CA1: Database Design and Development

Module Title: Databases and Business Applications

Module Code: B8IT101

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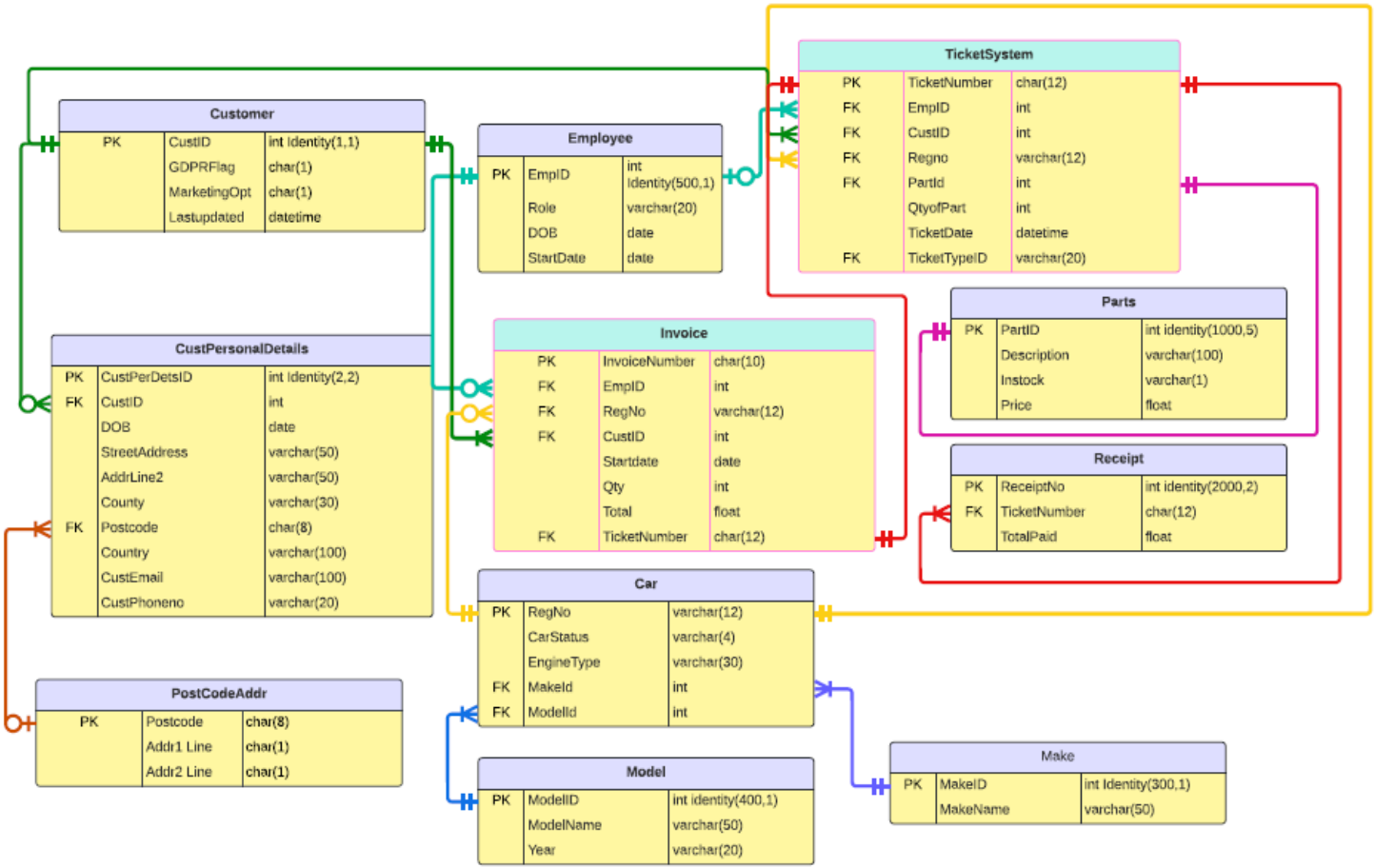
Contents

1. Project Overview/Scope

This project provides a technical design and provision of a new database server and the development of a new database for Car dealership.

2.Entity Relationship Diagram


Customer
PK CustID int Identity(1,1)
GDPRFlag char(1)
MarketingOpt char(1)
Lastupdated datetime
Employee
PK EmpID int Identity(500,1)
Role varchar(20)
DOB date
StartDate date
TicketSystem
PK TicketNumber char(12)
FK EmpID int
FK CustID int
FK Regno varchar(12)
FK PartId int
QtyofPart int
TicketDate datetime
FK TicketTypeID varchar(20)
Parts
PK PartID int identity(1000,5)
Description varchar(100)
Instock varchar(1)
Price float
CustPersonalDetails
PK CustPerDetsID int Identity(2,2)
FK CustID int
DOB date
StreetAddress varchar(50)
AddrLine2 varchar(50)
County varchar(30)
FK Postcode char(8)
Country varchar(100)
CustEmail varchar(100)
CustPhoneno varchar(20)
Invoice
PK InvoiceNumber char(10)
FK EmpID int
FK RegNo varchar(12)
FK CustID int
Startdate date
Qty int
Total float
FK TicketNumber char(12)
Receipt
PK ReceiptNo int identity(2000,2)
FK TicketNumber char(12)
TotalPaid float
Car
PK RegNo varchar(12)
CarStatus varchar(4)
EngineType varchar(30)
FK MakeId int
FK ModelId int
PostCodeAddr
PK Postcode char(8)
Addr1 Line char(1)
Addr2 Line char(1)
Model
PK ModelID int identity(400,1)
ModelName varchar(50)
Year varchar(20)
Make
PK MakeID int Identity(300,1)
MakeName varchar(50)

3.Assumptions Made

By making this ERD and writing queries I can assume how primary and foreign key works and what are the roles they perform in database. Besides from queries, I can find out the performance of the employee, less active customers and eventually most serviced vehicles.

4.Data Dictionary

All Data Dictionary based on ERD above.

Customer

Attribute	Datatype	Required	Description
CustID	Int	Y	This is the PK. It uses whole numbers from 1 and increments by 1. Uses Identity Property
GDPRFlag	Char(1)	Y	This is a flag showing if GDPR or not. Values allowed "Y" or "N".
MarketingOpt	Char(1)	Y	This is a flag showing if MarketingOpt or not. Values allowed "Y" or "N".
Lastupdated	Datetime	Y	This is the last date of update. Should be in the date with hh:mm:ss:mm

CustPersonalDetails

Attribute	Datatype	Required	Description
CustPerDetsID	Int	Y	This is the PK for this Table. It is a whole number starting from 2. This should increment in 2s.
CustID	Int	Y	This is a FK from the Customer Table. It is a whole number starting from 1. This should increment in 1s.
DOB	Datetime	Y	This is the date. Should be look like YYYY/MM/DD.
StreetAddress	varchar(50)	Y	This should be first address. (e.g. 123 marino street)
AddrLine2	varchar(50)	Y	This should be 2nd address.
County	varchar(30)	Y	This should be county name.(e.g. Cork, Galway)
Postcode	char(8)	Y	This is a FK from the Post code addr Table. This should be postal or EIR code for the address.
CustEmail	char(8)	Y	This should be email address.
CustPhoneno	varchar(20)	Y	This should be phone number.

PostCodeAddr

Attribute	Datatype	Required	Description
Postcode	Int	Y	This is a PK for this table. This should be postal or EIR code for the address.
Addr1 Line	Char(1)	Y	This should be a status indicator for First address. Should look like “Y” or ”N”. Here “Y” means yes and “N” means no.
Addr2 Line	Char(1)	Y	This should be a status indicator for 2nd address. Should look like “Y” or ”N”. Here “Y” means yes and “N” means no.

Employee

Attribute	Datatype	Required	Description
EmpID	Int	Y	This is the PK. It uses whole numbers from 500 and increments by 1
Role	varchar(20)	Y	This should be the employer role. Look like (e.g. repairing, sales)
DOB	date	Y	This is the date. Should be look like YYYY/MM/DD .
StartDate	date	Y	This is the date. Should be look like YYYY/MM/DD.

Invoice

Attribute	Datatype	Required	Description
InvoiceNumber	char(10)	Y	This is the PK for this Table. This should be the invoice number. Look like (e.g #098765AD)
EmpID	Int	Y	This is the FK from the Employer Table. It is a whole number starting from 500. This should increment in 1s.
RegNo	varchar(12)	Y	This is the Fk from Car table.This should be registration no.
CustID	int	Y	This is the FK from the Employer Table. It is a whole number starting from 1. This should increment in 1s.
Startdate	date	Y	This is the date. Should be look like DD/MM/YYYY.
Qty	int	Y	This is the amount field. This should be number.
Total	float	Y	This should be total. Look like(e.g. 123.15)
TicketNumber	char(12)	Y	This is FK from Invoice table.This should be ticket no.

Car

Attribute	Datatype	Required	Description
RegNo	varchar(12)	Y	This is the PK. This should be registration no. Look like (e.g. 05-D-1234)
CarStatus	varchar(4)	Y	This should be the status of the car. Look like (e.g. New, Used)
EngineType	varchar(30)	Y	This is should be the type of engine. Look like(e.g. electric, diesel)
MakeId	int	Y	This is the Fk from Make table. It is a whole number starting from 300. This should increment in 1s.
ModelId	int	Y	This is the Fk from Model table. It is a whole number starting from 400. This should increment in 1s.

Model

Attribute	Datatype	Required	Description
ModelID	Int	Y	This is a PK for this table. It is a whole number starting from 400. This should increment in 1s.
ModelName	varchar(50)	Y	This should be model name and look like(Model S, Civic)
Year	varchar(20)	Y	This should be the year and look like (e.g. 2023-2024)

TicketSystem

Attribute	Datatype	Required	Description
TicketNumber	char(12)	Y	This is the PK for this Table. This should be the ticket no and look like (e.g. VIP1234)
EmpID	Int	Y	This is a FK from the Employee Table. It is a whole number starting from 500. This should increment in 1s.
CustID	Int	Y	It uses whole numbers from 1 and increments by 1. Uses Identity Property
Regno	varchar(12)	Y	This is the Fk from Car table. This should be registration no.
PartId	Int	Y	This is a FK from the Parts Table. It is a whole number starting from 1000. This should increment in 5s.
QtyofPart	Int	Y	This should be the amount of parts. Look like(e.g 12,13)
TicketDate	Datetime	Y	This is the date of ticket. Should be in the date with hh:mm:ss:mm
TicketTypeID	varchar(20)	Y	This should be the type of ticket and look like(e.g.)

Parts

Attribute	Datatype	Required	Description
PartID	Int	Y	This is the Pk. It is a whole number starting from 1000. This should increment in 5s.
Description	varchar(100)	Y	This should be the description of parts. Look like (e.g. side mirror, headlight)
Instock	varchar(1)	Y	This is a flag showing if in stock or not. Values allowed “Y” or “N”.
Price	float		This should be price. Look like (e.g. 987.12)

Receipt

Attribute	Datatype	Required	Description
ReceiptNo	Int	Y	This is a PK for this table. It is a whole number starting from 2000. This should increment in 2s.
TicketNumber	char(12)	Y	This is the FK for this Table. This should be the ticket no.
TotalPaid	float	Y	This should be amount of pay. Look like(e.g. 456.87)

Make

Attribute	Datatype	Required	Description
MakeID	Int	Y	This is a PK for this table. It is a whole number starting from 300. This should increment in 1s.
MakeName	char(12)	Y	This should be the name. Look like (e.g. Toyota, Ford)

5.Technology Used

1.Lucid Chart

2.Sql Server

3.Notepad

4.Microsoft word

6.Test Plan

Table 1 – The Test Plan

Item Tested	Test Run	Expected Result	Actual Result
Delete Regno = '01-0D-123426' From Car table	Exec Delete '01-0D-123426' this value from Regno column	FK violation	The DELETE statement conflicted with the REFERENCE constraint "FK_TicketSystem.Regno". The conflict occurred in database "Cardealership", table "dbo.TicketSystem", column 'Regno'.
Delete Regno = '01-0D-231926' from Car table	Exec Delete = '01-0D-231926 504' value from Regno column	Delete the row which contain Regno = '01-0D-231926'	1 row affected. Query run sucessfully
Delete CustID = 6 from customer	Exec Delete CustID = 6 value from CustID column	Delete the row which contain CustID = 6	1 row affected. Query run sucessfully
Delete CustID=5 from Customer	Exec Delete CustID = 6 value from CustID column	Fk violation	The DELETE statement conflicted with the REFERENCE constraint "FK_TicketSystem.CustID". The conflict occurred in database "Cardealership", table "dbo.TicketSystem", column 'CustID'.

7.Reflections on Learning

By making this ERD and writing queries I can assume how primary and foreign key works and what are the roles they perform in database. Besides from queries, I can find out the performance of the employee, less active customers and eventually most serviced vehicles.

8.References

Following references are all reference material used:

1.*W3Schools.com*. (n.d.). https://www.w3schools.com/SQL/deFault.asp

2.Lucid Software. (2023, November 11). *Entity Relationship Diagram (ERD) Tutorial - Part 2* [Video]. YouTube. https://www.youtube.com/watch?v=hktyW5Lp0Vo

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4. *General Data Protection Regulation (GDPR) – legal text*. (2024, April 22). General Data Protection Regulation (GDPR). https://gdpr-info.eu/