

**Hong Kong Institute of Vocational Education**

**Department of Information Technology**

**ITP4915M System Development Project  
Case Study  
(2018-2019)**

## **Case Study: Smart & Luxury Motor Company (Spares) Limited**

### **1. Introduction**

#### **1.1 Terms of Reference**

Following recommendations contained in study prepared by consultants a decision to upgrade the computer system was made. The new system has been installed for seven months during which a number of jobs, including payroll and production scheduling, have been taken on. A system team is still working in the production area. You are a member of a team brought together a month ago to implement the next phase of the study. This consists of an investigation into the order processing, stock recording, and invoicing routines of the Smart & Luxury Motor Company (SLMC) spares operation.

You must examine in depth the existing procedures in the above areas. These procedures will, however, be linked with associated financial and management information procedures, and your terms of reference specify an open-ended system capable of extension in appropriate areas at a later date. Any proposals for an immediate extension of the area of investigation should have the approval of management. You should aim to design a system for order processing, stock recording and associated financial routines.

As a basis on which to commence your study, you are provided with extracts from the consultants' study report. This was presented two years ago; and therefore cannot be considered to reflect exactly the present situation. Nor does it contain all the information you will require.

Having analyzed the situation you will be expected to acquaint management with your findings about the existing situation and your outline proposals for overcoming difficulties before they give their permission for you to design a system to meet the immediate needs. You will then be responsible for the development of the approved system.

### **2. Profile of the Smart & Luxury Motor Company**

The Smart & Luxury Motor Company (SLMC) is a public limited liability company, assembling and distributing motor cars, and trading entirely in the Peoples' Republic of China (PRC). It manufactures the engines of its three basic types of car and buys-in all the other components from which the cars are assembled.

The business was founded as a production team concern in 1970, became a private company in 1995 and went public in 1998. In the

early years, the company was awarded a Government contract for the manufacture of trucks but since there has been concerned only with private cars. The current range is of three basic models, but there are some variants giving a comprehensive range of family, touring and sports cars.

In 1990, Easy Sit Limited – manufacturers of cars seats – became a subsidiary of the company. Easy Sit is autonomous and apart from giving an advantageous trading discount to SLMC, is otherwise treated as an ordinary supplier to the company.

Two years ago, following the consultants feasibility study, Smart & Luxury Motor Company (Spares) Limited was created as a distinct subsidiary of the parent company. Senior management and the area sales staff, however, remain common to the two companies.

The company organization chart is shown in Figure 1. The Board of Directors establish company policy and an executive committee consisting of the managing director, the sales and purchasing managers, and the secretary, are responsible for implementing these policies. This committee meets monthly to prepare budgets for sales, production, administration and capital expenditure. Within these budgets the production schedules and sales plan are prepared.

Progress is controlled by receiving monthly variance statements and balance sheets, and checking these against plans.

The company works a six days a week. Working hours are: stores and Despatch office – 0815-1930 (45 minutes of lunch); offices – 0845-1830 (45 minutes for lunch). The works, but not the spare parts stores, close for two weeks annual holiday. All departments close on statutory holidays.

### **3. Order and Stock Policy**

Consultants, engaged three years ago to examine company procedures and prepare a report, found that conflicting demands arose from an attempt to satisfy spares and production requirements from a common stock. Apart from their proposal regarding the upgrading of computer system, they recommend the creation of a separate stock for the spares demand, and the packaging, where possible, of items as ‘Smart & Luxury Spares’. This system has worked well and any attempt to recombine production and spares stocks would be vigorously resisted by management.

The consultants also installed an automatic re-ordering system based on

stock records and average consumption rates, but this quickly fell into disrepute as a result, it is assumed, of a clerical errors, and delays in stock recording. The present 'physical' control system was devised as an expedient and is regarded as the best possible in the circumstances.

Current company policy dictates that:

- delivery of items actually in stock is to be within two working days of the receipt of order, except for 'overnight' runs;
- despatch of items not in stock on receipt of order is to be 'automatic' (the dealer does not re-order) and must take place within five working days of the replenishment of stocks, oldest orders first;
- price must not appear on documents used in the spare parts store;
- invoices must be despatched within one working day of the despatch of material;
- an evaluated list (at standard purchase price) is required for all stock balances at the end of each accounting period.

This policy is based on what is thought to be practical rather than, necessarily, on what is desirable.

#### **4. The Sales Division**

The sales manager controls three functions:

- stimulating sales of cars and Smart & Luxury spares in the PRC. Since most items are bought-in, it is possible for dealers to buy spares direct from suppliers, but normally at a higher price than Smart & Luxury spares;
- maintaining an efficient sales order office to meet dealers' orders for cars and spares;
- holding sufficient stocks of Smart & Luxury spares to meet dealer demand within the timescale established by the executive committee but without inflating inventory levels, which are already considered by management to be too high.

##### **4.1 The Sales Function**

Cars and spares are sold through 50,000 main dealers in the PRC in different provinces and cities. Dealers distribute spares to a number of branches, or agents of their own choice. There are three hundred main sales areas, each with an area manager who controls a selling force making regular calls on dealers. The Smart & Luxury franchise is generally well thought of by the dealers. Salesmen are responsible for encouraging dealers to make use of the Smart & Luxury spares service.

## **4.2 The Spares Sales Order Office**

It is the responsibility of the sales order office manager to support the selling force by processing dealers' orders and issuing instructions for the despatch of spares. Dealers are instructed not to re-order items which are indicated as out of stock (although they may order further quantities of such items). The sales order office manager must therefore ensure that outstanding orders are dealt with promptly and automatically.

## **5. The Stock Control System**

Smart & Luxury spares are grouped into four categories:

A	Sheet Metal	(1,000 lines)
B	Major Assemblies	(10,000 lines)
C	Light Components	(25,000 lines)
D	Accessories	(14,000 lines)

Spares are located in the stores numerically within their physical category. Each bin location contains one complete line and is identified by a part number which consists of the category letter plus a 5 digit number. When a new part is introduced, a part number is allocated by the spare parts controller according to its physical category.

With the aim of satisfying the desired level of dealer service, re-order levels and quantities, and danger levels have been established. These are not altered except when the need to do so is highlighted by stockouts, by storemen commenting on slow-moving lines, or to take account of seasonal fluctuations (forecasts usually based on intuition and experience).

## **6. Growth of Competition**

Over the past year SLMC Spares has been subject to competition from several organizations selling spares and accessories which can be used on SLMC cars. These organizations are making inroads into SLMC Spares sales and profits by providing an off-the-shelf service over a limited range of products. This limited range incorporates SLMC's fast moving and highly profitable lines. The problem from SLMC's point of view, is essentially that they are unable (without considerable effort) to tell a dealer who enquires over the telephone whether or not stock of a particular item is available. Even if it is available and the Sales Office could so inform the dealer, there is no mechanism for reserving the stock for that dealer. This inability to answer dealer's queries and reserve stock is beginning to cause loss of sales and profit and the situation is likely to deteriorate further unless steps are taken to rectify it.

## **7. Computer System**

In these years, different offices and departments use their only budget to develop computer systems to support their own operations. All these systems developed in different offices and departments are independent systems. Depending on the budget and operation volume, some departments are using mini-computer systems while some use micro-computer based systems. These systems are not integrated with each other. At most, data are transferred by email or ftp between one department and the other. The IT department is only responsible for the use of IT in the head office and some major offices and sites.

The consultant recommended upgrading the system by putting all the operations in a coordinated and systematic way so as to better utilize the information that can be obtained from the computer system in all sites.

## **8. The Smart & Luxury Motor Company**

### **Extracts from Consultants Report System Description – Order Processing and Stock Recording**

#### **Incoming Orders**

Orders are received twice daily (0830 and 1200) in postal batches; throughout the day by telephone; throughout the day and night by telex and fax; and by verbal instructions, during the day, from dealers' vanmen & representatives, and emails to sales representatives & sales offices.

There are, currently, the following minimum requirements for order data supplied by the dealer:

- Dealer's name and address
- Dealer's code number (3 digits)
- Delivery address – if different from dealer's address
- Part number and quantity required

There is no standard order form either for issue to dealers or for use as a standard document at SLMC.

Order volumes are, approximately:

- Order per day from dealers

- Minimum 0, Maximum 16,000, Average 10,500

Items per order

- Minimum 1, Maximum 3750, Average 1550 Unique items ordered per day – average 80,000 Unique items ordered per week – average 120,500

### **Order Processing**

On receipt every order is allocated a SLMC serial number. The contents of the orders are input to computer by the Order Processing Clerk. The computer generate a Despatch Instruction Cover (DIC) for each order received and a Despatch Instruction Detail sheet (DID) is generated for each item on that order. Figures 2 and 3 are specimens of these forms.

During this process an outstanding orders file is referenced to establish whether or not a dealer has any previous orders still unsatisfied. These will be included in the DIDs in the space indicated, if they are for a part currently ordered; otherwise a separate DID will be raised for each item. This file is also inspected weekly for the clearance of outstanding orders not picked up during the normal order routine.

The DID's are sorted into part number order for each dealer and together with their DICs form a DI set which is sent to the spare parts store.

Original orders are then filed, in the sales office, by SLMC serial number within dealer. The SLMC serial order consists of eight digits.

### **Order Assembly Procedure**

The DI sets are received in the spare parts store and the storemen pick the items from the bins.

Where there is insufficient stock in any bin to meet the order then this is indicated on the DID by apportioning the ordered quantity between 'actual quantity despatched' and 'to follow'. The latter, clearly generates an outstanding order.

Where in meeting, wholly or partly, any order for a particular item it is necessary to reduce the stock to below the re-order level (ROL) then the re-order card (see Figure 4) is sent to the purchasing department.

Should the balance drop to below the minimum stock level, then the danger card (see Figure 5) is also sent to the purchasing department, together with the re-order card (if this is at the bin).

Where the order clears the bin then the out of stock card (see Figure 6) is sent to the purchasing department, together with the re-order card. (if available).

All three types of card are, under normal stock conditions, retained at the bin.



When an order has been assembled, it is passed with its DI set to the spares despatch department.

An automatic re-ordering system has been installed in the warehouse. The Stock Records Clerk has to input the amount of goods inward items and goods outward items every time. He has to input the discrepancy and amount of scrape items as well.

#### **Staff Comment and Opinion**

The spare parts controller is relatively satisfied with the present system (which he considers is the only one likely to work), but would appreciate and recognizes the need for, more regular and speedy information. He would like to know more quickly how items are moving and whether or not they display any particular trends. He feels it may be possible to group items on the basis of rate of turnover, not only from the classification aspect, but also to cut down on the amount of time spent by storemen walking between the bins and the despatch bay.

#### **Spares Despatch Procedure**

When the spares despatch department receive a despatch instruction set, an invoice set (6-part set, see Figure 7-12) is raised and part-completed. Excluded are 'number of bundles' (not now used), 'price' and 'value'. Copies 1, 2 and 3 of the 'invoice' are passed to the invoicing section.

Copy 4 is the advice note and is posted to the dealer. Copies 5 and 6 are despatch notes and after signature by the despatch foreman accompany the order to the dealer.

Copy 5 is signed by the dealer and returned by the van driver to the spares despatch department. Here it is filed in invoice number order. Invoice coding is currently 2 alphas, and 6 numeric.

Copy 6 is retained by the dealer.

Following the part-completion of the invoice set, the DI set is sent to the stock records clerk.

#### **Staff Comment and Opinion**

This generally bears out comments made by the stores controller, particularly in the matter of locating fast-moving items as near as possible to the despatch bay. There is, seemingly, some difficulty experienced in the final assembly of orders before loading on to the vans, and in the checking of orders.

It is felt that some better documentation to identify individual items on an order to the order serial number might be devised. Possibly ticketing might answer this. Difficulty is also experienced in getting staff to work overtime.

### **Stock Recording Procedures**

The stock records clerk receives the DI sets from the spares Despatch department. From each DID he enters the 'actual quantity Despatched' figure on to the stock record card for that part. A specimen stock record card is attached (see Figure 13). He then input the values to the computer. The computer calculates the new book stock balance. The stock records clerk copies the balance onto the record card. He also ticks the 'entered stock' box on the DID.

The DIDs are now returned to the sales office.

Goods received notes arrive from the goods inward department and each line entry is input to the computer and posted to the stock record as well. The new book stock is calculated by the computer and recorded in both computer and stock record. The item on the GRN is then ticked. The GRNs are subsequently sent to the purchasing department for invoice clearing. Figure 14 is a specimen GRN.

As the continuous inventory check proceeds the actual stock figures are entered on the record card in the 'inventory check, actual figure' column. Discrepancies are reported to the accountant where any exceeding 1 per cent or \$100 whichever is the greater, are investigated. The write-off last year was \$9,000,000.

### **Sales Manager's Comment**

The Sales manager has expressed some direct if not too confident views on the subject of inventory control. Whilst he is not fully aware of the implications of demand forecasting and exponentially smoothed forecasts and their influence upon re-order levels and re-order quantities, he knows that there is something of considerable value in these methods. In the main he is satisfied with the level of service provided by the stores, but feels that the sales order office does not always have sufficient information to answer customer queries.

Figure 1 SMLC Organization Chart

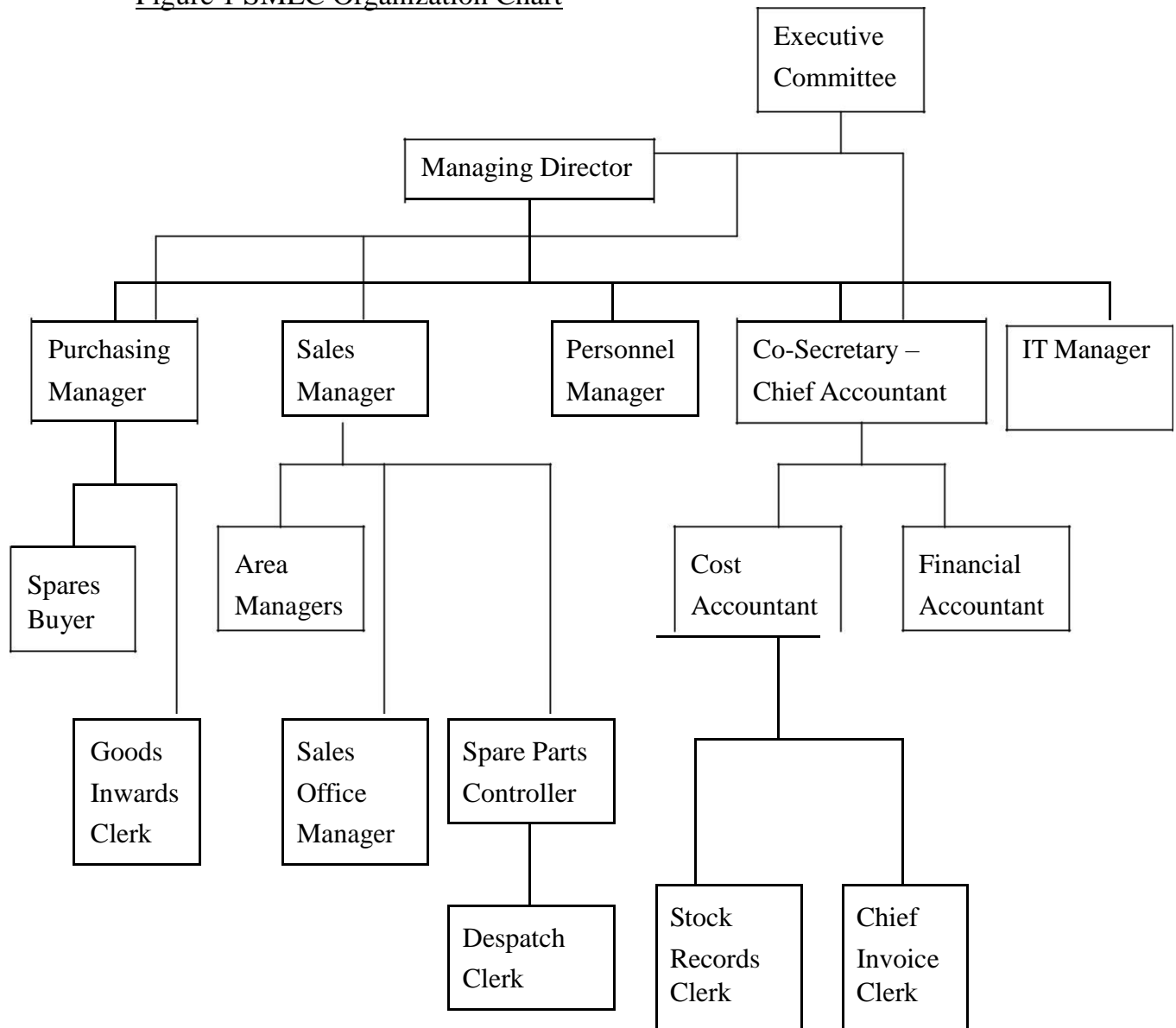


Figure 2 Despatch Instruction Cover

DESPATCH INSTRUCTIONS		
	DATE	ORDER SERIAL
	INVOICE NAME AND ADDRESS	DELIVERY ADDRESS
	DEALER ORDER NO.	

Figure 3 Despatch Instruction Detail

DESPATCH INSTRUCTION		DATE	From: Sales Office To: Spare Parts Stores	
		Order Serial		
		Dealer Code		
		Part No.		
Order Qty.	Previous Outstan- ding	Total to Despatach	Entd. Stk.	
		Actual Quantity Despatched (if different from ordered)	Entd. Stk.	
		Order Serial		To follow
		No. of Bundles		
		Weight		
		Carrier		

### Figure 4 Re-order Card

[illegible]

Figure 5 Danger Card

<p><b>DANGER</b></p> <p><b>LEVEL REACHED</b></p> <p>On Part No. _____</p> <p>Latest</p> <p>Order No. _____</p> <p><u>Storeman</u></p> <p>Please write latest Order No.</p> <p>in PENCIL</p>
---

Figure 6 Stock Card

OUT OF  
STOCK

Part No. \_\_\_\_\_

Latest

Order No. \_\_\_\_\_

Storeman

Please write latest Order No.

in PENCIL



Figure 7 Invoice Set – Part 1

<b>SMART &amp; LUXURY MOTOR Co. Ltd.</b>						INVOICE
SMLC District, Tienhou, Guangzhou.						
Tel: 133 808 12345			Grams: SmartLuxuryMC		Part 1	
INVOICE ADDRESS				DELIVERY ADDRESS (IF DIFFERENT)		
				PER		
DATE		YOUR ORDER NO.		OUR ORDER NO.		DEALER CODE
No. of bundles	Part No.	Prev. Qty. under delivered	Quantity to follow	Quantity delivered	Price	Value
Terms: Net 30 days						
Bankers: Bank of Chinese Merchant, Guangzhou						\$

Figure 8 Invoice Set – Part 2

<b>SMART &amp; LUXURY MOTOR Co. Ltd.</b>						INVOICE
SMLC District, Tienhou, Guangzhou.						
Tel: 133 808 12345			Grams: SmartLuxuryMC		Part 2	
INVOICE ADDRESS				DELIVERY ADDRESS (IF DIFFERENT)		
				PER		
DATE		YOUR ORDER NO.		OUR ORDER NO.		DEALER CODE
	Part No.		Quantity to follow	Quantity delivered	Price	Value
Terms: Net 30 days Bankers: Bank of Chinese Merchant, Guangzhou						\$

Figure 9 Invoice Set – Part 3

<b>SMART &amp; LUXURY MOTOR Co. Ltd.</b>					<b>INVOICE</b>	
SMLC District, Tienhou, Guangzhou.						
Tel: 133 808 12345		Grams: SmartLuxuryMC			Part 3	
INVOICE ADDRESS				DELIVERY ADDRESS (IF DIFFERENT)		
				PER		
DATE		YOUR ORDER NO.		OUR ORDER NO.		DEALER CODE
No. of bundles	Part No.	Prev. Qty. under delivered	Quantity to follow	Quantity delivered	Price	Value
<b>Terms:</b> Net 30 days <b>Bankers:</b> Bank of Chinese Merchant, Guangzhou						\$

Figure 10 Invoice Set – Part 4

Part 4

CONSIGNMENT NOTE

Part 4

CONSIGNMENT NOTE

**SMART & LUXURY MOTOR Co. Ltd.**

SMLC District, Tienhou, Guangzhou.

Tel: 133 808 12345      Grams: SmartLuxuryMC

The following goods

have been sent today

INVOICE ADDRESS			DELIVERY ADDRESS (IF DIFFERENT)		
			PER		
DATE	YOUR ORDER NO.		OUR ORDER NO.		DEALER CODE

No. of bundles	Part No.	Prev. Qty. under delivered	Quantity to follow	Quantity delivered	
					Total weight
					Despatch Foreman

All shortages or damage must be notified to us within 48 hours

Figure 11 Invoice Set – Part 5

DELIVERY NOTE					
Part 5					
<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p><b>SMART &amp; LUXURY MOTOR Co. Ltd.</b></p> <p>SMLC District, Tienhou, Guangzhou.</p> <p>Tel: 133 808 12345      Grams: SmartLuxuryMC</p> </div> <div style="width: 35%; text-align: right;"> <p>Please receive the</p> <p>following goods:</p> </div> </div>					
INVOICE ADDRESS			DELIVERY ADDRESS (IF DIFFERENT)		
DATE			YOUR ORDER NO.		OUR ORDER NO.
No. of bundles	Part No.	Prev. Qty. under delivered	Quantity to follow	Quantity delivered	
					Total weight
					Despatch Foreman
<p>Received in good order</p> <p>Date.....Signature.....</p>					

Figure 12 Invoice Set – Part 6

[illegible]

### Figure 13 Spares Stock Record Card

[illegible]

Figure 14 Goods Received note (GRN)

GOODS RECEIVED NOTE		Serial Stamp	
SUPPLIER			
		Our Order No.	Part/All
Part No.	Quantity	Part No.	Quantity