**CSC 406 Banking System Requirements Document**

**Team**

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**This Documentation Includes:**

1. A System Requirements Document. This document should identify the following requirements;

a. User Interface Requirements. List each of the interfaces (i.e. Customer Interface at ATM, Teller interface, Bank Management Interface, etc.). For each of the interfaces list; 1). The complete functionality of that interface with phrases like “The ATM interface must accept the credit card number of the user.

2). List all data the interface must accept, list the type of data and any bounds or range on this data.

3). List all data elements the interface must display, list the type of data and any bounds or range on this data. Include any dropdown menus or sliders.

4). Draw a sketch of each user interface.

b. The Functional Requirements of the system. Using the handout describing the banking system, list all the functionality of the system. These should be in the form of declarative statements such as; “The system shall display all transactions for a particular”, “The system shall allow transfer of money from checking to savings account”.

c. Data structures supporting the system. Layout the primary data records supporting the system. List all data elements and their data type. Add a short description of each piece of data.

**Customer Interfaces**

**Initial Customer Interface at ATM**

* This interface is the landing page for the ATM portion of the banking system. It will be fairly plain with one input box. This input will be the customers social security number (customerId) which will be used to fetch the customers information and the accounts in their name.

The ATM interface must include a input box

The ATM interface must accept the customer SSN

The ATM interface must fetch customer information

The ATM interface must fetch customer accounts

**Account Selection Interface at ATM**

* This interface will be displayed after the customer has entered their social security number and their account information has been fetched. This interface will display a drop down menu for each type of account(checking,savings,loan). It can also include a payment menu link. After choosing the from the dropdown, clicking the select button will transfer to the selected menu.

The ATM interface must provide a drop down menu displaying type of account

The ATM interface must accept the customer account selection

The ATM must transfer the customer to the selected account screen

**Withdraw/Deposit Selection Interface at ATM**

* This interface will be displayed after the customer has selected an account (either savings or checking). This interface will display two buttons, one displaying Withdraw and one displaying deposit.

The ATM must provide a withdraw or deposit action

The ATM must accept the selected action (withdraw/deposit)

The ATM must transfer the customer to the selection action screen

**Amount Input Interface at ATM**

* This interface will be displayed after the customer has selected an action (either withdraw or deposit). This interface will display a confirm amount button and an input box requesting an amount. The user will then be shown a confirmation message or request failed message if they don’t have enough money in their account or they’ve done too many withdrawals that day.

The ATM must accept a customer input of withdraw/deposit amount

The ATM must accept the inserted withdrawal/deposit amount

The ATM must confirm the inserted withdrawal/deposit amount

The ATM must provide a successful or failed confirmation notification i.e.

**Successful:**

* No thrown exceptions

**Failed:**

* Insufficient funds
* Too many withdrawals in same day

The ATM must transfer the customer back to the main menu upon transaction

completion

**Bank Teller Interfaces**

**Initial Bank Teller Interface**

* This interface has access to a list of all (checking/savings) account balances, recent debits, and account statuses. This portion of the banking system loads information from each category upon selection. A Teller requires an input box. This input takes the customers account number (customer/accountID) and uses it to grab the list of account information the Teller has access to.

The Teller interface must include an input box

The Teller interface must accept the customer SSN

The Teller interface must have access to the following:

* Customer checking account balance
* Customer savings account balance
* Customer account status
* Recent customer debits to specified account

The Teller interface must accept user selection of accessible information

The Teller interface must fetch the list of accessible information

The Teller interface must be able to load all information specific to the customer

accounts

**Teller Account Access Interface**

* This interface will be displayed after the Teller has entered the specified customer ID and the account information has loaded. This interface displays the account record of choice. It includes a display of the account balance and account status(current or behind), along with one button that displays the recent debits made to the account.

**Recent Debits May include:**

* Miscellaneous customer purchases
* Payments made to loans/credit cards
* Checks honored by the account
* Withdrawals from ATM/Teller

The Teller interface must display account records of choice

The Teller interface must display the chosen account balance

The Teller interface must display the account status, whether current or behind

The Teller interface must display the recent debits made to the chosen account

**Account Selection Interface**

* This interface is included in the account access display. This interface displays two buttons, one displaying checking and one displaying savings. Upon selection the interface grabs the specified account.

The Teller interface must display user options for account type: checking/savings

The Teller interface must fetch selected account

**Credit/Debit Selection Interface**

* This interface is displayed after the Teller has selected an account, either savings or checking. This interface displays two buttons once the account information has been loaded, one displaying Credit and one displaying Debit.

The Teller interface must load specified account information

The Teller interface must display user option to credit or debit the chosen account

The Teller interface must accept the user selection

**Transfer Funds Selection Interface**

* This interface is also displayed after Teller has selected an account. Similar to the previous interface description, this interface displays two buttons once the account information has loaded. One for displaying Transfer from checking to savings, and one that displays Transfer from savings to checking.

The Teller interface must display user option for transfer of funds action

The Teller interface must accept selection of transfer type:

- Checking → Savings

- Savings → Checking

**Teller Account Input Interface**

* This interface is displayed after the Teller has selected an action. This interface displays an input amount box and a confirm amount button. Upon amount confirmation this interface will show an action confirmation message or an action failed message.

The Teller interface must include a user input box

The Teller interface must accept the user inserted transfer amount

The Teller interface must confirm the transfer of funds action

The Teller interface must provide a successful or failed confirmation notification

i.e.

**Successful:**

* No thrown exceptions

**Failed:**

* Account balance too low
* Too many withdrawals that day
* Unsuccessful transfer of funds

The ATM must transfer the customer back to the main menu upon transfer

completion

**Bank Manager Interfaces**

**Initial Bank Manager Interface**

* This interface has access to all information on all customer accounts. This portion of the banking system loads information from each accessible category upon selection. A Manager requires an input box. This input takes the customers account number (customer/accountID) and uses it to grab the list of account information the Manager has access to.
* The Bank Manager interface includes multiple user action buttons. Featuring options to view and edit customer accounts, including the ability to credit or debit any account. The Manager interface also features options to send bills to customers, send rollover notices, and set customer interest rates on monthly payments.

The Manager interface must display an input box

The Manager interface must accept inserted customer SSN

The Manager interface must provide a drop down menu displaying account type

The Manager interface must accept account type selection

The Manager interface must display the following action buttons:

* View/Edit user
* Send bills
* Send rollover
* Set interest

**Manager View/Edit Account Interface**

* This interface is displayed after the manager user has selected the edit user button. The manager has access to all specified customer account information. This interface displays an account type drop down menu that allows the user to select the specified account to view/edit. This interface is also equipped with an input box that accepts a specified transaction amount to credit or debit. The entered amount is linked to the Teller interface that in turn credits or debits the specified amount.

The Manager interface must provide a drop down menu displaying customer account type

The Manager interface must accept account selection

The Manager interface must display all accessible information on all customer accounts

The Manager interface must provide a transaction amount input box

The Manager interface must accept inserted transaction amount

The Manager interface must link transaction amount to Teller credit/debit interface

The Manager interface must be capable of crediting or debiting any account

**Manager Manages Loan Accounts Interface**

* This interface displays the customer account and loan account drop down menu. This interface also includes an input amount box. This box allows the manager to enter the specified loan amount. Included in this interface is an update button that allows the manager to update the loan based on the inserted amount.

The Manager interface must display the specified customer account

The Manager interface must provide a drop down menu for loan account

selection

The Manager interface must accept selected loan account

The Manager interface must display an input amount box

The Manager interface must include an update amount button

The Manager interface must accept and update inserted amount

**(special screen for them)**

View account+some special attribute textboxes

**Send Out Bill Notices (button)**

* This button allows the manager to initiate the process that sends the bills out to the credit card and mortgage accounts. Upon selection it displays a “sending bill” message that notifies the manager that bill notices have been sent.

The Manager interface must accept button selection

The Manager interface must send bill notices upon selection

The Manager interface must confirm successful initiation of bill notice

**Send Out Rollover Notices (button)**

* This button allows the manager to initiate the process that sends the rollover notices to the CD accounts. Upon selection it displays a “sending rollover” message that notifies the manager that rollover notices have been sent.

The Manager interface must accept button selection

The Manager interface must send rollover notices upon selection

The Manager interface must confirm successful initiation of rollover notice

**Set Interest Rate (button)**

* This button allows the manager to initiate the process that sets the interest rate the customer must pay to their checking or savings accounts. Upon selection the button redirects the manager to the set interest rate interface.

The Manager interface must accept button selection

The Manager interface must direct the user to the set interest rate interface

**Manager Set Interest Rates Interface**

* This interface displays an input box that allows the manager user to enter a specified interest rate amount. This input box accepts the amount inserted and sets the interest rates paid monthly on checking and savings accounts. This interface also includes a “Set” button that allows the user to set the amount of interest specified.

The Manager interface must display an input interest amount box

The Manager interface must accept the interest amount inserted

The Manager interface must display a “Set” interest rate button

The Manager interface must set the newly inserted interest rate upon selection

**Functional Requirements**

The following requirements describe the way in which the Banking System must behave:

**Accounts:**

* The System shall include and display several different types of accounts:
  + Checking
  + Savings

**Savings accounts:**

* The system shall allow the customer to withdraw or deposit money at any given time
* The system shall enable the saving account to earn a fixed interest rate that is compounded daily
* The system shall include CDs (Certificate of Deposits)
* The system shall enable the CDs to earn a fixed rate of return for specified period of time
* The system shall enact a penalty for withdrawal before the period of time is complete and after the customer has been notified
* The system shall automatically initiate a rollover penalty on the CDs

**Checking accounts:**

* The system shall include two different types of checking accounts:
  + “That’s My Bank”
  + “Gold/Diamond”

**That’s My Bank**

* The system shall charge the customer $0.50 per transaction
* The system shall consider a transaction as both a deposit and a withdrawal
* The system shall be able to conduct monthly transfers of money from the TMB to other accounts i.e.
  + Home mortgages
  + Payment of bills
  + Movement of money across accounts
* The system shall charge the customer $0.75 per monthly transfer transaction
* The system shall not include a minimum balance to be maintained for the TMB account

**Gold/Diamond**

* The system shall maintain a minimum balance of $1000.0
* The system shall not charge the customer for transactions against The G/D account unless the minimum balance has ceased to be maintained
* The system shall enable the G/D account to earn interest on the average balance in the account
* The system shall make the interest rate flexible so it may be capable of changes on a daily basis
* The system shall change the interest at a rate of 0.50 \* (the rate on the saving account)

* The system shall offer services and penalties with respect to both checking and savings accounts
* The system services shall include a stop payment method
* The system shall allow the customer/account holder to contact the bank and submit a check number
* The system shall stop the payment based on the submitted check number
* The system shall not pay the check with stop payment number
* The system services shall charge the customer $15.00 to pay the check with the stop payment number
* The system shall include overdraft penalties
* The system shall initiate an overdraft fee of $20.00 if the customer has withdrawn an amount larger than what is available in the account
* The system shall leave a check unpaid if the customer account contains insufficient funds and charge the account a $20.00 overdraft fee
* The system shall offer and include protection policies for instances of an overdraft
* The system shall allow customers with savings accounts to use them as backup accounts to their checking accounts
* The system shall not initiate an overdraft process if there are sufficient funds in the customers savings account to fulfill the check amount
* The system shall be capable of removing the correct amount of funds from the savings account if there are sufficient funds present in the account
* The system shall be able to deposit the correct amount of funds from the customers savings account and into their checking account
* The system shall honor a check the customer intends to use if no penalties have been initiated
* The system shall not charge a customer for the transfer of funds from their savings account to their checking account
* The system shall and must prompt the customer to specify an overdraft backup account

**Loans:**

* The system shall include, maintain, and display three different types of loan accounts:
  + Long Term mortgage
  + Short Term
  + Credit cards

**Long Term Mortgage**

* The system shall provide a loan of either 15 or 30 year type
* The system shall calculate loan interest based on a fixed rate
* The system shall include a fixed payment plan on the loan account
* The system shall receive customer payments to the long term loans on a monthly basis
* The system shall add a $75.00 late fee charge to a particular month of payment if a customer payment is made beyond a given due date
* The system shall accept extra payments made to the loan account at any given time
* The system shall not add any amount to the already existing loan
* The system shall flag a customer account as a problem account if a payment is made late

**Short Term Loan**

* The system shall provide a loan of approx. 5 year type
* The system shall apply a short term loan for instances of customer requests for small loan amounts
* The system shall exhibit and enact the same characteristics pertinent to the long term mortgage loan in the short term loan

**Credit Cards**

* The system shall support a credit card system
* The system shall handle debits made against the credit card loan every time a credit card transaction is conducted
* The system shall include a specified limit of funds accessible to the card holder of the credit card account
* The system shall check each purchase to determine if the transaction will bring the credit card account balance over the specified limit
* The system shall and must authorize the purchase and the debit made to the account
* The system shall store and maintain a record of each purchase made to the account
* The system shall send a credit card bill on the first of each month
* The system shall accept credit card bill payments up until the 10th day of each month
* The system shall send bills that consist of a finance charge and a total of the charges incurred in a given month
* The system shall allow the account holder to pay the entire account off each month in which the account holder does not suffer a finance charge
* The system shall allow payments to be credited to the bill at anytime throughout a given month
* The system shall calculate the finance charge based on the average balance of the bill throughout the given month

**ATM Cards:**

* The system shall allow account holders to possess ATM cards for withdrawal
* The system shall only allow ATM cards to interact with checking accounts and simple savings accounts
* The system shall not allow card holders to withdraw more than the account is worth
* The system shall only allow no more than two ATM withdrawals per day

**User Interfaces:**

* The system shall consider and include the users of the system itself, they are as follows:
  + Banking Customers
  + Banking Tellers
  + Bank Management

**Banking Customers**

* The system shall display and implement an interface that allows a customer user to make withdrawals and deposits from the banking system
* The system shall allow the customer users to utilize ATM cards, credit cards and paper deposits
* The system shall allow for interaction between the banking customer and banking teller interfaces

**Banking Tellers**

* The system shall provide the teller interface with access to the following information on all accounts
  + Account balances
  + Recent debits
    - Checks honored by the account
    - Payments made to credit cards
    - Miscellaneous transactions
    - Payments to bills, etc
  + Account status (current or behind)
* The system shall permit the teller user to credit any account it has access to except for the savings CDs
* The system shall permit the teller user to debit any checking and or savings accounts belonging to the customer user
* The system shall permit the teller interface to transfer funds from checking to savings and vice versa
* The system shall permit the teller interface to interact with the customer user

**Bank Management**

* The system shall provide the bank manager interface access to all information on all accounts in the system
* The system shall permit the manager interface to credit and or debit any account
* The system shall permit the manager interface to interact with and manage all loan accounts
* The system shall permit the manager interface to initiate the process that sends out credit card bills and mortgage account bills on a monthly basis
* The system shall permit the manager interface to initiate the process that sends out the rollover notices for the customer CDs
* The system shall permit the manager interface to set the interest rate paid monthly on checking and savings accounts

**Banking System Data Structures**

**Account:**

|  |  |  |
| --- | --- | --- |
| **Data Element** | **Data Type** | **Description** |
| CustomerID | String | Customer’s identification number. Made up of customer SSN |
| Account Current Balance | Double | Customer’s current account balance |
| Account status | String | This is the customer’s account status either “current” or “behind” |
| Interest rate | Double | This is a fixed interest rate the customer’s savings account can earn. This rate is compounded daily |
| Account Type | String | This is the customer account type |
| Account number | Int | This is the customer’s unique banking account number. |
| Date Opened | Date | This is the date the customer’s account was opened |

**Savings Account:** *Extended by* Account

|  |  |  |
| --- | --- | --- |
| **Data Element** | **Data Type** | **Description** |
| CustomerID | String | Customer’s identification number. Made up of customer SSN |
| Account Current Balance | Double | Customer’s current account balance |
| Interest rate | Double | This is a fixed interest rate the customer’s savings account can earn. This rate is compounded daily |
| Account number | Int | This is the customer’s unique banking account number. |
| Date Opened | Date | This is the date the customer’s account was opened |

**Checking Account:** *Extended by* Account

|  |  |  |
| --- | --- | --- |
| **Data Element** | **Data Type** | **Description** |
| CustomerID | String | Customer’s identification number. Made up of customer SSN |
| Account Current Balance | Double | Customer’s current account balance |
| Account type | String | This is the customer’s account type; either “”TMB” or “Gold/Diamond” |
| Account number | Int | This is the customer’s unique banking account number. |
| Backup Account | Boolean | This checks for a customers backup accounts |
| Backup Account number | Int | Customer’s backup account number |
| Overdrafts | Int | Customer overdrafts to account |
| Date Opened | Date | This is the date the customer’s account was opened |

**Loan Accounts:** *Extended by* Account

|  |  |  |
| --- | --- | --- |
| **Data Element** | **Data Type** | **Description** |
| CustomerID | String | Customer’s identification number. Made up of customer SSN |
| Account Current Balance | Double | Customer’s current account balance |
| Interest rate | Double | This is a fixed rate on the customer’s loan account |
| Payment due date | Date | This is the customer’s payment due date on a monthly basis |
| Payment notification date | Date | This is the date notification for the customer’s due date |
| Payment amount due | Double | Amount due for payment by customer each month |
| Loan type | String | This specifies the loan type the customer has |
| Missed Payment | Boolean | This checks if a customer has a missed payment |
| Last payment date | Date | This is the date of the last payment the customer must fulfill |
| Account number | Int | This is the customer’s unique banking account number. |

**CD Account:** *Extended by* Account

|  |  |  |
| --- | --- | --- |
| **Data Element** | **Data Type** | **Description** |
| CustomerID | String | Customer’s identification number. Made up of customer SSN |
| Account Current Balance | Double | Customer’s current account balance |
| Interest rate | Double | This is a fixed interest rate the customer’s savings account can earn. This rate is compounded daily |
| Account number | Int | This is the customer’s unique banking account number. |
| Date Opened | Date | This is the date the customer’s account was opened |
| Rollover date | Date | This is the date the customer CD account is set to rollover |