SENG1140 – Assignment 1

SEEC Resource Access Database Design Project

Part 1: Requirements

Data Requirements

* Resources:

Detailed information about each resource is stored by the support services. Data collected on all resources are the unique resource ID, description and status (available or, if unavailable, why). They are further separated into movable and immovable resources.

Data on movable resources includes resource names (cameras, speakers, etc), make, model, manufacturer, year created and value. Data on immovable resources includes capacity (if applicable, e.g. for a classroom)

* Catalogue:

The SEEC support services keep detailed information about all of the resources that they own for loaning to students and faculty. They aim to allow easier access to and information about resources through an online searchable catalogue.

The catalogue is updated frequently. The appropriate number of available resources increments when acquisitions are made, loans are returned and reservations are cancelled, and decrements when loans and reservations are made. Additionally, all of the stored information relating to each resource is accessible through the catalogue.

* Categories:

Resources as listed in the catalogue are divided into categories based on the type of resource (all speakers, all classrooms, etc). Every category is allocated a unique code, a name, description and time allocated for use (borrowed speakers, booked rooms, etc)

* Locations:

Furthermore, resources are allocated a location where they can be found. Locations have a unique ID, campus, building and room.

* Loans:

This service allows any available resource owned by the SEEC to be loaned to and returned from staff or students, known as members. Each loan is linked to a single member. Collected member data includes ID, full name, address, telephone number, email and user comments.

Students additionally have their borrowing status (“active” or “disabled”) and course information/offerings stored. Information on course offerings include course ID, course name, semester available, year, start date and end date.

Different levels of priority and privilege are given to potential recipients depending on level of authority. In particular, student privilege is reflected by their enrolled courses. Privilege information for each course includes privilege name, description, allowed resource categories and maximum number of resources.

Resources in the loan are designated as movable or immovable. Movable resources have a return date based on time allocated to the resource category. Immovable resources are booked by the hour.

* Reservations:

Resources can be reserved based on member privilege for access for some determinate period of time. Rank is irrelevant – if any resource is reserved, it is deemed “unavailable” for anyone for the length of the reservation.

Member information is stored – ID, name, address, phone and email – as well as the pickup date and due date.

* Acquisitions:

SEEC acquires frequently acquires new/updated resources based on suggestions from students and faculty. Suggestions are regarded based on resource type – anything that facilitates research or teaching takes priority over more novel or leisurely items.

Acquisition details include the acquisition code, member making the request, resource name, make, model, manufacturer, description, year of creation and the urgency of the request. More details are added later by the administrator – item status, value, fund code, vendor code and any additional notes.

Transaction Requirements

* Data manipulation operations:
  + Insert/update/delete a resource
  + Insert/update/delete a copy of a resource
  + Insert/update/delete a reservation
  + Insert/update/delete a loan
  + Insert/update/delete a member
* Queries:
  + Search resources based on ID, name, make, model, manufacturer, year created or movability.
  + List loans by borrower, by resource or all current loans
  + List reservations by resource or all current reservations
  + List overdue loans

Business Rules

* Each student starts with 12 points. Each day that a student has overdue resources, they lose 3 points. A student 0 points will have their borrowing status set to “disabled”.
* No resource can be reserved more than once at a time.
* A reservation is cancelled if it is not collected before the end of the pickup date. The member who made the reservation will be given a penalty of 1 point. The administrator can cancel reservations at their discretion.
* A student’s borrowing privileges are temporarily revoked while the due date of any of their currently loaned resources is earlier than the current date – the resource is considered overdue and the student’s borrowing status is set to “disabled”. Further addition/subtraction/reset of points is left to the administrator.
* A student cannot borrow/reserve more than the maximum number of resources listed in their privileges.
* The category of each resource determines how long it can be booked/borrowed for.

Part 2: Documentation of EER Model

Data Dictionary

Entities

|  |  |  |  |
| --- | --- | --- | --- |
| **Entity Name** | **Description** | **Aliases** | **Occurrence** |
| Resource | Any tool, building or software owned by the SEEC. | Item | One unique instance of each resource owned by SEEC |
| Member | Term describing those who borrow/book resources | Borrower | Everyone who makes a loan/reservation or requests an acquisition |
| Catalogue | The online search tool used by members to find available resources |  | All movable and immovable resources can be searched for on the catalogue |
| Category | Describes the type of resource and broadly how it is used | Type | All resources fit into one category |
| Location | A place where physical resources are located |  | All physical resources have one location |
| CourseOffering | The courses that a student is undertaking |  | All students are enrolled in 1-4 courses |
| Privilege | Describes what sort of resources are available to each member |  | Staff have unlimited privilege, but students have privilege based on their enrolled courses |
| Loan | The resources loaned to a member by the SEEC, as well as the due date for returning |  | Staff can loan unlimited resources, but students are limited by borrowing status and privilege |
| Reservation | Any resource can be reserved when they would be otherwise available, allowing members to book them |  | Any member can reserve as many resources as their privilege allows. |
| Acquisition | Requests for new or updated resources made by members |  | Any member can make one or more requests but higher priority is given to research and teaching |

Relationships

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity name** | **Multiplicity** | **Relationship** | **Multiplicity** | **Entity name** |
| Resource | 0..\* | Categorised into | 1..1 | Category |
| 0..\* | Located in | 0..1 | Location |
| 1..\* | Acquired with | 1..\* | Acquisition |
| Member | 1..1 | Has | 0..\* | Loan |
| 1..1 | Has | 0..\* | Reservation |
| 1..1 | Requests | 0..\* | Acquisition |
| 1..1 | Has | 1..4 | CourseOffering |
| CourseOffering | 1..\* | Allows | 1..\* | Privilege |
| Loan | 1..1 | Contains | 1..\* | Resources |
| Reservation | 1..1 | Reserves | 1..\* | Resources |
| Catalogue | 1..1 | Displays | 1..\* | Resources |

Attributes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Entity Name** | **Attributes** | **Description** | **Data Type & Length** | **Nulls** | **Multi-valued** | **Derived** | **Default** |
| Resource | resourceID  description  status | Unique resource ID  Brief description  Availability of resource | 8 variable chars  200 variable chars  20 variable chars | N  N  N | N  N  N | N  N  N |  |
| Movable | name  make  model  manufacturer  yearCreated  value | Name of resource  Make of resource  Model of resource  Resource manufacturer  Year resource was created  Monetary value of resource | 30 variable chars  25 variable chars  25 variable chars  25 variable chars  Four-digit integer  Currency | N  Y  Y  N  Y  Y | N  N  N  N  N  N | N  N  N  N  N  N |  |
| Immovable | buildingCapacity | How many people allowed in building | Three-digit integer | Y | N | N |  |
| Member | memberID  name  firstName  lastName  address  number  street  city  state  postcode  phone  email  comments | Unique member code  Member first name  Member last name  House number  Street of address  City of address  State of address  Postcode of address  Contact number  Contact email  Member-submitted comments | 6 variable chars  25 variable chars  25 variable chars  1 – 5-digit integer  30 variable chars  20 variable chars  20 variable chars  Four-digit integer  12 variable chars  40 variable chars  200 variable chars | N  N  N  N  N  N  N  N  N  Y  Y | N  N  N  N  N  N  N  N  N  N  N | N  N  N  N  N  N  N  N  N  N  N |  |
| Category | categoryCode  categoryName  description  timeAllocated | Unique category code  Category name  Brief category description  Max time allowed for booking/borrowing | 6 variable chars  40 variable chars  200 variable chars  15 variable chars | N  N  N  N | N  N  N  N | N  N  N  N |  |
| Location | locationID  campus  building  room | Unique location ID  Campus of location  Room of location | 5 variable chars  40 variable chars  12 variable chars | N  N  N | N  N  N | N  N  N |  |
| CourseOffering | courseId  courseName  semester  year  startDate  endDate | Unique course ID |  |  |  |  |  |
| Privilege | privilegeName  description  allowedCategories  maxResources |  |  |  |  |  |  |
| Loan | loanID  borrowingMember  dueDate |  |  |  |  |  |  |
| Reservation | reservationID  reservedResources  borrowingMember  pickUpDate  dueDate |  |  |  |  |  |  |
| Acquisition | acquisitionCode  requestingMember  resource  requestUrgency  itemStatus  fundCode  vendorCode  notes |  |  |  |  |  |  |

EER Model

