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Databases: CSC-423

Part 1: Conceptual Data Model

Main Entities:

Clinic: Represents the physical location where pets receive care and treatment.

Staff: Dedicated individuals employed by Pawsome Pets to manage clinics and provide veterinary services.

Pet Owner: Individuals who entrust their beloved pets to Pawsome Pets for care and services.

Pet: The adorable animals owned by pet owners and registered for care at Pawsome Pets clinics.

Examination: The diagnostic procedures and treatments administered to pets during their clinic visits.

Primary Relationships:

Clinic Managed by Staff: Each clinic is overseen by a dedicated staff member responsible for its management.

Staff Assigned to Clinic: Staff members are assigned to specific clinics to ensure seamless service provision.

Pet Registered by Owner at Clinic: Pet owners can register their furry friends at a clinic for tailored care.

Pet Linked to Clinic: Every pet is linked to one specific clinic where they receive their care and attention.

Pet Undergoes Examination: Pets go through various examinations conducted by staff to ensure their well-being.

Examination Conducted by Staff: Every examination is carried out by a staff member equipped with expertise.

Multiplicity Constraints:

Clinic Managed by Staff: One staff member manages each clinic (1:1).

Staff Assigned to Clinic: Each staff member works at one clinic (1:1).

Pet Registered by Owner at Clinic: Owners can register multiple pets at a clinic (1:M).

Pet Linked to Clinic: Each pet is associated with one clinic (1:1).

Pet Undergoes Examination: Pets can undergo multiple examinations (1:M).

Examination Conducted by Staff: Each examination is handled by one staff member (1:1).

Identified Attributes:

Clinic: clinicNo, name, address, telephone

Staff: staffNo, name, address, telephone, DOB, position, salary

Pet Owner: ownerNo, name, address, telephone

Pet: petNo, name, DOB, species, breed, color

Examination: examNo, chief complaint, description, date seen, actions taken

Candidate and Primary Keys:

Clinic: candidate key: clinicNo, primary key: clinicNo

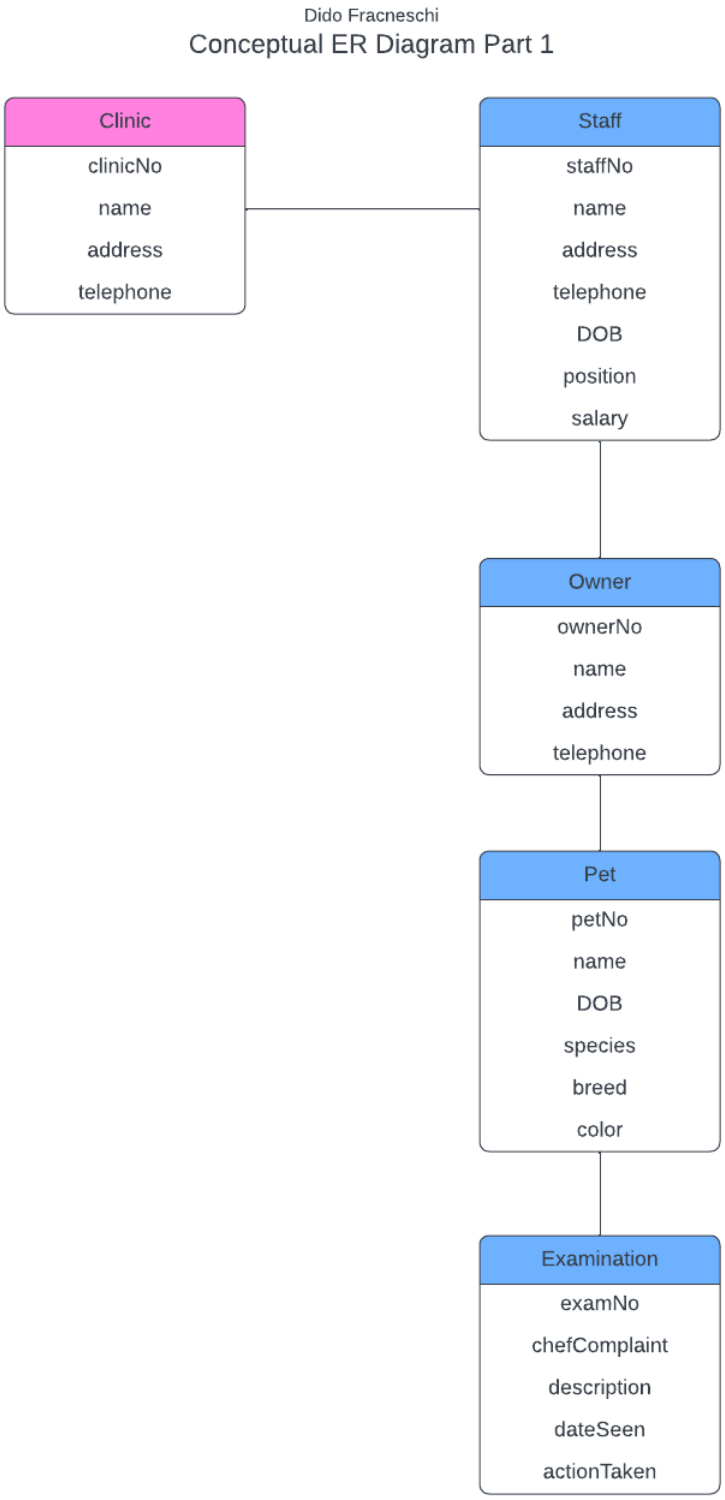
Staff: candidate key: staffNo, primary key: staffNo

Pet Owner: candidate key: ownerNo, primary key: ownerNo

Pet: candidate key: petNo, primary key: petNo

Examination: candidate key: examNo, primary key: examNo

E-R Diagram for Conceptual Level (No FKs as Attributes):



Part 2: Logical Data Model

Derived Relations:

Clinic: (clinicNo PK, name, address, telephone, staffNo FK)

Staff: (staffNo PK, name, address, telephone, DOB, position, salary, clinicNo FK)

Owner: (ownerNo PK, name, address, telephone)

Pet: (petNo PK, name, DOB, species, breed, color, ownerNo FK)

Examination: (examNo PK, chiefComplaint, description, dateSeen, actionsTaken, staffNo FK, petNo FK)

Normalization to 3NF:

First Normal Form (1NF): Each relation already possesses a primary key, and attributes are indivisible.

Second Normal Form (2NF): Each non-key attribute is fully dependent on the entire primary key, ensuring 2NF.

Third Normal Form (3NF): Each non-key attribute solely depends on the primary key, ensuring 3NF.

Validation Against User Transactions:

The logical model will undergo validation against user transactions to ensure seamless functionality and optimal performance. This includes:

Adding, updating, and deleting records for clinics, staff members, owners, pets, and examinations.

Querying for information based on various criteria such as clinic name, staff member name, and pet species**.**

Integrity Constraints:

Primary Key Constraints: Each relation includes a primary key attribute.

Referential Integrity/Foreign Key Constraints: Attributes like clinicNo, staffNo, ownerNo, and petNo are designated as foreign keys.

Required Data: Essential attributes such as clinic name, telephone, staff name, position, owner name, address, petNo, species, examination date seen, and actions taken must be provided with non-null values.

Attribute Domain Constraints: Staff salary must be a positive integer, while pet DOB must conform to a valid date format.

General Constraints:

There are no specific general constraints specified for the logical data model.

E-R Diagram for Logical Level (With FKs as Attributes):