PROBLEM DESCRIPTION

PRODUCT PERSPECTIVE

Customer Care services are primarily required to cater to various kinds of queries and issues which the customer of that particular service might have. For services which operate on a huge scale it is imperative that a proper database is present which contains all the relevant information pertaining to that service and also possesses the capability to efficiently fetch and modify data with proper provisions for validation and login for the end users. The primary purpose of this Customer Care Database is to meet the expectations of the customers with regards to an array of services/queries spanning over a wide variety of Financial Institutions. In addition to that it also aims to provide customers with constructive solutions for a user-friendly and hassle-free experience for their desired query/service. This product also aims to understand the queries of the customers and ensure that they enjoy a cost-effective and flawless experience with respect to their service. It furthermore enables the Service Providers to gain better insights with regards to the usability of their products which in turn helps them improve their services/products and makes them more efficient.

Users can get information regarding their account/balance after validating their account and can furthermore transfer money to other valid accounts. In addition to that customers can also block their existing accounts in case of extraordinary events. New users can also create accounts. Other general queries within the purview of the system shall also be catered to. Administrators would have access to the entire database in order to maintain information integrity throughout the database. Service Providers would have a lower sense of privilege with regards to the Admin and can only modify/provide information when prompted by the user. End Users can only view information pertaining to their own account after validation. Auditors can view the entire database and report faulty transactions to the admin and the bank as well. The owner also has admin privileges to facilitate policy changes for customers. Every User class after logging in will be redirected to different pages with respect to their functionality.

USER CLASSES

There are basically five categories of users: -

- **Administrator:** His role includes capacity planning, installation configuration, database design, data recovery etc. These are exclusive tasks and are only to be performed by the administrator. In addition to this they can also perform the following functions:
  - Create Individual Accounts
  - Manage existing accounts
  - View all transactions
  - Update/Delete/close account
  - View Account Information
  - View Active/Inactive accounts
  - User details list
  - Approve or reject customer transaction request

- **Service Provider:** The service provider primarily has access to look into the database. This allows them to help the customers with resolving their queries and providing them with services. Also, the service provider can modify certain fields of the database to cater to the immediate needs of the user provided he/she has provided the login credentials. Following are the functions that a service provider can perform:
  - Create Individual Accounts
  - Manage existing accounts
  - View Account Information
  - Balance Enquiry
  - View account specific transaction histories

- **End User:** They will not be having any access to the database apart from information pertaining to their own account, i.e. they cannot modify or look up the entire database. Following are the actions a user has access to:

- o User login
- o Use PIN system
- o Creating/open new account
- o Registration
- o Funds transfer (local/international/domestic)
- o View statements transaction
- o User account details
- o Change Password and PIN, recover password
- o delete profile
- o View about developer details

- **Auditor:** They shall have complete access to view the entire database and the changes incorporated by the Service Provider and the Administrator as well. Their primary role is to maintain data integrity and look for faulty transactions. In case of an issue it shall notify the same to the Administrator and the Bank as well. Following are the functions that an auditor can perform:
  - o View all transactions
  - o View Account Information
  - o View Active/Inactive accounts
  - o User details list
- **Owner Bank:** They shall have complete edit and view access to the entire database. This is primarily to facilitate policy changes for its customers or update information regarding certain queries.
  - o Update policy terms
  - o Manage existing accounts
  - o View Account Information
  - o View Active/Inactive accounts
  - o User details list
  - o Approve or reject customer transaction request

PRODUCT FUNCTIONS

This section provides the functional overview of the customer care database. Various functional modules that can be accessed by the user are:

1. Login:

The customer has an obligation to maintain secrecy in regard to Username & Password registered with the Bank. The bank presupposes that login using valid Username and Password is a valid session initiated by none other than the customer. The customer has to maintain secrecy in regard to Username & Password registered with the Bank. The bank presupposes that login using valid Username and Password is a valid session initiated by none other than the customer. The customer should keep his/her User ID and password strictly confidential and should not divulge the same to any other person. Any loss sustained by the customer due to non-compliance of this condition will be at his/her own risk and responsibility and the Bank will not be liable for the same in any manner. The login page would remain same for all the people but after logging in different page will come for different user classes according to their functionality.

2. Get balance information:

This module maintains the balance details of a particular account. The updated database of every customer is maintained with bank. Hence the balance information of every account is available in the database and can be displayed to the customer.

3. Customer info:

This module allows the customer to view and update the profile of their account. It also allows them to view their account status, load information and transaction details.

4. Transfer Money:

This module allows the customers to transfer funds from one account to another within the same bank. This is possible only if the customer has a sufficient enough balance.

5. Pay Bills:

For online payment of bills, you can just type in the unique bill number of the vendor and pay. Customers will be able to shop online and pay the bills from their account. A secure way will be provided for the billing. Online shopping will provide them the easiest way to buy and sell their items. This will be only possible until the moment the bank balance is sufficient and more than the billing amount.

6. Setup recurring bill payments:

It may happen that some of the services which you use would require recurring payments like the internet connectivity, television subscription etc. So, the customer care would allow you to set recurring payment so that you don't need to pay every time. It will automatically get deducted from your account until the moment you cancel it. This will be only possible until the moment the bank balance is sufficient and more than the billing amount.

7. Order cheques:

Although nowadays card payment is preferred but when we need to pay large amounts and especially when there's no card payment machine available, you'll be paying through a cheque. So, it is possible that after a few payments the cheque book finishes. So, rather than going to the bank to issue a new cheque book, you can simply order it online and it will be delivered to you in a few days.

8. General Grievances:

This module allows the customer to suspend their account and block their cards and allows new users to create a new account.

9. Bank Accounts:

A customer can have more than one bank account in a bank so, in this case, the customer is prompted to decide which account to use for debiting and crediting money. For these operations customers can add their owned bank accounts here and it will be approved by the administrations of the system.

10. Save or view up to 1-year past history of transaction:

It will be easy for the customer to view or save his history transactions up to past 1-year transactions. It will provide him the opportunity to maintain his bank balance and needs.

11. Online record search:

Bank staff will easily search a record and update it if needed transactions will be faster even physically from the branch because it will be very easy for the bank staff to check the balance of a specific person and update its record if necessary.

DESIGN CONSTRAINTS

- Scalability of the aforementioned database could be an issue if the user pool is extremely large. Distributed Database Systems need to be used for that.

- The data needs to be stored on a server. For large amounts of data, storing it on cloud servers could be an expensive affair and might require complete reconfiguration of the complete system.
- For highly scaled systems, there should be dedicated integrity checks to maintain and handle the complete system.

Table listing all nouns and verbs:

Noun	Noun	Noun	Noun	Noun
Customer Care services	various kinds	queries	issues	the customer
that particular service	services	a huge scale	it	a proper database
all the relevant information	that service	the capability	data	proper provisions
validation	login	the end users	The primary purpose	this Customer Care Database
the expectations	the customers	regards	an array	services/queries
a wide variety	Financial Institutions	addition	it	customers
constructive solutions	a user-friendly and hassle-free experience	their desired query/service	This product	the customers
they	a cost-effective and flawless experience	respect	their service	It
the Service Providers	better insights	regards	the usability	their products
turn	them	their services/products	them	Users
information	their account/balance	their account	money	other valid accounts
addition	customers	their existing accounts	case	extraordinary events
New users	accounts	Other general queries	the purview	the system
Administrators	access	the entire database	order	information integrity
the database	Service Providers	a lower sense	privilege	regards
the Admin	information	the user	End Users	information
their own account	validation	Auditors	the entire database	faulty transactions
the admin	the bank	The owner	admin privileges	policy changes
customers	Every User class	different pages	respect	their functionality
five categories	users	His role	capacity planning	installation configuration
database design	exclusive tasks	the administrator	addition	they
the following functions	The service provider	access	the database	them
the customers	their queries	them	services	the service provider
certain fields	the database	the immediate needs	the user	he

she	the login credentials	the functions	a service provider	They
any access	the database	information	their own account	they
the entire database	the actions	a user	access	They
complete access	the entire database	the changes	the Service Provider	the Administrator
Their primary role	data integrity	faulty transactions	case	an issue
it	the Administrator	the Bank	the functions	an auditor
They	complete edit	access	the entire database	policy changes
its customers	information	certain queries	Scalability	the aforementioned database
an issue	the user pool	Distributed Database Systems	The data	a server
large amounts	data	it	cloud servers	an expensive affair
complete reconfiguration	the complete system	This section	the functional overview	the customer care database
Various functional modules	the user	The customer	an obligation	secrecy
regard	Username	Password	the Bank	The bank
valid Username	Password	a valid session	none	the customer
The customer	secrecy	regard	Username	Password
the Bank	The bank	valid Username	Password	a valid session
none	the customer	The customer	User ID	password
any other person	Any loss	the customer	non-compliance	this condition
his/her own risk	responsibility	the Bank	any manner	The login page
all the people	different page	different user classes	their functionality	This module
the balance details	a particular account	The updated database	every customer	bank
the balance information	every account	the database	the customer	This module
the customer	the profile	their account	It	them
their account status	load information	transaction details	This module	the customers
funds	one account	the same bank	the customer	a sufficient enough balance
online payment	bills	you	the unique bill number	the vendor
Customers	the bills	their account	A secure way	the billing
Online shopping	them	the easiest way	their items	the moment
the bank balance	the billing amount	It	the services	you
recurring payments	the internet connectivity	the customer care	you	recurring payment
you	It	your account	the moment	you
it	the moment	the bank balance	the billing amount	card payment
we	large amounts	no card payment machine	you	a cheque

it	a few payments	the cheque book	the bank	a new cheque book
you	it	it	you	a few days
This module	the customer	their account	their cards	new users
a new account	A customer	more than one bank account	a bank	this case
the customer	which account	money	these operations	customers
their owned bank accounts	it	the administrations	the system	It
the customer	his history	transactions	past 1-year transactions	It
him	the opportunity	his bank balance	needs	Bank staff
a record	it	transactions	the branch	it
the bank staff	the balance	a specific person	its record	the customer care services
the complete data	the customers bank accounts	the banks	that information	We
the service providers/admin	any account	any debit/credit card	the customer	no need
a confirmation	the bank	this issue	The bank	explicit authority
the customer care centre	the information	the customers	highly scaled systems	the complete system

Verb	Verb	Verb	Verb	Verb
require	cater	may	operate	contain
pertain	possess	fetch	modify	meet
span	aim	provide	desire	aim
understand	query	ensure	enjoy	enable
gain	help	improve	make	can
regard	validate	can	transfer	can
block	exist	can	create	shall
cater	would	maintain	would	can
modify	provide	prompt	can	view
pertain	can	view	report	facilitate
log	will	redirect	include	perform
can	perform	follow	look	allow
help	resolve	provide	can	modify
cater	provide	provide	follow	can
perform	will	have	pertain	can
modify	look	follow	shall	view
incorporate	maintain	look	shall	notify
follow	can	perform	shall	view
facilitate	update	need	store	store
could	may	require	could	need
use	provide	can	access	maintain
register	presuppose	login	use	initiate
maintain	register	presuppose	login	use
initiate	should	keep	should	divulge

sustain	will	will	would	remain
log	will	come	accord	maintain
maintain	can	display	allow	view
update	allow	view	allow	transfer
can	type	pay	will	shop
pay	will	provide	will	provide
buy	sell	will	may	happen
use	would	require	recur	would
allow	set	recur	need	pay
will	deduct	cancel	will	prefer
need	pay	a	will	pay
go	issue	can	order	will
deliver	allow	suspend	block	allow
create	can	prompt	decide	use
debit	credit	can	add	own
will	approve	will	view	save
will	provide	maintain	will	search
update	need	will	will	check
update	assume	possess	regard	provide
assume	can	block	wish	regard
give	read	modify	scale	should
dedicate	maintain	handle	modify	open

Table listing Nouns after truncation:

Nouns
Service Providers
Customers
the Bank
Users
The service provider
the vendor
Auditors
Administrators
credit card
debit card
online payment
Online shopping
Account details
recurring payment

List of rejected nouns with reasons:

Noun	Reject Reason	Noun	Reject Reason	Noun	Reject Reason
all the people	General	various kinds	Vague	the customer care database	General
a cheque	Duplicates	valid Username	Attributes	issues	General
him	General	information	General	card payment	Associations
General	General	better insights	Irrelevent	certain fields	Vague
services/ products	General	customers	Duplicates	their account status	Attributes
new users	Duplicates	every customer	Duplicates	Other general queries	General
New users	Duplicates	this Customer Care Database	General	load information	General
the end users	Duplicates	we	General	the bank	Duplicates
the admin	Duplicates	the Service Provider	Attributes	Some classes	General
the customer care centre	General	the following functions	Irrelevant	a confirmation	Attributes
Financial Institutions	General	them	General	she	General
cloud servers	Irrelevent	a few payments	Attributes	that particular service	general
a server	General	the Service Providers	Attributes	constructive solutions	Associations
the user pool	General	Processor	Irrelevant	the purview	Vague
Bank staff	Attributes	1 GB	Irrelevant	the system	General
the customer	Duplicates	the opportunity	General	their service	Attributes
a bank	Duplicates	immediate needs	Attributes	a lower sense	Vague
A customer	Duplicates	aforementioned database	Vague	the services	Attributes
the administrations	Duplicates	faulty transactions	Attributes	validation	Attributes
an auditor	Duplicates	complete reconfiguration	Attributes	the moment	Vague
the complete data	General	other valid accounts	Attributes	any other person	Duplicates
a user	Duplicates	the balance details	Attributes	the profile	Attributes
responsibility	Vague	a new cheque book	Irrelevant	regard	Vague
large amounts	General	4 GB	Irrelevant	no need	Vague
The data	General	needs	General	transaction details	Attributes
the customer care	Associations	the Admin	Attributes	data	Attributes
which account	Vague	respect	Irrelevant	The login page	Attributes

Noun	Reject Reason	Noun	Reject Reason	Noun	Reject Reason
these operations	Vague	access	Vague	case	Vague
the login credentials	Attributes	microphone	Irrelevant	the information	Attributes
services	General	their cards	Attributes	certain queries	Attributes
a particular account	Vague	This module	Attributes	Password	Attributes
their own account	General	Hard Drive	Irrelevant	the complete system	General
a valid session	Associations	one account	General	the internet connectivity	Irrelevent
1 GHz	Irrelevent	complete access	Attributes	database design	General
his bank balance	Attributes	the bank staff	Irrelevant	the entire database	General
Various functional modules	Vague	the database	General	the balance information	Attributes
This product	Vague	a specific person	General	data integrity	Associations
money	Associations	all the relevant information	Vague	Every User class	Vague
secrecy	Associations	privilege	Irrelevant	that information	Vague
any manner	Vague	services/queries	Duplicates	the customer care services	Associations
the customers	Duplicates	the billing	Attributes	this condition	Vague
information integrity	Associations	The owner	Duplicates	their account	Attributes
the banks	Duplicates	transactions	Attributes	the functional overview	Vague
their functionality	Vague	Minimum	Irrelevant	they	General
password	Attributes	its record	Vague	different page	Vague
The primary purpose	Vague	any access	Vague	the unique bill number	Attributes
an obligation	Irrelevent	a service provider	Duplicates	a sufficient enough balance	Attributes

Noun	Reject Reason	Noun	Reject Reason	Noun	Reject Reason	Noun	Reject Reason
extraordinary events	Vague	a user-friendly and hassle-free experience	Associations	a wide variety	Vague	past 1-year transactions	Attributes
The customer	Duplicates	Scalability	Associations	It	Dulpicate	every account	Vague
complete edit	Associations	They	General	a few days	General	a record	General

the Administrator	Dulpicate	its customers	Duplicates	accounts	Attributes	the expectations	Vague
funds	General	RAM	Irrelevent	queries	Dulpicate	installation configuration	Vague
explicit authority	Vague	A secure way	Associations	We	General	this case	Vague
His role	Irrelevant	their items	Vague	the changes	General	recurring payments	Duplicates
admin privileges	Attributes	the same bank	Duplicates	the service providers/admin	Dulpicate	their existing accounts	Attributes
the easiest way	Vague	any account	General	none	General	the bank balance	Attributes
their products	Vague	the usability	Associations	Their primary role	Vague	the bills	Attributes
This section	General	the functions	Vague	policy changes	Attributes	exclusive tasks	General
highly scaled systems	Irrelevant	Any loss	Vague	bank	Dulpicate	regards	Vague
The bank	General	Customer Care services	Duplicates	a proper database	General	your account	Attributes
you	General	the user	Duplicates	Memory	Irrelevant	no card payment machine	Irrelevent
the branch	Attributes	capacity planning	General	Distributed Database Systems	General	proper provisions	General
an array	Vague	the customer's bank accounts	Attributes	Username	Dulpicate	he	General
a new account	Attributes	The updated database	Associations	the administrator	Dulpicate	different user classes	General
User ID	Attributes	a camera	Irrelevent	the balance	Attributes	different pages	Vague
login	Attributes	his history	General	End Users	Dulpicate	their account/balance	Attributes
bills	Attributes	more than one bank account	Irrelevent	the capability	Irrelevant	that service	General
the billing amount	Attributes	the cheque book	Irrelevent	their desired query/service	Dulpicate	an expensive affair	Vague

his/her own risk	Irrelevant	their queries	General	64 GB	Irrelevant	turn	Vague
it	General	the service provider	Duplicates	a cost-effective and flawless experience	Associations	this issue	Attributes

Truncated table listing the verbs:

Verb	Verb2	Verb3	Verb4	Verb5
span	enjoy	cancel	make	can
accord	come	pay	own	add
remain	buy	pertain	prefer	order
facilitate	type	follow	recur	meet
keep	happen	resolve	debit	approve
notify	presuppose	exist	desire	fetch
scale	perform	query	understand	recommend
deliver	require	maintain	incorporate	shall
view	transfer	regard	login	wish
aim	register	create	need	have
improve	redirect	enable	use	access
update	issue	contain	sell	possess
ensure	sustain	cater	modify	validate
â€™	block	suspend	prompt	may
assume	initiate	operate	read	should
credit	display	deduct	go	include
shop	report	help	search	give
log	look	save	handle	would
check	dedicate	will	set	allow
store	could	decide	gain	provide

ER DIAGRAM

Account details
- Account number(PK)
- Balance
- Credit Card number
- Debit Card number
- Recurring status

Credit Card
- Card Number(PK)
- Expiry Date
- Maximum limit
- Account number(FK)
- Credit card status

Debit card
- Card Number(PK)
- Expiry Date
- Account Number(FK)
- Debit card status

Recurring payment
- Account Number(FK)
- Recurring amount
- Beneficiary account

Perform/View Queries

Perform/View Queries

Customer
- Customer Name
- Account number
- Login credentials
- Customer ID(PK)

Service Provider
- Service Provider ID(PK)
- Service provider Name
- Audit details

View Details , Query resolution

View details, Query resolution

Administrator
- Administrator ID(PK)
- Administrator Name
- Audit details

View actions

View details,actions

Auditor
- Auditor ID(PK)
- Auditor Name
- Audit stage

View details

View details,update policy terms

Bank
- Bank Name
- Policy Version