

Group Assignment-2

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1. Introduction

1.1 Project Overview

This document provides a detailed analysis for a new video store management system. The system is intended to manage the rental and sale of entertainment materials, including video tapes, CDs, and DVDs. A key feature of the system will be its integration with bar code scanning devices to streamline the processes of renting, returning, and selling items. The system will also support customer-facing features such as reserving materials and ordering items that are not currently in stock. The primary goal is to create a robust and efficient system that manages inventory, customer data, and transactions seamlessly.

1.2 Purpose of this Document

The purpose of this document is to provide a comprehensive, detailed textual description of the core use cases identified for the video store system. As per the assignment requirements, this analysis serves as the foundation for the system's development. By clearly defining the interactions between users (actors) and the system, we aim to eliminate ambiguity and ensure that the final product aligns perfectly with the business requirements. This document will detail the workflows, preconditions, postconditions, and alternative/exception paths for each primary function.

1.3 Scope

The scope of this document is limited to the detailed analysis of the following four key use cases:

- **Rent Video**
- **Return Video**
- **Reserve Video**
- **Order Video**

This analysis covers the functional requirements from the perspective of the system's users. It does not include non-functional requirements, system architecture, database design, or implementation details, which would be covered in subsequent project phases.

2. System Actors and Use Case Diagram

2.1 Primary Actors

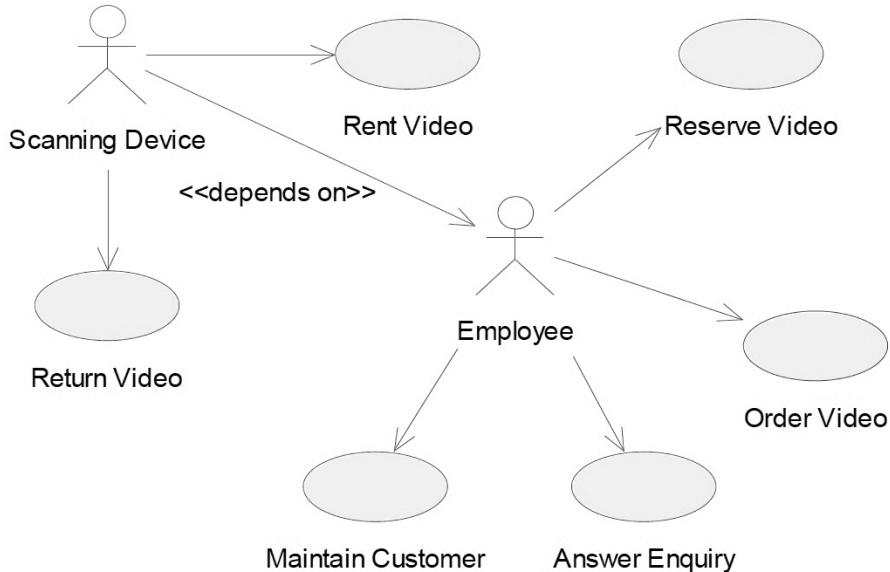
The system involves interactions with several key actors:

- **Employee:** A staff member of the video store who facilitates various processes such as customer management, answering enquiries, processing rentals and returns, and handling special orders.
- **Customer:** An individual who interacts with the store to rent, return, reserve, or purchase entertainment material. While not explicitly shown interacting with all use cases in the diagram, they are the initiator or beneficiary of most processes.
- **Scanning Device:** A hardware component (bar code scanner) that interacts with the system to identify entertainment media quickly and accurately during rental and return operations.

2.2 Use Case Diagram

The following diagram illustrates the relationships between the system's actors and the primary use cases. It provides a high-level overview of the functionalities that will be described in detail in this document.

Figure 1: A use-case diagram for the video store



3. Detailed Use Case Descriptions

This section provides the formal, detailed textual descriptions for each of the four main use cases.

3.1 Use Case 1: Rent Video

This use case describes the process of a customer renting one or more items from the store.

3.1.1 Use Case Details

- **Use Case Name:** Rent Video
- **Actor(s):**
 - **Customer:** The primary actor who selects items for rental.
 - **Employee:** A secondary actor who facilitates the transaction.
 - **Scanning Device:** The hardware used to input item data into the system.
- **Goal:** To allow a customer to rent one or more available videos, process payment, and update the inventory accordingly.
- **Preconditions:**
 1. The customer must have a valid, active membership account with the store.
 2. The entertainment item(s) to be rented must be physically present and listed as 'Available' in the inventory system.
 3. The Point-of-Sale (POS) system and Scanning Device must be online and fully functional.
- **Triggers:** The customer brings their selected item(s) to the checkout counter to initiate the rental process.

3.1.2 Main Success Scenario

1. **Initiate Transaction:** The Employee starts a new rental transaction on the system.
2. **Identify Customer:** The Employee asks for the customer's membership card or looks them up in the system by name or phone number. The system retrieves and displays the customer's account details and status.

3. **Scan Items:** The Employee uses the **Scanning Device** to scan the barcode on each video the customer wishes to rent.
4. **System Retrieves Item Details:** For each scanned item, the system instantly retrieves and displays its details from the inventory database, including:
 - Title and format (e.g., DVD, Blu-Ray).
 - The standard rental duration and its associated charge.
 - The current recorded condition of the specific copy (e.g., Excellent, Good).
5. **Confirm Rental Terms:** The system aggregates the items into a single transaction. The Employee confirms the total rental fee and the due date with the customer.
6. **Process Payment:** The customer selects a payment method (cash, credit/debit card). The Employee processes the payment through the system.
7. **System Records Transaction:** Upon successful payment, the system:
 - Creates a unique rental record linking the customer's ID to the specific item IDs.
 - Logs the rental date and calculates the due date.
 - Updates the status of each rented item in the inventory database from 'Available' to 'Rented'.
 - Decrement the count of available copies for that title.
8. **Generate Receipt:** The system generates and prints a receipt detailing the rented titles, total cost, and the return due date.
9. **Conclude Transaction:** The Employee gives the receipt and the rented videos to the customer, concluding the use case.

3.1.3 Alternative Flows

- **Video Not Available:**
 - If an item is scanned and the system shows it is not available for rent (e.g., already rented, reserved for another customer), the system will display an alert.

- The Employee informs the customer. The customer can choose to remove the item from the transaction or place a reservation for it (initiating the "Reserve Video" use case).
- **Customer Account Has Issues:**
 - If the system indicates the customer's account has issues (e.g., outstanding late fees, expired membership), the system will block the rental.
 - The Employee will inform the customer of the issue. The rental cannot proceed until the issues are resolved (e.g., late fees are paid).
- **Payment Fails:**
 - If the customer's payment is declined, the system will display a payment failure message.
 - The transaction is paused. The customer can provide an alternative payment method to complete the transaction. If they cannot, the employee cancels the transaction, and the inventory status of the items remains 'Available'.

3.1.4 Exception Flows

- **System Error:**
 - If the system experiences a critical error or goes offline during the transaction, the Employee will resort to a manual, paper-based rental process.
 - The transaction details will be entered into the system once it is back online to ensure inventory accuracy.
- **Unreadable Barcode:**
 - If an item's barcode is damaged and cannot be scanned, the Employee will attempt to look up the item manually in the system using its title or internal ID number.

3.2 Use Case 2: Return Video

This use case describes the process of a customer returning previously rented items.

3.2.1 Use Case Details

- **Use Case Name:** Return Video
- **Actor(s):**
 - **Customer:** The primary actor who brings back a rented video.
 - **Scanning Device:** The hardware used to process the return.
 - **Employee:** A secondary actor who can assist or oversee the return.
- **Goal:** To process the return of a rented video, check for timeliness, assess any fees, and update the video's status in the inventory system.
- **Preconditions:**
 1. The video being returned must have an active rental record in the system.
 2. The video must have a readable barcode.
 3. The system and Scanning Device must be operational.
- **Triggers:** A customer presents a rented video for return at a designated counter or self-service kiosk.

3.2.2 Main Success Scenario

1. **Initiate Return:** The customer places the video at the return station, or an Employee initiates the return process in the system.
2. **Scan Item:** The **Scanning Device** is used to scan the barcode on the video.
3. **System Retrieves Rental Record:** The system uses the barcode to find the corresponding open rental record and displays its details:
 - Video Title.
 - The customer who rented it.
 - The date it was rented and the expected return date.
4. **System Verifies Return Status:** The system compares the current date with the expected return date.
5. **On-Time Return:** As the video is on time, the system proceeds without penalties.

6. **Inspect Condition:** The Employee performs a quick visual inspection of the video for any damage. The condition is noted as 'Good'.
7. **Update System Records:** The system performs the following updates:
 - The rental record is closed and marked as "Returned" with the current date and time.
 - The inventory status of the specific video copy is changed from 'Rented' to 'Available'.
 - The count of available copies for that title is incremented.
8. **Generate Receipt:** The system generates a receipt confirming the successful on-time return, which is handed to the customer.
9. **Conclude Return:** The video is placed in a sorting area to be returned to the shelves, and the use case ends.

3.2.3 Alternative Flows

- **Video Returned Late:**
 - If the system determines the return is past the due date, it automatically calculates the late fee based on the store's policy.
 - The system displays the late fee amount and prompts for payment.
 - The customer pays the fee. Once payment is processed, the system closes the rental record and completes the return.
- **Video Returned Damaged:**
 - If the Employee's inspection reveals significant damage, they update the item's condition in the system to 'Damaged'.
 - The system may, based on store policy, calculate and apply a damage fee to the customer's account.
 - The item's inventory status is changed to 'Unavailable - Damaged' and it is set aside for repair or disposal.

- **Customer Disputes Fee:**
 - If a customer disputes a late fee, the Employee has the authority to review the customer's rental history and, if deemed appropriate, waive or reduce the fee with a manager override in the system.

3.2.4 Exception Flows

- **Video Not Found in System:**
 - If an item is scanned but the system cannot find an open rental record for it, an error is displayed.
 - This could happen if the item was never rented, was already returned, or belongs to another store. The Employee will investigate manually.
- **Technical System Failure:**
 - If the system is down, the Employee will accept the return and manually log it on paper. The item is kept aside, and the return is processed in the system once it is operational again to ensure record accuracy.

3.3 Use Case 3: Reserve Video

This use case describes the process of a customer reserving an item that is currently unavailable.

3.3.1 Use Case Details

- **Use Case Name:** Reserve Video
- **Actor(s):**
 - **Customer:** The primary actor who wishes to reserve a video.
 - **Employee:** A secondary actor who can place a reservation on behalf of a customer.
 - **System:** The store's management system that handles reservations.
- **Goal:** To allow a registered customer to place a hold on a video that is currently rented out, ensuring they are next in line to rent it when it becomes available.
- **Preconditions:**
 1. The customer must have a valid and active membership account.

2. The requested video must be part of the store's catalog but currently unavailable for rent (e.g., all copies are rented out).
- **Triggers:** A customer requests to rent a specific video but is informed that no copies are currently available.

3.3.2 Main Success Scenario

1. **Initiate Reservation:** The customer (or an Employee on their behalf) searches for a video title in the system.
2. **System Confirms Unavailability:** The system search results show that the video title exists but has zero copies currently available for rent.
3. **Offer Reservation:** The system presents an option to "Reserve This Video". The customer chooses this option.
4. **System Creates Reservation Record:** The system creates a new reservation record in its database, which includes:
 - The customer's membership ID.
 - The title of the reserved video.
 - A timestamp for the reservation request, placing the customer in a queue.
5. **Confirm Reservation:** The system displays a confirmation message, "You have been placed on the waiting list for [Video Title]." An email confirmation is also sent to the customer.
6. **System Monitors Availability:** The system continuously monitors the inventory. When a copy of the reserved video is returned (via the "Return Video" use case), the system checks for open reservations.
7. **Hold Item and Notify Customer:** The system finds the customer's reservation (as they are first in the queue), changes the item's status from 'Available' to 'Reserved - On Hold', and automatically sends a notification (email/SMS) to the customer stating that their video is ready for pickup.
8. **Customer Picks Up Video:** The customer comes to the store within the holding period (e.g., 48 hours), and the reservation is converted into a standard rental by initiating the "Rent Video" use case.

9. **Close Reservation:** Once the rental is complete, the reservation record is marked as 'Fulfilled' and closed.

3.3.3 Alternative Flows

- **Customer Cancels Reservation:**
 - Before the video becomes available, the customer can log into their account online or ask an Employee to cancel the reservation. The system removes the reservation record.
- **Customer Fails to Pick Up:**
 - If the customer does not pick up the reserved video within the specified holding period, the system automatically cancels the reservation.
 - The system then changes the video's status back to 'Available' and either notifies the next person in the queue or simply returns it to the general inventory.
- **Video Returned Damaged/Lost:**
 - If the copy that was due to be returned is instead marked as 'Damaged' or 'Lost', the system will cancel the top reservation in the queue and notify the customer of the issue, apologizing for the inconvenience.

3.3.4 Exception Flows

- **Reservation Queue Error:**
 - If a system error causes a problem with the reservation queue (e.g., two people notified for the same item), an Employee with manager-level access must manually resolve the discrepancy. The store policy (e.g., first-come, first-served) will be applied.

3.4 Use Case 4: Order Video

This use case describes the process for ordering a video that the store does not carry in its inventory.

3.4.1 Use Case Details

- **Use Case Name:** Order Video

- **Actor(s):**
 - **Customer:** The primary actor who requests a video not in stock.
 - **Employee:** The actor who facilitates the ordering process.
 - **System:** The store's system that manages orders and interfaces with suppliers.
- **Goal:** To enable customers to request and order entertainment material that is not part of the store's current inventory. The store then sources the item from a supplier.
- **Preconditions:**
 1. The customer must have a valid membership account.
 2. A search of the store's inventory confirms that the requested video is not stocked.
 3. The system must have an integrated module for communicating with external suppliers.
- **Triggers:** A customer's search or enquiry for a video yields no results, and they express a wish to obtain it.

3.4.2 Main Success Scenario

1. **Initiate Order Request:** An Employee searches for a video on behalf of a customer, and the system confirms it is not in the inventory database.
2. **System Searches Supplier Catalogs:** The Employee initiates a "Special Order" function. The system sends an automated query (e.g., via an API) to its integrated supplier databases to check for availability.
3. **Supplier Confirms Availability:** A supplier system responds affirmatively, providing the item's cost to the store and an estimated time of arrival (ETA).
4. **Present Options to Customer:** The Employee presents the ordering option to the customer, including the ETA and any required deposit or pre-payment for the order.
5. **Customer Confirms Order:** The customer agrees to the terms and pays the required deposit.

6. **System Places Order:** The Employee finalizes the request. The system:
 - Creates a special order record linked to the customer's account.
 - Logs the payment.
 - Sends a formal purchase order to the supplier's system.
7. **Track Order Status:** The system periodically checks the order status with the supplier. It updates from 'Ordered' to 'Shipped' when the supplier dispatches the item.
8. **Receive Video at Store:** When the video arrives, an Employee logs its arrival in the system by scanning its new barcode.
9. **Notify Customer:** The system automatically sends a notification to the customer that their ordered video has arrived and is ready for pickup.
10. **Customer Picks Up Video:** The customer comes to the store. The Employee retrieves the item and completes the transaction, either as a final sale or as the customer's first rental, initiating the "Rent Video" use case.
11. **Close Order:** The special order record is marked as 'Fulfilled' and closed. The video is now officially part of the store's inventory.

3.4.3 Alternative Flows

- **Video Unavailable from Supplier:**
 - If the system's query to all suppliers returns no results, the Employee informs the customer that the item cannot be sourced. The use case ends.
- **Customer Cancels Order:**
 - If the customer cancels the order before it ships from the supplier, the Employee cancels it in the system. The system sends a cancellation request to the supplier and processes a refund for the customer's deposit.
- **Delayed Delivery:**
 - If the supplier updates the ETA, the system automatically updates the order record and sends a notification to the customer about the delay.

3.4.4 Exception Flows

- **Supplier Cannot Fulfill Order:**
 - If the supplier accepts the order but later cancels it (e.g., discontinued product), the system receives this update. It notifies the Employee, who then contacts the customer to apologize and issue a full refund.
- **Item Arrives Damaged:**
 - If the video arrives from the supplier in a damaged condition, the Employee marks it as 'Damaged on Arrival' in the system. The system will trigger a re-order process while the Employee informs the customer of the delay.

4. Conclusion

This document has presented a textual specification in detail of the four major use of the new video store management system. Using the careful description of the key scenarios, alternative paths, and possible exceptions into renting, returning, reserving and ordering videos, we have developed an unambiguous and clear blueprint on how the system should develop. Such detail is important to reduce errors, address the expectations of the stakeholders, and eventually implement a powerful and user-friendly system successfully.