Plush Meadows

Online Management System Design

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Lab Day: Thursday
Lab Room: Online
Lab Time: 13:00
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Introduction

The purpose of this report is to expand on and improve the detailed analysis and design processes conducted by team RISKY to assist in modelling an online management system for the company Plush Meadows.

The report includes further refined Business Rules as defined by Plush Meadows. It details their implementation through either the system or organisational mapping and a detailed Class Diagram modelled off the Domain Class Diagram using the layered model. For each of the four Use Cases chosen by team members, this report contains updated Use Case Descriptions, subsets of the Class Diagram relevant to each Use Case Description, a Sequence Diagram and a User Interface Model.

These updates and additional inclusions have allowed the team to review and reflect on the previous reports system design shortcomings and understand the best practices to use when analysing and designing such a system.

The team tracked the development of this report using Microsoft Teams, and the report includes typed meeting minutes and a Gantt Chart. The Team Management section provides a complete overview of the project from creation to completion.

Business Rules

Business Rule Definitions

1. The Horse Hire is available for short-term (½ day), medium-term (1 day) or long-term (approx. 2 – 3 days) periods.
2. Any horse's total time out on hire cannot equal or exceed four or more days within a seven-day period.
3. Riders are divided into three experience levels (beginner, intermediate, experts), and horses are correspondingly divided into three types (placid, energetic, strong).
4. Horses tied to carts or for young children must be observed by an employee.
5. A veterinary service is present for 3.5 hours a day, 7 days a week. The Veterinarian inspects the horses five times a year, unless the horse has a problem or needs continuous treatment.
6. There are three package types for boarding horses. Basic services (accommodation and food), Special services (accommodation and food plus regular exercise and grooming), or Deluxe services (special services plus comprehensive inspections and reports by the veterinarian every quarter).
7. Customers who hire horses for a short-term are limited to specific time blocks, i.e., morning or afternoon.
8. The number of riders, the rider's ages, the rider's experience level, and any relevant medical information (e.g., allergies, epilepsy, dizziness), are considered when confirming a hire for a customer. The system will determine a list of available horses for an individual or group based on the information provided and display the list to the manager.
9. For long-term hires, customers must hold a 69797 Certificate III in Horsemanship.
10. Customers can cancel or change a hire request at any time.
11. People wishing to stable their mounts on the premises must contact the manager to arrange a level of service, length of contract (set time or ongoing) and other accommodation details. The manager arranges for a stall, grooms, strappers, and vet visits (as required by the contract).
12. Groups of 4 or more customers receive a 20% group discount.
13. Payment can be made by credit/debit card, cash, or gift card. A customer can redeem a gift card of any amount sold (as printed on the card) in any transaction.
14. Strappers must be hired to exercise horses and see to minor medical treatment as prescribed by the vet. Grooms must also be hired to exercise the horses and be responsible for everyday care and maintenance. Both strappers and grooms maintain a log of how often a horse has received attention.
15. Ostlers must be hired to maintain the riding equipment, saddles, bridles, bits, straps, and equipment for riders such as helmets and crops.
16. A record of the frequency in which stable workers service the stalls and the service provided, i.e. change water, replace straw, fix woodwork, must be recorded. The stable workers update these records.
17. Plush Meadows must comply with the Work Health and Safety Act 2011 (NSW Government, 2020), and Work Health and Safety Regulation 2017 (NSW Government, 2020), this is achieved through point 18 and it's subpoints.
18. To comply with the relevant Work Health and Safety Acts and Regulations, Horse Safety Australia provides specific Guides and Regulations (Horse Safety Australia, 2021) that are adhered to by Plush Meadows through:
    a. A log of workplace hazards and their associated risks and management processes must be kept and maintained.
    b. Helmets that are both well maintained and meet the AS/NZS 3838 or ASTM F1163 standards (Kentaur, 2017) must be worn by any persons riding a horse including staff.

c. Appropriate footwear that provides protection for the top of the foot (eg. steel/plastic caps) must be worn by riders and staff when handling horses.

d. Riders must wear full length trousers and a long-sleeved shirt when riding.

e. Saddles must be matched to the size of the horse and checked for secure fitting to the horse by an experienced staff member prior to hire.

f. Riders must not wear any loose-fitting jewellery or other items that could become tangled in equipment when riding.

g. All horse enclosures must be secure and separate from vehicle access.

h. Appropriate signage must be placed around horse enclosures to prevent unintended access to them by untrained personnel.

i. Clear escape routes from all areas on the premises must be signed and maintained.

j. All enclosure gates must open in both directions.

k. Appropriate first aid equipment must be present and well-maintained when handling or riding of horses is occurring.

l. Any on premises horse riding activity must have a staff member present that is at least 18 years of age and holds a level 2 first aid qualification.

m. Staff that are responsible for the allocation of horses (managers) must have a comprehensive knowledge of all available horses and their suitability for participants.

n. Staff that undertake dray/sulky rides with children must have current police checks or working with children cards.

o. Managers must have policies and procedures in place to identify and act upon the maltreatment of horses.

p. Horses that are known to behave dangerously must not be permitted to undertake riding activities, to achieve this bad behaviour must be kept in a log.

q. A log that identifies the hiring of horses to specific riders must be kept including:

    i. When the horse was used and who the rider was.

    ii. Any incidents relating to the use of the horse.

    iii. The training and competence of the horse.

r. An incident log must be kept of all safety incidents on site that contains details of the following:

    i. Accidents.

    ii. Near Misses.

    iii. Incidents that have the potential for psychological trauma.

    iv. Incidents involving property damage.

19. Plush Meadows must make all reasonable efforts to protect the privacy of employee and customer data collected during the conduct of business per the Privacy and Personal Information Protection Act 1998 (NSW Government, 2020), this is achieved through:

    a. All user data is to be stored in a local database on a server maintained by Plush Meadows.

    b. User data will not be used for any function outside of its primary purpose (Identifying customers for business purposes) and will not be used for commercial gain outside of this purpose (eg. The sale of customer data).

    c. All sensitive customer data such as medical records will only be kept for as long as is reasonably required, then it will be purged from the database.

Business Rule Mappings

Business Rule	System Mapping	Organisational Mapping
1	During the Hire Out Horse use case the system allows the specified durations.	
2	During the Hire Out Horse use case, a check is conducted to ensure the horse has not had hire contracts totalling more than 4 days or 96 hours (is overworked) in the last seven days.	
3	These attributes are stored against horse and rider entries in the database during the Create Rider and Create Horse use cases.	
4		An employee is assigned to this task when interacting with the customer.
5		The organisation has a contract with the veterinary to facilitate this.
6	This is entered as an attribute of the stabling contract during the Book In Horse use case.	
7		This is enforced by the Manager informing the customer of allowable time windows.
8	The system handles processing of these attributes and provides the list of suitable horses to the Manager during the Hire Out Horse use case.	
9	The system checks the qualifications of the rider when a long-term hire contract is being created during the Hire Out Horse use case.	
10	The system allows for cancelling or modifying of current hire contracts through the Cancel Hire Contract and Modify Hire Contract use cases.	
11	The system allows for creation of stabling contracts with the attributes specified during the Book In Horse use case.	
12	The system applies a group booking discount when taking payments during the Take Payment use case.	
13	The system allows payments to be made through all the required methods during the Take Payment use case.	
14	The log of attention is maintained in the system by strappers and ostlers through the Update Horse Log use case.	The business ensures adequate strappers and grooms are hired to conduct the required tasks.
15		The business ensures adequate ostlers are hired to conduct the required tasks.
16	The stall logs in the system allow stable workers to keep track of the required details in log entries through the Update Stall Log use case.	
17	See point 18a-r.	See point 18a-r.
18a	A hazard log is maintained in the system by Managers through the Update Hazard Log use case.	
18b		Employees overseeing horse riding on premises are the ensure the correct helmet is always worn.

18c		Employees overseeing horse handling on premises are to ensure correct footwear is always worn.
18d		Employees overseeing horse riding on premises are to ensure correct clothing is always worn.
18e		Employees are to ensure correct saddle fitting.
18f		Employees overseeing horse riding on premises are to ensure no loose jewellery is worn.
18g		The layout of horse enclosures at Plush Meadows facilitates this separation.
18h		The business provides signage and employees are responsible for their correct placement.
18i		The premises is structured in such a way that escape routes are present from all areas and signage is provided and maintained.
18j		Enclosure gates are installed with this functionality.
18k		The business provides first aid equipment and employees are responsible for its maintenance and use when handling or riding horses.
18l		The business is responsible for maintaining first aid certifications of its employees.
18m	During the Hire Out Horse use case the system provides managers with an overview of all available horses matching rider skill to horse temperament.	
18n		Employees are responsible for tracking their current police check/working with children card status prior to working with children.
18o	The system provides a means of tracking and updating rider/owner maltreatment flags through the Check Maltreatment Details and Update Maltreatment Details use cases.	
18q	The system provides a hire log for tracking of these details by managers through the View Hire Log use case.	
18r	The system provides an incident log for tracking of these details by managers through the Update Incident Log use case.	
19a	The system only stores data in a local database.	
19b	The system does not allow access to the database outside of through the program interface minimising the risk of misuse of data.	The business is required to uphold this policy in any dealings it has with other companies and ensure that their customers data is not leaked or sold.
19c	The system allows for maintenance of the database by trained database administrators.	The business has policies in place to archive or delete any user data that has exceeded its usable lifetime.

Design Classes

Design Class Diagram

The Design Class Diagram, seen in Figure 1, illustrates the classes required for the Plush Meadows Online Management System implementation. The team chose the Layered Architectural Style due to its similarity to most businesses' conventional IT communication and organisational structure. Within the depicted Class Diagram, most interactions occur within subsystems resulting in a higher level of cohesion; furthermore, the classes can call to each other without being privy to others class's internal components, thus achieving a lower level of coupling.

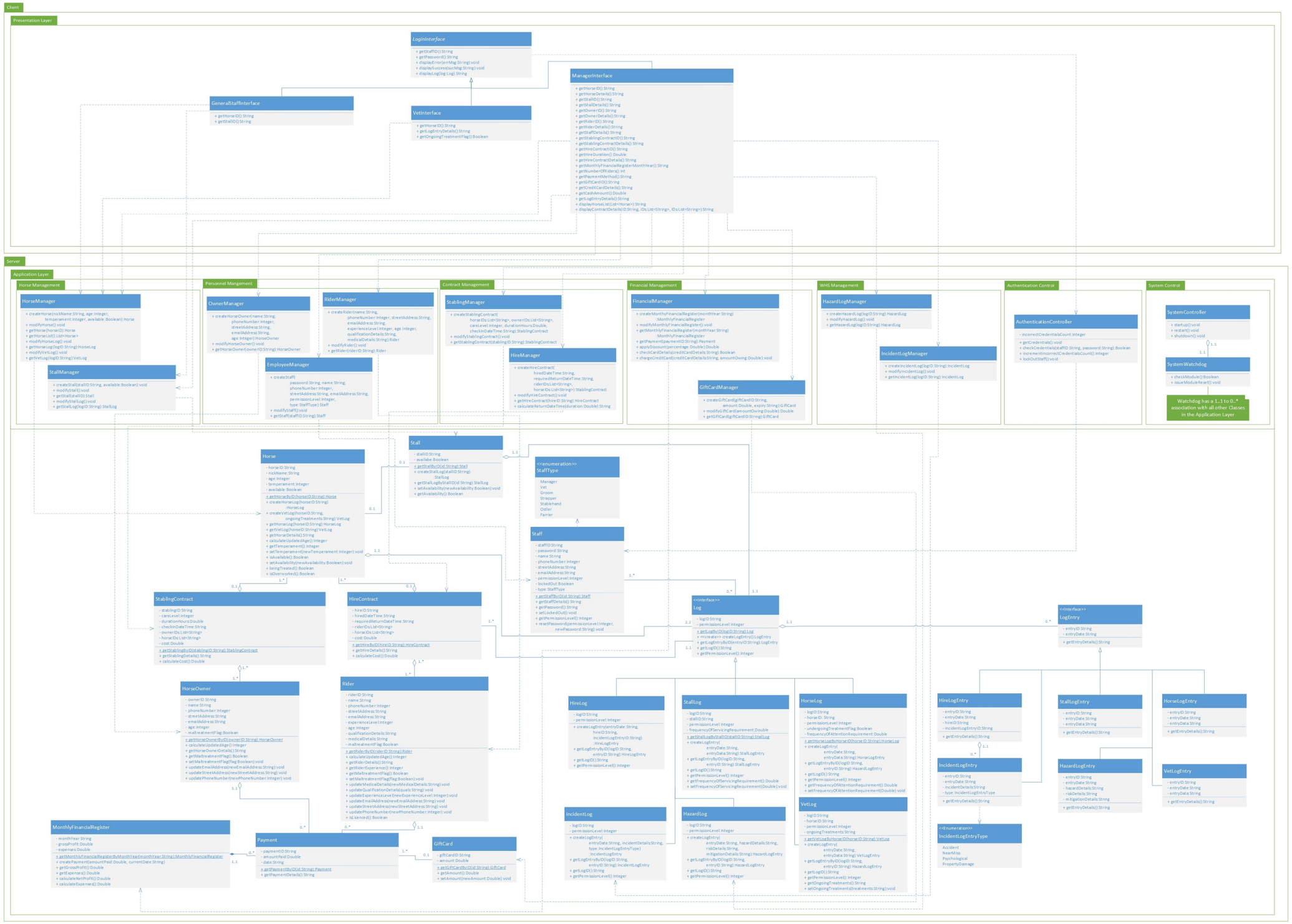


Figure 1: Design Class Diagram for Plush Meadows Online Management System

Use Case Mappings to Sequence Diagrams

Updated Use Case Descriptions

Conduct Scheduled Check-up

The Use Case Description for Conduct Scheduled Check-Up required a removal of the steps for the Log In Use Case.

Table 1: Use Case Description for Conduct Scheduled Check-up

Use Case Name	Conduct Scheduled Check-up	
Scenario	The Vet conducts a Scheduled Check-up of a Horse's Health.	
Triggering Event	The Vet receives a reminder from the system that a Horse is due for a check-up, or manually checks the Vet Log for overdue check-ups.	
Brief Description	Vet conducts a scheduled check-up of a Horse's health based on the information stored in the Vet Log, logging any findings of the check-up in the System, and prescribing any ongoing treatments.	
Actors	Vet	
Related Use Cases	Update Vet Diary Conduct Emergency Check-up Conduct Ongoing Treatment	
Stakeholders	Veterinary, Managers, Horse Owner.	
Pre-conditions	The horses' profile must exist in the system. The level of service in the Horse's contract must require vet care. The Vet must be present at Plush Meadows. The Vet's user account must exist in the system. The Vet must be logged in to the system. The Vet should have received a notification from the system that the Horse is due for a check-up.	
Post-conditions	The Vet Log will be updated with any findings of the check-up. The Vet Log will be updated with any specialised treatment provided to the Horse. The Strappers will be able to access details of any ongoing treatment the Horse requires in the Vet Log.	
Flow of Events	Actor	System
	1. Vet enters a HorseID in attempt to access the Horse's Vet Log. 2. Vet checks for any existing Health issues in the Vet Log. 3. If Issues exist the Vet conducts specialised treatment to rectify them, then the Vet checks the Horse for any issues. 4. Vet updates the Vet Log with any issues found/treatment provided. 5. Vet determines if ongoing minor treatments are required, if yes, the treatment is prescribed in the Vet log.	1.1 System displays the Vet Log. 3.1 System updates the Vet Log database with details of check-up and/or specialised treatment. 4.1 System updates the Vet Log database with ongoing treatment information. 5.1 If ongoing treatment is required, the System updates the Vet Log with details of the ongoing treatment. 5.2 If ongoing treatment is required, the System provides read only access of the Vet Log to Strappers.

Exception Conditions	1.1 If the HorseID entered does not map to an existing Horse in the system. An error message is displayed. Once acknowledged, the flow continues from activity 1. 1.1 A Vet Log is not yet created for a specific Horse. The system initialises a new Vet Log for the specified Horse. Once created, the flow continues from activity 1.1

Book In Horse

The feedback given required this use case to be updated with more pre and post conditions and needed to change the language used when referring to the actor and the system. The original use case was ambiguous about which actor was involved at what stage of the process. These issues have been corrected and addressed in the following version.

Preconditions added:

- There is available space in the stables.
- Manager must be present at plush Meadows.

Post conditions added:

- The horse is now in the system and the horse is allocated to a stall and package.
- The customers details are in the system.

All flow of events now state if the manager or system is involved in each step.

Table 2: Use Case Description for Book In Horse

Use Case Name	Book In a Horse	
Scenario	The manager facilitates the booking in of a horse for a set stay and care package.	
Triggering Event	Manager starts to attempt to stable horse.	
Brief Description	The manager logs into their user account and determines availability for the customer's request regarding set stay period and care package.	
Actors	Manager	
Related Use Cases	Select Care Package, Take payment.	
Stakeholders	Manager, horse owner and business owner.	
Pre-conditions	The manager's user account exists in the system. There is available space in the stables. Manager must be present at plush Meadows. The Manager must be logged in to the system.	
Post-conditions	Confirmation of booking is received. The horse is now in the system and the horse is allocated to a stall and package. The customers details are in the system.	
Flow of Events	Actor	System
	1.Manager enters the horse's ID.	1.1 System checks if the horse is already in the system. If yes, the system displays the horse's id to the managers interface, if not in the system, System prompts manager to enter the horse's details into the system.
	2. If no horse was found, Manager enters the new Horse's details.	2.1 If entered, System stores new horses' details in the database.
	3. Manager enters the owners ID.	3.1 System checks if the owner id is already in the system. If yes, the system displays the owner's id to the managers interface, if not in the system, System prompts manager to enter the owner's details into the system.
	4. If no owner was found, Manager enters the new Owner's details.	4.1 If entered, System stores new owner's details in the database. 4.2 System displays a form for the details of the Stabling Contract.
		5.1 System stores the new stabling contract details and calculates the cost of the stabling contract.

	5. Manager enters the Stabling Contract details into the system. 6. Manager takes payment from the Customer.	5.2 System invokes Take Payment process.
Exception Condition	2.3 If the manager inputs details to make a booking, then decides to not go ahead with it, Initialise the account and set details to default values.	

Hire Out Horse

The feedback received for Assignment 1 Part A specified that the Brief Description did not match the transaction described, and the Related Use Cases were not called in the previous Use Case Description. Thus, the following updates have been completed:

- The Brief Description has been updated to match the transaction described.
- Take Payment was added to the list of Related Use Cases and calls to the Related Use Cases have been added to the Flow of Events.
- The following steps have been added to the Flow of Events:
    - calculate and display the final cost of the hire.
    - confirm the details of the hire.
    - prompt for payment.
    - finalise the hire post payment.
    - update the availability status of the hired horses.
- Language throughout the Flow of Events has been updated to establish causality between the steps.
- The Exception Conditions have been expanded.
- The Pre-conditions and Post-conditions have been updated to reflect the above changes.

Table 3: Use Case Description for Hire Out Horse

Use Case Name	Hire Out Horse	
Scenario	A manager facilitates the hiring of a horse out to a customer.	
Triggering Event	A customer requests to hire a horse or group of horses.	
Brief Description	A manager enters the details of a hire request, and the system determines a list of suitable horses for hire according to the data entered by the manager, i.e., the duration of the hire, the results of a maltreatment check and licence check, and the rider's skill level. The manager then selects a horse/s from the appropriate list and processes the customer's payment to confirm the hire.	
Actors	Manager	
Related Use Cases	Maltreatment Check, Licence Check, Check Rider Skills, Take Payment	
Stakeholders	Manager, Customer, Stable Owner	
Pre-conditions	The manager's user account exists in the system. The manager is logged into the system. The horses' profiles exist in the system. The customer database is up to date. The vet log is up to date.	
Post-conditions	The payment and hire are confirmed in the system. The availability of each horse hired has been updated in the system.	
Flow of Events	Actor	System
	1. Manager opens a new hire request form. 2. Manager enters the details of the requested hire. 3. Manager enters the details of the rider/s.	1.1 System displays a new hire request form. 3.1 System processes the hire and rider details and invokes the Maltreatment Check. 3.2 System invokes Licence Check if the hire is for more than 24 hours (long term).

		3.3 System compiles a list of all hireable horses. 3.4 System removes any horses from the list currently out on hire, i.e., unavailable. 3.5 System removes any overworked horses from the list, i.e., hired out 4 of the past seven days. 3.6 System crosschecks the list of suitable horses with the vet log and removes any horses undergoing treatment. 3.7 System invokes Check Rider Skills. 3.8 System displays a final list of available horses for the requested hire.
	4. Manager sights lists of available horses and selects the appropriate number of horse/s from the list.	4.1 System processes horse selection, calculates and displays the cost of the hire.
	5. Manager takes payment from the Customer	5.1 System invokes Take Payment. 5.2 System updates schedule by marking the confirmed horse/s as unavailable. 5.3 System displays hire confirmation and hire ID.
Exception Condition	3.1 A rider fails the Maltreatment Check: a. The system displays an alert message, “The rider {riderID} has been banned from Plush Meadows due to previously recorded instance/s of maltreatment.” b. The Hire Out Horse use case is terminated. 3.2 A rider fails the Licence Check: a. The system displays an alert message, “A valid 69797- Certificate III in Horsemanship must be provided by {riderID} for this hire.” b. The manager is given the option to return to the New Request Form with the applicable rider’s details (event 3) or terminate the Hire Out Horse use case. 3.8 No suitable horses are available: a. The system displays an empty list and the message, “There are no horses available on the requested date for the requested hire duration." b. The manager is given the option to return to the New Request Form with the applicable hire’s date and duration details (event 2) or terminate the Hire Out Horse use case.	

Take Payment

Based on the feedback and the issues found after the actual creation of the sequence diagram, the considerations and the manager's actions did not interact with the system, therefore the conditions and flow of events have been corrected.

Table 4: Use Case Description for Take Payment

Use Case Name	Payment	
Scenario	Manager receives cash payments from customers when they pay to hire out horses.	
Triggering Event	The customer is renting or booking a horse or a group of horses.	
Brief Description	When a customer applies to hire or stable a horse, he or she must pay the manager by credit/debit card, cash, or gift card.	
Actors	Manager	
Related Use Cases	Book In Horses, Hire Out Horses.	
Stakeholders	Manager, customer, horse owner	
Pre-conditions	The login manager account exists in the system. The Manager must be logged in to the system. The customer meets the minimum business rules required to apply for the service. The customer information in the database is latest updated.	
Post-conditions	A payment will exist in the system for the amount received.	
Flow of Events	Actor	System
	1. The Manager conducts the Hire Out Horse or Book In Horse use case sequence up until the Take Payment use case is required.	1.1 The system calculates the amount due for the service being provided. 1.2 The system applies a discount if the number of riders is 4 or more. 1.3 The system displays a payment method selection screed.
	2. The Manager enters a method of payment.	2.1 The system verifies the details entered. 2.2 If gift card was entered as the payment method the system displays a form for the details of the gift card. 2.3 If card was entered as the payment method the system displays a form for the details of the credit card.
	3. If card or gift card was entered as the payment method the Manager enters their details.	3.1 The System verifies the details of the gift card/credit card if required. 3.2 The System creates a new payment in the database.
Exception Condition	3.1 If the credit/debit card details entered are not valid. The error message "Invalid Credit Card Details" is displayed. The flow continues from activity 1.3 3.1 If the gift card ID entered is not valid. The error message "Invalid Gift Card ID" is displayed. The flow continues from activity 1.3	

Subsets of Design Class Diagram

Conduct Scheduled Check-up

The Design Class Diagram Subset seen in Figure 2 shows only the boundary, control, and entity classes involved in the Conduct Scheduled Check-up use case and how each of them relates within the layered system model.

Figure 2: Design Class Diagram Subset for Conduct Scheduled Check-up

Book In Horse

The Design Class Diagram Subset seen in Figure 3 shows only the boundary, control, and entity classes involved in the Book In Horse use case and how each of them relates within the layered system model.

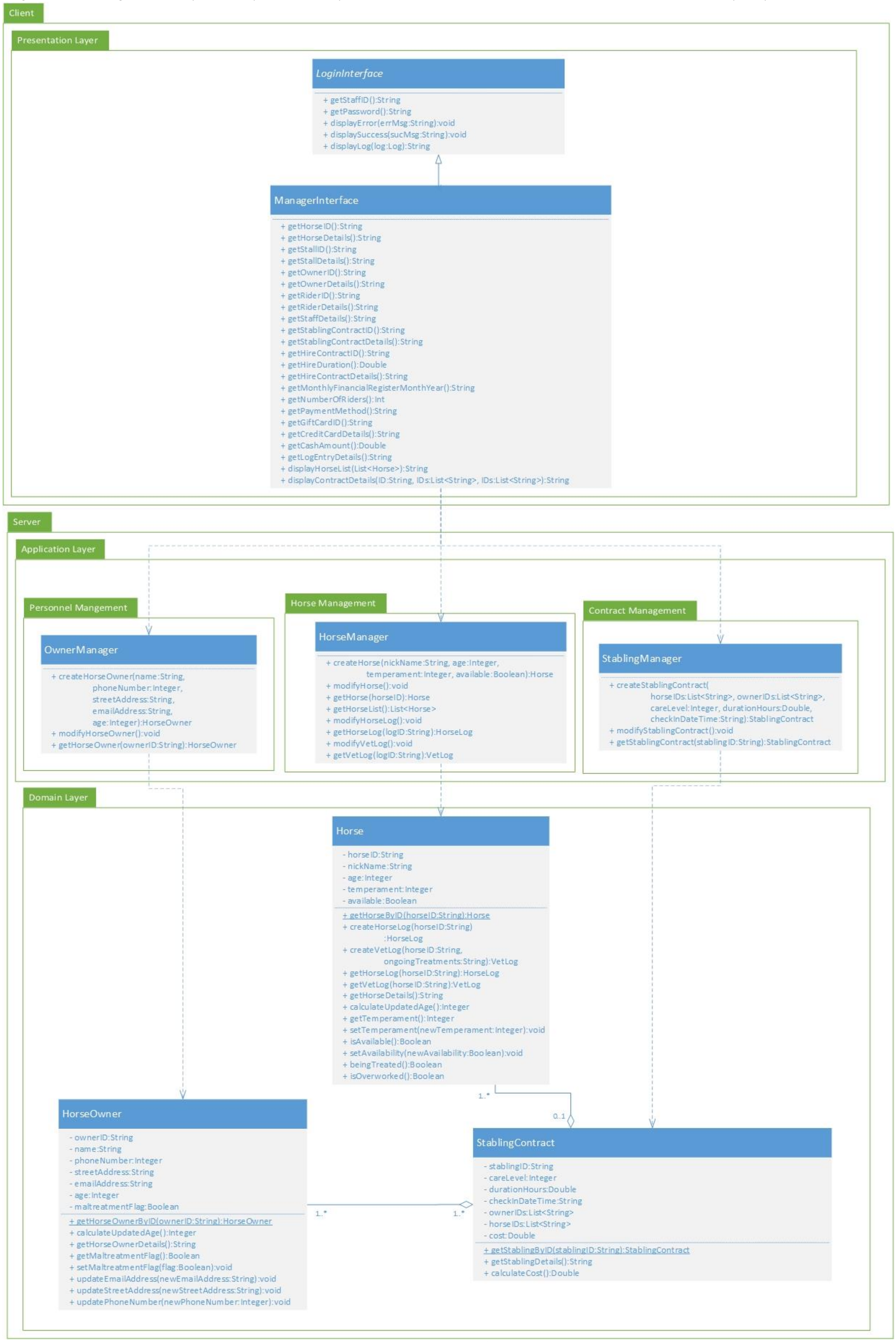


Figure 3: Design Class Diagram Subset for Book In Horse.

Hire Out Horse

The Design Class Diagram Subset seen in Figure 4 shows only the boundary, control, and entity classes involved in the Hire Out Horse use case and how each of them relates within the layered system model.

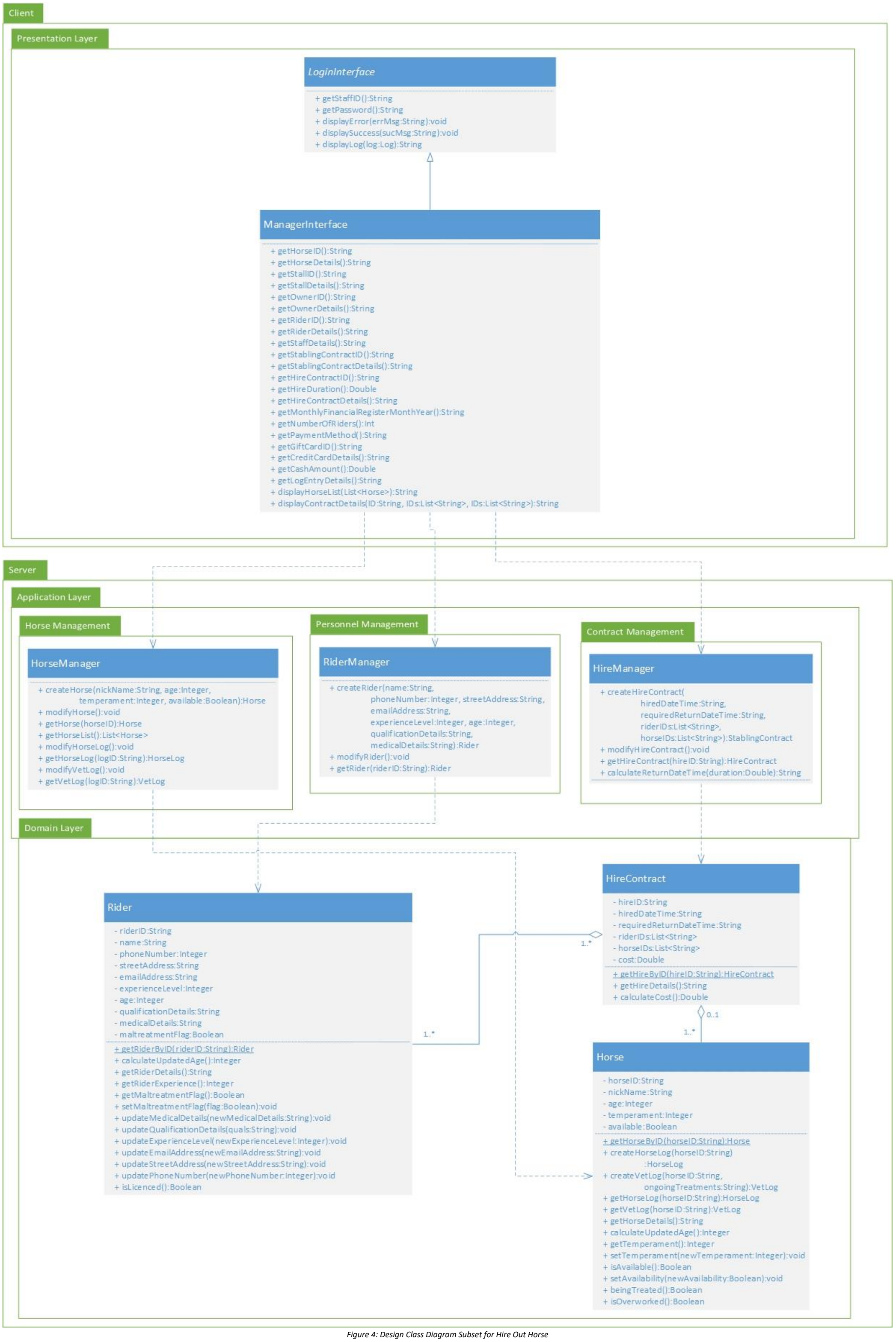


Figure 4: Design Class Diagram Subset for Hire Out Horse

Take Payment

The Design Class Diagram Subset seen in Figure 5 shows only the boundary, control, and entity classes involved in the Take Payment use case and how each of them relates within the layered system model.

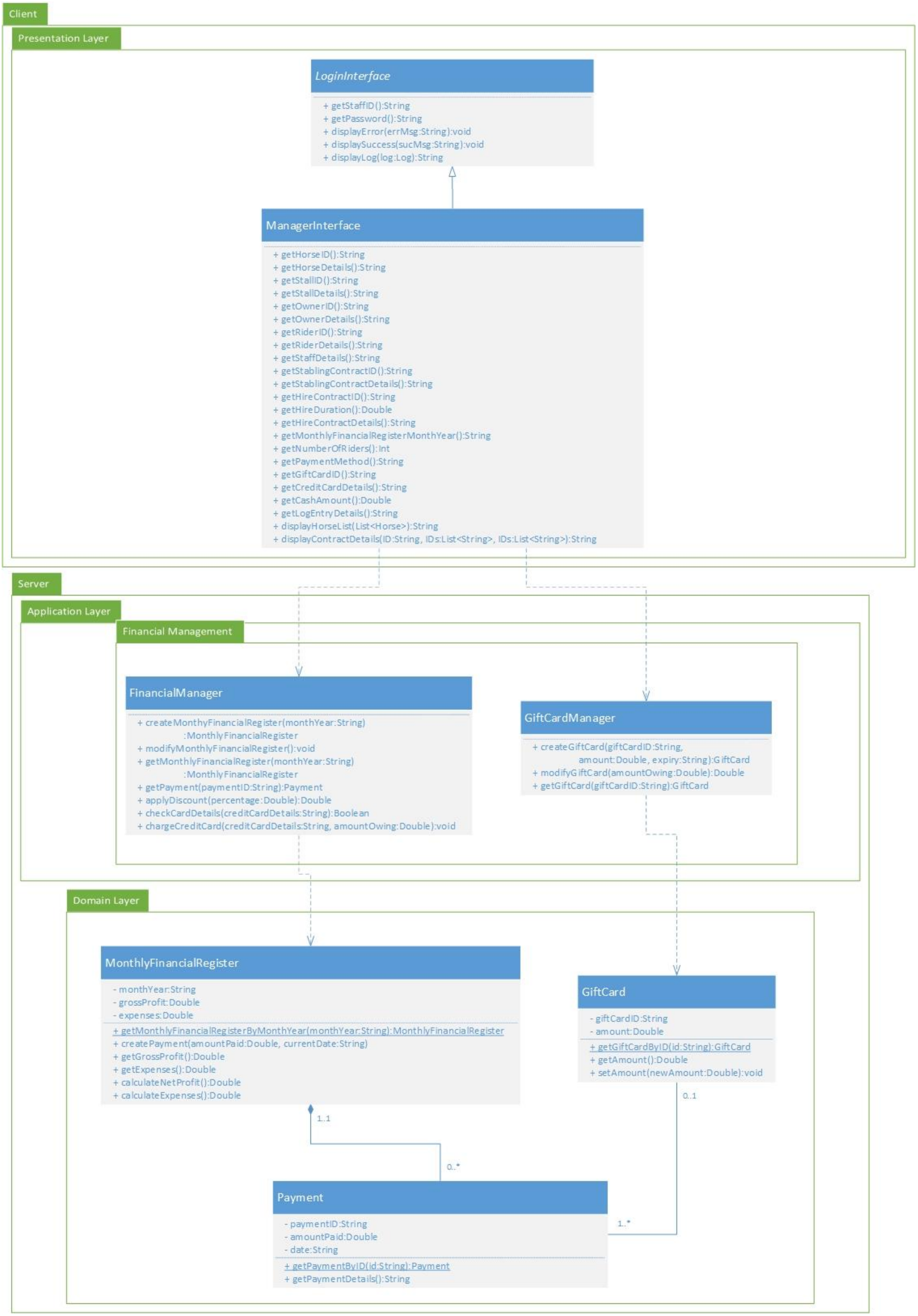


Figure 5: Design Class Diagram Subset for Take Payment

Sequence Diagrams

Conduct Scheduled Check-up

The Sequence Diagram seen in Figure 6 shows the sequence of method calls and information flow between classes over the duration of the Conduct Scheduled Check-up use case.

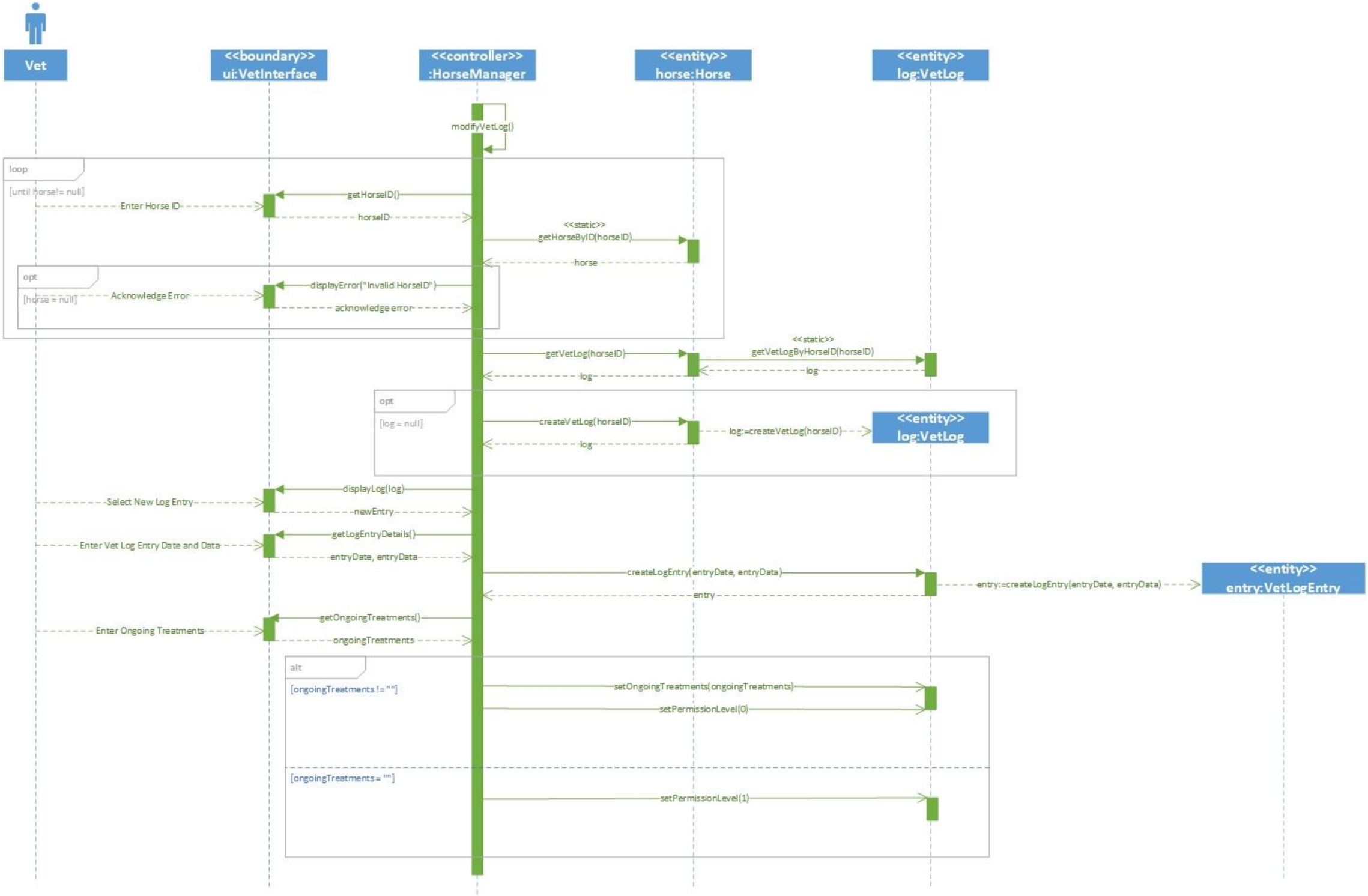


Figure 6: Sequence Diagram for Conduct Scheduled Check-up

Book In Horse

The Sequence Diagram seen in Figure 7 shows the sequence of method calls and information flow between classes over the duration of the Book in Horse use case.

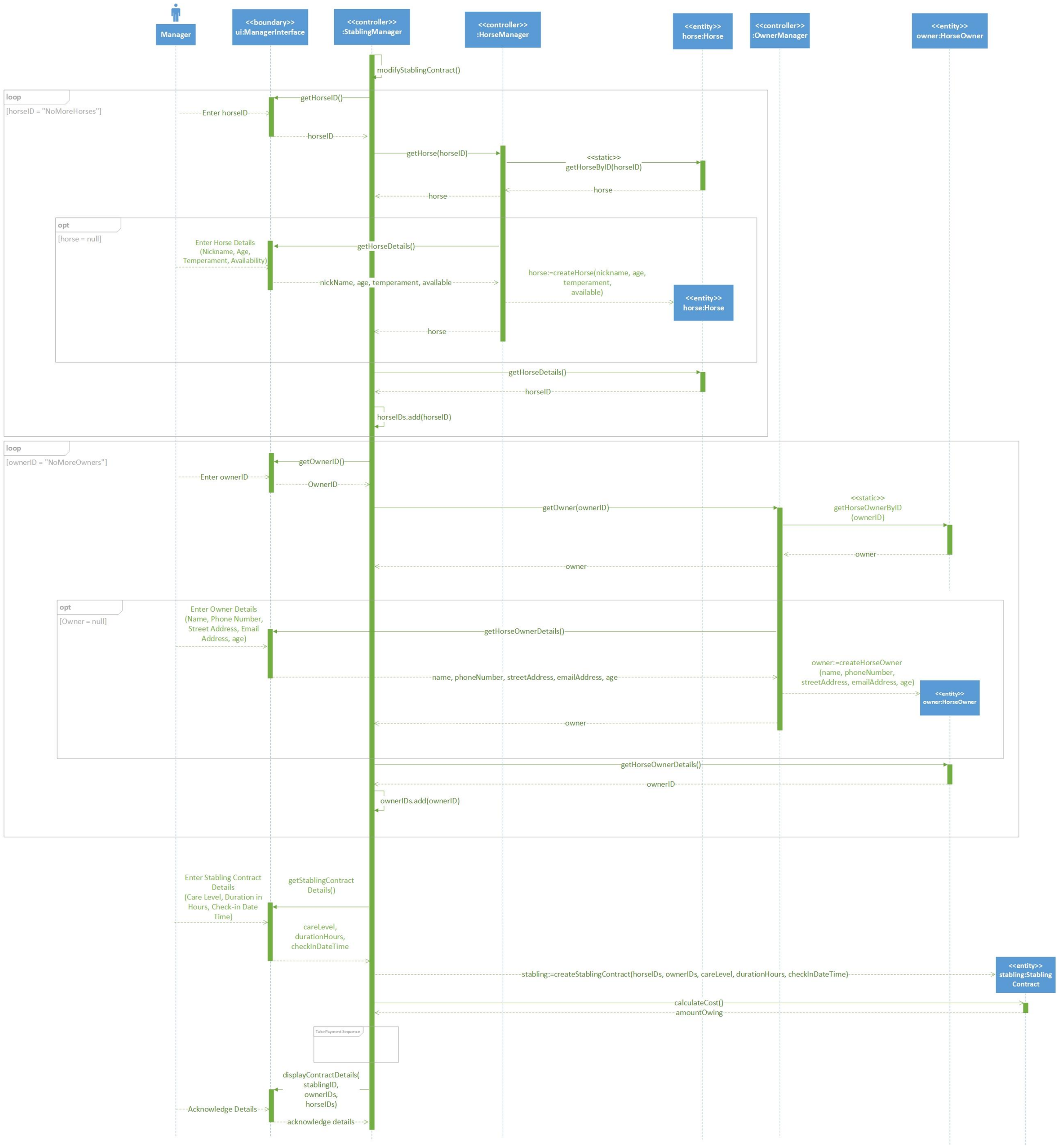


Figure 7: Sequence Diagram for Book In Horse

Hire Out Horse

The Sequence Diagram seen in Figure 8 shows the sequence of method calls and information flow between classes over the duration of the Hire Out Horse use case.

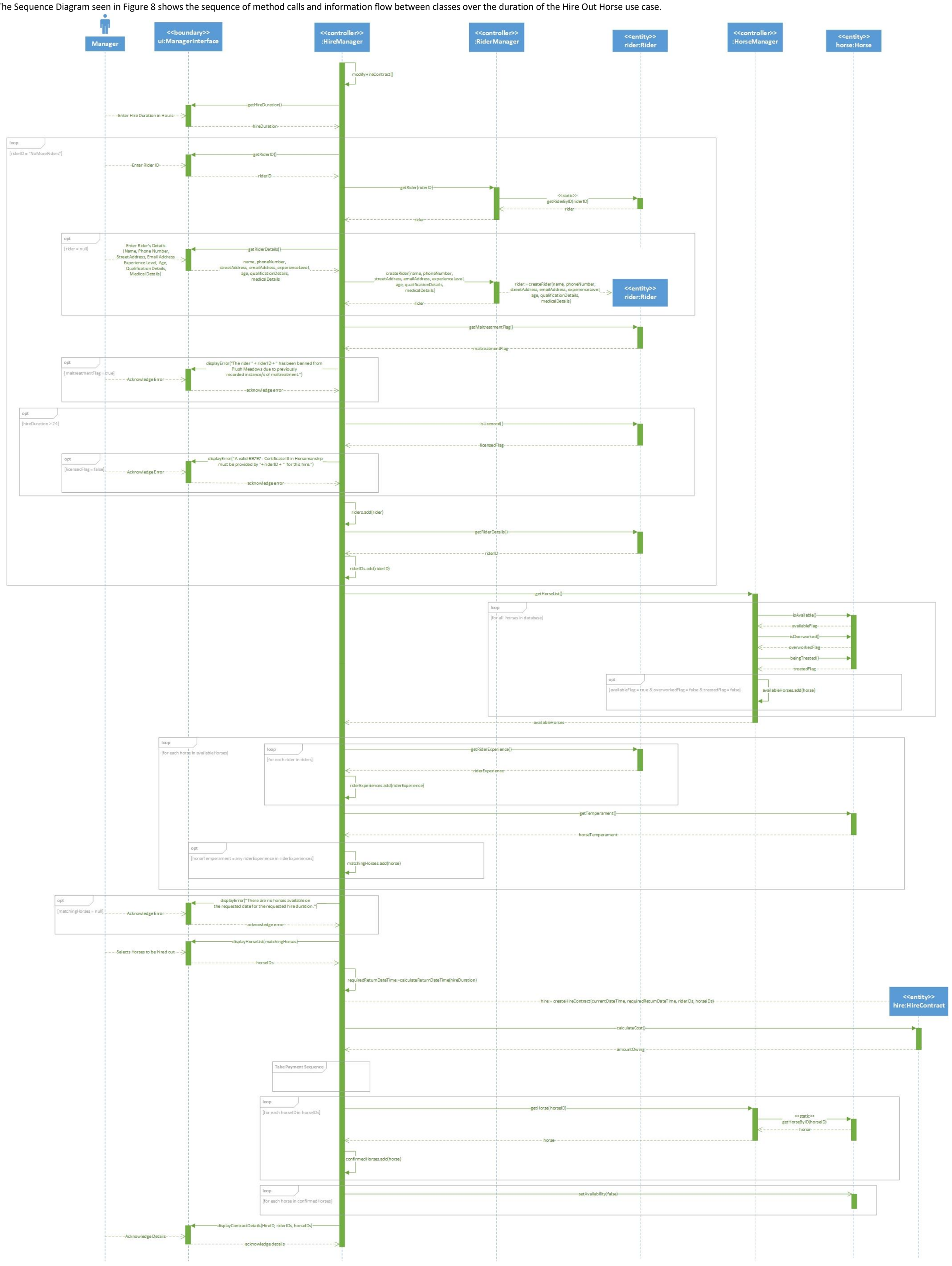


Figure 8. Sequence Diagram for Hire Out Horse

Take Payment

The Sequence Diagram seen in Figure 9 shows the sequence of method calls and information flow between classes over the duration of the use case Take Payment use case.

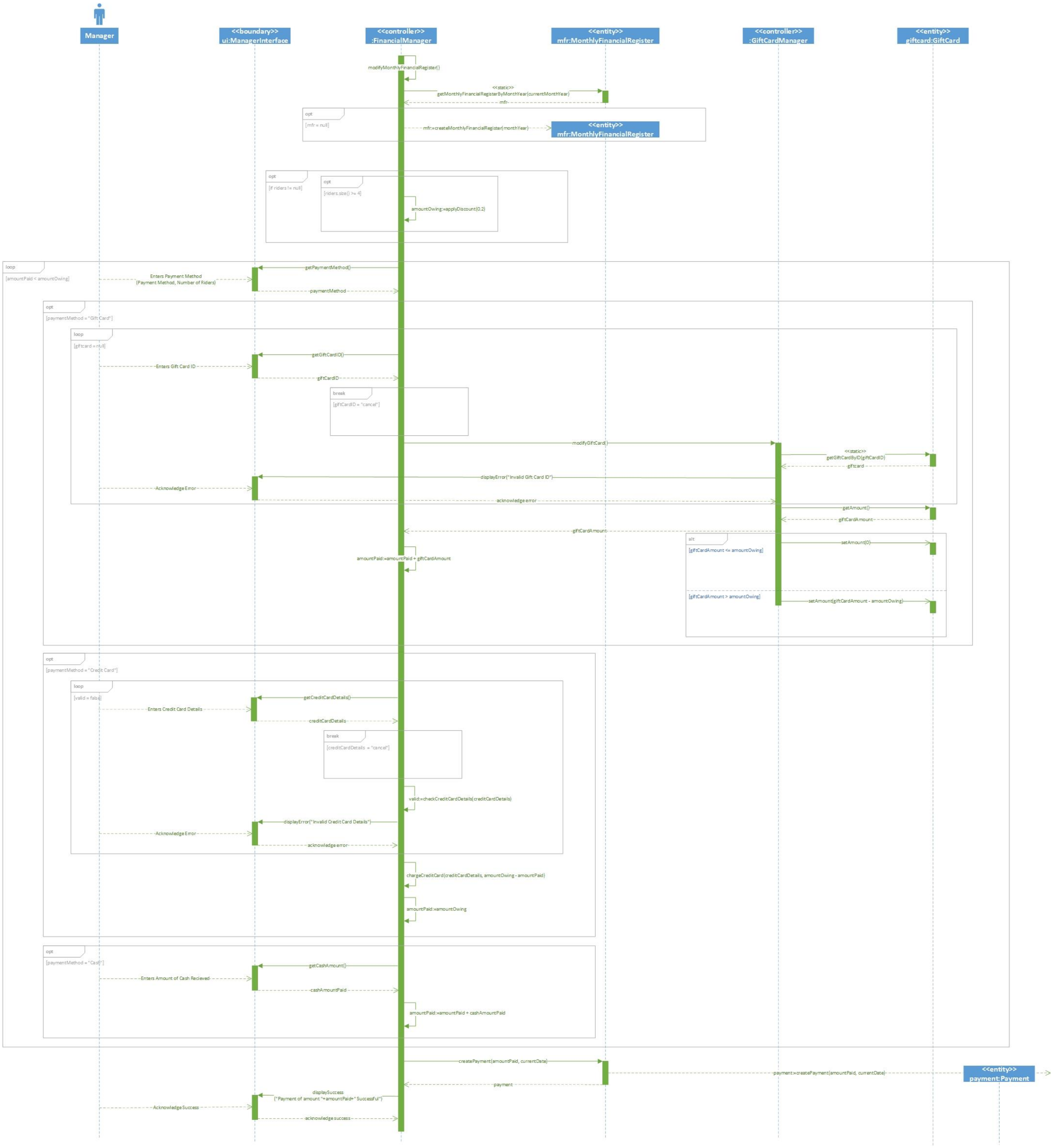


Figure 9. Sequence Diagram for Take Payment

User Interfaces

User Interface Models

Conduct Scheduled Check-up

The first interface displayed to the user in the Conduct Scheduled Check-up Use Case is a page for the Vet to enter the ID of the Horse they are conducting the check-up on as seen in Figure 10.

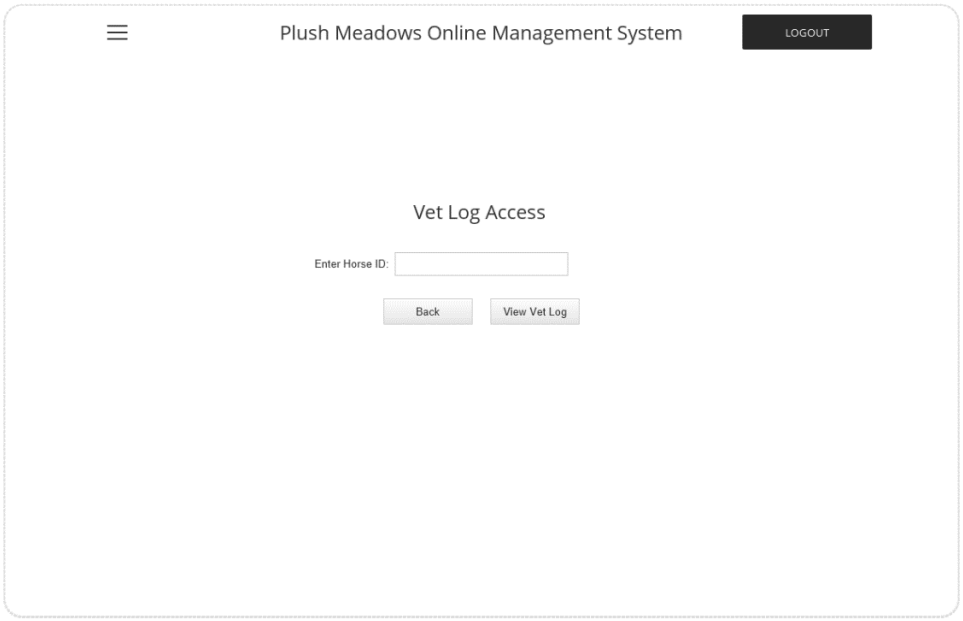


Figure 10: Vet Log Horse ID Input UI

The second interface displayed to the user is either an error page if the Horse ID is invalid as seen in Figure 11, or a display with the details of the Vet Log that corresponds to the Horse ID that was input as seen in Figure 12 where the Vet can check for current ongoing treatments and treatment history.

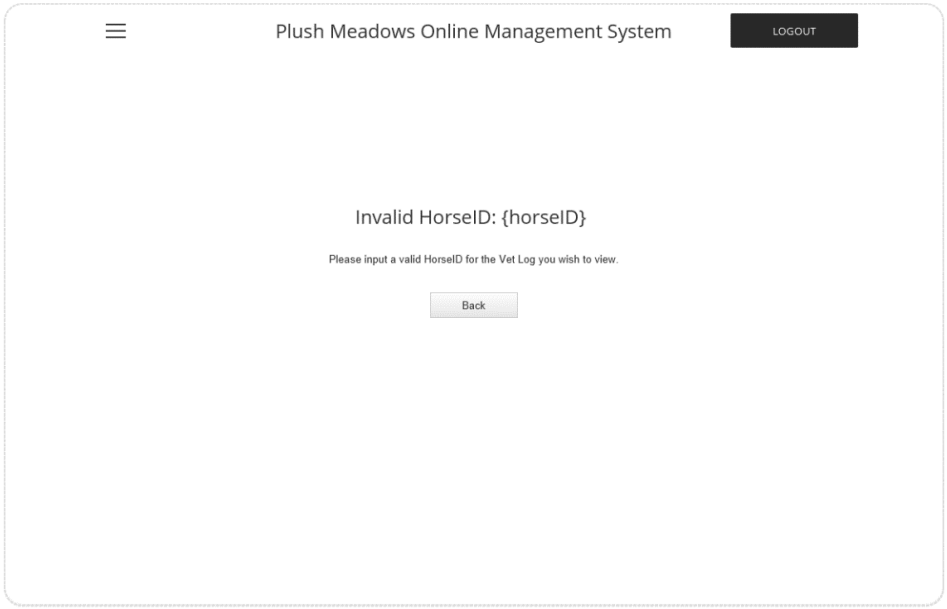


Figure 11: Vet Log Invalid Horse ID UI

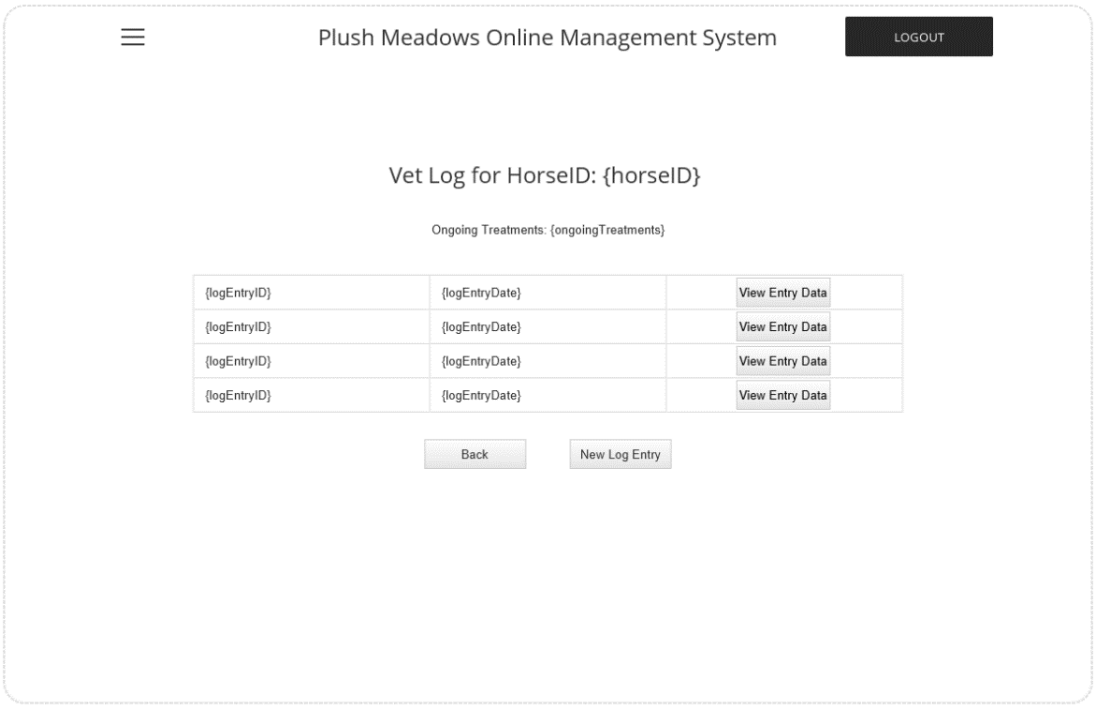


Figure 12: Vet Log Display UI

After conducting the physical Check-up, the Vet selects “New Log Entry” on the Log Display UI and is presented with a page to enter the details of the new log entry as seen in Figure 13.

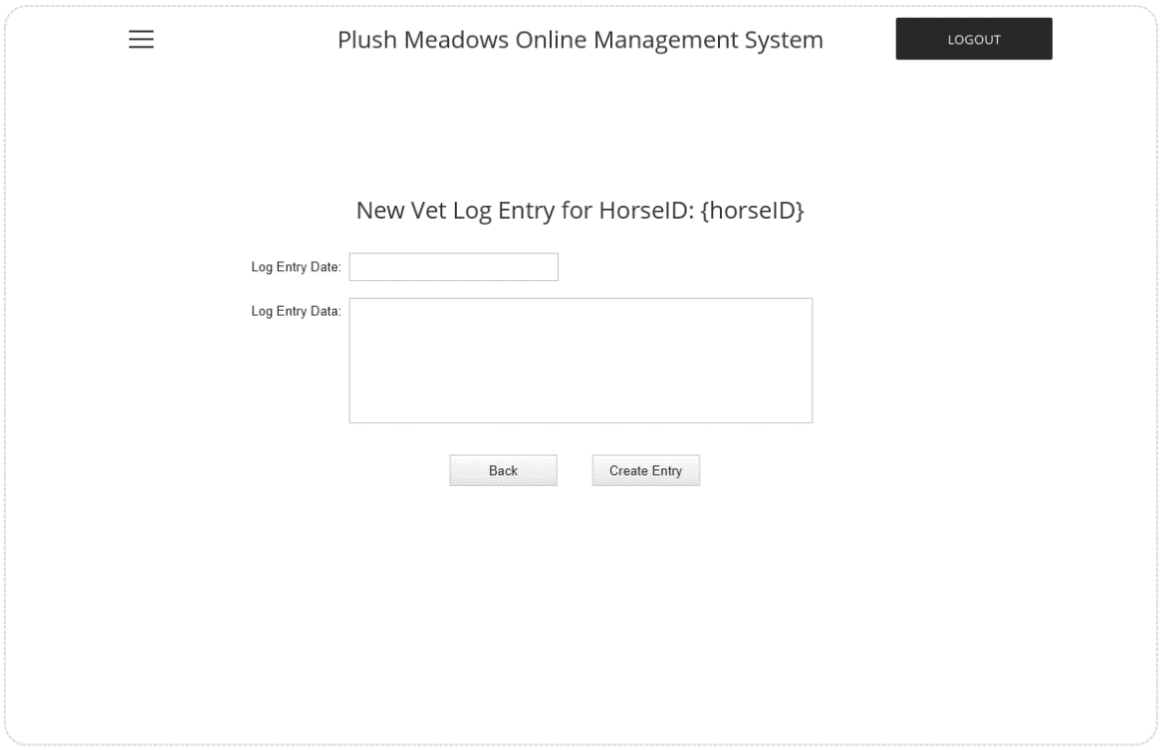


Figure 13: Vet Log New Entry Details UI

Once the Vet submits the new Log Entry a page is displayed for entering the details of any ongoing treatments as seen in Figure 14.

Figure 14: Vet Log Ongoing Treatments Input UI

Book In Horse

Figure 15 is the first interface displayed to the Manager when booking in a horse. The manager enters the Horse ID into the system to see if it is a new horse or returning horse that is already in the system.

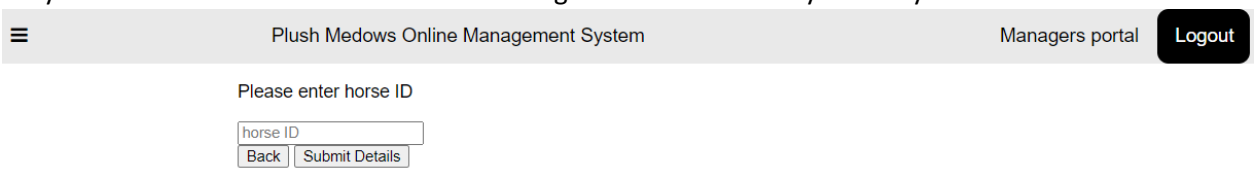


Figure 15: Book In Horse Horse ID Input UI

Figure 16 is the next interface for the Manager if the Horse ID is not found and a new horse needs to be created in the system. This interface is presented to the manager to input the new horse details.

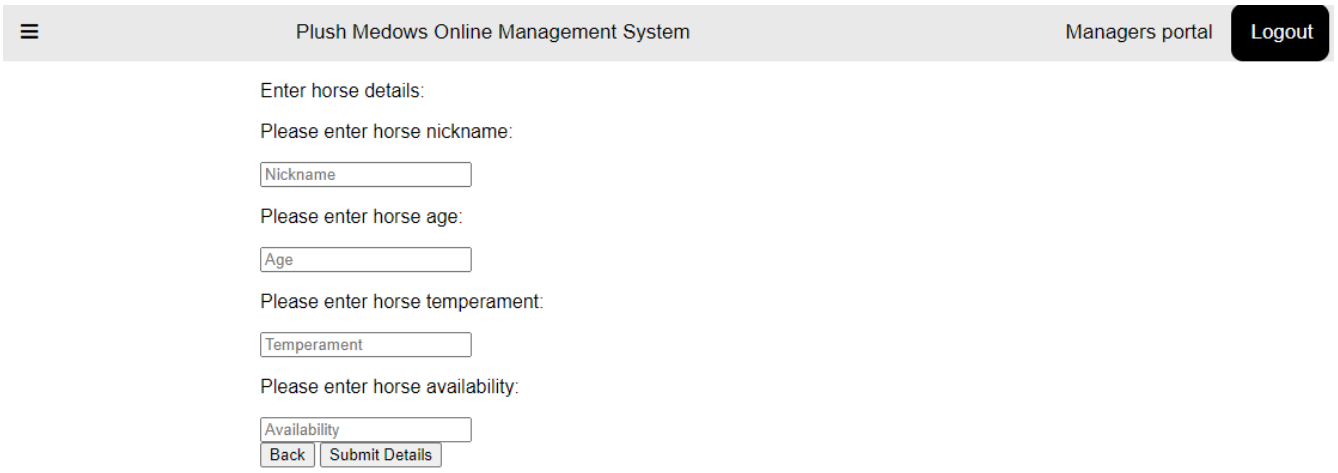


Figure 16: Book In Horse Horse Details Input UI

Figure 17 is the interface for the Manager once either a horse has been found or a new horse has been created. They now do the same for the Owner ID.

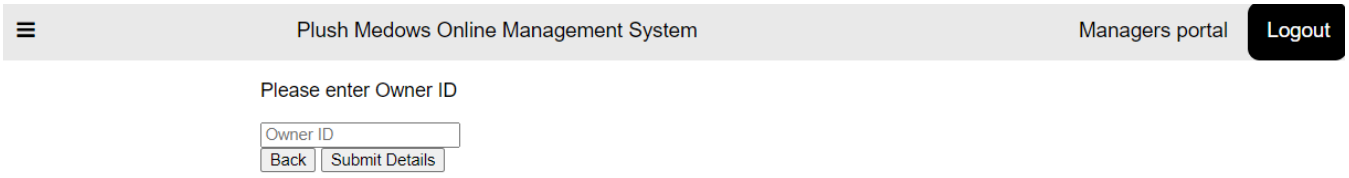


Figure 17: Book In Horse Owner ID Input UI

Figure 18 is the interface that is displayed to the manager if no Owner entity if found matching the Owner ID that was entered. The manager is then able to enter the owner's details to be stored.

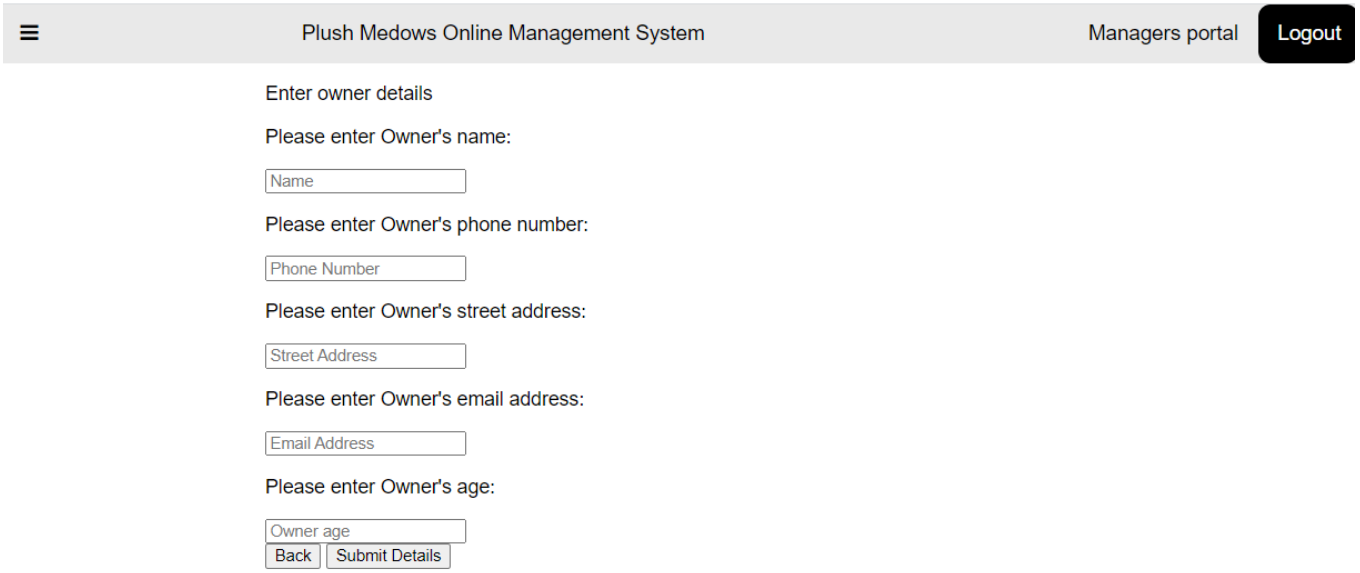
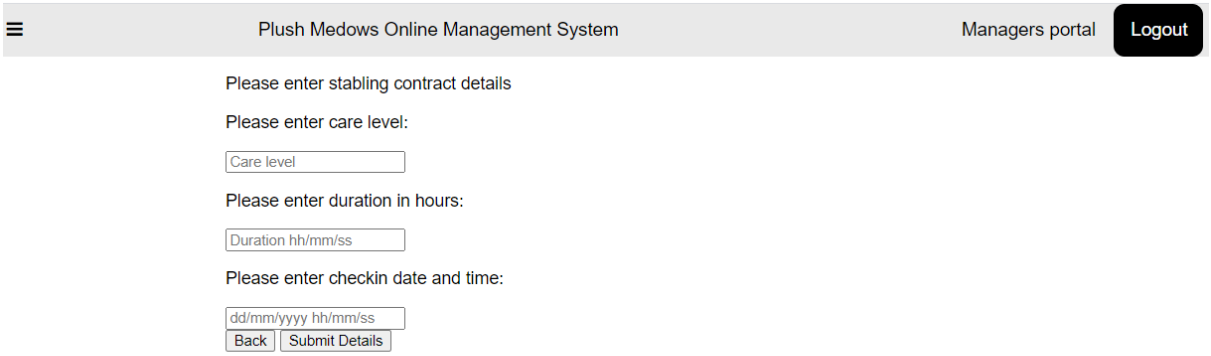


Figure 18: Book In Horse Owner Details UI

Figure

Figure 19 is the interface used to retrieve stabling contract details from the manager, this cannot be done unless an owner and horse was already obtained by the system. Now the manager can enter the contract details for booking in a horse and creating a new stabling contract by submitting these details.



Figure

Figure 19: Book In Horse Stabling Contract Details UI

Figure 20 is displayed after a new stabling contract has been successfully created.

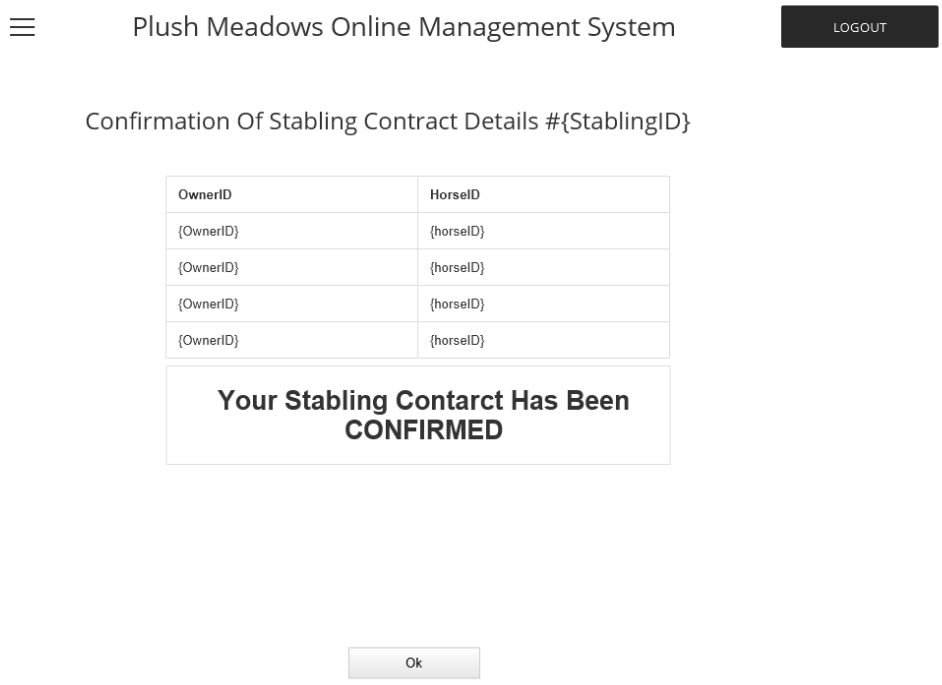


Figure 20: Book In Horse Stabling Contract Success UI

Hire Out Horse

When creating a new hire, the first interface displayed to the manager is the New Hire Request Form – Hire Date & Duration interface, as seen in Figure 21. From here, the manager selects to add a rider to the hire.

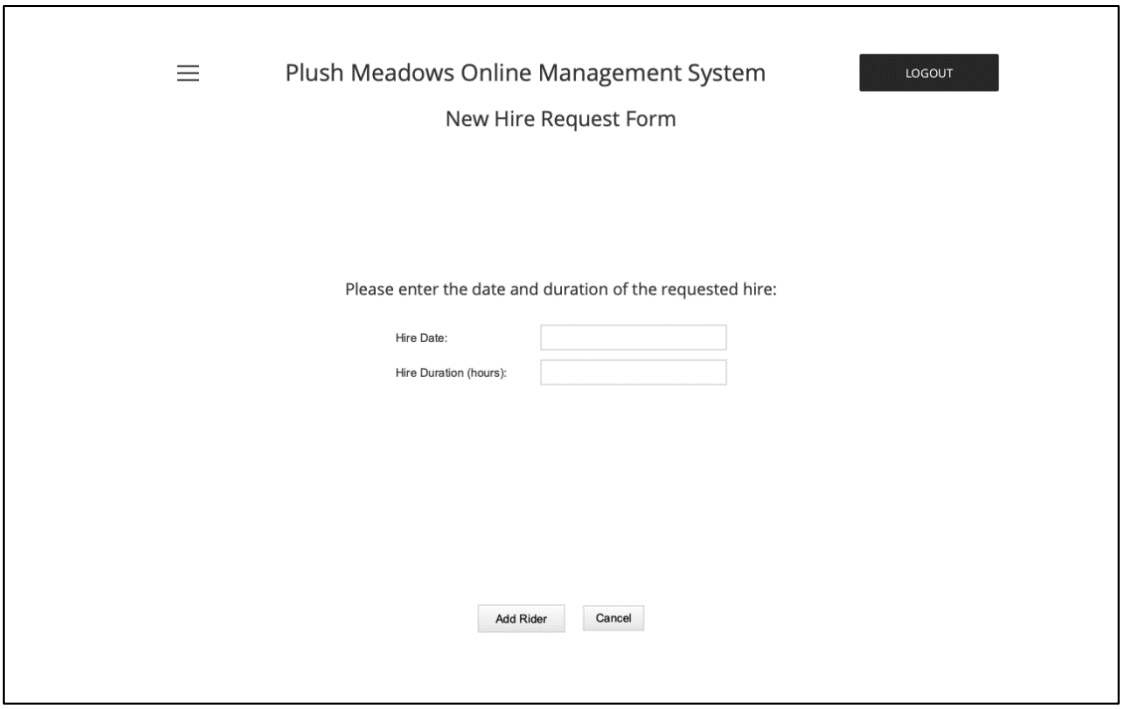


Figure 21: Hire Out Horse New Hire Request Form – Hire Date & Duration UI

The New Hire Request Form – Add Rider interface, seen in Figure 22, is a continuation of the New Hire Request Form. This interface allows the manager to enter the details of the rider/s. This interface includes the ability to search for the details of a customer who has previously hired from Plush Meadows via Rider ID or enter the details of a new customer. From here, the manager can add additional riders to the hire. Once all the riders are added, the manager proceeds to check the availability of suitable horses.

First, the system completes a Maltreatment Check, a Licence Check and compiles a list of horses for the requested hire. During this process:

- If the Maltreatment Check returns true, the error alert message "*The rider {riderID} has been banned from Plush Meadows due to previously recorded instance/s of maltreatment*." will be displayed to the manager.
- If the duration of the hire is greater than 24 hours and the Licence Check returns false, the error alert message "*A valid 69797 - Certificate III in Horsemanship must be provided by {riderID} for this hire*." will be displayed to the manager.

Assuming no error conditions are triggered, the system proceeds to remove any unavailable horses from the list, along with any horses currently overworked or undergoing treatment by the vet. Finally, the system invokes Check Rider Skills to match the experience levels of the riders and horses available, removing any horse whose temperament does not match one or more of the rider's experience levels.

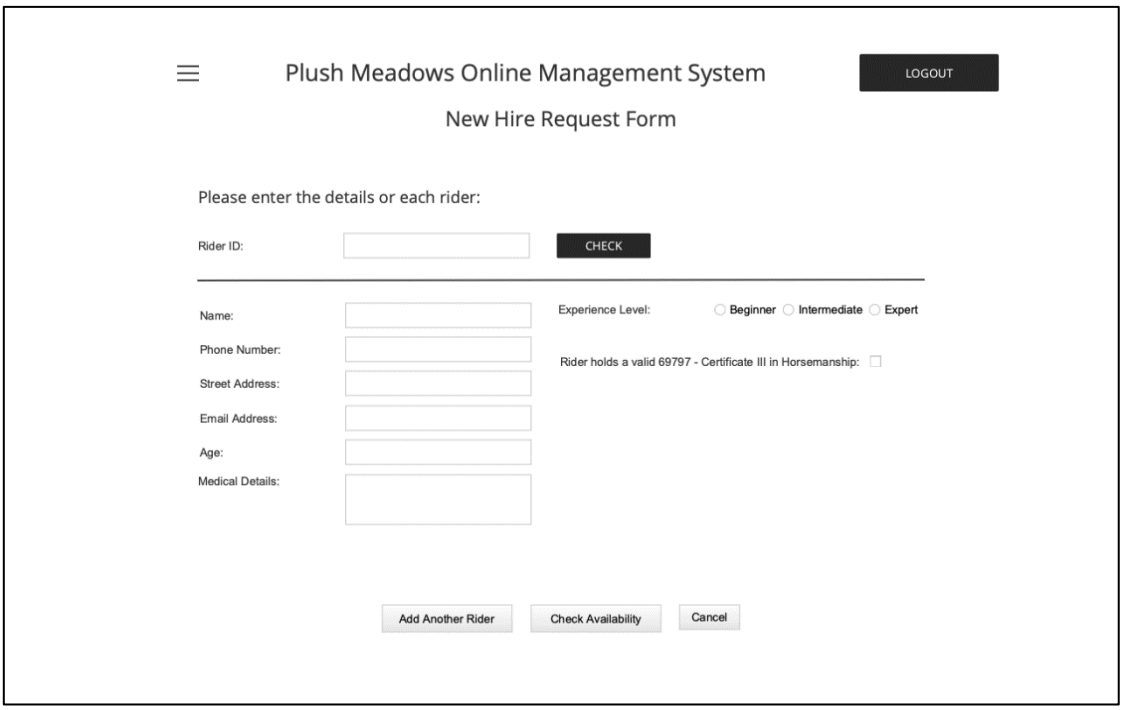


Figure 22: Hire Out Horse New Hire Request Form - Add Rider UI

The system then displays the Horses Available for Hire interface, as seen in Figure 23, with a list of horses matching the criteria set by the hire request. If the list of horses returned by the system is empty, the error message "*There are no horses available on the requested date for the requested hire duration*." will be displayed to the manager.

Assuming the list contains at the least the required number of horses to fulfil the hire request, the manager then selects a suitable number of horses from the list provided on the Horses Available for Hire interface and submits the lists.

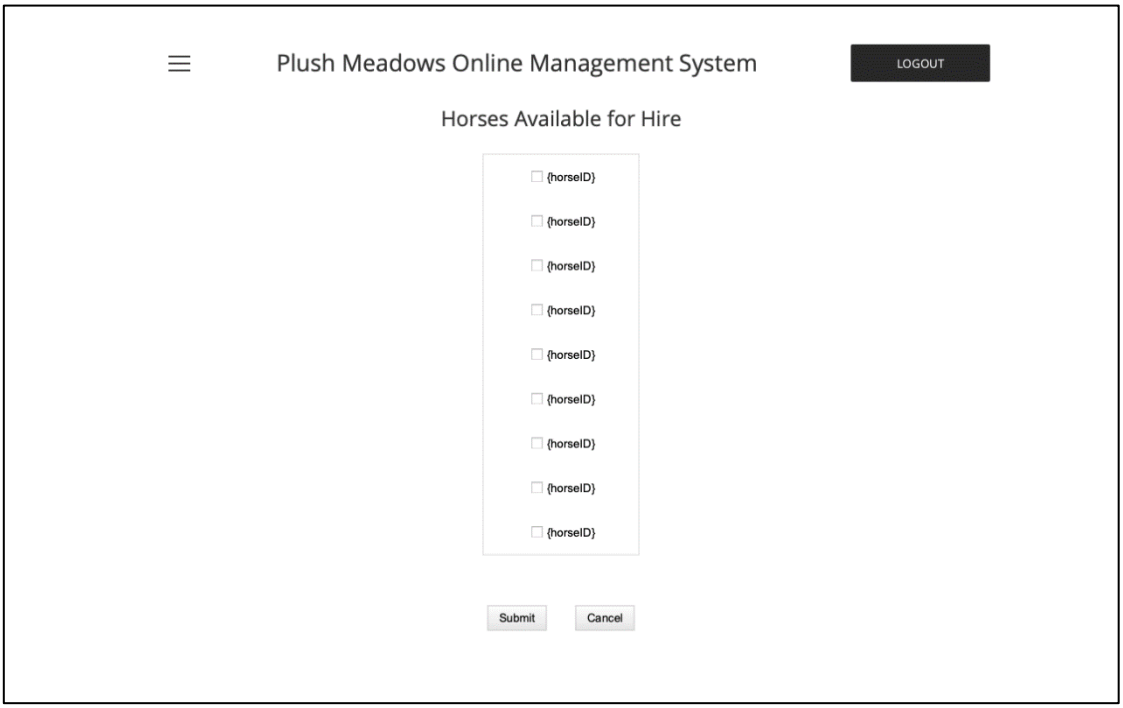


Figure 23: Hire Out Horse Horses Available for Hire UI

The system then calculates the cost of the hire based on the selected horses and displays the total amount of the hire along with the matched Rider IDs and Horse IDs on the Confirm Hire Details interface, as seen in Figure 24Figure 24: Hire Out Horse Confirm Hire Details , and prompts for payment.

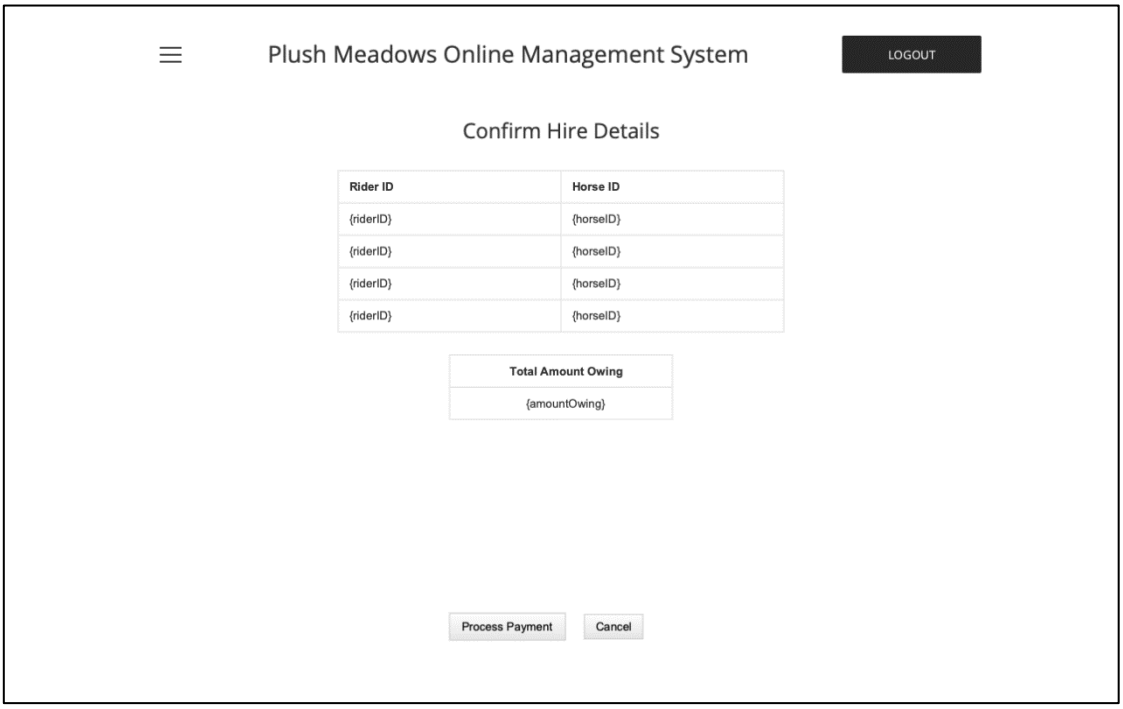


Figure 24: Hire Out Horse Confirm Hire Details UI

The manager selects Process Payment, and the system invokes the Take Payment Use Case. Once completed, the system displays the Confirmation of Hire interface, seen in Figure 25, to confirm the finalised details of the hire and provide the Hire ID to the manager and customer.

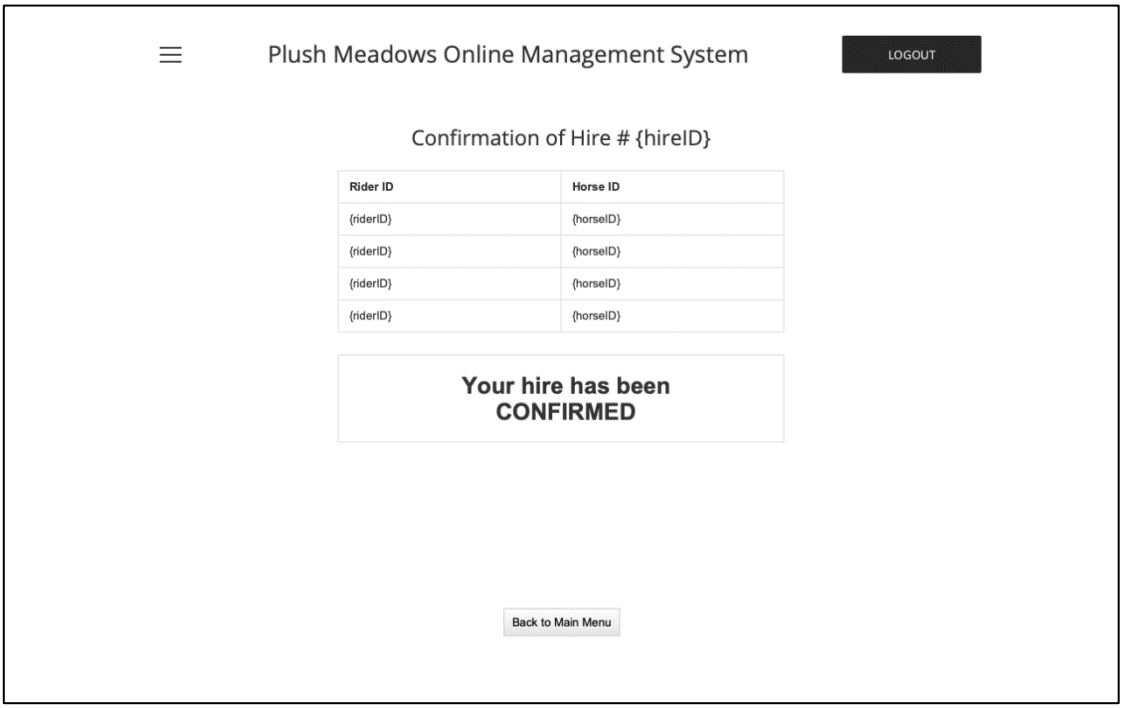


Figure 25: Hire Out Horse Confirmation of Hire UI

The Hire Out Horse use case is now complete. From here, the manager may select to return to the Main Menu or log out of the system.

Take Payment

Figure 26 is the interface which allows the manager to select a payment method by selecting a checkbox to start the payment process.

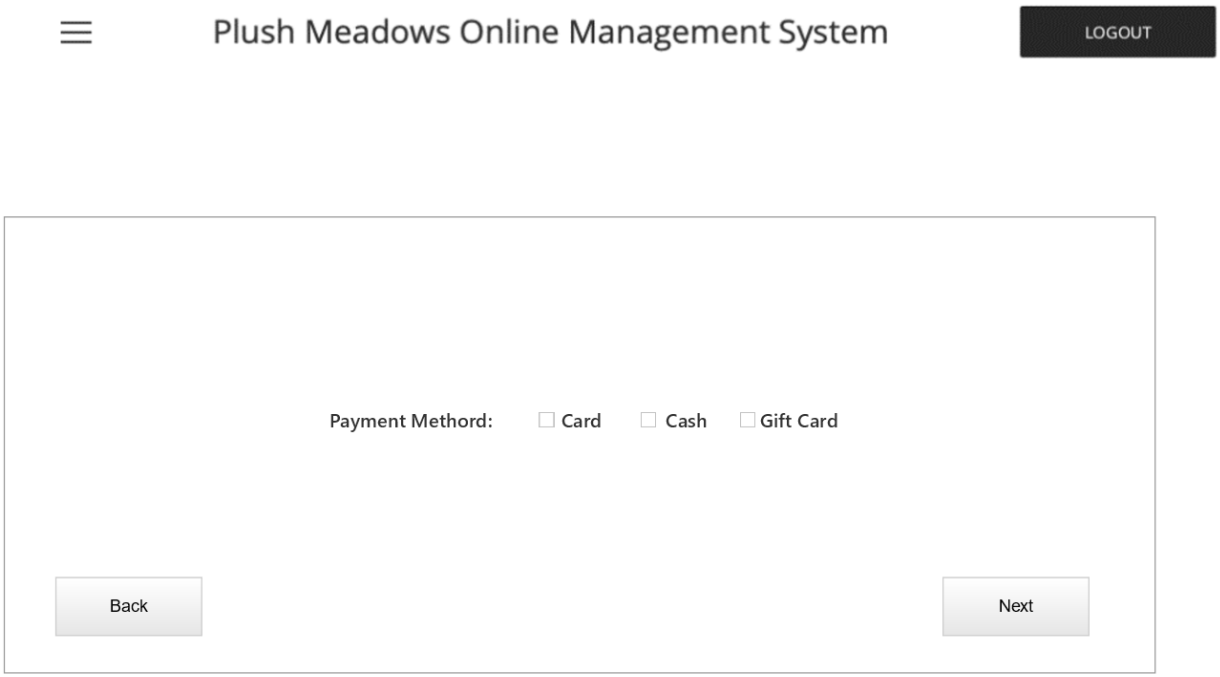


Figure 26: Take Payment Payment Method Selection UI

Figure 27 shows the gift card payment interface, the manager can enter the gift card ID to proceed with the gift card payment process. If the Gift Card ID entered is not valid, an error page is shown with the error “Invalid Gift Card ID”.

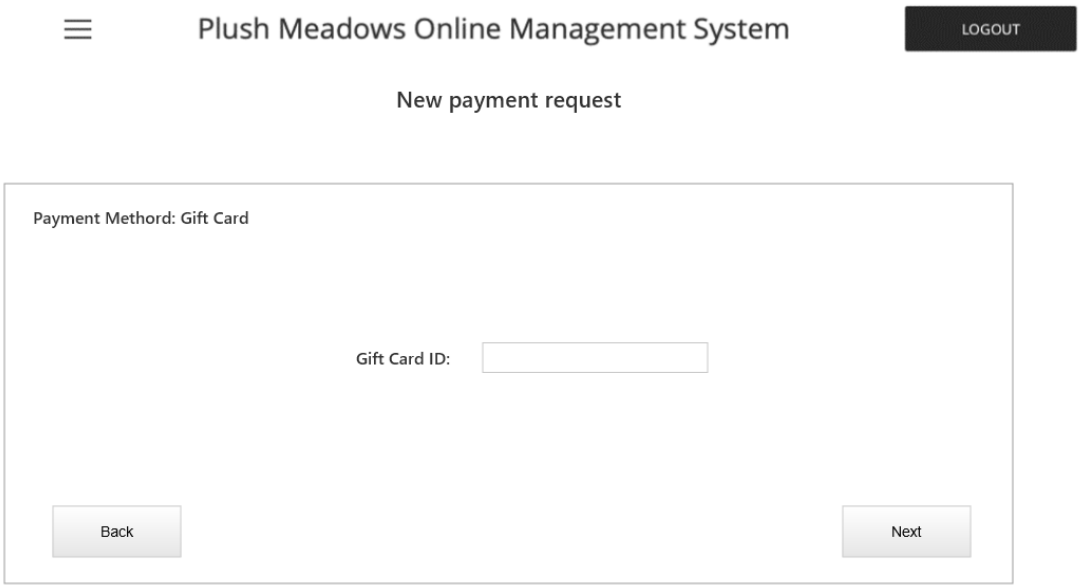


Figure 27: Take Payment Gift Card ID Entry UI

Figure 28 shows the card payment interface, the manager can enter the credit card details to proceed with the card payment process. If the system's validation of the credit card details is not successful, an error page is shown with the error "Invalid Credit Card Details".

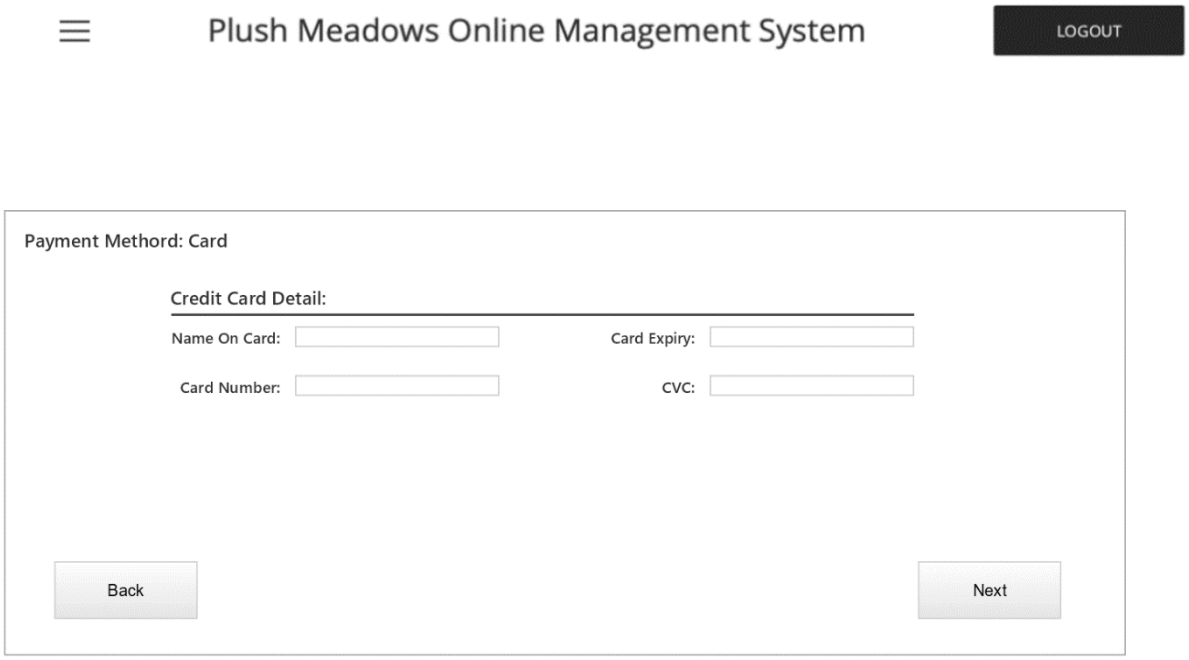


Figure 28: Take Payment Credit Card Details Entry UI

Figure 29 shows the cash payment interface, the manager can enter the cash amount to proceed with the cash payment process.

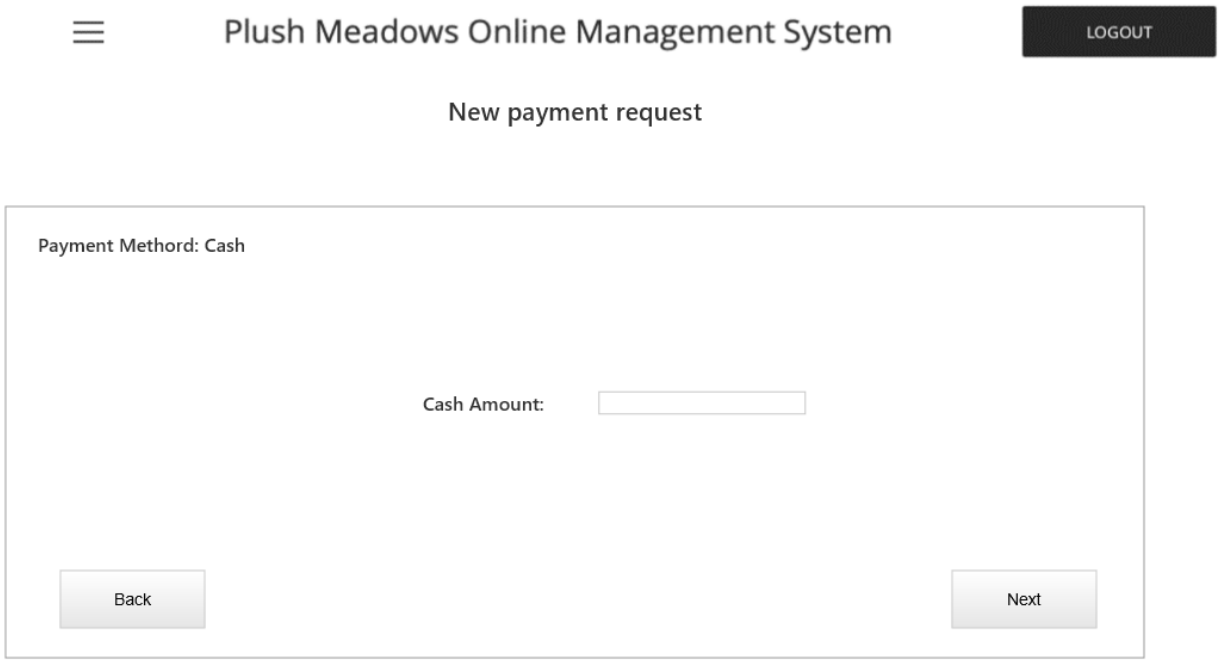


Figure 29: Take Payment Cash Amount Entry UI

Figure 30 shows the payment successful interface, the payment process is complete and the “amountPaid” is displayed.

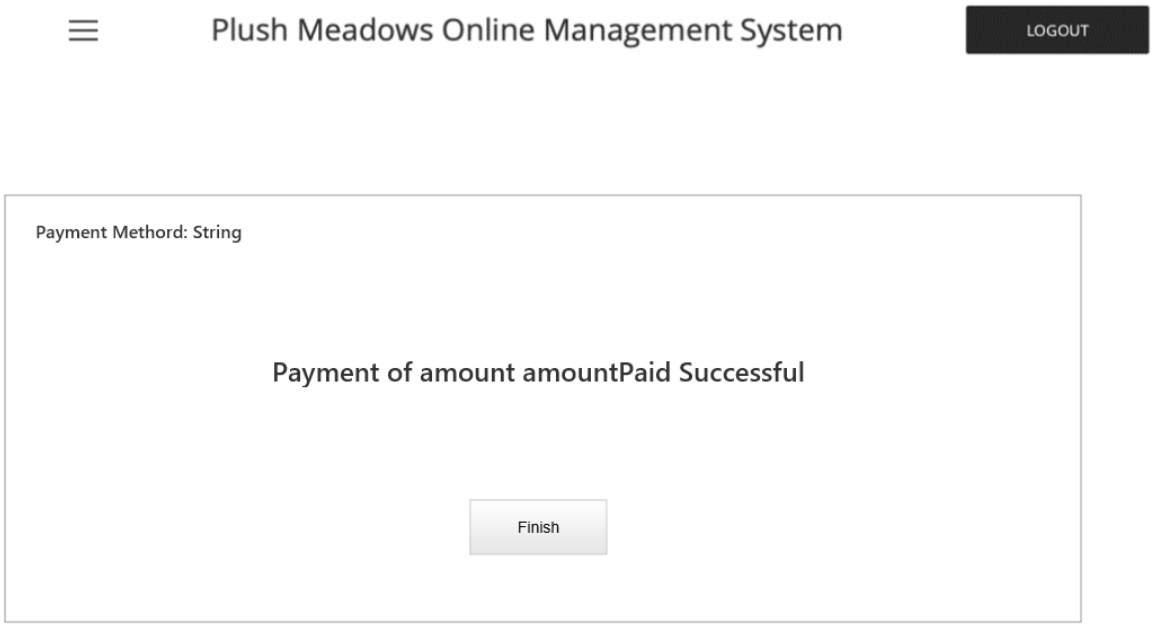


Figure 30: Take Payment Payment Successful UI

Deployment Strategy

Chosen Method

The parallel method of system deployment is best suited for the Plush Meadows Online Management System and the business needs of Plush Meadows.

Positives of Parallel Deployment

1. Parallel deployment provides a safety net allowing the old system to still run if the new system were to fail during introduction allowing the business to continue operations.
2. Parallel deployment allows for gradual training of staff so during the system implementation staff that need to take longer in learning the system can do so without any impact on the business functionality, performance, or reputation.
3. Parallel deployment allows real time testing of the system using current business data.
4. Parallel deployment allows comparison of both systems side by side allowing specific testing to be conducted to see when and how faults occur in the new system compared to the old.

Negatives of Parallel Deployment

The primary downside to this method is the extra cost associated with running both systems, however this cost can be justified if the following is considered.

1. The day-to-day operation of the business are not disrupted so there are no major impacts on revenue streams and business cash flow.
2. Once the system has been implemented it has done so only once with specific operational testing allowing for a certainty of performance.

Risks of Parallel Deployment

The major risks associated with the introduction of any new system are the fault tolerance of the business, data migration, and user training.

Fault Tolerance

As a business Plush Meadows has a medium level of fault tolerance due to business operation not being entirely dependent on System operation. Meaning there are still business activities that can be conducted without system input, and system faults would not cause a catastrophic loss of life or reputation.
The proposed deployment method minimises the risk of system faults effecting the business to an acceptable level through operational testing of the system and mitigating the impact of any faults through the ability to fall back to the old system if faults are found in the new system.

Data Migration

Plush Meadows has a low tolerance of risks associated with data migration as business-critical information is stored within the system that allows for current contracts to be enforced, payments to be tracked, and the identification of owners, riders, and horses.
The proposed deployment method minimises the risk of issues associated with data migration to an acceptable level by maintaining an unmigrated copy of all data in the old system that can be used as a reference if anything were to go wrong during migration.

User Training

Plush Meadows has a high tolerance of risks associated with user training due to the limited impact that undertrained users can have on the system based on their type of employment and access controls placed upon them.

The proposed deployment strategy mitigates this risk to an acceptable level through providing a crossover period where users that become competent with the new system can begin to assist in training users that are less competent. The risk will also be mitigated through introduction training where key users of the new system are provided with a train-the-trainer style training package allowing them to then train other individuals within the business on the new system.

Team Management

Projects Management Approach

According to this project scope, the project manager, Kurtis Simpson, was the overall authority and responsible for managing and directing the project. The current project team consists of:

- Kurtis Simpson – Project Manager, Communications Manager.
- Stephen Watson – Team Management.
- Isabella Andrews – Quality Assurance Manager.
- Yaokeng Chen – Technical Details Manager.

Project Scope

The scope of this assignment was to conduct analysis and design of an online management system that allows the following:

- Provide manager access to all information required to make booking decisions.
- Maintain and highlight safety as a priority for all parties involved.
- Allows all staff to communicate effectively.

Communications Management Plan

This Communications Management Plan sets the communications framework for this project. It serves as a guide for communications throughout the life of the project and will be updated as communication requirements change. This plan identifies and defines the roles of RISKY project team members.

The Communications Manager will take the lead role in ensuring effective communications on this project.

Table 5: Team Responsibilities

Communication Type	Description	Frequency	Format	Participants	Deliverable	Responsibility
Weekly Status Report	Message Summary on project status	Weekly	Via Discord	The Project Manager sends it to all team members.	Status Report	Kurtis Simpson
Weekly Project Team Meeting	Meeting to review action register and status.	Weekly	Via Discord	Project Team	Updated Actions required	Stephen Watson
Content Reviews and Proofreading	The closeout of project phases and kickoff of subsequent phase.	As Needed	Online	Team members in need of approval for finalised work.	Completion of that members work phase, e.g., introduction or conclusion.	Isabella Andrews
Technical Design Review	Review any technical designs or work associated with the project and lead the team to approach tasks.	As Needed	Online	Team members in need of advice or assistance.	At the beginning or during any phase of the work.	Kurtis Simpson
Project research	Gathering required resources for team members	As Needed	Online	Team members in need of advice or assistance.	During any phase of the project	Yaokeng Chen

Communications Conduct

Meetings

The Communication Manager will distribute a meeting agenda at least two days before any scheduled meeting, and all participants are expected to review the agenda prior to the meeting.

Informal Communications

While informal communication is a part of every project and is necessary for successful project completion, team members must communicate any issues, concerns, or updates from an informal discussion to the Project Manager so they may take the appropriate action. If the team member does not feel they can talk to the Project Manager, the Course Coordinator or Lab Demonstrator should be approached.

Team meeting Minutes

Meeting 1

SENG2130 Systems Analysis and Design

Minutes of meeting

Team: RISKY Place: Online Date/Time: 05/05/2021 1800

In attendance

- Kurtis Simpson
- Stephen Watson
- Isabella Andrews
- Yaokeng Chen

Apologies

N/A

Agenda

- Matters arising from previous meeting.

No issues to discuss. This is our first meeting regarding the assignment.

- Agenda items (as needed)
  - Review assignment 1 feedback
  - Establish editing and updating of use cases, establish Gantt chart and tasks required.
  - Review project management plan from assignment 1 and alter as required.
  - Review, edit, update the class diagram.
- Date, time and place for next meeting

Wednesday 12th May. 6pm via online

- Matters for consideration at next meeting.
- Make sure all Tasks are completed or contact is made if a member is not on track.
  - Edit update and improve business rules.
  - Edit update individual use cases.
  - Update Gantt chart.

Action sheet

Task	Responsible	Due	Notes
Organise team members.	Kurtis	Ongoing.	Keep everyone on track with the design structure of the project.
Communication between all members	Stephen	Ongoing.	Keep all team members actively communicating and make sure milestones are being met.

Review and edit team management plan.	Stephen, Kurtis, Isabella, Yaokeng	End of today	Have all members review how assignment one left and are we happy how we created and deploy the project as a team.
Review and edit class diagram.	Kurtis	ongoing	Edit and update the class diagram as required to make sure the system design is the best it can be.
Review and edit use case diagrams.	Stephen, Kurtis, Isabella, Yaokeng	Next week's meeting.	Have your individual use cases edited and updated based on feedback given to have them finalised and approved and completed.
Review and edit business rules.	Yaokeng	Next week's meeting.	Have your individual business rules edited and updated based on feedback given to have them finalised and approved and completed.
Create Gantt chart and update it.	Kurtis	End of today	Create Gantt chart to give the project structure, and define all tasks required.

Meeting 2

SENG2130 Systems Analysis and Design

Minutes of meeting

Team: RISKY Place: Online Date/Time: 12/05/2021 1800

In attendance

- Kurtis Simpson
- Stephen Watson
- Isabella Andrews
- Yaokeng Chen

Apologies

N/A

Agenda

- Matters arising from previous meeting.

Nothing to report.

- Agenda items (as needed)
  - Approve all edited updated material which is, Individual Use Case diagrams, business rules and Gantt chart.
- Date, time and place for next meeting

Wednesday 19th May 6pm via online.

- Matters for consideration at next meeting.
  - Matters for consideration at next meeting.
  - Finalise and compete subset diagrams, sequence diagrams.
  - Start designing user interfaces.
  - Complete user interface by next meeting
  - Draft conclusion.
  - Draft deployment.
  - Start building the report.

Action sheet

Task	Responsible	Due	Notes
Create and establish our individual subset class diagrams.	Kurtis, Stephen, Isabella and Yaokeng	19/5	Create, draft, and have class subset diagrams ready for approval by next week's meeting.

Draft individual sequence diagrams.	Kurtis, Stephen, Isabella and Yaokeng	19/5	Have sequence diagrams drafted up by next week ready for group approval.
Approve and finalise all material from last week. Being both individual use cases and business rules.	Kurtis, Stephen, Isabella and Yaokeng	End of today	Three team members ae to review and approve the use case diagrams of all members No member is to review their own. Make any changes and have completed and finished by tonight. Also have the business rules approved and completed.
Update Gantt chart	Kurtis	End of today	Gantt updated and accurate ready for next week.

Meeting 3

SENG2130 Systems Analysis and Design

Minutes of meeting

Team: RISKY Place: Online Date/Time: 19/05/2021 1800

In attendance

- Kurtis Simpson
- Stephen Watson
- Isabella Andrews
- Yaokeng Chen

Apologies

N/A

Agenda

- Matters arising from previous meeting.

Gantt Chart has been updated with tasks to be assigned this week.

- Agenda items (as needed)
- Finalise and compete subset diagrams, sequence diagrams.
- Start designing user interfaces.
- Complete user interface by next meeting.
- Draft conclusion.
- Start building the report.

- Date, time and place for next meeting

Wednesday 26th May 6pm via online.

- Matters for consideration at next meeting.

Everyone ensure you are on track to have the final report completed by 27th of May.

Action sheet

Task	Responsible	Due	Notes
Finalise subset diagrams.	Kurtis, Stephen, Isabella and Yaokeng	26/5	Approve all subset diagrams ready for final report.

Finalise sequence diagrams.	Kurtis, Stephen, Isabella and Yaokeng	26/5	Complete and approve all sequence diagrams ready to be placed into the final report.
Start designing user interfaces.	Kurtis, Isabella	23/5	Kurtis and Isabella have the user interface designed and ready by Sunday 23rd May so each member can make slight alterations to suit their needs.
Complete user interfaces ready for approval.	Kurtis, Stephen, Isabella and Yaokeng	26/5	Every member has their interfaces done and ready for approval and insertion into the final report.
Building of the final report	Stephen	26/5	Have a strong template and formatted draft of the report done ready for Isabella to make any editing changes. Minimal editing required if possible.
Draft deployment	Stephen	26/5	Have a strong template and formatted draft of the deployment strategy done ready for Isabella to make any editing changes. Minimal editing required if possible.
Draft conclusion	Yaokeng	26/5	Have a good draft of the conclusion ready by next week to allow Isabella time to edit any material required as she builds the report.

Meeting 4

SENG2130 Systems Analysis and Design

Minutes of meeting

Team: RISKY Place: Online Date/Time: 26/05/2021 1800

In attendance

- Kurtis Simpson
- Stephen Watson
- Isabella Andrews
- Yaokeng Chen

Apologies

N/A

Agenda

- Matters arising from previous meeting.

No matters to be discussed.

- Agenda items (as needed)

Everything needs to be finalised and placed into the report on MS Teams.

- Date, time, and place for next meeting

No future official meeting has been scheduled.
Unofficial contact will be made over the next forty-eight hours, between all members if anything is required to be done so the project meets the deadline and is presented to the highest quality possible.

- Matters for consideration at next meeting.

Action sheet

Task	Responsible	Due	Notes
Finalise the report and have it ready for submission.	Isabella	27/5	Have the report completed ready to submit.
Update Gantt chart	Kurtis	Today	Completed Gantt chart finished.
Final Editing	Steve	Today	Final inserting of and editing of material ready for Isabella tomorrow.
Approval subset and sequence diagrams.	Kurtis, Stephen, Isabella and Yaokeng	Today	Everyone approves each other's subset diagrams ready to be inserted into the report.

Approval of the interface designs	Kurtis, Stephen, Isabella and Yaokeng	Today	Everyone approves each other's interfaces ready to be inserted into the report.

Meeting 5

SENG2130 Systems Analysis and Design

Minutes of meeting

Team: RISKY Place: Online Date/Time: 27/05/2021 1800

In attendance

- Kurtis Simpson
- Stephen Watson
- Isabella Andrews
- Yaokeng Chen

Apologies

N/A

Agenda

- Matters arising from previous meeting.

No matters to be discussed.

- Agenda items (as needed)

Have team review and agree on is the project and submit.

Action sheet

Task	Responsible	Due	Notes
Agree project is ready.	Kurtis, Stephen, Isabella, Yaokeng	27/5	Have the final project approved by everyone.
Submit project.	Kurtis	28/5	Submit the project.
Celebrate as team.	Kurtis, Stephen, Isabella, Yaokeng	28/5	Teamwork makes our dream work. And we have been happy working with each other on this project.

Microsoft Teams Analytics

Due to Microsoft Teams causing frequent disconnects and latency issues for multiple members it was decided that to facilitate effective communication team meetings would be conducted on Discord. MS Teams was still utilised for file tracking.

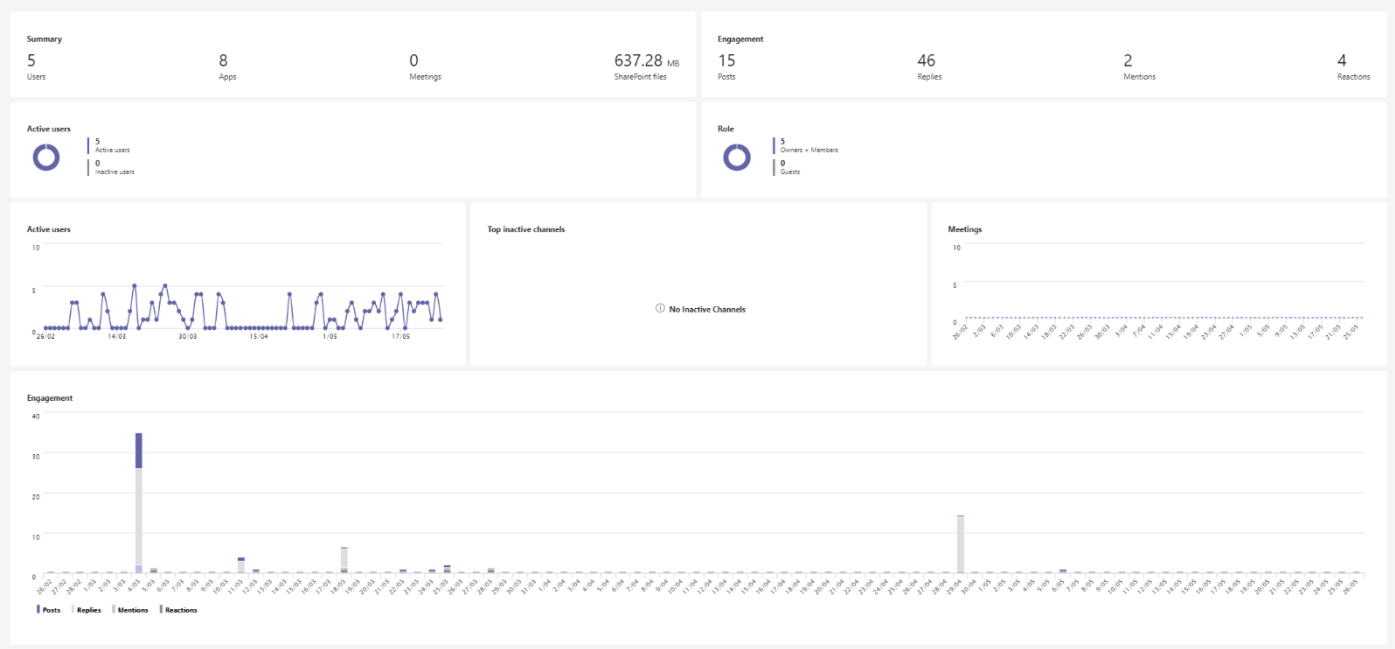


Figure 26: MS Teams Analytics Screenshot

Team summary

The team's workflow has continued from the first project's structure as we felt it to be quite successful. Most of the communication has been informal messages through Facebook Messenger, online meetings via the Discord platform and file version tracking through Microsoft Teams. The team has worked well together across all aspects of the project under the leadership of Kurtis. The team feels that each team member meets expectations when reviewing each other's work, and the team's feedback process produces good results. All RISKY team members feel each member fulfils their responsibilities sufficiently.

Conclusion

In summary, this report outlines team RISKY's updated and expanded analysis and design for the Plush Meadows Online Management System.

Existing processes at Plush Meadows, current legislation, and privacy considerations provide the Business Rules framework. The Design Class Diagram and relevant subsets clarify the system's structure and describe how the system's internal components interact to reduce coupling and increase cohesion. The amendment and additional development of relevant Use Case Descriptions and creation of the appropriate detailed Sequence Diagrams and User Interface Models illustrate the proposed system's workflow and how actors interact with the system.

The report outlined the positive and negative aspects of the parallel method of system deployment. Further, it supported the team's chosen deployment strategy by discussing the risks of this method in the context of the Plush Meadows Online Management System.

The team's progress and development were documented in Microsoft Teams, weekly meeting minutes and via the team Gantt Chart.

Overall, the team is confident the task specifications are satisfied by this report. The team gained valuable insight into additional system requirements and implementation practices by developing and completing this detailed analysis and design of the Plush Meadows Online Management System.

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