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Phase III –

Problem Overview:

An in-depth understanding of growth trajectories, health trends, and resources among different birth cohorts is necessary for sustainable goat farming. The inability to visually represent the growth curves of goats and classify them according to birth cohorts makes it more difficult for Silvies Valley Ranch to recognize and effectively solve sustainability challenges. The implementation of a database system that allows users to organize goats by birth cohort enables the viewing and comparison of growth curves over time, allowing Silvies Valley Ranch to maximize future resource efficiency, improve health management, and boost overall cohort well-being. With the help of this solution, Silvies Valley Ranch can improve breeding programs because our application allows them to make data-driven decisions and carry out focused practices, all of which will contribute to the development of a stronger and more sustainable goat farming business.

ER Diagram

Relational Schema
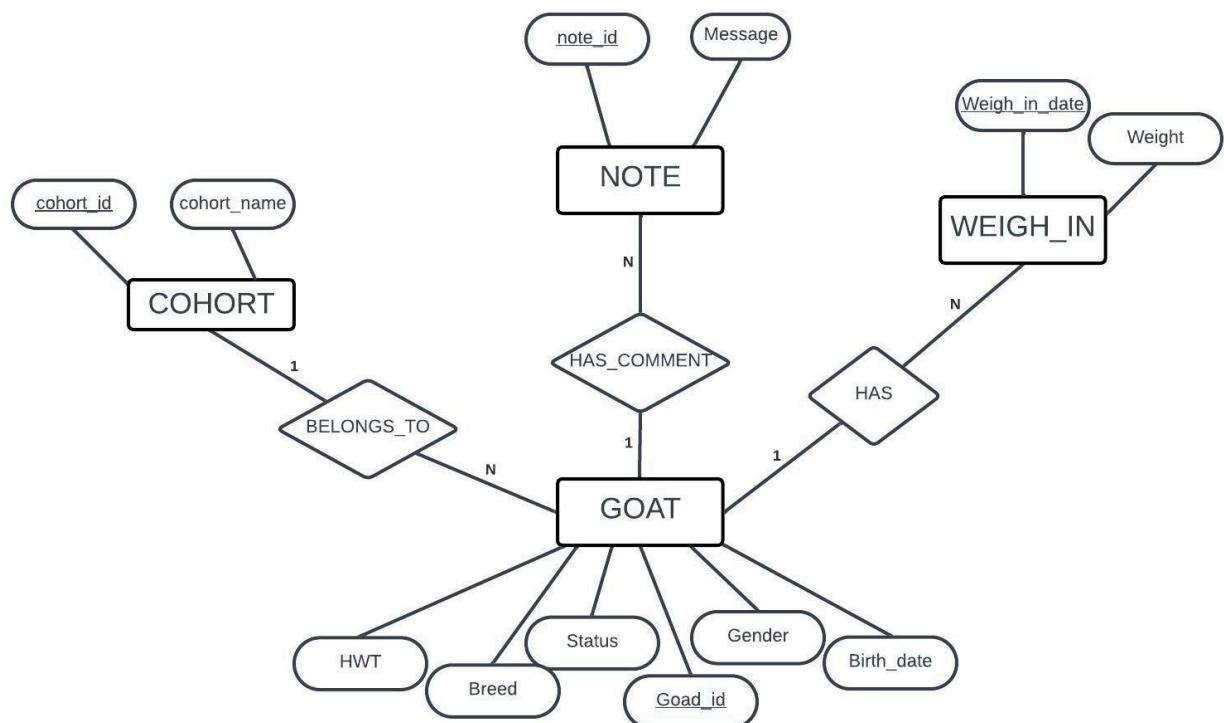
GOAT ER-RELATIONAL SCHEMA
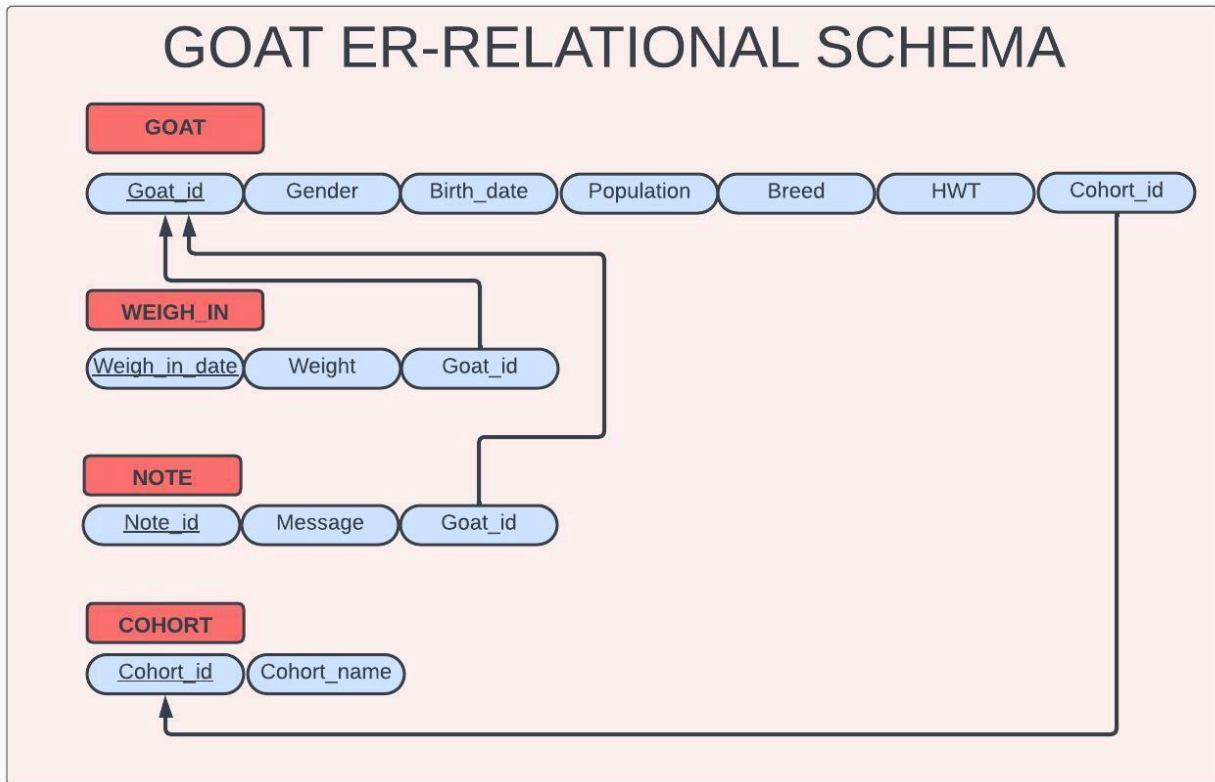
Questions:
Additionally, based on your research and understanding of the project requirements and scope, estimate the following:

Initial database size (estimated number of records * average size of a record)
- 59,411 Live Weights
- Approximately 9,000 Goats
- Meaning each goat approximately
- We can on estimate 75% of goats have a note
  - Meaning there is approximately 6750 note entities
- Average size of cohort esteemed to be 200
  - Meaning there is approximately 45 cohorts

Size ≈ 59,411+900+6750+45 = 67106

Search types and estimated number of searches required per query
- Most of our queries will require use to join the goats with the weights
- We will follow this with selects and projects

UML
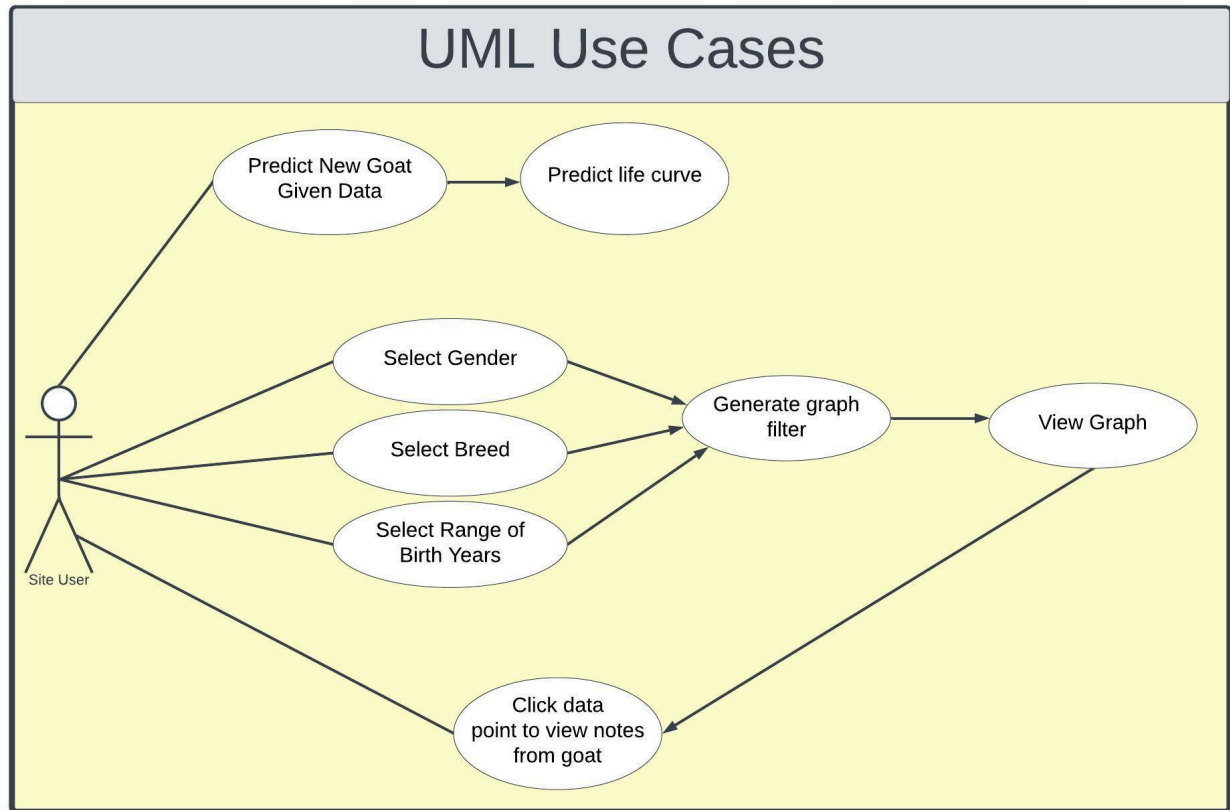
Use Cases:

Adding a goat to the database:

1. Actor chooses to impute a new goat.

2. The system prompts for Birth Weight and Birth Weight Date.

3. The actor inputs Birth Weight and Birth Weight.

4. The system validates Birth Weight and Birth Weight.

    a. The verification is invalid.

        1. The system tells the actor the Birth Weight or Birth Weight is invalid.

        2. Use case 3

5. The system prompts for Live Weight and Weight Date.

6. Actor inputs Live Weight and Weight Date.

7. The system validates the Live Weight and Weight Date.

    a. The verification is invalid.

        1. The system tells the actor the Live Weight or Weight Date is invalid.

        2. Use case 6

 8. The system displays a predictive model for the hypothetical goat data given.

Compare growth curves of different cohorts:

1. Actor selects a specific cohort.

2. The system accesses all goat ids based on birthdate to assemble cohort

3. The system calculates the growth curve for each cohort based on the live

    weights and weight dates.

4. The system displays the growth curves of the selected cohorts on a graph for

    visual comparison.

5. The cohort is given a specific color to show all goats data compared to other

    cohorts.

6. Actor analyzes the growth curves to identify trends and patterns among the

    cohorts.

7. Actor selects specific cohorts/filters for further analysis based on the growth

    curve comparison.

    a. Actor can specify system to display predictive growth modeling setting

    b. System displays predictive growth modeling setting for goat weights

Reasoning For Model

Entities and Attributes:
GOAT: Contains essential attributes such as Goat_id, Gender, Birth_date for cohort grouping, Status, HWT, and Breed. These attributes provide information about individual goats, allowing for effective **grouping,** tracking and analysis with simple queries.

WEIGHT: Includes Weigh_in_date, Goat_id, and Weight. This entity helps record the weight over time for goats, allowing the creation of growth curves for individual goats and groups of goats.

We use WEIGHT and GOATS in combination to create growth curves of groups of goats

COHORT: Allows the organization of goats based on their birth cohort, or any cohort we can think of or find in the pre-existing database we can use this for comparative analysis.

NOTE: Captures additional information we may have on these goats could help find common trends for potential health observations or management practices, providing a view of each goat.