



automated dvd rental

Redbox Order Processing System

Final Deliverable

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RedBox Order Processing System

1. Introduction and Background

Redbox was founded by Redbox Automated Retail LLC is a company that provides DVD, Blu-ray Discs and Video game retail through automated retail kiosks. Its kiosks are easily identifiable featuring its signature red color and arched top surface. Redbox's attracts consumers by offering rentals at a low price, while conveniently placing their kiosks in numerous shopping locations.

Redbox was originally funded by McDonalds. In 2002 Redbox initially had sold grocery items and DVD's from their first four kiosks. While Redbox withdrew the grocery kiosks within a year, the DVD-rental kiosks it had also installed in the area succeeded, and the company changed its focus to that market.

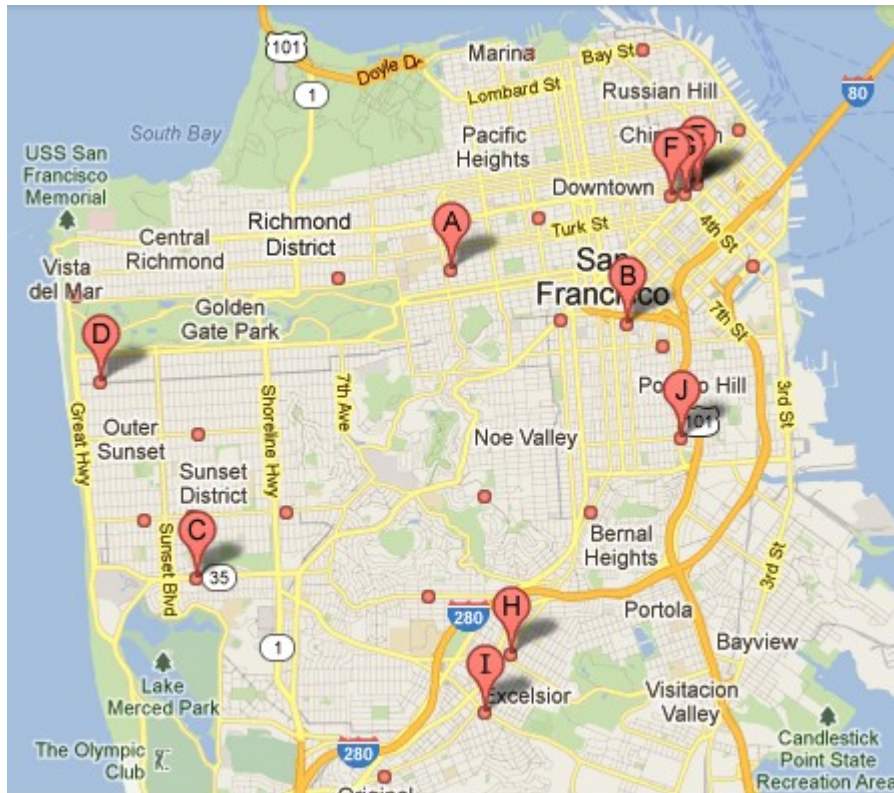
In 2005 Coinstar bought 47% of the company for 32 million ultimately obtaining the remaining share of the company from McDonald's in February of 2009. Redbox had 34.5% market share of discs rented as 2011.

The company passed Blockbuster in 2007 in number of U.S. locations, passed 100 million rentals in February 2008, and passed 1 billion rentals in September 2010. Competitors include Netflix and Blockbuster. As of Q2 2011, kiosks currently have 36 percent of the disc rental market, with 38 percent to rent-by-mail services and 25 percent to traditional stores, according to the NPD Group. As of Q2 2011, 68 percent of the U.S. population lives within a five-minute drive of a Redbox kiosk.

Redbox began internally testing its own video streaming service, dubbed Redbox Instant, in July 2012. The service is a joint effort between Redbox and Verizon.

The founder of Redbox, Gregg Kaplan, exits Coinstar as president & COO of Redbox. Anne Saunders is the new president of Redbox.

RedBox Locations in San Francisco



How does RedBox Work?

You don't have to set up an account but you do have to have a credit card. You can go to the kiosk and choose the movie you want, swipe your credit card and it will dispense your movie. Return it by 9:00 pm the next night and only pay \$1.00.

The benefit to going online and reserving your movie is you know exactly what that particular redbox has available before you go down to the store. The new releases can be difficult to get so it can be disappointing to go all the way down there only to find out the movie you really wanted is not available.

Used Movies to Buy

Redbox sells used movies from their kiosks ranging anywhere from 5-10 dollars. This makes up about 3% of their revenue.

Pros of Redbox

- Low Cost - \$1 rental
- Promotions
- Conveniently located
- Multiple kiosks at one location
- Easy return process
- New movie releases
- Online access

Cons of RedBox

- Keep for one day
- Late fees accrue for late returns up to 25 days then you own the movie
- No actual cashiers to help with check out
- No customer service on site
- Scratches on disc
- No digital service
- Long Lines

2. Statement of Scope for the New System**Problem Description**

- Customers are complaining that their rentals are badly scratched to the point where it is unreadable.
- Returns not accurately recorded by the system.
- Stolen Movies
- Product can be out of stock which is a direct result of the order processing system being inefficient
- Long lines

Anticipated business benefits (short-term)

- Reduce out-of-stock inventory
- Improve customer relationship and satisfaction
- Increase internet and mobile reservations to improve customer satisfaction
- Drastically reduce distribution and inventory management cost
- Provide instant customer gratification through consistency of in stock new releases
- Reduce excessive inventory

Anticipated business benefits(long-term)

- Increase profit and revenue
- Expand language availability for kiosk instructions
- Increase membership
- Offer an option for subscription
- Reduce Cost, labor, Liabilities
- Expanding kiosk locations
- Increase efficiency of tracking kiosk performance

System Capabilities

- Improve kiosk performance and design
- Be able to remind customers to return their rentals thru email or text after 10 days
- Fast and easy order process
- Be able to easily expand its products and services on a dynamically changing environment.
- Provide instant sales reports and information for managers and corporate offices to make future sound decisions
- Process credit card payments online in just a few seconds

Relationship Between Capabilities, Anticipated Benefits and System Functions

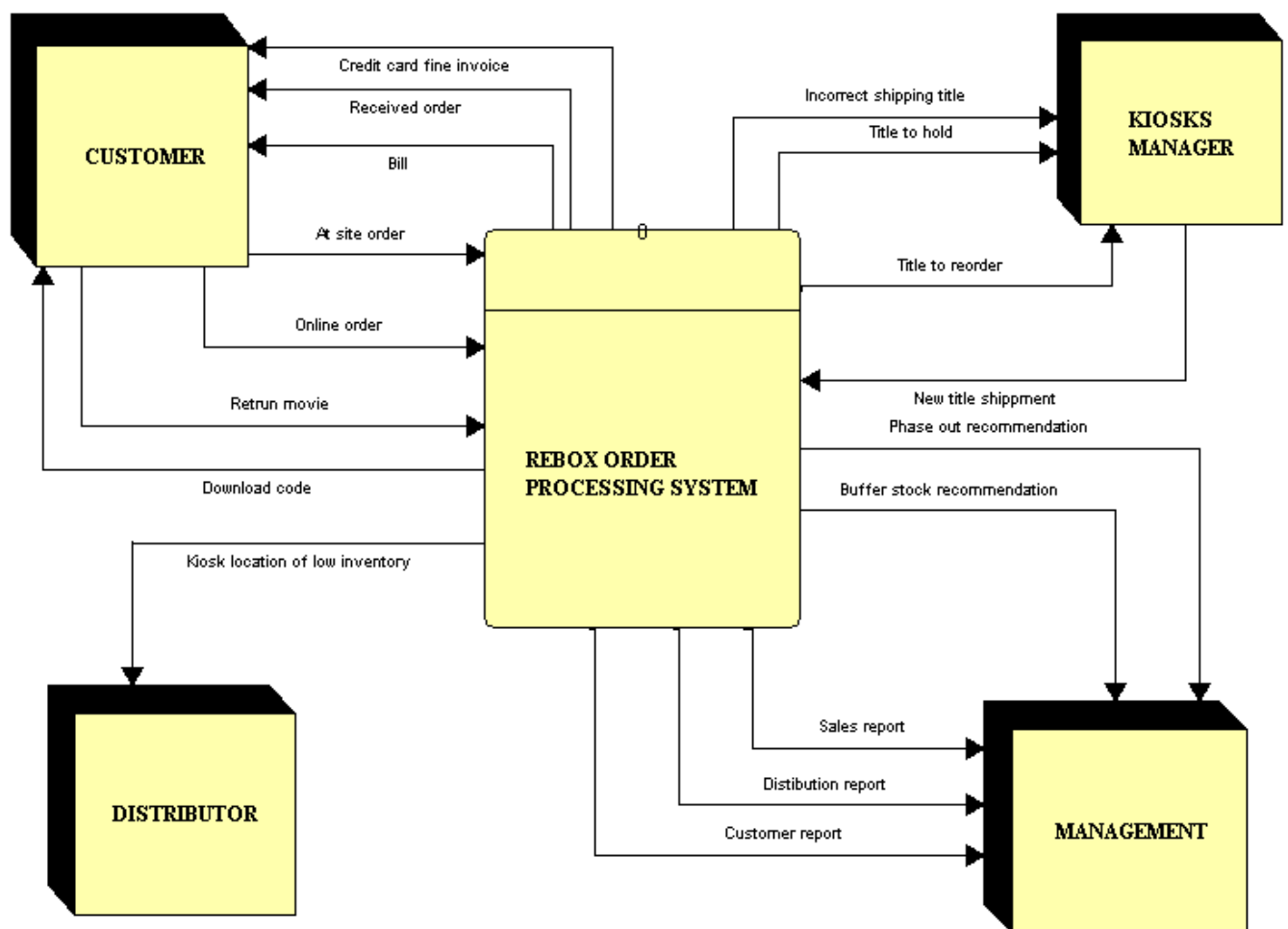
Capabilities	Anticipated Benefits	System Functions
<p>Fast and easy order process</p> <p>Be able to easily expand its products and services in a dynamically changing environment.</p>	<p>Reduce out-of-stock inventory (waiting time for high demand titles)</p> <p>Improve customer relationship and satisfaction</p> <p>Increase internet and mobile reservations to improve customer satisfaction</p> <p>Drastically reduce distribution and inventory management cost</p> <p>Provide instant customer gratification through consistency of in stock new releases</p>	Process Order
<p>Fast and easy order process</p> <p>Process credit card payments online in just a few seconds</p>	<p>Increase profit and revenue</p> <p>Improve customer relationship and satisfaction</p>	Process Payment
<p>Be able to easily expand its products and services on a dynamically changing environment corporate offices to make future sound decisions</p>	<p>Increase membership</p> <p>Reduce Cost, labor, Liabilities</p> <p>Expanding kiosk locations</p>	Inventory Management
<p>Be able to easily expand its products and services on a dynamically changing environment corporate offices to make future sound decisions</p>	<p>Reduce Cost, labor, Liabilities</p> <p>Expanding kiosk locations</p> <p>Increase efficiency of tracking kiosk performance</p>	Manage individual Kiosk Inventory
<p>Provide instant sales reports and information for managers and corporate</p>	<p>Reduce excessive inventory</p> <p>Reduce out-of-stock inventory (waiting time for high demand titles)</p> <p>Increase profit and revenue</p>	Manage Store Report

Diagrams:

RedBox Order Processing Context Diagram

REDBOX ORDER PROCESSING CONTEXT DIAGRAM

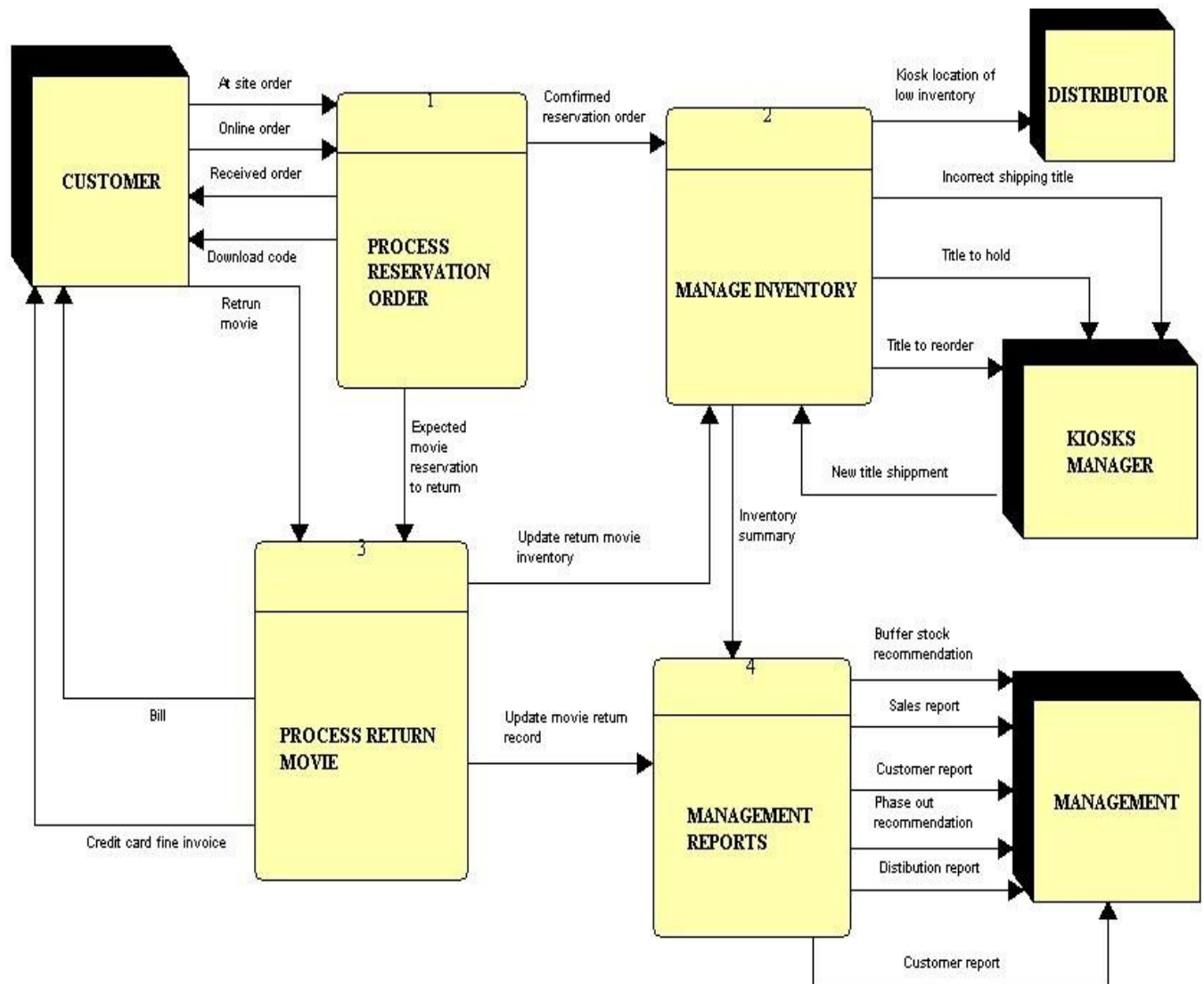
MANUEL DUENUS, ALEXJANDRO GOMEZ,
SIMON LI, YIWEN LI



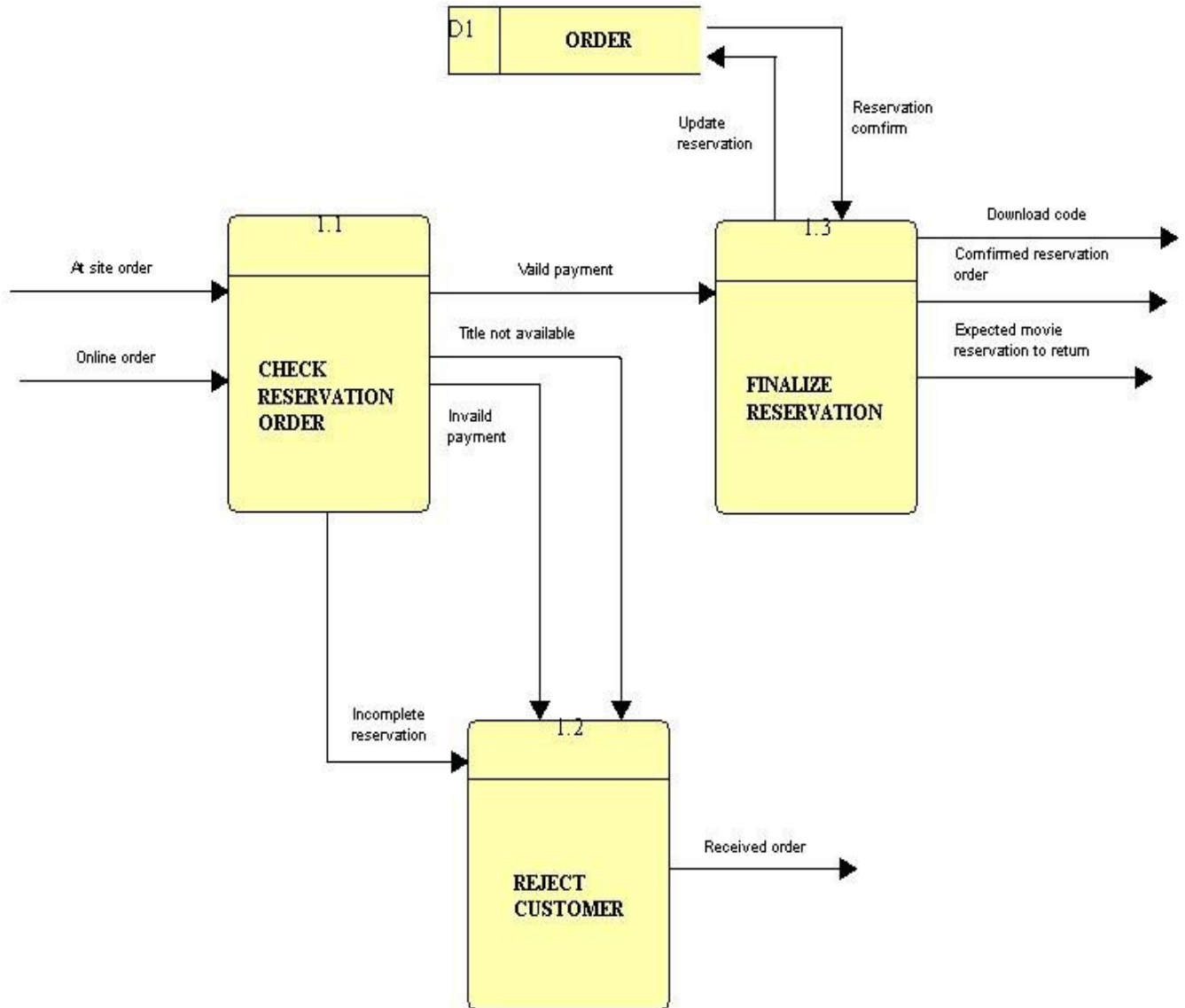
Event List

#	Event	Process
1.	Customer order is processed	1
2.	Customer reservation order is verified	1.1
3.	Customer's order rejected	1.2
4.	Customer's order finalized	1.3
5.	Customer's order check for reservation completeness	1.1.1
6.	Customer's order availability is checked	1.1.2
7.	Customer's order is checked for valid coupon	1.1.3
8.	Customer receives discount	1.1.4
9.	Customer payment is checked	1.1.5
10.	Customer delivery preference is checked	1.3.1
11.	Customer download is approved	1.3.2
12.	Customer receives pickup window	1.3.3
13.	Management has inventory maintained	2
14.	Inventory title buffer stock checked	2.1
15.	The system places order of unavailable titles	2.2
16.	Kiosk inventory is checked	2.3
17.	Distributor is notified	2.4
18.	Inventory Check Confirmed	2.5
19.	Kiosk manager receives reorder information to place reorders	2.2.1
20.	The system checks shipment information	2.2.2
21.	The system confirms shipment	2.2.3
22.	The system notifies vendor	2.2.4
23.	Customer returns are processed	3
24.	Customer is billed	3.3
25.	Customer's fine is determined	3.3.1
26.	Customer's deposit on hold is checked	3.3.2
27.	Customer's fine amount is finalized	3.3.3
28.	Customer's deposit is deducted	3.3.4
29.	Customer's credit card is validated	3.3.5
30.	Collection agent is notified	3.3.6
31.	Customer is credit card is charged	3.3.7
32.	Management has management reports maintained	4
33.	The system generates movie recommendation	4.3
34.	Inventory's movie rental checked	4.3.1
35.	Inventory is issued movie warning	4.3.2
36.	Inventory is checked for stock out	4.3.3
37.	Inventory generates buffer stock report	4.3.4

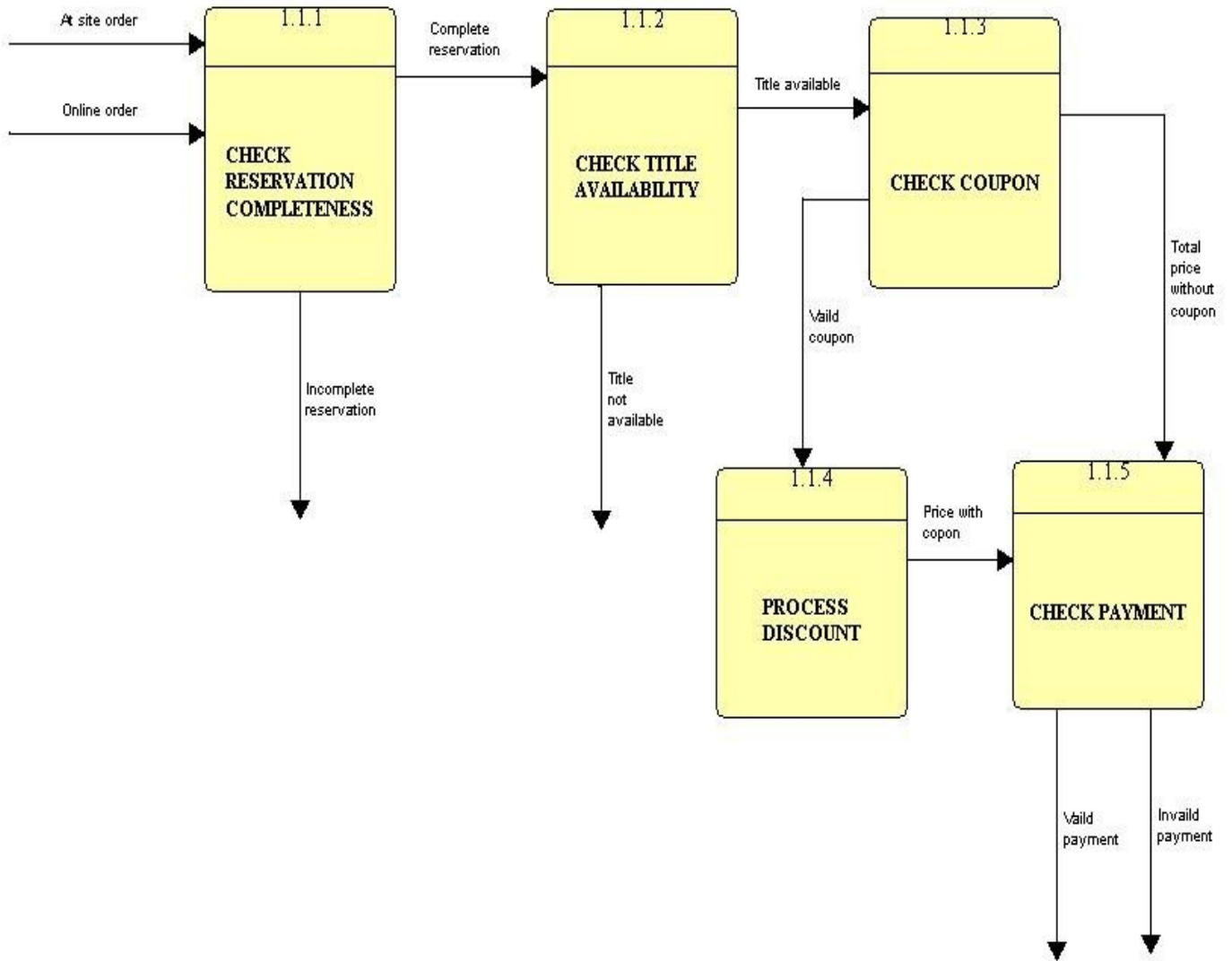
RedBox Order Processing Zero Level Diagram



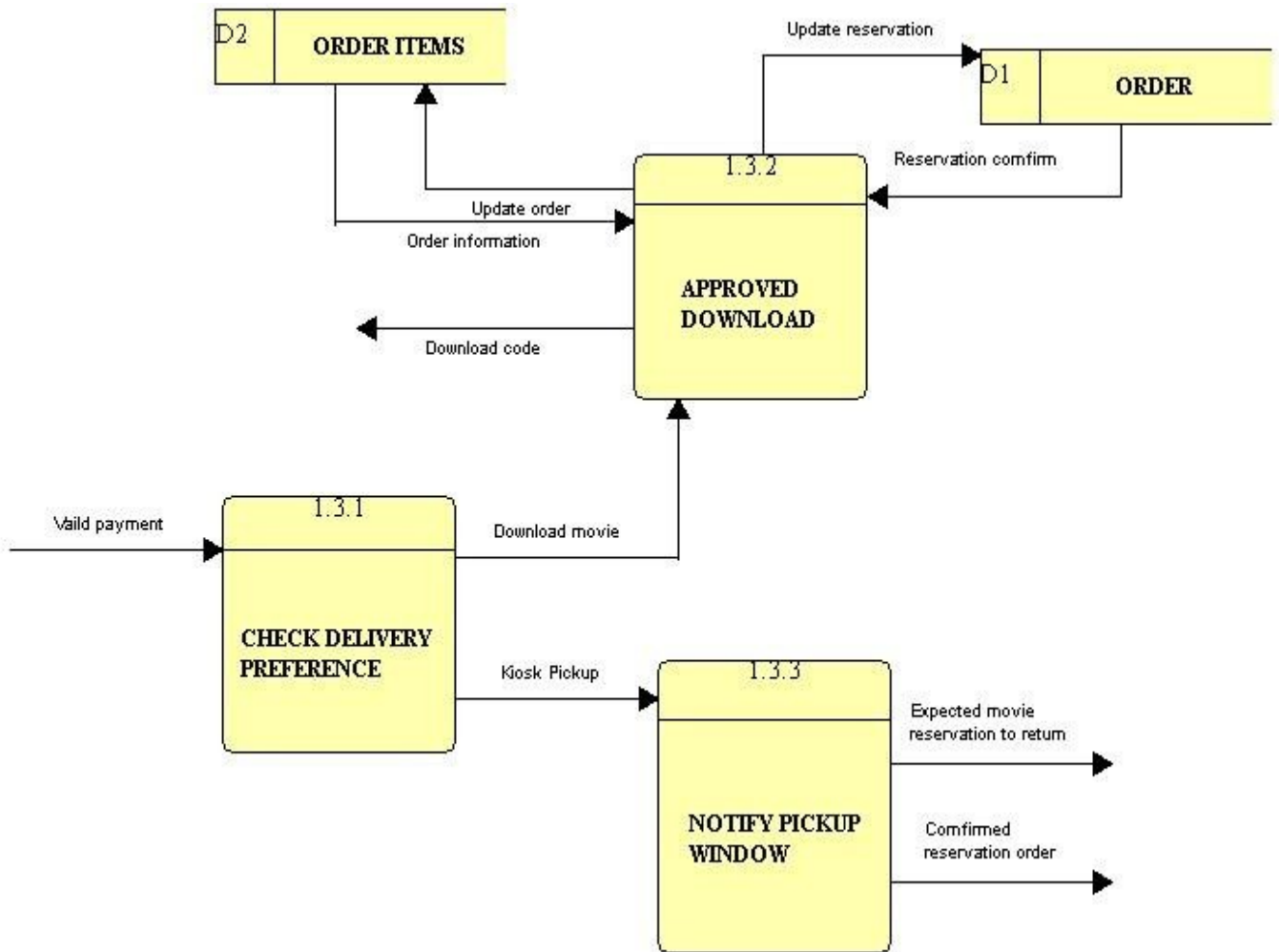
RedBox Order Processing
Diagram 1 - Process Reservation Order



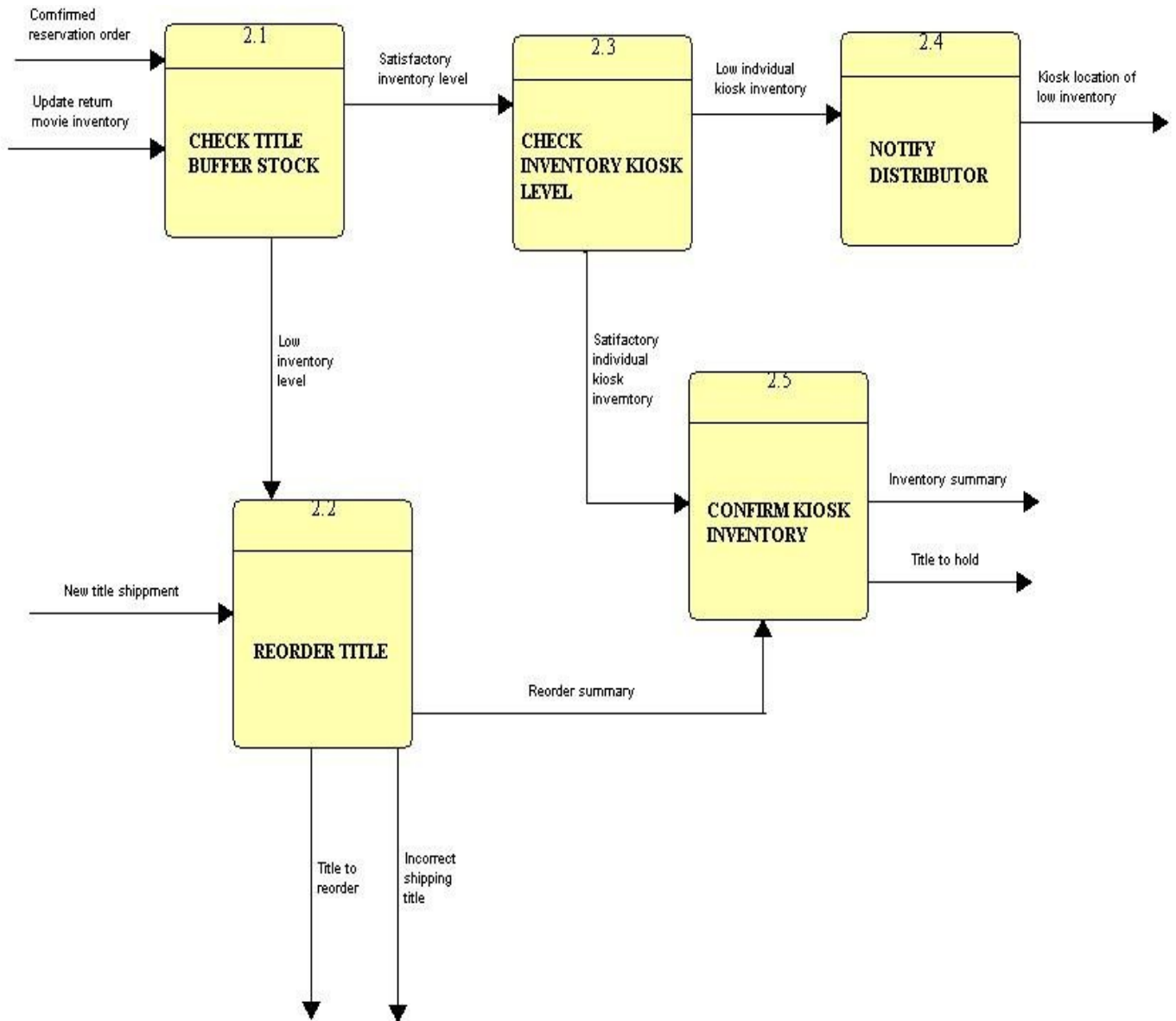
RedBox Order Processing
Diagram 1.1 - Diagram Process



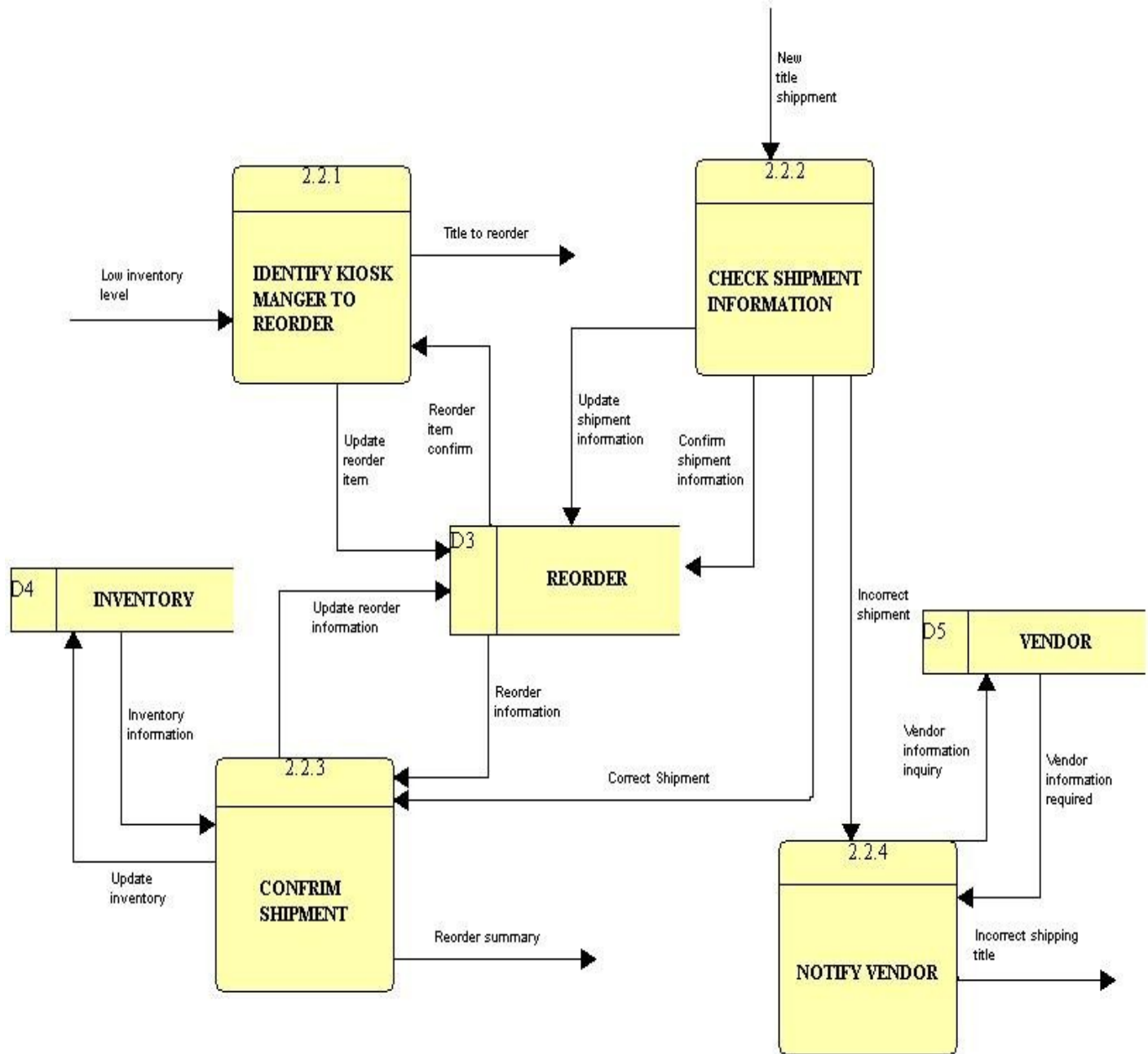
RedBox Order Processing
Diagram 1.3 - Finalize Reservation



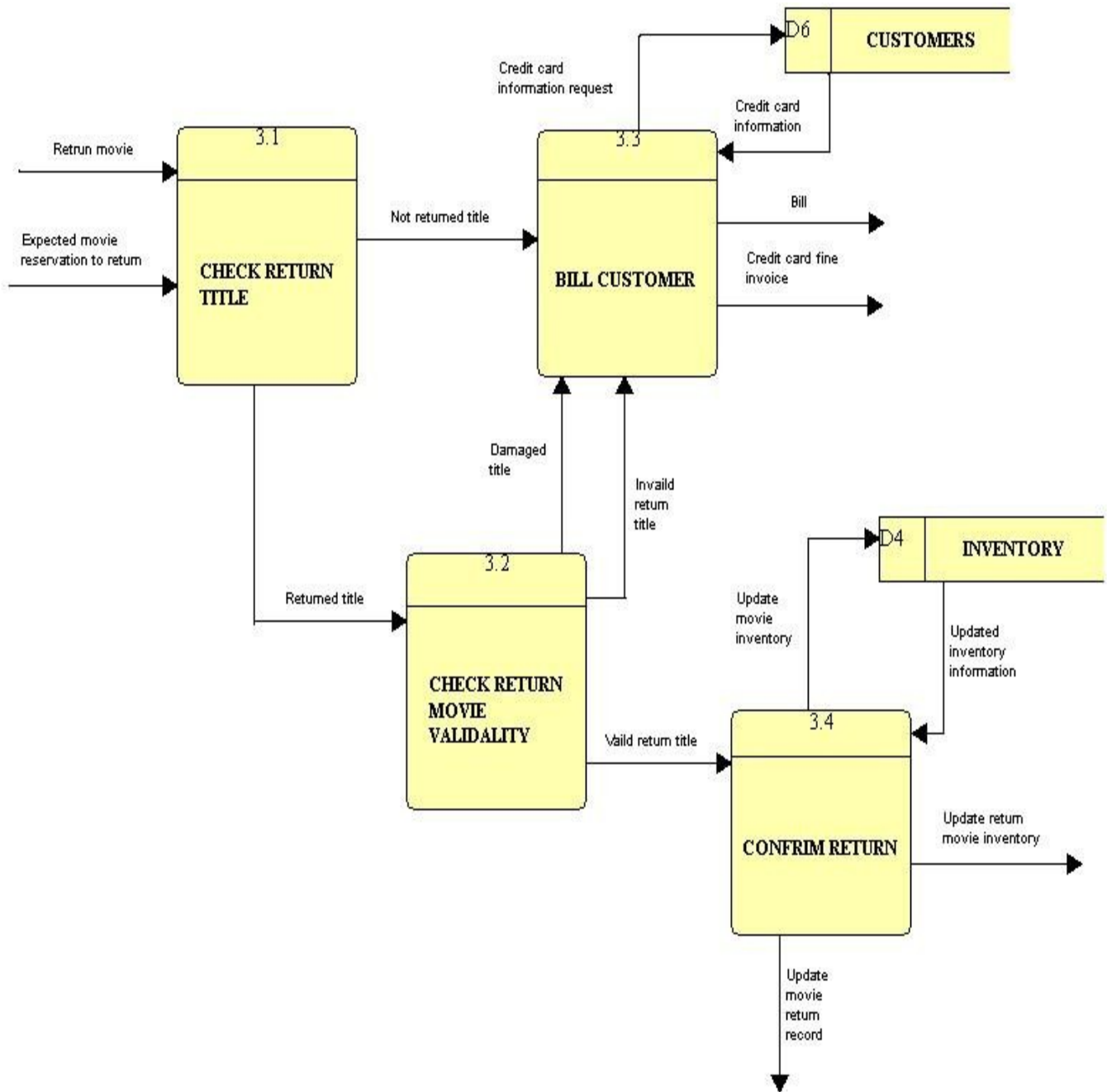
RedBox Order Processing
Diagram 2 - Manage Inventory



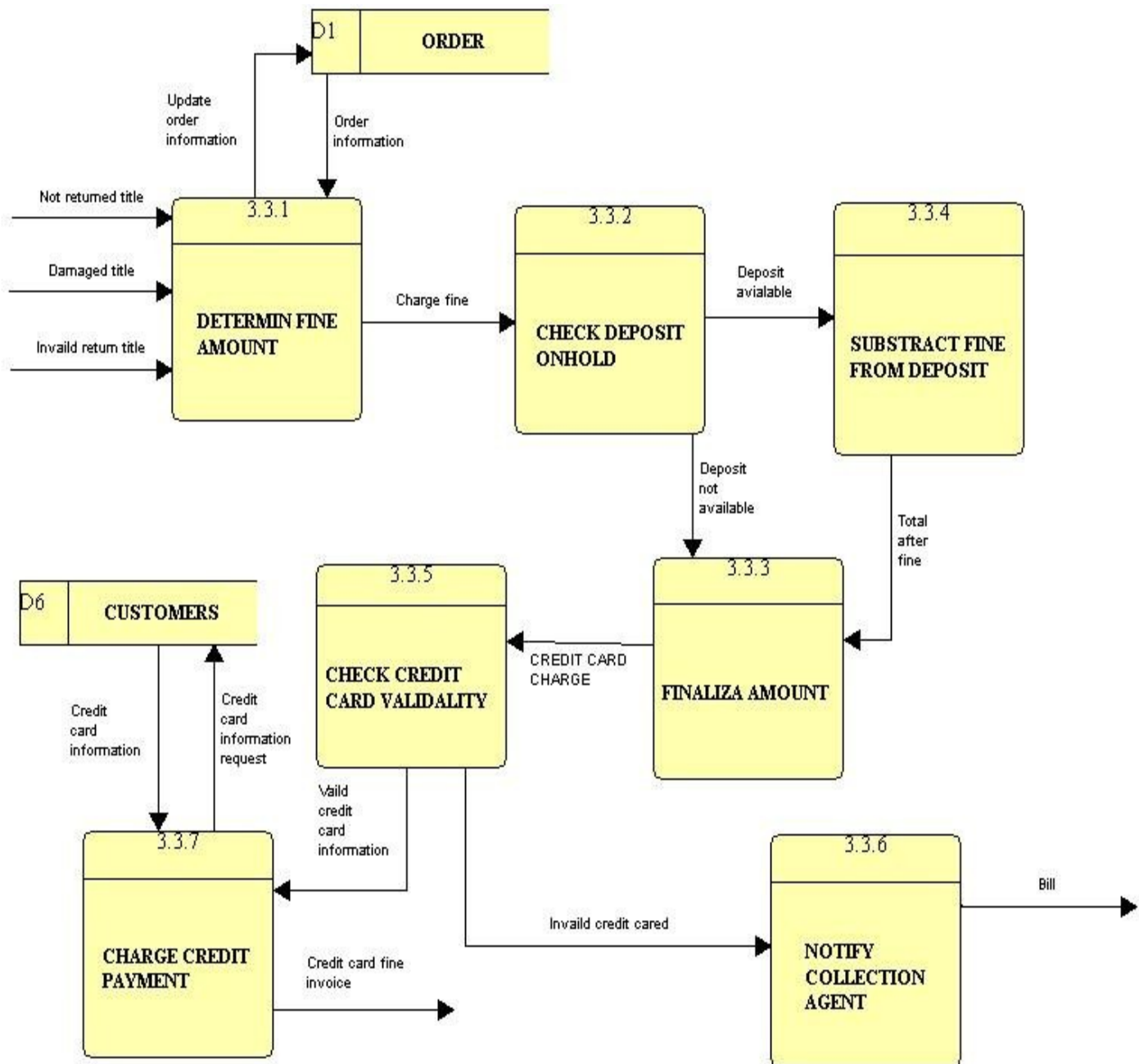
Redbox Order Processing
Diagram 2.2 - Reorder Title



RedBox Order Processing
Diagram 4 - Process Return Movie

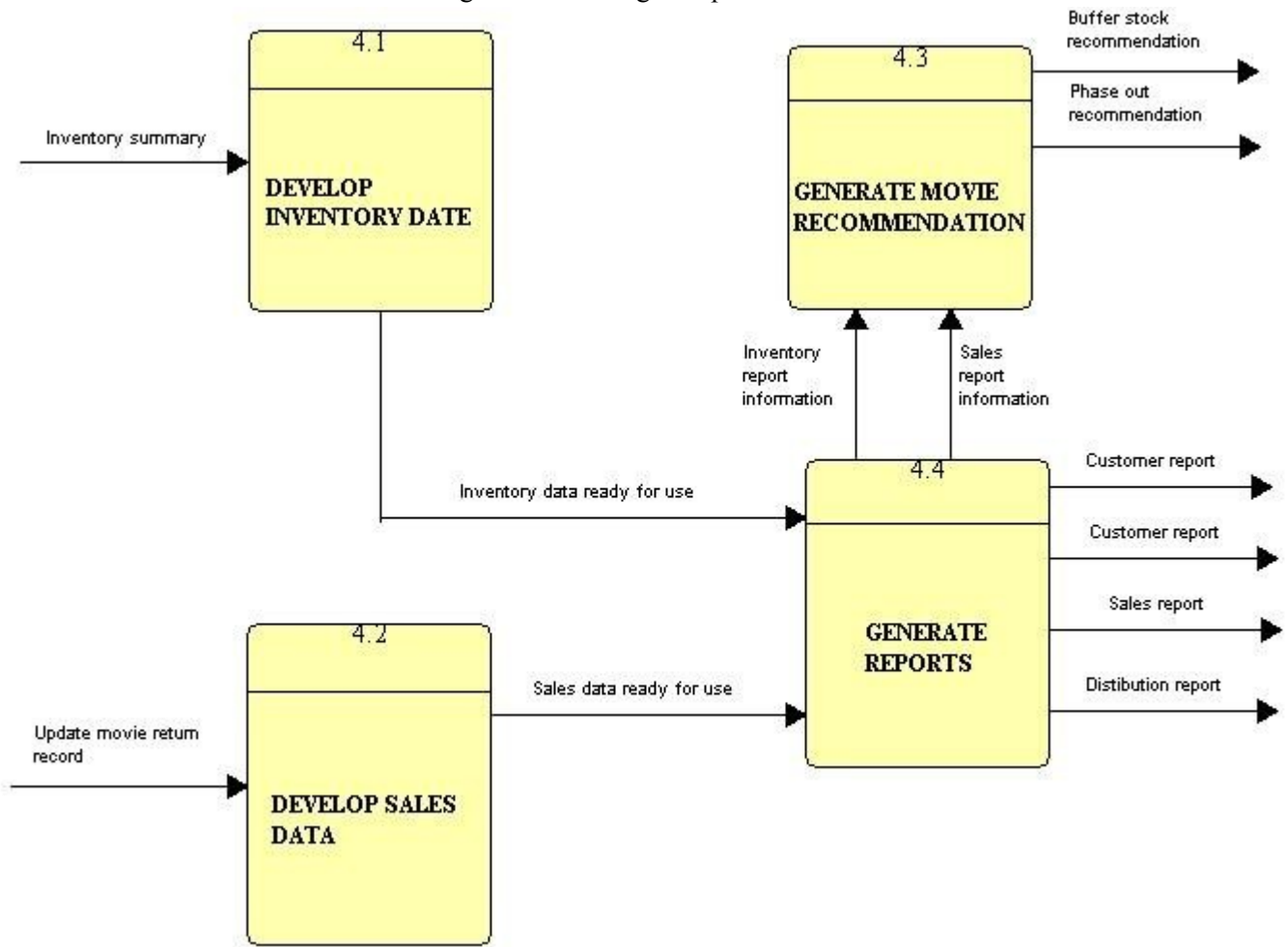


RedBox Order Processing
Diagram 4.4 - Bill Customer



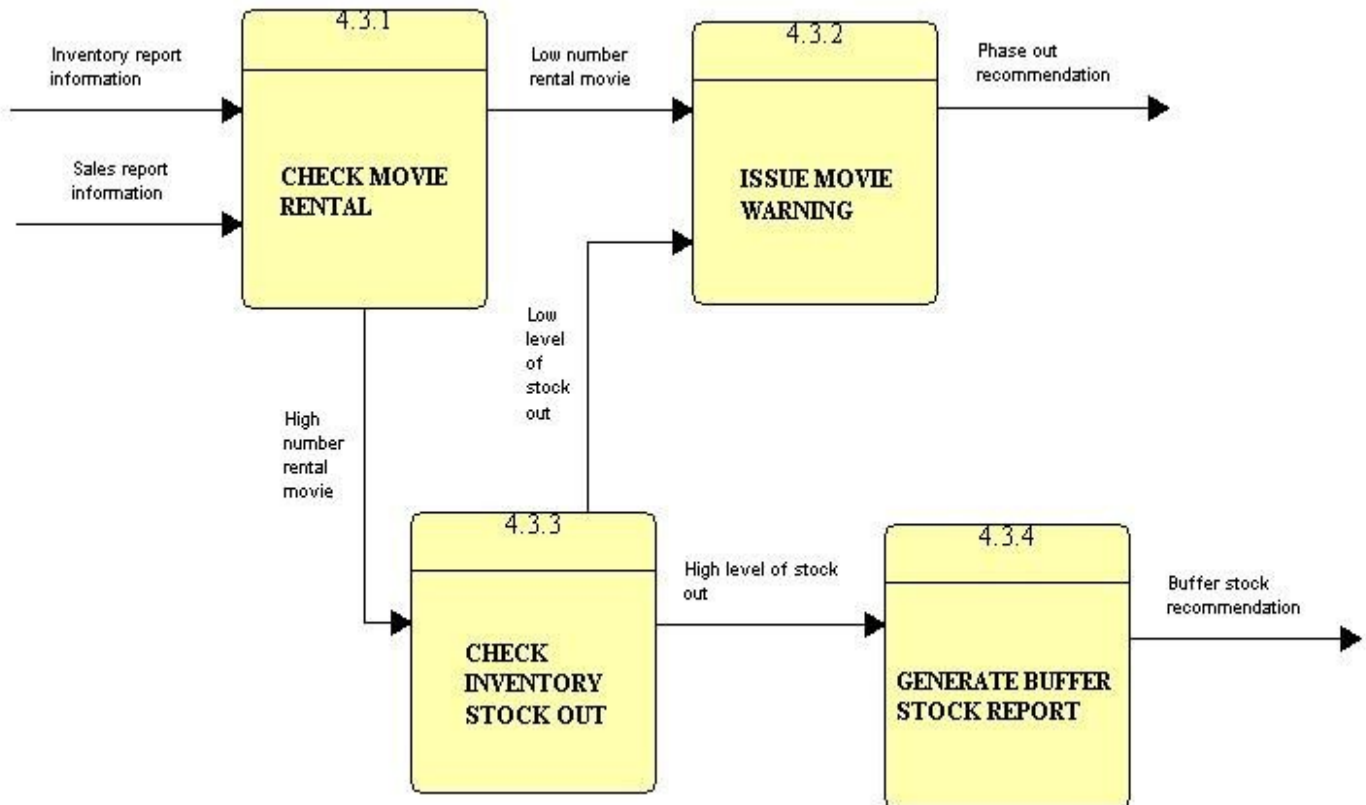
RedBox Order Processing

Diagram 4 -- Manager Report

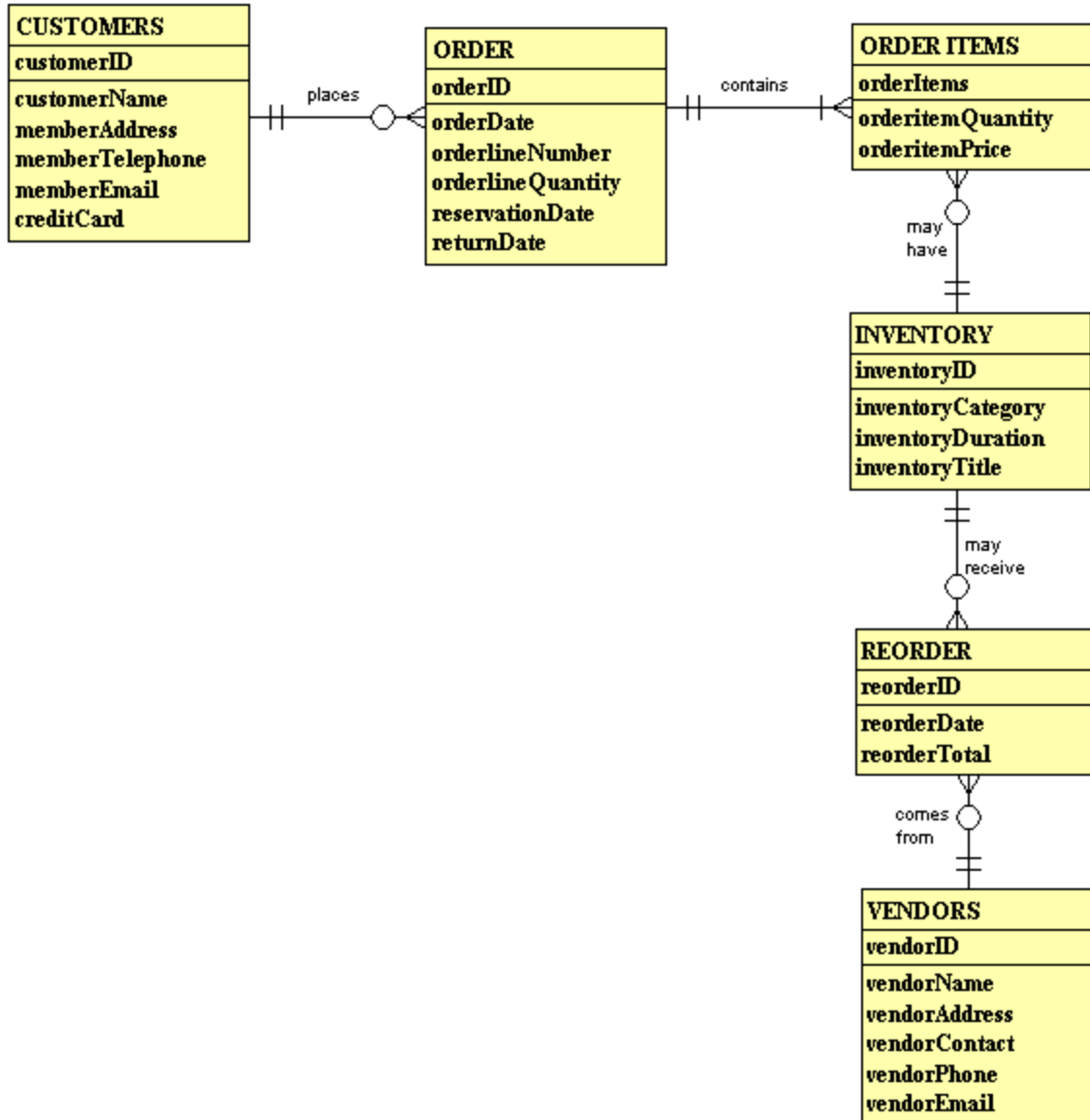


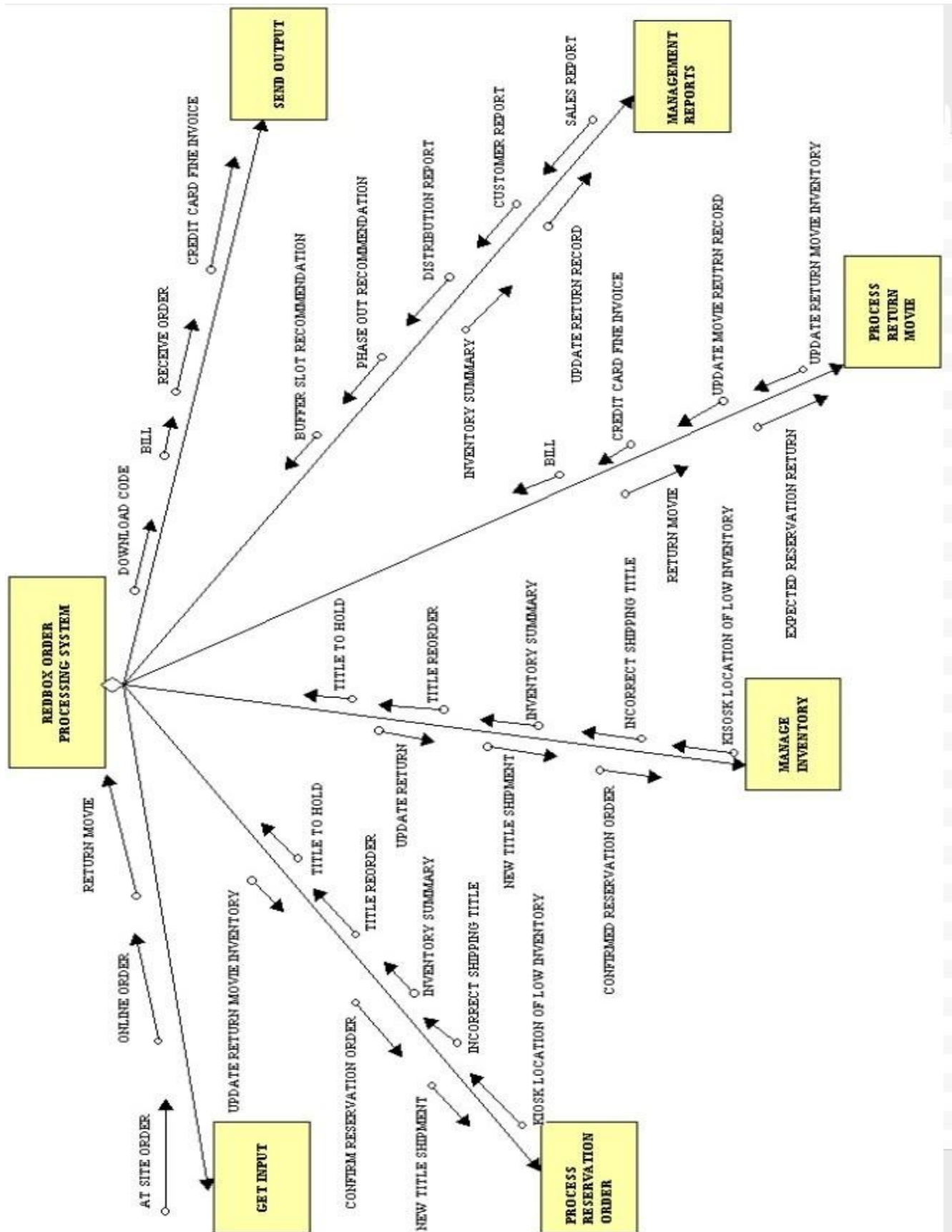
RedBox Order Processing

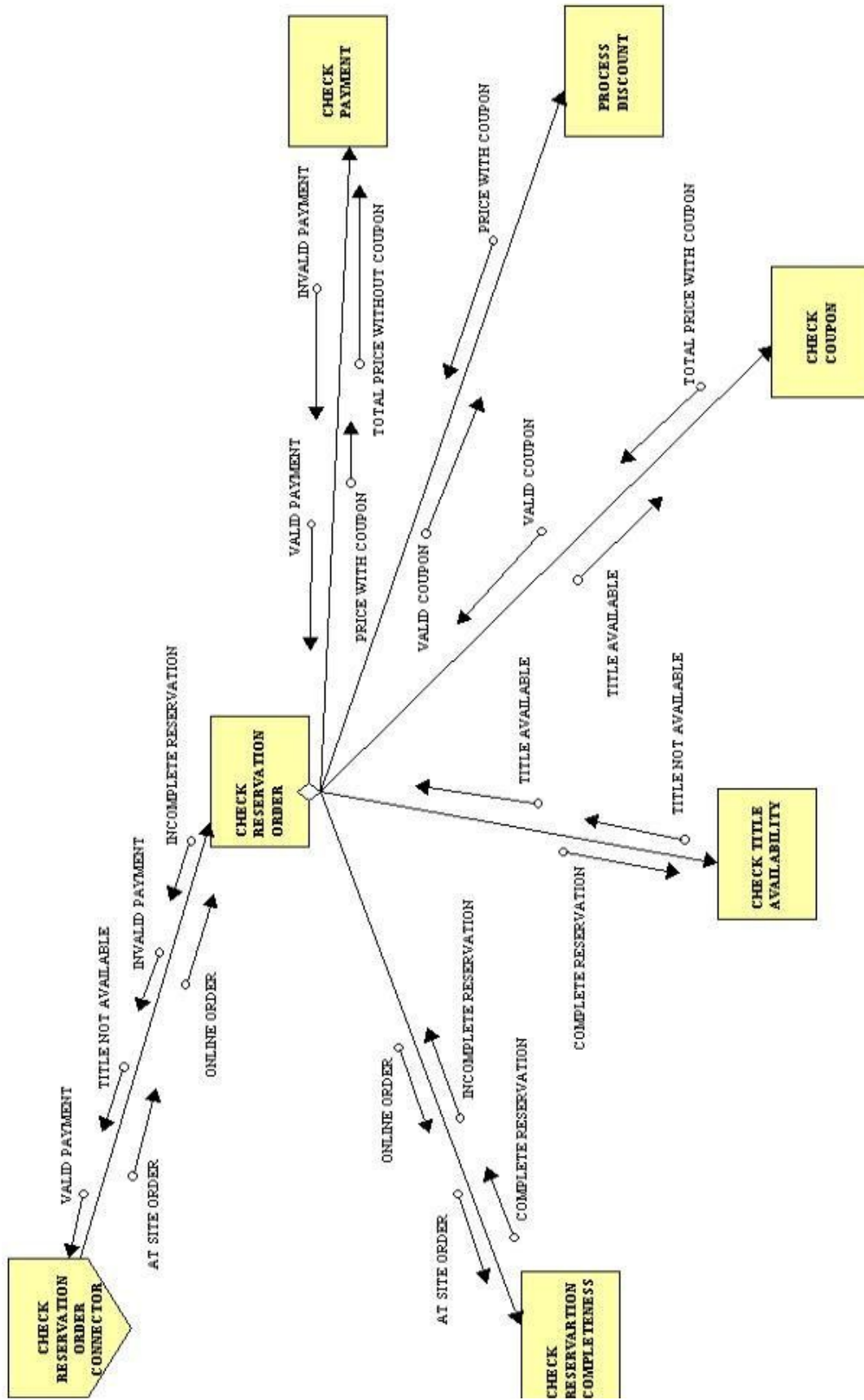
Diagram 4.3 -- Generate Movie Recommendation



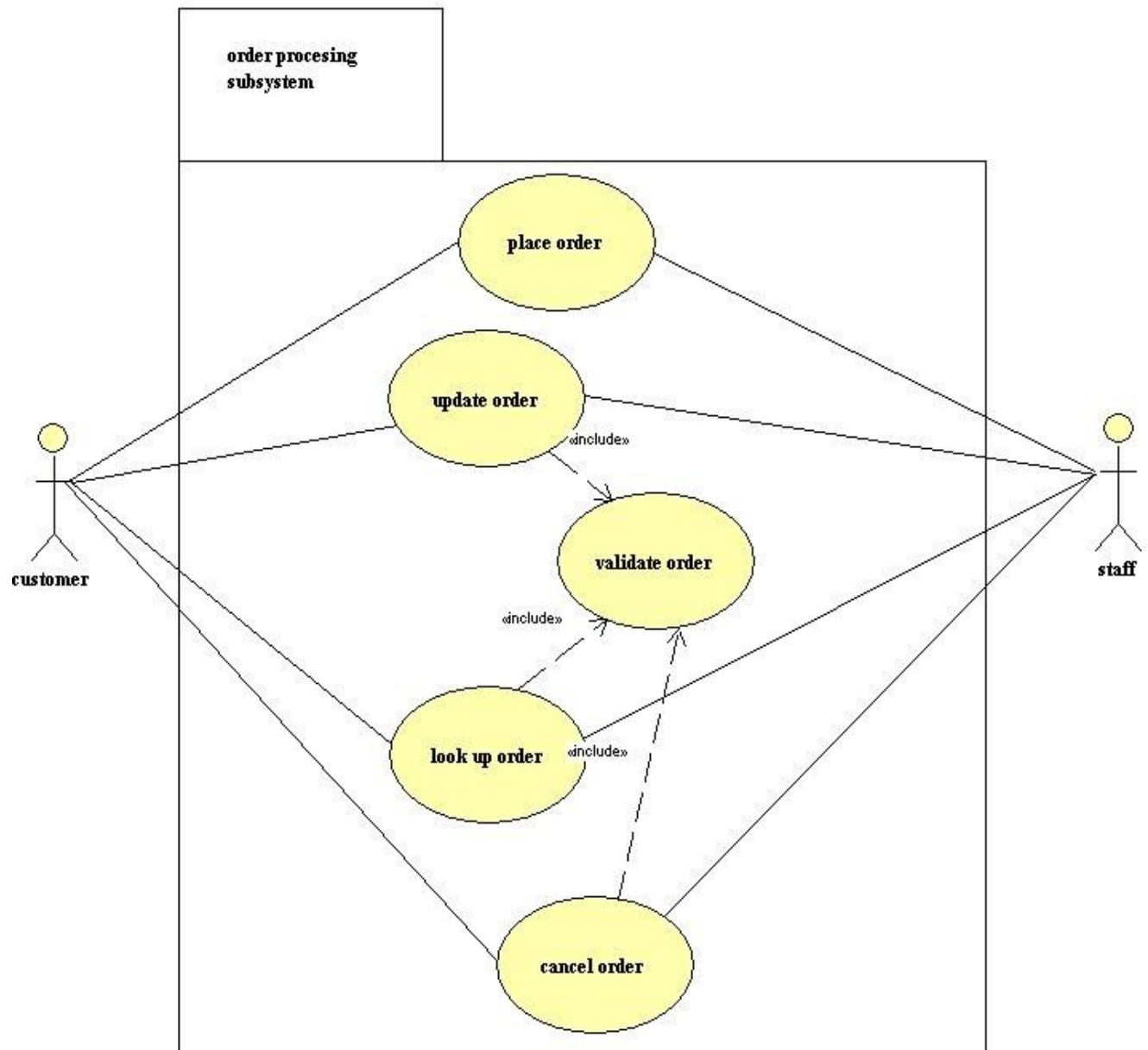
Redbox Entity Relation Diagram



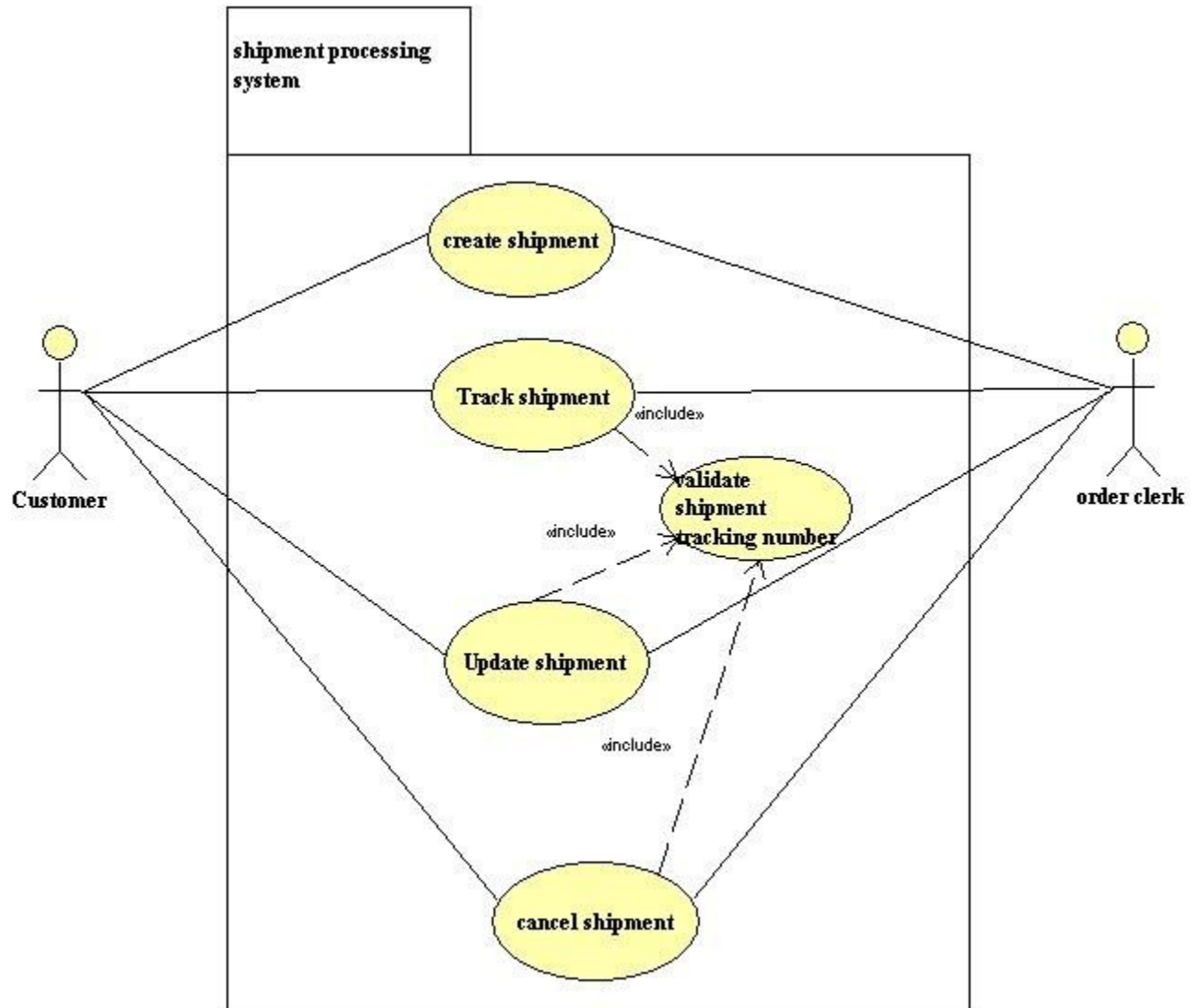




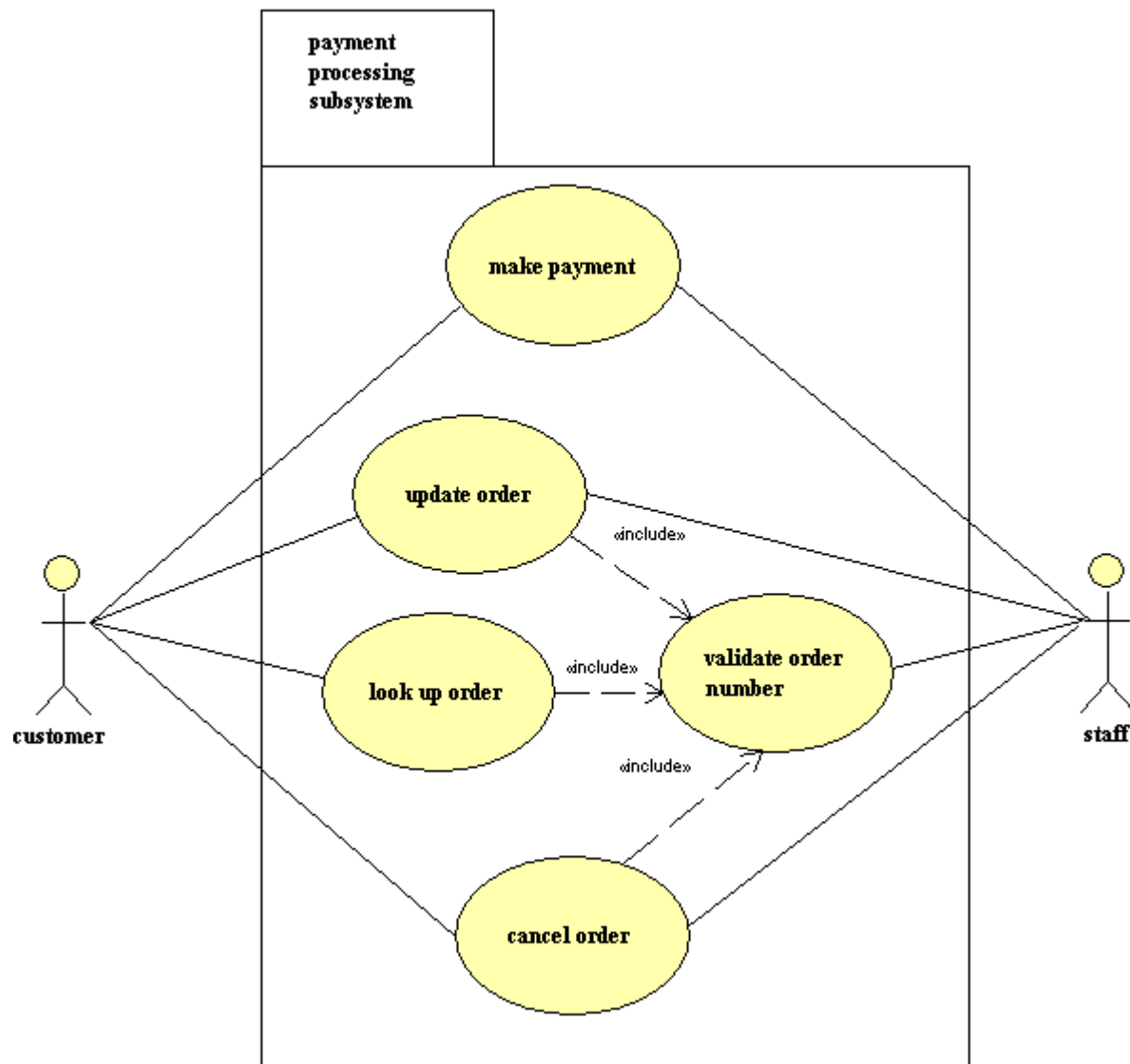
Use Case Diagram - Order Processing Subsystem



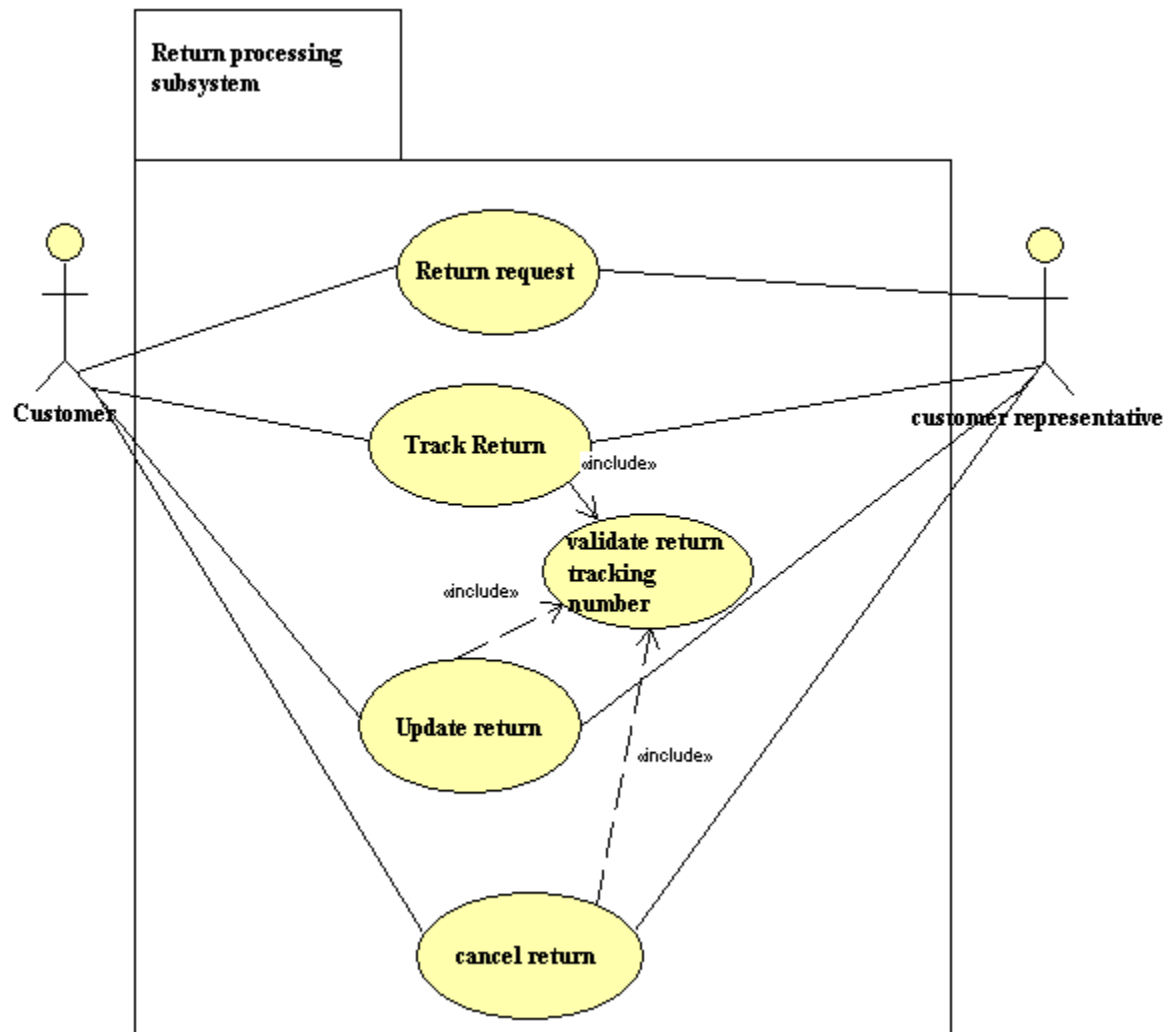
Use Case Diagram - Shipment Processing Subsystem



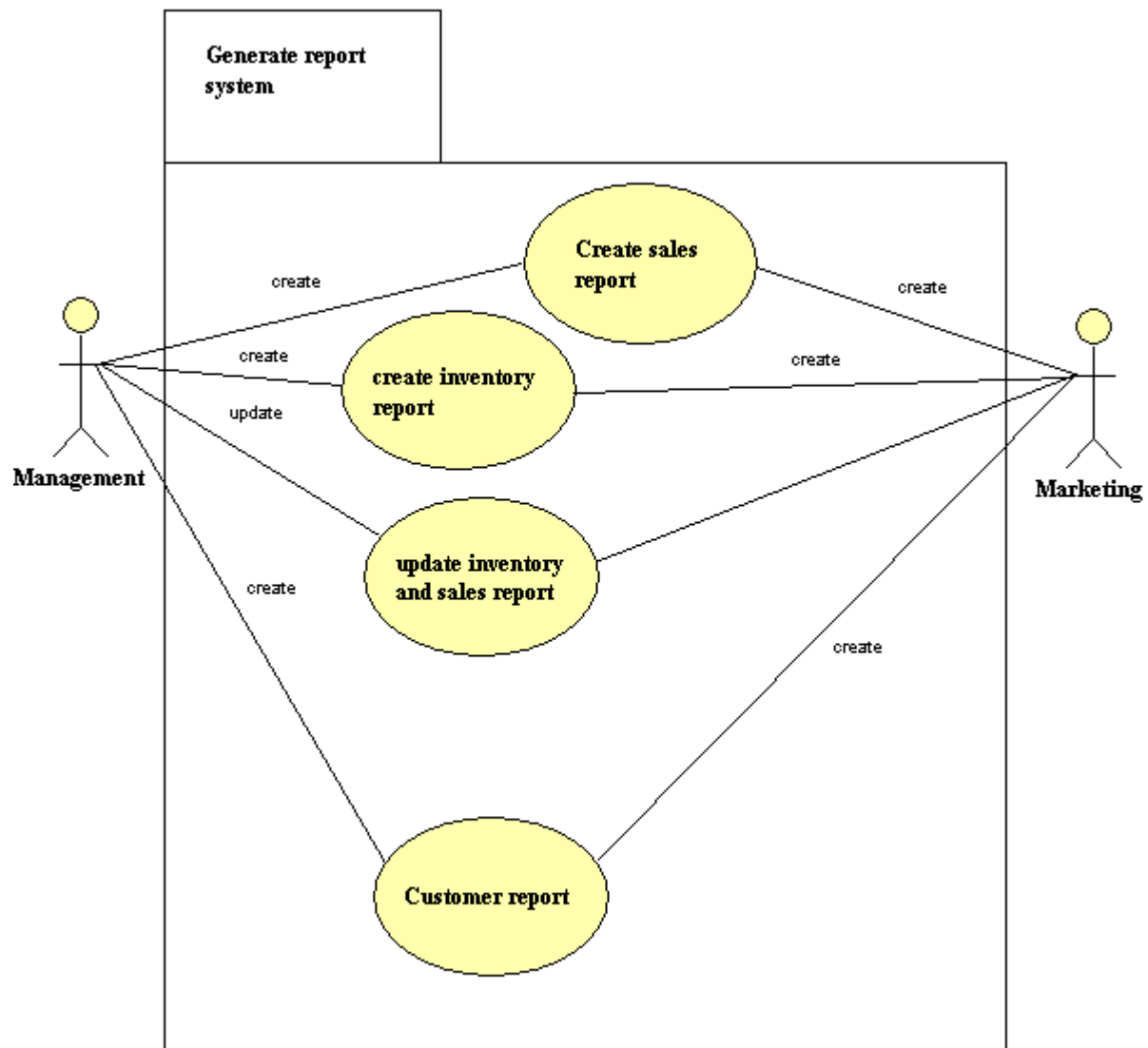
Use Case Diagram - Payment Processing Subsystem



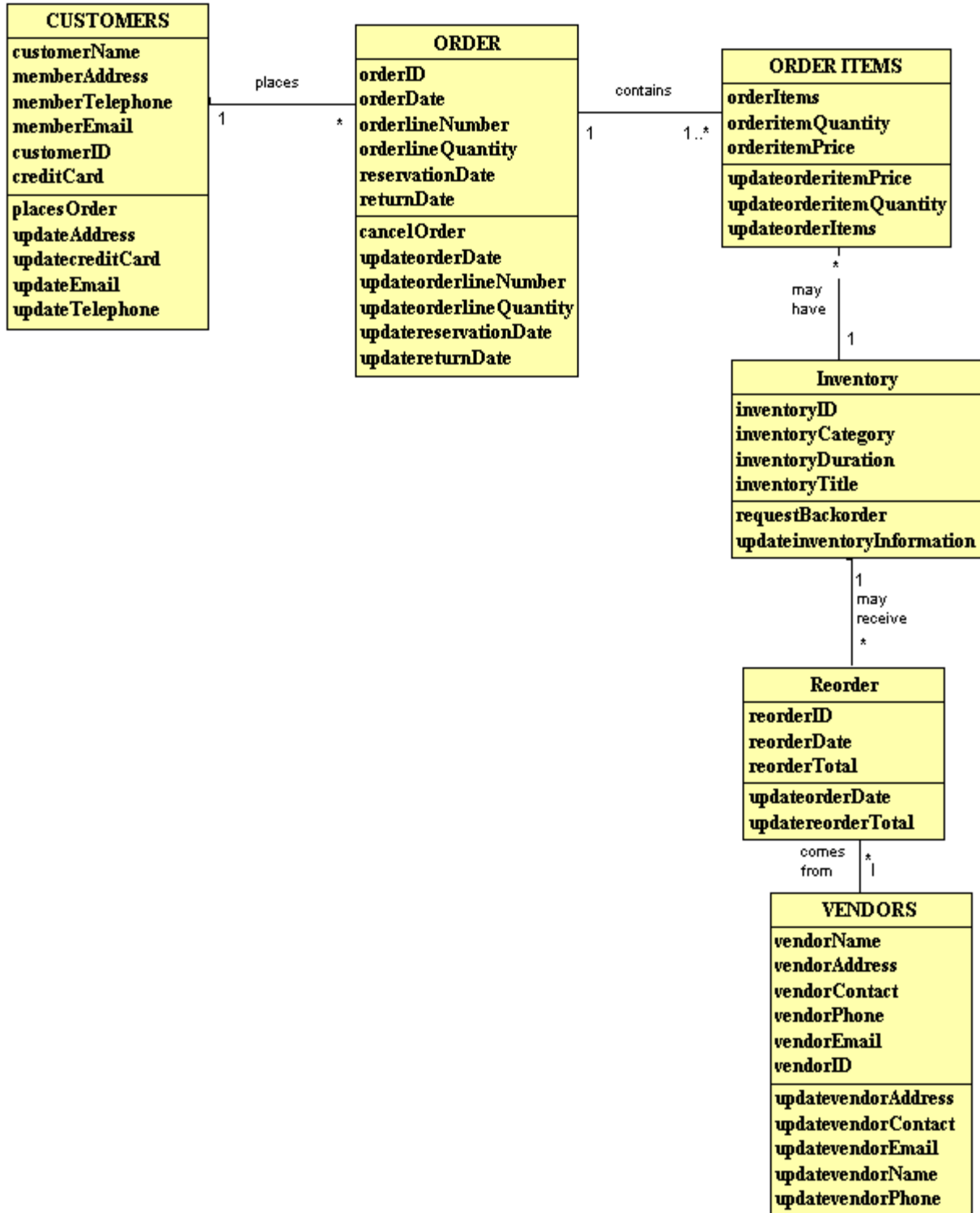
Use Case Diagram - Refund Processing Subsystem



Use Case Diagram - Generate Reports Subsystem



Redbox Class Diagram



Process Specification

1.1.1 Check Reservation Order

```
SET title_found = false;
WHILE title_found = false and not end of file (reorder STORE)
  GET title_name FROM reorder STORE /*get title name from reorder*/
  IF title_name = vendor new_title /*if title found*/
    THEN title_found = true /*set title_found to true and exit the loop*/
  END /*END WHILE LOOP*/
CASE title_found
  WHEN true
    /*the title is correct so we send it to Confirm order process*/
    SET correct_title = new_title
    SEND correct_title TO process 2.3.4 (Confirm Reorder)
  ELSE
    /*the title is incorrect so we send it to Notify vendor process*/
    SET incorrect_title = new_title
    SEND incorrect_title TO Process 2.3.3 (Notify Vendor)
  END /*END CASE statement*/
```

Data Dictionary

Customers	Date store has the entire customer's information
Inventory	Date store has all the inventory information
Order	Data store contains customer's order information
Order Item	Data store contains numbers of items in an order
Reorder	Data store contains all the information regarding reorder
Vendor	Data store contains the entire vendor's information
At site order	Movie is ordered on kiosk
Bill	Bill is sent to the collection agent
Buffer stock recommendation	The amount of each movie should be order
Charge fine	Charge customer for the late fee
Confirmed reservation order	Reservation has been approved
Complete order	All the require information has been entered
Confirmed shipment information	Information regarding an confirmed shipment
Correct shipment	Shipment has all the reordered movie
Credit card charge	Credit card will be charged
Credit card fine invoice	An invoice that contains fine amount
Credit card information	Customer's credit card information
Credit card information request	Retrieve customer's credit card from data store
Customer report	report contains all the information about customers
Damaged title	Movie is damaged
Deposit available	Deposit has been hold from Credit card
Deposit not available	Deposit has not been hold from Credit card
Distribution report	Report contains all the movies are distribute

Download code	Code is send to customer to download online
Download movie	Movie is downloaded
Expected movie reservation to return	Time frame of a movie will be returned
High level of stock out	Movie has high level of out of stock
High number of rental movie	Movie has high level of rental recorded
Incomplete reservation	Reservation has not finished or missing some information
Incorrect shipment	Shipment contains wrong titles
Incorrect shipment title	Shipping title is incorrect
Invalid credit card	Wrong credit card information
Invalid payment	Wrong credit card information was entered
Invalid return title	Wrong movie title was returned
Inventory data ready for use	Inventory information is available for management
Inventory Information	Information regarding all the in stock and out of stock title
Inventory report information	An inventory report with detail movie titles
Inventory summary	A list of in stock and out of stock titles
Kiosk location of low inventory	List all the location with low inventory
Kiosk pickup	Customer choose to pick up at Kiosk
Low individual kiosk inventory	List all the inventory within the same location
Low inventory level	List of Location with low inventory
Low level stock out	List of low level of stock out titles
Low number of rental movie	Movie with low rental history
New title shipment	Shipment of new released titles
Not returned title	Movie title was not being return

Online order	Customer order a movie online
Order information	An invoice contains order information
Phase out recommendation	No recommendation was suggested
Price with coupon	Price after a discount promotion
Received order	Order was entered in the ordering system
Reorder information	Information about reorder titles
Reorder item confirm	Reorder title has confirmed with vendor
Reorder summary	A summary of the reorder titles
Reservation confirm	Reservation has been confirmed
Return movie	Movie was being returned
Returned title	Movie title was confirmed by customer
Sales data ready for use	Sales data is available for management to use
Sales Report	A report that has all the sales information
Sales report information	List of all the rental movie title information
Satisfactory individual kiosk Inventory	Kiosks has enough movie title available for customer order
Satisfactory inventory level	Enough movie available to rent
Title available	Requested movie title is available to order
Title available	Requested movie is not available
Title to hold	Title has been hold for pick up
Title to reorder	List of titles that needs to reorder
Total after fine	List of total including fine
Total price without coupon	Price without any discount promotion
Update inventory	Inventory information has been updated
Update movie inventory	Movie title has been updated

Update movie return record	Movie return record has been updated
Update order	Customer's order has updated
Update order information	Order information has been updated
Update reorder information	Newest reorder information is available
Update reorder item	Reorder movie title has updated
Update reservation	Newest reservation information available
Update return movie inventory	A new list of inventory information available
Update shipment information	List the newest information about shipment
Update inventory information	New list of inventory information
Valid coupon	Promotion code has not expired
Valid return title	Movie title returned is correct
Vendor information inquiry	Request for vendor information
Vendor information required	Vendor's information is needed

Module: Check Return Movie Title Validity (3.2)

Purpose: To ensure the title returned by customer is valid and in good condition

Input: Returned Title: Object /* This represent the Returned Title going tto 3.2*/

Output: Returned Title: Object

Pseudo-Code Specification:

ReturnedTitle =Get Returned Title from CUSTOMER

ReturnedTitle.damage = FALSE

ReturnedTitle.wrong = FALSE

IF ReturnedTitle IS wrong

 SET ReturnedTitle.wrong=TRUE

 SEND ReturnedTitle TO process 3.3 bill Customer with Fine

 Return/* Stop execution here, done here*/

ELSEIF ReturneTitle IS damaged

 SET ReturnedTitle.damaged = TRUE

 SEND ReturnedTitle TO Process 3.3 Bill Customer with Fine

ELSE

 SEND ReturnedTitle To Process 3.4 Confirm Return

END/*End ELSELF statement*/

END IF/*End IF statement*/

Program Simplicity:

This Module gets a returned title from a customer and then checks the returned title to see if the title is wrong or damage. This module works with [ReturnedTitle] object and two boolean attributes. The right title check is first thing we check when a customer returns a title and then the condition of the title. The [ReturnedTitle.missing] attribute is setted to be TRUE when the returned title is missing, and the object is sent to Process 3.3 Bill Customer with a fine. when the title is missing we will set it returned since there will be a fine sent to the customer and it would be meaningless to continue the execute the code to check the condition. When the returned title is present (disc is not missing), the ReturnedTitle object passes to the ELSEIF statement and checks the condition of the title. This ELSEIF statement sets [ReturnedTitle.condition] attribute to be TRUE if the title is damaged and then the object is sent to process 3.3 to Bill Customer with a fine. Because of the following statement is ELSE, there is no need to set the object to be RERURN. The final step of the code is when the title is neither missing nor damage (Missing and damage are FALSE), the Returned title object will sent to Process 3.4 to confirm the return.

Coupling:

This module uses "Control Coupling" because the ReturnedTitle object is passed with TRUE or FALSE flag. The Flag of the ReturnedTitle is used to determine program flow which means the object is sent it to the different processes is dependent of the boolean type referenced by the ReturnedTitle "missing" and "damage" attributes. The module uses an ReturnedTitle object as input/output, so the module uses "Stamp Coupling". Avoiding querying the database is the main advantage of holding an entire object in memory.

Cohesion:

The module uses "Procedural Cohesion" because there is little data relationship among function elements and data relationships in the flow control (sequence is important). In the Check Return Movie Title Validity , the module checks the title whether missing or not at first. If it is TRUE, the "IF" statement is will Return, and at the same time, the flow of the program stops the execution. When the "IF" statement returns which means the missing title is FALSE (Returned Title is correct), the control will passed to the "ELSEIF" statement where the RetuenedTitle goes to the check the title condition. when the either one of the "IF" and " ELSEIF" statement is FALSE, the object will be sent to the " ELSEIF" statement to confirm the return is valid.

Module: Reorder Title (2.2.2)

Purpose: Check order title if is correct

Input: Title: object /*This is represents order title received by Vendor going into the Module*/

Output: Title: Object

Pseudo-code Specification:

```
SET Title_found = FALSE;
WHILE Title_found and not end of the file ( reorder STORE)
    GET Title_name FROM reorder STORE /*Get all the titles name from reorder*/
    IF Title_name = Vendor new_Title /*If title found*/
        THEN Title_found = TRUE /* When the Title_found to be true, the loop will exit*/
        END /* This is the end of the statement*/
END /*This is the end of the While Loop*/

CASE Title_found
    WHEN TRUE /*This means all the title are correct so we will sent to confirm shipment*/
        SET correct_title = new_title
        SEND correct_title TO Process 2.2.3 ( Confirm shipment)
    ELSE /*This happens when the title is incorrect, so it will sent to Notify Vendor*/
        SET incorrect_title= new title
        SEND incorrect_title TO Process 2.2.4 (Notify Vendor)
END /* End of the statement*/
```

Program Simplicity:

This module starts with setting the title_found variable to be FALSE, so that the loops will go through the Reorder STORE file until there is a title match otherwise the program will reach the end of the file. In the program, when there is a match, Title_found will be TRUE, otherwise Title_found to set be FALSE. After that, the Title_found variable will be passed to the CASE statement where it evaluated. when the value of the Title_found is true, the CASE statement sends the object to Process 2.2.3 to Confirm Shipment. And when the value is is FALSE, the CASE statement sends the title object to Process 2.2.4 to Notify Vendor.

Coupling:

This module also uses the “Control coupling” because the title object is passed with either a TRUE or FALSE flag. The title object is used to determine the program flow. The output of the object is depends on the the title object. When the title is TRUE, it will send to confirm the shipment. This module also uses the “ Stamp Coupling” because the variable passing an entire object instead of some of the attributes.

Cohesion:

This module uses “ Sequential Cohesion” Because of the variable acts as input for the WHILE loop and the output data from the loop will serve as the input for the CASE statement.

Cost Benefit Analysis

This Worksheet is a Capital Budgeting Analysis for Redbox Automated Retail LLC	
Author: Yiwen Li	
Ranges: none Macros: none	
Assumptions	
-	
Interest rate	7.0%
Salvage value	58,000
Annual additional income	178,000

Redbox Automated Retail LLC Capital Budgeting Analysis					
	2004	2005	2006	2007	2008
	-	-	-	-	-
Annual additional income	178,000	178,000	178,000	178,000	178,000
Salvage value					58,000
	-	-	-	-	-
Annual cash flow	178,000	178,000	178,000	178,000	236,000
Total cash flow	948,000				
Present value	771,188				
Cost of investment	220,000				
Net present value	551,188				

55118 8.34	5.0%	5.5%	6.0%	6.5%	7.0%	7.5%	8.0%	8.5%	9.0%	9.5%	10.0%	10.5%	11.0%
	(44,671)	(47,514)	(50,288)	(52,997)	(55,641)	(58,223)	(60,745)	(63,208)	(65,614)	(67,966)	(70,263)	(72,508)	(74,703)
30000	(23,024)	(26,162)	(29,226)	(32,218)	(35,140)	(37,994)	(40,781)	(43,505)	(46,166)	(48,767)	(51,309)	(53,794)	(56,223)
35000	(1,376)	(4,811)	(8,164)	(11,440)	(14,639)	(17,764)	(20,818)	(23,802)	(26,718)	(29,568)	(32,355)	(35,080)	(37,744)
40000								(4,098)	(7,270)	(10,370)	(13,401)	(16,365)	(19,264)
45000	20,271	16,541	12,897	9,339	5,862	2,465	(854)						
50000	41,918	37,892	33,959	30,117	26,363	22,695	19,109	15,605	12,179	8,829	5,553	2,349	(785)
55000	63,566	59,243	55,021	50,895	46,864	42,924	39,073	35,308	31,627	28,027	24,507	21,063	17,695
60000	85,213	80,595	76,083	71,674	67,365	63,153	59,036	55,011	51,075	47,226	43,461	39,777	36,174

Development Costs For Redbox	
Expense Category	Amount
Salaries and Wages	95,000.00
Equipment	25,000.00
New Kiosk	30,000.00
Support	50,000.00
Utilities	20,000.00
Licenses	15,000.00
Total Developmen cost	220,000.00

Anual Operating Costs For RedBox	
Recurring Expense	Amount
Conectivity	35,000.00
Technical and Equipment	35,000.00
Customer Support Center	20,000.00
Daily Operation	45,000.00
Amortization and Other	12,000.00
Total Recurring Costs	147,000.00

Annual Benefit For RedBox	
Benefit/Cost Saving	Amount
Incresed Efficiency in Kiosk	60,000.00
Incresed Efficiency FAQ System	35,000.00
Increased Earning From Web page	170,000.00
Saing Due to System Improvement	60,000.00
Total Anunal Benefit	325,000.00

Interview Questions:

For Manager:

1. How long have you been working for Redbox? I've been working for Redbox for 3 years.
2. Who are your main competitors? Netflix, Google play, Hulu, Crackle, Amazon, Youtube, iTunes. Blockbuster was a former competitor we acquired in June .
3. What is your company's competitive advantage? The ability to provide \$1 DVD rentals and \$2.50 Game rentals at a convenient location where customers already shop. . Like Walgreens, Walmart, Kroger, 7-eleven, and CVS.
4. What are your main sources of generating revenue? We generate revenue primarily through fees charged to rent or purchase a movie or video game, and we pay retailers a percentage of our revenue. We obtain our movie and video game content through revenue sharing agreements and license agreements with studios and game publishers, as well as through distributors and other suppliers.
5. What are the major Business processes? Order Process, Payment process, inventory management, management reports and customer relationship.
6. What processes could be improved in the system? Predicting and reacting to relevant business trends, to avoid over-install kiosks in certain geographic areas leading to non-profitable installations.Out of stock Inventory, acquiring New Releases from Manufacturer
7. What is your current position on customer service availability? Customers are our number one priority. The Redbox Customer Care team is available Monday through Sunday: 07:00 AM to 12:00 AM for a live online chat or call. Customers can also go to redbox.com and search the Customer Service Help Center
8. What new innovations does your company plan on having 5 years down the line? To capitalize in Redbox's Limited Liability Company Agreement and related arrangements with Verizon Ventures. For what we hope will be the launch of video distribution services, which will provide consumers with access to video programming delivered via broadband networks to video-enabled viewing devices

For Staff:

1. What is your job position? Customer service representative.
2. How long have you been working for Redbox? I've been handling customer service for 2 years now.
3. What type of products does Redbox offer? We offer used Movies and Game rentals, as well as the ability to purchase both.
4. Have you ever rented from Redbox? Why? No, because they do not offer digital service.
5. What are the key differences between Redbox and Netflix? Redbox offers cheap and competitive prices on rentals with location convenience, Netflix are subscription based offering digital service and Movie shipment.
6. What kind of deals do you offer? As a member you get monthly promotions through email and text for free rental codes.
7. How do you do you deal with customers who have problems with out of stock rentals? I look up their location then provided the closest Redbox kiosk that has the product in stock
8. How does a customer place an order(phone in/ email/ walk in)? Customer can go to our kiosk then follow instruction on screen to place order as well as reserve the product online to guarantee satisfaction.