

BSC (HONS) LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Modelling Report

Lecturer: Mr Graham Orr

Student: Mr xxxxx xxxxxxxx

Student ID: Pxxxxxx.

Executive Summary

From the outset the objective of the model was to display centralised results, by popularity, of the Ford Motor Company's sales throughout Financial Year 2011/12. The objective being to give the user a hub to extract information from that would assist the user in deciding which car model to chose – 30 combinations of Car and Colour were reported upon.

There were no major issues encountered during the build phase of the model apart from that mentioned within Para 2. A lack of experience in using Microsoft Access initially proved to be problematic, the online help guide became invaluable from the outset.

The applications created from the database enable the user to carry out 4 separate functions – The functions are all based around interrogating the database, the applications produced to display the interrogation results are all easily used however to assist in the use of the applications a basic user guide has been included.

As the database progressed it became clearly apparent the database could be adapted into an interactive method for predicting popularity, the intention being to adapt the database to any commodity – Car sales were used simply to get the database up and running. It is an intention to further develop the database into a method of predicting popularity of Operational Ration Packs, a prime commodity within 1st Line accounting.

It is a future intention to develop the model from a method of predicting popularity of ORP into a facility to forecast and control all 1st line stock checking within 6 Regiment RLC. The data required is extensive and was unavailable when the modelling phase commenced. The model therefore is in its infancy – The developed model will prove to be invaluable, in many ways, once completed.

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1. Introduction

1.1. The purpose of this report is to define the objective and use of a working model, produced in order to support this phase of the Supply Chain Modelling (SCM) module. The task set was to see how a simulation model, by the use of primary data, compares to that of the 'real world' and to establish how that real world compares to what could be the real world.

1.2. The initial plan was to provide a centralised hub for a 1st line unit such as a Quartermaster's Dept that would provide indicative data on the popularity of Operational Ration Packs (ORP). ORP is seen as a prime commodity within the Field Army: Selective ordering of ORP has repeatedly formed a bone of contention, there are in the region of 30 alternative menus now available to the customer, the model would affirm a method of parity in supporting those dependencies.

1.3. Unfortunately the data required to produce the hub was unavailable at the required time. As an alternative, data was sourced from the Ford Motor Company (FMC) annual sales were used, the theory being that regardless of commodity, the database could still be designed to meet the basic requirement.

1.4. FMC yearly sales figures were obtained through various sources. Collecting the sales figures and centralising the figures allowed visibility through a number of channels, specifically analysing the figures and calculating the most popular model within one period, in this case one year, it is an assumption that displaying the information at a central hub would prove to be useful in many ways.

2. The purpose of the Model

2.1. It is an assumption that a customer's decision process is based mainly on the suitability of the commodity requirement, in this case a car, the aim therefore of the model is to create a system that can be used in assisting the customer with that decision process.

2.2. The model, in its current format, uses Microsoft Access to produce graphical data to illustrate the findings. Those FMC models selected were Ka, Fiesta, Focus, Mondeo, S-Max and Kuga.

2.3. The secondary purpose of the model was to provide the user with a method of popularity driven decision making, the decision process would be supported by confirming that a particular model of a particular colour of a particular design that runs off a particular fuel type is more popular than another.

2.4. The same methodology can be applied to ORP, the diverse range of menu's currently available range from a general purpose menu through to specific menu's such as vegetarian. To provide the accountant with a correlation of customer usage and the customer with consolidated available would ultimately offer assurance to both parties concerned, the aim of which is to increase efficiency in the distribution and consumption of the ration commodity.

3. Model Construction

3.1. Initially a Microsoft Excel spreadsheet formed the basis for the model design, the first task being to create a database that reflected the real world but that also provided a suitable scenario to establish the end requirement which in this case was to create a working model.

3.1. 1. Data

3.1.2. The secondary data for the model was drawn from a number of multi-media based sources:

- The Ford Motor Company – Annual sales statistics.
- The World Wide Web in general – i.e. The Automotive Association annual statistics.
- Automotive Journals/Magazines – i.e. Top Gear magazine, What Car.

3.1.3. To compile the data base only the sales made during FY 2010/11 were included. To assist in the completion of the database a percentage of the sales were automatically populated by the Microsoft Excel Sum function.

3.1.4. Due to the structure of the model there was no requirement, at the time, for primary data. It should be noted at this point that if the model was

required to be used in subsequent FYs the current data would be out of date and therefore would require updating prior to use.

3.1.5. Having already established the secondary data, a distinct pattern became apparent in that the data referred to annual sales. The following were criteria that formulated the basis of the decision making process:

- Sales by price range – The lowest being £8,000 and the most expensive £16,000+.
- Sales by colour – A range of five differing but typically standard colours were selected.
- Sales by body type – The 3 and 5 door variants were obvious choices due to the overall popularity but to add an element of structure the Sports Utility Vehicle (SUV) and Multi Person Vehicle (MPV) variants were included.
- Sales by Transmission – The two most commonly used drives, Manual and Automatic, were included.
- Sales by Fuel type – Petrol and Diesel were chosen out of the fuel types available, battery power and Liquid Petroleum Gas (LPG) provided less value towards the SCMs objective and therefore were disregarded.

3.1.6. The model's database was developed to cross refer between each criterion mentioned within section 3. by cross referring the data sources the analytical properties of the model were increased.

3.2. Problems Encountered During the Build Phase

3.3. After establishing the data on Microsoft Excel it became apparent that for data relationship reasons the data would need to be transferred from Excel to Microsoft Access – The change was presumed to be the best method of making a working model from the data gathered.

3.4. Producing a working model from Microsoft Access proved to be a task in itself, inexperience proving to be the biggest contributing factor, this however proved to be a minor setback – the guidance provide by online help screens proved to be invaluable.

4. Model Database

4.1. To achieve the aim set out by this phase of SCM a working Access database was produced, the primary key used the model and colour and identified the focal point for the database. In addition the database contained the following criteria:

- The price range sales by car model/colour,
- The body style sales by car model/colour.
- The fuel type sales by car model/colour.
- The drive type sales by model/colour.
- The engine size sales by model/colour.
- The total of sales by model/colour
- The popularity by model/colour.

5. Model Applications

To create a working model the following applications were produced:

- Sales overview Screen.
- Sales Table.
- Sales Calculator.
- Sales Report.

5.1. Screen Orientation

5.2. The screenshot shown at *Figure 1* shows the sales application. The method used to present the secondary data, the screen itself is interactive which is

achieved through the query buttons. The database can be further interrogated by using a scroll selector to switch between the Ford model of choice.

The screenshot shows the Microsoft Access application window titled 'Database1 : Database (Access 2007) - Microsoft Access'. The interface includes a navigation pane on the left with 'Sheet1' selected. The main form area displays the following data and controls:

- Sales FY 2010/11** (Red box)
- Model Select** (Red box) with a dropdown menu showing 'Black Focus'.
- Buttons for model popularity: 'Ka Popularity', 'Fiesta Popularity', 'Focus Popularity', 'Mondeo Popularity', 'S-Max Popularity', and 'Kuga Popularity'.
- Price Range** section with a table:

Price Range	Count
8000:	6286
10000:	7582
12000:	8037
14000:	1138
16000:	456
- Fuel Type** section with a table:

Fuel Type	Count
Petrol:	8918
Diesel:	14582
- Engine Size** section with a table:

Engine Size	Count
1100 cc:	6286
1200 cc:	7582
1600 cc:	8037
2000 cc:	1138
2200 cc:	456
- Body Style** section with a table:

Body Style	Count
3 Door:	7436
MPV:	
5 Door:	11586
Estate:	4022
Convertible:	456
SUV:	
- Drive** section with a table:

Drive	Count
Manual:	21085
Automatic:	2415
- POPULARITY** section with a red box and a value of 4.
- Buttons for 'Sales Report' and 'Print Sales Report'.

The status bar at the bottom shows 'Form View', 'Record: 15 of 30', 'Unfiltered', and a search bar. The taskbar at the bottom includes icons for 'SCM', 'Model Report [Com...', and 'Microsoft Access - ...'.

Figure 1: Sales Application.

5.3. A central reporting and printing function has been added so that the user can provide supporting documentation (*Figure 2*). The interactive buttons within the sales application, when pressed, produce sales results by the Ford car model.

Print Preview

Sheet1 Sales Report

Sales

02 June 2011
09:10:39

Colour	Model	8000	10000	12000	14000	16000	MPV	3 Door	5 Door	Estate	Con
Red	Ka	4269	4031					4617			
Blue	Ka	4605	4495					4839			
Green	Ka	4074	3826					4422			
White	Ka	3370	3230					3488			
Black	Ka	4283	4117					4334			
Red	Fiesta	2466	4730	4433	1671			5991	7309		
Blue	Fiesta	3173	5726	5443	2058			7580	8820		
Green	Fiesta	1192	2259	2119	780			2854	3496		
White	Fiesta	4090	7571	7166	2673			9816	11684		
Black	Fiesta	5879	11614	10839	3969			14308	17992		
Red	Focus	4561	5542	5886	870	340		5481	8427	2953	
Blue	Focus	2659	3270	3411	467	193		3260	4761	1786	
Green	Focus	1338	1655	1681	189	88		1637	2307	918	
White	Focus	4655	5651	5985	866	344		5586	8549	3021	
Black	Focus	6286	7582	8037	1138	456		7436	11586	4022	
Red	Mondeo			7477	9078	2545			8440	10660	
Blue	Mondeo			9511	11144	3046			10412	13288	
Green	Mondeo			637	759	204			705	895	
White	Mondeo			7153	8892	2355			8201	10199	
Black	Mondeo			14072	17027	4601			15842	19858	
Red	S-Max					10510	1990	12500			
Blue	S-Max					8765	1735	10500			
Green	S-Max					2227	423	2650			

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Page: 1 of 1 Unfiltered

Figure 2: Sales Report.

5.4. The screenshot shown at *Figure 3*. refers to the total sales application, the application provides the user with an interactive button array that, when pressed, display overall sales by desired model.

Home Create External Data Database Tools

Sheet1 Ka Sales Table Sales Calculator

Fiesta Focus Ka

Kuga Mondeo S-Max

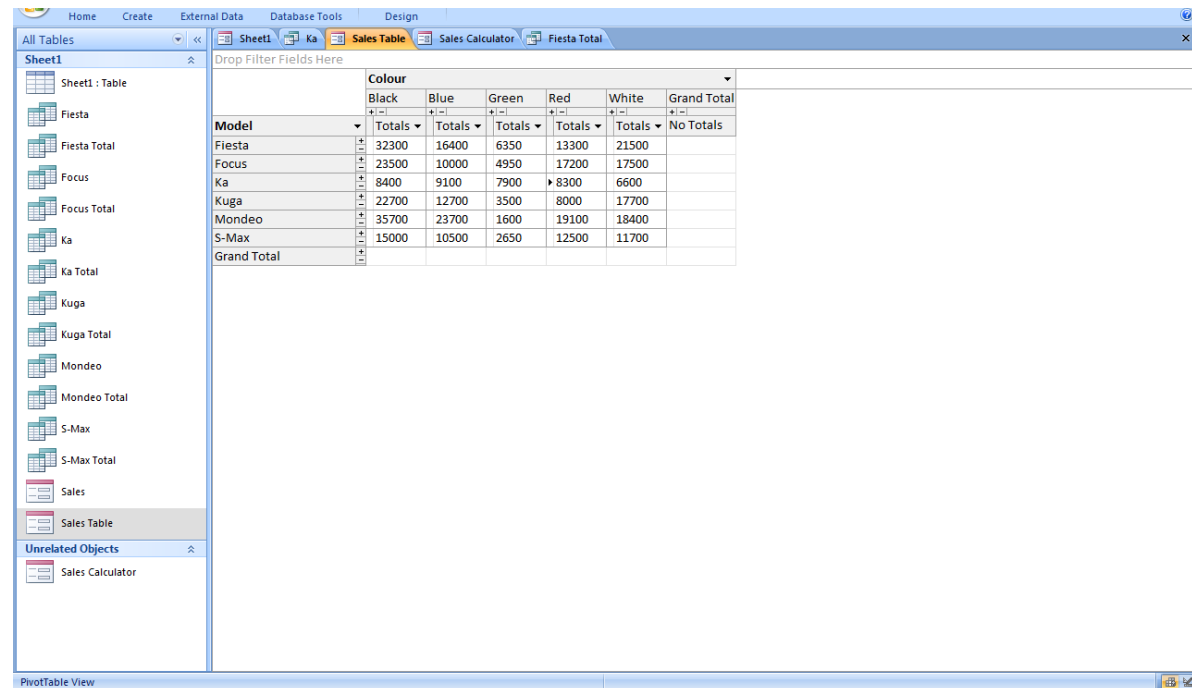
Select a model to see how well the sales performed over FY 2011/12

Record: 1 of 1 No Filter Search

Form View

Figure 3: Total Sales Application.

5.5. To present the data in table format a simple Microsoft Access based interactive table was produced (*figure 4*) the total sales by model are represented. The table can be interrogated to provide singular or multiple results dependant on user requirement.



Model	Colour					Grand Total
	Black	Blue	Green	Red	White	
Fiesta	32300	16400	6350	13300	21500	
Focus	23500	10000	4950	17200	17500	
Ka	8400	9100	7900	8300	6600	
Kuga	22700	12700	3500	8000	17700	
Mondeo	35700	23700	1600	19100	18400	
S-Max	15000	10500	2650	12500	11700	
Grand Total						

Figure 4: Sales Table Application.

6. Using the Model

The model's user guide can be found at Appendix A to this report.

7. Pre-Training Requirements

7.1. There is no current requirement to carry out any mandatory training in support of the use of this model, it is assumed that the user guide will be seen as sufficient documentary guidance to facilitate its use. Development of the model may require user training to be conducted.

8. Future Model Development

8.1. Initially the model will be adapted into a method of controlling the flow of attractive/popular commodities within the Quartermaster, 6 Regiment's area of

responsibility (AoR). Operational Ration Packs (ORP) will be used as a pilot to test the model's current value, once created and tested, the aim is to further develop the model into a centralised database of 1st line Stock Checking records within 6 Regiment both archived and planned.

8.2. The database will provide an information pool for the relevant accountants on the frequency of which their accounts would be checked and would also be a reference point, coupled with the accounting systems, for accountants to refer back to if required.

8.3. The model will become a live database and will only be presented once the necessary amount of development has been reached, the model in its current format is the first stage in the development process.

8.4. The model in its current format is unusable for its intended purpose. To assist in preparing the database a Snapshot of all the commodities held within 6 Regiment at 1st Line is required, in Excel format. Once the appropriate preparatory work has been carried out on the raw data the spreadsheet will be imported to Microsoft Access.

8.5. Microsoft Access will facilitate the creation of the Stock Checking model, it is intended to create a hub for all accountants to visit, the information presented to the accountants will take the form of the following:

8.5.1. Weekly Stock Checking programmes, by squadron. With the exception of valuable and attractive items such as Weapon Systems, the programme will cover a two year period.

8.5.2. Previous Stock Checking archives.

8.6. A method of printing the appropriate records will also be included, sub-unit commanders checks are a mandated requirement within Stock Checking programme, printing the requirement prior to the checks taking place will greatly improve the efficiency of the checking regime.

9. Recommendations

9.1. There are two avenues of approach regarding recommendations for the future, firstly the end objective of turning the model, in its current format, into a method for managing the 1st line Stock Checking within 6 Regiment. This will be the focus for the model in the future.

9.2. The Model in its current format can also be improved in many ways, the predictive qualities are only presented through the sales of the previous year. It would be possible to establish a method of forecasting requirement, based on the previous year's usage – Extensive research is required and a better understanding of the calculation side of Microsoft Access is essential.

User Guide.

1. The database itself is straight forward to use, the following guidelines should be followed to for updating and refreshing the existing database, as previously mentioned the whole process stems from the database, any keystroke made would be reflected throughout the various elements included within the database.
2. For the purpose of this report the data will be known as database 1. Select database 1 from the appropriate location within the IT Station of choice. Double click on the icon for database 1 and the programme will open. The user will be presented with the following options within the navigation field:
 - a. Sheet 1:Table – The main database required to produce the sales results.
 - b. Various Model enquiry screens – Required to interrogate the database effectively.
 - c. The main sales display screen – As previously shown at *Figure 3.1*.
3. Double clicking on Sheet 1:Table will bring up the database as previously mentioned at section 3.1. All of the fields within the database are amendable dependant on the current financial year/figures available.
4. There are two methods of interrogating the database:
 - a. By Sales – A consolidated view of sales by car model/colour.
 - b. By Total Sales – An interactive application for viewing total sales by car model.
 - c. To use the sales application - Double click on the application, as previously mentioned at section 3.3. of this report, using the scroll bar at the top of the application select the type of car model required. The sales figures are displayed as a result of selecting the appropriate car model.
 - i. The Icons available within the application, when clicked, present the user within a consolidated view of car model sales.

- ii. A method of printing a report of total sales is available – the user simply clicks on the ‘print report’ reporting has been added to the sales application
 - d. To use the Total Sales application, as previously mentioned within section 3.3., simply select the car model required and click the icon that refers, the total sales are then displayed.
5. A method of presenting the sales data has been added – To view the total sales in table format simply click the ‘Sales table’ icon. The table is interactive, sales by car model and colour can be added/taken away via the interactive buttons within the table.