Homework - 2

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Analysis

User Requirements

A database designing process goes through many stages, and one of the preliminary stages is the database designer asking for the user description, which mentions constraints, & potential users of the DB inter-alia, and then deriving the requirements from the description, such as entities, relationships and attributes.

Considering the aforementioned, the requirement analysis document given to us lacks the following feature -

1. A clear sense of purpose of the database
2. A clear indication of the users of the database
3. Explicit requirements from the user of the database
4. Coherent description of relationships between different entity types
5. Concise & exact inclusion of attributes/entity

Q: Are any requirements incorrectly included?

Considering the aforementioned, we have analysed the requirements and found the following mistakes leading to incomplete ER diagrams.

1. Two primary keys in one entity type
    a. For adjudicator, member_id & adjudicator_id.
    b. For hotel_manager, member_id & manager_id.
    c. For assassin, assassin_id & member_id.

2. Incomplete assumption
    a. Inclusion of task as a composite attribute without specifying its composition.
    b. Ammo_capacity specified as multivalued with no prior assumptions

3. Incomplete and/or incorrect constraints of relationship types.
    a. Participation constraints not specified in any of the relationships
    b. Though cardinality ratio is specified, it is not mentioned which entity type is it associated with, in both binary & ternary relationship types

4. Identifying relationships of weak entity types not specified.
5. Extraneous inclusion of attributes
    a. Attributes like is_cute, is_dead, is_aggresive are included which are not inline with the purpose of the database
6. Multiple partial key specified in weak entity types
    a. Victim1_member_id & Victim2_member_id in marker

Mistakes in functional requirements

1. In the insert operation an entity type is being inserted which is not possible only instances of an entity type i.e. an entity can be inserted.
2. In functional requirement DELETE , it's said to delete dead elder and broken car, while elder and car does not have any attribute regarding dead state, broken state respectively. Inclusion of Menu_available in Hotel as a multivalued attribute without specifying its attribute.
3. In the functional requirement PROJECTION we need to return columns while in the given requirements documents rows are being returned i.e. operation selection has been performed instead of projection.
4. In the search operation the word keyword is ambiguous.
5. Since identifying relationship types are not mentioned for weak entities , hence they are also not included in the ER diagram.

Relationship type constraints **rectification**:

- OPEN_CONTRACT
    - Degree: 5 (quintenary)
    - Entity Types: ELDER, HIGH_TABLE_MEMBER, ADJUDICATOR HOTEL_MANAGER, ASSASSIN
    - Min-max ratio:
        - ELDER → (0, N): An elder can open a contract against either no members or N members
        - HIGH_TABLE_MEMBER → (0, N): A high table member can open a contract against either no members or N members
        - ADJUDICATOR → (0, N): An adjudicator can open a contract against either no members or N members
        - HOTEL_MANAGER → (0, N): A hotel manager can open a contract against either no members or N members
        - ASSASSIN → (0, N): An assassin can open a contract against either no members or N members
- OWN
    - Degree: 3 (ternary)
    - Entity types: ASSASSIN → CAR, PET
    - Min-max ratio:
        - ASSASSIN → (0, N): An assassin can own 0 cars or pets, or can own N cars or pets
        - CAR → (1, 1): A car can be owned by either 1 assassin at least, or 1 assassin at most

        - PET → (1, 1): A pet can be owned by either 1 assassin at least, or 1 assassin at most
- USE
    - DEGREE: 3 (ternary)
    - Entity types: ASSASSIN → WEAPON, CAR
    - Min-max ratio:
        - ASSASSIN → (0, N): An assassin can use either 0 weapons or cars at least, or can N weapons or cars at most
        - WEAPON → (0, 1): A weapon can be used by either no assassins (0) or 1 assassins at most at once
        - CAR → (0, 1): A car can be used by either no assassins (0) or 1 assassins at most at once.

Q:How easy is it to design the ER model with these sets of requirements?

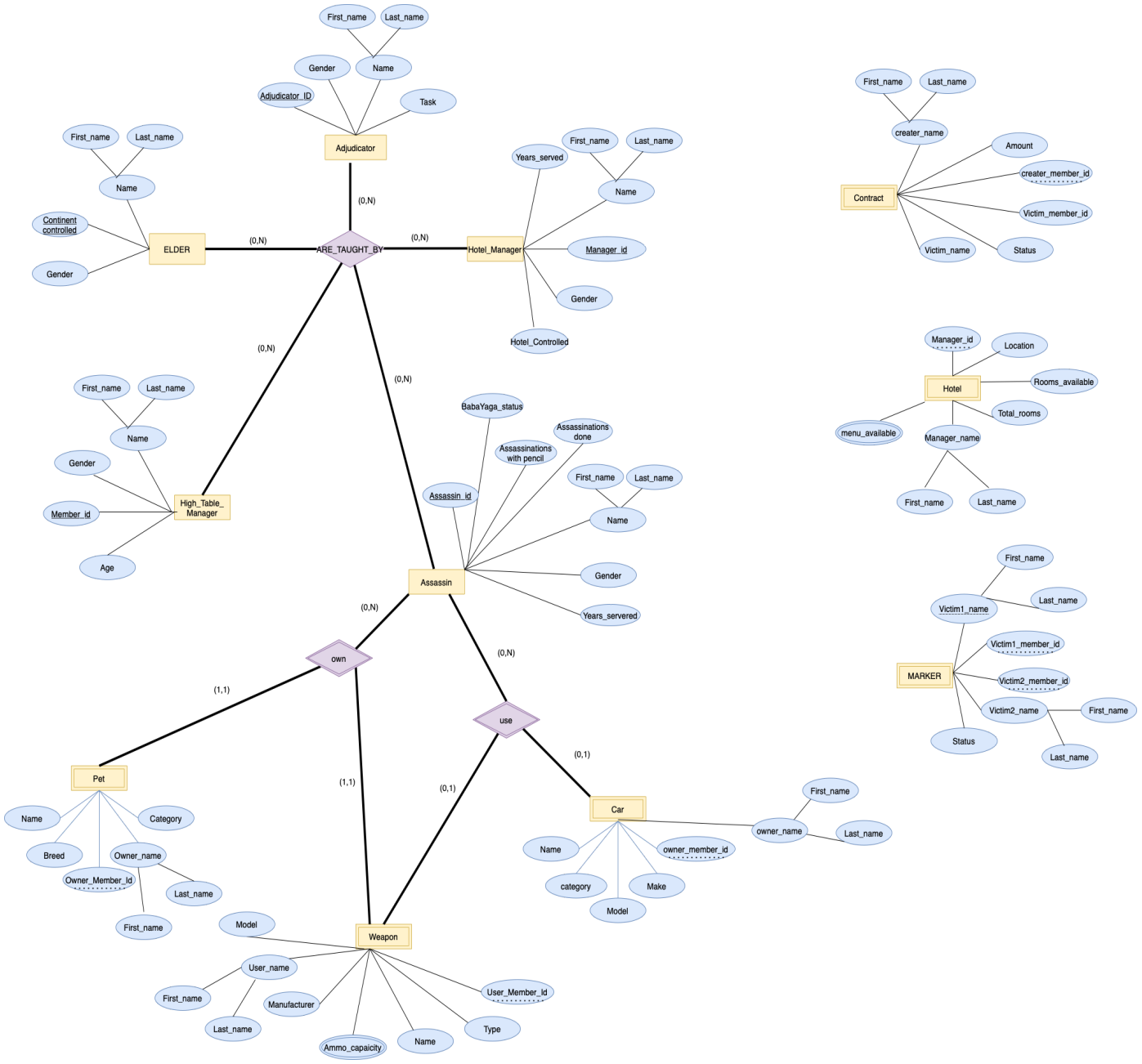
NO, Several issues were faced while drawing ER diagram as:

1. Identifying relationships were not defined.
2. Several entities mentioned did not participate in any relationship.
3. Various attributes which made no sense were included in the attributes list such as is_cute for the pet, horse-power/ acceleration for car etc, hence such attributes were not included in ER.
4. MIn-Max constraints were not defined.
5. Wrong degrees were being written, ternary relationship(own) mentioned was incorrect.

Q:Are the requirements complete or missing something?

Requirements were incomplete as ,

1. No identifying relationship mentioned.
2. Relationships between entities were missing.
3. Min-Max ratio and constraint ratio was not mentioned.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Victim2_name
Status