DAMG6210 - Data Management and Database Design

Homework 03

3-22.

Entity Types:

1. *PATIENT (Supertype):*
   Attributes:
   - Patient ID (Primary Key): Unique identifier for each patient.
   - Patient Name: Name of the patient.
   - Admit Date: Date when the patient was admitted or registered.

   Relationships:
   - Is Cared For by RESPONSIBLE PHYSICIAN

   Description: Represents all patients, including both outpatients and resident patients.
2. *OUTPATIENT (Subtype):*
   Attributes:
   - Checkback Date: Date for the outpatient's follow-up appointment.

   R**elationships:**
   - Inherits Is Cared For relationship from PATIENT

   Description: Patients receiving treatment without overnight stay.
3. *RESIDENT PATIENT (Subtype):*
   Attributes:
   - Date Discharged: Date when the resident patient leaves the hospital.

   Relationships:
   - Is Assigned to BED
   - Inherits Is Cared For relationship from PATIENT

   Description: Patients admitted for an extended hospital stay.
4. *RESPONSIBLE PHYSICIAN:*
   Attributes:
   - Physician ID (Primary Key): Unique identifier for each physician.

   Relationships:
   - Is Cared For by (with PATIENT)

   Description: Doctors responsible for patient care and treatment plans.
5. *BED:*
   Attributes:
   - Bed ID (Primary Key): Unique identifier for each hospital bed.

   Relationships:
   - Is Assigned to (with RESIDENT PATIENT)

   Description: Hospital beds available for resident patients.

Relationships:

1. Is Cared For (PATIENT - RESPONSIBLE PHYSICIAN):
   Cardinality: Many-to-One
   Description: Each patient is cared for by one physician; a physician can care for multiple patients.
2. Is Assigned (RESIDENT PATIENT - BED):
   Cardinality: One-to-One
   Description: Each resident patient is assigned one bed; each bed can be assigned to zero or one resident patient.

Key Considerations:

- Attribute Inheritance: OUTPATIENT and RESIDENT PATIENT inherit Patient ID, Patient Name, and Admit Date from PATIENT.
- Relationship Inheritance: Both subtypes inherit the Is Cared For relationship with RESPONSIBLE PHYSICIAN.
- Unique Attributes/Relationships: OUTPATIENT has Checkback Date, RESIDENT PATIENT has Date Discharged and Is Assigned relationship with BED.

3-23.

a. The zero minimum cardinality between CUSTOMER and DOES BUSINESS IN in Figure 3-13b illustrates the adaptability of entity clustering. By consolidating various customer types under a single CUSTOMER supertype, it enhances the organization and management of customer data. This structure allows for subtypes, such as national and regular customers, each having distinct attributes and associations. This design effectively models complex customer hierarchies while ensuring the database remains scalable. The zero minimum cardinality accounts for real-world situations where not all customers are immediately linked to specific sales territories, accommodating diverse customer engagement patterns across geographic regions.

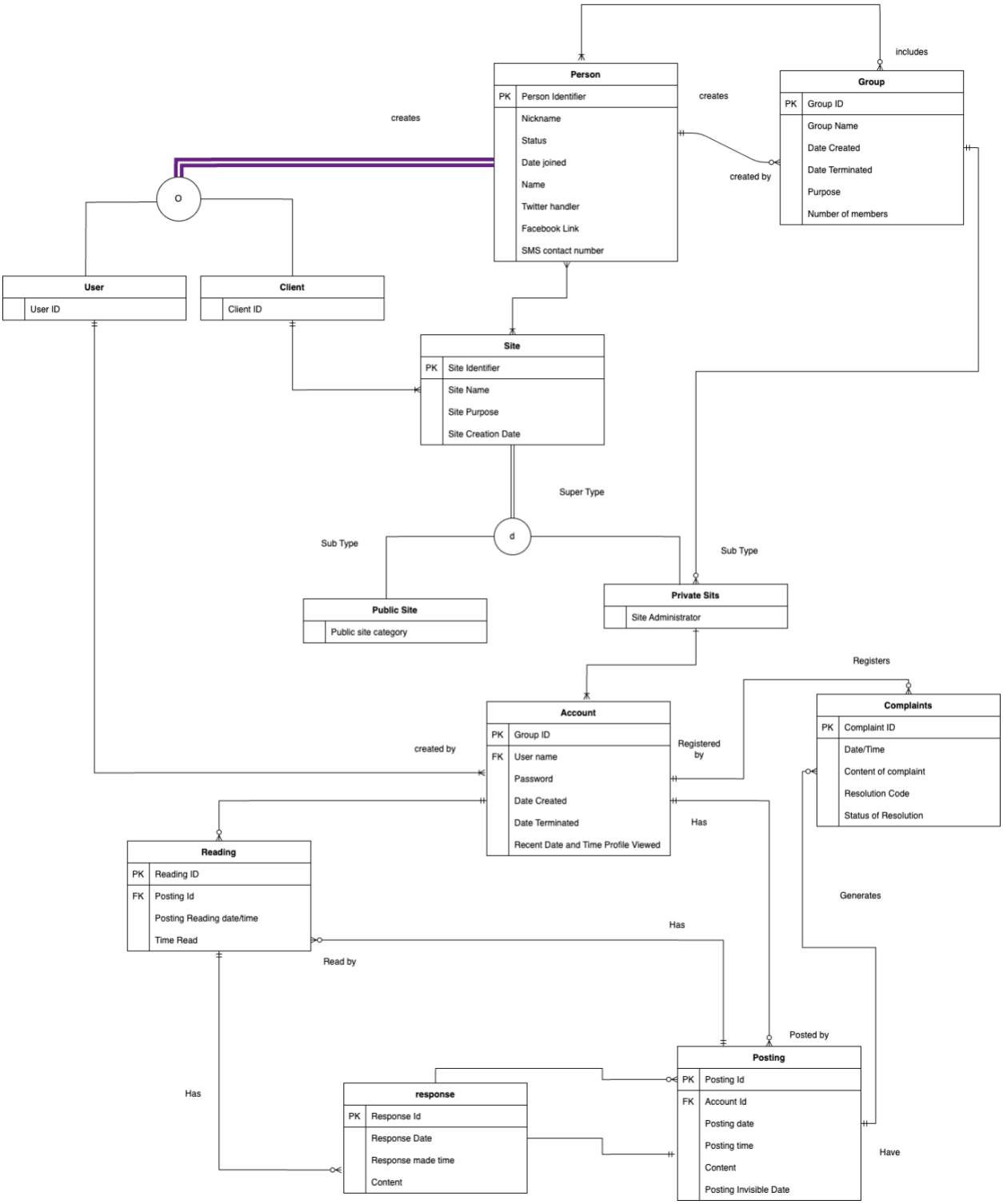
b. The ITEM entity cluster in Figure 3-13b merges attributes from both the Product and Product Line entities. The key attributes include:

- Product ID
- Standard Product Price
- Product Description
- Product Completion Date
- Product Quantity
- Product Line ID
- Product Line Name

c. The Material entity cluster in Figure 3-13b consolidates attributes from several related entities such as Vendor, Supplier, Supplies, and Raw Material. The attributes within this cluster include:

- Vendor ID
- Vendor Name
- Vendor Address
- Total Cost
- Supply Unit Price
- Material ID
- Material Name
- Available Quantity
- Material Standard Cost
- Unit of Measure

3-24.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PK
Person Identifier
Nickname
Status
Date joined
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Twitter handler
Facebook Link
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Site Purpose
Site Creation Date
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Public Site
Public site category
Private Sits
Site Administrator
Registers
Account
PK
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FK
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Password
Date Created
Date Terminated
Recent Date and Time Profile Viewed
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Has
Complaints
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Complaint ID
Date/Time
Content of complaint
Resolution Code
Status of Resolution
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PK
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