University of Toronto • Faculty of Information • Master of Information

INF 1343 • Systems Analysis and Process Innovation

Course Project – Phase I

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Executive Summary

The conceptual data model for Scotiabank's retail banking department includes the fundamental business processes, integrating account management, customer service, loans, and investments. This comprehensive model features 16 entities and subentities, and encompasses 10 relationships. Within this model, a total of 59 attributes are defined, covering essential customer information, account details, and financial product characteristics. The required data formats include text, integers, and floats. This conceptual model serves as a foundational framework for a relational database that can facilitate the management of customer accounts, transaction processing, and diverse lending and investment products within Scotiabank's retail banking department.

Context of Study

Scotiabank is one of the "Big 5" retail banks in Canada. Its core business objectives are to provide a wide variety of banking and financial services like personal and commercial banking, wealth management, corporate lending, investment banking, and more. Scotiabank has a long history dating back to 1832 when it was founded in Halifax, Nova Scotia as the Bank of Nova Scotia. It has grown over the years to become an international bank with operations in over 55 countries around the world.

Since one of our team members works for a bank, we've chosen to develop a database for Scotiabank's retail banking department, where the key objectives are to manage customer accounts and relationships, process transactions efficiently, provide competitive lending rates, issue credit cards, and offer customer service. Typically this database design is proprietary, so our model is our interpretation of the demands of a retail banking department.

The core business processes that this database needs to support are:

- Opening and closing personal and commercial bank accounts
- Processing daily transactions like deposits, withdrawals, transfers
- Providing customer loans, mortgages, lines of credit
- Issuing credit cards and managing credit card accounts
- Managing branches and employee records
- Setting competitive interest rates for deposits and lending
- Maintaining records for all supported currencies

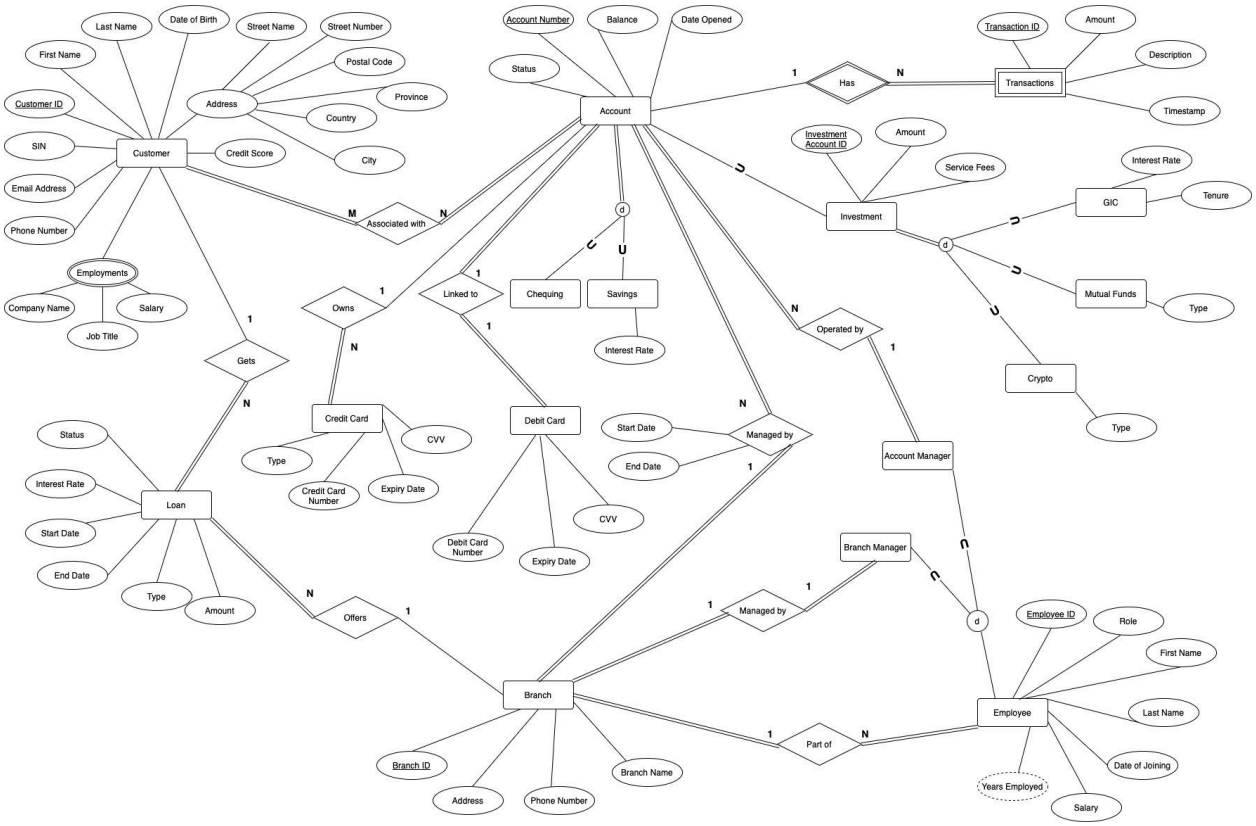
The database will allow Scotiabank retail banking to store and access critical customer information like accounts, transactions, and lending products, along with operational data fundamental to delivering the banking operations. By helping to connect customer information with products, services, transactions and analytics, it provides a 360-degree view of retail banking customers. This will allow Scotiabank to improve cross-selling of products to customers by understanding their needs better. The data can also drive more personalized, timely promotions to customers.

Data Requirements

1. A customer at the bank can have one or more accounts and must have a chequing account. The customer information includes; first name, last name, date of birth, SIN number, employment history, phone number, credit score, customer ID, email address and residential address. The address includes a street number, street name, postal code, province, city, country. A customer's employment history is also recorded along with details such as company name, role and salary.
2. The customer's bank account can either be a savings or chequing account. Each account has an account number, status, opening date and balance associated with it, and is managed by a branch and supervised by an account manager.

3. An account must have a debit card associated with it. Each debit card has a 12 digit card number, issuing date, expiry date, CVV associated with it.
4. An account can be linked to a credit card which has a CVV, credit card number, type and expiry date associated with it.
5. Each account holder has an account manager who is the point of contact for the customer. Every account manager can manage many customer accounts.
6. Customers can apply for a loan. Loans have a loan amount, tenure, rate of interest,type associated with them.
7. Every account may have transactions. Each transaction has a transaction ID, timestamp, description, and amount associated with it.
8. An employee has attributes like employee ID, first name,last name, date of joining, salary, role. An employee is assigned to one branch. Roles could be account manager branch manager. The years of employment can be calculated based on the date of joining of the concerned employee.
9. A bank account belongs to a branch and the branch maintains a record of the duration for which the account existed with a branch by recording the start date and end date. Every branch is managed by a branch manager and has Branch ID, address, phone number and branch name associated with it.
10. An account can have multiple investments. Each investment has an investment account ID, amount and service fees associated with it. The investments can be of 3 types: GIC, Mutual funds and Crypto. The mutual funds and Crypto investments have different types depending on the risks associated with them. The returns on the GIC investment are based on the interest rate and tenure.

Conceptual Data Model



There are a few assumptions that we are making;

- There can be more than one customer on the same account e.g. a joint account between spouses or business partners.
- Each customer can have multiple employments at the same time which is why we've made it multivalued.
- Customers can only get a loan from the branch associated with their account.
- Credit score is associated with a customer.
- Employee has subtypes of Account Manager and Branch Manager. This is a partial participation because Employees can have other roles too such as a cashier

Data Dictionary

Attribute Name	Domain	Meaning	Example Value

Name	text	The first name of the customer	Omer
Last Name	text	The last name of the customer	Imran
Date of Birth	date	Day of birth	1/12/1999
Address	text	Location of residency	60 Harbord Street, Toronto, Ontario, M53 3L1
Customer ID	int	Unique identifier of customer	s1516980
Social Insurance Number (SIN)	int	Unique citizen number	738494759
Email Address	text	Online mailing information	omer.imran@mail.utoronto.ca
Phone number	int	Telecommunication number	738455892
Employments	text	Details of current job employment	Senior Analyst, Scotiabank
Credit score	int	Number indicator of credit worthiness	740
Interest rate	float	The amount of interest due per period and this is associated with many entities	7.6%
Type	text	Indicates type of loan, credit card, mutual fund	Autoloan
Tenure	int	Length of an investment	10 years
Amount	int	Size of the loan, transaction, investment etc.	$3,421

Start date	date	Date when loan term began	1/12/2010
End date	date	Date when loan term ended	1/12/2032
Cash back	float	Percentage of transaction that you earn back for using a credit card	1.3%
Status	text	Whether an account is active or not	Active
Account number	int	Unique identifier of an account consisting of 12 digits	111222333456
Balance	float	Money in an account	$23,432.43
Date opened	date	Date when an account was opened	1/12/2006
Service fees	int	Fees charged by bank for a service like investments	$40
Years Managed	int	Number of years a manager manages a branch	5 years
Investment Account ID	int	Investment account unique identifier number	26738940
Transaction ID	text	a unique identifier code assigned to each sale that takes place between a customer and a merchant	T1234-5678-9012-3453
Recipient	text	Name of the	Fatima

		individual or organization that received transaction	
Date of transaction	date	The date the transaction was made	1/12/2023
Employee ID	text	Unique identifier of employee	ahmed1003
Date of Joining	date	Date of joining employment	1/12/2023
Salary	int	Amount of money made per year	70,000
Years Employed	int	Number of years in employment	10 years
Branch Name	text	Name of the branch	Scotiabank Erin Mills Town Centre
Branch ID	int	The transit or branch number that shows the branch	73845

References

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Statement of Individual Contributions

Omer Imran and Fatima Zohra designed the EER and drafted the data dictionary. Michaela Drouillard wrote the context for the study, and designed the initial draft of data requirements. Bhanvi made the project report according to the format and worked on the data requirements. The team worked together for final reviews and edits.