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# Library Application

## Overview

The example that we will look at in this document is the application to manage a public library. The system that we are going to configure will keep track of the library resources, such as books, CD's and videos and allow its members to borrow and reserve the library items. It will also manage information about library members keeping track of their activity and payments and registering any communication between members and the library. Members will be able to access the library system online to check their outstanding loans, reservation and fees, make online reservations and credit card payments.

In the following sections we will show how to design and configure such a system using **Aware IM**. Note that the complete configuration of the library system can be found in the `samples` directory of your **Aware IM** installation. You can use this configuration as reference when reading this document.

First we will list the requirements to the Library System so that we know exactly what system we are going to build.

## Requirements

This section states, from the management point of view, what the Library System should be able to do.

<note>that the requirements stated here are in no way affected by the subsequent configuration details and are not adjusted to the features and capabilities of **Aware IM**.</note>

## Items

1. Library item, or simply item, is a book, compact disk, video tape or any other resource that library members can borrow.
2. An item has a title and author(s)
3. Each item shall have a code, a short alphanumeric label uniquely identifying the item in the library.
4. It shall be possible to define an additional description of an item if required.
5. An item is kept in one of the well-known locations (usually inside a library but can be outside as well). From time to time some or all of items can be moved from one location to another.
6. An item can be of the types detailed in the [table below](#). Each type indicates how many items of this type can be borrowed by a member at any one time, maximum loan period in days and the number of times an item can be renewed
7. Users shall be able to see the photograph of the item where available.
8. The library may withdraw the existing item from use. The withdrawn items are retained by the library but are not available for borrowing any more.

## Item Types Table

Item Type	Max number that can be borrowed	Loan period (Days)	Max renewals
Book	10	28	2
Video	2	14	1
DVD	2	14	1
Magazine	4	14	1
CD	4	28	2
CD-ROM	4	28	2
Cassette	4	28	2
Community language book	4	28	2
Literacy item	5	28	2
Talking book	10	42	1

## Members

1. Only registered members can borrow items from the library.
2. The following member information shall be registered:
3. Name.
4. Address.
5. E-mail address, optional.
6. Age.
7. Gender.
8. Library-assigned 8-digit leading zero-padded membership number.
9. For certain violations the library management can suspend the member's ability to borrow items. The management can reverse the suspension.

## Borrowing Items

1. Unless suspended a member can borrow items from the library.
2. The maximum number of borrowed items cannot exceed 10 at any given time. From time to time the management can change this number, as well as item type-specific numbers. For example, during certain periods, such as school holidays, the numbers can be increased.
3. The loan duration is determined by the item type (see the item type table).
4. An item can be borrowed on any day.
5. The loan due date is determined based on the lent date and the loan duration.
6. The number of borrowed items of the same type, at any given time, cannot exceed the maximum specified for the type (see the item type table).
7. A member can renew the loan up to the maximum number of times as determined by the item type (see the item type table) and provided there are no reservations on the item.
8. If the borrowed item is not returned on the due day then on the next day:
  1. The member is charged \$1.00 overdue fee.
  2. The member is sent an e-mail if the e-mail address is available or an ordinary letter otherwise, informing the member of the overdue loans including the details of the loan.
  3. The fee and reminder letter are issued again with a 7-day interval until the borrowed item is returned.
9. Upon item's return the return date is registered and the loan is closed.

10. It shall be possible to produce at any time a printable loan statement showing the member details including currently borrowed items with indication of the following:
  1. Item code.
  2. Item title.
  3. Lent date.
  4. Due date.
  5. Details of all loans, whether current or past, are kept for reference purposes.

## Reserving items

1. If an item is currently on loan a member can make a reservation for the item.
2. The reservation fee \$2.00 and is charged to the member at the time the reservation is made. The fee is not refundable.
3. A member cannot reserve an item that is currently on loan to the member.
4. Once the reserved item is returned to the library:
  1. The member who reserved the item is notified by e-mail if the address is available or by ordinary letter otherwise. The e-mail/letter contains the details of the reservation, including the title and the reservation expiry date.
  2. A reservation remains open until the reserving member borrows the item or 7 days elapses in which case the reservation expires.
  3. If a reservation expires the item becomes available for borrowing to the next reserving member (who is notified accordingly) or to anyone if there are no more reservations.
5. If there is more than one reservation such reservations are processed in the order they are made.
6. A reservation can be cancelled by a member's request.
7. All reservations regardless of their status are kept for reference purposes.

## Fees

1. The library can charge its members fees for certain services or in certain events.
2. There are several predefined types of services/events.
3. When a fee is charged the system shall record the fee amount, date and the description of what the fee is for.
4. Once the fee is charged it increases the outstanding fees of the member by the fee amount.
5. Library management can remove a fee from the member in which case the outstanding fee amount should be decreased by the fee amount.

## Payments

1. A member can pay all or part of the outstanding fees
2. A member can pay online to the account of the Library by credit card. The system shall record the date and amount of the online payment.
3. A member can also pay by other (non-electronic) means, such as cheque, money order etc. It shall be possible to make an electronic record of the non-electronic payment in the system registering the amount of payment, the date of payment and the description of what the payment is for.
4. Once a payment is made the outstanding fees are decreased by the payment amount.
5. When a payment is made (both online or offline) a printed summary of the payment shall be

produced for the member showing the following:

1. Member name.
2. Date.
3. Amount.
4. Updated outstanding fees.

## Communication with members

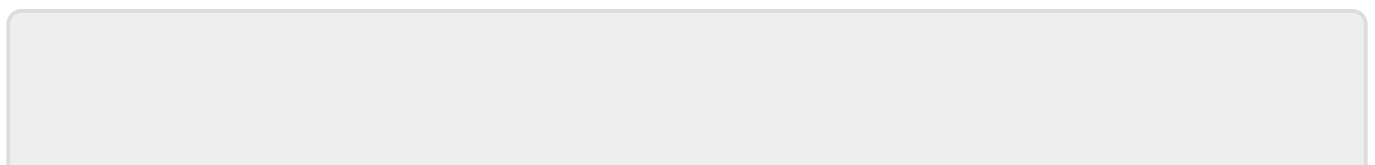
1. It shall be possible to record and store electronically the details of all forms of relevant communication between the library and its staff with library members. In particular:
  1. E-mails to members
  2. Letters to members
  3. E-mails from members
  4. Faxes to members
  5. Faxes from members
  6. Results of phone calls
  7. Results of discussions
2. The results of communication with a member shall be easily accessible on request

## Information access and activity restrictions

1. Library operators are allowed to see all information and perform all actions with the exception of modifying the details of the [Item Types](#).
2. Only the library manager can change details of the [Item Types](#)
3. Members can change their personal details and view their loan, reservation, fee and payment history. The only operations a member can perform are to reserve an item or to renew a loan, subject to the applicable rules. A member cannot see any information related to other members.
4. A guest of the library (any person not registered as library member) is allowed to browse and search the library collection of items, but is not allowed to perform any other operation or change any of the details.

## Internet access to library information

1. Members and guests should be able to access library information from outside of the library via the Internet using a standard Internet browser. No special software should be required to be downloaded or installed on the user's computer.
2. New library users should be able to register themselves as members via the Internet.
3. To access the library information members must login and their user name and password should be verified against the registered details.
4. Guests should not go through login process and can directly access library resources, subject to the restrictions for guests.



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