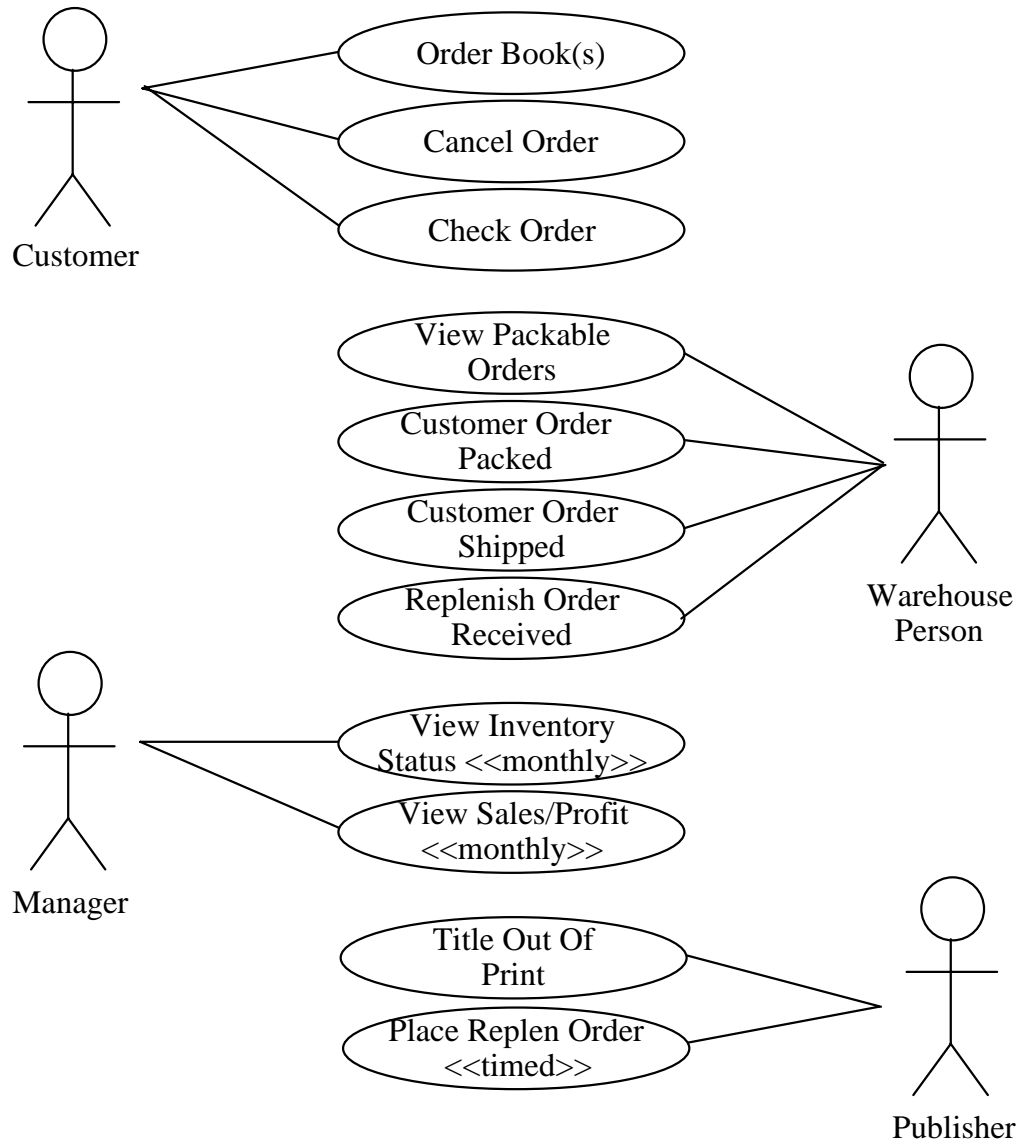# WebBooks: Conceptual Spec

This is an example UML conceptual model (a model of the business policy / business process) for the WebBooks case study.

Use Cases

The following diagram shows the use cases in the WebBooks system

<u>Customer</u>

The customer is the person who orders and pays for books.

Order Book(s)
The customer has selected one or more books to purchase and is placing an order.

Cancel Order
The customer has changed their mind about an order and wants to cancel it. The order will only be cancelled if it has not already been packed or shipped.

Check Order
The customer wants to see the current status of their order (e.g., has it been packed or shipped?).

Warehouse Person
The warehouse person is responsible for packing and shipping orders. Warehouse person also receives replenish orders.

View Packable Orders
The warehouse person needs to see which orders are in a condition to be packed and shipped.

Customer Order Packed
Some particular packable customer order has been packed and the books need to be deducted from the inventory.

Customer Order Shipped
The shipper has come by and picked up a bunch of customer orders for shipment. This order is among those that were picked up.

Replenish Order Received
A replenish order was received from a publisher and the books received need to be added to the inventory.

Manager
A manager at WebBooks who needs to examine the inventory and check the sales and profit status.

View Inventory Status
Show the manager which titles are available, what the current stock level is, and what the required re-order level is. This is viewed at the end of the month.

View Sales/Profit
Show the manager the summary financial data about how much sales and how much profit there are in the current calendar month. This is viewed at the end of the month.

Publisher
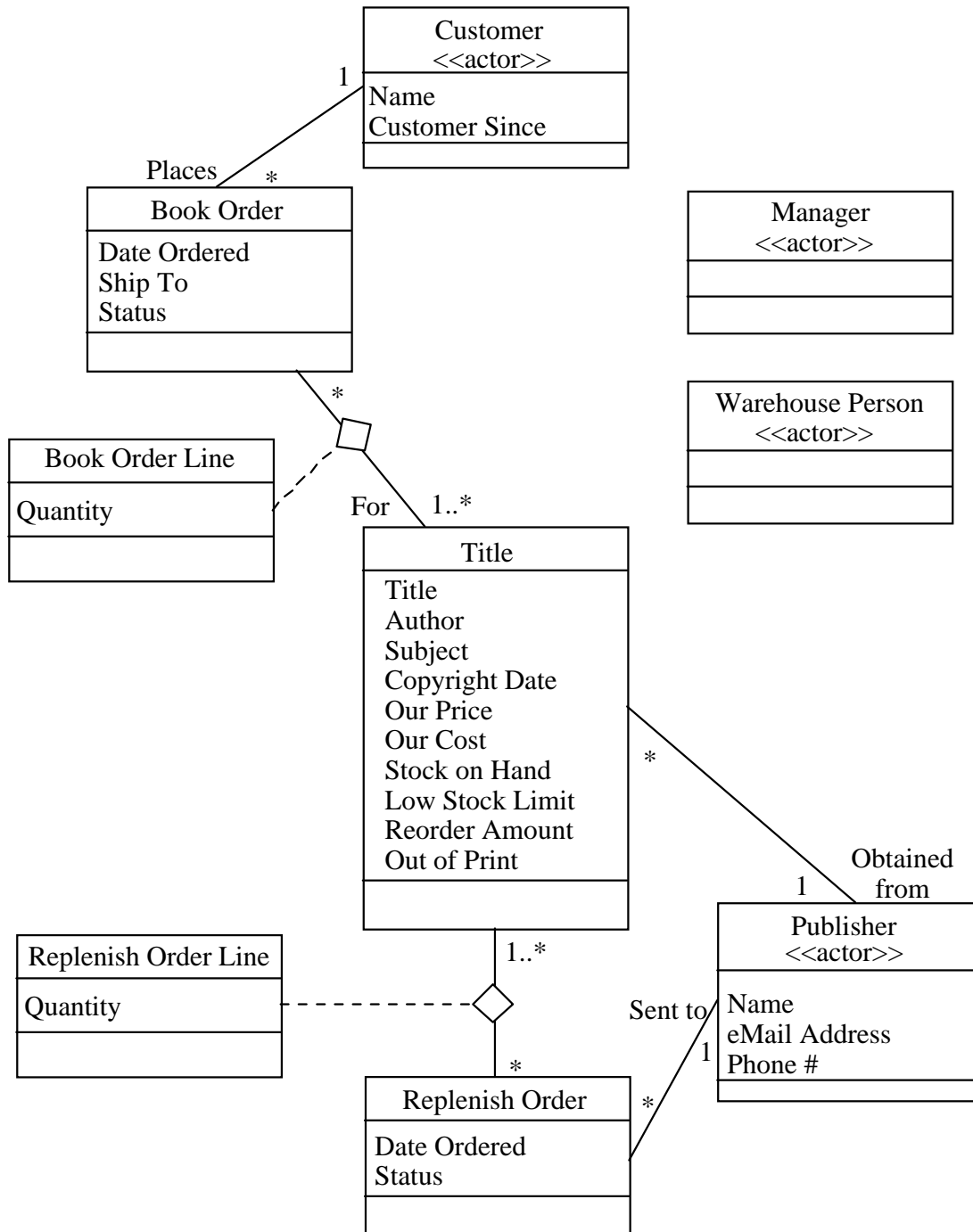A publisher is a company that WebBooks orders books from.

Out of Print

The publisher is notifying WebBooks that they will no longer be printing copies of some title, meaning that additional copies cannot be ordered.

Place Replenish order

A replenish order has collected re-order information for 24 hours and it is now time to send the order to the publisher.

Class Diagram

The following diagram shows the classes, attributes, associations, and generalizations in the WebBooks system.

```
                         ┌─────────────────────┐
                         │      Customer       │
                         │     <<actor>>       │
                     1   ├─────────────────────┤
                    ─────│ Name                │
                         │ Customer Since      │
                         ├─────────────────────┤
        Places           │                     │
                 *       └─────────────────────┘
    ┌─────────────────────┐                        ┌─────────────────────┐
    │     Book Order       │                        │      Manager         │
    ├─────────────────────┤                        │     <<actor>>        │
    │ Date Ordered         │                        ├─────────────────────┤
    │ Ship To              │                        ├─────────────────────┤
    │ Status               │                        └─────────────────────┘
    ├─────────────────────┤
    │                      │                        ┌─────────────────────┐
    └─────────────────────┘        *                │  Warehouse Person    │
                          ◇                          │     <<actor>>        │
    ┌─────────────────────┐                          ├─────────────────────┤
    │   Book Order Line    │                          ├─────────────────────┤
    ├─────────────────────┤   For    1..*            └─────────────────────┘
    │ Quantity             │
    ├─────────────────────┤
    │                      │      ┌─────────────────────┐
    └─────────────────────┘      │       Title          │
                                 ├─────────────────────┤
                                 │ Title                │
                                 │ Author               │
                                 │ Subject              │
                                 │ Copyright Date       │
                                 │ Our Price            │
                                 │ Our Cost             │     *
                                 │ Stock on Hand        │
                                 │ Low Stock Limit      │              Obtained
                                 │ Reorder Amount       │          1     from
                                 │ Out of Print         │        ┌─────────────────────┐
                                 ├─────────────────────┤        │      Publisher       │
    ┌─────────────────────┐      │                      │        │     <<actor>>        │
    │  Replenish Order Line │     └─────────────────────┘        ├─────────────────────┤
    ├─────────────────────┤       1..*          Sent to  │ Name                │
    │ Quantity             │- - - - - - -◇               1 │ eMail Address       │
    ├─────────────────────┤                  *             │ Phone #             │
    │                      │          ┌─────────────────────┤                     │
    └─────────────────────┘          │   Replenish Order    │ *                   │
                                      ├─────────────────────┤  └─────────────────────┘
                                      │ Date Ordered         │
                                      │ Status               │
                                      ├─────────────────────┤
                                      │                      │
                                      └─────────────────────┘
```

Collaboration Diagrams

The following diagrams shows the collaborations between the classes for each of the use cases.

Order Book(s)
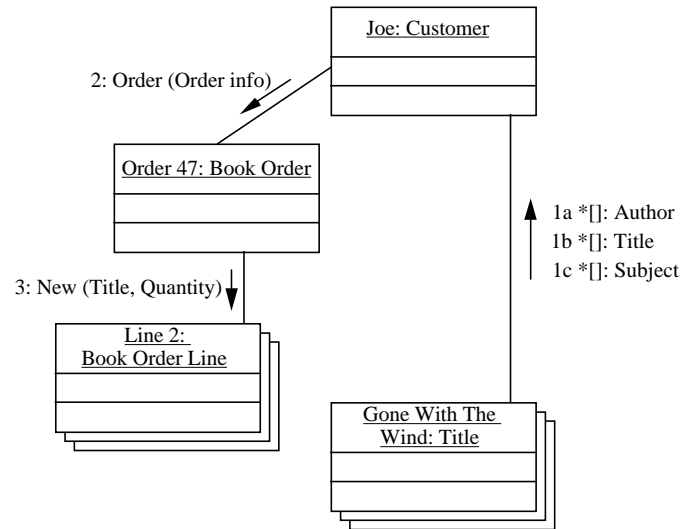
Cancel Order
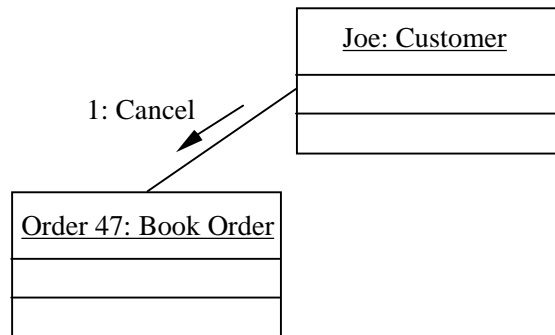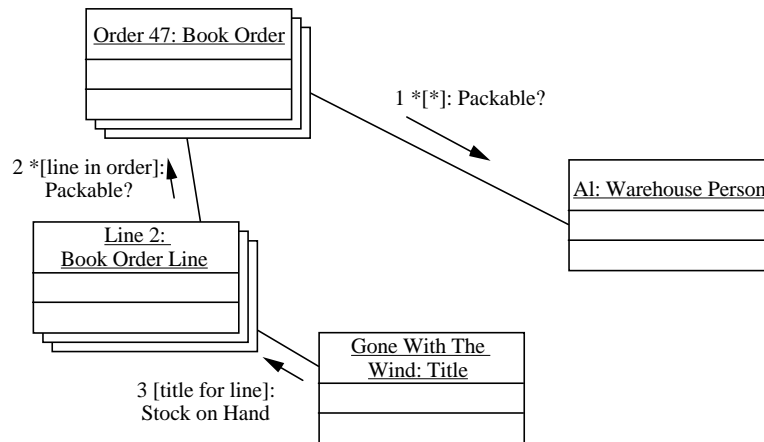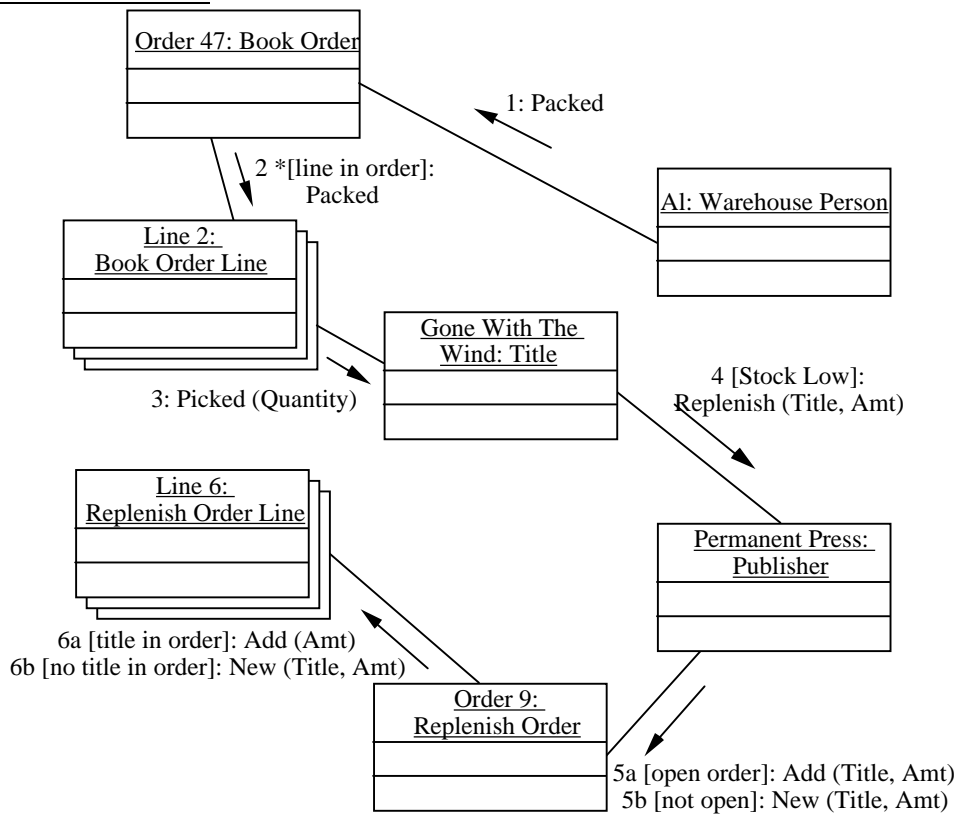

Check Order

This one was simple enough that I decided to leave the drawing out.

View Packable Orders

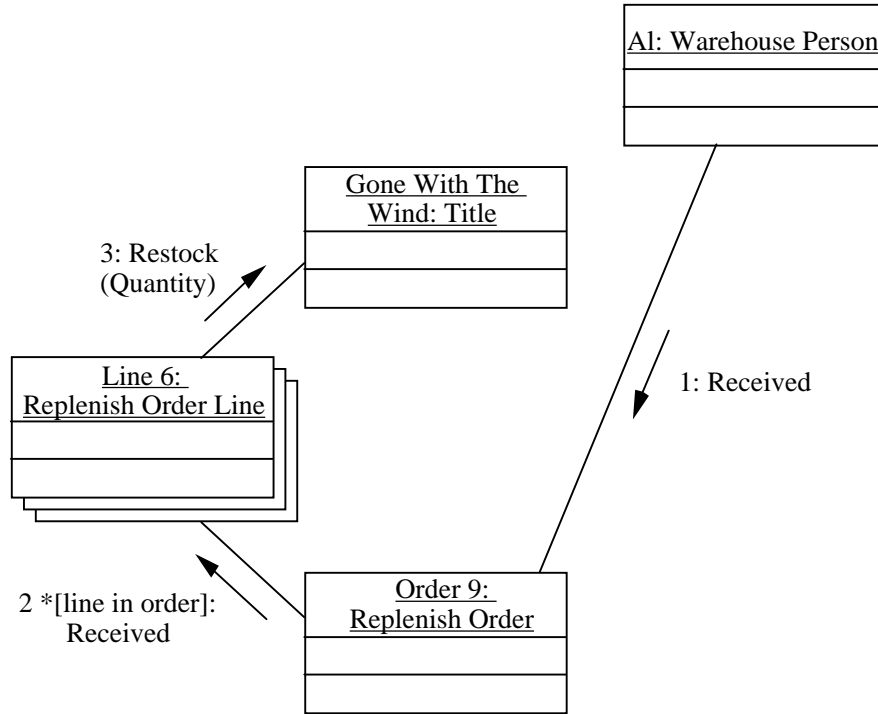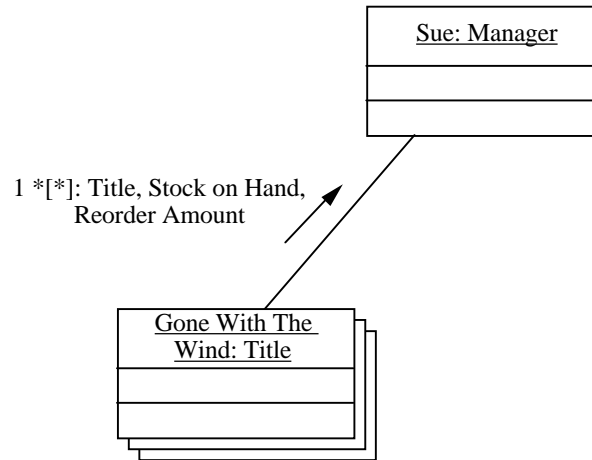Order 47: Book Order

1 *[*]: Packable?

Al: Warehouse Person

2 *[line in order]:
Packable?

Line 2:
Book Order Line

Gone With The
Wind: Title

3 [title for line]:
Stock on Hand

Customer Order Packed

Order 47: Book Order

1: Packed

2 *[line in order]:
Packed

Al: Warehouse Person

Line 2:
Book Order Line

Gone With The
Wind: Title

3: Picked (Quantity)

4 [Stock Low]:
Replenish (Title, Amt)

Line 6:
Replenish Order Line

Permanent Press:
Publisher

6a [title in order]: Add (Amt)
6b [no title in order]: New (Title, Amt)

Order 9:
Replenish Order

5a [open order]: Add (Title, Amt)
5b [not open]: New (Title, Amt)

Customer Order Shipped
This one was simple enough that I decided to leave the drawing out.

Replenish Order Received

```
                                              ┌─────────────────────┐
                                              │  Al: Warehouse Person │
                                              ├─────────────────────┤
                                              │                     │
                                              ├─────────────────────┤
                                              │                     │
                                              └─────────────────────┘
```

Al: Warehouse Person

Gone With The Wind: Title

3: Restock (Quantity)

Line 6: Replenish Order Line

1: Received

2 *[line in order]: Received

Order 9: Replenish Order

View Inventory Status

Sue: Manager

1 *[*]: Title, Stock on Hand, Reorder Amount

Gone With The Wind: Title

View Sales/Profit

1 *[Date Ordered in this month]: Sales, Profit

```
┌──────────────────────────┐
│ Order 47: Book Order      │
├──────────────────────────┤
│                           │
├──────────────────────────┤
│                           │
└──────────────────────────┘
```

```
┌──────────────────────────┐
│ Sue: Manager              │
├──────────────────────────┤
│                           │
├──────────────────────────┤
│                           │
└──────────────────────────┘
```

2 *[line in order]:
   Sales, Profit

```
┌──────────────────────────┐
│ Line 2:                   │
│ Book Order Line           │
├──────────────────────────┤
│                           │
├──────────────────────────┤
│                           │
└──────────────────────────┘
```

```
┌──────────────────────────┐
│ Gone With The             │
│ Wind: Title               │
├──────────────────────────┤
│                           │
├──────────────────────────┤
│                           │
└──────────────────────────┘
```

3: (Our Price, Profit)

Out of Print

```
┌──────────────────────────┐
│ Gone With The             │
│ Wind: Title               │
├──────────────────────────┤
│                           │
├──────────────────────────┤
│                           │
└──────────────────────────┘
```

1: Out of Print

```
┌──────────────────────────┐
│ Permanent Press:          │
│ Publisher                 │
├──────────────────────────┤
│                           │
├──────────────────────────┤
│                           │
└──────────────────────────┘
```

Place Replenish order
This one was simple enough that I decided to leave the drawing out.

Class Descriptions

The following sections provide the detailed descriptions of each of the classes in this system.

Customer

The actor who places book orders.

Name

The name that the customer has given us to represent this customer
Domain: [the name of a person or business]

Customer Since

The date on which this customer became known to WebBooks
Domain: [a date since 1997]

Book Order
A book order represents a customer's request for a certain set of books.
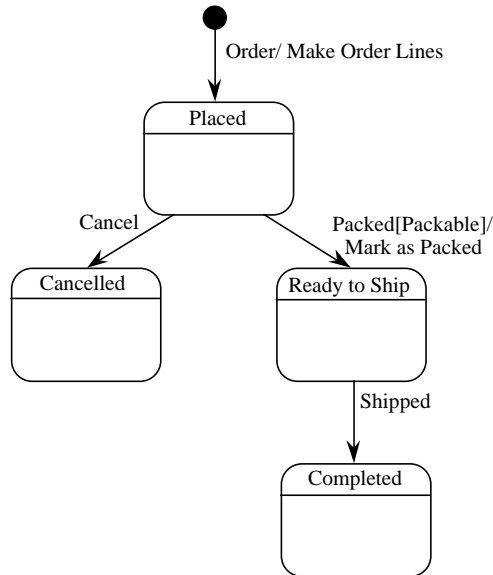
Date Ordered
Shows the date on which the book order was placed.
Domain: [a valid date since 1997]

Ship To
Shows the address that the customer wants the book(s) shipped to.
Domain: [any valid shipping address]

Status
Shows the current order status
Domain: [Placed, Ready to Ship, Completed, Cancelled]

Make Order Lines
Pre-condition
        none
Post-Condition
        New (Title, Quantity) has been signalled for each title in the order info

Mark as Packed
Pre-condition
        none
Post-condition
        Packed has been signalled to each book order line in this order

Packable?
        true if Status = Placed and Packable? is true for each book order line

Sales

      sum of Sales for each book order line in this order

Profit

      sum of Profit for each book order line in this order

Book Order Line
Represents the customer's request for a given number of copies of a particular title to be included in their order.
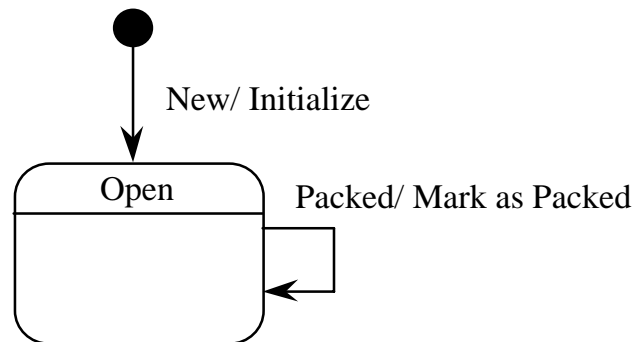
Quantity
Shows how many copies of a particular title have been requested by the customer
Domain: [one or more copies]

Initialize
Pre-condition
        Quan > 0
Post-condition
        this book order line is linked to book order and title
        post (.Quantity) = Quan

Mark as Packed
Pre-condition
        none
Post-condition
        Picked(Quantity) has been signalled to the corresponding title

Packable?
        true if Quantity <= Stock on Hand for the title

Sales
        Quantity * Title.Our Price

Profit
        Quantity * Title.Profit

Title
A book that either is, or was, being offered for sale to customers.
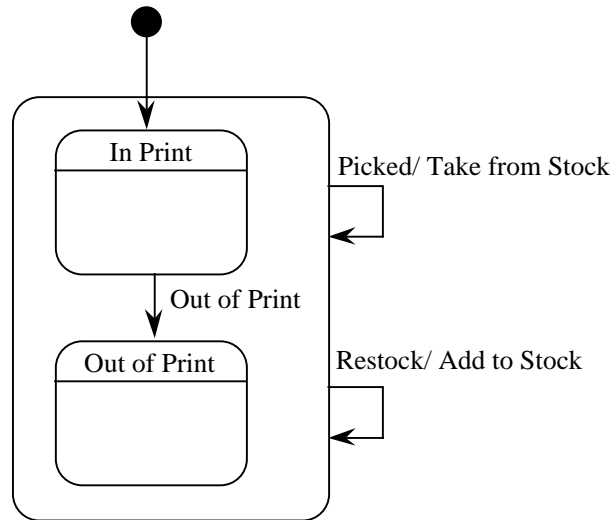
Title
The name of the book, e.g., Gone With the Wind
Domain: [The name of a published book]

Author
The name(s) of the person or persons who wrote the book
Domain: [Name(s) of one or more people]

Subject
The general topic area addressed by the book
Domain: [the name of a topic area]

Copyright Date
The date that the publisher declares as the copyright date for the title
Domain: [a date within the last 50 years]

Our Price
The price that we charge to customers who want to buy this book.
Domain: [$0.50 up to $1000.00]

Our Cost
The price that we pay to the publisher when we buy a copy from them.
Domain: [$0.25 up to $750.00]

Stock on Hand
The number of copies currently in the inventory that can be shipped to fulfill customer orders.
Domain: [0 .. 2000 copies]

Low Stock Limit
The threshold limit below which we request more copies from the publisher
Domain: [0..2000 copies]

Reorder Amount
The number of copies of this title that we will request from the publisher when it is time
to reorder this book.
Domain: [0..2000 copies]

Out of Print
Tells whether this book has been declared out of print by the publisher
Domain: [Yes | No]

Take from Stock
Pre-condition
        none
Post-condition
        post(Stock on Hand) = pre(Stock on Hand) - Quantity
        If Stock on Hand went below Reorder Amount then
                Replenish (Title, Reorder Amount) has been signalled to publisher
        If Stock on Hand was already below Reorder Amount then
                Replenish (Title, Quantity) has been signalled to publisher

Add to Stock
Pre-condition
        none
Post-condition
        post(Stock on Hand) = pre(Stock on Hand) + Quantity

Profit
        Our Price - Our Cost

Publisher
The actor who replenish orders are sent to and from whom replenish orders are received.

```
                    ●
                    │
                    ▼
          ┌──────────────────┐   Replenish/ Place Order
          │      Exists       │──────┐
          ├──────────────────┤      │
          │                   │◄─────┘
          │                   │
          └──────────────────┘
```
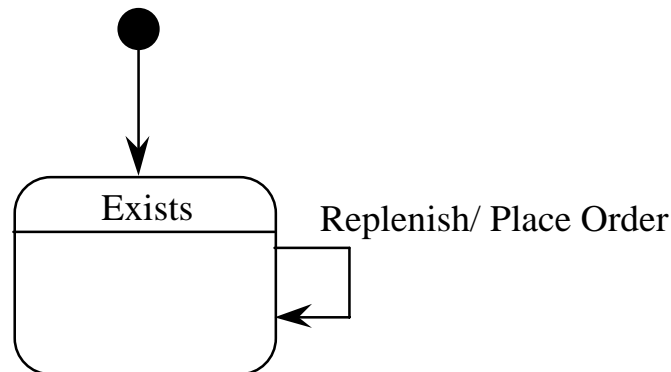
Name
The trade name of the publisher
Domain: [a valid business name]

eMail Address
The eMail address that we use to contact the publisher for more books
Domain: [a valid internet eMail address]

Phone #
The phone number that we use to call the publisher if there is some reason to contact a real person there.
Domain: [a valid international phone number]

Place Order
Pre-condition
        none
Post-condition
        if no open Replenish Order existed
                then New (Title, Amt) has been signalled
                else Add (Title, Amt) has been signalled

Replenish Order
Keeps track of the fact that we have ordered (or will be ordering) books to replenish
stocks depleted by customer sales.
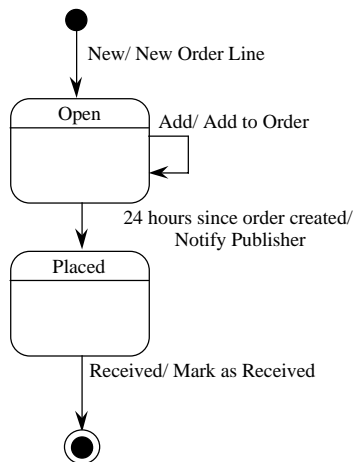
Date Ordered
The date on which the Replenish Order was first created
Domain: [a valid date since 1977]

Status
The current status of the Replenish Order
Domain: [Open | Placed]

New Order Line
Pre-condition
        none
Post-condition
        this replenish order is linked to the publisher
        New (Title, Amt) has been signalled to replenish order line

Add to Order
Pre-condition
        none
Post-condition
        if a replenish order line for that title already existed
                then Add (Amt) has been signalled to that line
                else New (Title, Amt) has been signalled

Notify Publisher
Pre-condition
        none
Post-condition
        the Publisher is now aware that a replenish order has been placed

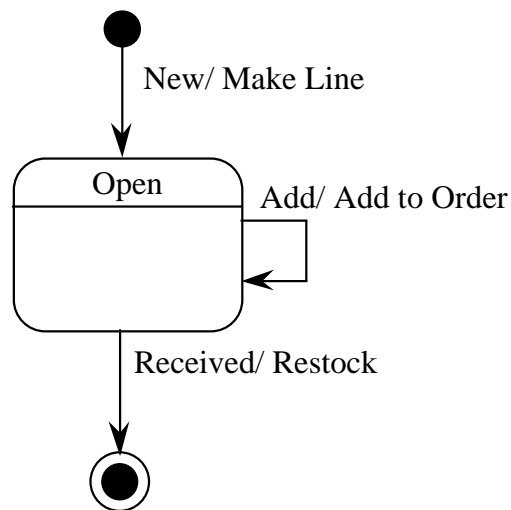Mark as Received
Pre-condition
        none
Post-condition
        Received has been signalled to all replenish order lines in this order

Replenish Order Line
Represents the request for a specified number of copies of a particular title to be ordered
from the publisher as part of a replenish order

Quantity
Shows how many copies of a particular Title have been requested from the publisher
Domain: [1..2000]

Make Line
Pre-condition
        none
Post-condition\
        this replenish order line is linked to the replenish order and the title
        post(Quantity) = Amt

Add to Order
Pre-condition
        none
Post-condition
        post(Quantity) = pre(Quantity) + Amt

Restock
Pre-condition
        none
Post-condition
        Restock (Quantity) has been signalled to the corresponding title