Computer Science Development Exercise – 5WWCM0001
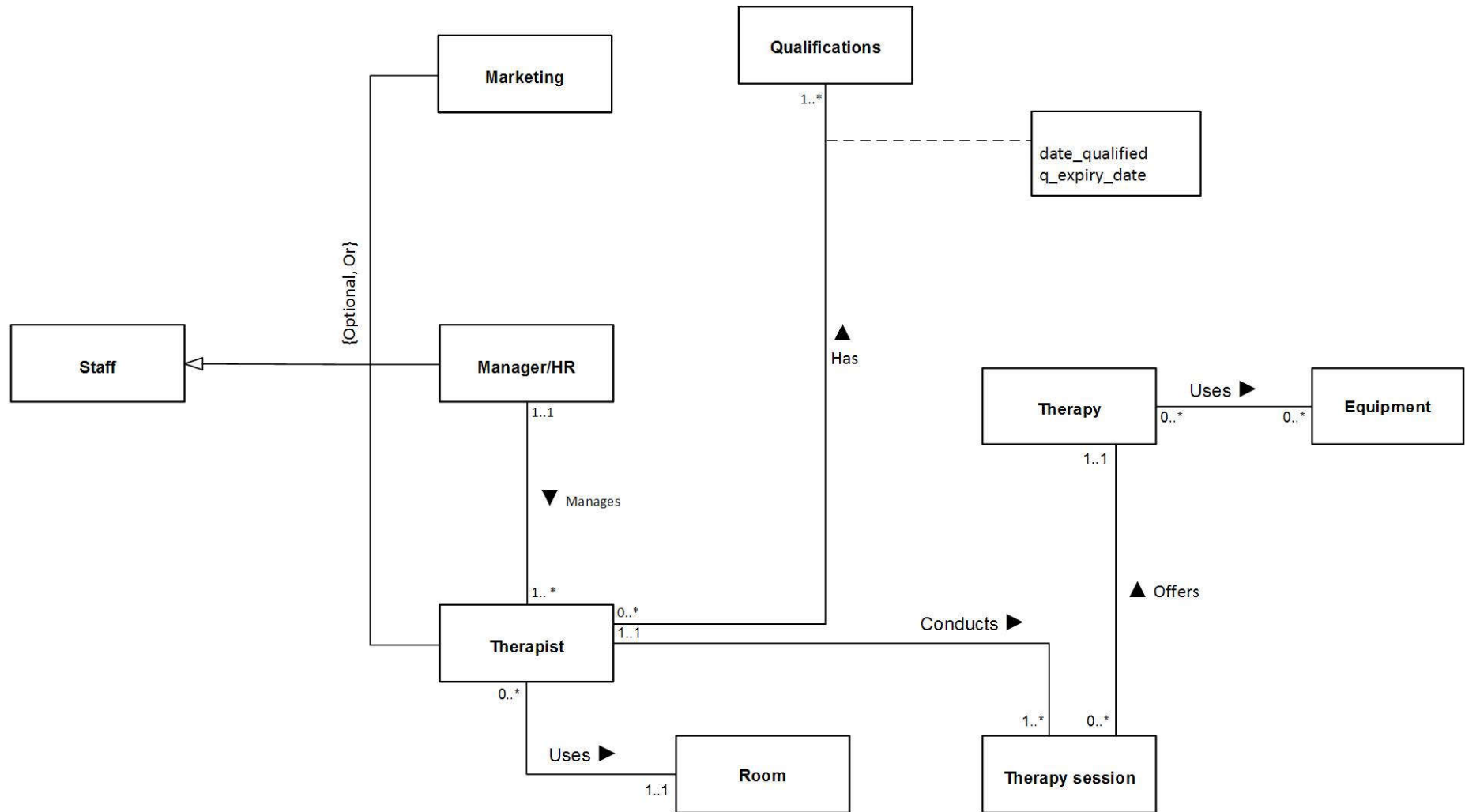
Course work 2 – Team A

Spa Resource Management System Prototype (SRMS-P) database

Data modelling

Given the system requirements (both CW1 and CW2 case study documents), in order to create SRMS-P system data model, we assume the following:

1. Each therapy session provides only one therapy
2. Each therapy can have more than one piece of equipment associated with it
3. A therapist can be qualified to provide one or more therapies, thus,
4. A therapist can have one or more 'qualifications'
5. Each therapist has one treatment room assigned where they conduct therapy sessions and each room can be used by more than one therapist
    'Room' has to be represented as an entity (instead of an attribute) to prevent the 'deletion anomaly'. For example, if any given treatment room was only stored in the database as an attribute of the 'therapist' entity, and was only used by one therapist, when the therapist's details are deleted form the database (say a therapist no longer works at the Spa), the only reference to the room would also be deleted.
6. Therapies may not use equipment (e.g. swimming coaching has no associated equipment), thus
7. Equipment may be associated with zero or more therapies. For example, if a therapy is withdrawn, put on hold or discontinued, as a result of management decision, when a record of the therapy is removed from database we cannot remove reference to the equipment used by the therapy as it may be used for another therapy – hence the optional participation of the equipment entity in the Therapy Uses Equipment relationship.

SRMS-P Entity – Relationship Diagram

Marketing

Qualifications

date_qualified
q_expiry_date

1..*

Staff

{Optional, Or}

Manager/HR

1..1

Has

▲

▼ Manages

Therapy

Uses ▶

Equipment

0..*   0..*

1..1

▲ Offers

1.. *

0..*

Therapist

1..1

Conducts ▶

0..*

Uses ▶

1..*   0..*

Room

1..1

Therapy session

Relational Schema

Therapy (<u>therapyId</u>, therapyName, tCategory, tType, tReviewDate, isOffered, enabled)
PK therapyId

Equipment (<u>eIdNumber</u>, eName, eMtnValue, eReviewDate, enabled)
PK eIdNumber

Staff (<u>staffNo</u>, fName, lName, enabled, staffLogin, staffPassword, accessLevel)
PK staffNo

Manager_HR (<u>managerNo</u>, staffNo*, enabled)
FK staffNo references Staff relation

MarketingStaff (<u>marketingStaffNo</u>, staffNo*, enabled)
PK marketingStaffNo
FK staffNo references Staff relation

Therapist (<u>staffNo*</u>, phoneNo, roomNo*, managerNo*, enabled)
PK staffNo
FK roomNo referencing Room
FK staffNo referencing staffNo
FK managerNo referencing Manager
-- we represent Therapist uses Room relationship by placing roomNo attribute in the Therapist relation as FK
-- we represent Manager manages Therapist relationship by placing managerNo attribute in the Therapist relation as KF

Qualifications (<u>qId</u>, qName, qLevel, qAccrBody, enabled)
PK: qId

Room (<u>roomNo</u>, enabled)
PK: roomNo

TherapySession (<u>sessionId</u>, therapyId*, staffNo*, sDate, startTime, finishTime, enabled)
PK: sessionId
FK: therapyId references Therapy
FK: staffNo references Therapist

TherapistQualifications (<u>staffNo*</u>, qId*, dateQualified, qExpiryDate, enabled)
PK: (staffNo, qId)
FK: staffNo references Therapist
FK: qId references Qualifications

TherapyEquipment ((<u>therapyId*, eIdNumber</u>), enabled)
PK: (therapyId, eId)
FK: therapyId references Therapy
FK: eIdNumber references equipment

Entity types

Entity Name	Description	Aliases	Occurrence
Therapy	Therapies provided at the spa.	-	Therapies are provided during therapy sessions.
Equipment	Equipment used in therapies	-	Each piece of equipment is associated with a therapy.
Staff	Employees of the Spa	Therapist Manager/HR staff Marketing staff	Members of staff fulfil various roles. Therapists conduct therapy sessions, Manager/HR manage therapists and all aspects of the Spa's resources, Marketing team manage all equipment and offered therapies.
Manager_HR	Member of management and/or Human Resources team	Staff	Manager / HR staff manage all aspects of the Spa's resources and also manage all therapists employed at the Spa
Marketing staff	Member of the marketing team	Staff	Marketing team manage Spa's equipment and offered therapies
Therapist	Member of the Spa staff qualified to carry out therapies.	Staff	Conducts therapies during therapy sessions.
Qualifications	Qualifications alongside which therapists are qualified	-	Each therapist holds relevant qualifications in order to carry out therapies.
Room	Room where a therapy takes place.	-	Each therapist has personal room assigned where they conduct therapy sessions.
Therapy Session	Session during which a therapy is provided.	-	Therapy session is conducted by a therapist with the use of an associated equipment.

Relationships

Entity name	Multiplicity	Relationship	Multiplicity	Entity name
Therapist	1..1	Conducts	1.. *	Therapy Session
	0.. *	Has	1.. *	Qualifications
	0.. *	Uses	1..1	Room
	1..1	IS A	1..1	Staff
Therapy Session	0.. *	Offers	1..1	Therapy
Therapy	1.. *	Uses	0.. *	Equipment
Manager/HR	1..1	IS A	1..1	Staff
	1..1	Manages	1.. *	Therapist
Marketing	1..1	IS A	1..1	Staff

Relations and attributes

Entity	Attribute name	Description	Data Type	Nulls	Multi-valued	PK or FK	FK referenced entity	Format
Therapy	therapyId	Uniquely identifies therapy offered at the Spa	VARCHAR(10)	No	No	PK	–	XXXXXXXXXX
	therapyName	Therapy name	VARCHAR(50)	No	No	–	–	Xxxxxxxxxx
	tCategory	Category of the therapy (health or beauty)	VARCHAR(6)	No	No	–	No	Xxxxxx
	tType	Type of therapy (individual or group)	VARCHAR(10)	No	No	–	No	(individual|group)
	tReviewDate	Date therapy is to be reviewed	DATE	No	No	–	No	dd-mm-yyyy
	isOffered	Whether or not the therapy is currently offered at the Spa (Y for yes N for no)	VARCHAR(1)	No	No	–	No	(Y|N)
	enabled	Flag indicating if the data is available	VARCHAR(1)	No	No	–	No	(Y|N)

Equipment	eIdNumber	Uniquely identifies therapy equipment	VARCHAR(6)	No	No	PK	–	XXXXXX
	eName	Equipment name	VARCHAR(50)	No	No	–	–	Xxxxxxx
	eMtnValue	Type of equipment either consumable or shared equipment	VARCHAR(10)	No	No	–	–	(consumable|shared)
	eReviewDate	Due to health and safety reasons the date on which equipment is to be reviewed	DATE	No	No	–	–	dd-mm-yyyy
	enabled	Flag indicating if the data is available	VARCHAR(1)	No	No	–	No	(Y|N)
Staff	staffNo	Uniquely identifies member of staff	VARCHAR(6)	No	No	PK	–	XXXXXX
	fName	Member of staff's first name	VARCHAR(15)	No	No	–	–	Xxxxxxx
	lName	Member of staff's last name	VARCHAR(25)	No	No	–	–	Xxxxxxx
	enabled	Flat indicating if the data is available	VARCHAR(1)	No	No	–	–	(Y|N)
	staffLogin	Member of staff's username they use to login to the system	VARCHAR(15)	No	No	–	–	Xxxxxx
	staffPassword	Member of staff's password they use to authenticate log-in to the system.	VARCHAR(4)	No	No	–	–	XXXX
	accessLevel	Specifies user's system access privileges	VARCHAR(1)	No	No	–	–	(1|2|3) 1 – Manager/HR staff 2 – Marketing staff 3 – Therapist

manager_HR	managerNo	Uniquely identifies member of manager's/HR team	VARCHAR(6)	No	No	PK	-	XXXXXX
	staffNo	Uniquely identifies member of staff	VARCHAR(6)	No	No	FK	Staff	XXXXXX
	enabled	Flag indicating if the data is available	VARCHAR(1)	No	No	-	-	(Y|N)
MarketingStaff	marketingStaffNo	Uniquely identifies member of manager's/HR team	VARCHAR(6)	No	No	PK	-	XXXXXX
	staffNo	Uniquely identifies member of staff	VARCHAR(6)	No	No	FK	Staff	XXXXXX
	enabled	Flag indicating if the data is available	VARCHAR(1)	No	No	-	-	(Y|N)
Therapist	staffNo	Uniquely identifies member of staff	VARCHAR(6)	No	No	PK	-	XXXXXX
	phoneNo	Therapist's phone number	VARCHAR(15)	No	No	-	-	9999999999999
	managerNo	Staff Number of the member of management team who manages the therapist	VARCHAR(6)	No	No	-	-	XXXXXX
	enabled	Flag indicating if the data is available	VARCHAR(1)	No	No	-	-	(Y|N)
	roomNo	Personal room number in which therapy is conducted	VARCHAR(3)	No	No	FK	Room	XXX

Qualifications	qId	Uniquely identifies therapist qualifications	VARCHAR(10)	No	No	PK	-	XXXXXXXXXX
	qName	Qualification name	VARCHAR(100)	No	No	-	-	Xxxxxxxxxxx
	qLevel	Level of the given qualification	VARCHAR(12)	No	No	-	-	(basic|intermediate|advanced)
	qAccrBody	Qualification accreditation body	VARCHAR(100)	No	No	-	-	Xxxxxxxxxx

Room	roomNo	Room number	VARCHAR(3)	No	No	PK	-	XXX

TherapySession	sessionId	Uniquely identifies therapy session	VARCHAR(8)	No	No	PK	-	XXXXXXXX
	therapyId	Uniquely identifies therapy offered at the Spa	VARCHAR(10)	No	No	FK	Therapy	XXXXXXXXXX
	staffNo	Uniquely identifies member of staff	VARCHAR(6)	No	No	FK	Therapist	XXXXXX
	dDate	Date of therapy session	DATE	No	No	-	-	dd-mm-yyyy
	startTime	Time of therapy session start	TIME	No	No	-	-	hh:mm
	finishTime	Time of therapy session finish	TIME	No	No	-	-	hh:mm
	enabled	Flag indicating if the data is available	VARCHAR(1)	No	No	-	-	(Y|N)

TherapistQualifications	staffNo	Uniquely identifies member of staff	VARCHAR(6)	No	No	FK	Therapist	XXXXXX
	qId	Uniquely identifies therapist qualifications	VARCHAR(10)	No	No	FK	Qualificat ions	XXXXXXXXXX
	dateQualified	Date on which qualifications obtained	DATE	No	No	-	-	dd-mm-yyyy
	qExpiryDate	Date on which therapist's qualification expires	DATE	No	No	-	-	dd-mm-yyyy
	enabled	Flag indicating if the data is available	VARCHAR(1)	No	No	-	-	(Y|N)
TherapyEquipment	therapyId	Uniquely identifies therapy offered at the Spa	VARCHAR(10)	No	No	FK	Therapy	XXXXXXXXXX
	eIdNumber	Uniquely identifies therapy equipment	VARCHAR(6)	No	No	FK	Equipment	XXXXXX
	enabled	Flag indicating if the data is available	VARCHAR(1)	No	No	-	-	(Y|N)