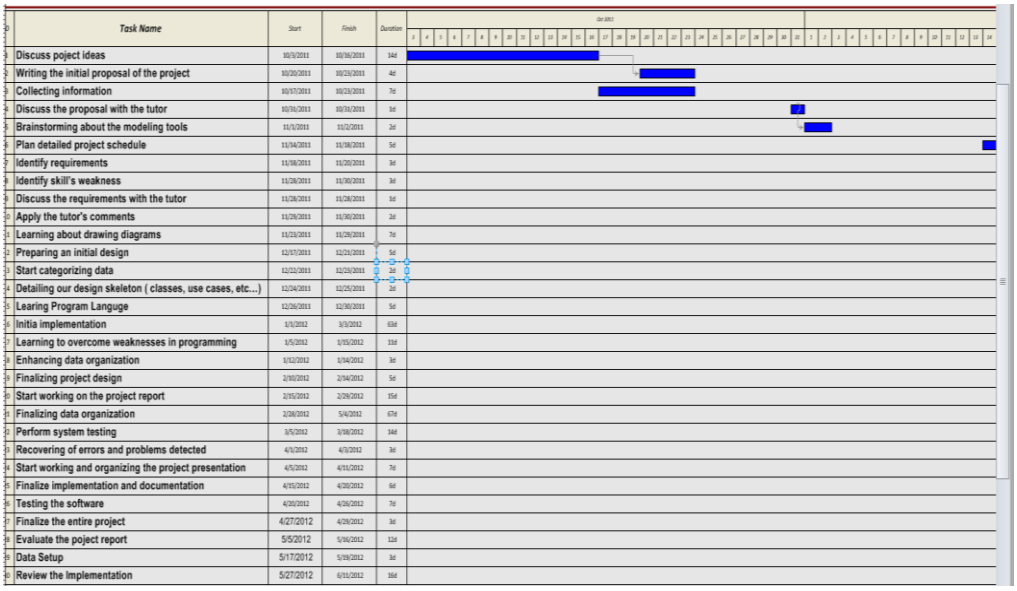
1. Project Objectives

Using LTN will perform the followings:

- All the training data and trainees' data will be managed into the system.
- Formal Reports, such as the number of trainees per month in a particular section, will be generated automatically by the application.
- Any kind of customized reports can be easily generated at no matter of time
- The Training Administrators can review the training information of a trainee and easily produce the training schedule for him/her.
- Updating the training schedules can be made easily.
- Following up a trainee performance during his/her training is available.
- All the training records can be maintained easily for many years with no physical space.
- Using a computerized system will eliminate the use of paper which conforms to the hospital's Retention Policy.

2. Project plan

To illustrate the tasks and the time plan to accomplish them I have made the GANNT Chart



	Task Name	Start	Finish	Duration
1	Discuss poject ideas	10/3/2011	10/16/2011	14d
2	Writing the initial proposal of the project	10/20/2011	10/23/2011	4d
3	Collecting information	10/17/2011	10/23/2011	7d
4	Discuss the proposal with the tutor	10/31/2011	10/31/2011	1d
5	Brainstorming about the modeling tools	11/1/2011	11/2/2011	2d
6	Plan detailed project schedule	11/14/2011	11/18/2011	5d
7	Identify requirements	11/16/2011	11/20/2011	3d
8	Identify skill's weakness	11/28/2011	11/30/2011	3d
9	Discuss the requirements with the tutor	11/28/2011	11/28/2011	1d
10	Apply the tutor's comments	11/29/2011	11/30/2011	2d
11	Learning about drawing diagrams	11/23/2011	11/29/2011	7d
12	Preparing an initial design	12/17/2011	12/23/2011	5d
13	Start categorizing data	12/22/2011	12/23/2011	2d
14	Detailing our design skeleton (classes, use cases, etc...)	12/24/2011	12/25/2011	2d
15	Learing Program Languge	12/26/2011	12/30/2011	5d
16	Initia implementation	1/3/2012	3/3/2012	63d
17	Learning to overcome weaknesses in programming	1/3/2012	1/15/2012	11d
18	Enhancing data organization	1/12/2012	1/14/2012	3d
19	Finalizing project design	2/10/2012	2/14/2012	5d
20	Start working on the project report	2/15/2012	2/28/2012	15d
21	Finalizing data organization	2/28/2012	5/4/2012	67d
22	Perform system testing	3/5/2012	3/18/2012	14d
23	Recovering of errors and problems detected	4/3/2012	4/3/2012	3d
24	Start working and organizing the project presentation	4/5/2012	4/11/2012	7d
25	Finalize implementation and documentation	4/15/2012	4/20/2012	6d
26	Testing the software	4/20/2012	4/26/2012	7d
27	Finalize the entire project	4/27/2012	4/29/2012	3d
28	Evaluate the poject report	5/5/2012	5/16/2012	12d
29	Data Setup	5/17/2012	5/19/2012	3d
30	Review the Implementation	5/27/2012	6/11/2012	16d

Figure 0.1 GANTT Chart

To illustrate the details and the intended date to finish a task compared with the actual data of finishing the task I have created a project plan table

Table 2.0.1 The CO-OP Plan

Project Plan Schedule					
Month	Activity	Duration/ Days	start day	finsh day	acutule day
Oct.	Discuss poject ideas	14	10/3/2011	10/16/2011	10/20/2011
	Writing the initial proposal for the project	4	10/21/2011	10/24/2011	10/26/2011
	Collecting information	7	10/17/2011	10/23/2011	10/25/2011
	Discuss the proposal with the tutor	1	10/30/2011	10/30/2011	10/30/2011
Nov	Brainstorming about the modeling tools	3	11/1/2011	11/3/2011	11/2/2011
	Plan detailed project schedule	5	11/12/2011	11/17/2011	11/18/2011
	Identify requirments	3	11/18/2011	11/20/2011	11/22/2011
	Identify skill's weakness	3	11/25/2011	11/27/2011	11/28/2011
	discuss the requirements with the tutor	1	11/28/2011	11/28/2011	11/28/2011
	Apply the tutor's comments	2	11/29/2011	11/30/2011	11/30/2011
	Learning about drawing diagrames	7	11/23/2011	11/30/2011	12/1/2011
	Preparing an initial design	5	12/17/2011	12/21/2011	12/21/2011
	Start categorizing data	2	12/22/2011	12/23/2011	12/23/2011
	Keep on organinzing the information we've got in presentatic	2	12/24/2011	12/25/2011	12/25/2011
	Detailing our design skeleton (classes, use cases, etc...)	5	12/26/2011	12/30/2011	12/30/2011
Jan	Learing Program Languge	63	1/1/2012	2/29/2012	3/3/2012
	Initia implementation	11	1/5/2012	1/11/2012	1/15/2012
	Learning to overcome weaknesses in programming	3	1/12/2012	1/14/2012	1/14/2012
Feb.	Enhancing data organization	5	2/10/2012	2/14/2012	2/14/2012
	Finalizing project design	15	2/15/2012	2/27/2012	2/29/2012
	Start working on the project report	65	2/28/2012	5/2/2012	5/4/2012
March	Finalizing data organization	14	3/5/2012	3/19/2012	3/18/2012
April	Perform system testing	3	4/1/2012	4/3/2012	4/3/2012
	Recovering of errors and problems detected	7	4/5/2012	4/12/2012	4/11/2012
	Start working and organizing the project presentation	3	4/15/2012	4/18/2012	4/20/2012
	Finalize implementation and documentation	7	4/20/2012	4/26/2012	4/26/2012
	Testing the software	3	4/27/2012	4/29/2012	4/29/2012
May	Finalize the entire project	5	5/1/2012	5/4/2012	5/5/2012
	Evaluate the poject report	12	5/5/2012	5/11/2012	5/16/2012
	Data Setup	3	5/17/2012	5/23/2012	5/19/2012
	Review the Implementation	16	5/27/2012	6/10/2012	6/11/2012

3. Requirements Definitions

This section lists the requirements for the application. It will include the different types of requirements such as the functional, user, data, hardware and software requirements.

1. System Processes Definition

The system contains 4 main processes which are:

- For a new trainee, his/her data should be stored in the system. They arrive for the first time to the department; they apply of the needed paper to approve their personal identification and qualifications. Then, after the verification process is completed a form of this data is entered into the system.

- For the training administrator, according to the applied data by the trainee, a customized schedule for the trainee is created and handed over to the trainee.

- For the trainer, the trainee hand over a copy of his/her schedule to the trainer to be sure that he/she is permitted to attend the training. At the end of training, the trainer submits a report of the score of the trainee to the training administrator.

- For the training administrator, when a trainee finishes his/her training, they ask for the training completion certificate. The training administrator collects the past score reports of the trainee and enter the needed data to be recorded in the certificate.

2. Functional Requirements

The system should manage the training data for the laboratory and that has the following functional requirements:

1. Log In: the user needs to Log In before doing anything. We have only one level of users which is training administrators.
2. Exit: The user chooses to close the application to finish his work.
3. Add New Medical Section
4. Add New Staff Member
5. Add New Trainee Evaluation
6. Add New Trainee Schedule
7. Add New Trainer
8. Add New Training Section

9. View the Information of a Medical Section
10. View the information of a Staff Member
11. View the information of a Trainee Evaluation
12. View the information of a Trainee Schedule
13. View the information of a Trainer
14. View the information of a Training Section
15. Search for a Specific Medical Section
16. Search for a Specific Staff Member
17. Search for a Specific Trainee Evaluation
18. Search for a Specific Trainee Schedule
19. Search for a Specific Trainer
20. Search for a Specific Training Section
21. Modify the information an existing Medical Section
22. Modify the information an existing Staff Member
23. Modify the information an existing Trainee Evaluation
24. Modify the information an existing Trainee Schedule
25. Modify the information an existing Trainer
26. Modify the information an existing Training Section
27. Delete the information an existing Medical Section
28. Delete the information an existing Staff Member
29. Delete the information an existing Trainee Evaluation
30. Delete the information an existing Trainee Schedule
31. Delete the information an existing Trainer
32. Delete the information an existing Training Section

3. Use Case Diagram

To illustrate the functional requirements of the system, I have created a UML Use Case Diagram. Just to make the diagram more readable, the five cases of Add, Modify, View, Search and Delete are gathered in one case be called Manage. So every manage use case includes the five use cases.

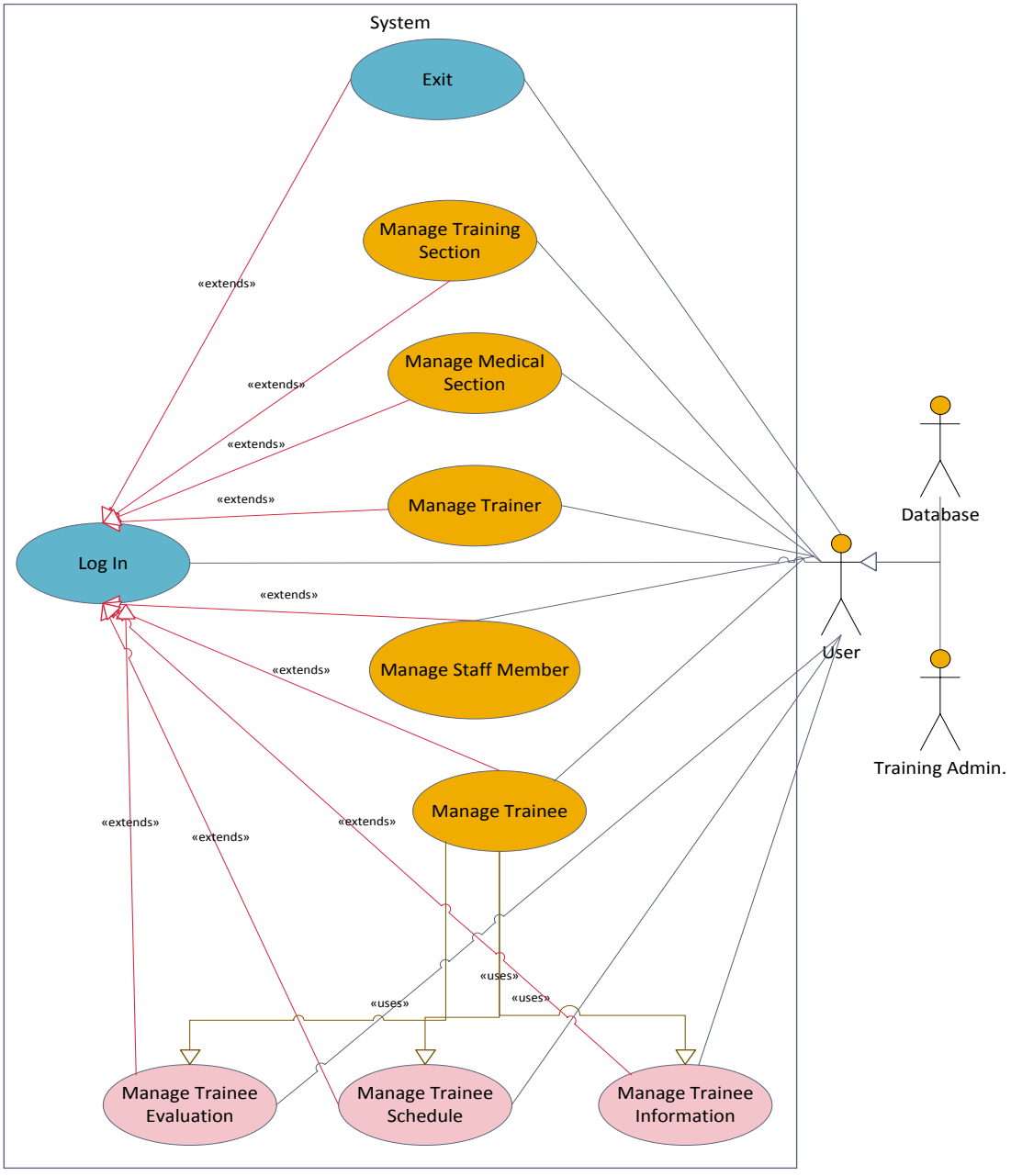


Figure 2.1 Use case Diagram

4. Data Requirements

The system contains major entities which are Trainee, Trainer, Schedules, Training Admin and the medical section. The tables' schemas will illustrate them and their relationships

Table 0.1 StaffMember Table Schema

Table	StaffMembers		
Field Name	**Constraints**	**Optional?**	**Data Type**
StaffId	PK	N	Int
StaffName		Y	Nvarchar(50)
StaffIdNumber		Y	varchar(100)
StaffPhone		Y	varchar(50)
StaffPhoneExt		Y	varchar(50)
StaffJobTitle		Y	varchar(100)
StaffEmail		Y	varchar(50)
StaffMobile		Y	varchar(50)
StaffSection		Y	varchar(50)

Table 0.2 MedicalSection Table Schema

Table	MedicalSections		
Field Name	**Constraints**	**Optional?**	**Data Type**
MedicalSectionCode	PK	N	Nvarchar(50)
MedicalSectionName		N	Nvarchar(50)
SupervisorId	FK (Labs)	Y	int
HeadDepartmentId	FK (Staff_Members)	Y	int
CoordinatorId	FK (Staff_Members)	Y	int

Table 0.3 TrainingSection Table Schema

Table	TrainingSections		
Field Name	**Constraints**	**Optional?**	**Data Type**
TrainingSectionCode	PK	N	Nvarchar(50)
TrainingSectionName		N	Nvarchar(50)
MedicalSectionCode	FK (Staff_Members)	Y	Nvarchar(50)

AdminId	FK (Staff_Members)	Y	int

Table 0.4 Trainees Table Schema

Table	**Trainees**		
Field Name	**Constraints**	**Optional?**	**Data Type**
TraineeID	PK	N	int
TraineeName		N	Nvarchar(50)
GraduatedFrom		Y	Nvarchar(50)
Major		Y	Nvarchar(50)
TraineeIdNumber		Y	Varchar(100)
StartDay		Y	smallDateTime
TrainingPeriod		Y	Varchar(50)
MobileNo		Y	Nvarchar(50)
Email		Y	Nvarchar(50)
TrainingKind	CC (1=Intern, 2=SCDP)	Y	Nvarchar(50)

Table 2.0.5 TraineeEvaluation Table Schema

Table	**TraineeEvaluation**		
Field Name	**Constraints**	**Optional?**	**Data Type**
EvaluationId	PK	N	int
DateFrom		Y	datetime
DateTo		Y	datetime
TraineeIndividualId	FK (TraineeIndividualScheduale)	N	int
PerformanceScore		Y	Nvarchar(50)
Comment		Y	Nvarchar(50)
SubmissionDate		Y	datetime
PreparedBy		Y	Nvarchar(50)

Table 0.6 TraineeIndividualSchedule Table Schema

Table	TraineeIndividualSchedule		
Field Name	**Constraints**	**Optional?**	**Data Type**
TraineeIndividualId	PK	N	int
TraineeID	FK (trainees)	Y	int
TrainingSectionCode	FK(trainingSections)	Y	Nvarchar(50)
Training_Start_Date		Y	datetime
Trianing_End_Date		Y	datetime
Section_Training_Start_Date		Y	datetime)
Section_Training_End_Date		Y	datetime
Eidalftar_Holida_Start_Date		Y	datetime
Eidalftar_Holiday_End _Date		Y	datetime
Eidaladha_Holiday_Start_Date		Y	datetime
Eidaladha_Holiday_End_Date		Y	datetime

Table 0.7 Admin Table Schema

Table	Admin		
Field Name	**Constraints**	**Optional?**	**Data Type**
AdminId	PK	N	Int
AdminName		Y	Nvarchar(50)
AdminUsername		N	Nvarchar(50)
AdminPassword		N	Nvarchar(50)
AdminIdNumber		Y	Varchar(100)

5. Hardware and Software Requirements

This part includes the software and hardware requirements.

5.1 Hardware Requirements

- Pentium 4 or above pc or any equivalent
- 1 G RAM
- 700 Megabyte or hard disk space
- A good VGA card that support minimum of 256 color
- A printer for printing the reports

5.2 Software Requirements

- Windows XP or above operating system
- .NET framework 3.0

6. Look and feel requirements

- The system should have a Graphical User Interface.
- It should be easy to understand and use.

7. Security requirements

- Authentication is needed to log in to the system.

4. The Conceptual Model (ER Diagram)

This step will describe what the system will do. This stage includes using data modeling techniques to create a model of data structure which represents the real world objects. The structural data stores in the database. The database with the constraints can be represented as ER diagram

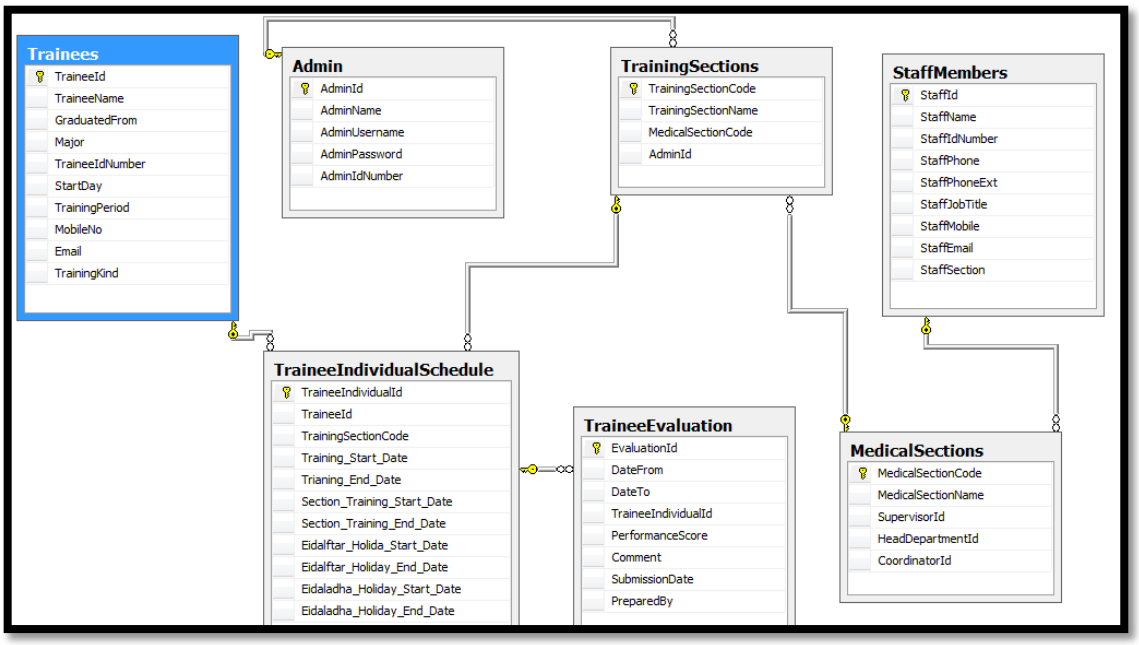


Figure 3.01 ER Diagram

5. Data Flow Diagram (DFD)

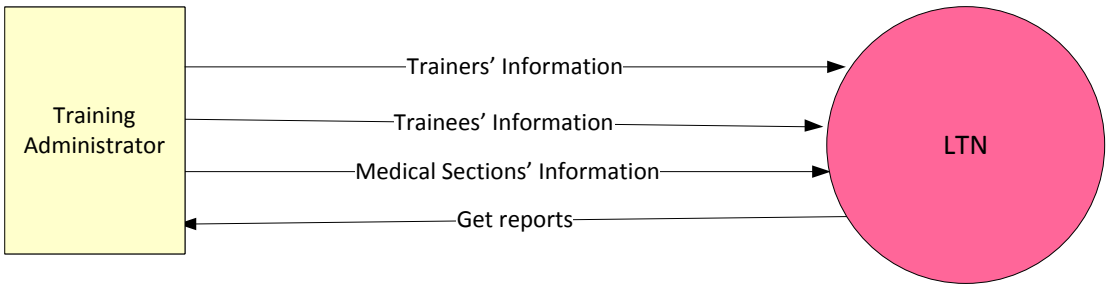


Figure 0.1 Context Diagram

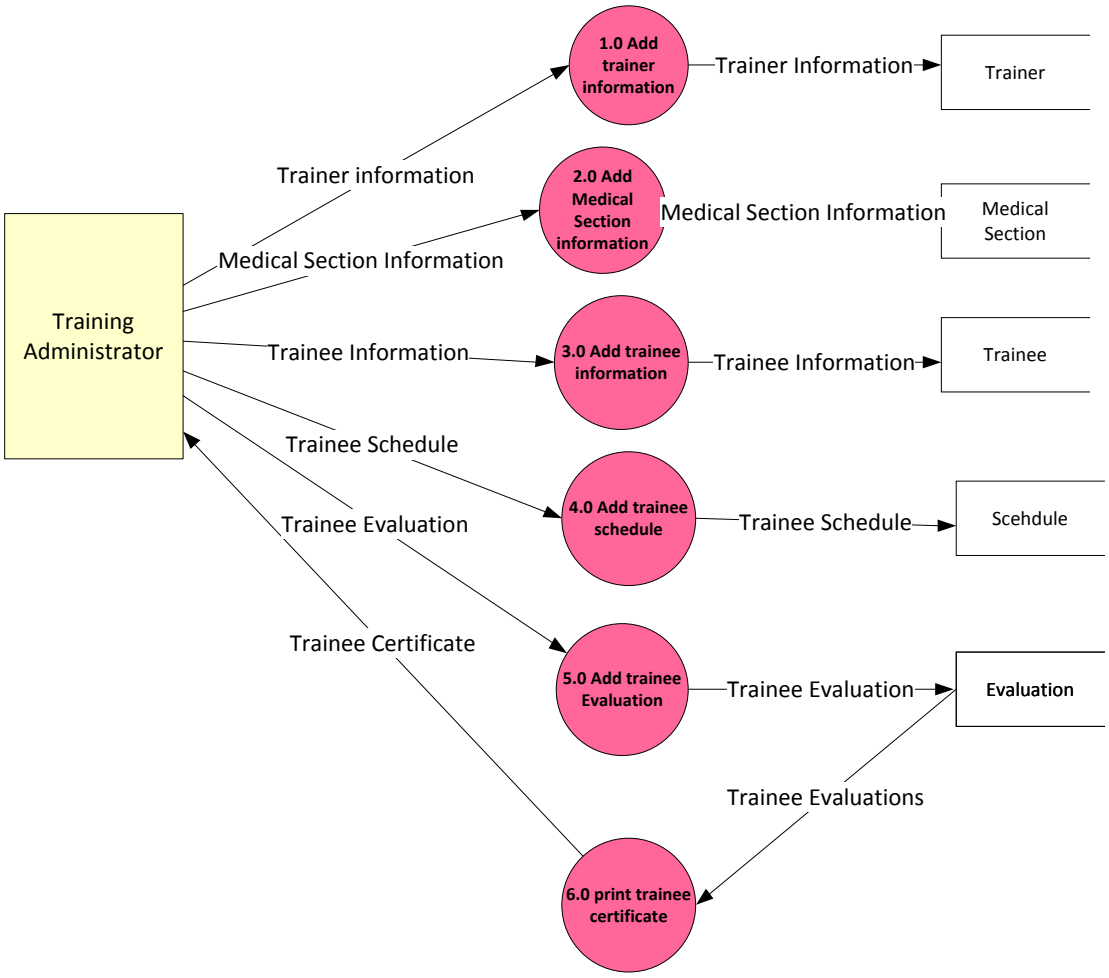


Figure 0.2 DFD Level 0

Description of DFD

The training process in the laboratory contains several processes.

1.0 Add Trainer Information: this process includes storing the information of the trainers including their names, sections, skills and the courses they train on.

2.0 Add Medical Section information: this process is to store data about the different sections in the laboratory

3.0 Add Trainee Information: this process stores the information of the trainee such as the name the id and other personal and professional Information

4.0 Add Trainee Schedule: the training administrator prepares a schedule for the trainee and store this information in the schedules database.

5.0 Add Trainee Evaluations: this process is to store the information of the evaluation of a trainee in one of his/her training course.

6.0 Print Trainee Certificate: this process is to print the certificate of a trainee. The certificate will include all of the evaluations that the trainee has.

6. Functional Dependencies

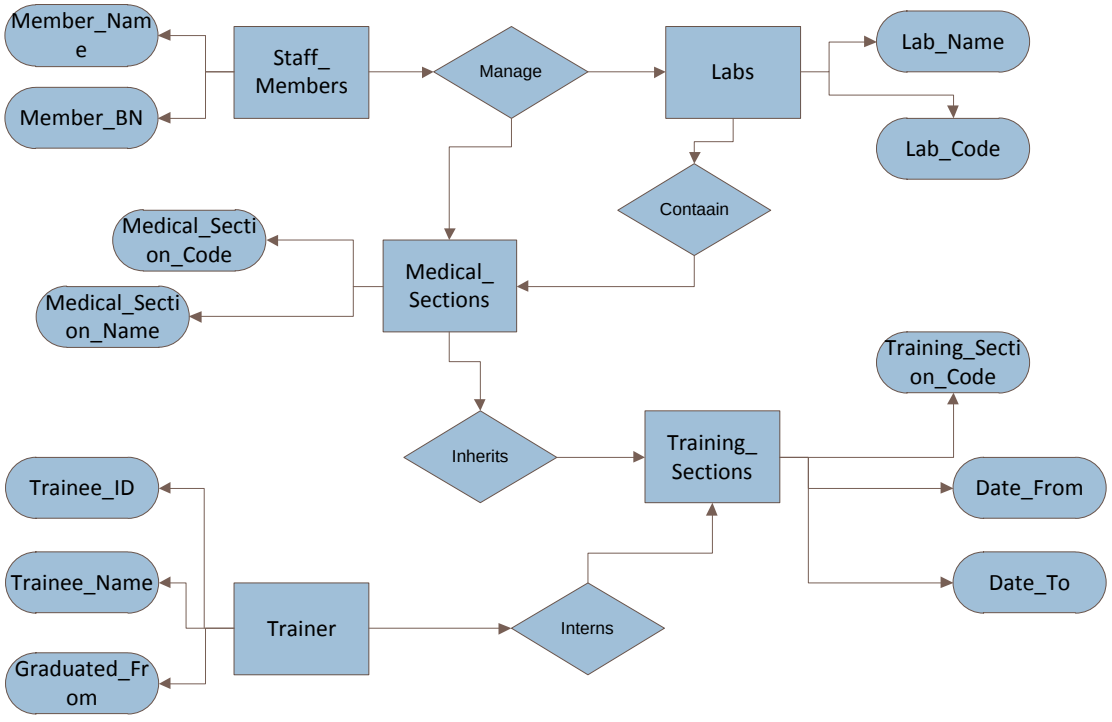


Figure 3.1 Functional Dependencies

7. Schema Diagrams

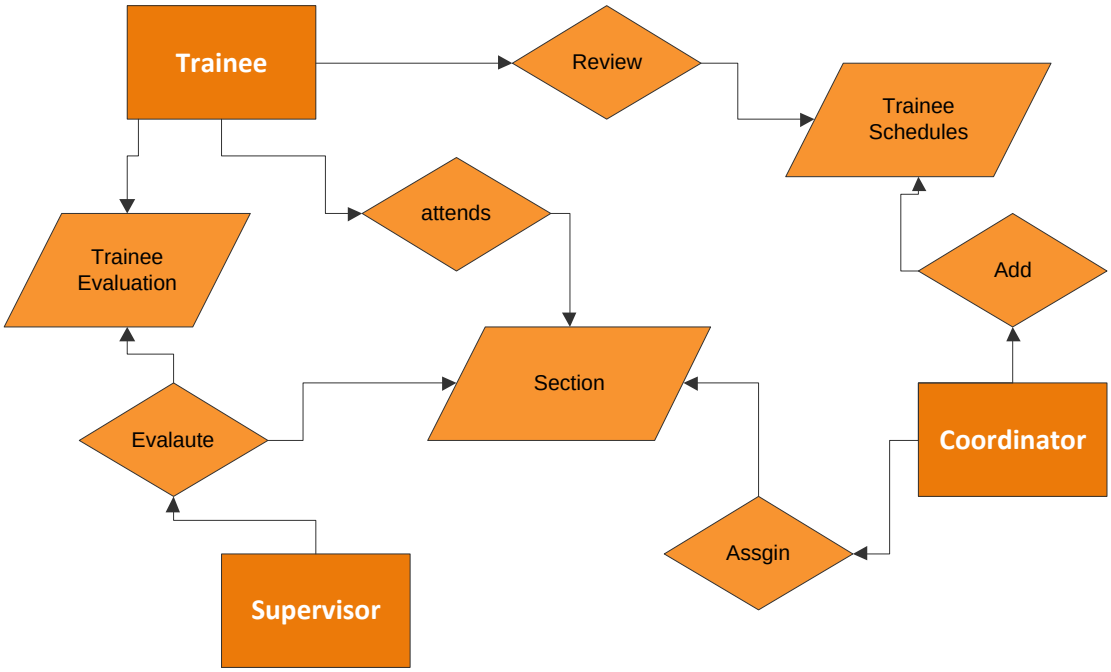


Figure 3.1 Schema Diagram

8. Implementation Guide

8.1 The Tables after Populating with Data:

They are illustrated below.

Table 0.1 Medical Sections Table

MedicalSectionCode	MedicalSectionName	SupervisorId	HeadDepartmentId	CoordinatorId
BB	Blood Bank	1	2	3
CHMS	Chemistry	5	2	7
CYT	Cytology	6	2	1
HLA	HLA	3	2	5
HMTG	Hematology	1	2	6
HST	Histology	6	1	7
MCB	Microbiology	4	2	3
MOL	Molecular	1	2	3
REC	Receiving	1	2	7
SER	Serology	6	2	7
STT	Stat Lab	7	2	6
TOX	Toxicology	4	2	5

Table 0.2 Staff Member Table

St...	StaffName	StaffIdNumber	StaffPhone	StaffPhoneExt	StaffJobTitle	StaffMobile	StaffEmail	StaffSection
1	Misa Ali Alahmade	123123	2145625	112	Training Admin	50147258	Misa@ng.med	CHMS
2	Nadia Saleem Mohamed	25082	1145520	100	General Manager	50542222	NadiaS@ng.med	TOX
3	Mustafa Alradeed	224556322	1471585	200	Assistant	554935576	Mustafa.A@hotmail.com	MOL
4	Mounera Adli	7892586	2123456	12	Doctor	557893692	MouneraA@ng.med	REC
5	Shareef Zahed	9876983	2456528	111	Doctor	501234444	shareefZ@ng.med	CHMS
6	Sama Elhamrane	546987	4257896	556	Training Manager	504563218	samae@ng.med	BB
7	Jehan Mouneer	789568	2045698	114	Training Manager	507896544	jehanm@ng.med	HLA

Table 0.3 Admin Table

AdminId	AdminName	AdminUsername	AdminPassword	AdminIdNumber
2	Samy Marawan	admin	123	fre2
3	Nadia	nda	22222	ghb3
4	Shaheed Komar	ska	789654	tre12

Table 0.4 Trainee Table

T...	TraineeName	GraduatedFrom	Major	TraineeIdNumber	StartDay	TrainingPeriod	MobileNo	Email	TrainingKind
3	Khaled Ali Abdel...	BAS	Chemistry	bs568	2012-01-15...	1 year	502366552	khaled_ali@hotmail.com	Phlebotomy
4	Salma Seror	BAS	Animal	as369	2012-02-05...	2 months	504569632	Salma_ser@yahoo.com	Summer
5	Foad Mahde	BS	Chemistry	bs458	2012-01-03...	5 months	554561471	foad@hotmail.com	On Job
6	Layla Mohsen	BS	Chemistry	bs325	2012-06-20...	1 year	509876431	lolo_lyly@gmail.com	Phlebotomy
7	Abduallah Alkhedr	BSA	plant	sa658	2012-03-12...	1 year	569874123	abdo_abdo@yahoo.com	SCDP

Table 0.5 Training Section Table

TrainingSection...	TrainingSection...	MedicalSection...	AdminId
01	sec01	BB	2
02	sec02	CHMS	3

Table 0.6 TraineeIndividualSchedule Table

TraineeIndividu...	TraineeId	TrainingSecti...	Training_Start_Date	Trianing_End_Date
1	3	01	2012-05-20 00:00:0...	2012-05-30 00:00:0...
2	3	01	2012-06-01 00:00:0...	2012-06-30 00:00:0...
3	4	01	2012-04-12 00:00:0...	2012-05-16 00:00:0...
4	4	01	2012-01-01 00:00:0...	2012-05-12 00:00:0...
5	5	01	2012-03-14 00:00:0...	2013-03-01 00:00:0...

Table 0.7 TraineeEvaluation Table

EvaluationId	DateFrom	DateTo	TraineeIndividu...	PerformanceSc...	Comment	SubmissionDate	PreparedBy
4	2012-06-13 00:...	2012-07-17 00:...	1	A+	NULL	2012-07-09 00:...	Nesreen
8	2012-01-15 00:...	2012-03-16 00:...	1	A+	NULL	2012-03-20 00:...	Ramez
9	2012-01-01 00:...	2012-04-23 00:...	2	B+	NULL	2012-05-01 00:...	Abed

8.2 SQL Queries:

8.2.1 SQL Retrieval Queries:

- A query to get the evaluations of Trainee 5

SELECT * FROM traineeEvaluation WHERE traineeIndividualId= 5

- A query to display a list of all of the medical section with their details

SELECT * FROM medicalSections

- A query to display a list of all of the trainees in year 2012

SELECT * FROM trainee t, taineeIndividualSchedule s

WHERE t.traineeId= s. traineeIndividualId

AND training_start_date LIKE '%2012%'

- A query to display a schedule made for trainee 1

SELECT * FROM taineeIndividualSchedule WHERE traineeIndividualId=1

- A query to display a list of the trainee who get A+ as their evaluation degree

SELECT * FROM trainee t, taineeEvaluation e

WHERE t.traineeId= e. traineeIndividualId

AND performanceScore= 'A+'

8.2.2 SQL Data Manipulation Queries:

INSERT NEW DATA:

- Insert a new trainee

INSERT INTO trainee VALUES ('Ali Mohamed', 'BAS', 'Plant', 'bsa543' , '2012/02/14', 'two months', '0505987786', ' Ali@hotmail.com', 'summer')

- Insert a trainee schedule

INSERT INTO traineeIndividualSchedule (traineeid, trainingSection, training_start_date, training_end_date) VALUES ('5, 01, '2012/01/01' , '2012/02/14')

- Insert an Evaluation of a trainee

INSERT INTO TraineeEvaluation ('2012/01/01' , '2012/02/14', 'bsa234' , 'A+' , 'good trainee', '2012/02/15', 'Eman')

UPDATE DATA

- Update Trainee Information

UPDATE trainee SET mobile='0502316541' WHERE traineeIdNumber='bsa324'

- Update Medical Section

UPDATE medicalsections SET supervisorId=5 WHERE supervisorId=1

- Update a trainee schedule

UPDATE TraineeIndividualSchedule SET training_start_date=' 2012/02/14" WHERE traineeId=3

DELETE DATA

- Delete a Medical section

DELETE medicalSections WHERE medicalSectionCode='BB'

- Delete a trainee

DELETE Trainee WHERE traineeName='Adbuallah Ali Kader'

- Delete a schedule

DELETE TraineeIndividualSchedule WHERE traineeId=3

9. Setup Guide

To run the system we need:

1. SQL Server 2008.
2. Visual studio .Net Frame work 2.0.
3. We need to have the source file we include in the CD (.Net Frame work).
4. Just double click the file and it will setup the program.
5. Go with the steps of the setup by next and it will finish.

If you want to open the code, you must do as follow:-

- We must have Microsoft Visual studio 2010 CD.
- We should install the frame work needed for the program.
- We now ready to choose what language you will install.
- You must choose C# from the menu.
- Go with next and do what the program need.
- We now ready to open the source file code be determining its location in the hard Disk or in CD.