Principles of Banking Module ‘C’

V Rajendran
Venkrajen.in
venkrajen@yahoo.com
+91-44-22473849; 09444073849

Computerisation in Banks

- History: Dr C Rangarajan Committee 1983-84, to study the possibilities and stages involved in bank computerisation and to prepare guidelines.
- Branch Computerisation:

  Early stage: Stand-alone systems ie PCs (Workstation or a node)

  Multi user systems: Client Server concept, Mini computers and the stage of Total Branch Automation/Computerisation in a database in the branch (distributed database)

  Now the stage of Core Banking Solution: centralised data for the entire bank at one core centre/server

Computerisation at Admin Offices

- Administrative offices are Zonal Offices, Circle Offices, Zonal Offices and Central/Head Office
- Branch data is of two types: i) Fixed particulars like branch premises details, date of opening etc and ii) variable components like business data, profit figures, HR Data etc
- Besides these, inter-branch reconciliation, credit monitoring and personnel data management are all critical areas in administrative offices

LAN – Local Area Network

- Typically for a branch, a building, one premises and for distances upto 100 mtrs and with some additional devices upto 1000 mts
- Topology is the way (system, design) in which the devices (PCs) are connected in a LAN. Topologies like Star, Tree have centralised control and ring and bus have distributed control.
- Protocol is the manner (communication) in which two computers interact with each other, ie a common language understandable by computers

WAN Wide Area Network

- Just like a LAN for a TBA environment, WAN is required for connecting many branches/cities and is a pre-requisite for a CBS
- Telephone lines are the commonly used medium of communication in banking
- Since telecom lines transmit sounds (analog signals) and since computers read only digital signals, Modems are used – ***MO***dulators and ***DEM***odulators that transform digital to analog and analog to digital signals

ATMs

- Offline ATMs: Not connected to the branch database – Withdrawals upto predetermined limit only and without debiting customers' A/c and Stand-alone ATMs are those that are not connected to any ATM network and connectivity to the particular branch only –Nowadays both these not prevalent
- Networked ATMs – connected to a network
- ATM Components: Video Display Monitor, Key-pad, Touch Screen and slots for Card Reader, Cash Dispenser, Envelope Dispenser and Deposit slot
- PIN is a randomly generated sequence of four digits and customers are to change it frequently

Cards

- In a charge card, total amount of transactions are accumulated and debited to the customer's account
- In a credit card, the total amount of transactions is debited to the a/c once in a month and the customer has the option to pay the entire amount imdtly or pay in instalments
- In Debits Cards, the purchase amount is debited to the customers a/c imdtly after the transaction
- Smart Cards are those that have an integrated circuit or chip installed and contains a memory. Already in use in pay phones, entry identification for physical access control etc. When it contains a processor. It becomes much more valuable and can be used in banking with facility for operating system, enabling security standards and other protection mechanism

Signature Storage, Scanning and CTS

- Signatures are scanned and stored in the system and retrieved nowadays. Viewing normally restricted to authorised users only
- CTS stands for Cheque Truncation Systems: process of scanning a cheque and creating an electronic image by the collecting banker and thereby stopping its physical movement in clearing. The image travels the clearing cycle and goes to the paying banker. MICR data in the cheque is made use of and Image processing is done. Both sides are scanned. Since image travels and gets paid, clearing process is faster and can be completed imdtly. Security is ensured by the process of digital signature while sending and receiving.

Communication medium

Data transmission can take place through

i) Terrestrial cables (a. copper wire-pair, b.coaxial pair or c. optical fibre for high quality, costlier but ensuring high speed with laser beam light source)

ii) Microwave systems with high frequency radio waves and

iii) satellites fitted with transmitters, receiving antennas and receivers etc used in internet and spread over a wide geographical area and considered to be very fast and reliable and widely used globally.

Transmission processors enhance data communication between two points and are categorised as message switches used for storing, routing and forwarding to a large network, multilexers used for combining two or more inputs channels into one high speed output channel and front-end processors that reduce the communication overload from the host computers

Mode of communication

- Simplex: capable of transmitting data only and not receiving. eg. Radio broadcast
- Semi duplex or half duplex Capable of receiving and transmitting both but only one at a time. Modem, on a line, and walkie talkie are examples
- Duplex: Capable of receiving and tranmitting at all time. Two-way communication simultaneously possible. eg: Four-wire modems and all communication equipment used commonly in banks and other places

RBI's VSAT network

- VSAT: Very small Apperture Terminal
- Set up in IDRBT Institute for Development and Research in Banking Technology in Hyderabad called INFINET
- VSAT contains an outdoor unit, ie a small dish antenna and an indoor unit which is an interface to users' computer system
- Most of the banks' applications like payment systems, interbank transactions, reporting systems to RBI and MIS related information run on this network

SWIFT

- Society for Worldwide Inter-bank Financial Telecommunication founded in 1973
- A co-operative non-banking organisation, headquarters in Brussels, Belgium
- Creates a unified international transaction processing and transmission system functioning 24 x 7 with all messages acknowledged or rejected,
- Ensures security while in transmission, assumes financial liability for the accuracy and timely delivery from the network origin point upto the point of leaving the network

RTGS and NEFT

- Saraf Committee Recommendations
- Real Time Gross Settlement processes payment instructions processed continuously and real time and settled gross
- IFTP – Interbank Funds Transfer Processor acts as a broker stores the messages and routes it to the RTGS system of RBI
- RBI acts as a settlement agent and checks whether paying bank has sufficient funds and sends settlement advices
- NEFT is National Electronic Funds Transfer is part of the banks' own networks and could be used for inter-branch communication also
- Messaging system is based on Structured Financial Messaging System prepared by the sending bank
- National Clearing Cell of the RBI is the data processing NEFT clearing centre

Digital Signature

- Is not a scanned signature affixed to any electronic communication like email etc but a concept or a process by which the security of a communication like authenticity, integrity and non-repudiation is ensured
- It is a process of public key cryptography with a public key and a private key issued by the designated authorities called certifying authorities (in the case of banks, it is IDRBT).
- Sender ‘signs’ the document by entering his password (private key) and a hash function is created which is then tallied with the hash function created at the other end by the receiver confirming that the document has not been tampered with during transmission

Data Warehousing

- As opposed to a data centre wherein data gets updated online and is under production always, data warehousing is normally a store-house or a repository of all data of a bank and can be subject-oriented, with no inconsistencies and is normally kept for longer periods of time, spread over a few years.
- Data from heterogeneous sources is stored to generate critical information for the decision support systems
- Data Mining is a technique to reveal the strategic information hidden in the data warehouse; it is a process of finding patterns in large data to take out what is critical to enhance operational efficiency, data analyse and to enable decision support systems and MIS service

Risks in computer systems

- Computerised environment carries its own risks ie those associated with the software used, data or information and the hardware used.
- Risks that may emerge are incorrect decision making, interruption in activities, due to loss of data etc, violation of privacy and direct financial loss due to computer frauds
- Data and software and Infrastructure are major components that are exposed to serious risks and in the absence of proper control may result in serious crimes and resultant loss
- Peopleware which refers to the group of people involved in running the computerised systems.

Threats

- Errors and omissions in data and software, unauthorised disclosure of confidential information, computer abuse and mis-utilisation of banks assets and frauds are some of the threats in a computerised environment
- Accidental damages in computers are a major cause for threats may be due to environmental hazards, human errors and omissions, malicious damages, interruption in services and frauds
- There are many control mechanisms to manage and contain risks
- Physical controls are restricted access to assets, checking etc
- Internal controls are accounting, adminstrative controls etc
- Operational controls are audit trails and logs, checksum, encryption of data ensuring absolute integrity etc

Computer Audit

- Computer Audit covers areas like review of operations to check policies, standards etc, review of quality of policies, fraud detection etc
- Audit of computer systems may be one of the following:
  - Around the computer used for a well tested software, checking the input and output without going through the computer language etc
  - Through the computer involves the testing of logic and outputs with a good technical knowledge of computer language, reading the programs
  - With the computer involves the use of audit tools like CAAT etc
- IS Audit is a specialised form of audit focussing on computer systems often with the aid of Computer Aided Audit Tools and Techniques or such other customised tools verifying the availability of and adequacy of and effectiveness of controls

IS Security

- Checks and controls are to be implemented to protect the integrity of the computer systems and all information assets, be it hardware assets or software asset or data
- Confidentiality, Integrity and Availability are considered to be the three pillars of I.S. Security and a well documented IS Security Policy should have these three objectives
- Many controls are required for successful implementation of IS Security Policy
- Software application should ensure that it has proper controls in authentication, authorisation, confidentiality, integrity and non-repudiation
- Threats to IS Security include email viruses, phishing attacks etc

Disaster Recovery Management

- Disaster is any event which results in direct denial or stoppage of essential business functions for a considerable period of time
- Disruption is normally a minor event and disaster is a major event
- Business Impact Analysis is to be done to identify the critical areas
- Natural disasters, hardware or software failures, virus and acts of terrorism are some of the major threats resulting in a disaster
- DRM involves steps like defining a disaster, spreading awareness, financial planning for recovery, preparation for recovery and going in for an alternative site or a Disaster Recovery Centre/Site, testing all the components that are part of DRM

Legal Framework

- I.T. Act 2000 is the first major legal enactment on Information Technology in India
- I.T. mainly gave legal recognition to electronic records and transactions carried out by electronic communication
- Use of Electronic Data Interchange, electronic signatures etc is recognised in the Act
- List of offences is furnished in the Act that include data theft, hacking, obscenity in electronic communication etc
- The Act amends the four Acts: The Indian Penal Code, RBI Act, Indian Evidence Act, Bankers Books Evidence Act

Some important abbreviations

- RDBMS: Relational Database Management Systems

  eg Oracle, Sybase – Front-end tools: Powerbuilder, Developer 2000
- SQL Structured Query Language
- DRS Disaster Recovery Site
- BPR Business Process Re-engineering
- SFMS
- RTGS
- NEFT
- CTS
- MICR
- BCP-DRM

Abbreviations contd

- INFINET
- BANKNET
- TCP-IP
- EFT-PoS
- CSMA-CD
- E-PIN
- EDI-STP
- OFC
- FTP
- IRC

Thank you

Best wishes