

# COMP1140: Database and Information Management

## Assignment 1: SCS Resource Management Database Design Project

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## PART 1: REQUIREMENTS

### 1.1 SCS Administration Staff User View – Data Requirements

#### *1.1.1 Data Requirements*

SCS staff members are responsible for the day-to-day operation of the SCS department, including the administration of the SCS resource management database.

#### *1.1.2 Catalogue Service*

A web-based searchable catalogue of all resources, e.g. cameras, software and meeting rooms. Once logged in, SCS administration staff (admin staff) will be able to search the database by keyword, identification numbers, category, make, model or name etc. Admin staff will be able to view catalogue records, availability, loan status, expected return dates, loan history and also add new or remove old items from the catalogue depending the requirements of the service.

#### *1.1.3 Loan Service*

The SCS resource collection consists of a variety of items available for loan and physical spaces available for booking by University of Sunshine staff and students, known as members. Through the loan service module, admin staff will manage the issuing and returning of resources to borrowers and the booking of rooms. The data being accessed in the loan service module will be member ID, resource ID, date and time borrowed, date and time due, and date and time returned.

#### *1.1.4 Resources*

The resources will be separated into moveable and immovable resources, and then into general categories such as phones, speakers, cameras.

##### *1.1.4a Moveable Resources*

The data being stored is a unique resource identification number, category number, category name, description, current status/condition, name of the item, make of the item, manufacturer, model, year, asset value, and lending and storage details being storage id, room number and building. Where the item is housed when not in use?

##### *1.1.4b Immovable Resources*

The data being stored for immovable resources is capacity.

### *1.1.5 Reservation Service*

The reservation module will be used to keep track of all resources requested by members and access will be based on availability and a 'first-come-first-serve' basis. The data being stored in the reservation module is the unique reservation number, member ID number and name of the person who made the request, resource ID number, resource type being either moveable or immovable, category and dates required and rank of reservation e.g. 1/3.

### *1.1.6 Acquisition Service*

The acquisition module will provide a means for admin staff to capture and respond to requests for new and/or updated versions of resources made by members that they would like to see added to the SCS resource collection. The data being stored for an acquisition will need to be the unique request number, member ID and name, name of resource, make, model, features, a brief description, and the purpose for why this request is being made. If a student member makes a request, they must also provide their course and lecturer's details for admin staff to gain approval prior to purchase.

## **1.2 SCS Administration Staff User View – Transaction Requirements**

### *1.2.1 Data Entry*

Admin staff will be able to perform the following functions:

- Enter a new member into the database, e.g. (John Stuart, Student, course enrolled Software engineering)
- Enter a new resource into the database, e.g. (00001 Nikon D5600 camera)
- Enter new rooms into immovable resources, e.g. (Blossom Room, capacity 60 people)
- Enter a new category into moveable resources, e.g. (010291, speakers)
- Enter new acquisition, e.g. (173643, SLIII Bose, speaker, Elliot Mash, Music department, received)
- Enter new reservation, e.g. (0233210 Lucy Evans, D5600 Nikon camera)

### *1.2.2 Data Update/deletion*

Admin staff will be able to perform the following functions:

- Update/delete the details of admin staff
- Update/delete the details of members
- Update/delete the details of resource categories
- Update/delete the details of loans
- Update/delete the details of acquisition requests
- Update/delete the details of reservations

- Update/delete the details of moveable resources
- Update/delete the details of immovable resources
- Update/delete the details of loan parameters
- Update/delete the details of resource visibility in the online public access catalogue (OPAC)
- Update/delete the details of courses being taught to or by members

### *1.2.3 Data Queries*

Examples of data queries performed by admin staff may include:

- List details of all current members enrolled in or teaching a particular course
- List all current non active members (including any information regarding why status is non active which will be found in the members comments field)
- Identify details of current courses on offer (displaying the conditions under which resources can be loaned based on the course requirements)
- List all items due for returning today, by rank of the greatest number of loans to least
- Identify which rooms have bookings over the next seven days
- Display a member's outstanding reservations
- List all acquisitions purchased in the past three months
- List all resource available in a category, e.g. cameras
- Display a member's loan privileges, e.g. how many resources can be loaned at any given time
- Display an immovable resource availability and capacity
- List all available rooms on a particular date/time

## **2.1 SCS Member User View – Data Requirements**

### *2.1.1 Data Requirements*

Member users will consist of university staff, e.g. lecturers, and university students. Members are allowed access to SCS resources based on the courses in which they are enrolled or teaching, and loan privileges will depend on their status as staff or student, e.g. students may only borrow a limited number of items per the business rules. The data being stored associated with members includes a unique identification number, password, name, staff or student, address, contact number, email, current status, comment field, courses enrolled/teaching and loan privileges.

### *2.1.2 Catalogue*

A web-based searchable catalogue of all resources, also known as an online public access catalogue (OPAC) from the member view. Once logged in, members will be able to search

the database by keyword, identification numbers, category, make, model or name etc. Members will be able to view details about the resource, instructions for use and availability. However, unlike admin staff, members will not be able to view or make changes to the catalogue record, availability, loan status, expected return dates, loan history or add/remove items from the catalogue.

### *2.1.3 Loan Service*

Although the loaning and returning of resources are conducted by admin staff, members will be able to use the loan module to view their account details, list resources currently on loan with due dates and the option to renew where available, and access their loan history. . The data being stored in the loans service will be member id, resource id, date and time borrowed, date and time returned, date and time due.

### *2.1.4 Reservation Service*

The reservation module will be used to keep track of allocated items or resources requested by a borrower based on availability and the “first-come first serve” basis. A member will be allowed to make reservations, view all current reservations, and cancel any unwanted reservations. The data being stored in the reservation module is the unique reservation number, member id number and name of the person who made the request, resource id.

### *2.1.5 Acquisition Service*

The acquisition module will allow members to suggest new and/or updated versions of resources that they would like to see purchased and added to the collection. Similar to loan privileges and as per the business rules, acquisition privileges will differ between university staff and students. For example, students are required to list their course and lecturer when making a request. This will send the request to the lecturer for approval prior to admin staff considering the request and making a purchase.

The data being stored for an acquisition will need to be the unique request number, member ID and name, course, name of lecturer, name of resource, make, model, features, a brief description, and the purpose for why this request is being made.

## **2.2 SCS Member User View – Transaction Requirements**

### *2.2.1 Data Entry*

Members will be able to perform the following functions:

- Enter new reservation, e.g. (0233210 Lucy Evans, D5600 Nikon camera).
- Enter members contact details
- Enter a new acquisition into the database (depending on the privileges as per business rules)

### *2.2.2 Data Update/Deletion*

Members will be able to perform the following functions:

- Update the contact details of the member user, e.g. new address or phone number (these details will be checked per business rules for membership)
- Update the due date of a current loaned resource (renewal) if the item has no other reservations
- Update/delete the details of an acquisitions made by user member (depending on the privileges as per business rules and prior to the actual purchase of the resource)
- Update/delete the details of reservations made by member

### *2.2.3 Data queries*

Examples of data queries performed by admin staff may include:

- List specific category of requested items in catalogue
- Display immovable resource availability with date and time options
- Display all resources types
- Display all membership details of the user member
- List all of the member's reservations
- Display member's status (status either active or non-active per the business rules)
- List all current member's loans with due dates
- Identify the member's acquisition request status (checking the condition on acquisitions as per the business rules)
- Do a keyword search, e.g. Nikon, camera, iPod
- Refine searches to only items currently available
- Display all immovable resources with a particular capacity or greater

## **3.1 SCS Business Rules**

### *3.1.1 Membership*

To become a member of the SCS department and its services, an individual must provide the following:

- SCS department staff members will need SCS identification number, password, name, address, contact number and email
- University staff members and student must provide university ID number, password, name, address, contact number, email, course enrolled if student and course teaching if a university staff member
- Identification must be provided, and membership checked with every transaction
- Members who are inactive (no loans or reservations) for longer than 24 months will be removed from the database and will need to reapply in order to resume membership

### *3.1.2 Privileges*

Members can do the following online:

- Extend the loan period of borrowed items if the item has availability for requested time
- View loan history
- View your current items on loan
- Search the catalogue, see item availability
- Place a reservation request on an item if the item is available for selected time period

### *3.1.3 Reservation Service*

- Any member can make a reservation request for any item; however, the item may not be loaned if the request does not meet the loan service business rules requirements

### *3.1.4 Loan Service*

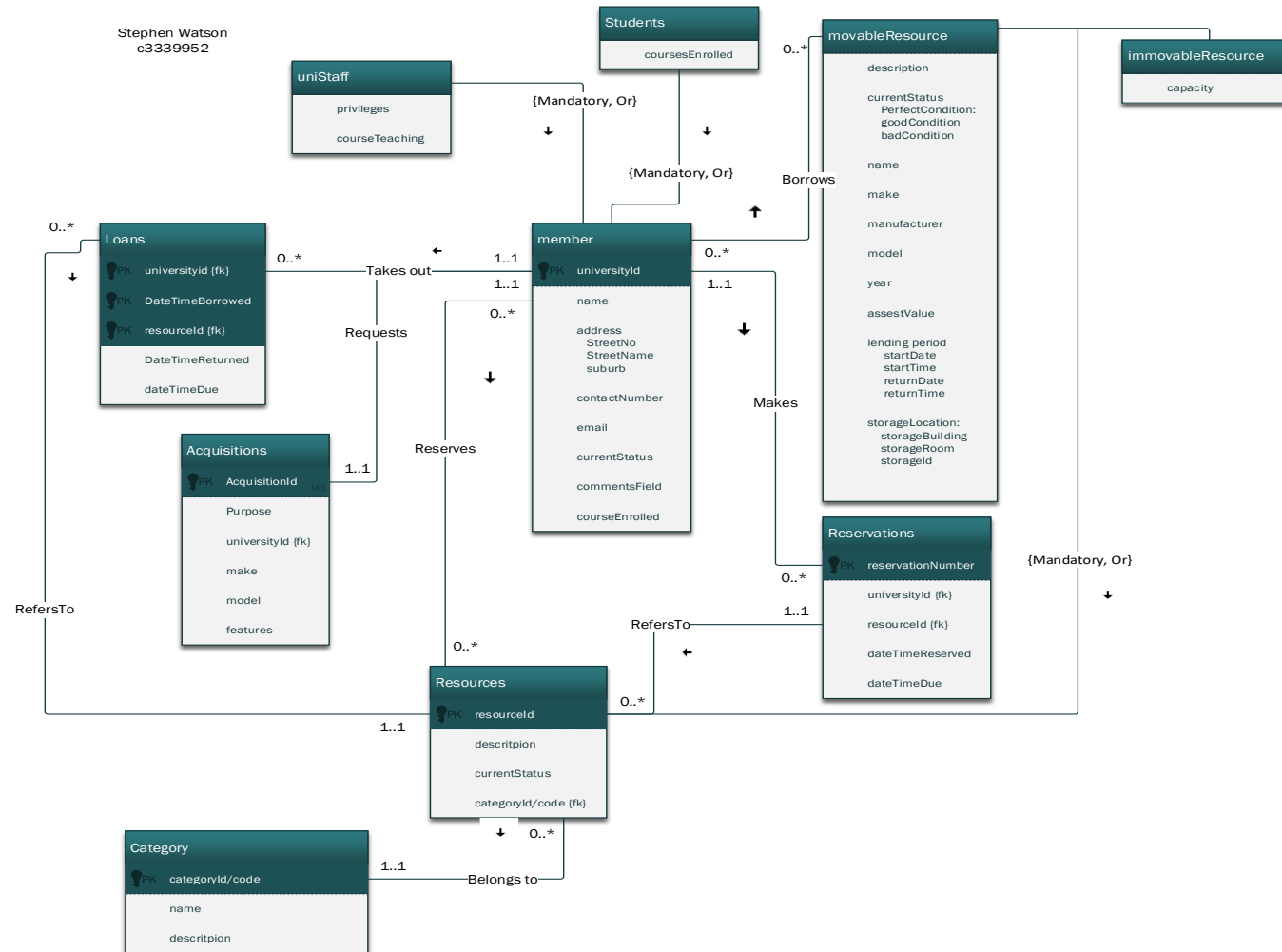
- To borrow items, an individual must be a member or SCS staff member
- Students can only be members if currently enrolled in courses at the university
- Students can only borrow a maximum of three items at once
- Loan periods are four weeks for most items, or two weeks for popular
- University staff members that require popular resources may borrow the resources but if they loan the item more than three times in one semester, they will need to put in an acquisition request for the item so they can have the resource for their course as well as the same resource available to other members
- Items which are out on loan can still be reserved for future available time periods.
- A member will be charged twenty percent of the value of a lost or damaged item, in addition to an administration fee
- View and cancel reservations
- Late fees of five dollars per item per day apply to all overdue resources

### *3.1.5 Acquisition Service*

- Acquisition requests may only be made by SCS admin staff or university staff members
- Student members may complete an acquisition request, but it will require approval by their lecturer before the request continues to the admin staff for consideration
- Request approval/denial will be received within 48 hours
- All acquisitions must provide a reason or purpose for the request; if no reason is provided as to why an item is needed, then the item will not be approved for purchase

## PART 2: EER MODEL WITH DATA DICTIONARY

## 4.1 EER diagram





## 5.1 Data Dictionary

### Data dictionary

#### Entity Types

Entity Types			
Entity Name	Entity Description	Aliases	Occurrence
Students	Student is an enrolled person of the university and is a Subclass of members.		A new student is created when a student enrolls into the university and commences classes.
University staff	A university staff is a person who is employed by the university. University staff is a subclass of members.		University Staff is created when a University Staff becomes employed by the university and commences work.
Member	Member is a person who uses the SCS department services.		A member is created when A new student is created when a student whose details are not in the database goes to use the service.
Loans	Loans is a record of a member borrowing a resource.		A loan is created when a member borrows a resource.
Acquisitions	An Acquisition is a record of the process of a request and purchasing of an asset or object brought by the SCS department used for learning and development of university and SCS members.		An acquisition is created when a member submits a request.
Resources	Resource is a physical item that can be loaned to members.		A resource is created when the SCS department has purchased or obtained the item and it is ready for member use.

Immoveable resources	An immovable resource is a type of study room or studio that can be booked for use.		Immoveable resource is created when the SCS department has a new physical structure or area for member use and is ready to be used by members.
Moveable resources	A moveable resource is a portable item that can be taken from the SCS department by a member.		A moveable resource is created when the SCS department has purchased an item and it is ready to be loaned to members.
Reservations	A reservation is a record of the request submitted by a member to the SCS department ask to be allocated a resource over a defined time period.		A reservation is created when a member submits a reservation request.
Category	A category is a record of a collection of like resources defined by the item's attributes and functions. Example phone or camera.		A category is created when a physical item becomes property of the SCS department. And it is the first of its type.

### Relationship Types

Relationship Types				
Entity name	Multiplicity	Relationship	Multiplicity	Entity name
Member		Mandatory , or.		Student
Member		Mandatory , or.		UniStaff
Member	1..1	Requests.	0..*	Acquisitions
Member	0..*	Borrows.	0..*	Moveable Resources
Member	0..*	Reserves	0..*	Resource
Member	1..1	Makes	0..*	Reservations
Member	1..1	Takes Out	0..*	Loan
Reservation	0..*	Refers To	1..1	Resource
Resource	0..*	Belongs to	1..1	Category
Resource		Mandatory , or.		Moveable
Resource		Mandatory , or.		Immoveable
Loans	0..*	Refers to	1..1	Resource

**Attributes**

<b>Attributes</b>							
<b>Entity name</b>	<b>Attributes</b>	<b>Description</b>	<b>Data type and length</b>	<b>Nulls</b>	<b>Multi-valued</b>	<b>Derived</b>	<b>Default</b>
<b>Student</b>	Courses enrolled	The course a Student is enrolled in to determine resources allowed.	varchar(30)	N	Y	N	
<b>Uni Staff</b>	Privileges	A record of the staff member privileges	varchar(30)	N	Y	N	
	Course Teaching	The course a Staff member is teaching to determine resources allowed.	varchar(30)	N	Y	N	
<b>Member</b>	Name	Name of the member.	varchar(30)	N	N	N	
	Address	Address of the member.	varchar(30)	N	N	N	
	Street number	The Street number of the member.	varchar(30)	N	N	N	
	Street name	The street name when the member lives	varchar(15)	N	N	N	
	Suburb	The suburb where the member lives	varchar(15)	N	N	N	
	Contact Number	Contact phone number of the member.	Int	N	Y	N	
	Email	Email of the member.	varchar(30)	N	N	N	
	Current status	Current status of the member being either active or inactive.	varchar(15)	N	N	N	
	Comment Field	Any comments relating to member.	varchar(30)	N	Y	N	
	Course Enrolled or teaching	Course enrolled in or teaching that determines members privileges.	varchar(30)	N	Y	N	

<b>Loans</b>	Id	Loan identification number.					
	Date and time borrowed	The date and time the item was borrowed.	dateTime	N	N	N	
	Resource Id	The identification number of the resource borrowed.	varchar(30)	N	N	N	
	Date and time returned	The date and time the item was returned.	dateTime	N	N	N	
	Date and time Due	The date and time the item was due to be returned.	dateTime	N	N	Y	
<b>Acquisitions</b>	Acquisition Id	The identification number of the item being acquired.	varchar(30)	N	N	N	
	Purpose	The reason for the item to be purchased.	varchar(30)	N	N	N	
	University Id	The identification number of the person making the request.	varchar(30)	N	N	N	
	Make	The make number of the object wanting to be acquired.	varchar(30)	N	N	N	
	Model	Model number of the object wanting to be acquired.	varchar(30)	N	N	N	
	Features	What features the object has that relates to the purpose of purchasing the item.	varchar(30)	N	N	N	
<b>Reservations</b>	Reservation number	The identification number of the reservation to keep track of all reservations.	varchar(30)	N	N	N	
	University Id	The identification number of the member making the reservation.	varchar(30)	N	N	N	
	Resource Id	The identification of the resource wanting to be reserved.	varchar(30)	N	N	N	

	Date and time reserved	The date and time the item is reserved.	dateTime	N	N	N	
	Date and time Due	The date and time for the item to be returned.	dateTime	N	N	N	
<b>Resources</b>	Resource Id	The identification number of the resource.	varchar(30)	N	N	N	
	Description	The description of the resource.	varchar(30)	N	N	N	
	Current status	Current status of the resource refers to its current condition.	varchar(30)	N	N	N	
	Category Id	The identification number of which category the resource belongs to.	varchar(30)	N	N	N	
<b>Category</b>	Category Id/code	The category identification code for the category a resource belongs.	varchar(30)	N	N	N	
	Name	The name of the category a resource belongs to.	varchar(30)	N	N	N	
	Description	The description of the category a resource belongs to.	varchar(30)	N	N	N	
<b>Moveable</b>	Description	The description of the immovable resource.	varchar(30)	N	N	N	
	Current Status	Current status of the resource refers to its current condition.	varchar(30)	N	N	N	
	Name	The name of the resource.	varchar(30)	N	N	N	
	Make	Name of the brand name of the item.	varchar(30)	N	N	N	
	Manufacturer	Name of the manufacturer of the resource.	varchar(30)	N	N	N	
	Model	Model number of the resource.	varchar(30)	N	N	N	
	Year	The year model the resource was produced.	varchar(30)	N	N	N	
	Asset Value	The current market value of the resource.	Int	N	N	N	

	Lending period	The period of which the item is borrowed and allowed to be kept until it has to be returned.	varchar(30)	N	N	N	
	Storage Location	The location of the item in the SCS department when it is not in use or being borrowed.	varchar(30)	N	N	N	
<b>Immoveable</b>	Capacity	The capacity refers to how many people can safely fit into a particular room.	Int	N	N	N	