DATABASE PROJECT

INSTRUCTOR: DR. KUTSAL DOGAN

MIS 6326.501 Group 15

Group 15
Aseem Mittal
Riti Kumari
Paryag Mehta
Kriti Jain

TABLE OF CONTENTS

.

STEEL FABRICATORS AND PIPE MANUFACTURERS

1. COMPANY OVERVIEW:

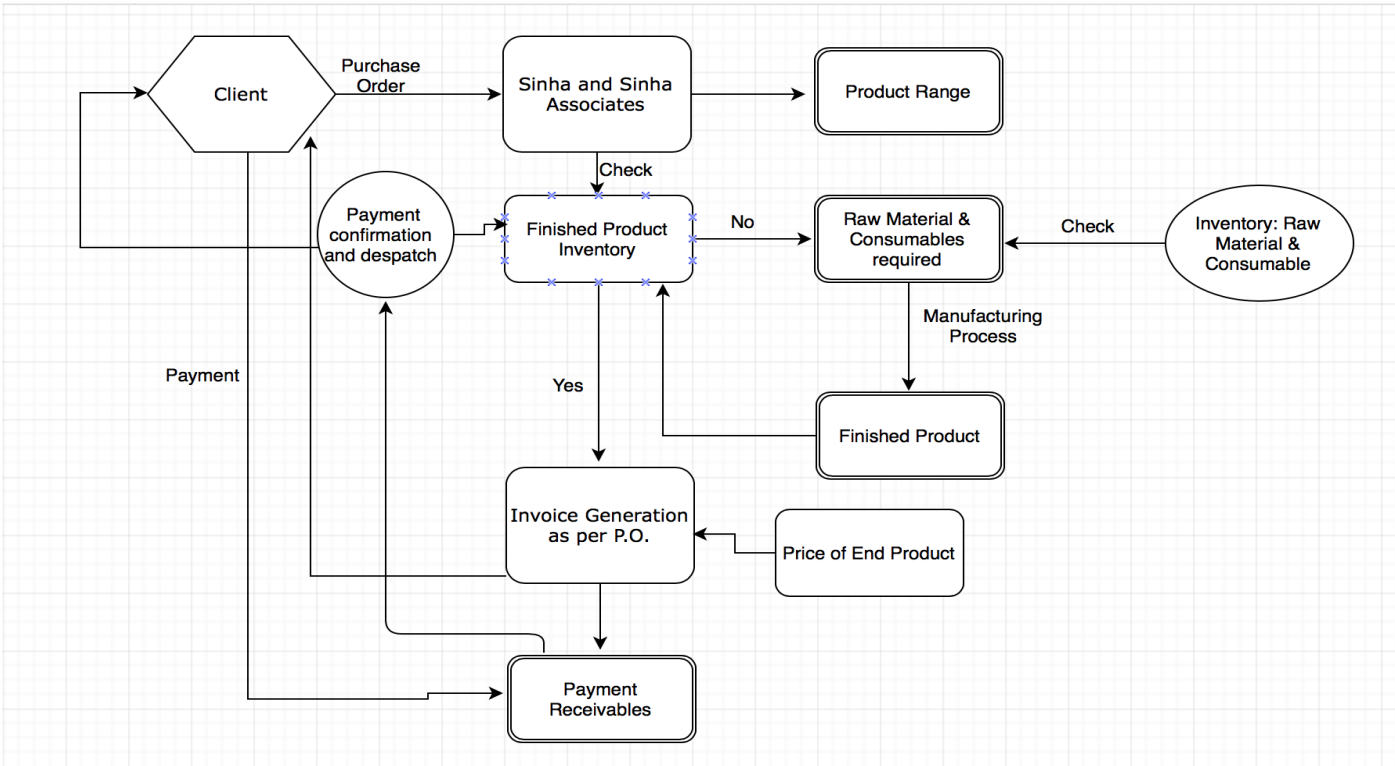
Sinha & Sinha Associates is a small-scale steel pipes manufacturing company, based in India. The company accepts bulk orders from different construction companies and from various government sector units such as Thermal Plants, Refineries, Industrial units, Irrigation departments etc.

The business involves a lot of paper-work and account maintenance. A few years back, they used cash-books and ledgers to keep accounts record. As the business started growing, data-handling became a challenge and introduction to Relational database management system became a necessity.

With the introduction of database, the tracking of Clients, Purchase Orders, Manufacturing, Invoicing, Delivery and Payments became easy.

2. BUSINESS PROCESS:

The Sinha & Sinha Associates offers a wide range of Mild Steel and Stainless-Steel Pipes. The customer can place an order as per its requirements. Once the company receives the purchase order from its client, the company first checks the stock in inventory for the finished product.
If the items and quantity meet the purchase requirements, the invoice is generated, payment is processed, and the product is dispatched, completing the transaction.
If the inventory doesn't have the requisite finished goods, it checks and orders for the quality and quantity of raw materials and consumables required. It undergoes the manufacturing process to produce the finished good.



3. ISSUES WITH THE CURRENT SCENARIO

- Difficult to keep track of all the orders, inventory data, product logistics.
- Customer conversations, pending payments and reminders are hard to track.
- There was no analysis for maintaining the loyal customers and hence even the old customers were not acknowledged with discounts/gifts.

4. PROPOSED SOLUTION

Digitalization of record to help the company to store, fetch, analyze and share data to make informed decisions. This database can be used to generate various reports to better connect to our customers.

4.1 Tables (Entities): Based on the current analysis, the following tables will be helpful in systematically store, maintain and use business data.

1. **Customer**:
   The table will be used to store the customer details such as "Customer_ID, CustomerName, CustomerAddress, ContactPerson, Designation, Phone, EMail, GST_Number".

2. **Product_List**:
   This table will include all the range of products "Product_ID" along with its specifications such as "ProductDesc, standard Length, Weight, Thickness, Diameter".

3. **Order_Details:**
   This table will contain the measures for the order placed like "PO_Number, Product_ID, Quantity, Amount".

4. **RawMaterial_Inventory**:
   This table will have actual count/ information for the inventory of both the raw materials and consumables. "Component_Id, Description, Category, Quality_Grade, Quantity"

5. **Product_Inventory**:
   This chart will have the inventory information about the finished products. "Site_ID, Product_Id, Quantity".

6. **Purchase_Order**:
   This table will store the invoice attributes i.e. "PO_Number, Customer_ID".

7. **Payment**:
   This table will include details of payments receivables i.e. "PO_Number, Payment_Date, Payment Amount".

8. **Inquiry**:
   This table will store all the communications held with a customer with date, time and comments. Attributes- "Inquiry_ID, PO_Number, Date, CR_Name, CR_Contact, Query_Desc, Attendant, Response".

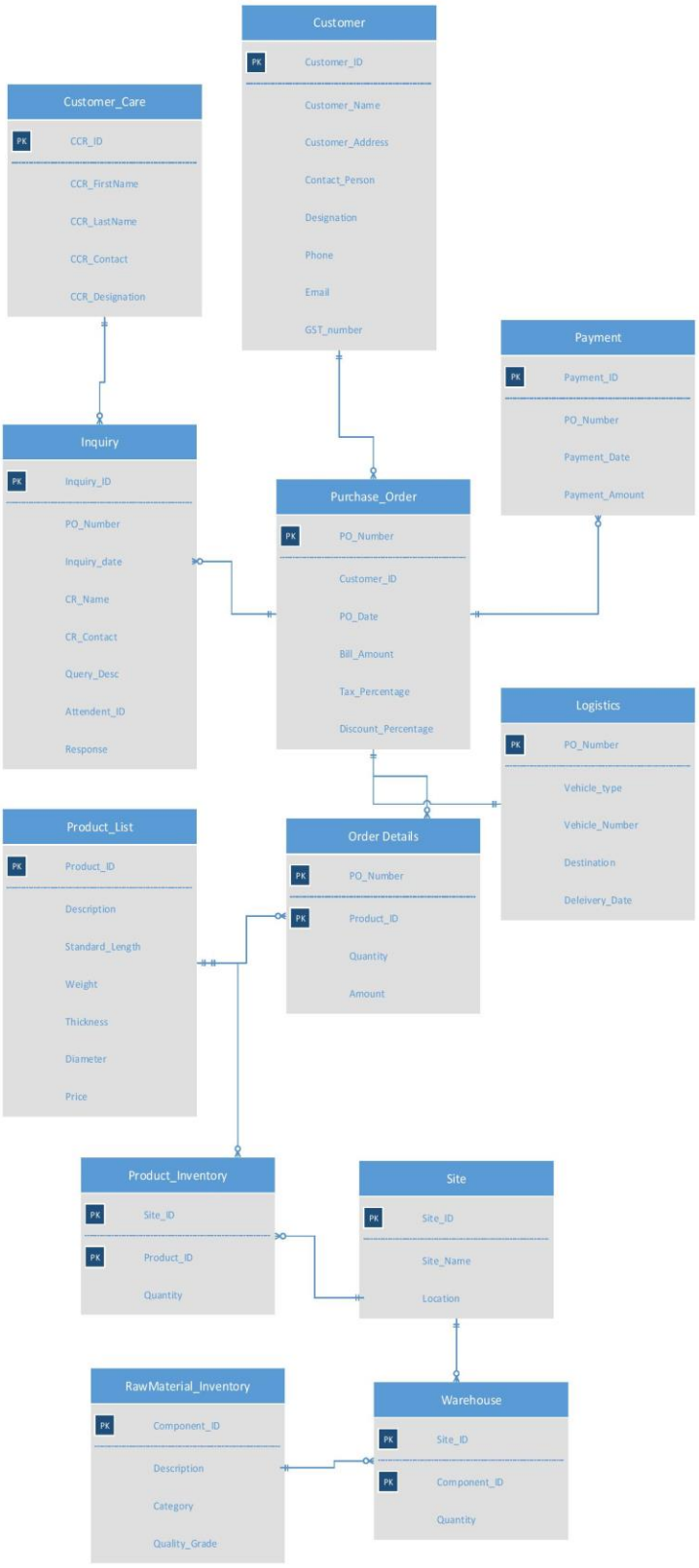
9. **Site:**
   This table will be a master table to contain the details of the site from where the delivery will take place and will have the attributes like "Site_ID, Site_Name, Location".

10. **Logistics**:
    This table will include the transportation details for various locations for various customers: "Site_ID, Vehicle_type, Vehicle_Number, Destination".

11. **Warehouse:**
    This table will act as the associate table for 'Site' and 'RawMaterial_Inventory' and will contain the measures like "Quantity" and primary keys.

12. **Customer_Care:**
    This table will contain the records of the employees of **S&S Associates** like ID, FirstName, LastName, Contact, Designation" etc.

5. ENTITY-RELATIONSHIP DIAGRAM


Customer
PK Customer_ID
Customer_Name
Customer_Address
Contact_Person
Designation
Phone
Email
GST_number
Customer_Care
PK CCR_ID
CCR_FirstName
CCR_LastName
CCR_Contact
CCR_Designation
Payment
PK Payment_ID
PO_Number
Payment_Date
Payment_Amount
Inquiry
PK Inquiry_ID
PO_Number
Inquiry_date
CR_Name
CR_Contact
Query_Desc
Attendent_ID
Response
Purchase_Order
PK PO_Number
Customer_ID
PO_Date
Bill_Amount
Tax_Percentage
Discount_Percentage
Logistics
PK PO_Number
Vehicle_type
Vehicle_Number
Destination
Deleivery_Date
Product_List
PK Product_ID
Description
Standard_Length
Weight
Thickness
Diameter
Price
Order Details
PK PO_Number
PK Product_ID
Quantity
Amount
Product_Inventory
PK Site_ID
PK Product_ID
Quantity
Site
PK Site_ID
Site_Name
Location
RawMaterial_Inventory
PK Component_ID
Description
Category
Quality_Grade
Warehouse
PK Site_ID
PK Component_ID
Quantity

6. RELATIONAL DATABASE SCHEMA

```
USE master
go

CREATE DATABASE SteelManufacturingProject
go


 1.
 CREATE TABLE Customer(
       [Customer_ID] [integer] NOT NULL ,
       [Customer_Name] [varchar](255) NOT NULL,
       [Customer_Address] [varchar](255) NOT NULL,
       [Contact_Person] [varchar](255) NOT NULL,
       [Designation] [varchar](255) NULL,
       [Phone] [varchar](255) NULL,
       [Email] [varchar](255) NOT NULL,
       [GST_number] [varchar](255) NOT NULL,

 CONSTRAINT [Customer_IDpk] PRIMARY KEY CLUSTERED
(
       [Customer_ID] ASC
)GO


 2.
 CREATE TABLE Purchase_Order (
PO_Number           INTEGER      NOT NULL,
Customer_ID         INTEGER      NOT NULL,
PO_Date             DATE         NOT NULL,
Bill_Amount         DECIMAL(5,2)   NOT NULL,
Tax_Percentage      DECIMAL(5,2)   NULL,
Discount_Percentage DECIMAL(5,2)   NULL,
CONSTRAINT PO_NumberPK PRIMARY KEY (PO_Number),
CONSTRAINT Customer_IDFK FOREIGN KEY (Customer_ID) REFERENCES Customer )
go

INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('14','22-Jan-16','217736','10','5');
INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('10','13-Apr-16','302778','11','8');
INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('14','27-Jan-17','601498','13','4');
INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('10','09-Feb-17','797564','14','7');
INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('8','18-May-16','942291','10','6');
INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('10','05-Nov-16','559518','14','6');
INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('12','18-Jun-17','488742','14','6');
INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('17','23-Apr-16','829311','14','7');
INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('13','29-Nov-16','478384','10','7');
INSERT INTO Purchase_Order ( Customer_ID,PO_Date, Bill_Amount, Tax_Percentage,
Discount_Percentage) VALUES ('9','00-Jan-00','915211','7','3');
```

```
 3.
 CREATE TABLE Payment (
Payment_ID          INTEGER       NOT NULL,
PO_Number           INTEGER       NOT NULL,
Payment_Date        DATE          NOT NULL,
Payment_Amount      DECIMAL(10,2)   NOT NULL,
CONSTRAINT Payment_IDPK PRIMARY KEY (Payment_ID),
CONSTRAINT PO_NumberFK FOREIGN KEY (PO_Number) REFERENCES Purchase_Order)
go

 4.
 CREATE TABLE Customer_Care (
CCR_ID                  INTEGER       NOT NULL,
CCR_FirstName           VARCHAR(255) NOT NULL,
CCR_LastName            VARCHAR(255) NULL,
CCR_Contact             VARCHAR(255) NULL,
CCR_Designation         VARCHAR(255) NULL,
CONSTRAINT CCR_IDPK PRIMARY KEY (CCR_ID))
go


INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Shoeb','Jamal','469-929-4930','Account Coordinator');
INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Rashib','Aggarwal','469-929-7594','Account Specialist');
INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Sunpreet','Singh','469-929-4847','Benefit Coordinator');
INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Jopinder ','Singh','469-929-2171','Business Service Representative');
INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Aman','Singla','469-929-4503','Call Center Lead');
INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Michale','Jr','469-929-5313','Call Center Representative');
INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Papa','Johns','469-929-3348','Call Center Supervisor');
INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Kathrein','Jakson','469-929-4150','Client Relations Associate');
INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Conel','Katt','469-929-3841','Client Relations Manager');
INSERT INTO Customer_Care (CCR_First_Name, CCR_Last_Name, CCR_Contact, CCR_Designation) VALUES
('Sara','Wang','469-929-2188','Client Support Manager');

 5.
 CREATE TABLE Inquiry (
Inquiry_ID          INTEGER       NOT NULL,
PO_Number           INTEGER       NOT NULL,
Inquiry_date        DATE          NOT NULL,
CR_Name             VARCHAR(255) NOT NULL,
CR_Contact          VARCHAR(255) NOT NULL,
Query_Desc          VARCHAR(400) NOT NULL,
Attendent_Id              INTEGER NOT NULL,
Response            VARCHAR(400) NOT NULL,
CONSTRAINT Inquiry_IDPK PRIMARY KEY (Inquiry_ID),
CONSTRAINT PO_Number2FK FOREIGN KEY (PO_Number) REFERENCES Purchase_Order,
CONSTRAINT Attendent_Id2FK FOREIGN KEY (Attendent_Id) REFERENCES Customer_Care(CCR_ID))
go

 6.
 CREATE TABLE Logistics (
PO_Number           INTEGER       NOT NULL,
```

```
Vehicle_type        VARCHAR(255) NULL,
Vehicle_Number      VARCHAR(255) NOT NULL,
Destination         VARCHAR(255) NOT NULL,
Delivery_Date       DATE NOT NULL,
CONSTRAINT PO_Number1PK PRIMARY KEY (PO_Number),
CONSTRAINT PO_Number1FK FOREIGN KEY (PO_Number) REFERENCES Purchase_Order)
go
```

```
 7.
 CREATE TABLE Product_List (
Product_ID        INTEGER       NOT NULL,
Description       VARCHAR(255) NOT NULL,
Standard_Length   VARCHAR(255) NULL,
Weight            VARCHAR(255) NULL,
Thickness         VARCHAR(255) NULL,
Diameter          VARCHAR(400) NULL,
Price             VARCHAR(255) NOT NULL,
CONSTRAINT Product_IDPK PRIMARY KEY (Product_ID))
go
```

```
 8.
 CREATE TABLE Order_Details (
PO_Number         INTEGER       NOT NULL,
Product_ID        INTEGER       NOT NULL,
Quantity          INTEGER       NOT NULL,
Amount            DECIMAL(10,2) NOT NULL,
CONSTRAINT PO_Number3PK PRIMARY KEY (PO_Number, Product_ID),
CONSTRAINT PO_Number3FK FOREIGN KEY (PO_Number) REFERENCES Purchase_Order,
CONSTRAINT Product_ID3FK FOREIGN KEY (Product_ID) REFERENCES Product List)
go
```

```
 9.
 CREATE TABLE Site (
Site_ID           INTEGER        NOT NULL,
Site_Name         VARCHAR(255)   NOT NULL,
Location          VARCHAR(255)   NOT NULL
CONSTRAINT Site_IDPK PRIMARY KEY (Site_ID))
go

INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Bhilai','Bhilai');
INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Korba','Korba');
INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Rourkela','Rourkela');
INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Hirakud','Hirakud');
INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Sundargarh','Sundargarh');
INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Durgapur','Durgapur');
INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Bokaro','Bokaro');
INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Salem','Salem');
INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Vijayanagar','Vijayanagar');
INSERT INTO Site (Site_Name, Location) VALUES ('S&S_site_Vishakhapatnam','Vishakhapatnam');
```

```
 10.
 CREATE TABLE RawMaterial_Inventory (
Component_Id    INTEGER        NOT NULL,
Description     VARCHAR(255)   NOT NULL,
Category        VARCHAR(255)   NOT NULL,
Quality_Grade   VARCHAR(255)   NOT NULL,
CONSTRAINT Component_IdPK PRIMARY KEY (Component_Id))
go
```

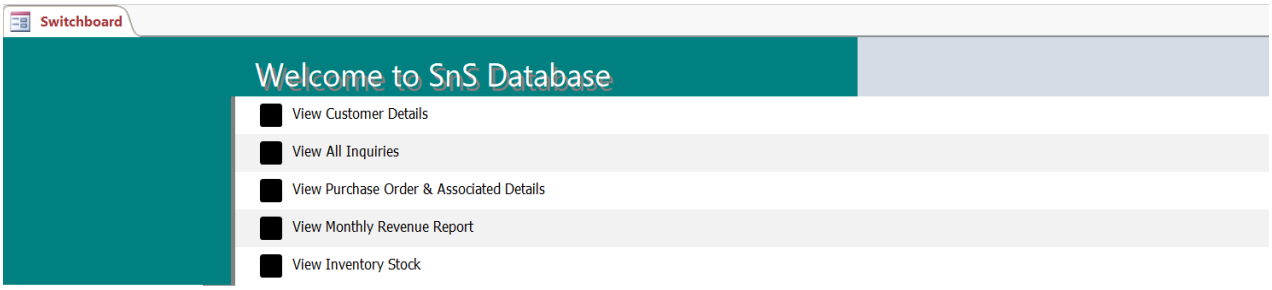
```
 11.
```

```
 CREATE TABLE Warehouse (
Site_ID          INTEGER       NOT NULL,
Component_Id     INTEGER       NOT NULL,
Quantity         INTEGER       NOT NULL,
CONSTRAINT Site_ID5PK PRIMARY KEY (Site_ID, Component_Id),
CONSTRAINT Site_ID5FK FOREIGN KEY (Site_ID) REFERENCES Site,
CONSTRAINT Component_Id5FK FOREIGN KEY (Component_Id) REFERENCES RawMaterial_Inventory)
go

 12.
 CREATE TABLE Product_Inventory (
Site_ID          INTEGER       NOT NULL,
Product_ID       INTEGER       NOT NULL,
Quantity         INTEGER       NOT NULL,
CONSTRAINT Site_ID6PK PRIMARY KEY (Site_ID, Product_ID),
CONSTRAINT Site_ID6FK FOREIGN KEY (Site_ID) REFERENCES Site,
CONSTRAINT Component_Id6FK FOREIGN KEY (Product_ID) REFERENCES Product_List)
Go
```

7. S&S MAIN MENU

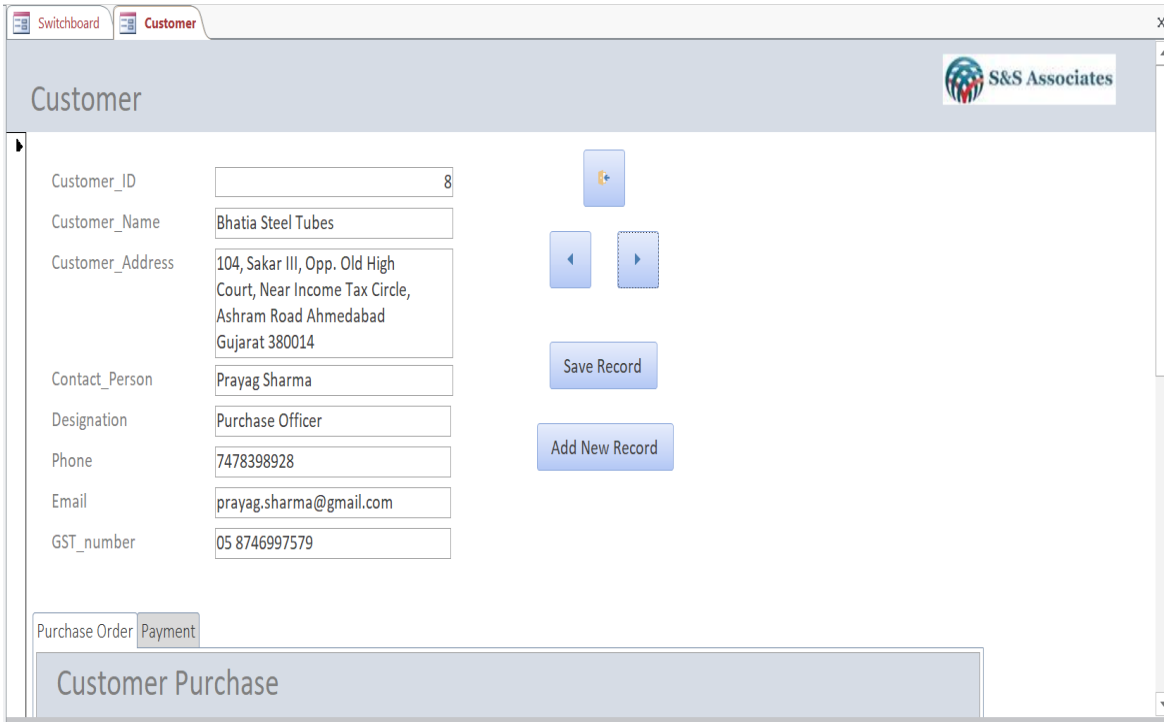
This will act as the switchboard for the employees of the company. This will provide different menus/buttons to navigate among different forms/reports.

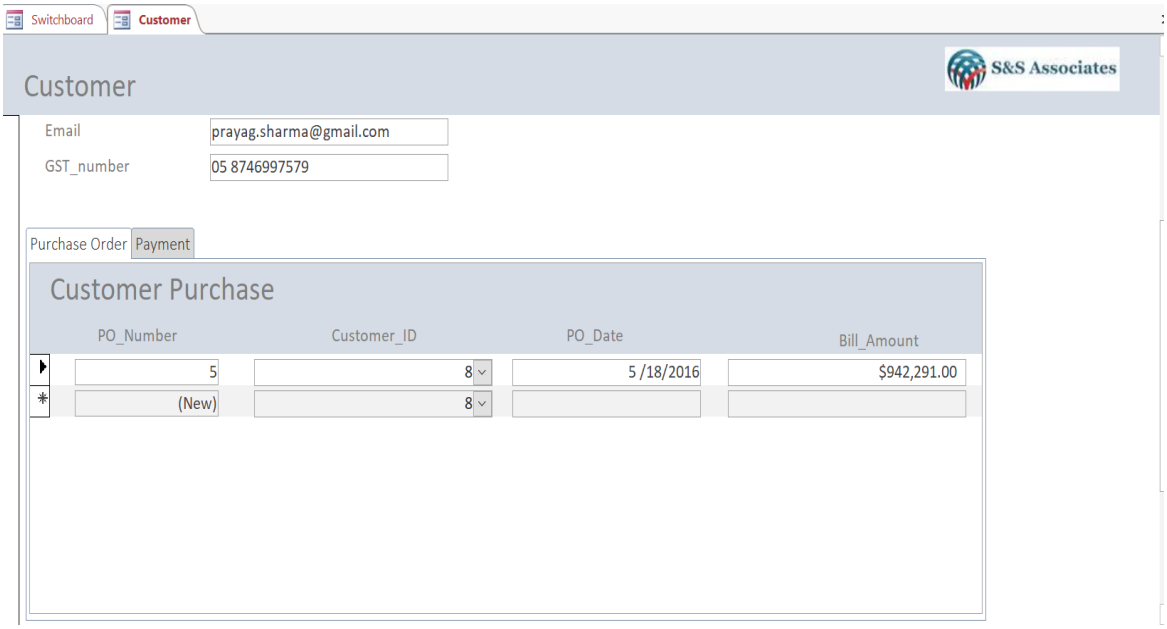


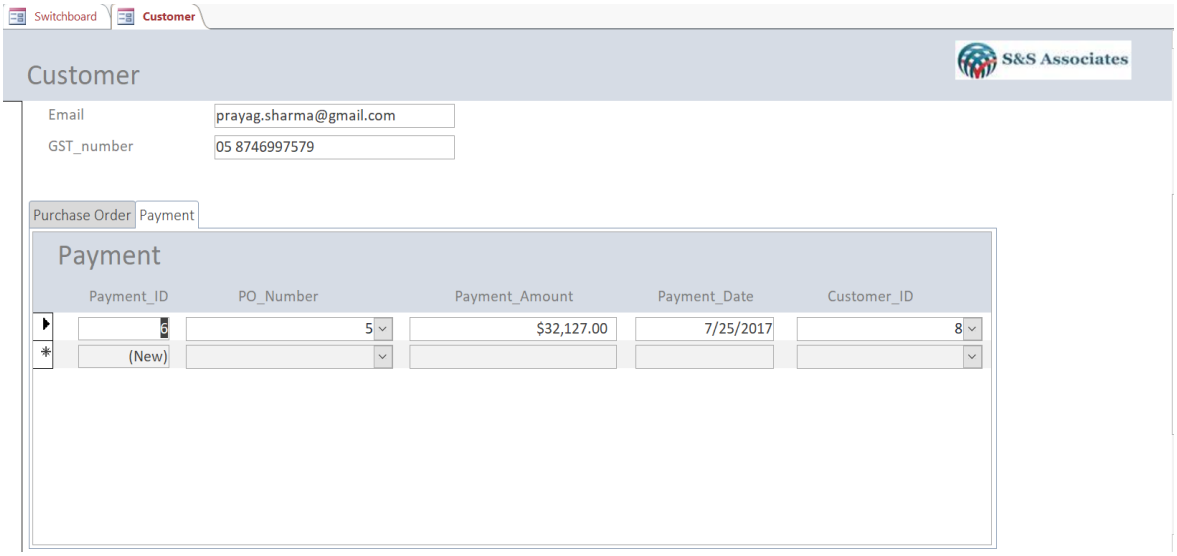
8. Forms

8.1. Customer

This form will be used by the company's employee who is been appointed for customer-facing. This will help them capture the clients' details which will be further be stored in the database. This will further help in identifying the loyal customers of the company and they could be acknowledged with the discounts/ gifts.

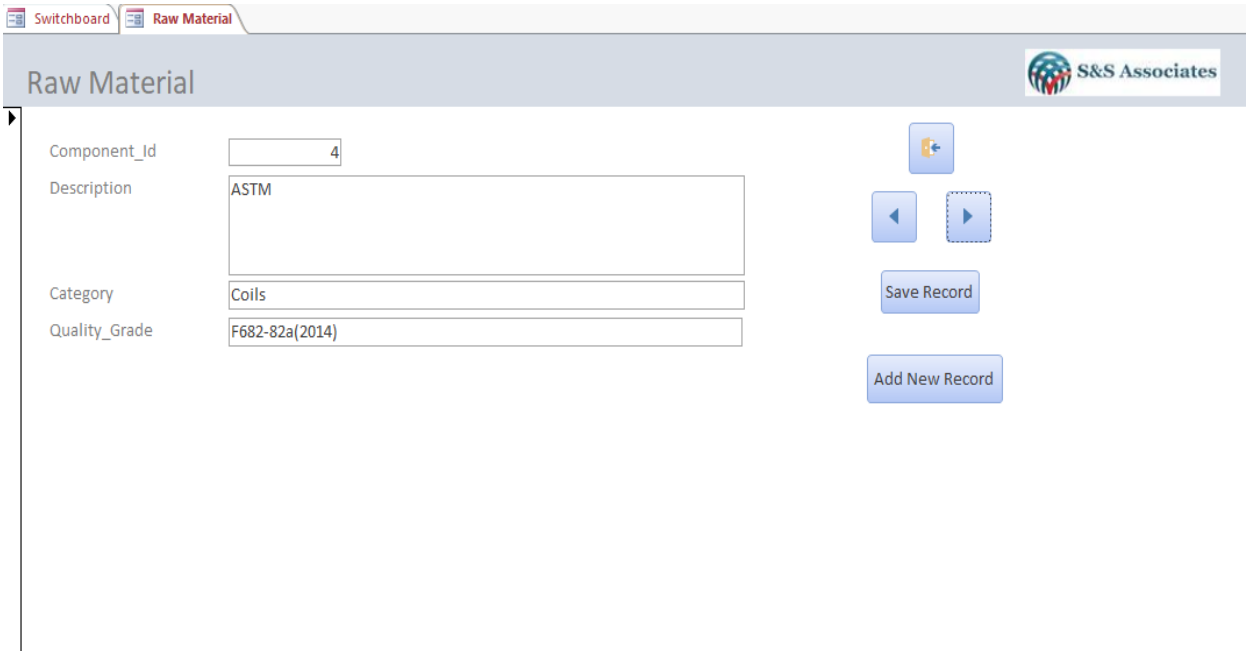

Switchboard
Customer
Customer
S&S Associates
Customer_ID
8
Customer_Name
Bhatia Steel Tubes
Customer_Address
104, Sakar III, Opp. Old High Court, Near Income Tax Circle, Ashram Road Ahmedabad Gujarat 380014
Contact_Person
Prayag Sharma
Designation
Purchase Officer
Phone
7478398928
Email
prayag.sharma@gmail.com
GST_number
05 8746997579
Save Record
Add New Record
Purchase Order
Payment
Customer Purchase


Switchboard
Customer
Customer
S&S Associates
Email
prayag.sharma@gmail.com
GST_number
05 8746997579
Purchase Order
Payment
Customer Purchase
PO_Number
Customer_ID
PO_Date
Bill_Amount
5
8
5/18/2016
$942,291.00
(New)
8



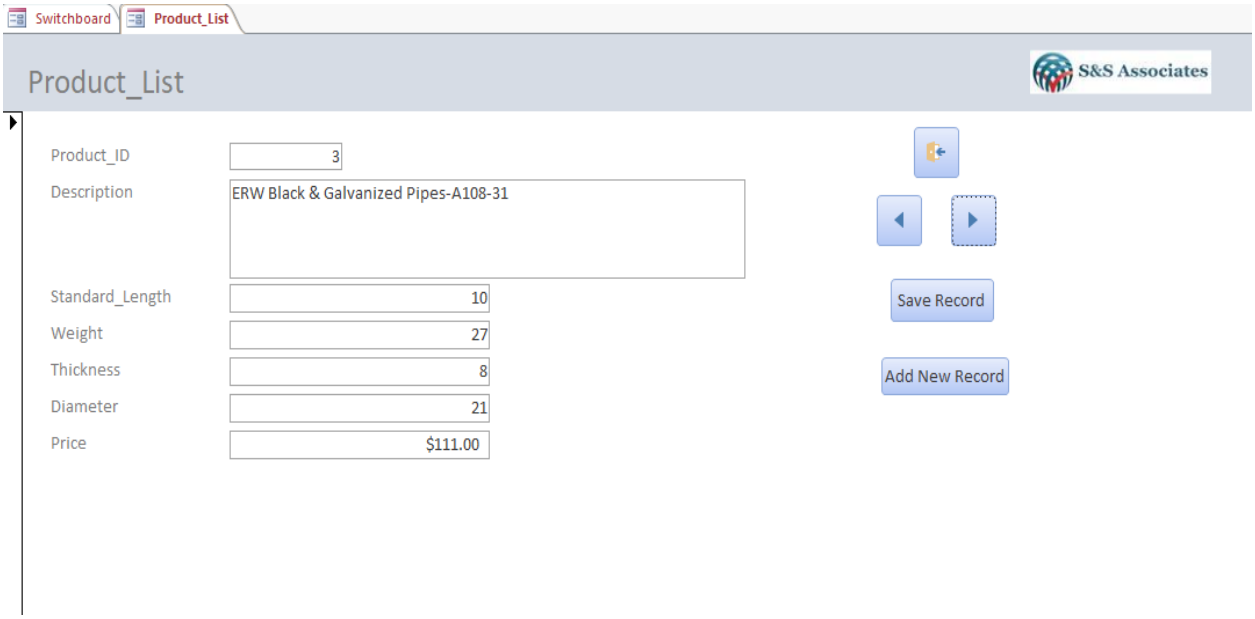
8.2. Raw Material

Initially, there was difficulty in maintaining the raw materials stock and the manual entry always witnessed human associated errors and sometimes there were huge mismatch in the documents. The form will provide an easy interface for the employee to keep the inventory data updated.



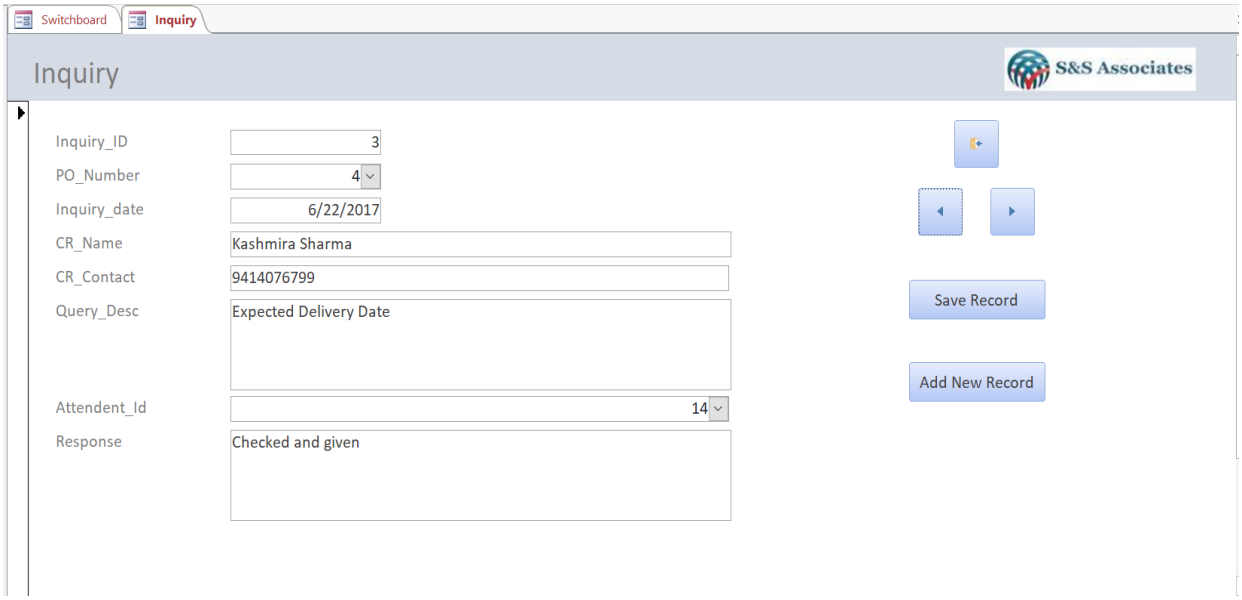
8.3. Product List

To keep a copy of the updated product list throughout the vendors was a challenge. With the easy interface, the maintenance and the uniformity of the products and their prices becomes busy.



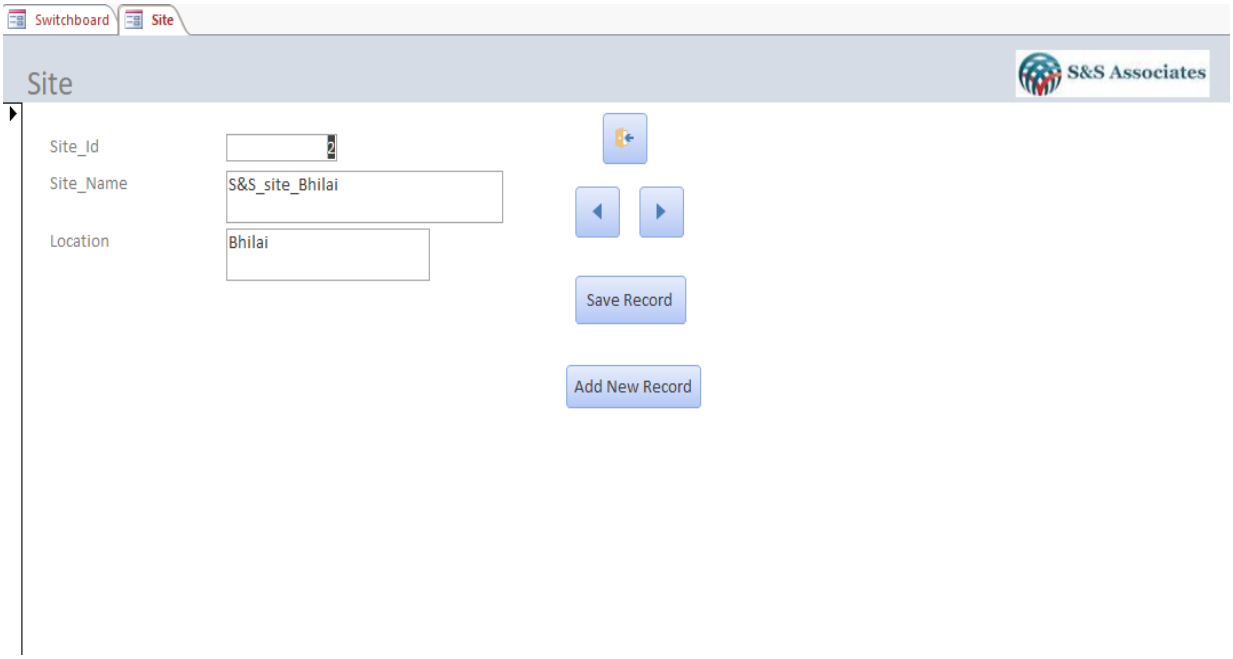
8.4. Inquiry

The company faced a lot of challenges with respect to the client conversation and there were no records of the conversations held between stakeholders and the respondents. Hence, the delivery/payment related issues occurred the most.



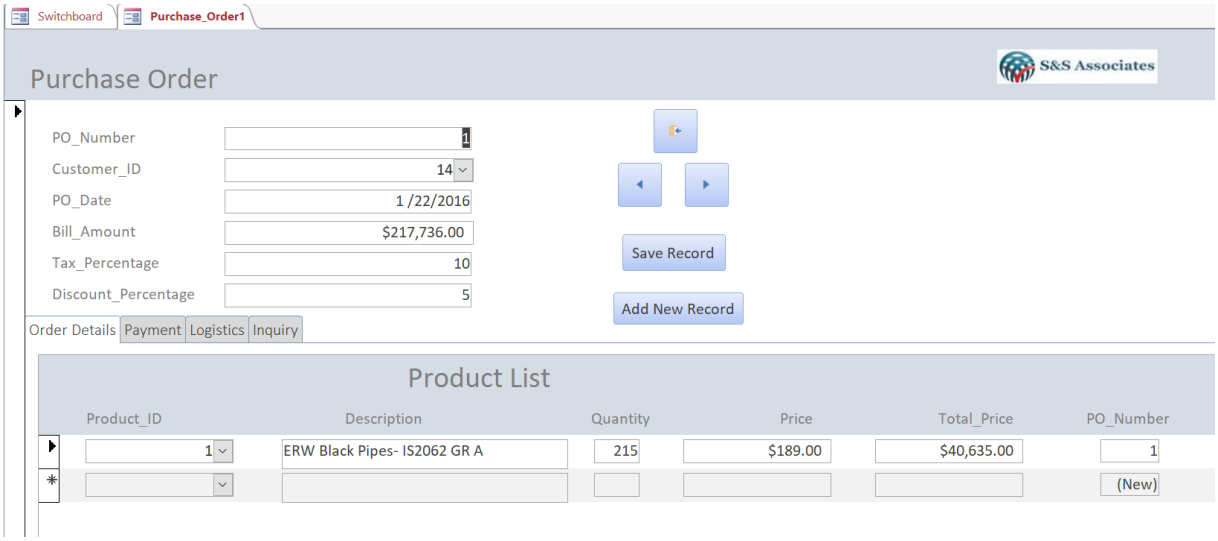
8.5. Site

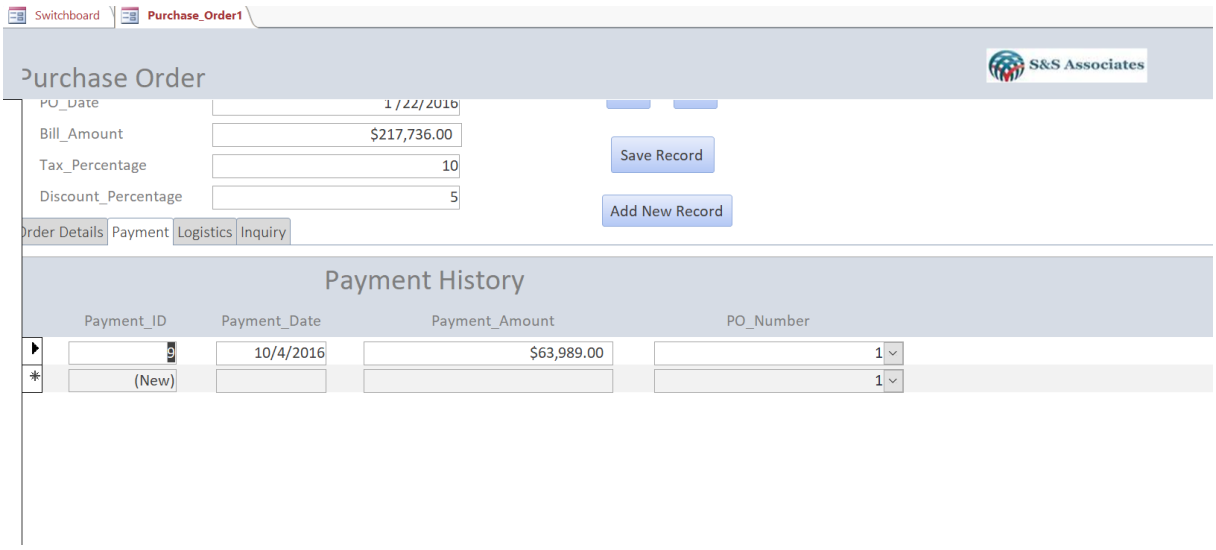
The 'site' is a master location to keep all the products and raw materials. This interface will help to update the master site data.

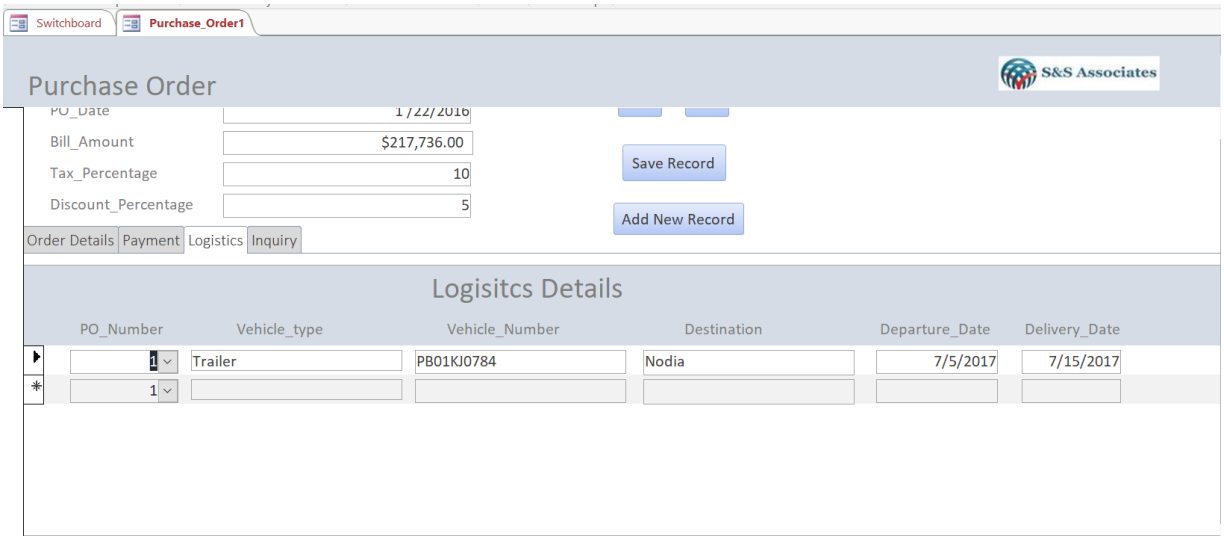


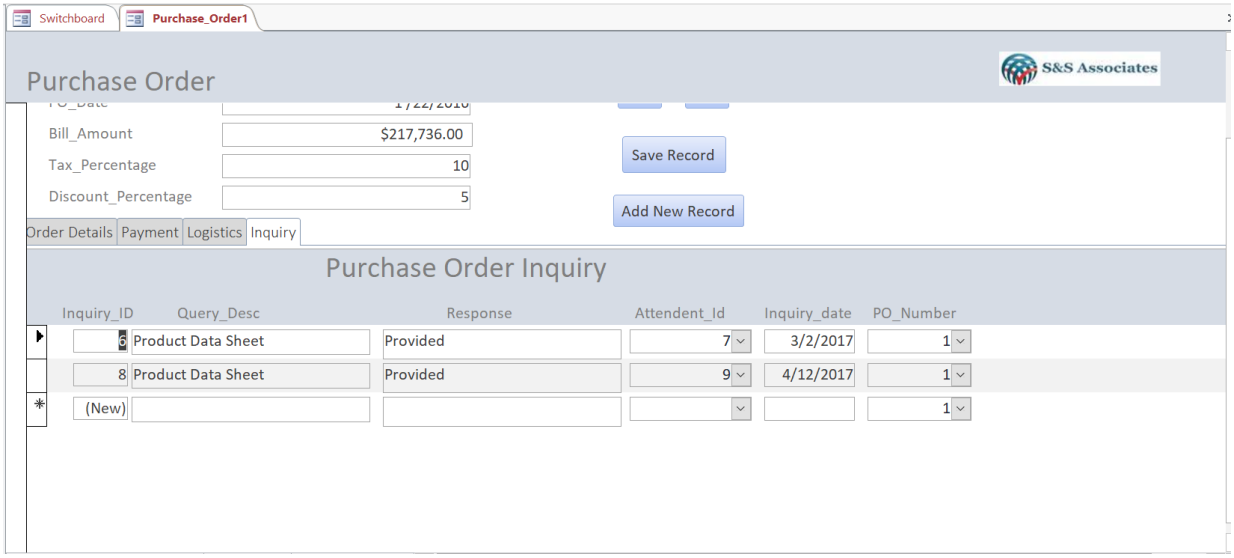
8.6. Purchase Order

This form is associated with all the information related to the product ordered by the customer like payment details, order/product details, details of dispatching and receiving the order by customer and related inquiries. This will help in tracking of the product, faster and consistent approach to respond customer's queries and aiding navigation for current and future references.




Switchboard
Purchase_Order1
Purchase Order
S&S Associates
Bill_Amount
$217,736.00
Tax_Percentage
10
Discount_Percentage
5
Save Record
Add New Record
Order Details
Payment
Logistics
Inquiry
Payment History
Payment_ID
Payment_Date
Payment_Amount
PO_Number
9
10/4/2016
$63,989.00
1
(New)
1

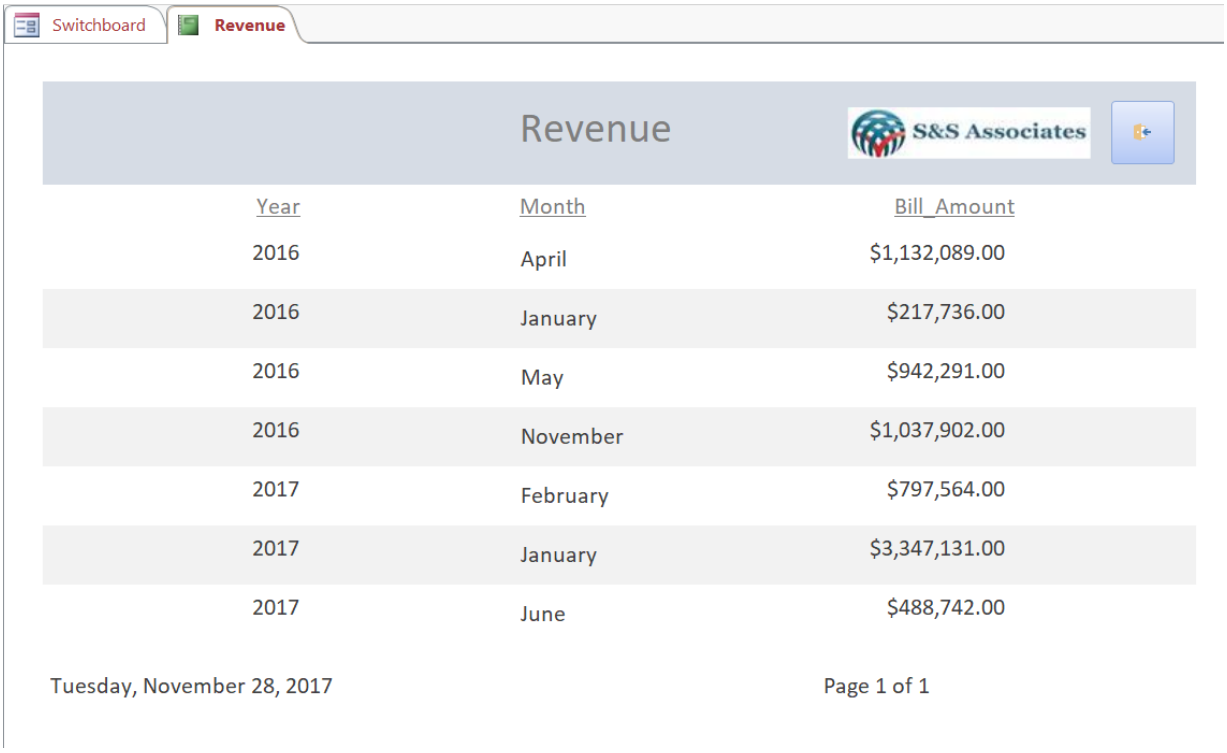

Switchboard
Purchase_Order1
Purchase Order
S&S Associates
Bill_Amount
$217,736.00
Tax_Percentage
10
Discount_Percentage
5
Save Record
Add New Record
Order Details
Payment
Logistics
Inquiry
Logisitcs Details
PO_Number
Vehicle_type
Vehicle_Number
Destination
Departure_Date
Delivery_Date
1
Trailer
PB01KJ0784
Nodia
7/5/2017
7/15/2017
1


Switchboard
Purchase_Order1
Purchase Order
S&S Associates
Bill_Amount
$217,736.00
Tax_Percentage
10
Discount_Percentage
5
Save Record
Add New Record
Order Details
Payment
Logistics
Inquiry
Purchase Order Inquiry
Inquiry_ID
Query_Desc
Response
Attendent_Id
Inquiry_date
PO_Number
Product Data Sheet
Provided
7
3/2/2017
1
8
Product Data Sheet
Provided
9
4/12/2017
1
(New)
1

9. Reports

9.1. Revenue

This report will help to keep a check on the revenues collected for a given month of the year. This figure is important from company's fiscal perspective.
The report displays three columns precisely year, month and the total revenue collected with respect to the month and year.

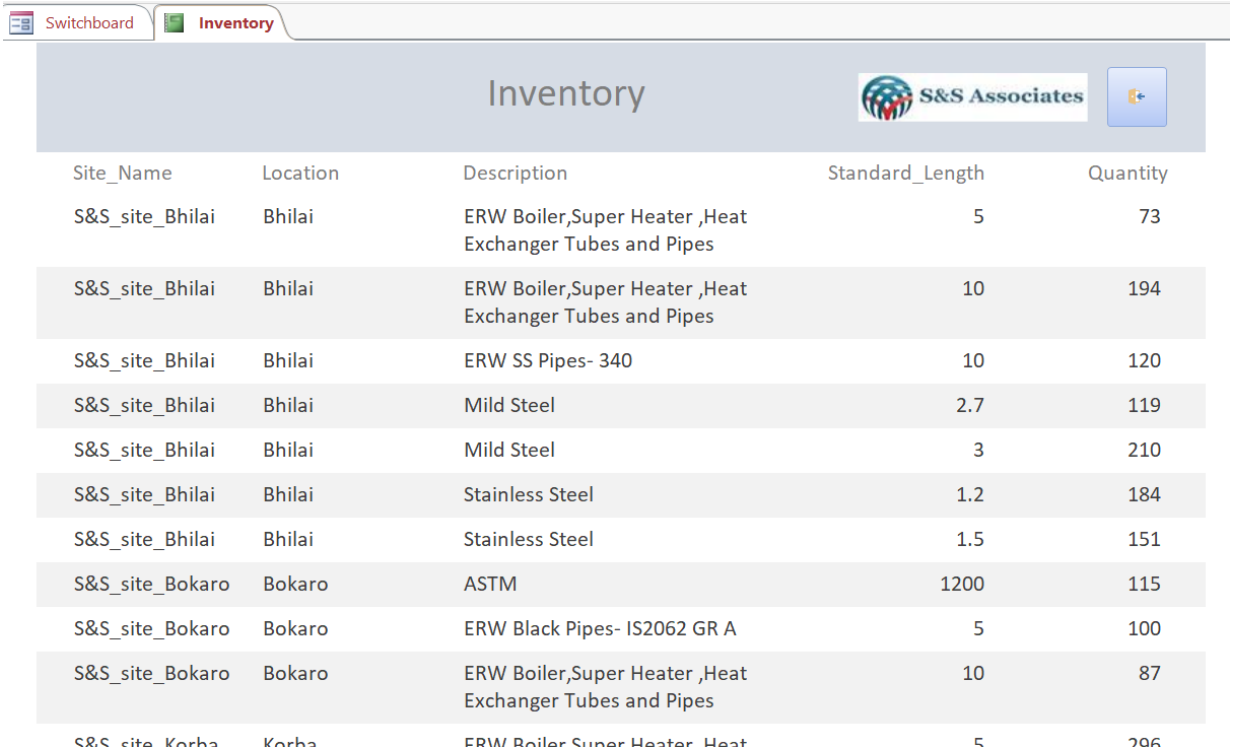


Year	Month	Bill_Amount
2016	April	$1,132,089.00
2016	January	$217,736.00
2016	May	$942,291.00
2016	November	$1,037,902.00
2017	February	$797,564.00
2017	January	$3,347,131.00
2017	June	$488,742.00

Tuesday, November 28, 2017 Page 1 of 1

9.2. Inventory Stocks

This report displays the total availability of the finished products and the raw materials at the different sites/ locations.


Switchboard Inventory

Inventory S&S Associates

Site_Name	Location	Description	Standard_Length	Quantity
S&S_site_Bhilai	Bhilai	ERW Boiler,Super Heater ,Heat Exchanger Tubes and Pipes	5	73
S&S_site_Bhilai	Bhilai	ERW Boiler,Super Heater ,Heat Exchanger Tubes and Pipes	10	194
S&S_site_Bhilai	Bhilai	ERW SS Pipes- 340	10	120
S&S_site_Bhilai	Bhilai	Mild Steel	2.7	119
S&S_site_Bhilai	Bhilai	Mild Steel	3	210
S&S_site_Bhilai	Bhilai	Stainless Steel	1.2	184
S&S_site_Bhilai	Bhilai	Stainless Steel	1.5	151
S&S_site_Bokaro	Bokaro	ASTM	1200	115
S&S_site_Bokaro	Bokaro	ERW Black Pipes- IS2062 GR A	5	100
S&S_site_Bokaro	Bokaro	ERW Boiler,Super Heater ,Heat Exchanger Tubes and Pipes	10	87
S&S_site_Korba	Korba	ERW Boiler,Super Heater ,Heat	5	296

10. Individual Contributions:

- *Riti Kumari*
  - ✓ *Contributed with different project ideas and its implementation.*
  - ✓ *Identified different problems associated with the company.*
  - ✓ *Proposed the solutions for the identified issues.*
  - ✓ *Identified the entities.*
  - ✓ *Wrote the first draft of the project.*
  - ✓ *Finalised first draft of the project.*
  - ✓ *Created the ERD.*
  - ✓ *Prepared the queries for the data entry.*
  - ✓ *Proposed and designed the forms and reports.*
  - ✓ *Finalised the final report draft.*

- *Paryag Mehta*
  - ✓ *Contributed with different project ideas and its implementation.*
  - ✓ *Identified different problems associated with the company.*
  - ✓ *Proposed the solutions for the identified issues.*
  - ✓ *Identified the entities.*
  - ✓ *Created the ERD.*
  - ✓ *Ensured the required cardinalities for the ERD.*

- ✓ *Prepared the relationship schema.*
- ✓ *Proposed and designed the forms and reports.*
- ✓ *Finalised the final report draft.*

- *Aseem Mittal*
  - ✓ *Proposed the final project idea.*
  - ✓ *Identified different problems associated with the company.*
  - ✓ *Proposed the solutions for the identified issues.*
  - ✓ *Created the initial business process flow.*
  - ✓ *Wrote the first draft of the project.*
  - ✓ *Worked on data entry.*
  - ✓ *Prepared the relationship schema.*
  - ✓ *Proposed and designed the forms and reports.*
  - ✓ *Finalised the final report draft.*

- *Kriti Jain*
  - ✓ *Worked on data entry*
  - ✓ *Helped in preparing the relationship schema.*
  - ✓ *Worked on forms and reports.*
  - ✓ *Finalised the final report draft.*