented in this sector. AMC (Annual Maintenance Cost) and software updating cost may be recovered from the participant banks from time to time.
3. **Mandatory CBS in DCBs:** CBS computerization may made mandatory in all SCBs (State Co-operative Banks), DCBs (District Co-operative Banks), UCBs (Urban Co-operative Banks), etc. having banking license.
4. **KYC Documentation:** KYC documentation is a tedious and time consuming, expensive process for the poor and downtrodden people. Hence Aadhaar eKYC service offered under Aadhaar project by UIDAI department of Government of India may be utilized to establish the Identity of the applicant by validating their Name, Address and other information against their Biometric Identity with Aadhaar data center.



5. **BCs and Ultra Small Branches:** Provisions to be made to appoint financially sound agencies as Business Correspondents on a commission basis, in their service area. POs and Mini ATM based transaction are only to be allowed.
6. **Availability of banking services:** Sufficient number of Ultra Small branches to be opened in financially excluded areas with online and off line transaction facilities to ensure banking service to the needy people.
7. **Mobile Banking:** Mobile became a part of human life and it is the most familiar technology among the poor and downtrodden class. Mobile enabled banking transaction system may be made available among the financially excluded. Creating awareness among the target groups through various agencies like BCs, USBs, Kudumbasree units, SHGs, etc will definitely help to accelerate its growth.
8. **One Man One Account:** All the direct benefit transfers (DBT) may be given to beneficiary accounts through a single adhaar enabled single account. For the same, policy decisions on

Government level may be taken for account portability and balance transfer system on a national basis.

**9. Biometrical authentication machines:** There are many cards like debit, credit, smart, pre-paid, and post paid, shopping cards, traveler's cards, etc. Bio-metric authentication machines with multiple service choices can be set up and implemented, so that the customers can login with bio-metric system and chose their required service. It will enable the customers to avoid the issues related to carrying the cards and remembering PINs etc. And also can avoid fraudulent activities in e-payment systems.

### **Conclusion**

Financial inclusion can make tremendous changes in our economy. It ensures better standard of living and the orderly growth. Access to a bank account is the first step toward financial inclusion since it allows people to come in contact with formal financial institutions like banks. A real financial inclusion can be achieved only through the use of technology. In today's fast changing technological environment, even the currency notes and coins may end up in museum and will become a part of history.

Traditional method of manual banking efforts alone cannot eliminate financial exclusion in full, but can only be minimized. National level consortium of co-operative banks on a cost sharing basis, adhaar enabled e- KYC documentation, sufficient number of technology enabled BCs and Ultra Small Branches, Mobile enabled banking transaction, adhaar enabled single account, Biometrical authentication machines in residential areas etc. will definitely accelerate the process of financial inclusion.

In a country like India, it is always wise to follow varied strategies like life style banking for different segment of people. Effective implementation of financial inclusion through co-operative sector (popularly known as the doorstep banking) mixed with appropriate technology will definitely help to attain financial inclusion a great success.

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