Problem Statement

We Do Secure (WDS) is one of the largest life insurance provider company in the USA. Recently WDS has expanded its operation to offer Auto and Home insurance to their customers. After a careful analysis, the business team has decided to build a separate information system for its Auto and Home insurance services. The project team has articulated a product scope to create a relational database that will incorporate schema design with all related entities and relationships among them to meet WDS's new business services. The business analyst has provided following details/requirements for the database design.

a) WDS intends to have all customer details that includes the customer's full name, address, gender, marital status and customer type. The possible data value of gender must be either "M", or "F" representing "Male" or "Female" respectively. A customer may choose not to provide gender data. The possible data value of marital status must be either "M", "S", or "W", representing "Married", "Single", and "Widow/Widower" respectively. The customer can be an Automobile Insurance customer or Home Insurance customer or both. The customer type data value "A" represents Automobile Insurance customer and "H" represents Home insurance customer.

b) For Home Insurance customers, WDS intends to store home insurance policy start date and end date, home insurance premium amount, and home policy insurance status. If the home insurance policy term is current, the status column should have value "C", and if it is expired, it should have value "P". WDS wants to keep all previously expired policy data in the same table.

c) More than one home can be insured under each home insurance policy. For each home insured, WDS intends to store home purchase date, home purchase value, home area in Sq. Ft., Type of home (one of the values as, S,M,C,T representing Single family, Multi Family, Condominium, Town house respectively). In order to decide an appropriate home insurance premium, WDS intends to store four parameters namely: Auto Fire notification, Home Security System, Swimming Pool, and Basement. Please note the following possible values for each of the parameters.

Parameter	Possible Value	Meaning
Auto Fire Notification	1	There is automatic fire notification to the fire department
Auto Fire Notification	0	There is NO fire notification to the fire department
Home Security System	1	The home security system is installed and monitored
Home Security System	0	The home security system is not installed or not monitored
Swimming Pool	"U"	Underground swimming pool
Swimming Pool	"O"	Overground swimming pool
Swimming Pool	"I"	Indoor swimming pool
Swimming Pool	"M"	Multiple swimming pool
Swimming Pool	null	No swimming pool
Basement	1	There is a basement
Basement	0	There is NO basement

d) Each home insurance policy will generate one or more invoice on different invoice dates. Invoice should include payment due date, and invoice amount.
e) WDS accepts home insurance premium in installments and each payment should be stored with payment date and method of payment. WDS accepts payment either as "PayPal", "Credit", "Debit", "Check".
f) For Auto Insurance customers, WDS intends to store auto insurance policy start date and end date, auto insurance premium amount, and auto policy insurance status. If the auto insurance policy term is current, the status column should have value "C", and if it is expired, it should have value "P". WDS wants to keep all previously expired policy data in the same table.
g) Each Auto insurance policy will generate one or more invoice on different invoice dates. Invoice should include payment due date, and invoice amount.
h) WDS accepts Auto insurance premium in installments and each payment should be stored with payment date and method of payment. WDS accepts payment either as "PayPal", "Credit", "Debit", "Check
i) For each of Auto Insurance policy, one or more vehicles can be insured. For each insured vehicle, WDS intends to store vehicle VIN (vehicle identification number), vehicle make-model-year, and status of the vehicle. The status of the vehicle can be one of "L", "F", or "O" representing "Leased", Financed", "and Owned'.
j) For each vehicle insured, WDS intends to store details of drivers. There may be more than one driver for each vehicle insured. For each driver, WDS intends to store driver's license number, name, and birthdate.

→ For this project, identify appropriate entities, identify relationship among entities, attributes of each entity and their data type- size-constraints, design and implement a centralized relational database system that collects relevant data for WDS.
→ For any business rule not defined, please state all assumptions you have made (if any) while designing and implementing the database.

Summary

→ I have the following assumptions while creating the entities and deciding the column attributes for the business model:

→ A customer can have multiple insurances and an insurance can consist of one or more customers. This would create a many-many relationship between customer and insurance tables which is resolved by creating an intersect entity 'PM_CUST_INSR'.

→ A customer can have both home and auto insurance. **To maintain uniqueness of the primary key for the insurance table**, **I have assumed that each of the insurance is given a seperate insurance number**. For example, if a customer has both home and auto insurance, then the home insurance will have a different insurance number compared to the insurance number of the auto insurance.

→ Since auto and home insurance have many common attributes, I have created a supertype of common entities which is called 'PM_INSRNCE', and 'INS_TYPE' - insurance type acts as the discriminator attribute which tells us whether an insurance is home or auto insurance. The insurance type can either be 'A' or 'H' indicating it's auto or home insurance.

→ An insurance can have multiple invoices and an invoice can be cleared by the customer through multiple payments. A single invoice can be cleared before the due date though 1 or 2 or more payments.

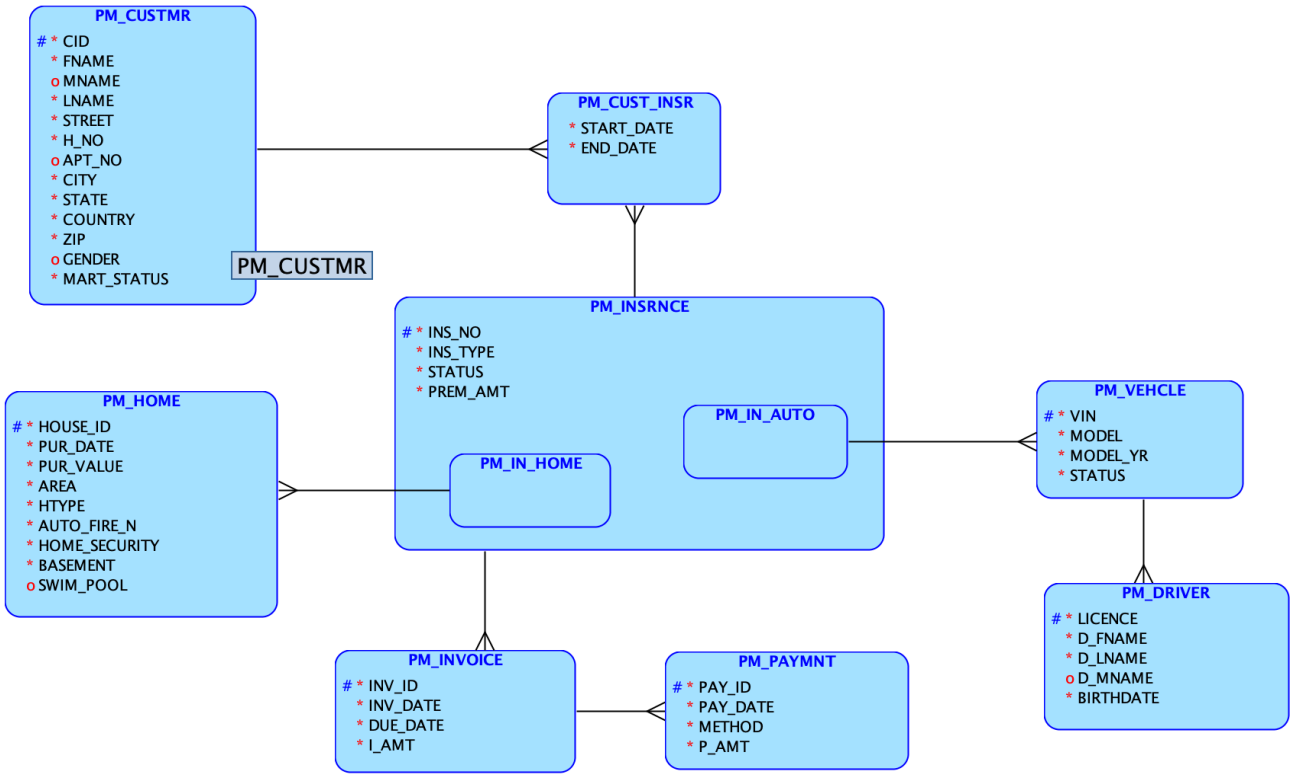
→ Customer ID must be greater than or equal to 5 digits.

→ Insurance number must be a 10 digit number.

→ Licence number must be a 10 digit number.

→ The method of payment must be 'CC', 'DC', 'PP', or 'CK' indicating payment through credit card, debit card, paypal or check respectively.

Logical Model



Relational Model