Pharmacy Management System

Session: 2020 – 2024

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Acknowledgments

We are grateful to Allah Almighty that He provided us with the strength and power to complete this project in time.
We are thankful to our course teacher Sir Nazeef Ul Haq for guiding us and it is due to his supervision that we are able to complete the project on time.
We would also like to thank Mr. Samyan Qayyum Wahla for his theory lectures which helped us analyse and understand the working of the database
Moreover, we as a team were able cope the problems which were encountered during the implementation of this project.

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Abstract

The sole reason of the final term project was to analyse the working and effectiveness of the databases in real world scenarios. Databases helps one store large amount of records in the shape of tables which consists of rows and columns. The data is easily analysed by the layman who is a non technical person . It is more easier and simpler to use as compared with the file system. The real world problem which was catered in this project was to manage a pharmacy store. The requirements were to manage the medicines in the store . Moreover the information of the customers was to be handled similarly the employees were managed through this system . So the crust of this whole project was to securely and efficiently manage the data of the pharmacy. The task which our teachers assigned was to make such a database design which solved the problems faced by the users of the pharmacy system and the owners as well. Moreover CRUD operations were also performed after successfully managing a database design . At last crystal reports were generated which gave useful information for the admin .

1 Introduction

1.1 Description

Pharmacy Management System manages the whole pharmacy in an effective manner.Previously the process was manually done by the person appointed at this position . Nevertheless it was quite a time taking process and not quite efficient as there were more chances of mistake while writing the data . Moreover data loss was very easy in this case . Hence this problem needed a solution . So this management system was build in order to resolve all the problems and shortcomings. In this system there are multiple types of people having certain kind of jobs. These people include the customer,employee,shippers and manufacturers.Their information is stored in the databases for security and verification.The admin can have a clear view of his employees..The attendance and sales of the employees is also maintained on the daily basis. Furthermore the information of the employees who are working in other branches are also kept .The customer information is kept for updating them about the new promotions and the discounts on the new medicines.

Most important thing in this system is the data of the products which are being sold from different branches of the company by different customers .Their data is safely stored for the record if in case the customer comes for return .Moreover the stock which keeps on decremented and incremented while selling and buying the product from the manufacturer is to be stored. The information of the total stock present in different stores is handled in order to purchase more medicines if the stock of the respective medicine gets finished and it is ordered for more medicine. The information of the stock is stored along with the supplier who supplied that particular medicine from the manufacturer , so that if any unusual activity is performed then the pharmacy can launch a complain towards the supplier and the manufacturer. Manufacturer and Supplier has a key role in maintaining the quality of the medicines.

The information of different pharmacy is also stored ,for smooth inter-branch communication.

1.2 Motivation

The main motivation for this project was to understand the working of the databases and learn how to apply CRUD operations along with query writing for efficient retrieval,insertion,updation,deletion of data. Different queries were used ranging from the very basics to advanced. Th project was designed on visual Studio using C# .NET Framework and SQL Server as a database. T SQL was the language used in writing queries . The reports were generated through crystal reports.

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1.3 Target Audience

The target audience for this project are the pharmacies located anywhere around the globe for efficient way of maintaining the record of the products,customers and the employees working. The information of supplier and manufacturer can also be handled in effective manner. This application will enable the user to enter data related to members of the pharmacy system. Moreover the admin and the employee can view the details of any kind easily. Employee can order more medicines in case the medicine is empty. Large amount of data is stored efficiently in the small laptop or computer and no risk of data loss .

2 Operational Details

There is only a single admin that has access over the whole data stored and he is the acting manager of the entire pharmacy.

1. The admin will deal with employee,manufacturer,supplier,stock manipulator.
2. The cashier will deal with the customer and he will generate order.
3. Other employees will be assisting the customers and the suppliers.
4. Manufacturer will supply the medicines to the supplier assigned
5. Supplier will then take those medicines to the desired pharmacy branch where request for medicine has been made.
6. More orders can be made to the manufacturer for more stock
7. Employees attendance will be marked on the daily basis
8. Customer will be able to order any product
9. PDF reports can be generated by the admin

3 Database Design

3.1 Lookup

Lookup has all the relations which are used in other relations. It consist of an id , name and category . ID is its primary key.

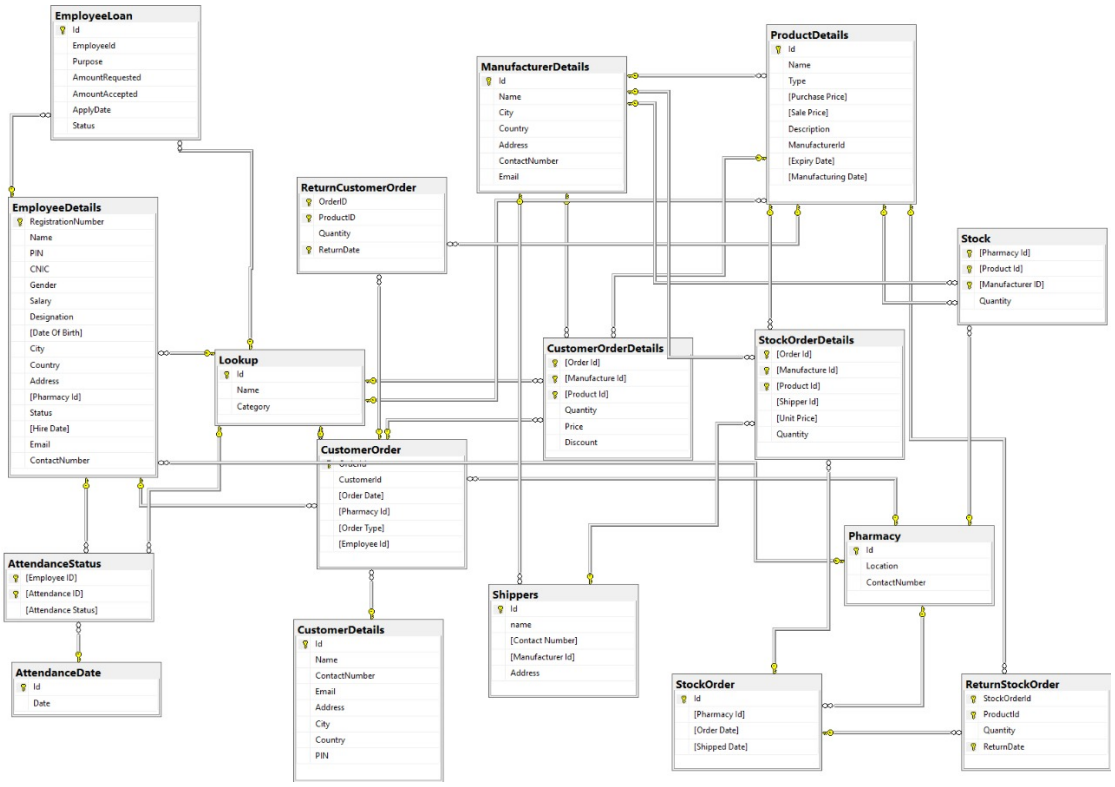

FIGURE 1: Database Diagram

3.2 Pharmacy

Pharmacy consist of the branch information. It has an id , its location where it is located and contact number which is the number of that branch.

3.3 Customer Details

This table will consist of the personal details of the customer which are necessary due to security purposes. Id will act as the primary key.

3.4 Customer Order

Customer Order consists of the information of the order placed by the customer. It contains Order Id which is associated by the order placed by the customer.It serves as the Primary key . It also contains Customer Id which is the id allocated to the customer's order. It also has order date which is the date on which order was placed by the customer. Further it has a Pharmacy Id which is a unique id of the branch . It also has the attribute of order type which will further specify the type of product . Moreover it also has an employee id which is the id given to the employee . The employee id will be used to count the number of times this employee has sold a product .

3.5 Customer Order Details

It consist of Order Id which is foreign key which is taken from Customer Order. It has 2 more foreign keys Manufacturer Id and Product Id . Manufacturer Id is the Id allocated to the manufacturer and it is taken from the Manufacturer Details Table . Moreover all these three foreign keys acts as Primary keys. It also contains price , quantity and Discount attribute for each product.

3.6 Return Customer Order

In this table Order Id , Product Id serve as foreign keys . Moreover these two foreign keys and attribute return date as a combine acts as primary key. This entity will help in storing the records of the products which are returned by the customer within seven days of buying .

3.7 Employee Details

In employee details all the details are added for each employee working in the pharmacy . Registration Number is the primary key in this case . It has 1 foreign key in it which is the pharmacy id which will indicate his/her branch where he/she is working.Other attributes are added for information purpose.

3.8 Attendance Date

In this table there is only single attribute of date which will only take date on which we have to mark the attendance.The id will be auto incremented . Id will serve as a primary key.

3.9 Attendance Status

In this table there are 2 foreign keys Employee Id from Employee table and Attendance Id from attendance table. There is another attribute attendance status which tells his status as present or absent.Both these foreign keys act together as primary key.

3.10 Employee Loan

It contains 2 foreign keys Employee Id from Employee table and Pharmacy Id from pharmacy table . The auto incremented id will be served as the primary key. Other attributes will be used to list down reason for the loan , the amount required and date on which the employee took the loan . This information will help admin to examine his concern and whether he/she is eligible for the loan or not.

3.11 Product Details

In this entity the details about the product is mentioned . Moreover there are certain foreign keys in this table. Purchase price which is the price at which it was bought form the manufacturer , Sale Price which is the price at which it was sold to the customer , Manufacturer Id is the id allocated to the manufacturer automatically . These are all the foreign keys used in this table.

3.12 Stock

The stock will manage all the stocks which are sold or is remaining .It has 3 foreign keys which acts as primary key. Pharmacy Id , Product Id and manufacturer id are all part of the foreign keys and together they form primary key.

3.13 Stock Order

In this table the order will be placed by the respective branch towards manufacturer whenever the stock in that branch is finished . Pharmacy Id is the only foreign key which is linked with the Pharmacy table.The primary key in this case is the auto incremented Id.

3.14 Stock Order Details

There are 4 foreign keys in this table. Order Id , Product Id, Manufacturer Id , Shipper Id . Among these Order Id , Product Id, Manufacturer Id together serve as primary key .Shipper Id in this case is the Id allocated to the shipper who will be responsible of delivering the items to the pharmacy branch.It also contains Quantity and Unit price attribute which will help in specifying the quantity for a given medicine,

3.15 Return Stock Order

This entity will be storing the record of the stock which are returned by the store to the manufacturer. Stock Order Id will act as the foreign key along with Product Id .The quantity will be specified which will be used in the return process.

3.16 Manufacturer Details

In this table the details of the manufacturer will be inserted which will help the admin or any employee to get in touch whenever required.The auto incremented id will serve as the primary key of the entity .Moreover, In case of any unforeseen circumstances , complain could be lodged against the manufacturer .

3.17 Supplier

The supplier has a name , contact number , manufacturer id which in this case is a foreign key and its address.The auto incremented Id is served as a primary key.

4 GUI

4.1 Add Employees Page

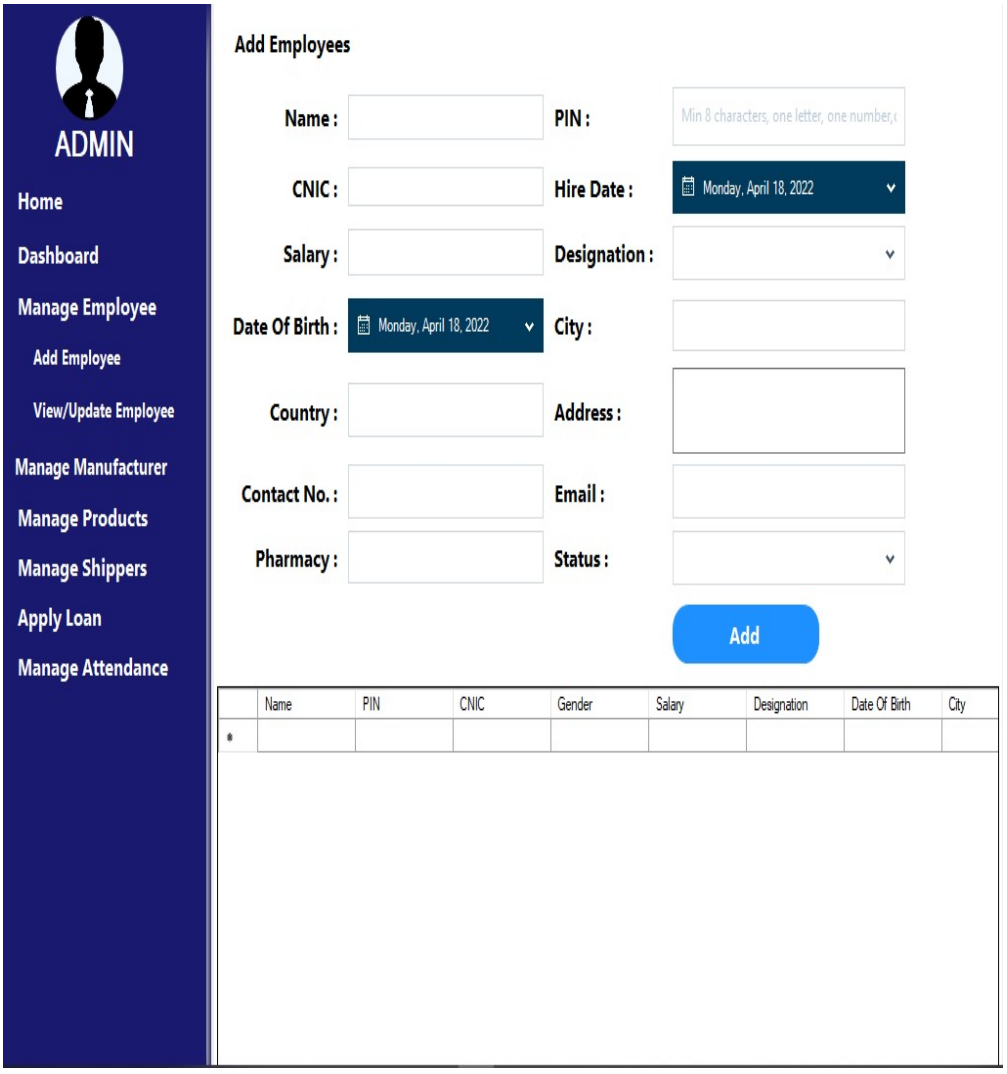

FIGURE 2: Adding Employees in Database System

The add employee page prompts user to enter details of the employee . It consist of name, pin, cnic and many other useful details of the employee.

4.2 Add Manufacturer Page

FIGURE 3: Adding Manufacturer in Database System

The add manufacturer page is used to add the manufacturer of the product. It has several attributes such as name of the manufacturer company, its address, city, contact number etc.

4.3 Add Products Page

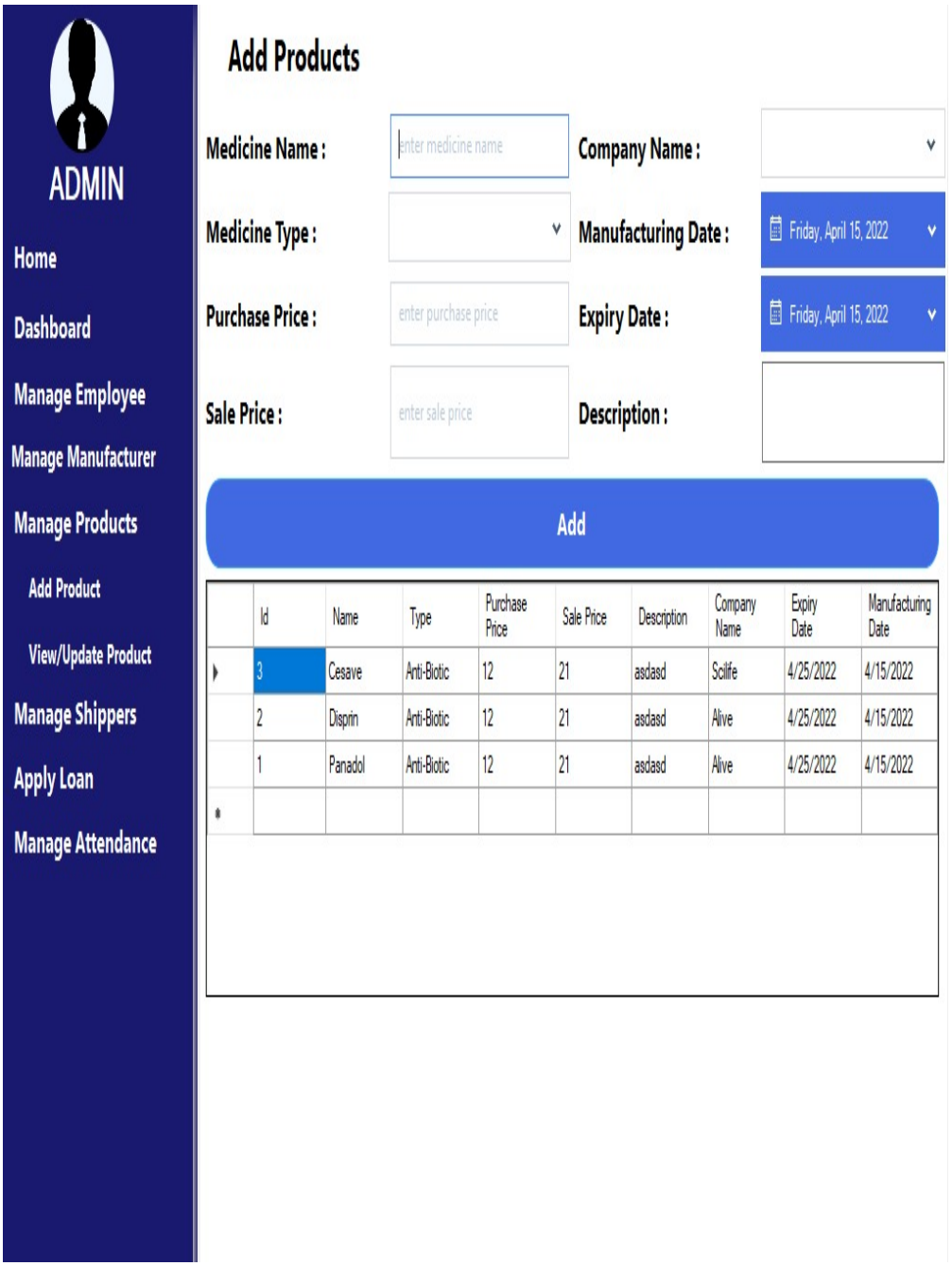

FIGURE 4: Adding Products in Database System

The add products page adds different products which are in the pharmacy store. This includes its name, company name, its type, sale and purchase price of the product and several other useful attributes which are necessary .

4.4 Add Shippers Page

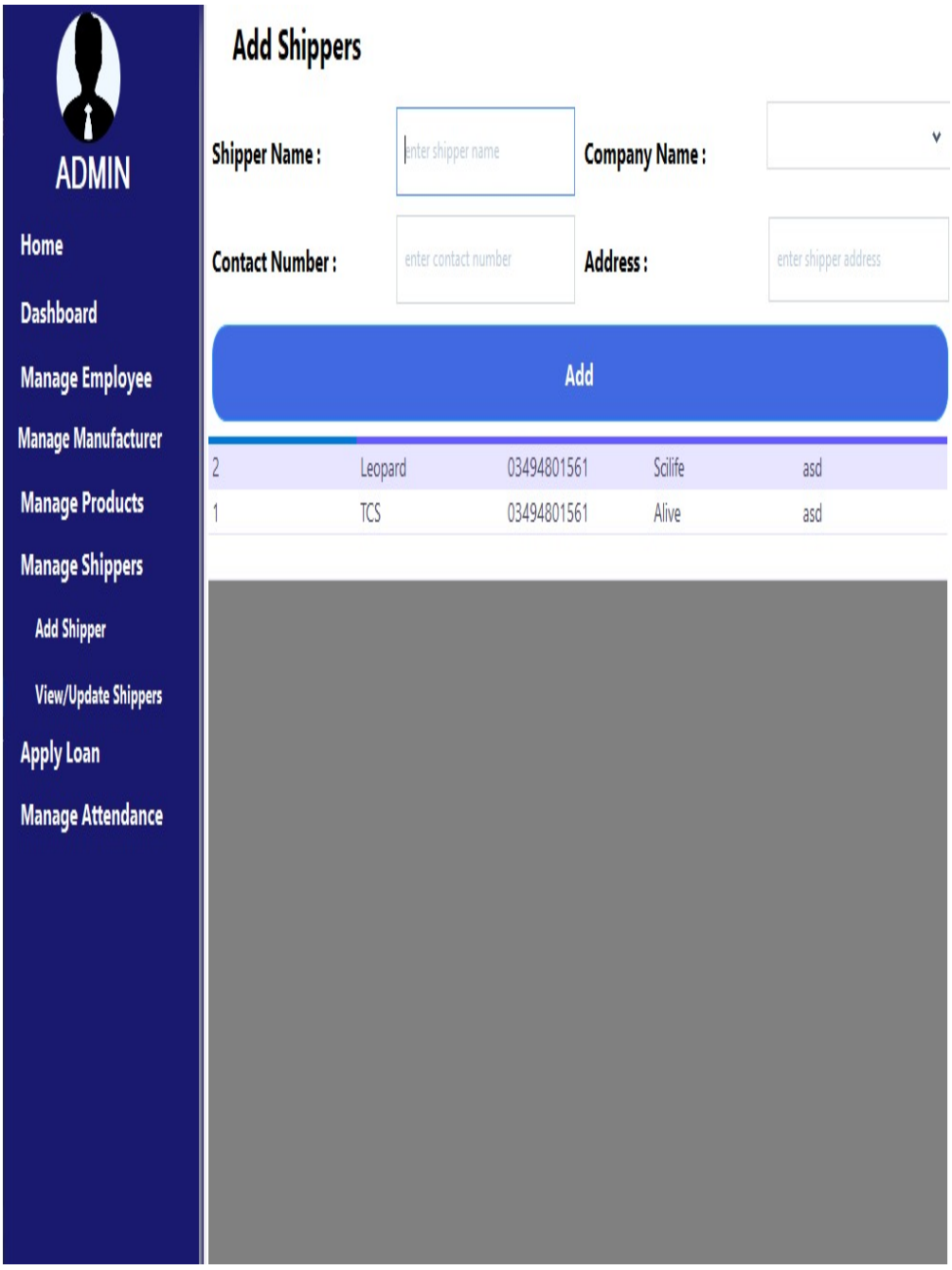

FIGURE 5: Adding Shippers in Database System

The page is used to add the shippers which are used for transportation of the products from the manufacturer to the shop . The attributes consist of name, contact number, address and the name of the company .

4.5 Attendance Page

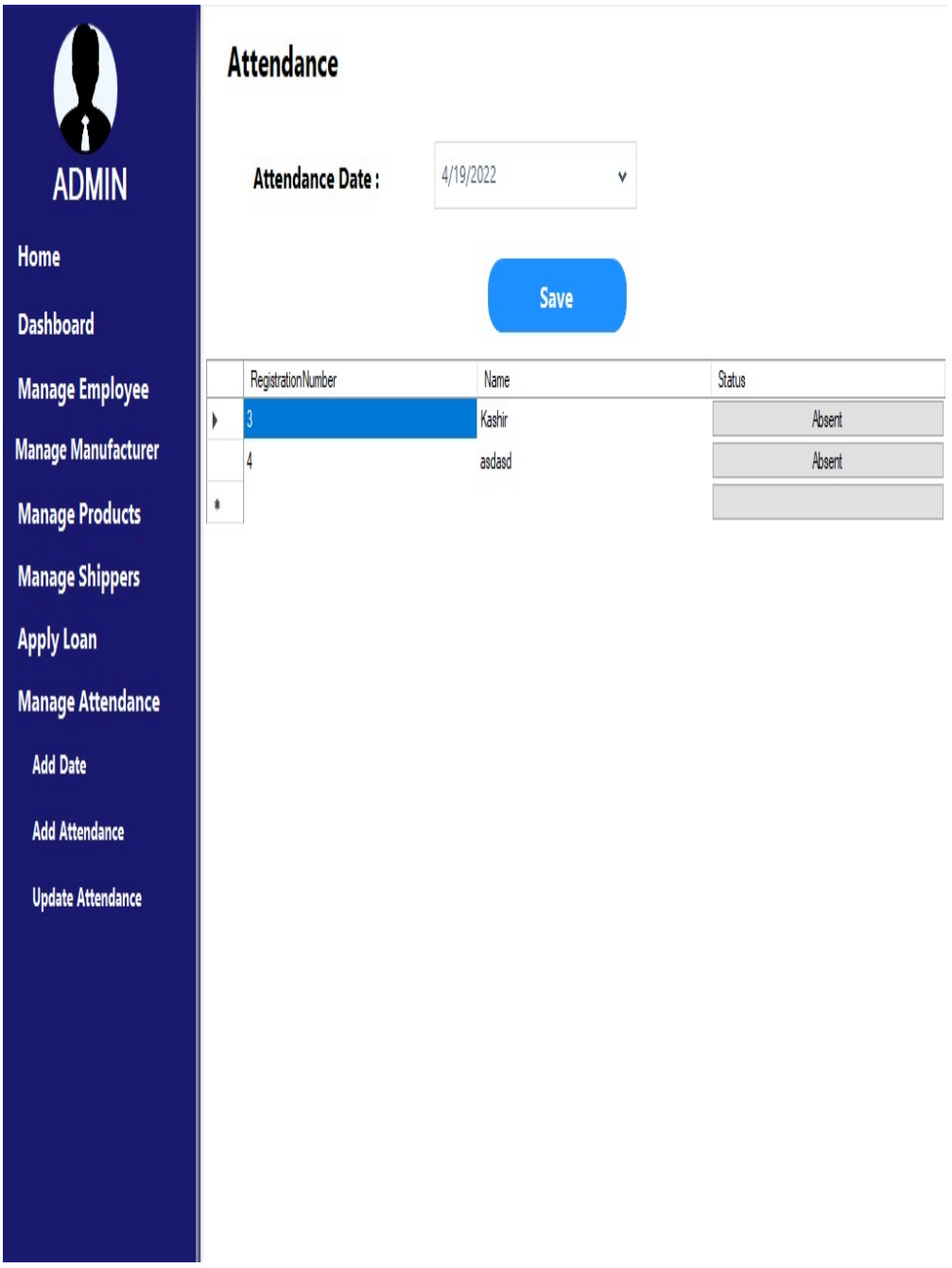

FIGURE 6: Marking Attendance of Employees in Database System

This page is responsible for taking the attendance of the employees on daily basis. The status of the attendance can be late, leave, absent and present .

4.6 Check Stock Order Page

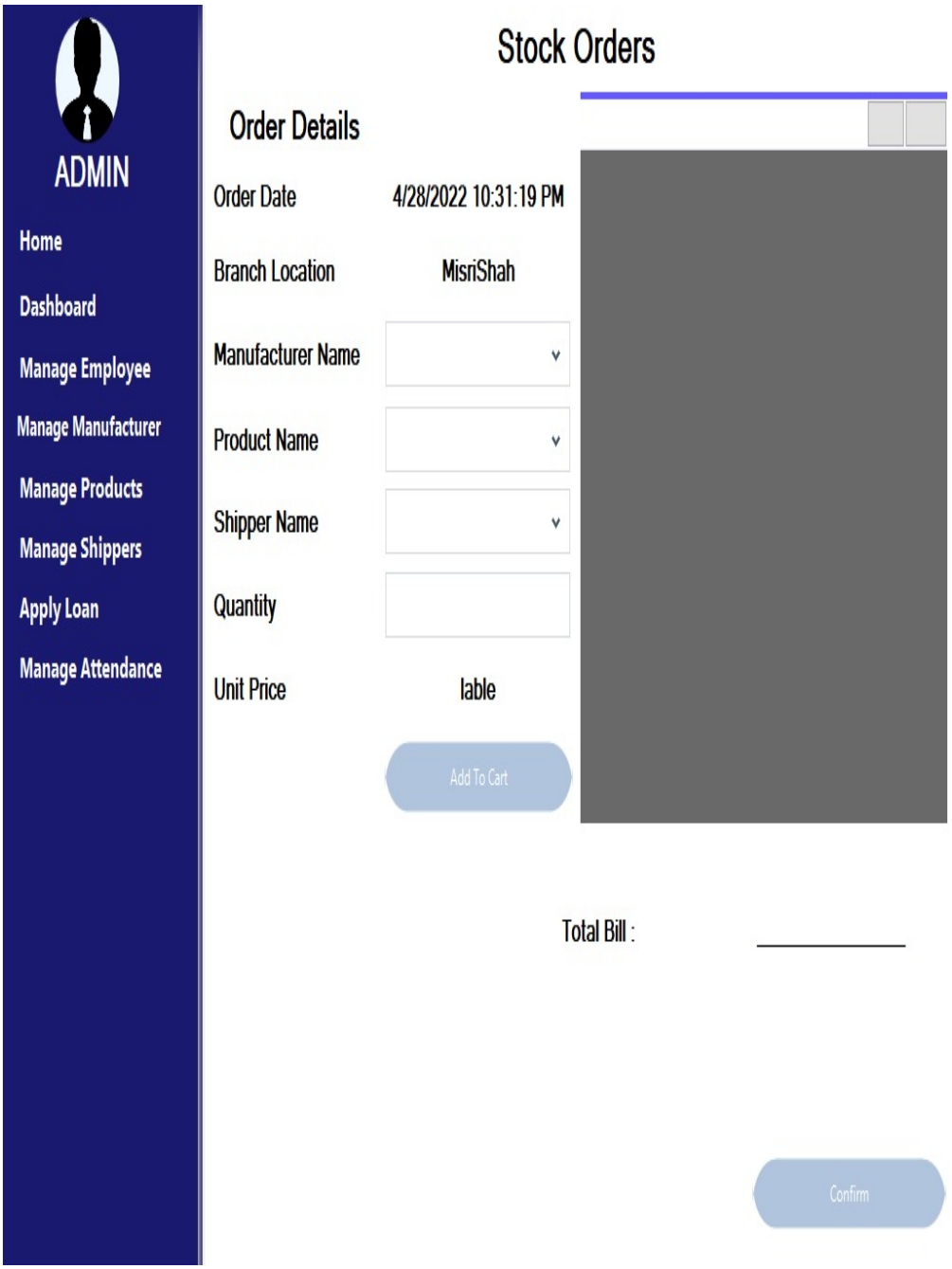

FIGURE 7: Checking Stock Order in Database

This page is used to ask customer for its order details and calculate bill against its order.

4.7 Loan Application Page

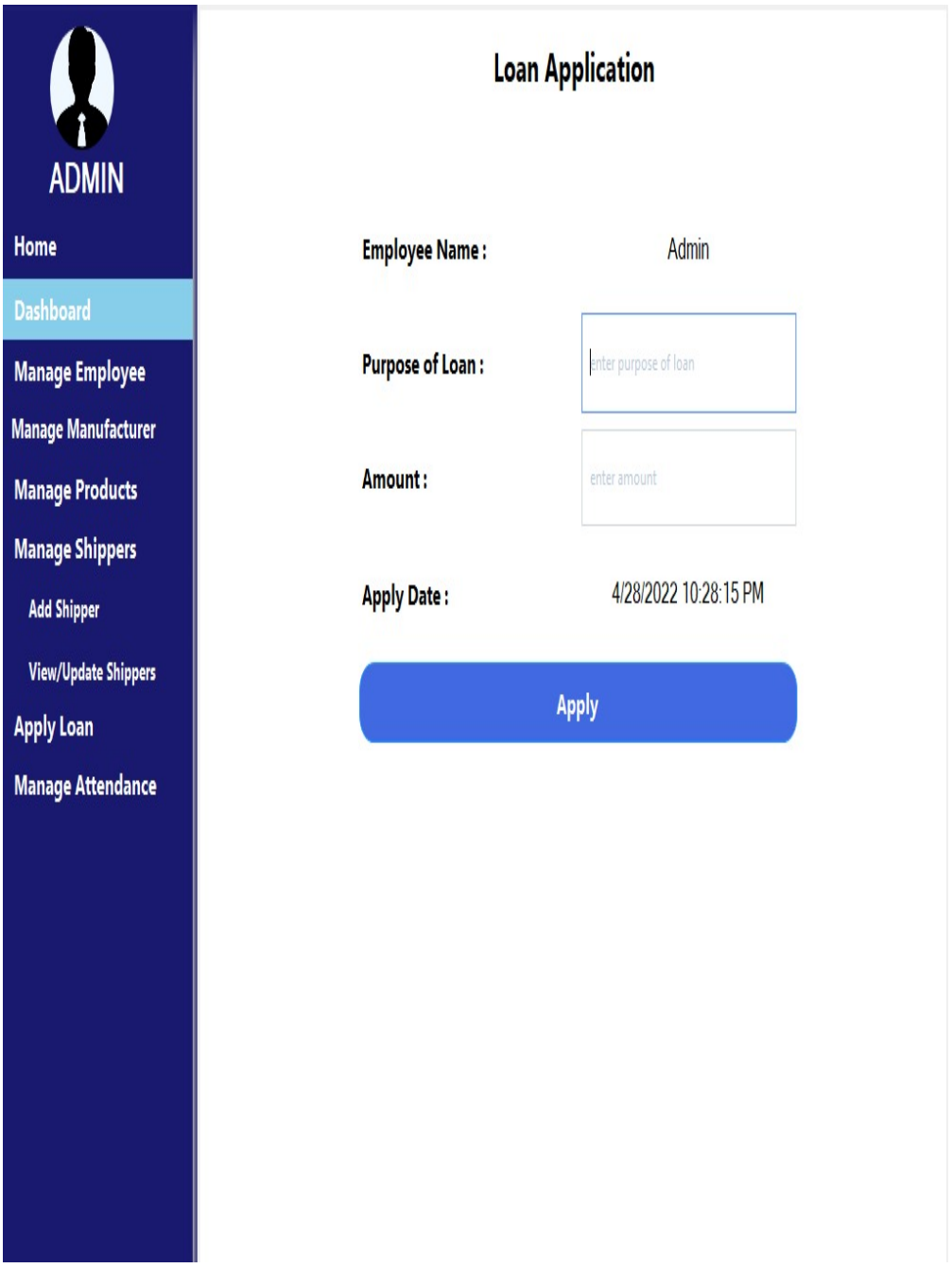

FIGURE 8: Loan Application Form

This page is used to prompt user to enter the details about why he/she wants loan and the amount which is required for the loan.

4.8 Main Dashboard Page

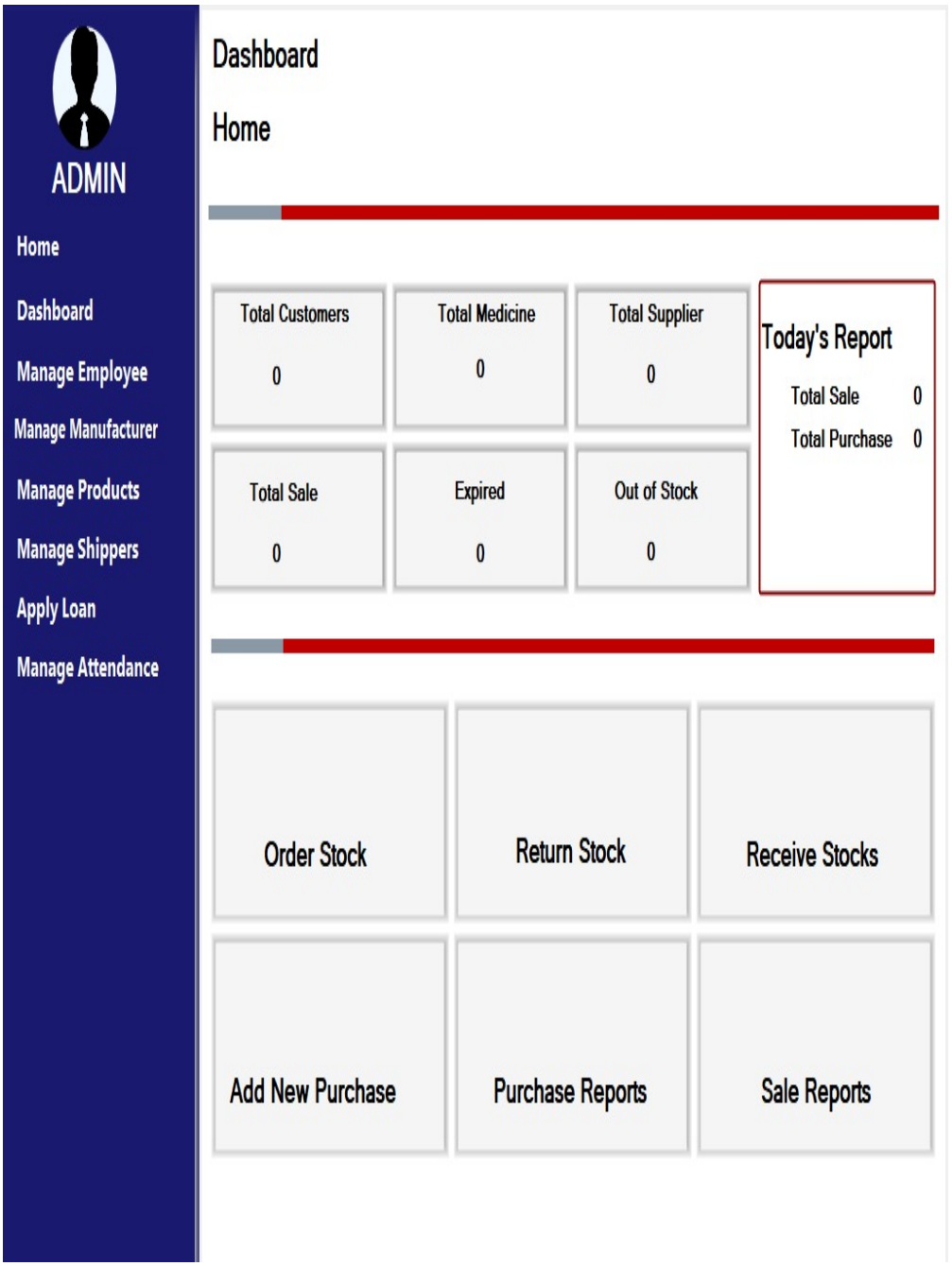

FIGURE 9: Main Dashboard

This is the main dashboard screen of the project which shows the admin about the total customers which are currently stored in the database . Total medicine which is stored in the store . Total Supplier, Total Sale, Expired medicines, Out of stock products and many more .

4.9 Receive Stock Order Page

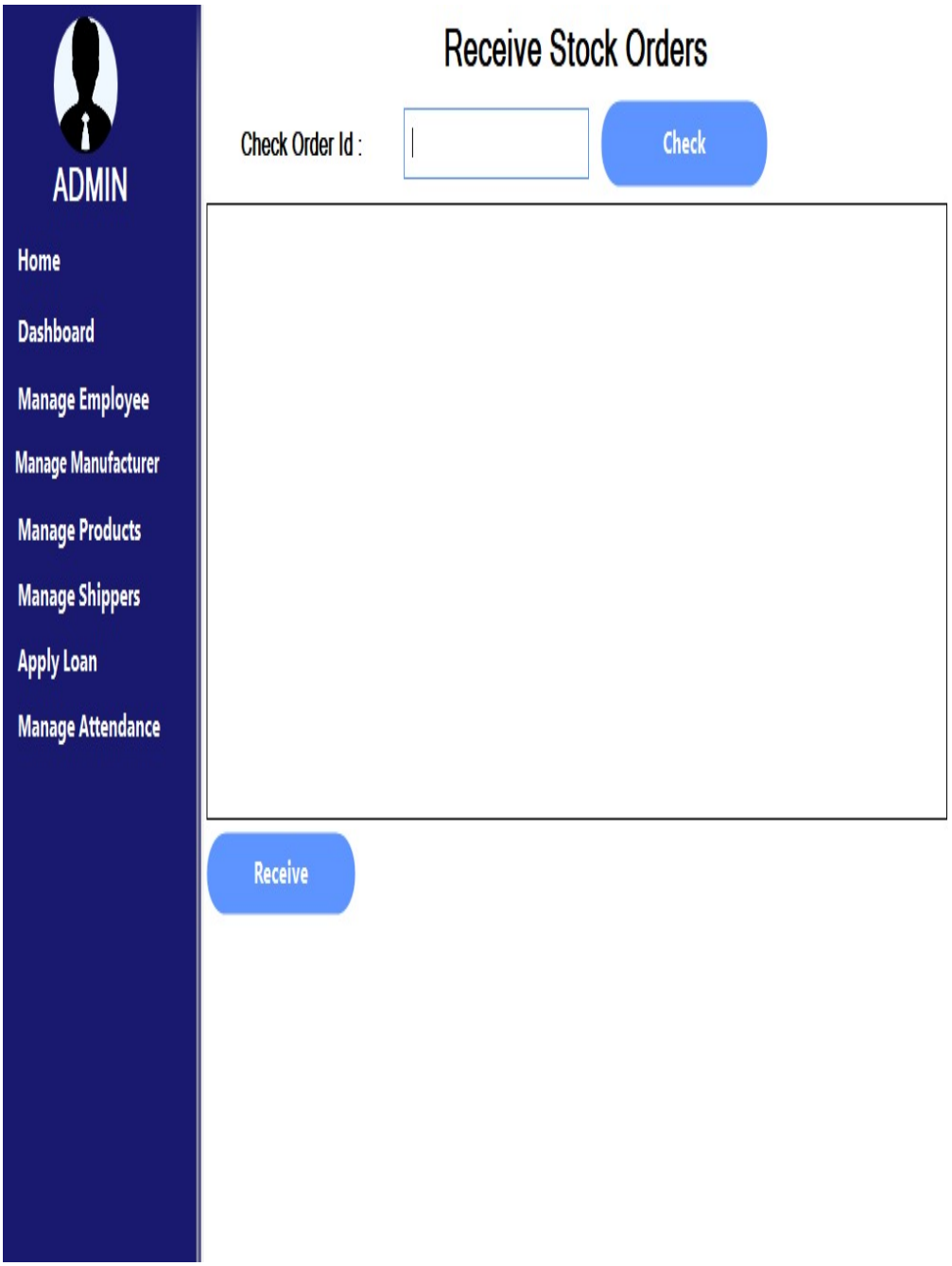

FIGURE 10: Stock Order Details

This page is used to search for the stock which has arrived from the distributor and to receive more orders to the stock.

4.10 Return Stock Order Page

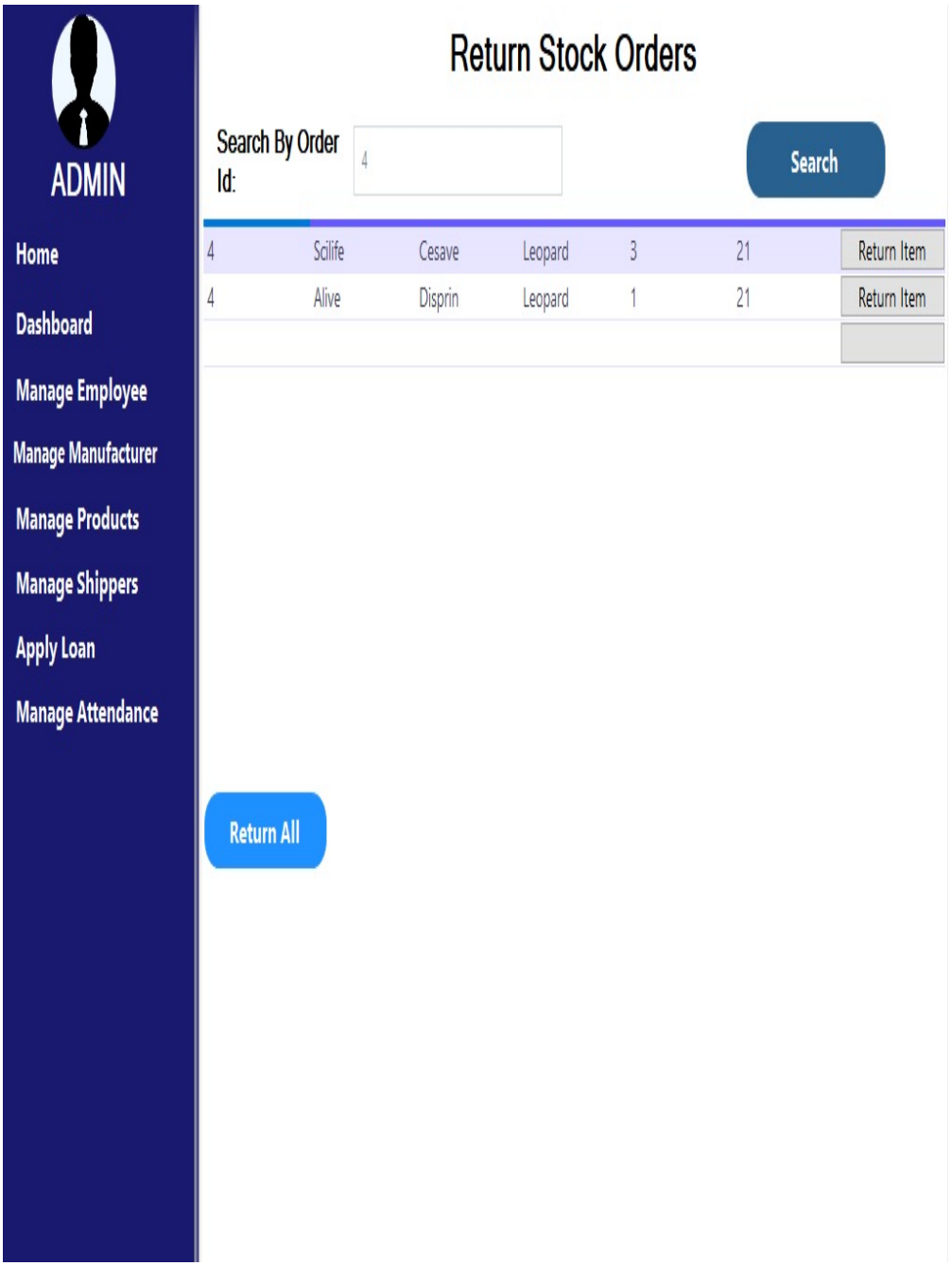

FIGURE 11: Return of Stock Order

This page returns any stock back to the manufacturer for several reasons. It may be the expiry , extra stock and many other reasons which enabled the admin to make this return.

4.11 Update Attendance Page

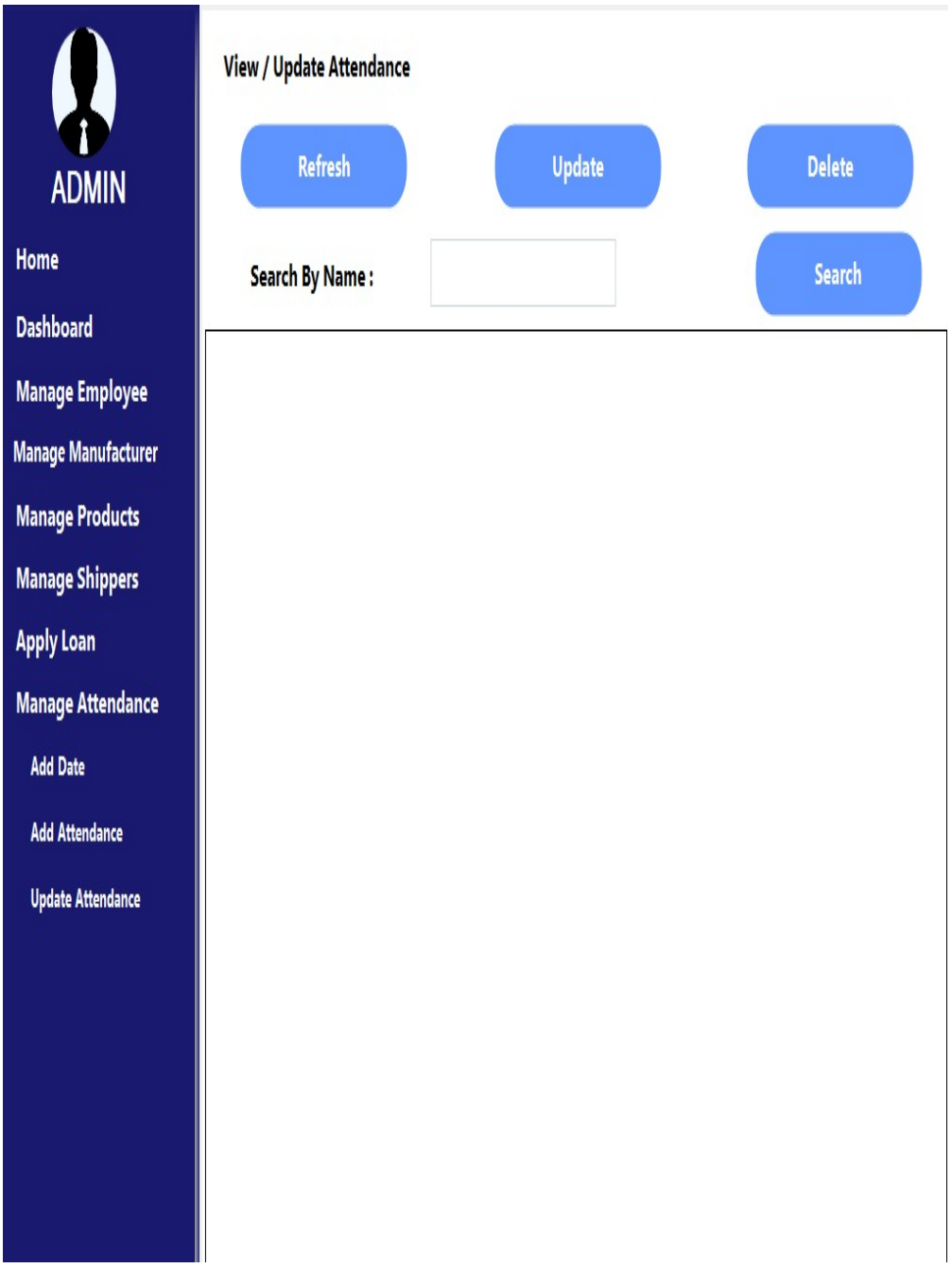

FIGURE 12: Update Attendance

This page is used to update and view attendance of any employee by searching through his/her name.

4.12 View Update Product Page

FIGURE 13: View and Update Product Form

The page is used to view, update and delete the products already added to the database.

4.13 Update Supplier Page

FIGURE 14: Update Supplier Form

The page is used to view, update and delete the suppliers already added to the database

4.14 Update Manufacturer Page

FIGURE 15: Update Manufacturer Form

The page is used to view, update and delete the manufacturers of the products which are already added to the database.

4.15 Update Date Page

FIGURE 16: Update Date Form

4.16 Update Employee Page

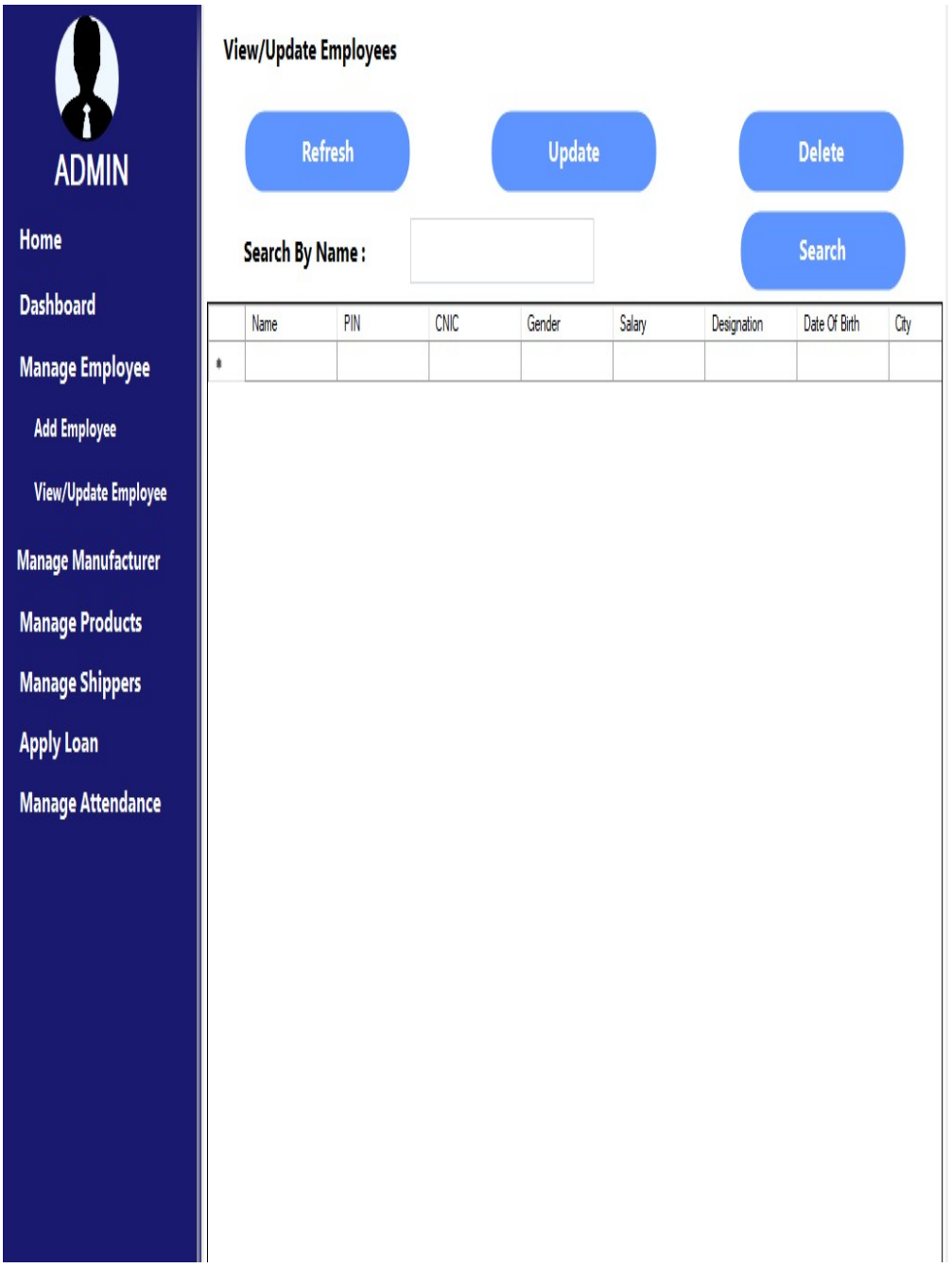

FIGURE 17: Update Employee Form

The page is used to view, update and delete the employees already added to the database.

4.17 Sign In Sign Up Page

FIGURE 18: Sign In Sign Up From

The Page is used by the admin or the employee to log in to the pharmacy .

4.18 Forget Password Page

FIGURE 19: Change Password Form

The Page is used to change password whenever admin forgets his/her log in password. The screen prompts the user to write the old password as well as the registration number which in this case is the key . Afterwards the new password is written.

4.19 Main Interface Page

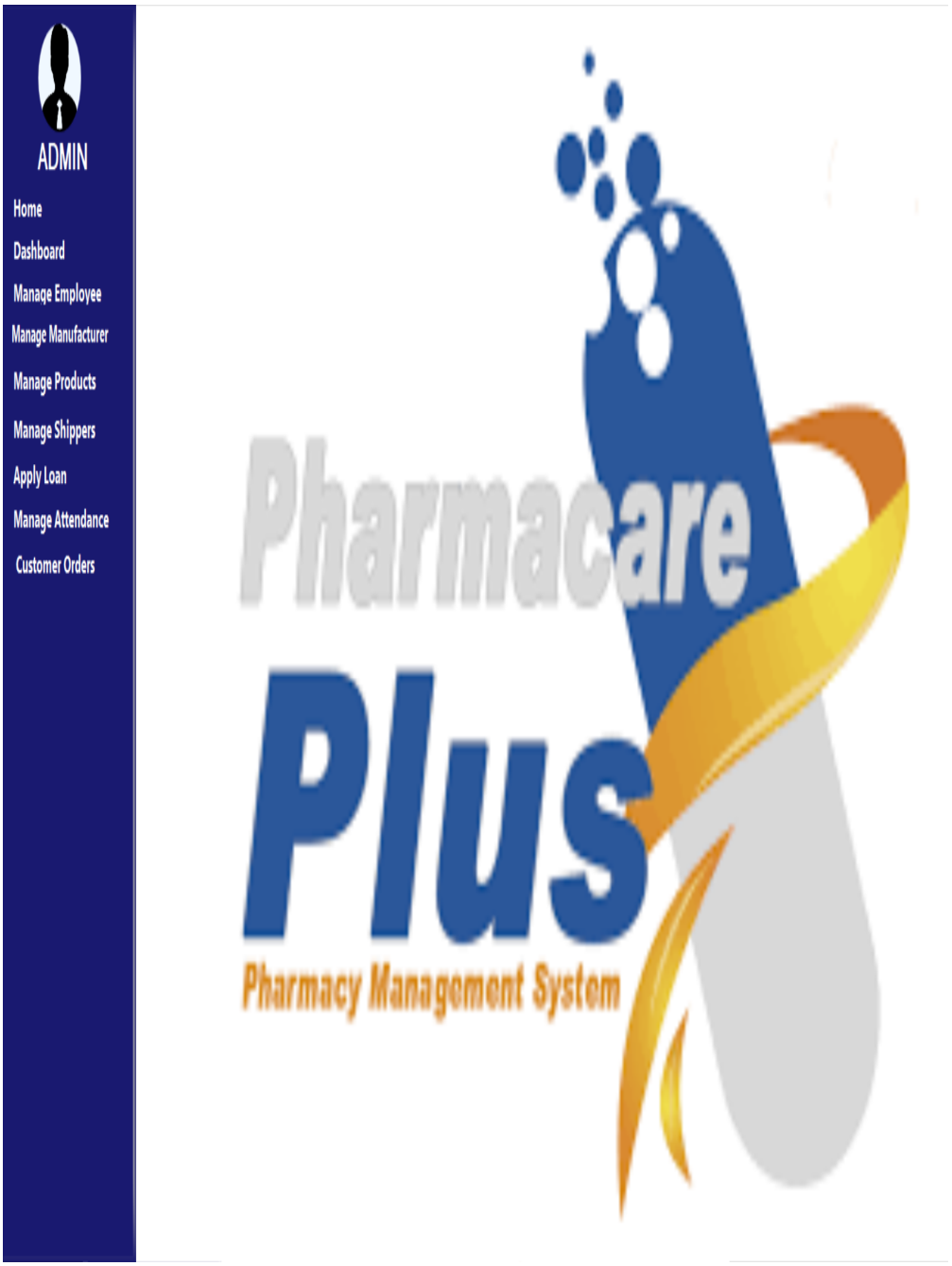

FIGURE 20: Main Screen Form

The page prompts in front the admin or the user whenever he/she logs in to the system.

4.20 Customer Order Page

FIGURE 21: Customer Order Form

This screen prompts the customer to enter information required to place order. He/She can view the bill generated .

4.21 Return Customer Order Page

FIGURE 22: Return Customer Order Form

The page is used to search for the orders placed within the 7 days period . First the order will be searched if the order is placed within the seven day period . The return will be placed.

5 Flow Diagram

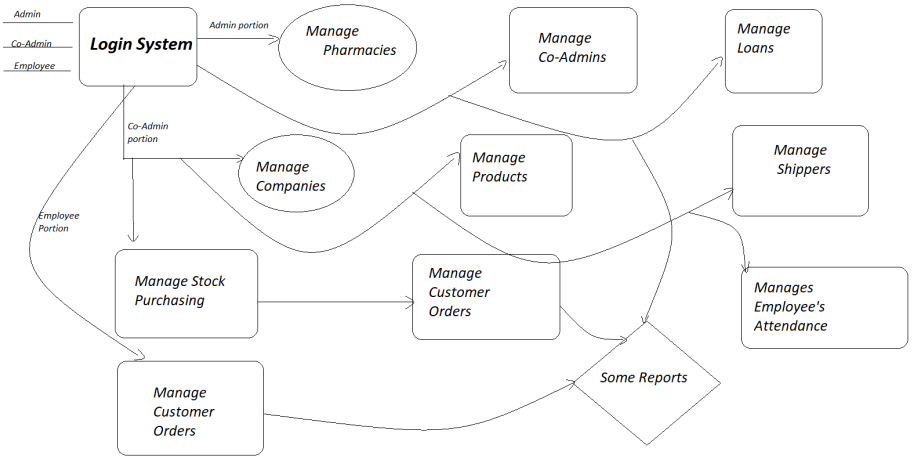

FIGURE 23: Flow Diagram

6 Generated Reports

6.1 Report 1

6.1.1 Query

```
select R.OrderId , CustomerDetails.Name , CustomerDetails.ContactNumber , R.Total_Amount ,
R.Discount , R.After_Discount
from ((select CustomerOrder.OrderId ,
CustomerOrder.CustomerId ,
Sum(CustomerOrderDetails.Quantity
* CustomerOrderDetails.Price) AS Total_Amount ,

CAST(discountValue.Name as float)/100 *

(Sum(CustomerOrderDetails.Quantity * CustomerOrderDetails.Price)) as Discount ,
(Sum(CustomerOrderDetails.Quantity *
CustomerOrderDetails.Price) -
CAST(discountValue.Name as float)/100 *

(Sum(CustomerOrderDetails.Quantity * CustomerOrderDetails.Price))) AS After_Discount
from (select Name  from Lookup
where Category = 'Discount')
as discountValue , CustomerOrder
join CustomerOrderDetails
on CustomerOrder.OrderId =
CustomerOrderDetails.[Order Id]
where Convert(date, getdate())
= CONVERT(date , [Order Date])
and CustomerOrder.[Pharmacy Id] = 2
group by CustomerOrder.OrderId,
CustomerOrder.CustomerId,
discountValue.Name)) as R
```

```
join CustomerDetails on
CustomerDetails.Id = R.CustomerId
```

LISTING 1: Sales Report of the Day

6.2 Report 2

6.2.1 Query

```
select R3.RegistrationNumber ,
EmployeeDetails.Name ,
R3.Total_Days ,R3.Present_Days ,
R3.Present_Percentage
from
(select  EmployeeDetails.RegistrationNumber,    MAX(R2.Total_Days) AS Total_Days ,
COUNT(AttendanceStatus.[Employee ID]) as Present_Days ,
(CAST(CAST(COUNT( AttendanceStatus.[Employee ID] ) AS float)
/ CAST(MAX(R2.Total_Days) AS float) AS float)*100)
AS Present_Percentage
from
        (select   count(DISTINCT [Date]) AS Total_Days ,
        Min(R1.Id) as Present_Status
        from (select Id from Lookup
        where Category = 'ATTENDANCE_STATUS'
        and Name = 'Present') as R1
        CROSS JOIN AttendanceDate
        JOIN AttendanceStatus
        ON AttendanceDate.Id =
        AttendanceStatus.[Attendance ID]) as R2
    CROSS JOIN AttendanceDate
        JOIN AttendanceStatus
        ON AttendanceDate.Id =
        AttendanceStatus.[Attendance ID]
        JOIN EmployeeDetails
        ON EmployeeDetails.RegistrationNumber
        = AttendanceStatus.[Employee ID]
        WHERE AttendanceStatus.[Attendance Status]
        = R2.Present_Status
        GROUP BY EmployeeDetails.RegistrationNumber)
        as R3
        join EmployeeDetails
        on R3.RegistrationNumber =
        EmployeeDetails.RegistrationNumber
        where EmployeeDetails.[Pharmacy Id] = 2
```

LISTING 2: Employee Wise Attendance

6.3 Report 3

6.3.1 Query

```
select R2.Product_Name ,
R2.Product_Type ,
ManufacturerDetails.Name AS Company_NAme ,
```

```
R2.[Expiry Date] , R2.Quantity as Stock
from
(select R1.Name as Product_Name ,
Lookup.Name as Product_Type ,
R1.ManufacturerId   as Company_Name,
R1.[Expiry Date] ,R1.Quantity
from
        (select ProductDetails.Name ,
        ProductDetails.Type ,
        ProductDetails.ManufacturerId ,
        [Expiry Date] , Quantity
        from ProductDetails join Stock
        on ProductDetails.Id = Stock.[Product Id]
        where  Quantity <=0 or
        GETDATE() >=  [Expiry Date]) as R1
        join Lookup on Id = R1.Type) as R2
join ManufacturerDetails
on R2.Company_Name = ManufacturerDetails.Id
```

LISTING 3: Expired Or Stock Is Zero

7 Testing

Testing was the performed on regular intervals as each entity was linked with the other entities and it required some testing before marching on to the next part of the project. The tools which were used for testing were the visual studio and SQL server for queries. In case of any ambiguity in the correctness of the query , then it was first written and tested on the SQL sever and once the the resulted output seemed correct then it was merged into the project. Visual Studio debugger was used for testing for syntax errors and even for the logical errors as well.

8 Limitations

Following are the limitations of the project:

1. More views could have been added
2. More Triggers could be inserted
3. Transactions without delay can be achieved

9 Future Work

The future work that can be done on the project are enlisted below:

1. Making better Graphical User Interfaces with more features

2. The project can be linked with the web .

10 Collaboration

The final term project was a group project consisting of 3 members each. The project was under the supervision of Mr. Nazeef Ul Haq. The project had alot of stuff to learn as previously the database design was provided and we had to manipulate the data using the CRUD operations.But this time around we had to make the database design as well which was the most imp and was the main learning part. Apart from this teamwork and leadership quality was also tested as in near future IA we will be doing mega projects and these scenarios will boost our confidence in ourselves . We (Group Of three) managed the task extremely well as the leader (Asad Mehmood) assigned us with the indiviual tasks which were to be done and later these tasks were to be merged into a single project. Moreover this time around the workload was properly managed and this helped complete our task before time.Furthermore each group member was hospitable towards other fellow partners and helped each other whenever they required any help. We used to do meeting online on Microsoft Teams but whenever we had the chance to meet each other ,we used to arrange meetings . Last but not the least Our Lab sir Mr.Nazeef Ul Haq helped a lot in the problems we faced and provided optimal solutions.

11 Conclusion

The Pharmacy Management System was our final term project for the fulfillment of the course Database Management System Lab. Building this project along with the other team members was a great experience . We encountered different situations and got to know how to tackle them in such pressure situations.Moreover the project gave a great insight about how things actually work in the Databases and how to link it with Desktop application.Earlier, there was a vague idea about the databases and how they work , but once we implemented this project we got to know many different things.We had the opportunity to to thing with respect to the client and how they perceive things .
Furthermore in the end , we were able to manage our workload which was a key leadership skill and we as a team are now even more confident on working on such projects individual or even as a group.