

# Implementation Report for Invoice System

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## **Section two : Project Summary**

This project focuses on designing an invoice database for the Contract Department in Huawei company, which is a Chinese multinational technology company. There are more than 50 countries that do business with Huawei and there are so much data involved such as: How many customers are currently doing business with Huawei? What products that those customers need? How many quantities of products do customer need and how to query information for Indian region.

In other word, this invoice system will record the customer transactions history; numbers of invoice issued per day, week, month, or year; the number of invoices that customers accepted; the total amount of each invoice. Therefore, this system is like financial system that record details of every transaction.

In general, each country collects one tax rate for the products in the same industry. To illustrate, when Huawei, which is a Chinese multinational technology company, sells its products (like mobile phone) in Laos, the Laos government will collect one tax rate for these products from Huawei. However, there is a special case in India. India is divided into central, state and local government agencies to levy different taxes. For example, when you sell products from New Delhi to Mumbai, the government will levy one tax rate, but when you sell products from New Delhi to other cities, the government will levy a totally different rate. There are eight tax categories for central tax, and 9 for state, which add a lot of difficulties for Huawei to design its invoice system for India region.

However, the current solution for this problem is not very efficiency. For non-India region, all of the invoicing business are done by the headquarter of Huawei, which is located in China, but for India region, the invoicing businesses are done by India's representative offices manually in EXCEL. Therefore, India representative offices want to transfer the invoice business to headquarter, but there is no feasible solution for this problem right away. Because there is exponential business growth in India, manually invoicing is very low efficient, Huawei needs a system to automatically issue invoices for India region to increase the efficiency and reduce errors that might happen when manually issue invoices. Therefore, the current solution is not adequate.

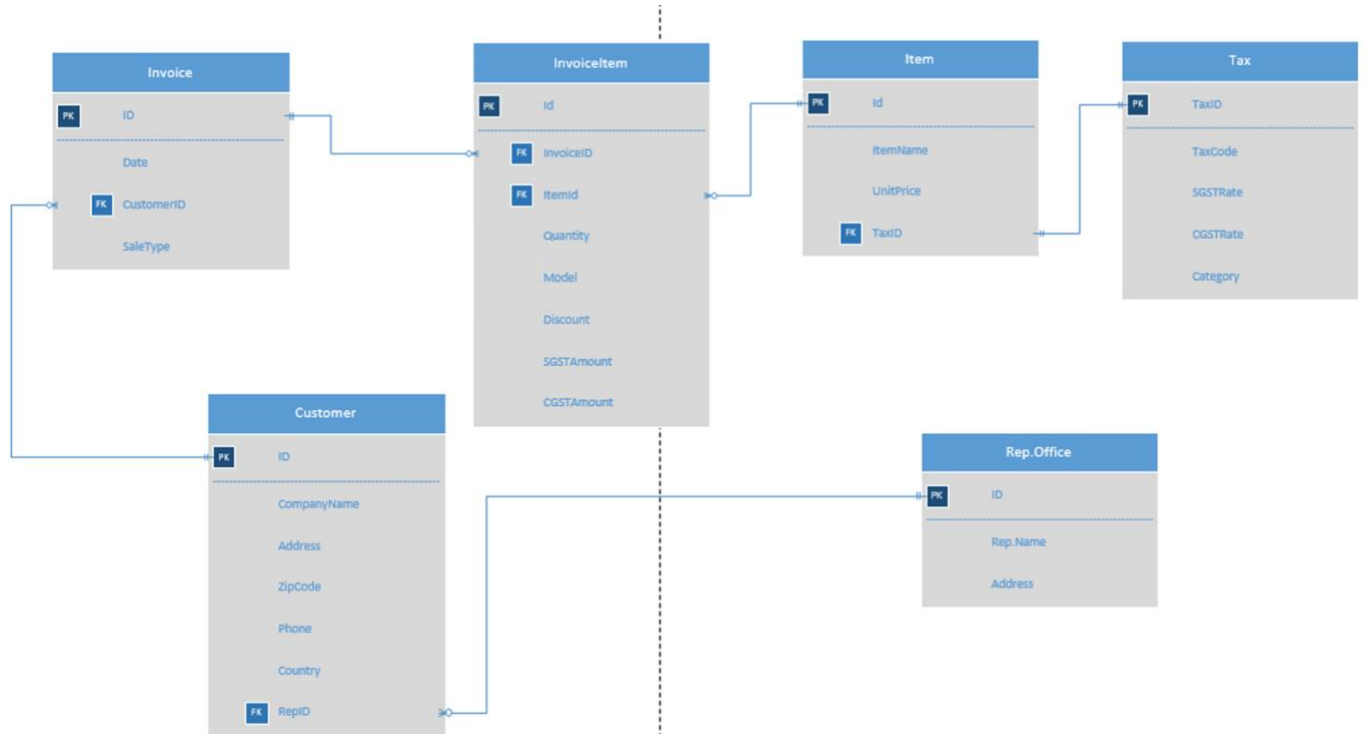
For this we need to structure a database, where the representatives in other countries, especially in India region can access the invoice information very quickly and transfer invoice files to customer without time-consuming procedures. The purpose of this project are that new India tax database can be added into the original invoice database and cause no problems, attributes can be added or deleted in the database in order to fit government policy change, and representative offices can connect and review invoice report in the proposed system.

### **Section Three: Entities and their attributes**

Objects:	Description:
<b>1. RepOffice</b>	Representative offices across the world
a. Id	Primary key/unique identifier of the RepOffice
b. RepName	Representative Office name
c. RepAddress	The address of representative office
<b>2. customer</b>	Database for customer that stored the basic information of customer
a. Id	Primary key / unique identifier of the Customer
b. CompanyName	Customer's name, usually customer are companies
c. CustomerAddress	The address of customer
d. ZipCode	The zip code of customer
e. Country	The country that customer belong
f. Phone	The phone number of customers
g. RepID	The Representative office that manage the customer
<b>3. Invoice</b>	The information included in each invoice
a. Id	Primary key/ unique identifier of the Invoice
b. InvoiceDate	Issue date of this invoice
c. CustomerId	Foreign key that links to customer table
d. SaleType	Full payment / Prepaid
<b>4. Invoiceltem</b>	Database that stored the detail in each invoice
a. Id	Primary key / unique identifier of Invoiceltem Table
b. Invoiceld	Foreign that links to Invoice table
c. Model	The model of product, new/old
d. Quantity	The quantity of each item
e. Discount	The discount information of this invoice
f. SGSTAmount	For India region, record tax information
g. CGSTAmount	For India region, record tac information
h. ItemId	Foreign key that links to the Item table
<b>5. Item</b>	Item table that stored the information of product
a. Id	Primary key / unique identifier of this table
b. ItemName	The name of this product
c. UnitPrice	The unit price of this product
d. TaxID	Foreign key that link to the tax table
<b>6. Tax</b>	Database that stored the tax information
a. TaxId	Primary key / unique identifier of this table
b. TaxCode	The tax code that this customer should use
c. SGSTRate	Tax rate for India region
d. CGSTRate	Tax rate for India region
e. Caregory	The tax category

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### Entity-relationship Diagram (ERD)

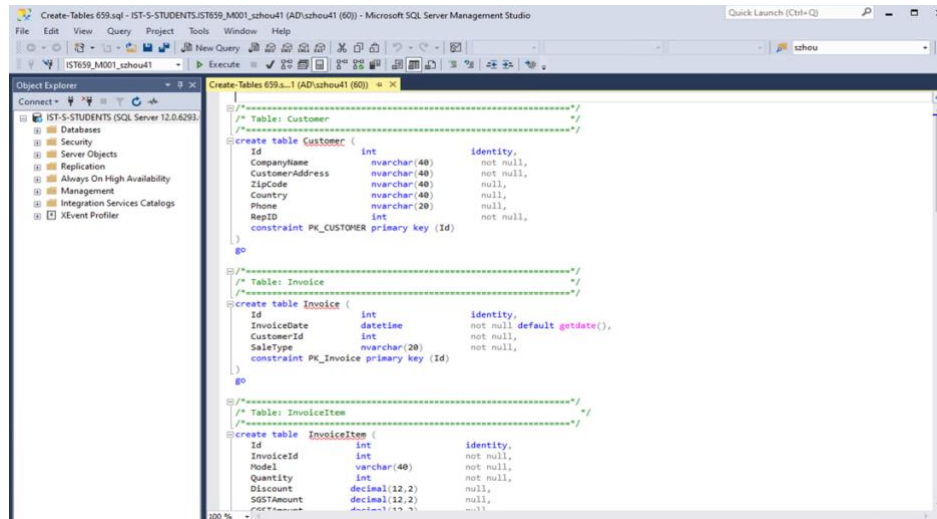


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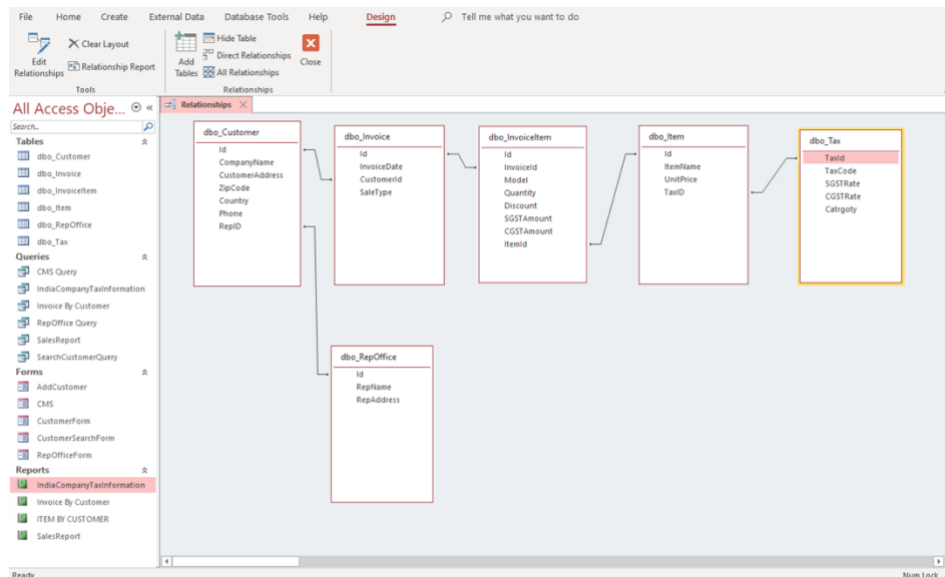
### Section four: Database System Infrastructure

The database design tool I used to implement the system for my project is Microsoft SQL Server Management Studio 18.

For the interface design tools, I used Access to link the tables I created in SQL Server



*I use SQL server tool to create tables and insert sampling data*



*I use access do the interface design*

## Section five: SQL script for creating tables and inserting sample data

### Create Tables

```
/*=====*/
/* Table: Customer */
/*=====*/
create table Customer (
    Id                int                identity,
    CompanyName       nvarchar(40)      not null,
    CustomerAddress   nvarchar(40)      not null,
    ZipCode           nvarchar(40)      null,
    Country           nvarchar(40)      null,
    Phone             nvarchar(20)      null,
    RepID             int                not null,
    constraint PK_CUSTOMER primary key (Id)
)
go

/*=====*/
/* Table: Invoice */
/*=====*/
create table Invoice (
    Id                int                identity,
    InvoiceDate        datetime          not null default getdate(),
    CustomerId        int                not null,
    SaleType           nvarchar(20)      not null,
    constraint PK_Invoice primary key (Id)
)
go

/*=====*/
/* Table: InvoiceItem */
/*=====*/
create table InvoiceItem (
    Id                int                identity,
    InvoiceId          int                not null,
    Model             varchar(40)        not null,
    Quantity          int                not null,
    Discount           decimal(12,2)     null,
    SGSTAmount        decimal(12,2)     null,
    CGSTAmount        decimal(12,2)     null,
    ItemId            int                not null,
    constraint PK_InvoiceITEM primary key (Id)
)
go

/*=====*/
/* Table: Item */
/*=====*/
create table Item (
    Id                int                identity,
    ItemName          nvarchar(50)      not null,
    UnitPrice         decimal(12,2)     null default 0,
    TaxID             int                not null,
    constraint PK_Item primary key (Id)
)
go

/*=====*/
/* Table: Tax */
/*=====*/
create table Tax (
```

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```
TaxId                int                identity,
TaxCode              nvarchar(40)        not null,
SGSTRate             decimal(12,2)       null,
CGSTRate             decimal(12,2)       null,
Catrgoty             nvarchar(20)        null,
constraint PK_Tax    primary key (TaxId)
)
go
/*=====*/
/* Table: RepOffice */
/*=====*/
create table RepOffice (
    Id                int                identity,
    RepName           nvarchar(40)        not null,
    RepAddress        nvarchar(50)        null,
    constraint PK_RepOffice primary key (Id)
)
go

alter table InvoiceItem
    add constraint FK_InvoiceItem foreign key (InvoiceId)
        references Invoice (Id)
go

alter table InvoiceItem
    add constraint FK_InvoiceItem_Item foreign key (ItemId)
        references Item (Id)
go

alter table Customer
    add constraint FK_Customer foreign key (RepID)
        references Repoffice (Id)
go

alter table Item
    add constraint FK_Item foreign key (TaxID)
        references Tax (TaxID)
go

alter table Invoice
    add constraint FK_Invoice foreign key (CustomerId)
        references Customer (Id)
go
```

## Insert Sample Data

```
SET IDENTITY_INSERT dbo.Customer ON
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (1,'Paper Produc','47/b,Dena Indl
Est,GodhbunderRdMajiwadat','400601','India','00222533061', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (2,'Burns Industries','Shop No 27, Kamdar Shopping
Centre','400057','India','02226186574', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
```



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```
VALUES (3,'Origin Express India Limited','332 Shop No , rd Floor, Connaught
Place','110001','India','01123712430', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (4,'Dhwal Offset Printers','53 Reg No.p South,Sv Road','400062','India','02228723395',
1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (5,'G S Transport Private Limited','207,Nd Flr, Niti Apt, Undrai Rd
','400064','India','02265906047', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (6,'Janata Tourist','Jai Mahavir Apts.,Link Road','400053','India','02226770545', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (7,'Sarvodaya Hostel','Indraprasth Shopping Cent,S V
Road','400092','India','00222808123', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (8,'Mehta Raheja Construction','10 Floor, Nirmal Sagar, Lj
Road','400028','India','222446460', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (9,'Bicha Tours & Travels','Modrn House, Dr.v.b.gandhi Marg,
Fort','400023','India','02222046899', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (10,'Saint Joseph Womens','Shivshakti Industrial Est','400086','India','02225003144',
1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (11,'Shringar Textile','Giri Kunj,S V Road,Behind Vip
Showroom','400062','India','02228723395', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (12,'Warden Kailash Communication','Hind Service Indl.est.,Cadel
Road','400028','India','02224449131', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (13,'United Transport','Kadri Mansion,Near Kismat
Theatre','400025','India','02224220239', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (14,'Tanjore Roadways','16 Ganga Bhavan,Linking
Road,Santacruz','400054','India','02226491503', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (15,'New Akhilesh Agency','Widco Bldg,Ramchandra Extn
Lane','400064','India','02228811364', 1001)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (16,'Dynatronics Accessories','86 rue des Lacs','400062','France','01.20.29.17451',
1002)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (17,'The Jolly Farmer','36 rue du Paillle en queue','92300','France','01.66.26.77671',
1002)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (18,'Kinney Phone','Rúa Olmos 7','37319','Spain','695 807 582', 1003)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (19,'Super Place','Estrela 96,Camargo','39509','Spain','660 987 818', 1003)
```

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```
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (20,'Kenny Rogers Roasters','Çankaya, Postalcode St','400062','Turkey','312 4684841',
1004)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (21,'Frame Scene','Merkez','43327','Turkey','342 3249345', 1004)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (22,'Treasurer (Corporate)','110-1298, Sakuragicho, Neyagawa-shi','572-
0041','Japan','212-4894469', 1005)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (23,'Phone Counselor','Asachinodaichi, Sarufutsu-mura Soya-gun','098-
6102','Japan','+8111-878-2774', 1005)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (24,'Fashion Coordinator','Incheonbupyeonggyeongchalseo','403-702','Korea','+82-4-850-
6184', 1006)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (25,'Material Collectors','Gumi-si, Gyeongsangbuk-do','730-833','Korea','+82-9-073-
9125', 1006)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (26,'Independent Investors','No.14, SiriDhamma Mawatha','10078','SriLanka','94-773-
426230', 1007)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (27,'Afforda','334, T.B. JAYAH MAWATHA','23467','SriLanka','94-1-699029', 1007)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (28,'E.J. Korvette','101 thomson road 26-01a united square','307591','Singapore','0 6253
4833', 1008)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (29,'Brown Derby','6 Gul Street 3, 629264, Singapore','629264','Singapore','68978930',
1008)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (30,'Mars Music','15 Tuas View Square, 637556,
Singapore','637556','Singapore','68610028', 1008)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (31,'Studies','1000 rue Levy, Montreal','400062','Canada','514-608-0824', 1009)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (32,'Strategy Consulting','1740 Kinchant St','V2V 4H9','Canada','604-476-6979', 1009)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (33,'Schaak Electronics','60 Felix Lane','TA5 1NA','UK','070 7689 1566', 1010)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (34,'Suncoast Video','117 Park Avenue','DG10 6ZB','UK','077 2074 8692', 1010)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (35,'Maxiserve ','64 Plantation Place','2795','Australia','(02) 4047 0323', 1011)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (36,'Nedick','81 Ferny Avenue','4670','Australia','(07) 3552 1057', 1011)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (37,'The Independent Planners','Balaju Kathmandu','221','Nepal','4350386', 1012)
```

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```
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (38,'Aaronson Electronic','Kathmandu Kathmandu','227','Nepal','4721320-4720493', 1012)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (39,'Britling Cafeterias','20/33 Le Thanh Tong Street','2033','Vietnam','3 952 273',
1013)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (40,'Asian Plan','79 Pham Van Hai, Ward 3','2344','Vietnam','38442470', 1013)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (41,'Sure Save','13 Soi Sukhumvit 15 Sukhumvit Rd','10110','Thailand','662 2550166',
1014)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (42,'Prospa-Pal','Grand Pacific Hotel 259 Sukhumvit Rd','10250','Thailand','02 651-
1000', 1014)
INSERT INTO [Customer]
([Id],[CompanyName],[CustomerAddress],[ZipCode],[Country],[Phone],[RepID])
VALUES (43,'Young and Tech','28 Birch Ave, Romney Park','2639','Zimbabwe','263-9-880002', 1015)
SET IDENTITY_INSERT Customer OFF

SET IDENTITY_INSERT dbo.RepOffice ON
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1001,'HuaweiIndia','Plot No 41, Gr
& 4 Th Flr')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1002,'HuaweiFrance','65 Rue
Roussy, NOUMÉA, Île-de-France')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1003,'HuaweiSpain','Ctra. Beas-
Cortijos Nuevos 88,El Villar de Arnedo')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1004,'HuaweiTurkey','TURGUTLU
MANİSA,Merkez')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1005,'HuaweiJapen','4-1, Kioi-cho,
Chiyoda-ku, Tokyo')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1006,'HuaweiKorean','238-11,
Noejukri, Godal-myeon, Gokseong-gun')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1007,'HuaweiSriLanka','122, YMBA
BUILDING')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1008,'HuaweiSingapore','171 tras
street 04-171a union building')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1009,'HuaweiCanada','4557 Port
Washington Road,Okotoks')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1010,'HuaweiUK','39 Ethelbert Rd,
London, SW20 8QE')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1011,'HuaweiAU','91 Fairview
Street,COWLEYS CREEK')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1012,'HuaweiNepal','Lake Side
Pokhara')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1013,'HuaweiVietnam','31Lang Ha
Street, Ba Dinh District')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1014,'HuaweiThailand','91/1 Chaiyo
Building Unit 505 Rama 9 Road')
INSERT INTO [RepOffice] ([Id],[RepName],[RepAddress]) VALUES(1015,'HuaweiZimbabwe','2088 Unit a
Seke Chitungwiza, Harare, Zimbabwe')
SET IDENTITY_INSERT RepOffice OFF

SET IDENTITY_INSERT Invoice ON
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(1,'Jul 4
2018',3,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(2,'Jul 4
2018',5,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(3,'Jul 4
2018',7,'Full Payment')
```

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```
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(4,'Jul  4
2018',3,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(5,'Jul  4
2018',5,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(6,'Aug  15
2018',3,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(7,'Aug  15
2018',3,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(8,'Sep  16
2018',3,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(9,'Sep  16
2018',10,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(10,'Sep  16
2018',11,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(11,'Oct  17
2018',13,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(12,'Oct  17
2018',14,'Full Payment')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(13,'Dec  18
2018',15,'Prepaid')
INSERT INTO [Invoice] ([Id],[InvoiceDate],[CustomerId],[SaleType])VALUES(14,'Dec  18
2018',28,'Prepaid')
SET IDENTITY_INSERT Invoice OFF

SET IDENTITY_INSERT [Tax] ON
INSERT INTO [Tax] ([TaxID],[TaxCode],[SGSTRate],[CGSTRate],[Catrgoty])
VALUES(1,3050,0.05,0.08,'Sale')
INSERT INTO [Tax] ([TaxID],[TaxCode],[SGSTRate],[CGSTRate],[Catrgoty])
VALUES(2,3070,0.06,0.02,'Sale')
INSERT INTO [Tax] ([TaxID],[TaxCode],[SGSTRate],[CGSTRate],[Catrgoty])
VALUES(3,4020,0.08,0.11,'General')
INSERT INTO [Tax] ([TaxID],[TaxCode],[SGSTRate],[CGSTRate],[Catrgoty])
VALUES(4,2324,0,0,'Singapore')
SET IDENTITY_INSERT [Tax] OFF

SET IDENTITY_INSERT [Item] ON
INSERT INTO [Item] ([Id],[ItemName],[UnitPrice],[TaxID])
VALUES(1,'Honor10',200,1)
INSERT INTO [Item] ([Id],[ItemName],[UnitPrice],[TaxID])
VALUES(2,'Honor20',220,2)
INSERT INTO [Item] ([Id],[ItemName],[UnitPrice],[TaxID])
VALUES(3,'Honor30',240,3)
INSERT INTO [Item] ([Id],[ItemName],[UnitPrice],[TaxID])
VALUES(4,'Honor50',260,1)
INSERT INTO [Item] ([Id],[ItemName],[UnitPrice],[TaxID])
VALUES(5,'HonorPro',300,4)
INSERT INTO [Item] ([Id],[ItemName],[UnitPrice],[TaxID])
VALUES(6,'HonorPro10',400,4)
SET IDENTITY_INSERT [Item] OFF

SET IDENTITY_INSERT [InvoiceItem] ON
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(1,1,'New',4000,0.02,20,20,1)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(2,2,'New',5300,0.02,30,20,2)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(3,3,'New',1000,0.02,20,20,3)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(4,4,'New',4500,0.02,20,20,4)
```

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```
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(5,5, 'New', 2500,0.02,20,20,1)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(6,6, 'New', 2000,0.02,20,20,2)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(7,7, 'New', 2000,0.02,20,20,3)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(8,8, 'New', 2300,0.02,20,20,4)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(9,9, 'New', 8000,0.02,20,20,1)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(10,10, 'New', 2000,0.02,20,20,2)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(11,11, 'New', 1500,0.02,60,20,3)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(12,12, 'New', 500,0.02,20,20,4)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(13,13, 'New', 9000,0.02,20,20,1)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(14,14, 'New', 4200,0.02,0,0,5)
INSERT INTO [InvoiceItem] ([Id],[InvoiceId],[Model],
[Quantity],[Discount],[SGSTAmount],[CGSTAmount],[ItemID])
VALUES(15,14, 'New', 2000,0.02,0,0,6)
SET IDENTITY_INSERT [InvoiceItem] OFF
```

## Section Six: SQL statements for answering major data questions

Question 1: What item did customer “Origin Express India Limited” bought?

```
select Customer.CompanyName,Item.ItemName
from Customer,Invoice,InvoiceItem, Item
where Customer.Id=Invoice.CustomerId and Invoice.Id=InvoiceItem.InvoiceId and
Item.Id=InvoiceItem.Id and Customer.CompanyName='Origin Express India Limited'
```

	CompanyName	ItemName
1	Origin Express India Limited	Honor10
2	Origin Express India Limited	Honor50
3	Origin Express India Limited	HonorPro10

Question 2: How much of the NetAmount of each Invoice

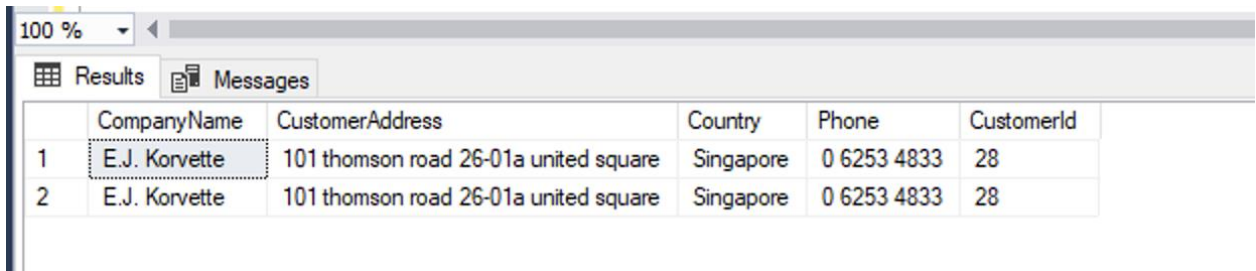
```
select Customer.CompanyName, Invoice.Id, UnitPrice, Quantity, UnitPrice* Quantity as
NetAmount
from Customer, Invoice, InvoiceItem, Item
where Customer.Id=Invoice.CustomerId and Invoice.Id=InvoiceItem.InvoiceId and
Item.Id=InvoiceItem.Id
```

	CompanyName	Id	UnitPrice	Quantity	NetAmount
1	Origin Express India Limited	1	200.00	4000	800000.00
2	G S Transport Private Limited	2	220.00	5300	1166000.00
3	Sarvodaya Hostel	3	240.00	1000	240000.00
4	Origin Express India Limited	4	260.00	4500	1170000.00
5	G S Transport Private Limited	5	300.00	2500	750000.00
6	Origin Express India Limited	6	400.00	2000	800000.00

## Project Implementation Report for Invoice System

Question 3: How many invoices from Singapore Customer?

```
select Customer.CompanyName,  
Customer.CustomerAddress, Customer.Country, Customer.Phone, Invoice.CustomerId  
from Customer inner join Invoice on Invoice.CustomerId=Customer.Id  
inner join InvoiceItem on Invoice.Id=InvoiceItem.InvoiceId  
inner join item on InvoiceItem.ItemId=Item.Id  
inner join Tax on Item.TaxID=Tax.TaxId  
where Customer.Country='Singapore'
```



	CompanyName	CustomerAddress	Country	Phone	CustomerId
1	E.J. Korvette	101 thomson road 26-01a united square	Singapore	0 6253 4833	28
2	E.J. Korvette	101 thomson road 26-01a united square	Singapore	0 6253 4833	28

Question 4: Customer “Nedick” is managed by which Representative office?

```
select Customer.CompanyName, RepOffice.Id, RepOffice.RepName  
from Customer, RepOffice  
where Customer.RepID=RepOffice.Id and CompanyName='Nedick'
```



	CompanyName	Id	RepName
1	Nedick	1011	HuaweiAU

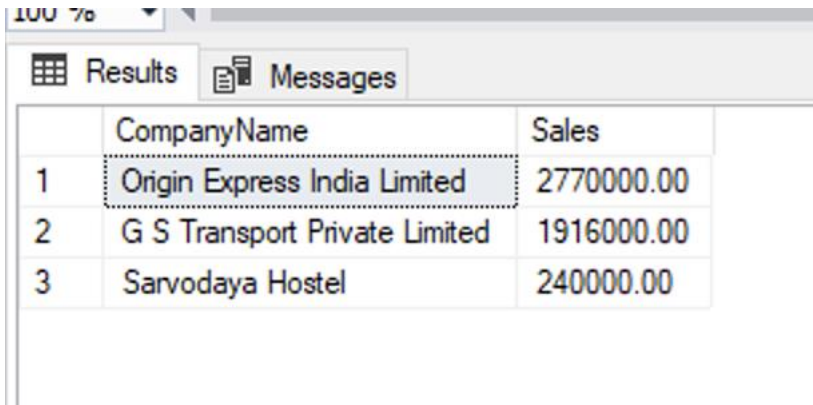
Question 5: Which customer had the highest sale record?

```
select Customer.CompanyName, sum(UnitPrice* Quantity) as Sales  
from Customer, Invoice, InvoiceItem, Item  
where Customer.Id=Invoice.CustomerId and Invoice.Id=InvoiceItem.InvoiceId and  
Item.Id=InvoiceItem.Id
```



## Project Implementation Report for Invoice System

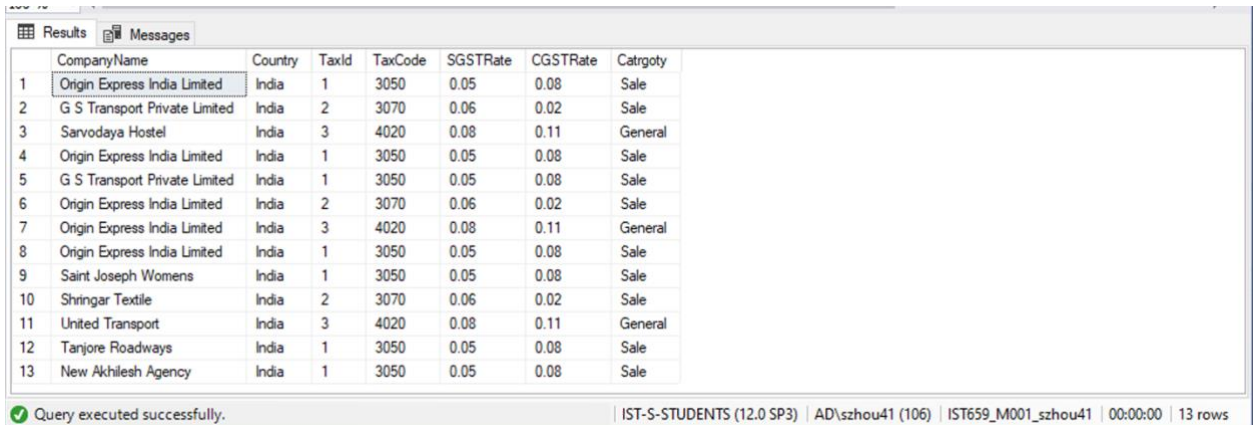
```
group by Customer.CompanyName
order by Sales desc
```



	CompanyName	Sales
1	Origin Express India Limited	2770000.00
2	G S Transport Private Limited	1916000.00
3	Sarvodaya Hostel	240000.00

Question 6: How to check the tax information, especially for India region?

```
Select Customer.CompanyName, Customer.Country, Tax.*
from Customer inner join Invoice on Invoice.CustomerId=Customer.Id
      inner join InvoiceItem on Invoice.Id=InvoiceItem.InvoiceId
      inner join item on InvoiceItem.ItemId=Item.Id
      inner join Tax on Item.TaxID=Tax.TaxId
where Country='India'
```



	CompanyName	Country	TaxId	TaxCode	SGSTRate	CGSTRate	Catrgoty
1	Origin Express India Limited	India	1	3050	0.05	0.08	Sale
2	G S Transport Private Limited	India	2	3070	0.06	0.02	Sale
3	Sarvodaya Hostel	India	3	4020	0.08	0.11	General
4	Origin Express India Limited	India	1	3050	0.05	0.08	Sale
5	G S Transport Private Limited	India	1	3050	0.05	0.08	Sale
6	Origin Express India Limited	India	2	3070	0.06	0.02	Sale
7	Origin Express India Limited	India	3	4020	0.08	0.11	General
8	Origin Express India Limited	India	1	3050	0.05	0.08	Sale
9	Saint Joseph Womens	India	1	3050	0.05	0.08	Sale
10	Shringar Textile	India	2	3070	0.06	0.02	Sale
11	United Transport	India	3	4020	0.08	0.11	General
12	Tanjore Roadways	India	1	3050	0.05	0.08	Sale
13	New Akhlesh Agency	India	1	3050	0.05	0.08	Sale

Query executed successfully. | IST-S-STUDENTS (12.0 SP3) | AD\szhou41 (106) | IST659\_M001\_szhou41 | 00:00:00 | 13 rows



## Section Seven: Input Forms, Reports, Buttons, Interfaces, Etc.

### FORMS

#### Customer Search Form

If salespersons want to check all the information about this customer, they just need to input some letters they remember of this customer name in the search box, and in the list box, it will show all the results of customers that contain the letters salesperson just input in the search box

Search: aa

Aaronson Elect	Kathmandu Kal	227	Nepal
Schaak Elect	60 Felix Lane	TA5 1NA	UK

#### Customer Management System Form

Salesperson can use customer's phone number to query this customer's information they want to know

## Project Implementation Report for Invoice System


The screenshot shows the Microsoft Access interface with the 'CMS' form open. The left pane lists tables (dbo\_Customer, dbo\_Invoice, etc.), queries (CMS Query, etc.), and forms (AddCustomer, CMS, etc.). The 'CMS' form is highlighted. The form fields are: Phone (00222533061), Name, Address, ZipCode, and Country. A 'Run Query' button is located below the form fields.

CompanyNa	CustomerAc	ZipCode	Country	Phone
Paper Product	47/b,Dena Indl	400601	India	00222533061
*				

### Rep Office Form

For the management people, if they want to check the number of customer that each representative office in charge.

## Project Implementation Report for Invoice System

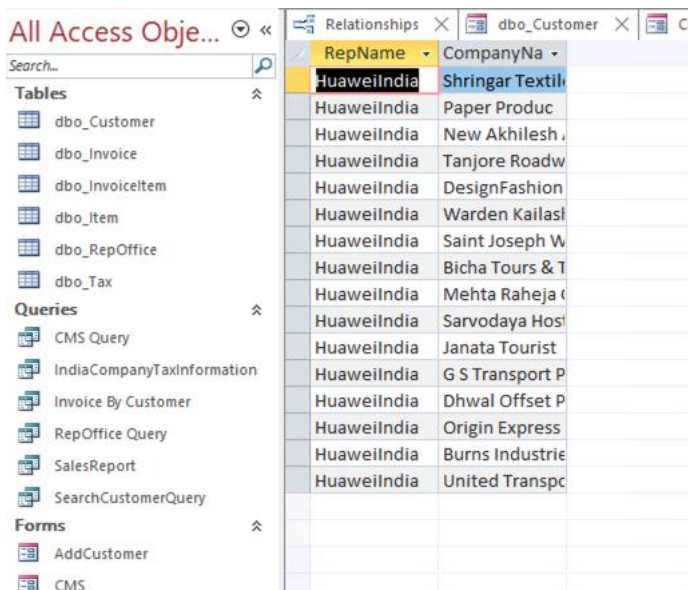
 RepOfficeForm

RepOffice

Customer

RepName	CompanyNa
HuaweiIndia	Shringar Textile
HuaweiIndia	Paper Produc
HuaweiIndia	New Akhilesh
HuaweiIndia	Tanjore Roadw
HuaweiIndia	DesignFashion
HuaweiIndia	Warden Kailas
HuaweiIndia	Saint Joseph W
HuaweiIndia	Bicha Tours & T
HuaweiIndia	Mehta Raheja C
HuaweiIndia	Sarvodaya Hos
HuaweiIndia	Janata Tourist
HuaweiIndia	G S Transport P
HuaweiIndia	Dhwal Offset P
HuaweiIndia	Origin Express
HuaweiIndia	Burns Industrie
HuaweiIndia	United Transpc

### Add new customer record

Salesperson can add new customer record through this form

## Project Implementation Report for Invoice System



### AddCustomer

CompanyName	<input type="text" value="DesignFashion"/>
Address	<input type="text" value="ProdcStreet,25"/>
ZipCode	<input type="text" value="400067"/>
Country	<input type="text" value="India"/>
Phone	<input type="text" value="2003175679"/>
RepID	<input type="text" value="1001"/>

Add

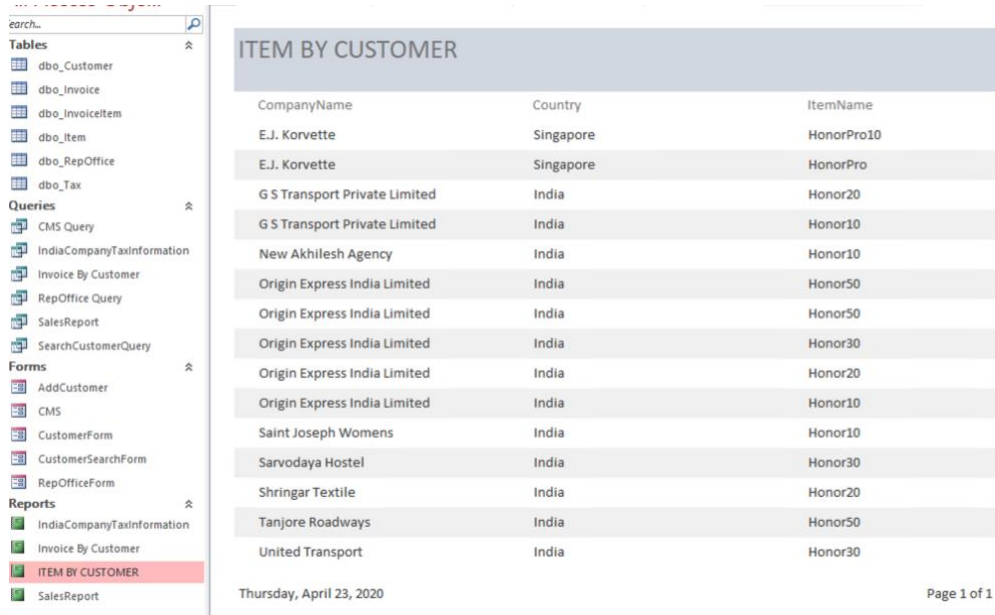
42	Prospa-Pal	Grand Pacific H 10250	Thailand	02 651-1000	1014
43	Young and Tec	28 Birch Ave, R 2639	Zimbabwe	263-9-880002	1015
44	DesignFashion	ProducStreet,2 400067	India	2003175679	1001
(New)					

## Project Implementation Report for Invoice System

### Reports

#### Item by Customer

Salesperson can use this report to check what products did customers buy.



**ITEM BY CUSTOMER**

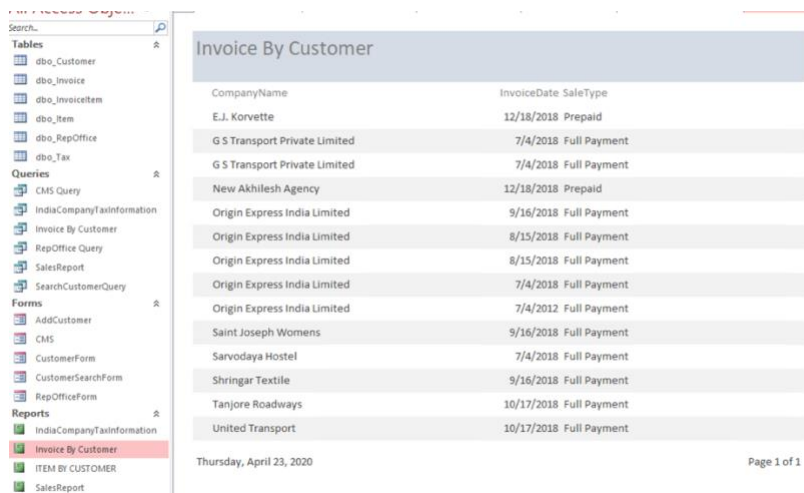
CompanyName	Country	ItemName
E.J. Korvette	Singapore	HonorPro10
E.J. Korvette	Singapore	HonorPro
G S Transport Private Limited	India	Honor20
G S Transport Private Limited	India	Honor10
New Akhilesh Agency	India	Honor10
Origin Express India Limited	India	Honor50
Origin Express India Limited	India	Honor50
Origin Express India Limited	India	Honor30
Origin Express India Limited	India	Honor20
Origin Express India Limited	India	Honor10
Saint Joseph Womens	India	Honor10
Sarvodaya Hostel	India	Honor30
Shringar Textile	India	Honor20
Tanjore Roadways	India	Honor50
United Transport	India	Honor30

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#### Invoice by Customer

Salesperson can check the date when each invoice is issued and the saletype of each invoice.



**Invoice By Customer**

CompanyName	InvoiceDate	SaleType
E.J. Korvette	12/18/2018	Prepaid
G S Transport Private Limited	7/4/2018	Full Payment
G S Transport Private Limited	7/4/2018	Full Payment
New Akhilesh Agency	12/18/2018	Prepaid
Origin Express India Limited	9/16/2018	Full Payment
Origin Express India Limited	8/15/2018	Full Payment
Origin Express India Limited	8/15/2018	Full Payment
Origin Express India Limited	7/4/2018	Full Payment
Origin Express India Limited	7/4/2012	Full Payment
Saint Joseph Womens	9/16/2018	Full Payment
Sarvodaya Hostel	7/4/2018	Full Payment
Shringar Textile	9/16/2018	Full Payment
Tanjore Roadways	10/17/2018	Full Payment
United Transport	10/17/2018	Full Payment

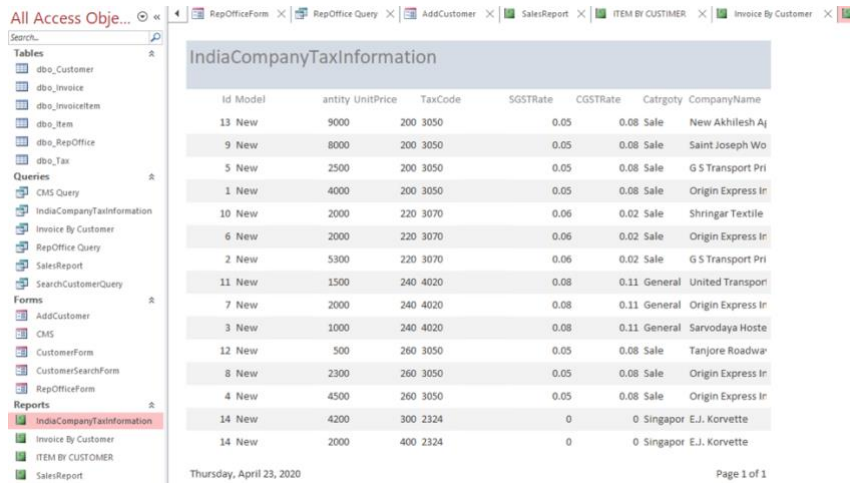
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## Project Implementation Report for Invoice System

### India Company Tax Information

The most important function of this database, that salesperson can check the tax information of India company. This report is only valid for Indian companies, companies in other country would not have SGST and CGST fields

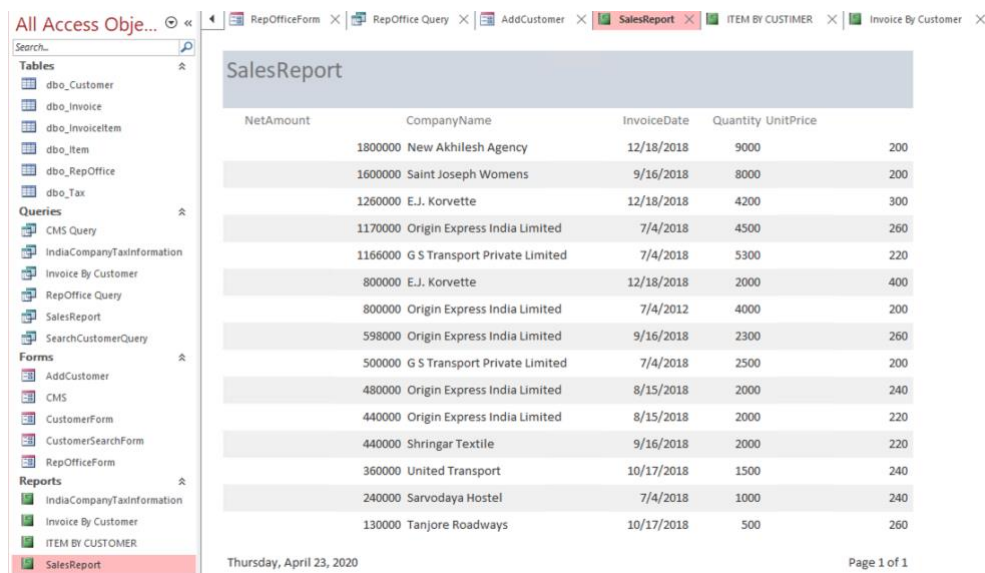


Id	Model	Quantity	Unit Price	Tax Code	SGST Rate	CGST Rate	Category	Company Name
13	New	9000	200	3050	0.05	0.08	Sale	New Akhilesh Aj
9	New	8000	200	3050	0.05	0.08	Sale	Saint Joseph Wo
5	New	2500	200	3050	0.05	0.08	Sale	G S Transport Pri
1	New	4000	200	3050	0.05	0.08	Sale	Origin Express In
10	New	2000	220	3070	0.06	0.02	Sale	Shringar Textile
6	New	2000	220	3070	0.06	0.02	Sale	Origin Express In
2	New	5300	220	3070	0.06	0.02	Sale	G S Transport Pri
11	New	1500	240	4020	0.08	0.11	General	United Transpor
7	New	2000	240	4020	0.08	0.11	General	Origin Express In
3	New	1000	240	4020	0.08	0.11	General	Sarvodaya Hoste
12	New	500	260	3050	0.05	0.08	Sale	Tanjore Roadwa
8	New	2300	260	3050	0.05	0.08	Sale	Origin Express In
4	New	4500	260	3050	0.05	0.08	Sale	Origin Express In
14	New	4200	300	2324	0	0	Singapor	E.J. Korvette
14	New	2000	400	2324	0	0	Singapor	E.J. Korvette

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### Sales Report

The other important function of this database, salesperson can check the financial report of each invoice, through this report, salesperson would know which customer is the origin of main profit and which customer need to target to sale more products to them.



NetAmount	CompanyName	InvoiceDate	Quantity	UnitPrice	NetAmount
1800000	New Akhilesh Agency	12/18/2018	9000	200	1800000
1600000	Saint Joseph Womens	9/16/2018	8000	200	1600000
1260000	E.J. Korvette	12/18/2018	4200	300	1260000
1170000	Origin Express India Limited	7/4/2018	4500	260	1170000
1166000	G S Transport Private Limited	7/4/2018	5300	220	1166000
800000	E.J. Korvette	12/18/2018	2000	400	800000
800000	Origin Express India Limited	7/4/2012	4000	200	800000
598000	Origin Express India Limited	9/16/2018	2300	260	598000
500000	G S Transport Private Limited	7/4/2018	2500	200	500000
480000	Origin Express India Limited	8/15/2018	2000	240	480000
440000	Origin Express India Limited	8/15/2018	2000	220	440000
440000	Shringar Textile	9/16/2018	2000	220	440000
360000	United Transport	10/17/2018	1500	240	360000
240000	Sarvodaya Hostel	7/4/2018	1000	240	240000
130000	Tanjore Roadways	10/17/2018	500	260	130000

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## **Section Eight: Summary**

This report comprises of system design for the invoice system and what problems this system can solve. For a simple invoice system, it just needs three tables in the database. But real-world, the problem will be far more complicated, especially for a multinational corporation. In this project, I want to focus on solving tax issues.

Different from simple invoice system, I add a tax table, which contain all the tax rule the customer and multinational corporation should comply with. With the help of MSSQL server and relational database, I can easily connect the tax table to the customer table, with three intermediary tables: Invoice table, invoice item table and item table. Under this database design, I can choose what field I need to add in the final report. For example, in the Indian region invoice, it should contain the amount of CGST and SGST, otherwise customer will not receive this invoice, this kind of problem will cause huge blow for sale business. In other word, the supplier, Huawei, in this example should also report tax to the local government based on these special fields. In fact, for special country, such as Indian, local representative offices need to issue invoice using EXCEL manually, it is very time consuming. Using database design can solve this kind of problem to a certain extent and realize the automation of invoice.

In addition to the tax query function, this invoice system can also solve other problems, such as find which customer has the highest sales, what products customer like to buy, is there any difference product preferences for different regions? To be specific, in the example, Indian customers prefer to buy Honor 10, 20, and 30. For Singapore, they prefer to buy Honor pro. And salesperson can also use this report to calculate the total sale amount and do financial analysis.

From the first version to the last version of this report, this is a process that simplify a complicated problem. When I know about MSSQL server and relational databases, it always gives me new ideas to solve real life problems. I will continue to learn database knowledges; it is vital for skill set.