Islamic University of Technology

Department of Business & Technology Management

Project Name: Sales & Inventory Management System

Course Name: System Analysis

Course Code: BTM 4763

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Submitted To

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Introduction

Jewelry business is common in any country. Likewise, it's a demanding business in Bangladesh. In Bangladesh, many jewelry shops are trying to bring automation in their business operations. One such shop is Dhakaiya Goyna. The shop operates mainly in online with some offline presence.

With the help of system analysis and design, we will examine the systems used by Dhakaiya Goyna to process transactions, store information, make decisions, and analyze customers' feedback. Also, there will be discussion regarding the relation between those systems and their integration.

Business Description

The jewelry shop Dhakaiya Goyna is a newly established. The jewelry shop owned and operated by an entrepreneur Deepa Monalisa. Dhakaiya Goyna offers a variety of premade and custom-made traditional jewelry products that are designed and created by the local jewelry makers. The products are designed for the professional woman, students and sociable woman. Theonline shop is operated by 24/7 virtual assistants. Dhakaiya Goyna also has physical store in Banasree area, Dhaka.

Figure: Logo of Dhakaiya Goyna

Stakeholder

Dhaka Goyna is a sole proprietorship business. Deepa Monalisa is the sole owner of the jewelry shop Dhakaiya Goyna.

Business Functions of Dhakaiya Goyna

There are different departments of Meena Bazar such as:

- Accounting
- Marketing
- Sales
- Customer Service
- Operations

Business Process of Dhakaiya Goyna

The main business process of Dhakaiya Goyna can be segmented into-

- **Operating Process:** These are the main functions of the business. These processes are directly related to the fundamental values, vision, and mission of the business. The operations of Dhakaiya Goyna mainly focuses on sales of their products. The firm's operating processes ensure that it is going towards its goals.
- **Managing Process:** The processes of Dhakaiya that plan, organize, coordinate and control all the functions of the business fall under managing processes. These processes are goal oriented. The owner of Dhakaiya Goyna performs is the sole coordinator of the business.

Different Systems at Dhakaiya Goyna

- **Automated System:** For marketing its products and advertising campaigns, Dhakaiya Goyna emphasizes on Social Media Marketing. Their marketing is mainly Instagram and Facebook based. Thus, the firm's marketing department use this automated system.
- **Manual Systems:** Expect marketing, other departments of Dhakaiya Goyna use manual procedures. Sales, accounting, operations are recorded manually.

Planning: Project Identification, Selection, Initiation and Planning

Problem Identification

- Lack of automated systems for sales and accounting.
- No use of AI chatbots.

Problem Description

One of the main problems that Dhakaiya Goyna faces is that lack of an automated system for their sales and inventory management. As automation system is not developed in some departments, for that reason the efficiency of overall business may not utilized properly. We know that the process of sales is important for cash flow. Since, it is not automated yet thus it's become tough to determine the monthly or annual profit, sales forecast and so on. Every business takes major decisions based on its sales data, and it becomes more easier for forecast regarding the sales when all sales data are available. Similarly, an automated inventory system can help a business for efficient production and determine the demand and supply. Nowadays automated customer service is popular overall the world. There are different types of AI chatbot system are available for managing the customers automatically. If Dhakaiya Goyna automates their customer service, they can serve and satisfy their customer more easily within appropriate time.

Selecting IS Development Project

Automation of sales, accounting process and inventory is very crucial the business growth. Therefore, we have selected Sales and Inventory Management system of Dhakaiya Goyna.

As-is-System

Current system of sales and accounting department of Dhakaiya Goyna is manual. Each transaction is recorded manually.

To-Be-System

Proposed New System: Sales and Inventory Management System
Type: Automated
Description: The to-be-system will be able to record the daily transactions, update inventory and the data on a database.

Project Description and Feasibility Analysis

Description of our project and feasibility analysis is illustrated with a baseline study below:

Baseline Project Plan Report

Introduction

I. Project Overview: Building an automated Sales and Inventory Management System for Dhakaiya Goyna. The project has been analyzed to provide the perfect solution. Several feasibility checks have been made from different perspectives. Also, we have identified how the management of Dhakaiya Goyna can use this project. The scope of the project is that- the new system will incorporate with the sales and accounting department of Dhakaiya Goyna.

II. Recommendation: Dhakaiya Goyna can easily record the daily transactions automatically. The new system will enhance the speed of the firm's operating processes also.

System Description

The new system can record the daily transactions, update inventory and based on this support the accounting procedures. Sales and Inventory Management System will store the sales data in a database

Feasibility Assessment

I. **Economic Feasibility Analysis**: A process of identifying the financial benefits and costs associated with a development project. Our project's economic feasibility can be segmented into:

a) Tangible Benefits:
   - Performing sales forecast
   - Increased Inventory Accuracy
   - Increased operations speed

b) Intangible Benefits:
   - Can be able to recognize potential customers
   - Gain knowledge about customers

II. **Technical Feasibility:** Since, the firm doesn't use any automated system in this regard, Dhakaiya Goyna might face problems in combining data of related departments. Besides, there can be a delay in the estimated project completion time.

III. **Operational Feasibility:** Currently, the operations of Dhakaiya Goyna follow manual procedures. After implementing Sales and Inventory Management System, Dhakaiya Goyna will be able to record the daily transactions, update inventory automatically.

IV. **Legal and Contractual Feasibility:** The new system will keep the firm's sales data, associated databases within the firm's management. Thus, there is no risk of data stealing.

V. **Political Feasibility:** The owner of the business views the project as an inevitable upgrade of the business.

Table: Baseline Project Plan Report of Dhakaiya Goyna

Schedule of Project

The schedule of the project is shown with a Gantt Chart:

Sales and Inventory Management System

Dhakaiya Goyna

Project Start:	Tue, 6-1-2021
Display Week:	1

TASK	PROGRESS	START	END
Planning	100%	6-1-21	6-7-21
Requirement Collection	100%	6-8-21	6-15-21
Interface Design	100%	6-16-21	7-7-21
Data Design	100%	6-16-21	7-7-21
Documenting The System	100%	7-8-21	7-21-21
Programming	100%	7-22-21	8-16-21
Testing	100%	8-17-21	8-23-21
Installation	100%	8-24-21	8-27-21

Figure 1:Gantt Chart (part 1) of the Project

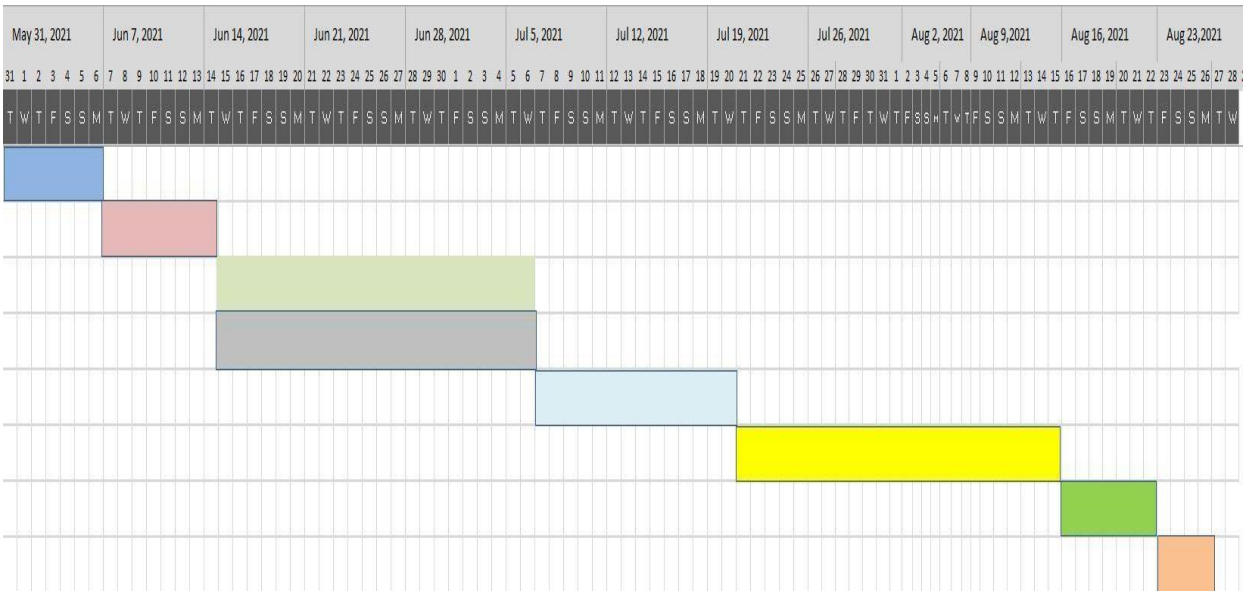


Figure 2:Gantt Chart (part 2) of the Project

Analysis: Requirement Determination and Structuring

The goal of the analysis phase is to truly understand the requirements of the new system and develop a system that addresses them. Thus, by analyzing, we will be able to determine what information and information processing services are needed to support selected objectives and functions of the organization. The overall process can be segmented into two subphases:

- Requirement Determination: In requirement determination phase, we collect the new system's requirement, analyze them and list all the functional and non-functional requirements.
- Requirement Structuring: In this phase, we will structure the process requirement and data requirement.

Collecting System Requirement

Requirement analysis can be performed by many techniques. In this case, we have collected the system requirements via interview with the owner of the Dhakaiya Goyna. We have conducted the interview, documented it and based on this; we have developed a post interview follow up.

Post Interview Follow-Up: Collecting and Analyzing System Requirements
Person Interviewed: Deepa Monalisa, Founder and Owner of Dhakaiya Goyna **Interviewer:** Md. Zubayer Ojhor, Alvi Rahman **Purpose of Interview:** Understand the business processes of Dhakaiya Goyna and how to implement automated system in the firm's operations. **Summary of the Interview:** Conducting the interview, we learnt about Dhakaiya Goyna's current systems, their mission, vision, their marketing plans, their financial plans. Owner's words about Dhakaiya Goyna: "***Our main goal is to surpass our client's expectations on every product with superior traditional quality, service and value. In our business we treat every customer with sincerity, fairness and professionalism while delivering a quality product in a timely manner."*** But the firm has no automated systems in most of the departments. Thus, to chase her goal, Dhakaiya Goyna will need automated systems eventually. Sales and Inventory Management System is the best fit in this regard. It is the of the major requirement of the firm that it can record the daily transactions and manage the inventory automatically. Two major the problems of the current system are: 1. The data are of poor quality, thus cannot be used for future sales forecasting. 2. High probability of Data losing.

Table: Interview Follow-up

List of Functional Requirements

Sales and Inventory Management System: The new system will record sales and allow the manager to store & access all the data.

Inputs: Daily transactions, sales data, inventory information

Outputs: Invoice for every transaction, storing data in the database.

List of Non-Functional Requirements

Operational

1. The system should run on Laptop/ Computer/ Smartphone.
2. Invoices can be printed via printers.

Performance

The system should support sales and accounting operations.

Context Diagram of Process Requirement

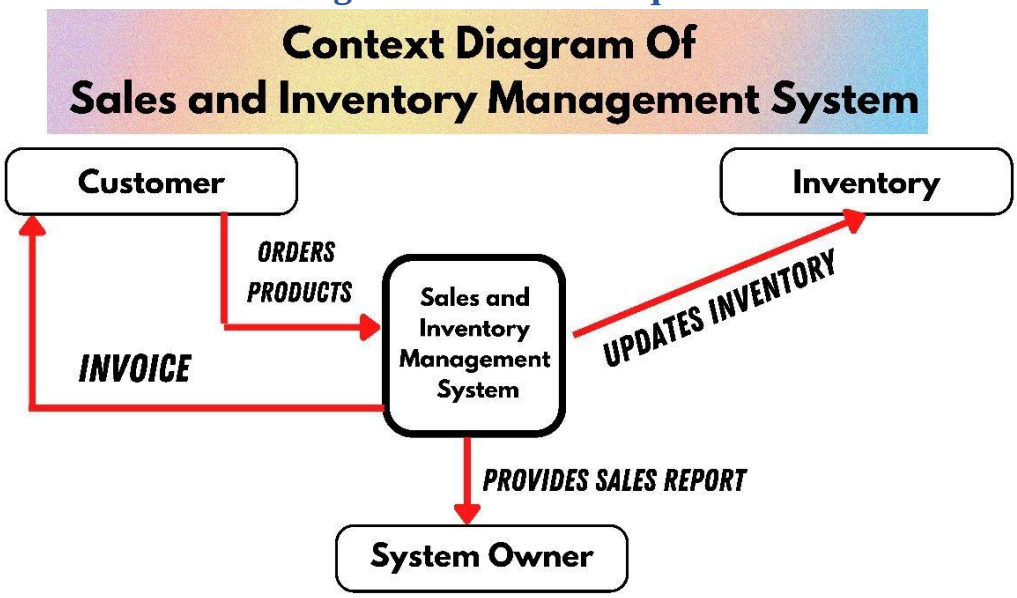


Figure 3: Context Diagram

DFD Diagram of Process Requirement

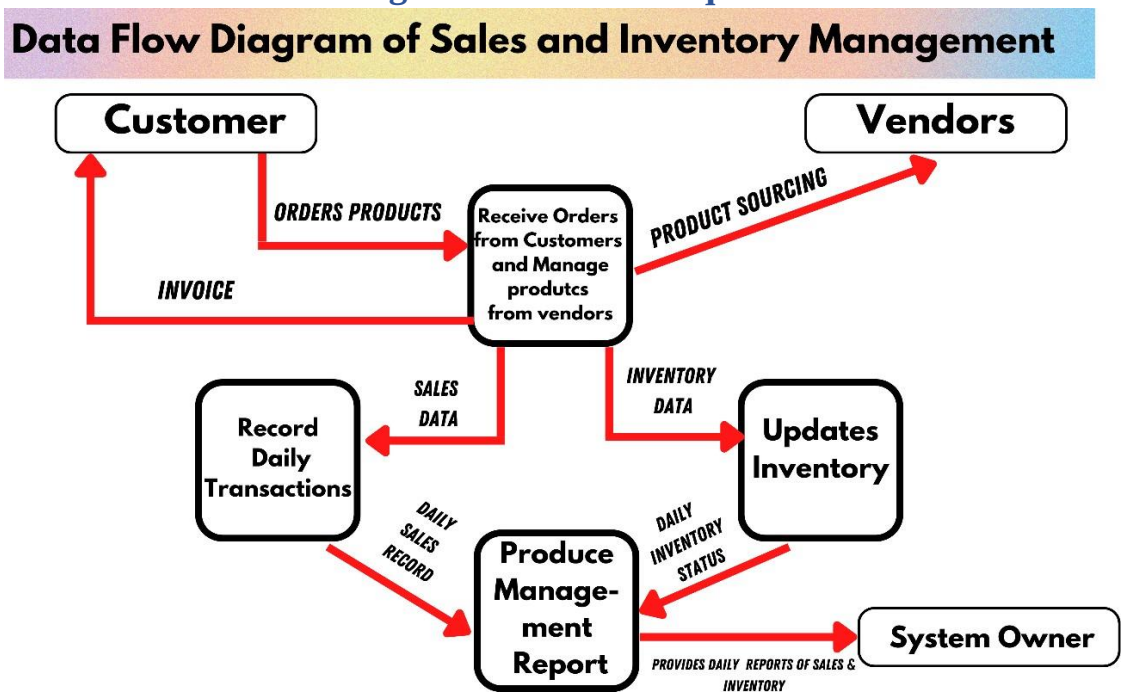
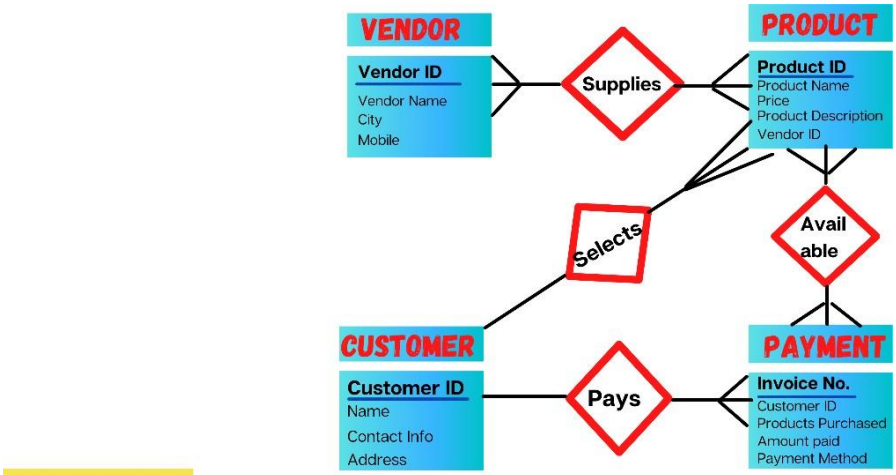


Figure 4: Data Flow Diagram

ER Diagram of Data Requirement



E-R Model of Sales and Inventory Management System

Figure 5: E-R Model of Sales and Inventory System

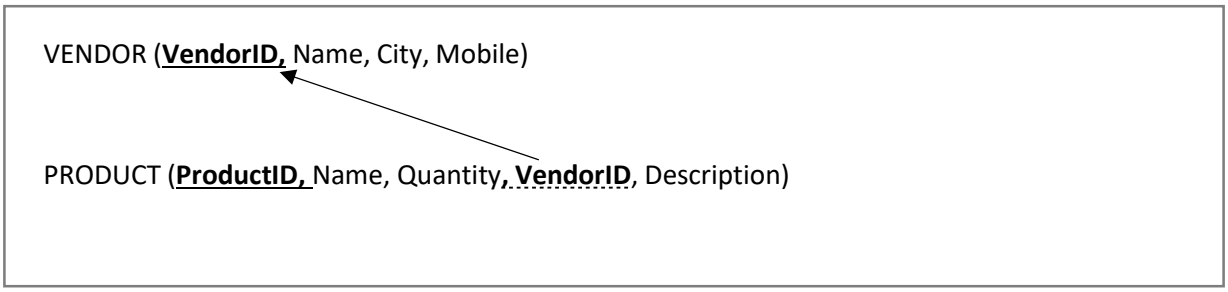
Design

The designing phase serves basically the following purpose:

i. Structure the date in stable structured that is in normalized forms with minimal redundancy
ii. Developing the logical database which reflects the actual data representation
iii. Translating a relational database into a technical file and database design

Referential Integrity

In our project we have used cross referencing between relations. For example, the value of VendorID in Product table must be existing in the Vendor table. We will not be accepting any nonexciting or unknown vendor.



Designing Tables

The following are the tables which are created for database designing:

tblCustomer (Customer Details Table)

Column Name	Data Type	Size	Description
Customer_ID(PK)	Num	6	Customer Identification
Name	Short Text	255	Customer's Name
Address	Short Text	255	Customer's Address
Mobile	Short Text	255	Contact Number

tblVendor (Vendor Details Table)

Column Name	Data Type	Size	Description
Vendor_ID(PK)	Num	6	Vendor Identification
Vendor_name	Short Text	255	Vendor's Name
City	Short Text	255	Vendor's Location
Mobile	Short Text	255	Contact Info

tblProduct (Product Details Table)

Column Name	Data Type	Size	Description
Product_ID(PK)	Num	6	Product identification
Product_name	Short Text	255	Product's name
Vendor_ID(FK)	Num	6	Vendor Id derived from vendor's table
Price	Currency	12	Price of product
Quantity	Num	6	Amount of product
Description	Long text	410	Description/ notes on product
Customer_ID(FK)	Num	6	Cust.name from tblCustomer

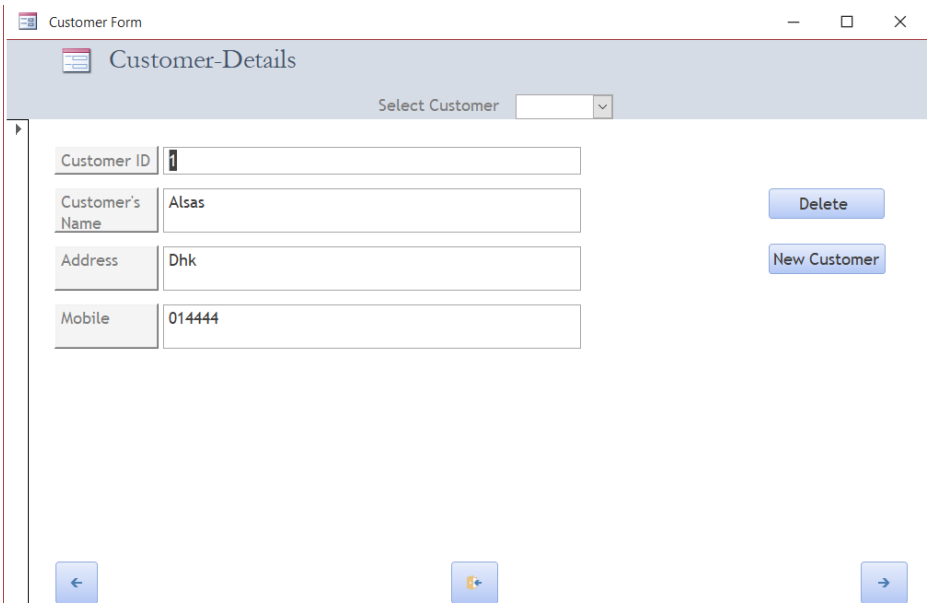
Invoice (For Invoicing and bill preparation)

Column Name	Data Type	Size	Description
Invoice_ID(PK)	Num	6	Invoice Identification
Date_of_Sale	Date/time	12	Time of purchase
Customer_ID(FK)	Num	6	Customer_Id from customer table
Product_ID(FK)	Text	255	Product ID from product table
Quantity	Num	6	Amount
Price	Currency	6	Price from product table
Product Name	Text	255	Name from product table
Subtotal	Currency	12	Calculating from price and quantity

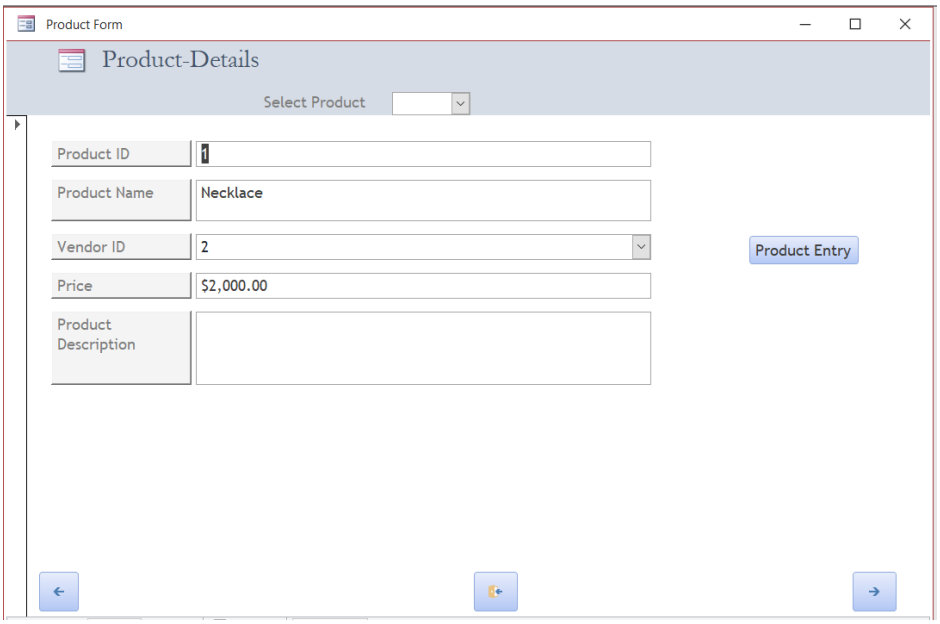
Designing Forms & Report with Interface

We have attached here the designed version of forms for collecting data for the table that we have prepared earlier

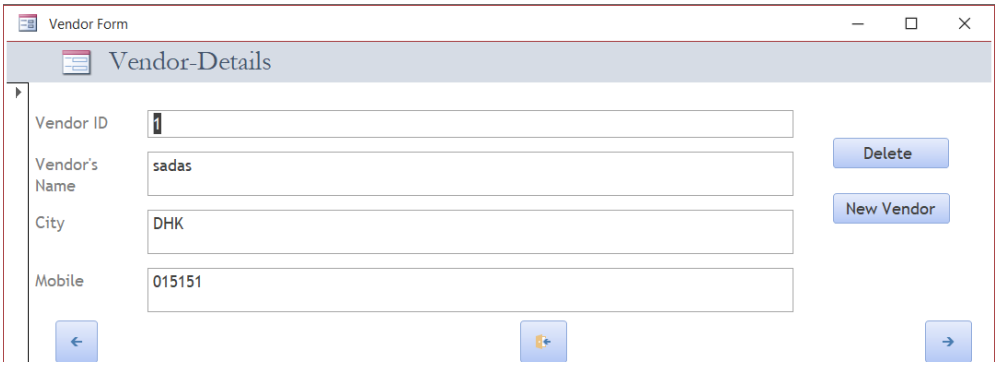
Customer Form



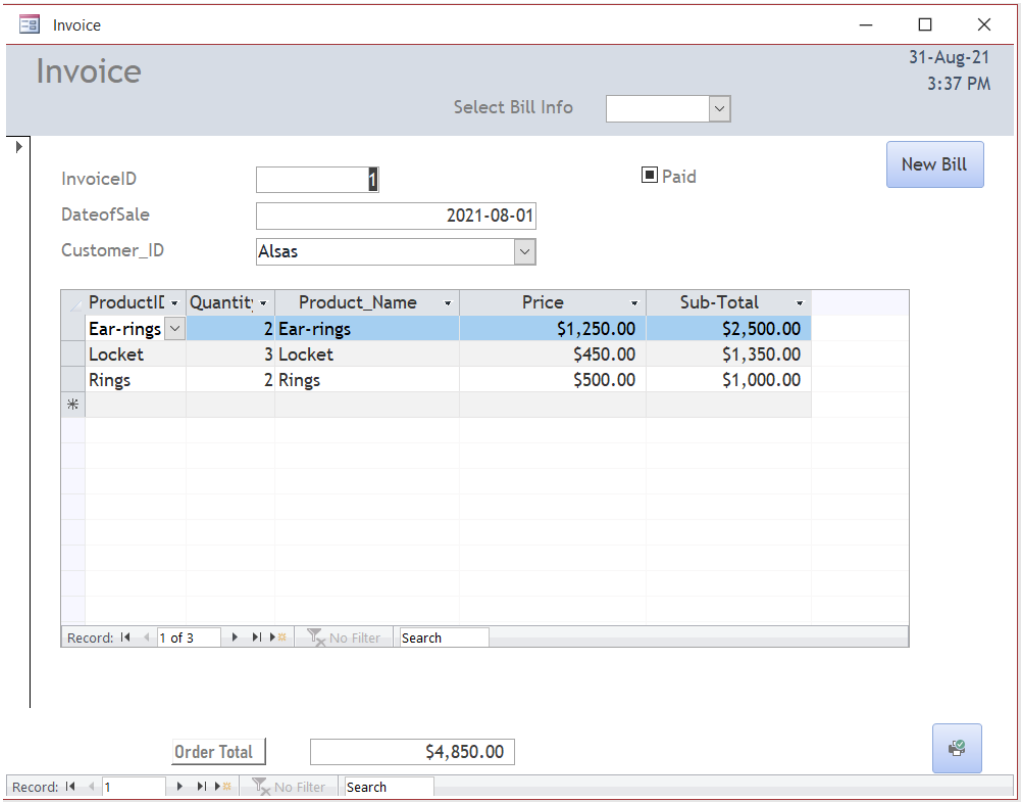
Product Form



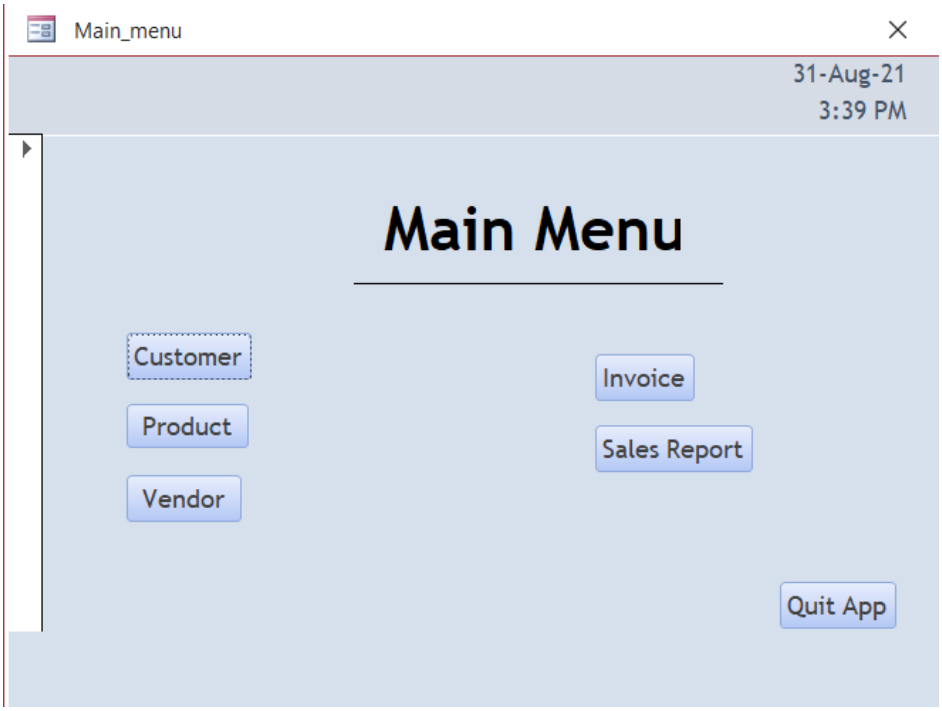
Vendor Form



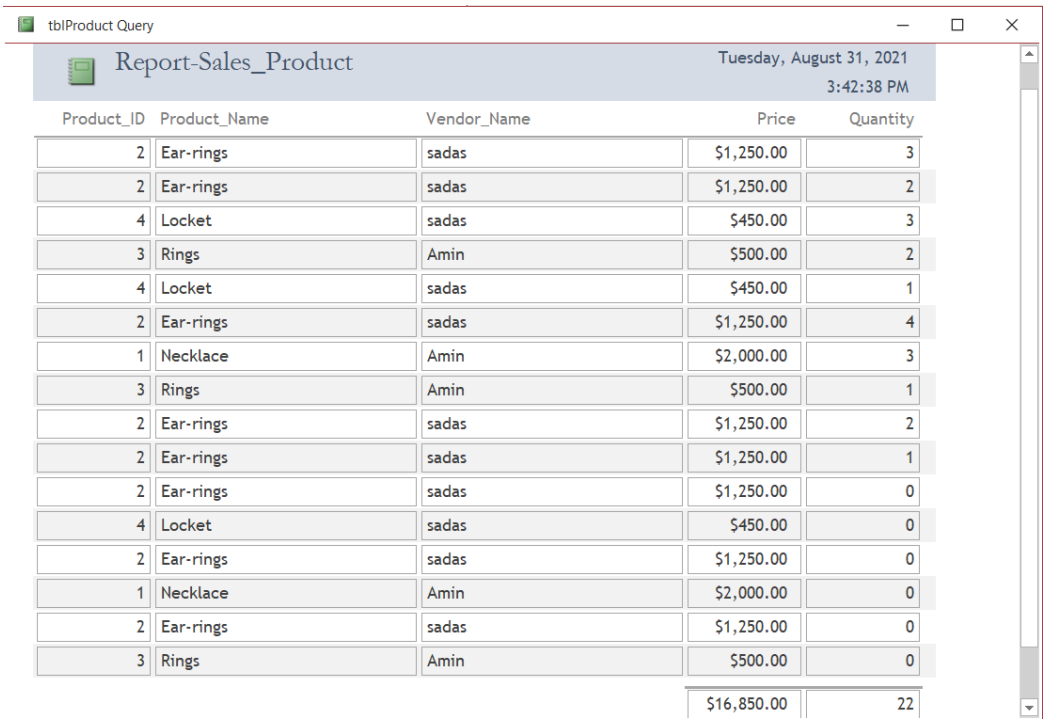
Invoice



Main Menu



Report- Sales & Product



Product_ID	Product_Name	Vendor_Name	Price	Quantity
2	Ear-rings	sadas	$1,250.00	3
2	Ear-rings	sadas	$1,250.00	2
4	Locket	sadas	$450.00	3
3	Rings	Amin	$500.00	2
4	Locket	sadas	$450.00	1
2	Ear-rings	sadas	$1,250.00	4
1	Necklace	Amin	$2,000.00	3
3	Rings	Amin	$500.00	1
2	Ear-rings	sadas	$1,250.00	2
2	Ear-rings	sadas	$1,250.00	1
2	Ear-rings	sadas	$1,250.00	0
4	Locket	sadas	$450.00	0
2	Ear-rings	sadas	$1,250.00	0
1	Necklace	Amin	$2,000.00	0
2	Ear-rings	sadas	$1,250.00	0
3	Rings	Amin	$500.00	0
			$16,850.00	22

Designing Distributed and Internet System

There can be two alternatives for the system to work smoothly in the organization. First thing is that they can store their data in the SQl Server database that would be in their premise. Other thing that they can do is buy cloud storage from Azure or Google Services to remotely access them and broaden their working capacity.

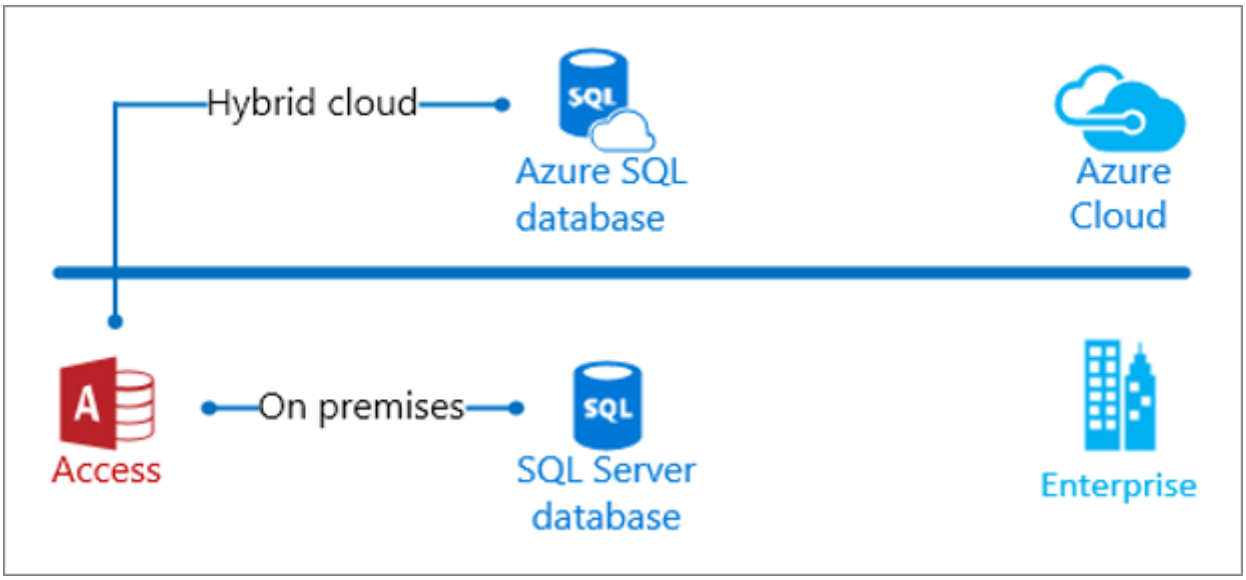


Figure 6: Distributed and Internet Systems

Implementation

The purpose of system implementation is to convert the physical system specifications into working and reliable software and hardware, document the work that has been done and provide help for current and future users.

Coding Process

From database designing to user interface designing everything was done in Microsoft Access for this there was hardly any inclusion of codes without some basic queries

Code for login page and validation

```
Option Compare Database

Private Sub Command1_Click()
If IsNull(Me.txtLoginID) Then
    MsgBox "Please Enter LoginID", vbInformation, "LoginID Required"
    Me.txtLoginID.SetFocus
ElseIf IsNull(Me.txtPassword) Then
    MsgBox "Please Enter password", vbInformation, "Password Required"
    Me.txtPassword.SetFocus
Else
    'process the job
    If (IsNull(DLookup("UserLogin", "tblUser", "UserLogin='" & Me.txtLoginID.Value & "'"))) Or _
    (IsNull(DLookup("Password", "tblUser", "Password='" & Me.txtPassword.Value & "'"))) Then
        MsgBox "Incoorect LoginID or Password"
    Else
        MsgBox "Logged In Successfully"
        DoCmd.OpenForm "Main_menu"


    End If


End If
End Sub
```

Testing Process

Testing when conducted successfully (according to the objectives stated previously), it will uncover errors in the software. As a secondary benefit, testing demonstrates that software functions appear to be working according to specification, that behavioral and performance requirements appear to have been met. In addition, data collected as testing is conducted provide a good indication of software reliability and some indication of software quality.

The testing process is basically conducted in following steps shown in the figure below:

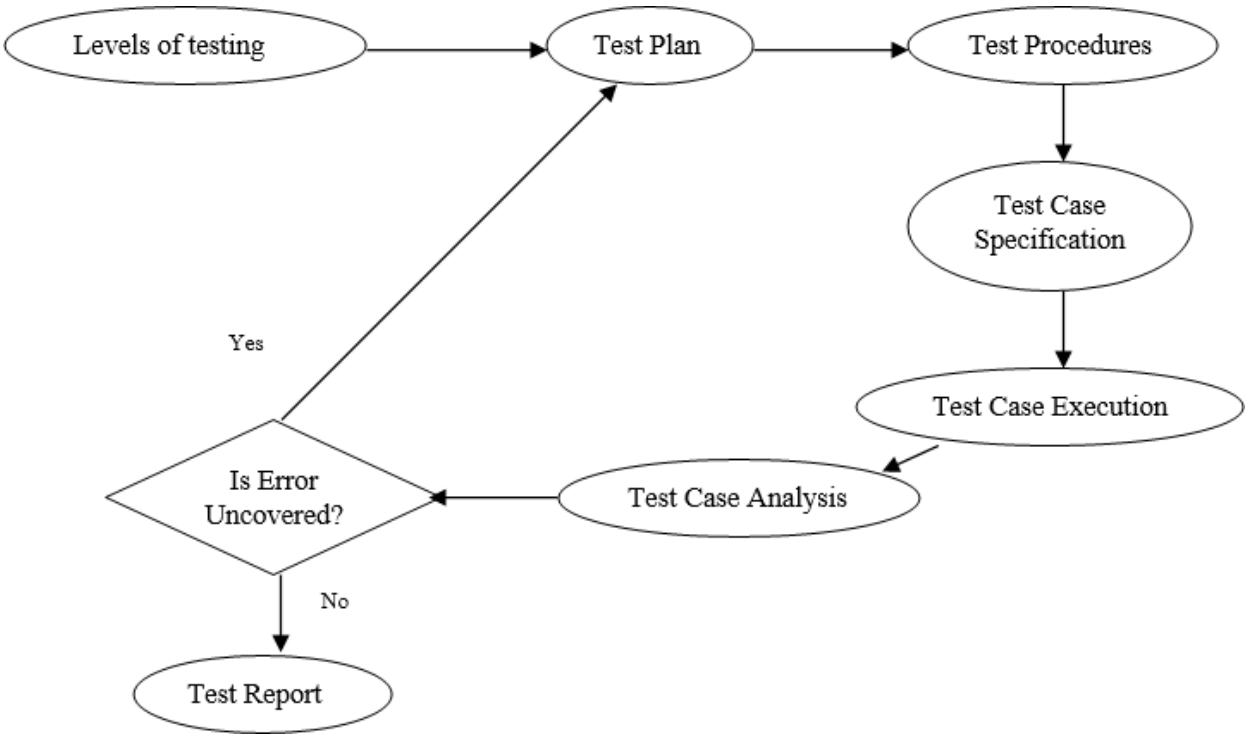


Figure 7: Testing Process

Tests that were performed to verify the system:

- ✓ Unit Testing
- ✓ Integration Testing
- ✓ Database Testing
- ✓ Stress Testing
- ✓ Performance Testing
- ✓ Recovery Testing
- ✓ Security Testing

Installation

Required Software: Microsoft Access 2007-2019 (any one)

Required Operating System: Windows 7,10, etc.

RAM: 2GB Minimum

Storage: 500 MB

Since our organization was fully manual, we can directly install this new system. For this direct installation system would be appropriate

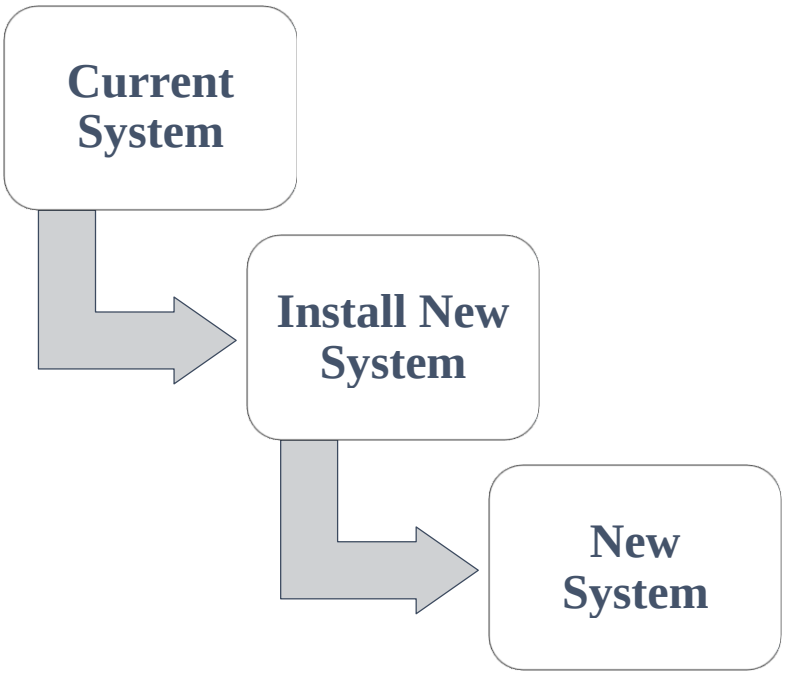


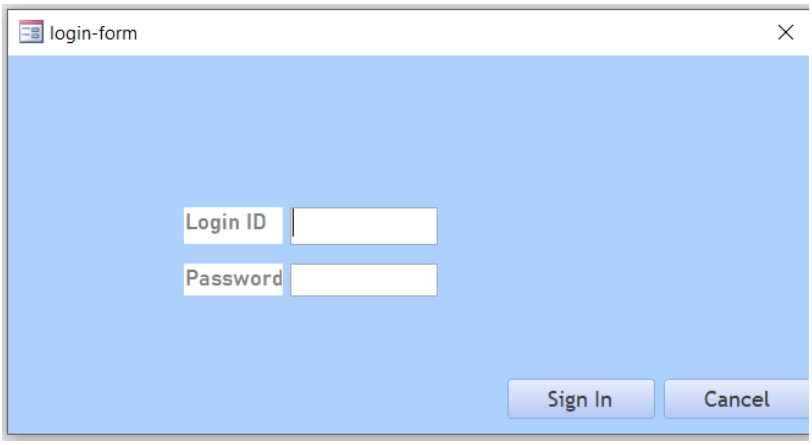
Figure 8: Direct Installation

Whole software would be in a .exe format so a portable format will be used for installation in the system and it would not need much time.

User Documentation

i. Login Page:

User/ admin would require a password and login ID to sign in the system.



ii. Main Menu:

Here the user will find different command box to enter like customer, vendor, product, invoice. Lastly to see the total sales he/she can see the report of everything

iii. Customer page:

New Customer details can be added and all other records can be seen thoroughly through the combo box. Customer records can be modified and deleted in this view.

iv. Vendor Page:

New vendor with their details can be created as new records and previous records can also be modified here

v. Product Page:

Product details and their price associated with vendor can be recorded here. Deletion and update both can be done for the products in inventory

vi. Invoice:

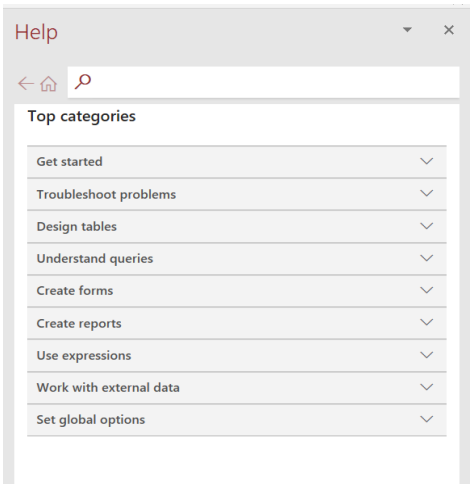
Billing of the customer with its date of sale can be selected. Product is selected from the product recorded in product page and customer is selected from. Automatic bill is generated and which can also be printed

vii. Sales Report:

In this window a fully automated sales report and quantity of inventory will be shown as the user clicks it from main menu.

Training Users

The last part of installation process would be the training end system users and guiding them with the path of documentation



As a part of online service ms access also guides the user how to use the application more smoothly without any trouble.

Maintenance

After the successful installation of the project, we will be doing its maintenance works also. In this case, we have identified 3 main maintenance activities.

1. **Perfective maintenance:** Enhancing and modifying the system to respond to changing user requirements.

2. **Adaptive maintenance**: Changing the application to adapt it to a new hardware or software environment. Adaptive maintenance may involve, for example, moving an application from a mainframe to a client/server environment, or converting it from a file to a database environment.

3. **Corrective maintenance**: Correcting an error discovered during operations.

Our technical analyst and business analyst will be very supportive if the corresponding firm, Dhakaiya Goyna confronts any issue while using the new system.

Conclusion

The world is becoming a global village. Businesses must introduce automatic computed based systems in order to remain competitive in the market. Thus, Dhakaiya Goyna is taking a timely and important decision of automating their sales and inventory. Sales and Inventory Management System will help the owner of the company to make data driven decisions. This will, in turn, achieve efficiency, target potential customers and so on.

Appendix

System Service Request

Dhakiya Goyna
System Service Request

Requested By: Md. Zubayer and Alvi Rahman Date: 06 June 2021

Department: Sales and Accounting

Location: Banasree, Dhaka

Contact: email1: z.ojhor@gmail.com email2: alvirahman@gmail.com

Type of Request: New System Urgency: Medium

System Service Request

Problem Statement: Dhakaiya Goyna is willing to provide quality jewelry items within affordable price. But the firm faces some problems since there is no automated system to track its daily transactions. At the same time, the firm has to evaluate its inventory status manually, which is also time consuming. In addition, lack of a sales and inventory management system has reduced flexibility in the operations. There are high possibilities of data losing. Information cannot be summarized, and data driven decisions cannot be made.

Service Request: After analyzing the overall perspective of the problem, our team has come to a feasible solution. Therefore, we request to design and build a new information system- Sales and Inventory Management System. This system will record the daily transactions, update the inventory and provide sales report to the owner.
Liaison: Deepa Monalisa, Owner of Dhakaiya Goyna
Sponsor: Dhakaiya Goyna