

Business Data Management and Analytics
Tutorial 7 – Data Modelling – Anomalies – POTENTIAL SOLUTION
Task 2 – Business Case Model 2

S.A.R.C. wants to store all its data into a database. Below is an invoice currently used by the repair technicians. It is hoped that this information can be entered directly into a portable device, eg. iPhone. The invoice could then be generated and sent to customers via email, fax or post.

Provide the following:

- Entity Relationship Diagram.
- Relational Model (showing fields, primary keys, foreign keys and concatenated keys).
- Justify the choices you have made. Are the entities and relationships you have chosen free of problems? What assumptions have been made?



**Smart Appliance
Repair Company Ltd**

ABN 12 345 678 901
73 Traders Avenue West Coleby NSW 2999
02 1234 5678

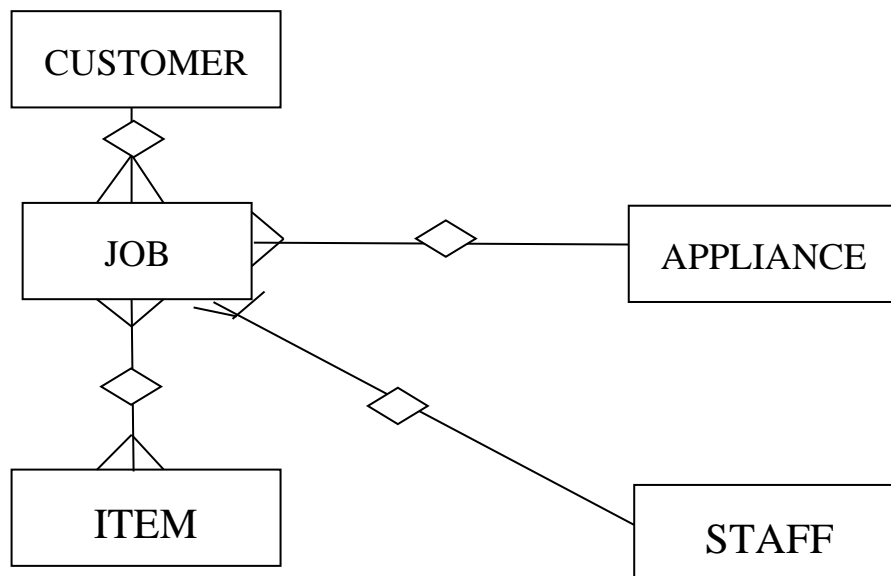


TAX INVOICE

JOB No.		DATE	
CUSTOMER'S NAME		APPLIANCE	
ADDRESS		BRAND	
		MODEL	
		SERIAL	
PHONE No		WARRANTY	
CUSTOMER COMMENTS		TECHNICIAN	
Responsibility for all work itemised on this invoice is strictly limited to the parts and labour as shown. Those parts and labour carry a 12 months warranty. Any other repairs subsequently done on the same appliance will be at the customer's expense.		Start Time	:
Reasons for Service:-		Finish Time	:
		TOTAL TIME	:
		LABOUR RATE	
		\$	per hr.
DESCRIPTION OF SERVICE OR GOODS SOLD		PRICE	
ALL SERVICE STRICTLY C.O.D. UPON COMPLETION OF WORK		TOTAL PARTS	
AIA repairers follow the agreed Fair Trading principles set out in the Whitegoods Repair Code of Practice jointly sponsored by the Industry and the Department of Fair Trading.		SUNDRIES	
		CALL FEE	
		LABOUR	
Customer Signature: _____		TOTAL(Incl GST)	
This work has been carried out to my satisfaction			

***** This is ONE potential solution based on assumptions specified below *****

Entity Relationship Diagram



Relational Model

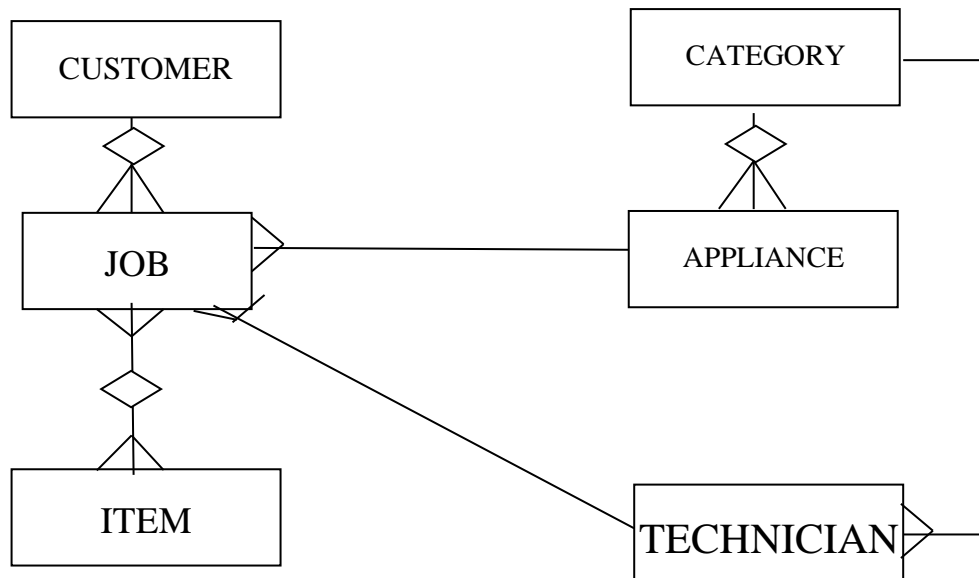
CUSTOMER	JOB	APPLIANCE	STAFF	ITEM
<u>Customer No</u>	<u>Job no</u>	<u>Appliance No</u>	<u>Staff No</u>	<u>Item No</u>
Lastname	Date of job	Name	Name	Type (P or S)
Firstname	Start time	Brand	Type (T,A)	Description
Address	Finish time	Model		Price
phone	labour rate	Serial		
Customer comments	Reason for service	Warranty		
	<u>Customer No</u>		JOB LINE	
	Sundries		<u>Jobline No</u>	
	Call fee		<u>Item no</u>	
	Signature		<u>Job no</u>	
	<u>Staff No</u>			
	<u>Appliance no</u>			

Assumption

- The type field in STAFF describes the role of the staff in the company, i.e. A Administrator; T – technician
- Labour rate is based per job (not technician), because this is quoted to customer
- Only one appliance per job... if more appliance... add multiple jobs.
- Assume signature required and stored for contractual purposes
- If more than one staff.... Place a note on the customer notes about any additional staff used.

*** This is ANOTHER potential solution based on assumptions specified below ***

Entity Relationship Diagram



Relational Model

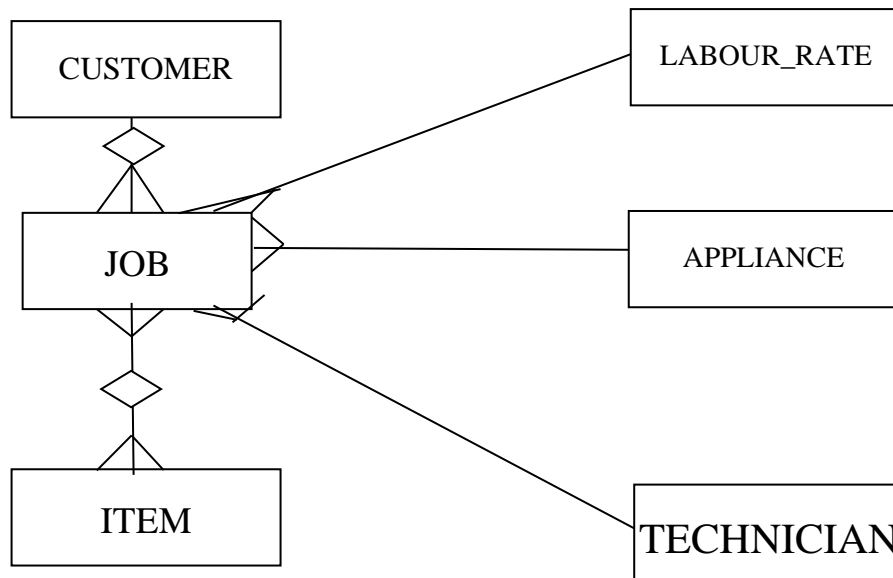
CUSTOMER	JOB	APPLIANCE	CATEGORY	TECHNICIAN
<u>Customer no</u>	<u>Job no</u>	<u>Appliance no</u>	<u>Category no</u>	<u>Technician no</u>
Last name	Reasons for service	Name	Description	Name
First name	Date of job	Brand		Contact
Address	Start time	Model		<u>Specialist</u>
Phone	Finish time	Serial		<u>Category no</u>
Email	Labour rate	warranty	ITEM	JOB LINE
	<u>Customer no</u>	<u>Category no</u>	<u>Item no</u>	<u>Jobline no</u>
	<u>Appliance no</u>		Description	<u>Job no</u>
	Sundries		Price	<u>Item no</u>
	Call fee			
	signature			
	Customer comments			

Assumption

- Assume customer comment relates to something common about customer that will be repeated on subsequent jobs
- Based on quoting for jobs a labour rate is based on the appliance to be serviced.
- If more than one appliance required to be service... separate JOB to be created for customer
- In order to have preference/specialist technical expertise... added relationship to category.

*** Yet ANOTHER potential solution based on assumptions specified below ***

Entity Relationship Diagram



Relational Model

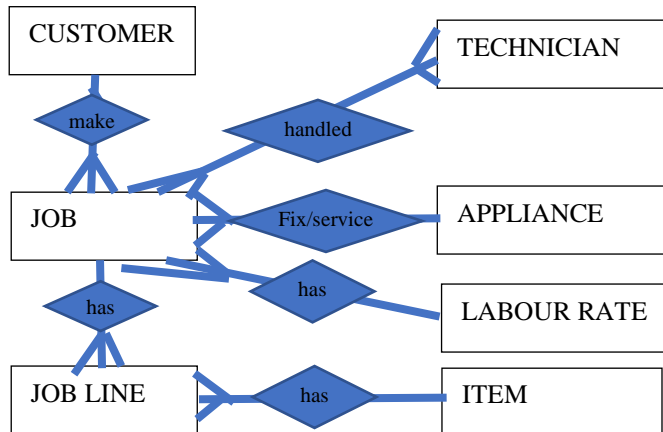
CUSTOMER	JOB		APPLIANCE	TECHNICIAN
<u>Customer no</u>	<u>Job no</u>		<u>Appliance no</u>	<u>Technician no</u>
Last name	Date of job	Reasons for service	Name	Name
First name	Start time		Brand	Contact
Address	Finish time		Model	
Phone	Labour rate		Serial	
Email	<u>Customer no</u>	<u>LABOUR_RATE</u>	<u>ITEM</u>	<u>JOB LINE</u>
Customer comments	<u>Appliance no</u>	<u>Labour Rate No</u>	<u>Item no</u>	<u>Jobline no</u>
	Sundries	Description	Description	<u>Job no</u>
	Call fee	Labour rate	Price	<u>Item no</u>
	signature			quantity
	Warranty			
	<u>Labour Rate No</u>			

Assumption

- Assume customer comment relates to something common about customer that will be repeated on subsequent jobs
- Based on quoting for jobs a labour rate is based selecting the appropriate labour rate based on description, i.e. standard, after hours, public holidays, etc....
- If more than one appliance required to be service... separate JOB to be created for customer.

*** Yet ANOTHER potential solution based on assumptions specified below ***

ERD



Relational Model

CUSTOMER	JOB	APPLIANCE	TECHNICIAN	LABOURRATE
<u>Customer no</u>	<u>Job no</u>	<u>Appliance no</u>	<u>Technician no</u>	<u>Labour rate no</u>
Title	Date of job	Name	Name	Rate per hour
First name	Cust_ comments	Brand		Type of rate
Last name	<u>Customer no</u>	Model	JOBTECH	Tax on rate
Address	<u>Appliance no</u>	Serial	<u>Jobtech no</u>	Call fee
Suburb	<u>Labour rate no</u>	Warranty	<u>Technician no</u>	
Postcode	Start time		<u>Job no</u>	
Phone no	Finish time		ITEM	JOBLINE
	Reason service		<u>Item no</u>	<u>Jobline no</u>
	sundries		Name	<u>Item no</u>
	Signature		price	<u>Job no</u>
			Type (G/S)	Quantity

Assumption

- each appliance must be a separate job
- for flexibility labour rate is related to a specific job.
- Call fee is related to the type of labour rate chosen for the job.
- Type field in ITEM is either “G”ood or “S”ervice.