Requirements Engineering

Livestock Auction System

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Computing with Software Development

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­­­**Table of Contents**

[1. Introduction/overview 4](#_Toc121241086)

[2. Functional Components 5](#_Toc121241087)

[3. User Requirements 6](#_Toc121241088)

[3.1 Livestock Auction System will manage Owner Data 6](#_Toc121241089)

[3.2 Livestock Auction System will manage Auction Data 6](#_Toc121241091)

[3.3 Livestock Auction System will perform administrative reporting 6](#_Toc121241092)

[4. System Requirements 7](#_Toc121241093)

[4.1. System Level Use Case Diagram 7](#_Toc121241094)

[4.2. Manage Owners 8](#_Toc121241095)

[4.2.1. Register Owner 9](#_Toc121241096)

[4.2.2. Update Owner Info 10](#_Toc121241101)

[4.2.3. Deregister Owner 11](#_Toc121241107)

[4.3. Manage Auctions 12](#_Toc121241108)

[4.3.1. Schedule Auction 13](#_Toc121241109)

[4.3.2. Register Livestock 14](#_Toc121241110)

[4.3.3. Query Auction 15](#_Toc121241114)

[4.3.4. Record Sale 16](#_Toc121241115)

[4.4. View Data 17](#_Toc121241116)

[4.4.1. Yearly Revenue Analysis 18](#_Toc121241117)

[4.4.2. Yearly Livestock Analysis 19](#_Toc121241118)

[5. System Model 20](#_Toc121241119)

[5.1. Level-0 DFD 20](#_Toc121241120)

[5.2. Level-1 DFD 21](#_Toc121241121)

[5.3. Level-2 DFD (Process P1: Manage Owners) 22](#_Toc121241122)

[5.4. Level-2 DFD (Process P2: Manage Auctions) 23](#_Toc121241123)

[5.5. Level-2 DFD (Process P3:View Data) 24](#_Toc121241124)

[6. Data Model (Class Diagram) 25](#_Toc121241125)

[6.1. Class Diagram 25](#_Toc121241126)

[6.2. Relational Schema 26](#_Toc121241127)

[6.3. Database Schema 26](#_Toc121241128)

[7. Conclusion 27](#_Toc121241129)

[8. Appendices 28](#_Toc121241130)

[8.1. Declaration of Originality Form 28](#_Toc121241131)

# Introduction/overview

The livestock auction system will deal with the input of data needed to run a livestock auction mart. The program will set up an account using values gathered from the owner and allow the user to update or delete the account, it will allow the user to register both an auction and livestock for that auction. It also allows you to look up the livestock and register the sale of that livestock. When you want to look over information from the year specified, you can do that and be able to look at the yearly livestock and revenue analysis

# Functional Components

Livestock Auction System registers owner accounts, auction data and lets you view yearly revenue analysis and Livestock analysis

# User Requirements

## Livestock Auction System will manage Owner Data

* + 1. Livestock Auction System Will Register an Owner
    2. Livestock Auction System Will Deregister an Owner
    3. Livestock Auction System Will Update an Owner’s Info



## Livestock Auction System will manage Auction Data

1. Livestock Auction System Will Schedule an Auction
2. Livestock Auction System Will Register Livestock in an auction
3. Livestock Auction System Will Record a Sale
4. Livestock Auction System Will Query an Auction

## Livestock Auction System will perform administrative reporting

* + 1. Livestock Auction System Will produce a yearly revenue analysis
    2. Livestock Auction System Will produce view yearly livestock analysis

# System Requirements

## System Level Use Case Diagram

The following system level use case diagram illustrates the high-level system requirements.

Clerk

Owner

Guest

Manager

## Manage Owners

This module provides functions to:

* Register an owner

this function allows you to register an account for the farmer to sell his livestock and save it in the owner file

* Update owner

This updates the owner selected and saves the info in the owner file

* Deregister owner­­

This updates the owner selected status and changes it to deregistered

### Register Owner

owner

Clerk

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name | Register Owner | | |
| Use Case Id | La001 | | |
| Priority | 1 | | |
| Source | Clerk | | |
| Primary Business Actor | Clerk | | |
| Other Participating Actors | Owner | | |
| Description | This will register an Account for the Owner and collect info such as name, Address and Contact info and Store it in the database. | | |
| Preconditions |  | | |
| Trigger |  | | |
| Expected Scenarios | | | |
| Actor | | System |
| **Step 1: Invoke Register Owner**  **Step 3 Enter New data**   * **Enter owners name** * **Enter phone number** * **Enter email** * **Enter addresses** | | **Step 2: Display UI**  **Step 4: Validate Data**   * **Verify owners name size** * **Verify addresses size** * **Validate using checkdata()** * **Verify valid phone number** * **Verify email** * **Verify if owner is in system**   **Step 5: Valid = Yes**  **Step 6: Save Data in owner file**  **Step 7: Display Conformation**  **Step 8: Reset UI** |
| Unexpected Scenarios | | |
| Actor | | System |
|  | | **Step 4: Valid = No**  **Step 5: Display Error Message**  **Step 6: Return to Enter Required Data** |
| Conclusions | Owner is added to the system | |
| Post conditions | Owner can now Register Livestock | |



### Update Owner Info

owner

Clerk

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name | Update Account | | |
| Use Case Id | La002 | | |
| Priority | 2 | | |
| Source | Clerk | | |
| Primary Business Actor | Clerk | | |
| Other Participating Actors | Owner | | |
| Description | This will retrieve Owner info from the database and Change Owner info Such as name, Address and contact info | | |
| Preconditions |  | | |
| Trigger |  | | |
| Expected Scenarios | | | |
| Actor | | System |
| **Step 1: Invoke Manage Owners**  **Step 4: Enter Owner Data**   * **Get info from combo box**   **Step 7: Enter New data**   * **Enter new owners name** * **Enter new phone number** * **Enter new email** * **Enter new address** | | **Step2: retrieve owner info such as name id contact address**  **Step 3: Display Ui**  **Step 5: Display owner info on the side**  **Step 6: open new window form**  **Step 8: Validate**   * **Validate using checkdata()** * **Verify valid phone number** * **Verify email**   **Step 9: Valid = Yes**  **Step 10: Load up update window**  **Step 11: Update Owner file**  **Step 12: Send Confirmation Message**  **Step 13: Return to Enter Required Data** |
| Unexpected Scenarios | | |
| Actor | | System |
|  | | **Step 8: Valid = No**  **Step 9: Send Error Message**  **Step 10: Return to Enter Required Data** |
| Conclusions | Owner Information is updated | |
| Post conditions | Owner info is updated | |

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name | Deregister owner | | |
| Use Case Id | La003 | | |
| Priority | 3 | | |
| Source | Clerk | | |
| Primary Business Actor | Clerk | | |
| Other Participating Actors | Owner | | |
| Description | This will retrieve Owner info from the database and Remove info from the database | | |
| Preconditions |  | | |
| Trigger |  | | |
| Expected Scenarios | | | |
| Actor | | System |
| Step 1: Invoke manage owners  Step 4: Select Owner   * **Select from the combo box** | | **Step 2: retrieve owner’s data**  **Step 3: Display Ui**  **Step 5: display user data**  **Step 6: Retrieve Owner Data from owner file biased on data given**  **Step 7: update owner file Deregister Owner Data**  **Step 8: Send Confirmation Message**  **Step 9: Return to Enter Required Data** |
| Conclusions | Owner is Removed from the system | |
| Post conditions | Owner cannot Register Livestock | |



### Deregister Owner

Clerk

owner

## Manage Auctions

This module provides functions to:

* Schedule Auction

this function is used to schedule an auction and generate the time slots, then save the data onto the auction file

* Register livestock

This function is used to register the livestock and save the data in the livestock file

* Query auction

This function allows you to query livestock and see the info of the livestock

* Record sale

This function is used to register the sale of livestock and save it in the sales file

### Schedule Auction

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name | Schedule Auctions | | |
| Use Case Id | Lab04 | | |
| Priority | 4 | | |
| Source | Clerk | | |
| Primary Business Actor | Clerk | | |
| Other Participating Actors |  | | |
| Description | This will schedule the auction by date, starting time and Finishing time and assign blocks of time by number entered. | | |
| Preconditions |  | | |
| Trigger |  | | |
| Expected Scenarios | Actor | System |
|  | **Step 1: Invoke schedule auction Type**  **Step 3: Enter Date** | **Step 2: Display Ui**  **Step 5: Validate**   * **If date is set before current date** * **If date is picked**   **Step 6: Valid = Yes**  **Step 7: Save Date in auction file**  **Step 8: Send Confirmation Message**  **Step 9: Return to Enter Required Data** |
| Unexpected Scenarios | Actor | System |
|  |  | **Step 5: Valid = No**  **Step 6: Send Error Message**  **Step 7: Return to Enter Required Data** |
| Conclusions | **Auction is scheduled** | |
| Post conditions | **Buyer can buy livestock at auction** | |

Clerk

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Use Case Name | Register Livestock | | | |
| Use Case Id | Lab05 | | | |
| Priority | 5 | | | |
| Source | Clerk | | | |
| Primary Business Actor | Clerk | | | |
| Other Participating Actors | Owner | | | |
| Description | This will Register the Livestock Data Such as Animal, Bread, age, gender onto the Database. | | | |
| Preconditions |  | | | |
| Trigger |  | | | |
| Expected Scenarios | Actor | | System |
|  | **Step 1: Invoke Update Owner Type**  **Step 4: enter**   * **Livestock type** * **Breed** * **Sex** * **Age** * **Initial price** * **Tag number** | | **Step 2: Retrieve Required Data**  **Step 3: Display Ui**  **Step 5: Validate**   * **Livestock type(check box index)** * **Breed (check box index)** * **Sex(check tick box)** * **Age(check if number)** * **Initial price(check if double)** * **Tag number(check if number and 15 chars long)**   **Step 6: Valid = Yes**  **Step 7: Save data into the livestock file**  **Step 8: Send Confirmation Message**  **Step 9: Return to Enter Required Data** |
| Unexpected Scenarios | | | |
| Actor | | System | |
|  | | **Step 6: Valid = No**  **Step 7: Send Error Message**  **Step 8: Return to Enter Required Data** | |
| Conclusions | **Livestock is added to the system** | | |
| Post conditions | **Livestock can be sold** | | |

### Register Livestock

Clerk

owner

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name | Query Auction | | |
| Use Case Id | Lab06 | | |
| Priority | 6 | | |
| Source | Clerk | | |
| Primary Business Actor | Clerk | | |
| Other Participating Actors | Buyer | | |
| Description | This will Register the Livestock Data Such as Animal, Bread, age, gender onto the Database. | | |
| Preconditions |  | | |
| Trigger |  | | |
| Expected Scenarios | | | |
| Actor | | System |
| **Step 1: Invoke Update Owner Type**  **Step 3: Enter Required Data** | | **Step 2: Display Ui**  **Step 4: Show Livestock Data**  **Step 5: Send Confirmation Message**  **Step 6: Return to Enter Required Data** |
| Unexpected Scenarios | | |
| Actor | | System |
|  | | **Step 5: Valid = No**  **Step 6: Send Error Message**  **Step 7: Return to Enter Required Data** |
| Conclusions | Owner is added to the system | |
| Post conditions | Owner can now Register Livestock | |



### Query Auction

Buyer

Clerk

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name | Record Sale | | |
| Use Case Id | Lab07 | | |
| Priority | 7 | | |
| Source | Clerk | | |
| Primary Business Actor | Clerk | | |
| Other Participating Actors | Buyer | | |
| Description | This will Register the Livestock Data Such as Animal, Bread, age, gender onto the Database. | | |
| Preconditions |  | | |
| Trigger |  | | |
| Expected Scenarios | | |
| Actor | | System |
| **Step 1: Invoke Update Owner Type**  **Step 4: Enter**   * **Final price** * **Livestock tag number** | | **Step 2: Retrieve livestock and auction Data**  **Step 3: Display Ui**  **Step 5: Validate**   * **Final price** * **Livestock tag number**   **Step 6: Valid = Yes**  **Step 7: Update livestock**   * **Set livestock to sold**   **Step 8: Save data in sales file**  **Step 9: Send Confirmation Message**  **Step 10: Return to Enter Required Data** |
| Unexpected Scenarios | | |
| Actor | | System |
|  | | **Step 5: Valid = No**  **Step 6: Send Error Message**  **Step 7: Return to Enter Required Data** |
| Conclusions | **Sale data is Recorded onto the Database** | |
| Post conditions | **Sale data will be used when viewing yearly revenue Analysis** | |

### Record Sale

Buyer

Clerk

## View Data

This module provides functions to:

* View Yearly Revenue Analysis

This function allows the user to view the yearly revenue analysis

* View Yearly Livestock Analysis

This function allows the user to view the yearly livestock analysis

### Yearly Revenue Analysis

Business owner

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name | View Yearly Revenue analysis | | |
| Use Case Id | Lab08 | | |
| Priority | 8 | | |
| Source | Business Owner | | |
| Primary Business Actor | Business Owner | | |
| Other Participating Actors |  | | |
| Description | This will Register the Livestock Data Such as Animal, Bread, age, gender onto the Database. | | |
| Preconditions |  | | |
| Trigger |  | | |
| Expected Scenarios | Actor | System |
|  | Step 1: Invoke Update Owner Type  Step 4: Enter Year | Step 3: Display Ui  Step 5: Retrieve livestock profits from sales file and multiply it by 15%  Step 6: Show yearly Revenue  Step 7: Return to Enter Required Data |
| Conclusions | Owner Can view yearly Revenue analysis | |
| Post conditions | Owner can make business Decisions biased on Revenue Analysis | |

### Yearly Livestock Analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case Name | View Livestock Analysis | | |
| Use Case Id | Lab09 | | |
| Priority | 9 | | |
| Source | Business Owner | | |
| Primary Business Actor | Business Owner | | |
| Other Participating Actors |  | | |
| Description | This will Register the Livestock Data Such as Animal, Bread, age, gender onto the Database. | | |
| Preconditions |  | | |
| Trigger |  | | |
| Expected Scenarios | | |
| Actor | | System |
| **Step 1: Invoke Update Owner Type**  **Step 3: Enter Year** | | **Step 2: Display Ui**  **Step 4 retrieve livestock type from year selected**  **Step 5: Show Livestock type in pie chart**  **Step 6: Reset Ui** |
| Conclusions | Owner can view yearly livestock analysis | |
| Post conditions |  | |

­­

Business Owner

# System Model

The following dataflow diagrams have been produced for the system:

## Level-0 DFD

Buys livestock

Get service

buyer

Live auction system

owner

Gives info

gives info

## Level-1 DFD

Get owner info for update/delete

Owner file

D1

Manage owners

P1

Save info in owner file

Get owner data

Get owner file data for livestock

Auction file

D2

owner

Get auction data for livestock

Save auction date

Get owner info for livestock

View Auction Data

P3

Manage Auction

P2

View data

Get livestock data to view query/register sale

Livestock & booking file

D3

Save livestock data

View sales data

Save sales data

Get buyer data

sales file

D4

buyer

## Level-2 DFD (Process P1: Manage Owners)

Register owners

1.1

Save owner data

Get owner data

retrieve owner data

Update owner info

1.2

Get owner data

Owner file

D1

owner

Save owner data

(optional)

Retrieve owner data

Deregister Owner

1.3

## Level-2 DFD (Process P2: Manage Auctions)

Schedule Auction

2.1

Save auction data

Auction file

D2

Save auction status

Get auction data

Get livestock data

owner

Register livestock

2.2

Save livestock data

Livestock & booking file

D3

Get owner input

Retrieve livestock data

Query Livestock

2.3

Set booking status

Retrieve livestock an booking data

Get buyer input

buyer

Get buyer data

save sales data

Record sale

2.4

sales file

D4

## Level-2 DFD (Process P3: View Data)

Retrieve sales data

Retrieve livestock data

Yearly Livestock analysis

3.2

Yearly Revenue analysis

3.1

Livestock file

D3

sales file

D4

# Data Model (Class Diagram)

This data model shows how the data in the program interacts with each other.

## Class Diagram

Tagno

Type

Breed

Age

gender

livestock

OwnerId

Forename

surname

address

town

county

phone

email

owners

Auction date

Auction id

auction

Has a

0..\*

1

1

1

in a

Has a

1

0..\*

1

bookingid

Timeslot

Starting price

Status

booking

0..\*

Final price

sale id

Sale

Relates to

1

1

## Relational Schema

Owners (Owner ID, forename, surname, Address, town, county, phone, email)

Livestock (TagNo, Type, Breed, Age, Gender)

Auction (auction id, Auction Date)

Booking(booking id, timeslot, starting price, status)

Sales (sale id, Final Price)

## Database Schema

Relation Owners

OwnerId numeric (3) NOT NULL, UNIQUE

forename varchar2(20) NOT NULL

surname varchar2(20) NOT NULL

Town varchar2(15) NOT NULL

County varchar2(10) NOT NULL

` PhoneNo char (12) NOT NULL UNIQUE

Email varchar2(20)

Primary key OwnerId

Relation Auction

auctionDate Date NOT NULL

time varchar2(5) NOT NULL

slot\_status char (1) NOT NULL

Primary key auctionDate time

Relation Livestock

Tag Char (15) NOT NULL, UNIQUE

OwnerId numeric (3) NOT NULL, FOREIGN KEY

Type varchar2(6) NOT NULL

Breed varchar2(20) NOT NULL

Age numeric (2) NOT NULL

Gender char (1) NOT NULL

Primary key Tag

Foreign Key OwnerID References Owners

Foreign Key auction Id References Auction

Relation Bookings

Booking id numeric (5) not null

Auction id

Timeslot chat(5)

Owner id numeric(3) not null

Starting price numeric 7,2 not null

Status char(1) default ‘u’,

Tag no not null

Primary key booking id

Foreign key auction Id references auction

Foreign key tag no references livestock

Relation Sales

Saleid numeric (3) NOT NULL, UNIQUE

Final Price numeric (3.2) NOT NULL

Booking id

Primary key Saleid

Foreign Key booking id references bookings

# Conclusion

I have completed the forms for the livestock auction and organised the data into 4 files which could make it easier for integrating the sql into the project, I have also translated my knowledge of java into c# in such ways as finding a char, using a try catch, and parsing values into ints and doubles. I have learned how to make lists and managing the list values.

# Appendices

## Declaration of Originality Form

|  |  |
| --- | --- |
|  | |
| Name James Clifford  T Number t00225039  Class Group kcompb2s  Assignment Title livestock auction system | |
| **Students are advised to inform themselves of the Institute Anti-Plagiarism Policy.** | |
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