

# DBAS 27198 Database Design

## Specialty Imports Database

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# Normalized Relations

## Sales Invoice

0NF:

SalesInvoice(InvoiceNo, Date, Salesman, CustName, Address, City, State, PostalCode, Telephone, SerialNumber, VehicleMake, VehicleModel, VehicleYear, VehicleColor, [InsuranceCoverage], [Code, Description, Price], [SerialNo, TradeInMake, TradeInModel, TradeInYear, TradeInAllowance], TotalPrice, Trade-InAllowance, Discount, Net, Taxes, TotalPayable)

1NF:

SalesInvoice(InvoiceNo, Date, Salesman, CustName, Address, City, State, PostalCode, Telephone, SerialNumber, VehicleMake, VehicleModel, VehicleYear, VehicleColor, TotalPrice, Trade-InAllowance, Discount, Net, Taxes, TotalPay)

Insurance(Coverage, InvoiceNo)

InvoiceOptions(Code, InvoiceNo, Description, Price)

InvoiceTrade-In(SerialNo, InvoiceNo,

TradeInMake, TradeInModel, TradeInYear, TradeInAllowance)

2NF:

SalesInvoice(InvoiceNo, Date, Salesman, CustName, Address, City, State, PostalCode, Telephone, SerialNumber, VehicleMake, VehicleModel, VehicleYear, VehicleColor, TotalPrice, Trade-InAllowance, Discount, Net, Taxes, TotalPay)

Insurance(Coverage, InvoiceNo)

InvoiceOptions(Code, InvoiceNo)

Options(Code, Description, Price)

InvoiceTrade-In(SerialNo, InvoiceNo, Allowance)

Trade-In(SerialNo, TradeInMake, TradeInModel, TradeInYear)

3NF:

SalesInvoice(InvoiceNo, CustName, SerialNumber, Date, Salesman, TotalPrice, Trade-InAllowance, Discount, Net, Taxes, TotalPay)

Customer(CustName, Address, City, State, PostalCode, Telephone)

Vehicle(SerialNumber, VehicleMake, VehicleModel, VehicleYear, VehicleColor)

Insurance(Coverage, InvoiceNo)

InvoiceOptions(Code, InvoiceNo)

Options(Code, Description, Price)

InvoiceTrade-In(SerialNo, InvoiceNo, Allowance)

Trade-In(SerialNo, TradeInMake, TradeInModel, TradeInYear)

SPECIALTY IMPORTS SALES INVOICE				
InvoiceNo:	S1239		Date:	January 14, 1997
SOLD TO:	Name:	Bugs Bunny		
	Address:	24 Carrot Lane		
	City:	Looneyville		
	State:	California	Postal code:	55555
	Telephone:	(890 ) 453 - 5421		
	Salesman:	Mark Smith		
SerialNumber	Make	Model	Year	Color
J97UX301	Jaguar	UX	1997	Black
Insurance Coverage Includes				
Fire & Theft	[ ]	Liability	[X]	
Collision	[ ]	Property Damage	[ ]	
OPTIONS				
Code	Description	Price		
S24	Sun Roof	349.00		
TRADE-IN				
SerialNo.	Make	Model	Year	Allowance
Total Price: 70,348.00				
Trade-in Allowance:				
Discount: 3,200.00				
Net: 67,148.00				
Taxes: 10,072.20				
Total Payable: 77,220.20				

## Vehicle Sales Accounting Supplement

0NF:

Supplement(SalesInvoiceNo, Customer, Date, [Item, Cost, Sale], Serial#, Freight&Prep, Tax, LicenseFees, Other, Commission, Total)

1NF:

Supplement(SalesInvoiceNo, Customer, Date, Serial#, Freight&Prep, Tax, LicenceFees, Commission)

SupplementOptions(Item, SalesInvoiceNo, Cost, Sale)

2NF:

Supplement(SalesInvoiceNo, Customer, Date, Serial#, Freight&Prep, Tax, LicenceFees, Commission)

SupplementOptions(Item, SalesInvoiceNo)

Options(Item, Cost, Sale)

3NF:

Supplement(SalesInvoiceNo, SerialNo, Customer, Date, Commission)

SupplementOptions(Item, SalesInvoiceNo)

Options(Item, Cost, Sale)

Vehicle(SerialNo, Freight&Prep, Tax, LicenceFees)

VEHICLE SALES ACCOUNTING SUPPLEMENT			
Sales Inv.No.	<u>S1252</u>	Customer:	<u>Elmer Befudd</u>
		Date:	<u>1997/01/28</u>
	<u>Item</u>	<u>Cost</u>	<u>Sale</u>
Serial#	<u>M97CL701</u>	<u>32,000.00</u>	<u>33,160.00</u>
	<u>R63</u>	<u>120.00</u>	<u>140.00</u>
Freight & Preparation	<u>4,200.00</u>	<u>4,200.00</u>	
Tax	<u>5,625.00</u>	<u>5,625.00</u>	
License Fees			
Other			
Commission	<u>340.00</u>		
TOTAL	<u>42,285.00</u>	<u>43,125.00</u>	

## Service Work Order

0NF:

WorkOrder(ServiceInvoiceNo, Date, Name,  
Address, City, State, PostalCode,  
WorkPhone, HomePhone SerialNo, Make,  
Model, Year, Color, [WorkTODO], Parts,  
Labor, Tax, Total)

1NF:

WorkOrder(ServiceInvoiceNo, Date, Name,  
Address, City, State, PostalCode,  
WorkPhone, HomePhone Serial#, Make,  
Model, Year, Color, Parts, Labor, Tax, Total)  
WorkList(WorkTODO, ServiceInvoiceNo)

2NF:

WorkOrder(ServiceInvoiceNo, Date, Name,  
Address, City, State, PostalCode,  
WorkPhone, HomePhone SerialNo, Make,  
Model, Year, Color, Parts, Labor, Tax, Total)  
WorkList(WorkTODO, ServiceInvoiceNo)

3NF:

WorkOrder(ServiceInvoiceNo, Name,  
Serial#, Date, Parts, Labor, Tax, Total)  
Customer(CustName, Address, City, State,  
PostalCode, WorkPhone, HomePhone)  
Vehicle (SerialNo, Make, Model, Year,  
Colour)  
WorkList(WorkTODO, ServiceInvoiceNo)

<b>SPECIALTYIMPORTS SERVICE WORK ORDER</b>				
Service Invoice No: <u>W21642</u>		Date: <u>1997/02/11</u>		
Service for: Name: <u>Bugs Bunny</u>				
Address: <u>24 Carrot Lane</u>				
City: <u>Looneysville</u>		State: <u>California</u>	Postal code: <u>55555</u>	
Telephone Work: _____		Home: <u>(890)453-5421</u>		
Serial Number	Make	Model	Year	Color
J34865	Jaguar	UX	1997	Black
Work to be Done: <u>Find squeak</u>				
<u>Tighten seat</u>				
<u>Replace lost screw</u>				
Costs:				
Parts: <u>0.00</u>				
Labor: <u>0.00</u>				
Tax: <u>0.00</u>				
Total: <u>0.00</u>				

## Service Log

0NF – 3NF:

ServiceLog(InventoryNo, SerialNo, Date, TotalCost)

### **SERVICELOG**

<u>Inv.No.</u>	<u>Date</u>	<u>SerialNo.</u>	<u>TotalCost</u>
W21642	1997/02/11	J97UX301	0.00
W21645	1997/02/12	L96SR201	250.00
W21708	1997/02/15	A92AR404	4,329.00
W22772	1997/05/11	J97UX301	18.00
W22955	1997/05/24	M97CL701	234.00

## Vehicle Inventory Record

0NF:

VehicleRecord(SerialNo, Make, Model, Year, ExteriorColor, Trim PurchaseFrom, PurchaseInventory#, PurchaseDate, PurchaseCost, ListBasePrice, [Code, Desc, ListPrice])

1NF:

VehicleRecord(SerialNo, Make, Model, Year, ExteriorColor, Trim PurchaseFrom, PurchaseInventory#, PurchaseDate, PurchaseCost, ListBasePrice)

VehicleRecordOptions(Code, SerialNo, Desc, ListPrice)

2NF:

VehicleRecord(SerialNo, Make, Model, Year, ExteriorColor, Trim, PurchaseFrom, PurchaseInventory#, PurchaseDate, PurchaseCost, ListBasePrice)

VehicleRecordOptions(Code, SerialNo)

Options (SerialNo, Desc, ListPrice)

3NF:

VehicleRecord(SerialNo, PurchaseInventoryNo, Make, Model, Year, ExteriorColor, Trim, ListBasePrice)

InventoryPurchase(PurchaseInventoryNo, PurchaseFrom, PurchaseDate, PurchaseCost)

VehicleRecordOptions(Code, SerialNo)

Options (SerialNo, Desc, ListPrice)

Vehicle Inventory Record					
SerialNo.	Make	Model	Year	ExteriorColor	Trim
M07CL701	MercedesBenz	JL	1997	Red	BlackLeather
PurchasedFrom	Purch. Inv.No.	PurchaseDate		PurchaseCost	ListBasePrice
MercedesBenz	M32145	Jan. 18, 1997		34,000.00	38,900.00
Optional Equipment and Accessories- Factory					
Code	Description			ListPrice	
W31	Aluminumwheels			440.00	
L12	Lighting Group			390.00	

## Prospect List

0NF:

ProspectList(CustName, [Year, [Color, [Brand, [Model, [Trim, [OptionsCode]]]]]])

ProspectListYear(CustName, Year, [Color, [Brand, [Model, [Trim, [OptionsCode]]]])

ProspectListYear(CustName, Year)

ProspectListYearColor(CustName, Year, Color, [Brand, [Model, [Trim, [OptionsCode]]]])

ProspectListYear(CustName, Year)

ProspectListYearColor(CustName, Year, Color)

ProspectListYearColorBrand(CustName, Year, Color, Brand, [Model, [Trim, [OptionsCode]]])

ProspectListYear(CustName, Year)

ProspectListYearColor(CustName, Year, Color)

ProspectListYearColorBrand(CustName, Year, Color, Brand)

ProspectListYearColorBrandModel(CustName, Year, Color, Brand, Model, [Trim, [OptionsCode]])

ProspectListYear(CustName, Year)

ProspectListYearColor(CustName, Year, Color)

ProspectListYearColorBrand(CustName, Year, Color, Brand)

ProspectListYearColorBrandModel(CustName, Year, Color, Brand, Model)

ProspectListYearColorBrandModelTrim(CustName, Year, Color, Brand, Model, Trim, [OptionsCode])

1NF:

ProspectListYear(CustName, Year)

ProspectListYearColor(CustName, Year, Color)

ProspectListYearColorBrand(CustName, Year, Color, Brand)

ProspectListYearColorBrandModel(CustName, Year, Color, Brand, Model)

ProspectListYearColorBrandModelTrim(CustName, Year, Color, Brand, Model, Trim)

ProspectListYearColorBrandModelTrimCode(CustName, Year, Color, Brand, Model, Trim, OptionsCode)

2NF:

ProspectListYear(CustName, Year)

ProspectListYearColor(CustName, Year, Color)

ProspectListYearColorBrand(CustName, Year, Color, Brand)

ProspectListYearColorBrandModel(CustName, Year, Color, Brand, Model)

ProspectListYearColorBrandModelTrim(CustName, Year, Color, Brand, Model, Trim)

ProspectListYearColorBrandModelTrimCode(CustName, Year, Color, Brand, Model, Trim, OptionsCode)

3NF:

ProspectListYear(CustName, Year)

ProspectListYearColor(CustName, Year, Color)

ProspectListYearColorBrand(CustName, Year, Color, Brand)

ProspectListYearColorBrandModel(CustName, Year, Color, Brand, Model)

ProspectListYearColorBrandModelTrim(CustName, Year, Color, Brand, Model, Trim)

ProspectListYearColorBrandModelTrimCode(CustName, Year, Color, Brand, Model, Trim, OptionsCode)

## PROSPECTLIST

<u>Name</u>	<u>Want</u>
Bugs Bunny	1997 Green Land Rover w/ Power Steering (P47)
Bugs Bunny	1992 White Jaguar UX Black Leather
Elmer Befudd	1993 Mercedes Benz
Sam Molare	1996 Red Acura w/ Aluminum Wheels (W32)

## Integrated Relations

SalesInvoice (InvoiceNo, CustName, VehicleSerialNo, SalesInvoiceDate, Salesman, Discount, Commission, Taxes)

Customer (CustName, CustAddress, CustCity, CustState, CustPostalCode, CustWorkPhone, CustHomePhone)

Options (OptionsCode, OptionsDesc, OptionsListPrice, OptionsSale)

Insurance (Coverage, InvoiceNo)

InvoiceOptions (OptionsCode, InvoiceNo)

InvoiceTrade-In (TradeInSerialNo, InvoiceNo, Allowance)

Trade-In (TradeInSerialNo, TradeInMake, TradeInModel, TradeInYear)

VehicleShipment (VehicleSerialNo, Freight&Prep, Tax, LicenceFees)

WorkOrder (ServiceInvoiceNo, CustName, VehicleSerialNo, WorkDate, Parts, Labor, Tax)

WorkList (WorkTODO, ServiceInvoiceNo)

VehicleRecord (VehicleSerialNo, PurchaseInventoryNo, VehicleMake, VehicleModel, VehicleYear, VehicleColor, VehicleTrim, VehicleListBasePrice)

InventoryPurchase (PurchaseInventoryNo, PurchaseFrom, PurchaseDate, PurchaseCost)

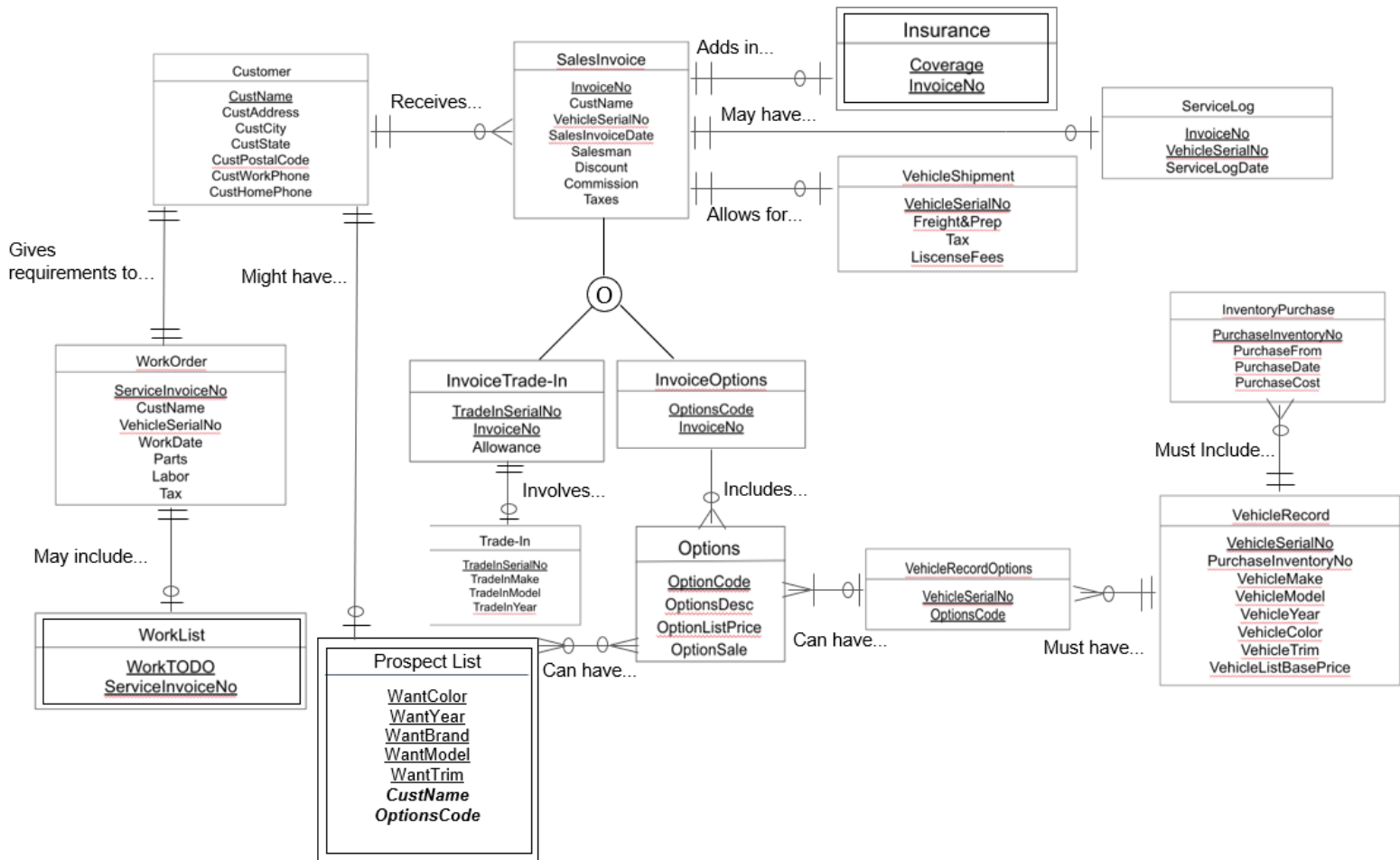
VehicleRecordOptions (VehicleSerialNo, OptionsCode)

ServiceLog (InvoiceNo, VehicleSerialNo, ServiceLogDate)

ProspectList (WantYear, WantColor, WantBrand, WantModel, WantTrim, OptionsCode, CustName)



## Enhanced E-R Diagram



We reverse-engineered the normalized relations to create this conceptual EER diagram.

This showed relationships among the entities to give the team a better idea of how implementing the database in SQL was going to work.