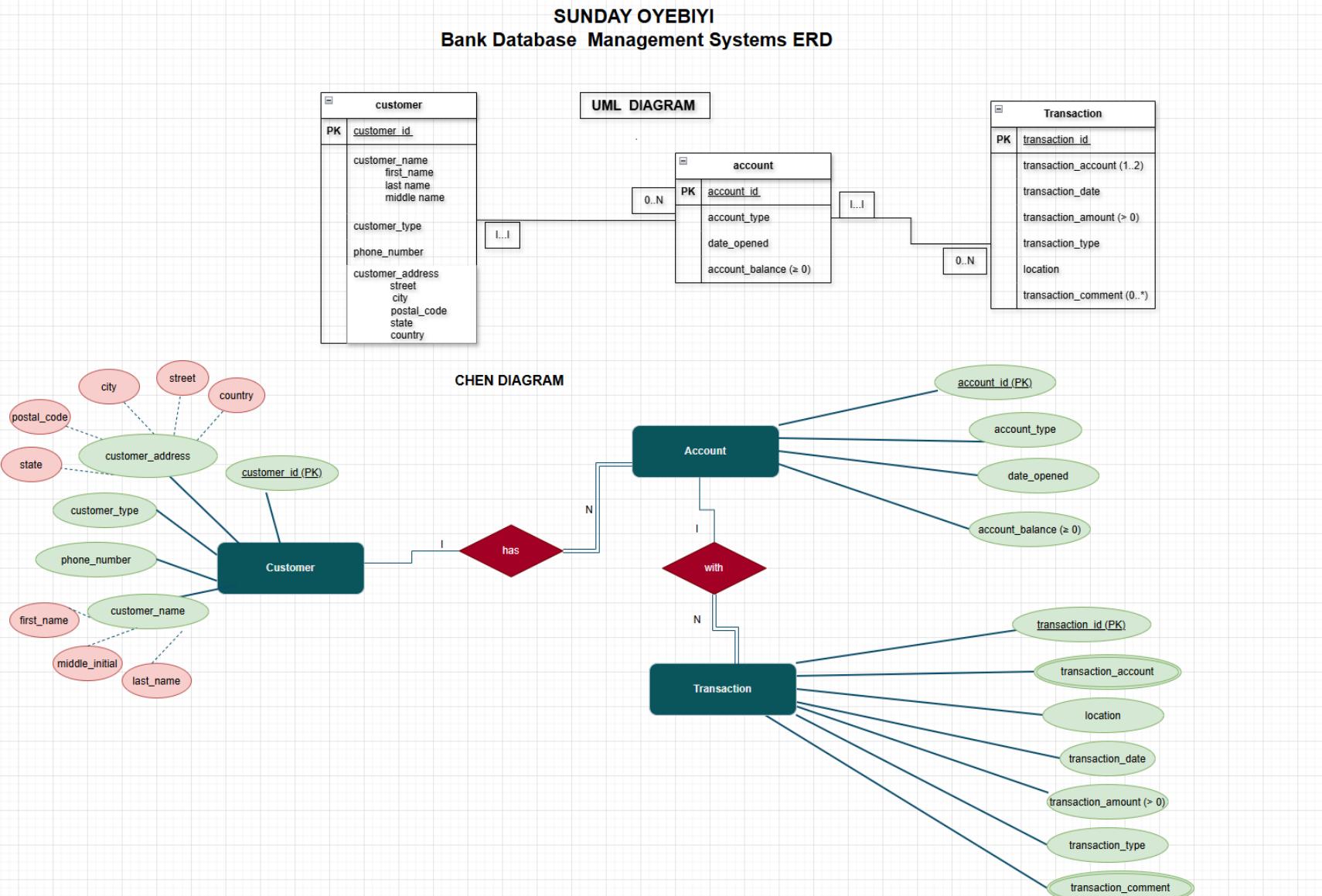


Database Design and Implementation (ERD/UML)



Designed & Implemented by
Sunday Oyebiyi

Physical Design

	A	B	C	D	E	F	G	H	I		
1	Table / Column	Data Type	Not Null	pk	fk	identity / sequence	check	description	Sample		
2	Customer										
3	customer_id	int	Y	Y		Y	> 0	Bank customer master			
4	first_name	varchar(30)	Y					surrogate key	1		
5	middle_initial	char(1)						given name	Ada		
6	last_name	varchar(50)	Y					optional middle initial	M		
7	phone_number	varchar(20)						family name	Lovelace		
8	street	varchar(120)						contact phone	410-555-1212		
9	city	varchar(60)						street address	123 Main St		
10	state	varchar(60)						city	Baltimore		
11	postal_code	varchar(15)						state / province / region	MD		
12	country	varchar(60)						postal/ZIP code	21201		
13	customer_type	varchar(20)	Y				IN ('PERSONAL','BUSINESS')	country	USA		
14								validated via CHECK	PERSONAL		
15	Account										
16	account_id	int	Y	Y	Y	Y	> 0	Accounts (owned by one customer)			
17	customer_id	int	Y		Y			surrogate key	1001		
18	account_type	varchar(20)	Y					FK → Customer(customer_id)	1		
19	date_opened	date	Y					validated via CHECK	CHECKING		
20	account_balance	numeric(14,2)	Y					>= '1910-01-01' AND <= today	2025-10-06		
21									>= 0	stored balance (maintained by triggers)	2500
22	Transaction										
23	transaction_id	int	Y	Y		Y	> 0	Monetary movements			
24	transaction_type	varchar(20)	Y					surrogate key	10411441		
25	amount	numeric(14,2)	Y					validated via CHECK	DEPOSIT		
26	transaction_date	datetime	Y					transaction amount	125.99		
27	location	varchar(120)	Y					timestamp	2025-01-15 13:45:00		
28								branch/city/channel	Online Banking		
29									Note: accounts linked via TransactionAccount (1..2 per transaction)		
30	TransactionAccount										
31	transaction_account_id	int	Y	Y		Y	> 0	Associates Transaction with 1 or 2 Accounts			
32	transaction_id	int	Y	Y	Y			surrogate key (identity)	1		
33	account_id	int	Y	Y	Y			PK part & FK → Transaction(transaction_id)	500000		
34	role	varchar(10)	Y					PK part & FK → Account(account_id)	1001		
35	UQ_trans_role							role of the account in this transaction	TO		
36									Unique (transaction_id, role) to cap at 2 accounts		
37	TransactionComment										
38	comment_id	int	Y	Y		Y	> 0	Multiple comments per transaction			
39	transaction_id	int	Y		Y			surrogate key	900001		
40	comment_text	varchar(255)	Y					FK → Transaction(transaction_id)	500000		
41	created_at	datetime	Y					comment body	Payroll deposit		
42								time comment added	2025-10-06 17:47:31		