Introduction of Mini Bank System
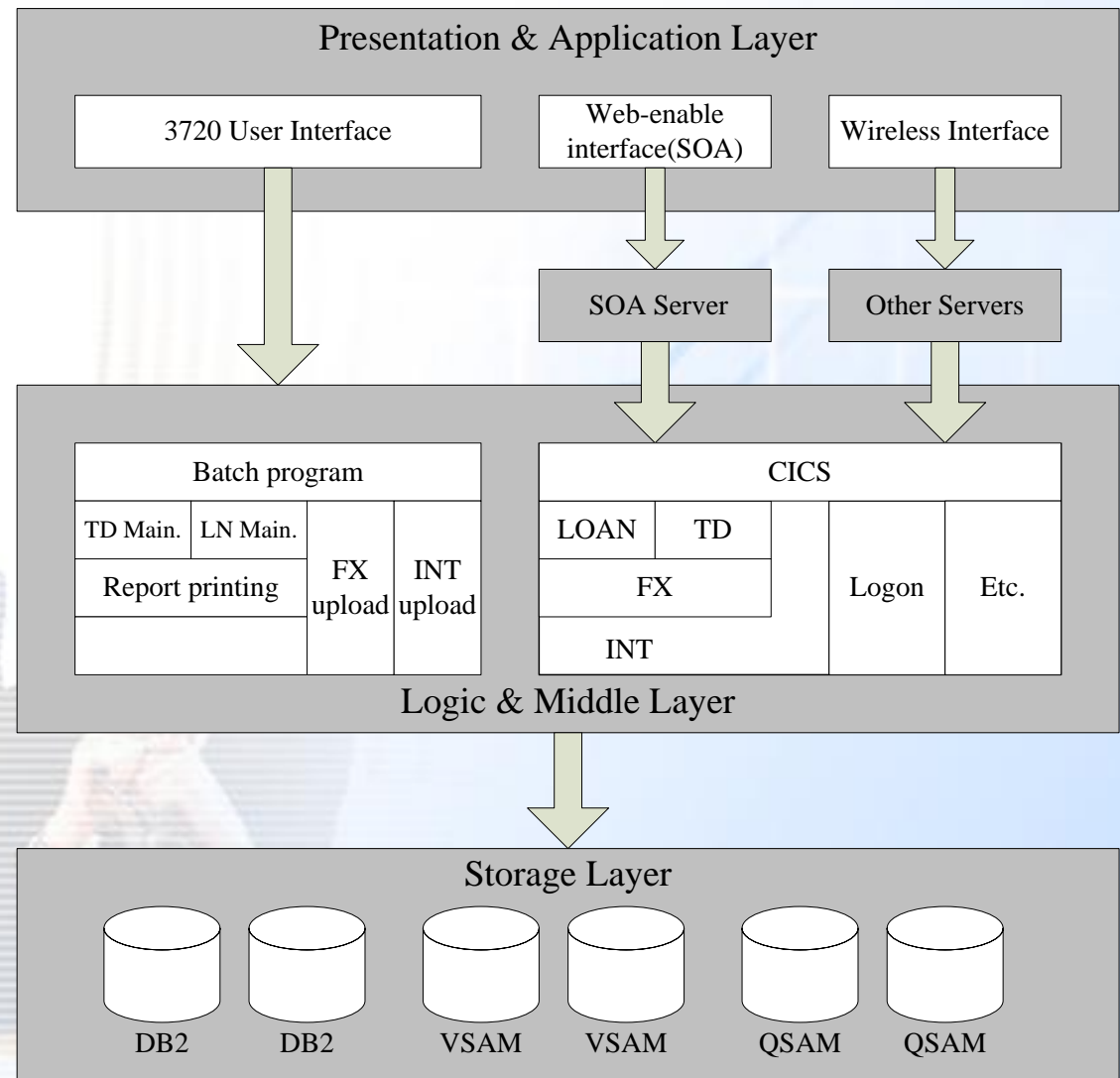
Tongji University Mini Bank Group

Introduction

- The Mini Bank system is a banking system based on the IBM Z/900 Mainframe platform.

- Our Objective is to provide a banking system of both functionality and integrity, with complete and extendable functions .

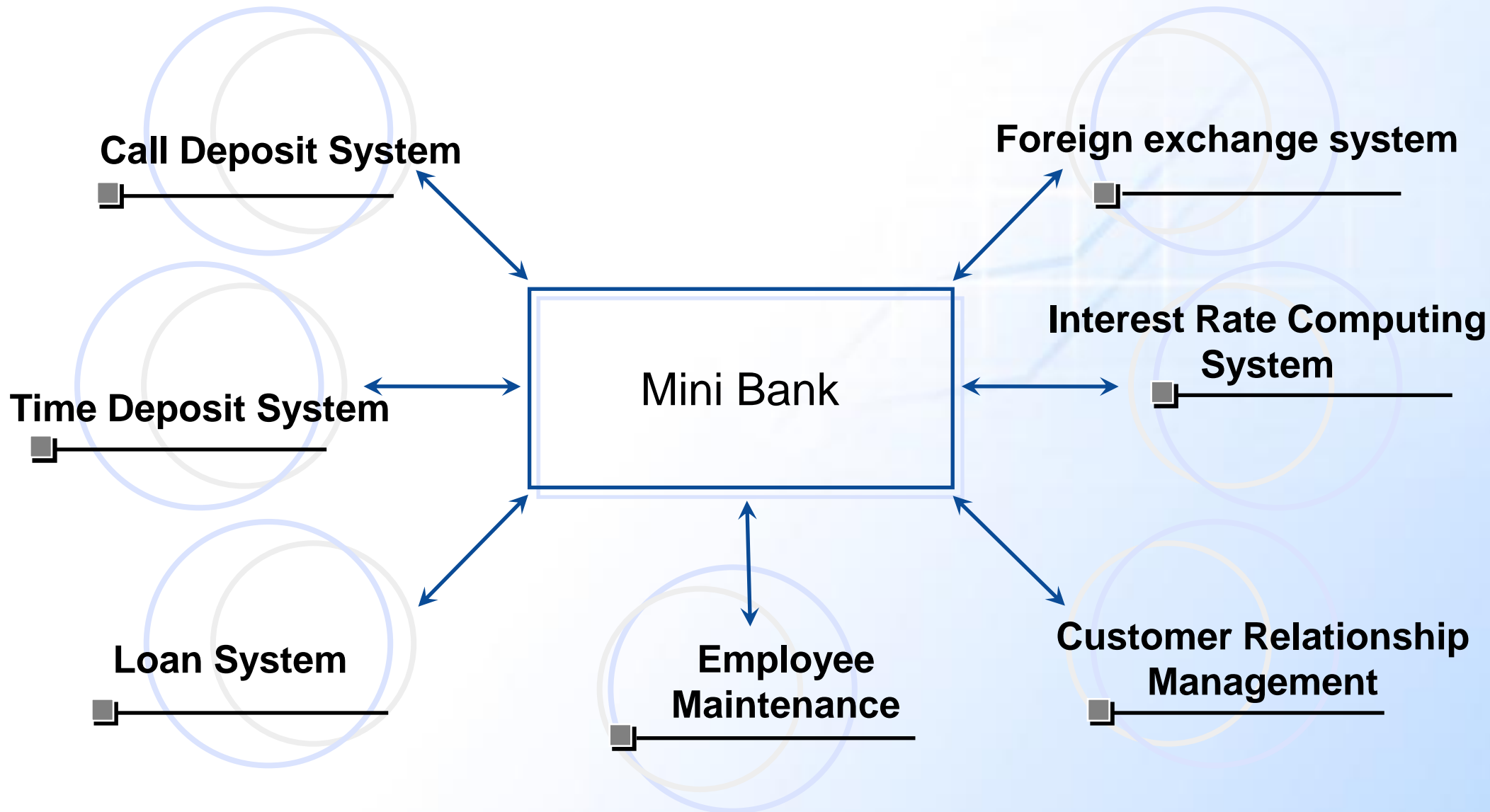- We hope it can provide some ideas and solutions for the local banks when enhancing their systems.

Vision
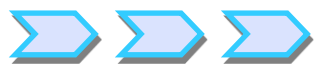
Vision

System Architecture

- The system can be divided into 5 layers, From bottom to top is: Storage Layer , Middle Layer , Logic Layer , Presentation Layer , Application Layer.

Presentation & Application Layer

3720 User Interface	Web-enable interface(SOA)	Wireless Interface

	SOA Server	Other Servers

Logic & Middle Layer

Batch program

TD Main.	LN Main.	FX upload	INT upload
Report printing			

CICS

LOAN	TD		
FX		Logon	Etc.
INT			

Storage Layer

DB2	DB2	VSAM	VSAM	QSAM	QSAM

Introduction of main functions

Call Deposit System

Foreign exchange system

Time Deposit System

Mini Bank

Interest Rate Computing System

Loan System

Employee Maintenance

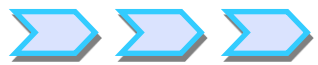**Customer Relationship Management**

Call Deposit System

Booking

Deposit or withdrawal

Maintenance of call deposit account

Account closing

Booking of Call deposit

- An online transaction
- Customer should provide customer ID, Account type and Currency type
- The fund in account can be zero
- Computed interest rate is a suggestive rate and allows bank staff to manually override according to the discussion with customer

Vision

Vision

Difficulty

Deposit or withdrawal

- Provide 3270 user interface for deposit and withdrawal
- Customer should provide customer ID, Call deposit ID, Operation and Fund.
- The fund is not limited but overdraft is not allowed
- 24×7 transaction is supported
- By connecting with different external devise to implement functions such as ATM and POS

Difficulty

Maintenance of call deposit account

- Management of account dormant ,Report the loss and mortgage
- Only when the account state is active , deposit、 withdrawal and fund transfer can be valid
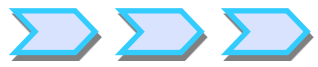
Vision

Vision

Account closing

- Deposit account can be closed manual by the online transaction

- Must make sure that there are no Time deposit or other finance product connected with the closing account.
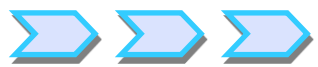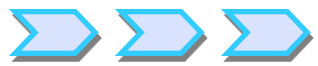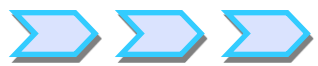
Vision

Vision

Time Deposit system
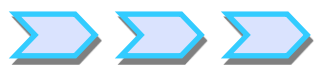
> > >   Booking

> > >   Early break

> > >   Float interest rate supporting

> > >   Everyday maintenance

> > >   Maturity

Booking of Time deposit

- Customer should provide time deposit information when booking
- System input information of operator , suggestion rate automatically.
- System generate booking report to customer automatically.

Vision

Vision

Early break

- Provide 3270 user interface for the early break transaction
- Computing interest according to the penalty rate for different product.
- Principal and new calculated interest transfer to principal withdrawal account and interest withdrawal account respectively
- System generate early break report in the batch transaction .

Vision

Vision

Float interest rate supporting

- Interest rate can be modified manually in the 3270 user interface

- The new interest rate become effective from the modifying day ,The interest rate will remain until the next modify transaction or the maturity day

- When early break transaction occurs , the original interesting rate will be replaced by the penalty rate.

Vision

Vision

Difficulty

Everyday maintenance

- Manually maintenance ：

  When the account is active , some insensitive data can be modified by manually maintenance.

- Automatically maintenance ：

  Interest rate computing, new account report printing, maturity report printing, early break report printing, log maintenance.

Vision

Vision

Maturity transaction

- Maturity report will be print two days before the maturity day.

- Compute and gather the fund of interest and interest tax, implement the foreign exchange of principle, and make the fund transfer with the computed fund

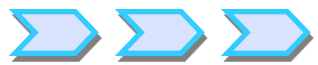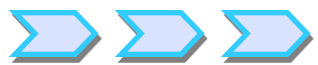Vision

Vision

Housing loan system
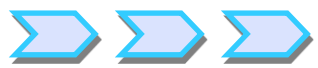
Booking

Auto refund

Pay in advance

Defaulter payment

Loan information browse and update

Booking of housing loan

- Loan account has an initial balance, which decreases with each payment
- Customer should provide information such as currency type、tenor、 interesting rate、original currency of loan、payment date、payment frequency、cash account ID for booking.
- Interest rate is a suggestive rate and allows bank staff to manually override according to the discussion with customer
- The new founded account will be activated in the batch transaction.
- A Booking report will be provided.

Vision

Vision

Difficulty

Auto refund

- A part of the batch transaction
- Using the fixed principal payment strategy
- System checks each account's state and balance day , automatically do the refund transaction according to the result of check
- The monthly refund fund consist of monthly payment principal and interest generated by the remained principal.
- A refund report will be print.

Vision

Vision

Pay in advance

- An online transaction
- Precondition： don't exist an defaulter payment.
- Expiry payment
- Partial payment
- A pay in advance report will be print

Vision

Vision

Defaulter payment

- A part of the batch transaction
- The fund in the associate payment account is not enough to pay for the monthly payment, the defaulter payment will be occurred.
- System modify the payment interesting rate to a penalty rate automatically.
- Recalculate the interest of this month, accumulated it as the arrearage payment.
- A defaulter payment report.

Normalization of default account

- Two method: online and batch transaction。

- Online arrearage payment

- Batch arrearage payment by deposit enough fund in the associate payment account.

- An account normalization report

Vision

Vision

Loan information browse and update

- The online browse and update of loan information.
- The authorized bank staff can modify the loan interesting rate 、account state and remained principal.
- The application of account dormant.
- System everyday maintenance
- An information update report will be provided

Vision

Vision

Difficulty

Foreign exchange system

Compute the exchange rate and fund

Online foreign exchange transaction

Real time data update

Compute the exchange rate and fund

- Spot transaction
- Forward transaction
- Direct transaction
- Indirect transaction
- Cross transaction

Vision

Vision

Online foreign exchange transaction

- Customer should provide Customer ID, tenor, currency type, fund, transaction date, source call deposit account, transfer call deposit account to found an foreign exchange transaction.

- The batch transaction will occurs one day before the maturity day.

Vision

Vision

Difficulty

Real time data update

- Refresh the data of foreign exchange rate according to the newest data table list
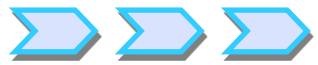- Distinguish the validity of update data according to define an accepting scope .

Interest Rate Computing System

Provide a 3270 user interface to bank staff

Provide API interface to other module.

The maintenance of interesting parameter table.

Customer Relationship Management

We take each customer uniquely by assigning each customer a unique customer number, and manage all product accounts by customer, so we're able to do assets and risk analysis to our customer hence provide better services

Employee Maintenance
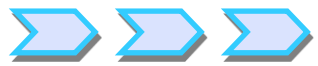
We provide separate employee management functions for the resource and transaction control. Upon logon, information like branch Id, employee levels etc are retrieved. They can be taken out directly from unique TSQ to authorize the transactions.

Product feature

- **Capability**

  The capability of mass data processing , high performance multi-processors, large memory and huge disc volume

- **Serviceability**

  Friendly user interface , Careful online and Batch scheduling

- **Extendable**

  The modularity of the system and the parameterized design Easy to extend to include more functions.

Product Merits

Integrity

- Develop on the mainframe is that mainframe itself is a system of integrity at the system level
- Integrity at logical level is achieved by our careful database design

Security and Stability

- Employee authentication limitation
- RACF、VTAM connection 、DB2

Robustness and Concurrency of Online Module

- At application level, we identify each user with their unique user id and terminal ID
- At system level, our online programs with pseudo-conversational mode limit the occupation to the resources

Innovations
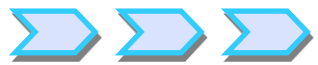
FX enabled

Market linked

Flexible loan payment

Difficulties of the implementation

- We have to comprehend the complex banking business logic

- Mainframe COBOL developing, limited by the platform nature, requires us to manually handle many trivial factors, like data conversion, date computation, map operation, response handling, making the developing process extremely difficult.

Vision

Vision

Difficulty

Technologies

Knowledge of Bank	Z/OS	DB2
Software Engineer knowledge	JCL	SDF II
SQL	COBOL	CICS

The process of development and specification
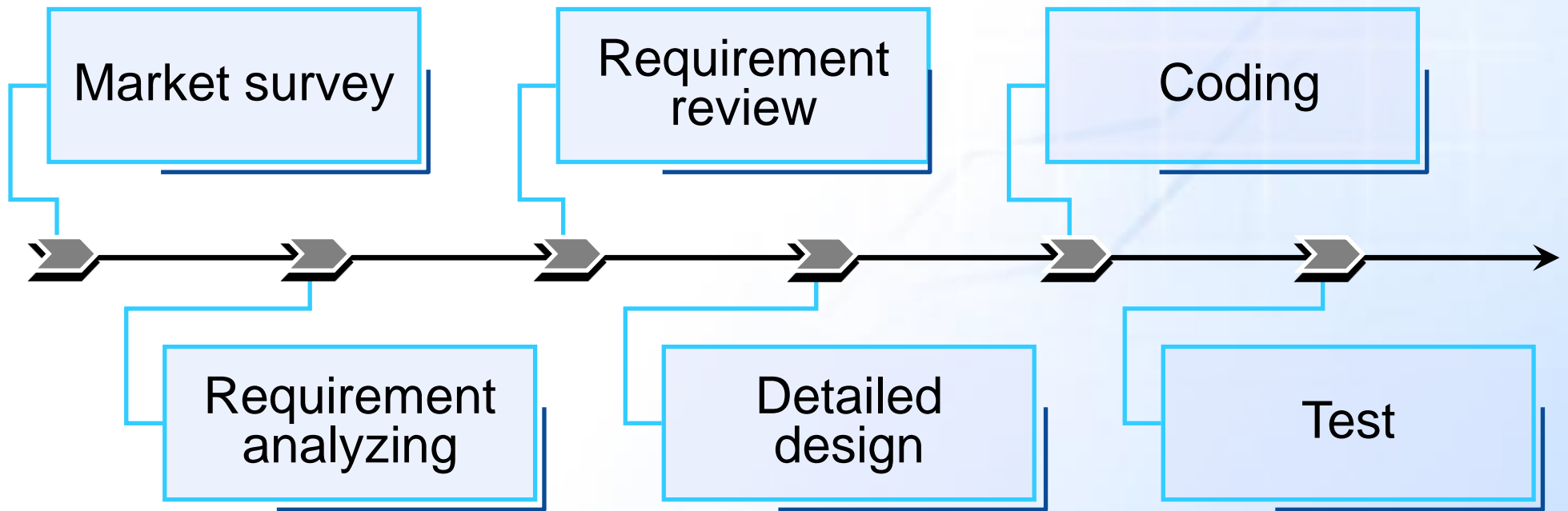
- Development Period：Aug. 1st, 2006 – Oct. 14th, 2006
- Total effort： 35 people month
- line of code：50,000 lines
- Number of developers：14
- Page of documents: 2,500 pages

Ask Questions

The developing process

Market survey → Requirement analyzing → Requirement review → Detailed design → Coding → Test

End

Our team is an excellent, cooperated, and disciplined team. We believe only the better team can develop better product.