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**Improvements in the Materials Supply Chain for a Motor
Sport Supplier using Quality Management Techniques.**

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This Thesis is submitted in partial fulfilment of the
requirements for the degree of Master of Research

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Abstract

Ray Mallock Ltd is a medium sized business operating in one of the fastest developing, expensive, international industries, motor sport. A tremendous amount is spent every year on research and developing cars to go faster because the company's reputation stands upon their cars winning. Motor sport is primarily located in the south of England with many small specialist suppliers developing around the various teams.

The suppliers to the motor sport industry are often under considerable pressure to respond instantaneously to the needs of each team. With such a wide range of skills and types of suppliers the supply chain becomes very complex and awkward for a company the size of RML to manage as it requires a lot of resources. Therefore the overall project aim was to look at the approach RML took toward their supply chain and resolve the major problems that were encountered by the Materials Department.

The Materials Department consists of Purchasing, Inspection and Stores. These departments are closely linked and incorporate quality. A number of quality tools were used to gather data and information regarding the department including interviews, internal literature review, observation, flow process mapping, gap analysis and data collection. This highlighted a common problem to medium sized companies, informality. Procedures were not in place so improvements were limited, a wealth of experience lay with employees regarding suppliers but this needed to be gathered and methods for selecting, appraising and measuring performance formulated. Communication externally needed improvement, with the high variability and randomness of orders placed with suppliers they needed to be made more aware of how projects are progressing to help them plan. There is extra emphasis placed upon critical components for car builds which is the reason why a supplier development scheme was adapted for use by RML.

The project concludes that proper procedures, supplier appraisal and selection schemes, performance measurement and future supplier development, if used properly and wholeheartedly the tools ought to aid the department. The Materials Department can improve after the initial implementation by developing the tools and make real steps towards making better informed decisions about suppliers, managing supplier relationships, continuous improvements and contributing to the bottom line of RML.

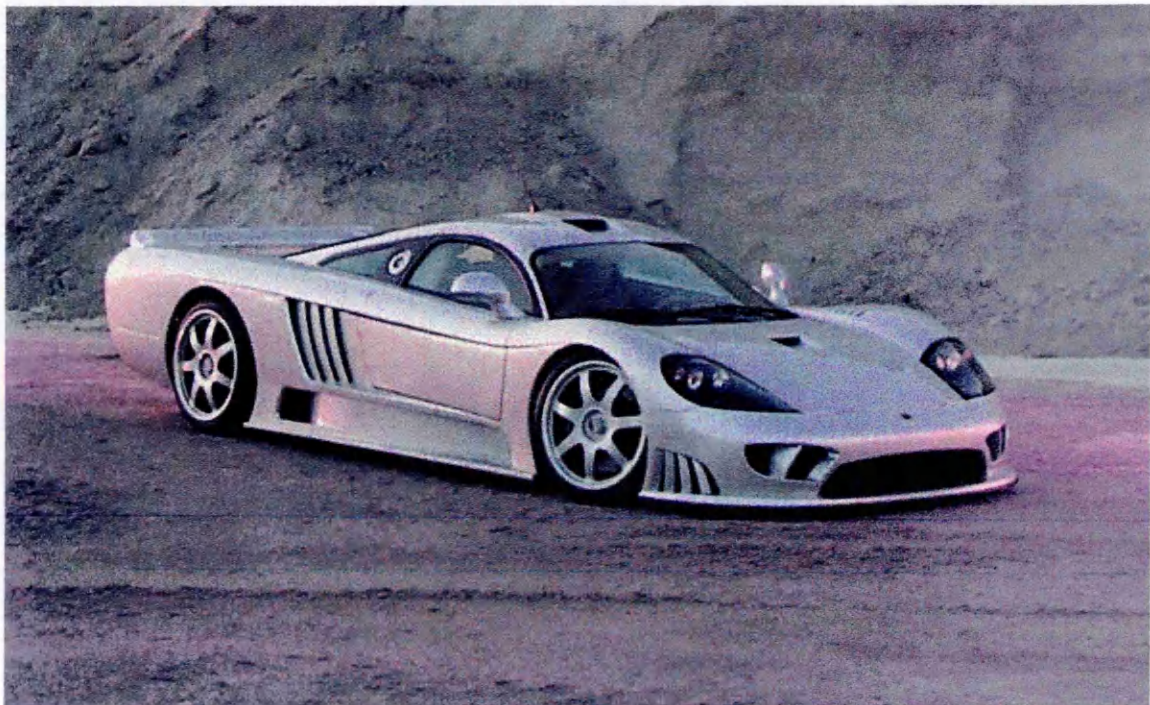
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To my Dearest Meg
&
In Memory of Coy
who taught, nurtured and loved so well

Acronyms

BOM - Bill of Materials

BPR - Business Process Re-engineering

CEO - Chief Executive Officer

EFQM - European Foundation for Quality Management

ERP - Enterprise Resource Planning

EU - European Union

FIA - Federation of International Automobiles

GT - Grand Touring road car

JIT - Just In Time

KPI - Key Performance Indicators

MIA - Motor Industry Association

MRP II - Material Resource Planning II

P20 - RML car build

P22 - RML car build

P23 - RML car build

RML - Ray Mallock Ltd

SCM - Supply Chain Management

SCOR - Supply Chain Operations Reference model

SME - Small to Medium size Enterprise

SMMT - Society of Motor Manufacturing and Traders

SWOT - Strengths, Weaknesses, Opportunities and Threats Model

TQM - Total Quality Management

List of Contents

Chapter	Contents	Page
	Abstract	2
	Acknowledgements	3
	Acronyms	5
1	Introduction	
1.1	Project Aim and Objectives	9
1.2	RML Supply Chain & its Reasons for Change	10
1.3	The Motor Sport Industry	11
1.4	Suppliers to the Motor Sport Industry	12
1.5	Quality Management Techniques	13
1.6	Scope of Study	14
1.7	Summary of the Chapter	15
2	Literature Review	
2.1	Introduction to the Chapter	16
2.2	Ray Mallock Ltd	16
2.3	Small to Medium Size Enterprises	16
2.4	Total Quality Management	17
2.5	Models and Techniques	19
2.6	Supply Chain Management	23
2.7	Supplier Relationships	26
2.8	Models of Supplier Development	29
2.9	Procurement	30
2.10	Performance Measures	32
2.11	Summary of the Chapter	34
3	Methodology	
3.1	Introduction to the Chapter	35
3.2	Approach and Deployment	35
3.3	Involvement	35
3.4	Interviews	36
3.5	Review of Supplier Appraisal Forms	37
3.6	Observation	37
3.7	Daily Use of KPI's	38
3.8	Building Flow Process Charts	40
3.9	Gap Analysis	41
3.10	Data Gathering	44
3.11	Summary of the Chapter	47
4	Discussion of Initial Conclusions	
4.1	Introduction to the Chapter	48
4.2	SWOT Analysis Highlights	48
4.3	Areas Identified for Improvement	48
4.4	Summary of the Chapter	52
5	Introduction of Analysis: Building the Strategy	
5.1	Introduction to the Chapter	53
5.2	Reasons for Making Suppliers an Extension of RML	53
5.3	Summary of the Chapter	55

6	Analysis Part 1 - Procurement Strategy, Procedures and Guide	
6.1	Introduction to the Chapter	56
6.2	Procurement Strategy	56
6.3	The Need for Procurement Control	56
6.4	Needs of Procurement	57
6.5	The Needs of Stores and Inspection	57
6.6	Procedures	58
6.7	Guides	58
6.8	Summary of the Chapter	60
7	Analysis Part 2 - Supplier Selection and Evaluation	
7.1	Introduction to the Chapter	61
7.2	Authority for Selection	61
7.3	Selection Procedures	62
7.4	Development of Pre-Qualification and Supplier Questionnaires	63
7.5	Site Visits - Validity of a Potential Supplier	65
7.6	Summary of the Chapter	67
8	Analysis Part 3 - Performance Measurement	
8.1	Introduction to the Chapter	68
8.2	Performance Measurement	68
8.3	Monitoring	70
8.4	Internal Self Assessment	70
8.5	Internal Audit	71
8.6	Summary of the Chapter	74
9	Analysis Part 4 - Process Map for Supplier Development	
9.1	Introduction to the Chapter	75
9.2	The Process Map for Supplier Development	76
9.3	Summary of the Chapter	81
10	Implementation	
10.1	Introduction to the Chapter	82
10.2	Create A Map	82
10.3	Pilot Schemes	82
10.4	Resources	83
10.5	Communication	83
10.6	Continual Change	84
10.7	Summary of the Chapter	85
11	Conclusions and Recommendations	86
12	Appendices	88
12.1	Organisational Structure	89
12.2	SWOT Analysis	90
12.3	Flow Process of Materials Department to Other Functions	91
12.4	Flow Process Map of Materials Department	92
12.5	Gap Analysis Diagram	93
12.6	Graphs showing the Expenditure Variability toward Suppliers	94
12.7	Pre-Qualification Questionnaire Front Cover	107
12.8	Supplier Questionnaire (Complete Document)	108
12.9	Internal Customer Satisfaction Measure	115

12.10	Internal Self Assessment for Materials Department	124
	Research Definitions	154
	References	156
	Additional Reading	160

List of Figures, Tables & Graphs

Table 1	Range of Expenditure	45
Figure 1	On Time Delivery Results Weekly	46
Figure 2	All Delivery Results over Three Months	47
Figure 3	Supplier Availability Versus Value Added	51
Figure 4	The Missing Link	54
Figure 5	EFQM Excellence Model	71
Figure 6	Pareto Analysis of Selected Suppliers	78
Figure 7	Continuous Improvement	84

Chapter 1

Introduction

Ray Mallock Ltd are producers of motor sport vehicles for a variety of categories from endurance races to sprint races anywhere in the world. RML are building upon strong foundations laid by one generation to become a major competitor within the motor sport industry. RML is a company whose revised vision is to win in every championship in which they participate and build the best cars. The company has the motivation to engineer, design, build, supply and support racing cars and road cars, wherever the cars are because they are determined for their cars to win.

At this point RML compete for contracts from major automotive producers therefore any competitive advantage that they can achieve is important. Due to changes in the Materials Department it was agreed that the project would focus upon the Materials Department. The Materials Department consists of three primary functions; purchasing, inspection and stores. Tons of equipment passes through the department during every project. Often the components are highly delicate and are prototypes, this increases the need for security, damage prevention, confidentiality and accuracy. The suppliers involved are often small and highly specialised. Due to the development needs and confidentiality that these types of components require, the need for managing the shared information and having a sound relationship with the supplier becomes critical. The study aims to work at finding a way for the Materials Department to improve and aid the effectiveness of their supply chain within the context of total quality that RML insist upon.

1.1 Project Aim and Objectives

Aim

The study aim is to find ways to improve and aid the supply chain with which RML is associated using quality management techniques. The study will assess the current situation and locate the most problematic areas and look at the processes which are the

source of the difficulty. The conclusion will be to suggest a strategy to RML to take forward their Materials Department.

Objectives

The key objectives are designed to gather a full picture of how RML operates and the relationships it has with the suppliers. The study is to take a critical view of the approach and emphasis that RML take towards their supply chain and how well quality techniques have been accepted thus far.

Analysis was focused on understanding the processes that link the Materials Department to internal customers and their suppliers. Therefore the objectives were as follows:

- The first objective was to discover what form the processes in the Materials Department took and how they were documented.
- The second objective was to look specifically at the approach to suppliers, the level of external communication, and techniques for selection, appraisal and evaluation of suppliers.
- The third objective was to look at methods of continuous improvement and how they were implemented and suggest improvements.
- The fourth objective was to expand supplier relationships on critical components so as they become integrated as an extended part of the organisation.
- The final objective was to locate and research the appropriate literature which contributed to both the author's understanding of recent work on the topics and the formulation of the final strategy and implementation issues.

1.2 RML Supply Chain and its Reasons for Change.

The Supply Chain Management Review Global Supplement (Spring 1999) quotes R.J Easton, Senior Manager at Anderson Consulting Change Management Practice, as saying that Supply Chain Change is primarily a leadership challenge. Clear vision, adequate resources, and employee communication and training are essential to make it happen. The RML supply chain provides the backdrop to the project. In order to assess the current supply chain it was broken down during the methodology chapter to analyse its

performance and more importantly its efficiency. A major part of the supply chain is the relationship a company holds with its suppliers; this will be carefully reviewed during the project since the accuracy of the components is paramount. If one of RML's cars fails due to a faulty component or poor workmanship, a championship could be lost and RML's reputation for excellence damaged.

Generally supply chains have changed dramatically in recent years due to globalisation of industry. Supply chains have responded to globalisation by becoming increasingly complex. The supply chain of any manufacturing company is a web of suppliers, factories, warehouses, distribution centres and retailers through which raw materials are acquired, transformed and delivered to customers. In order to optimise performance, supply chain functions must operate in a co-ordinated manner. But the dynamics of business and the market make this task incredibly difficult: materials do not arrive on time, production facilities fail, workers are ill, customers change or cancel orders, problems come from every angle causing deviations from what is planned. In some cases, these events may be dealt with locally, i.e. they lie within an RML function that works closely with the supply chain. In other cases, the problem can not be locally contained, it is more difficult to reach and to solve it modifications across many functions are required.

Consequently, the supply chain management system must co-ordinate the revision of plans and schedules across supply chain functions. The agility with which the supply chain is managed at the tactical and operational levels in order to enable timely dissemination of information, accurate co-ordination of decisions and management of actions among people and systems, is what will ultimately determine the efficient, co-ordinated achievement of the company goals.

1.3 The Motor Sport Industry

RML operates within the motor sport industry, which is small but highly competitive. Therefore any improvement that can be made is likely to add value to the company. The United Kingdom is home to numerous motor sport teams from a number of categories.

For example, the pinnacle category of motor sport, Formula One, has seven of the total eleven teams on the grid within the UK. This makes the UK the epicentre of an international business with an annual turnover of around £1 billion (Levy 1999).

The motor sport industry has many, remarkable strengths. One of them is the amount of money that the teams put back into development. According to the Department of Trade and Industry, the ratio of investment to turnover in motor sports is more than 25 per cent, compared with only 2.2 per cent in engineering and 14.8 per cent in pharmaceuticals. An example of this massive expenditure is the revolutionary wind tunnel Benetton Formula One recently developed spending a reported £20 million.

Another feature of motor sport is the uncompromising commitment to excellence. "This is an industry where customers demand the best in the world and are prepared to pay for it," says Chris Aylett, CEO of the Motor Industry Association (MIA). Aylett calls F1 "Britain's NASA", adding that it is a business where innovation is crucial and a fast turn around of orders is essential.

1.4 Suppliers to the Motor Sport Industry

This attitude of the teams gives access to spin off opportunities. Motor sport teams may only make a small number of cars a year but the teams are big business for hundreds of specialist suppliers. Suppliers tend to stay close to the teams and grow with them. They are well paid but often work under intense pressure

Suppliers to motor sport teams must be; responsive, very accurate, and able to work within tight specifications. This is demanding but each component is ultimately crucial to the performance of a competition car. Each team's car is customised; the knowledge and business practise of mass production has little relevance to motor sport. Therefore it would be fair to say that there is a lot to learn about the processes that take place. This environment requires a strong, flexible infrastructure within the company, which was an important aspect looked for within RML. Secondly there needs to be an accurate, well measured, timely flow of information to ensure that the supply chain works with

maximum efficiency. Therefore the flow of communication becomes critical to a successful relationship with the supplier.

Due to the specialised and secretive needs of each motor sport company, there is little published or available help regarding the implementation and application of useful supply chain and materials management techniques. Each supplier must therefore invent their own strategy and process. This can lead to a great deal of inconsistency for the company to manage. This study intends to assess the current infrastructure of the sponsoring company, including procedures, processes, materials management and performance measurement of the supply chain.

1.5 Quality Management Techniques

RML has spent a lot of time and effort developing a vision and strategy based upon the total quality philosophy. Quality is discussed in depth in the literature review but basically the main focus of total quality is on *why*, why do we do what we do? It goes beyond the *how to* too include the *why to*. It is an attempt to identify the causes of defects in order to eliminate them. It is a continuous cycle of detecting defects, identifying their causes, and improving the process. The end result being that any defects are totally eliminated.

Today we see most companies striving to take on board Total Quality initiatives, a mixture of the tools and measurements that come under the quality umbrella that they hope will be the right fundamental strategy for competitiveness today. This competitiveness stems from the growing demand in society for products and services that are not only "right first time", but durable, attractive and reliable. The real push for companies has come from the consumers renewed attention to price. They are looking at what they are receiving critically, meaning that the consumer is increasingly inspecting the quality. As a result quality initiatives must be carefully developed because quality is as likely as price to bring back repeat customers.

Producers are also increasingly aware of the importance of quality and safety. The Materials Department in RML places a great emphasis upon quality and safety through the inspection and traceability of their products. This is because if a component on the car is found to have operated defectively and caused an accident then RML might be held liable.

1.6 Scope of study

Motor sport means a lot to the UK economy. From multi-million sponsorship deals to contracts with specialist suppliers it has quite an effect. The massive injections of sponsorship cash that gravitate to the motor racing industry go directly to support the race team's efforts to make their machines go faster. Motor sport research and development is currently running at more than 20 per cent of turnover, compared with an average 2.3 per cent in British industry (1998 figures).

It is this investment that provides the lifeblood for many suppliers in motor sport, but the industry is increasingly looking to improve supply chain relationships to get more for its money. The project will endeavour to highlight any weak areas with evidence, and suggest appropriate recommendations for improvement. Any financial or quality advantages to be found by improvement will mean added value for RML.

Several aspects characterise RML which were considered whilst the project progressed. They included all of the following:

- The company is medium sized, it will face the challenges like any other SME's (see literature review). The most important is the limit on their resources.
- RML is a low volume producer with high variability. This means that the well tested supply chain strategies employed by the mass automotive producers may not be suitable.
- Volatility of the motor sport cycle. RML competes for contracts they can not predict the timing or the size of a car build. Long term planning is difficult therefore they

have to be very dynamic. 'It is always madness or dead as a door nail in this place' Milton Keynes Paint and Equipment, supplier representative.

- Flexibility, resources have to move between projects at a moments notice, therefore any long term plan will also have to adapt, without being forgotten.
- RML has put a lot of time and effort over the past year into developing their overall company strategy, aims and objectives within a total quality philosophy. Therefore, change must compliment this strategy.

So the scope for solutions is limited from the beginning. However the challenge that this provides will make the solution unique to RML, so they will be able to use this to their advantage. The increasing turbulence and dynamics of the business environment will provide enough of a challenge to RML in the future.

1.7 Summary of the Chapter

The study has evolved from a topic that the author is interested in and a company with a situation which demands change. The introduction has explained that the supply chains performance is critical to a company's efficiency and quality of output. It also details that the motor sport industry provides numerous challenges that are unique of the industry, which increases the discussion for a solution. The literature review then presents a summary of existing research, which will influence the development of the final strategy. The methodology discloses how the strategy was developed, the reasons behind it and introduces the results of the data collection. The resultant materials department strategy is disclosed which is substantiated by the discussion surrounding each point that tells how the strategy will improve RML's ability to relate to their supply chains needs.

Chapter 2

Literature Review

2.1 Introduction to the Chapter

The aim of this chapter is to detail and critically review both past and present Literature in several areas: Ray Mallock Ltd; Quality Management techniques; Supply Chain Management; Supplier Relationships and Procurement. This documentary analysis covers books, journals, presentations and theses from a variety of sources. It is important to mention that where any work from other authors that has been extracted as supportive or critical commentary for this thesis, the references will be clearly cited. The documentary analysis begins with a description of the company and the literature that RML was able to put forward. The chapter will look at each topic and how it has grown followed by an assessment of the merits, encompassing possible implementation issues and developments.

2.2 Ray Mallock Ltd

The company with one hundred employees would be classified as being a medium sized enterprise (Appendix 12.1). Growth has been steady, and the combination of limited capacity and the increased need for confidentiality and security between projects, led to the expansion into the Northamptonshire facility. It has been a transitional period for RML over the last few years. They are taking on bigger and ever more challenging projects which increases the need for their supply chain to run smoothly and be effective. Employees at RML predominantly possess the core competencies to design and build race cars; process change does not appear to be one of their priorities at present.

2.3 Small to Medium Size Enterprises

As a medium sized company many models become limited or not applicable to RML. It is read that SME's are categorised generally as being companies in any industry with less than 250 employees. They are likely to be operating in a single market or a limited number of markets, probably with a limited range of products or services (Johnson,

1997). It was read in the literature review that SME's entertain several characteristics that make them different. First in comparison with their larger industry rivals they will suffer from a lack of resources. However Oakland appears to argue that they can compensate for this through being able to maintain a commendable flexibility in their operations (Oakland, 1993).

Often SMEs are less formal and structured than their larger counterparts, as documentation is often seen as unnecessary or costly (Oakland, 1993). The informality of the structure will allow fast responses to market opportunities and customer requirements. However as a result problems may be caused by the duplication of roles, confusion of responsibilities and muddled decision making (Lynch, 1997). To companies such as RML the values and expectations of senior management who are in an ownership position are very important, and linger through the ranks.

The main obstacle could be that the inability of the management in smaller organisations to achieve the necessary standards may well be exposed by pressure. Many will have little if any experience outside their own organisation (Render, 1997). Since many of the management will occupy multi-functional roles this could exacerbate the problem of setting aside time to contemplate, initiate, and implement the improvements. However RML appear to have recently side stepped this issue when they employed a new Operations Manager with the intention of seeking improvement.

2.4 Total Quality Management

Total Quality Management (TQM) has been essentially about the development of an ideology, a philosophy, methods and actions that are designed to satisfy customers completely, through continually improving and reviewing these strategies. Quality is an area that has grown rapidly with important implications towards a company's survival. It has gone from theory to being a strategic issue, or from traditional to enlightened, companies not only compete on cost but also on the basis of quality.

The prowess of Japanese firms who during the 1950's had afforded low profitability with an undervalued currency in order to build market share, in major world markets only

became fully apparent during the late 1970's and the 1980's. The recent quest of the West to improve quality, is largely in response to this Japanese challenge, for many of the basic techniques of quality management were originally taken to Japan by those Western academics who were point blank ignored by the West

The meaning of quality has been expressed in several ways by several reputable authors who are known quality specialists:

- Juran's definition of quality is *fitness for use*.
- *The totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs.* (ISO 8402 - 1986 Quality Vocabulary: Part 1, International terms)
- ISO CD2 9000:2000(2) the current draft for the new vocabulary interestingly gives quality
- *Quality should be aimed at the needs of the consumer, present and future* - Deming
- *The total composite product and service characteristics of marketing engineering, manufacture and maintenance through which the product or service in use will meet the expectation by the customer* - Feigenbaum
- *Conformance to requirements* - Crosby
- *Elimination of waste* - Cranfield University course notes.

By consistently meeting customer requirements, it is possible to move to a higher plane of satisfaction by delighting the customer. Occasionally a company reaches an extraordinary level because their strategy is so well defined that they are able to meet their customer requirements, time and time again. Only through this type of continuity can a company create a reputation for "excellence".

It appears difficult to give Quality a uniform meaning this speaks volumes about the subject. Therefore perhaps the best description is simply unique. "Quality" has been attributed to all kinds of management techniques and initiatives. Every company with a quality department will have put together a unique plan, which is directed at meeting their particular requirements. The appeal of this term is that it can be used to legitimise all sorts of measures and changes in the name of a topic so associated with doing good for the company.

With this information it comes as little surprise that quality initiatives are increasing dramatically in the Western world. They are reportedly to be as high as three-quarters of companies in the United States and the United Kingdom (The Economist -1992), or to learn that such initiatives are supported enthusiastically by ninety per cent of chief executives who regard it as "critical" to their organisation (McKinsey - 1989).

What quality initiatives broadly share is a concern to encourage each employee - the term includes managers as well as office or shop floor workers - to take responsibility for the continuous improvement of production and delivery processes. In general, the emphasis upon responsibility is directly concerned with the elimination of waste and removing the duplication of effort through changes in job design and work process. It does not necessarily extend to the enhancement of working conditions or greater control over key decisions about investment, the fundamentally hierarchical division of labour, or the organisation of work.

2.5 Models and techniques

The analytical tools and techniques that are reviewed, so as to understand their value and potential to the project have been used before by many organisations to help senior management teams clarify a situation in order to facilitate decision making. Instead of accrediting articles and books that include them credit has been given directly to those who formulated them. A variety of tools was chosen to be used, based upon past experience and case studies of their application. No single approach would be capable of giving a company a complete picture, by using several tools the project gathered a better feel of what was going on and what the options were. The tools discussed are value analysis, flow process mapping, gap analysis, Pareto analysis, JIT, BPR, SWOT, Ishikawa, and SPC. The ones selected are those that fitted the business needs.

Value chain/analysis

This model began in the late 1940's in the purchasing department of General Electric. Value analysis looks at the function and assesses whether value is being added. The approach is systematic and addresses the needs of the purchasing organisation.

Value chain analysis is widely used as a means of describing the activities within and around an organisation, and relating them to an assessment of the competitive strength of an organisation (or its ability to provide value-for-money products or services). Value analysis was originally introduced as an accounting analysis to shed light on the value added of separate steps in complex manufacturing processes, in order to determine where cost improvements could be made and/or value creation improved (Johnson et al , 1997). These two basic steps of identifying separate activities and assessing the value added from each were linked to an analysis of an organisation's competitive advantage by Michael Porter. It became apparent that in the time allowed for the project and with current car build within RML that to start breaking down RML's processes into value chains would be overly time consuming and complex. Therefore an alternative was sought.

Flow Process mapping and Gap analysis

The next option was a flow process map aiming to organise the tasks within a process and display them in chronological order to display a process (Brunt 1999). The gap analysis is an evaluation technique that looks at links and between tasks.

The process chart graphs the steps of the process and their relationship. General literature concludes that this type of analysis involves:

- Studying the flow of the process
- Identifying waste removal opportunities
- Considering whether the process can be rearranged in a more efficient sequence
- Considering if a better flow pattern, involving different flow layout or transportation routing is possible
- Considering whether everything that is being done is absolutely necessary and if any superfluous tasks can be removed.

This is a useful tool because it demands that a company organise a process before they can look for the value added and inadequacies. This can be followed up by improvements so it offers a lot if used by RML.

Gap analysis, as its name states, looks specifically at the gaps in a process. It is not a well documented technique. It is a process based technique which added significant value because during the internal analysis (Wu B et al, 2000) it looked at the following:

- Gaps occur where there is a misalignment between strategy objective (customer requirements) and company performance
- Gap analysis provides a realistic picture of the total resources required to meet customer requirements both now and in the future.
- Gap analysis used to help in resource selection

(Wu B, 2000)

These were the main reasons that it was selected for assessing processes over techniques such as SCOR.

SWOT

A SWOT analysis can be a useful way to summarise the relationship between key environmental influences, the strategic capability of the Materials Department and hence the agenda for developing new strategies.. Therefore to get the maximum benefit from the technique it will be used in the discussion to sum up the findings.

JIT

JIT is a philosophy of continuous and forced problem solving that drives out waste (Render B et al, 1997). In terms of the delivery of goods it is not useful because of the size of the company; they are not in the same position as a mass producer like Rover who might order 10,000 seats and be able to forecast exactly when they are required. Whereas RML who are prone to high variability in their car builds are more concerned about having the delivery of the part in advance so it is ready when it is required. Therefore for RML's process it is more effective to hold stock ready for a few days.

Statistical Process Control

High variability, described previously was also the problem when SPC control charts were considered. Statistical process control is concerned with monitoring standards, making measurements, and taking corrective action as a product or service is being produced. SPC control charts are normally portrayed graphically. Samples of process outputs are examined; if they are within acceptable limits, the process is permitted to continue. If they fall outside certain specific ranges, the process is stopped and, typically, the assignable cause is located and removed. However this method is unemployable within RML since these techniques do not cope well with variability and the irregular volume of work that is produced at RML. The mathematical equations become very difficult to operate and it would take too much time for RML to consider.

Business Process Re-engineering

BPR is a quality management initiative. It involves starting from scratch and determining the fundamental needs of the business and designing the most effective and efficient process to address those needs. Mercedes Benz were able to do this for their processes at a new plant built to producing the AAV off road vehicle in 1997. The size and resources of the company allowed a complete study of how other Mercedes plants operated before a strategy was developed for the new plant (Distribution May 1996). Success in BPR really depends on a company's culture, strategy and resources. Applying this to RML as an SME that is focused on growth and does not have many procedures in place at the current time, BPR is too radical to contemplate and more fundamental issues such as procedures must be addressed first..

Pareto Analysis

Pareto analysis charts are a method of organising errors, problems, or defects to help focus on problem solving efforts. They are based on the work of Alfredo Pareto, a nineteenth century economist. Joseph M Juran popularised Pareto's work when he suggested that 80% of a firm's problems are a result of only 20% of the causes (Operations Management - 1997). Although this is quoted from one particular book it is a well-known axiom. Pareto analysis indicates which problems may yield the greatest

payoff. The limitation for RML using this technique immediately is that there needs to be some form of accurate data collection in place. The model has an excellent reputation and is very flexible to company needs. It may be useful to RML as part of a long term strategy.

This is what Pacific Bell discovered when it tried to find a way to reduce damage to buried phone cable, the number one cause of phone outages. Pareto analysis showed that 41% of cable damage was caused by construction work. Armed with this information, Pacific Bell was able to devise a plan to reduce cable cuts by 24% in one year, saving \$6 million (The Wall Street Journal, Feb 24 1994). This type of analysis would possibly work for RML by identifying the largest causes of problems, which prevents the Materials Department from functioning effectively.

2.6 Supply Chain Management

A supply chain encompasses all the activities associated with moving goods from the raw materials stage through to the end user. It includes a variety of firms, ranging from those that process raw materials to those engaged in wholesaling and retailing. It also includes all types of organisations engaged in transportation, warehousing, and materials handling.

Most of the literature on SCM follows the purchasing and supply perspective. According to this perspective, SCM is synonymous with the supply base integration that evolved from the traditional purchasing and materials function. It is a management philosophy that extends from the traditional organisation by bringing suppliers together with a common goal of optimisation and efficiency (Harwick T, 1997). Since the supply chain is not a visible entity or department with whom you can interact, SCM tries to create a virtual organisation with the goal of efficiently and effectively managing the processes and operations of the separate organisations. The contribution that a good supply function can make to the success of an organisation is today almost universally recognised. (Jessop, D 1994).

It has been outlined that there are four main goals of SCM. These are waste reduction, time compression, flexible response and unit cost reduction. These goals have been articulated in several contexts associated with SCM, and they speak to the importance of both interfunctional and interfirm coordination (Davis T, 1992). These goals are in line with what other authors describe as competitive advantage. The literature portrays that a customer driven corporate vision and effective SCM can result in several competitive advantages. Each of the suggested advantages was analysed to evaluate its potential benefits to RML. The short term objectives are primarily to increase productivity and reduce inventory and cycle time while the long term objective is to increase customer satisfaction, market share, and profits for all members of the supply chain. Literature on SCM indicates that in order to realise the objectives, all strategic partners must recognise that purchasing is the crucial link between the suppliers and the customer, with support coming from overlapping activities such as accounts, engineering and design. SCM seeks to improve performance through better use of internal and external supplier capabilities. With the specialist small suppliers that dominate the motor sport industry this would be a crucial development for RML who must compete for suppliers attention. This, in turn, could change inter-company competition into inter-supply chain competition (Morgan J, 1996).

How will SCM be applied to RML? Due to the specialised and secretive needs of each motor sport company, there is little published or available help regarding the implementation and application of useful supply chain and materials management techniques. To assist RML other sources were utilised.

Agile Supply Chains is what is being called the revolution for the millennium (Christopher M, Winter 1999). Agility implies responsiveness from one end of the supply chain to the other. This idea focuses upon eliminating the barriers to quick response, be they organisational or technical. Agility should not be confused with lean-ness. This is probably the best description of the type of supply chain that RML is trying to achieve.

While bringing costs down is a benefit of SCM, it ought to emphasise the leveraging of skills, expertise and capabilities of the firms who are apart of RML's network known as the supply chain. Managers have long acknowledged the importance of getting close to their key customers (Spekman R, 1998). Now it is fair to say that the very same logic has been extended upstream, forging closer ties to a company's key suppliers.

When researching how to develop a supply chain strategy it became clear that the following points were necessary. An understanding of the elements of sourcing strategy, information flows (internal and external), new product co-ordination, concurrent procurement, component strategies, long-term requirements planning (which is almost impossible for RML), industry collaboration and staff development.

So many variables are involved in developing a supply chain strategy that each strategy is likely to be unique, which makes the study and interpretation of SCM extremely complex (Monczka R et al, 1998). This means that this is another topic, like quality management on which both academics and professionals lack a unified definition of what constitutes SCM (Bechtel C et al, 1997).

Finally it would appear from the literature that many companies have embraced SCM with the hope of reducing costs and improving efficiency throughout the supply chain. Additional challenges to successful SCM include exploiting supplier strength and technology to support new product development (Morgan J, 1995) and achieving delivery without the need for inspection (Onge, A 1996). Facilitating the evolution of SCM is the rapid development of SCM software for client/server environments that enables users to integrate suppliers and customers existing and future SCM systems (King J, 1996 & Semich J W, 1994).

One model that was considered for making these improvements was SCOR, but finally it was deemed unsuitable. To assist companies in increasing the effectiveness of their supply chain, and to support the move to process based management was SCOR (Stewart G, 1997). SCOR was the first cross industry framework for evaluating and improving

enterprise wide supply chain performance management. It appears to be the next logical step from BPR. A process reference model describes, characterises and evaluates a complex management process. Once the complex management process has been captured it can be redesigned and aid their efforts toward supplier integration. Unfortunately many companies have found this to be a difficult exercise due to the complexity and detail involved, which is why the earlier described Gap analysis was selected.

2.7 Models of Supplier Relationships

This part of the literature review found an abundant amount of work about the various relationships. Models and descriptions of application were more elusive. Dr Kaoru Ishikawa, in one of his books, developed a comprehensive list of values and principles for buyer-supplier relationships. They are considered to be comprehensive and the basis for development of long term relationships. The basis of the points is that a relationship needs the highest level of trust, communication, commitment and motivation.

Supply chains such as RML's have an extreme mix of suppliers. Their supply chain contains a large number of, small privately held, businesses making inexpensive parts. However it also contains some larger publicly held companies producing more expensive parts or assemblies such as gear boxes. Literature for this mix was difficult to find. RML's supply chain is closely located to suppliers who cope desperately with the variability to which the motor sport industry is prone. Still RML must manage numerous specialist relationships, because to survive they must compete with bigger motor sport organisations with larger budgets. These competitors, due to the location of the motor sport industry, also draw upon the same pool of suppliers. How can RML get their attention and maintain it?

Sourcing

Sourcing can be defined as the strategic philosophy of selecting vendors in a manner that makes them an integral part of the buying organisation for the particular component or part they are to supply (Suppliers Critical in the Quest for Quality" Purchasing (Jan 18, 1990), pp121, 123). The term has grown to denote a closer relationship between suppliers

and buying organisations than was traditionally the case. The integration of suppliers into buying operations is in large part an outgrowth of the move toward Just in time (JIT) buying, whereby the production facilities of the supplier and buyer theoretically integrate.

New sources are not always necessary, obviously, but it can aid contingency planning and responding to market changes if the company is aware of what is available in the market. Therefore sourcing is becoming ever more strategic through plans to develop relationships with suppliers. This is reflected in the fact that what companies buy has been increasing in importance, size and complexity. Organisations are now exploiting several opportunities to leverage the company buy, optimise the supplier base, minimise linked costs in the supply chain, and maximise the value of goods and services for the internal customers.

Supplier Partnership

Supplier partnership appears to have been a knock on from the growth of outsourcing. In the quest for increased competitiveness, companies seek closer ties with the supply base. This move toward co-operation and away from adversarial relationships (Spekman R, 1998).

A partnership between a buying and a supplying firm is a mutual ongoing relationship that involves a high level of trust, commitment over time, joint conflict resolution and the sharing of information risks and rewards. Such collaboration gives many of the benefits of vertical integration without the loss of flexibility (Spekman R, 1988). In contrast, adversarial or transactional buyer-supplier relationships are characterised by sourcing from multiple suppliers, the use of competitive bidding, fully developed bidding specifications, and short term contracts to achieve a low purchase price (Hahn C et al 1990).

Co-operative relationships appear to offer advantages over discrete market transactions and vertical integration in certain situations. Effective supplier partnering is associated with improved performance in terms of cost, quality, innovation, and flexibility (Cooper

M et al, 1993). For RML, since they are limited by resources, closer relationships would be only feasible on critical components since they are often extremely complicated to develop and manage (Minahan T, 1998).

Supplier Development

Supplier development requires a long term co-operative effort between a buying and supplying firm to upgrade the supplier's technical, quality, inspection, delivery and cost capabilities to foster on going improvements (Hahn C et al, 1990). Key processes to improve supplier performance include: competitive pressure (Dyer J, 1990); evaluation of supplier performance (Hartley J, 1996); promises of increased present and future business if supplier performance improves (Monczka R et al, 1993); training and education of suppliers personnel (Galt J et al, 1991) and direct investment in a supplier by the buying firm (Krause D et al, 1998).

RML as an SME cannot undertake all these points for their suppliers. However they could put together with the supplier a programme for development. Companies with a successful supplier development strategy find that it requires (1) a long term focus and commitment; (2) proactive customers and suppliers; (3) integrated processes and activities; (4) development and maintenance of cooperative and close relationships; (5) a well defined framework for establishing cost, price, and profitable for both parties; (6) shared benefits from the development effort driven by a "win-win" philosophy and (7) a continuous focus on improvement in all processes and activities (Burnes B et al, 1995).

Supplier development could be the most realistic for use by RML as it is adaptable giving the purchaser the opportunity to choose what will be involved in the development programme. Also, that area of supplier relationships is not overly documented so it does not have a huge stigma attached with pre-empted expectations that the suppliers may shy away from. The potential improvement to RML's competitive position through lowering costs, increasing quality and flexibility, improving technology and reducing cycle times are a definite invitation to try.

2.8 Models of Supplier Development

Schermerhorn (1992) wrote about her own four step plan to lead suppliers into a similar quality approach as the buyer, this involved:

1. Developing a supplier quality management strategy: defining the relationships to be developed with suppliers, this vision needs to be communicated to the entire company. Key suppliers need to be identified and an action plan put together.
2. Sharing the vision with suppliers: communicating the vision to help suppliers understand the buyer's expectations. The relationship is helped by a site visit.
3. Educating suppliers: in the common philosophy of quality also; measuring work processes, prioritising problems, identifying root causes of problems and building in corrective action.
4. Coordinating improvement efforts; this needs to involve measurement, corrective actions, problem solving and recognition systems.

(Schermerhorn M, 1992)

This work has been expanded upon since then based upon the experiences of companies over the past decade. The Supplier Development Model (Handfield, 2000) is a process map that many firms intuitively employ. However it was found that although most firms were able to identify suppliers needing development, relatively few are completely successful in their supplier development efforts. Therefore the goal of the model was to provide general guidelines for supplier development, which is what makes the model adaptable to RML's needs.

It is useful to not only consider what type of relationship would be best for RML but what are the risks. The literature makes out that relationships are the only way to go for companies to get the most for their money from suppliers. However, perhaps sourcing, integration and partnering are merely a way for companies to shrug off the responsibility of managing their supplies. How can RML avoid becoming too dependent on suppliers if they establish these types of relationships? The literature suggests that companies ought to consider where their boundary is going to be set (Lonsdale C, 1999) and the managers

ability to deal with supplier relationships at such a close level. It appears to come down to; can the company's human resources communicate effectively?

The danger of dependency appears to come from:

- Managers ability to handle the relationship
- To take care when outsourcing into a limited supply market
- Poor internal alignment, particularly between engineering and purchasing
- Contractual demands

To conclude this section, there is an obvious use and need to develop relationships. Other companies have shown how they can now utilise suppliers capabilities effectively, by concentrating their efforts with a few suppliers, communication has been improved and research and development speeded up through shared information. The monetary gains and value added in terms of better more reliable quality, creates great incentives to participate in supplier development activities. However, it is important to be aware of the danger of dependency. If it is ignored it is at great cost to the company's competitive position.

2.9 Procurement

Procurement is quickly becoming recognised as a priority function that offers high impact opportunities for improving the bottom line (Anderson MG, 1998). It is also in response to many of the new challenges that a company faces on its supply chain as to why many organisations have upgraded their purchasing function to be an integral part of the corporate planning process (Tan 1998). The purchasing profession has gone through a significant transformation (Humphreys P, 2000). Although it still has a low status and low profile (Parsons W, 1997). Like SCM there has been an influx of numerous articles describing programmes or technologies that can be implemented to help a company achieve a competitive advantage through its purchasing function.

Purchasing and supply management will become more process focused, rather than activity focused. Purchasing strategy development is becoming a process that reaches far

beyond a purchasing and supply department; it encompasses the total organisation and supply partners. (Duffy R, 1999)

Although earlier it was reasoned that JIT would be unfit for the materials for purchasing it could possibly add value. JIT purchasing appears to be merely an acceptable name for tightening up the procedures by which a company purchases products and services. Therefore, it has potential to aid RML.

Across industries, JIT purchasing appears to be increasingly viewed as a strategic supply chain process. JIT purchasing provides materials that meet or exceed all customer requirements in the correct quantities to a producing facility when they are needed for use (Giunipero L et al, 1988). It views the buyer-supplier relationship as a partnership in profit creation rather than the traditional adversarial and competitive relationship (Leavy B, 1994). JIT purchasing strives to minimise all forms of waste in the supply chain and to control lead times. As with supplier development and supplier partnering, JIT purchasing requires extensive communication between the buyer and supplier.

Supplier Appraisal, Evaluation and Selection

Experts also agree that to aid the supply chain the purchasing has other duties to perform that are most important such as; supplier selection, appraisal, evaluation and performance measurement (Humphries P et al, 1998).

Appraisal should be undertaken before choosing a supplier (Short M, 2000). This means buyers need to:

- Assess suppliers and their ability to perform to contract
- Seek out possible weaknesses, so that action can be taken if a contract is signed
- Use information about a supplier in negotiations, for example, to highlight deficiencies or obtain discounts.

To conclude this section we can see the growth in the importance of the purchasing role over the past decade. As it moves from being activity focused to process focused it will

be easier to analyse and find improvements. Purchasing has become the heart of supply chain management activities and consequently it should be clearly documented, which will require attention to detail. Supply chain partner research ought to be formalised and structured to find out as much as possible about a supplier before the relationship begins.

2.10 Performance Measures

Performance Measurement has its origins in management accounting practises of the late nineteenth and early twentieth centuries. Literature is being written extensively on the back of the fact that the suppliers are increasingly expected to deliver high quality products and materials on time.

Strategic partners are often selected by the level of performance that they can provide (Atkinson D, Jan 1999). Commonplace measures such as on time delivery and percentage of defects rate have been crucial in driving improvements especially in the automotive industry and are quickly gaining ground in aerospace.

One established performance measurement technique was the balanced scorecard. The process of formulating a balanced scorecard begins when senior managers define the firm's strategy (Kaplan RS, 1996). The balance on the score card is obtained by adopting performance measures from four different areas. These are customer perspective, the internal business process perspective, the innovation and learning perspective (Kaplan RS, 1992). This framework although credible is too demanding for a single department as it tends to overemphasise financial performance by incorporating metrics related to long term profitability.

EFQM Quality literature offers a great insight into why measurement is useful. In particular it focused upon self-assessment through its renowned Excellence Model. This states that there is no single "right" way to perform self assessment (EFQM, 1999) but the great thing about it is that it can be initiated in the whole of an organisation or functionally. It is also more subjective than audits, which are useful as random systematic checks of processes i.e. stock accuracy.

Returning to the issue of performance measures, several industries have published documents on their performance measures, the two most prominent being the Motor trade QCD and the Construction Industry.

The SMMT named their document "Quality, Cost, Delivery - Seven measures for improved competitiveness in manufacturing industry, which was written for the Department of Trade and Industry. Their measures: not right first time; people productivity; stock turns; delivery schedule achievement; overall equipment effectiveness; value added per person and floor space utilisation are all commonplace. The fact that they are so generic means that they are being employed widely through manufacturing. This level of standardisation would be useful for RML to consider because it increases their customers recognition of the measures which adds to their value and usefulness.

The Construction Industry have been working towards putting together some standard KPI's for the industry over the last few of years. The most recent update on these KPI's was published in January 2000 (www.detr.gov.uk). The construction industry is similar to motor sport as in their products are low volume and high variability. The industry has had a very bad reputation for not finishing projects on time nor to cost, which resulted in contractors not having the ability to make a profit (Latham Sir M 1994).

To try to control the situation industry-wide they have taken a customer focus when choosing measures. They also became aware of their supply chains poor performance so they wanted to set up a scheme where the sub-contractors could benchmark performance to enable them to identify their strengths and weaknesses and assess their ability to improve over time. The KPI framework for construction consists of seven main groups; time, cost, quality, client satisfaction, client changes, business performance and Health and Safety. Within these groups, a range of indicators has been developed to analyse either project or company performance, or both. Implementation across the industry has been gradual but it is growing in importance. There are great similarities between these

measures and those developed by the SMMT which confirms that the measures already in place within RML are on the right track.

One article especially discussed the downside to performance measures. Before going ahead with the process of establishing performance measures (Nageotte M, April 1997) a company will have to be aware of people's personal motives for good results, also just because a process looks as if it is being efficient it may no longer be effective. Therefore any performance measures put in place must be relevant, reviewed and understood by all.

2.11 Summary of the Chapter

The literature review revealed that there is a very strategic direction that supply chains across many industries are adopting. Business demands that suppliers are increasingly expected to deliver high quality products and materials on time. It is also shown that many firms are reducing their supplier base in exchange for being able to develop closer relationships or form strategic partnerships with a smaller number of suppliers. Since much of this stems from the developed relationship between purchasing and supply it is important that purchasing is extremely focused in line with the overall business aims and needs of other departments. Numerous, but carefully selected tools and techniques are available to aid and evaluate the requirements of RML.

Chapter 3

Methodology

3.1 Introduction to the Chapter

This chapter provides the background to the thesis. It covers the gathering of information about RML. It shows the active use of carefully selected tools and techniques, which were described in the literature review to build a picture of RML's existing processes. This is an important chapter as its findings will be highly influential in deciding the course a new strategy will take. The review of the internal approaches to suppliers, evaluation, appraisal and the relationships, will start from the top of the supply chain at design and engineering; work through the organisation to materials and purchasing and finally through to the suppliers.

In order to understand the benefits of a purchasing/supplier quality management system, it is necessary to first understand the types of problems that could be encountered in the absence of such a system. Consequently a full study of RML's current practises was carried out.

3.2 Approach & Deployment

The tools that were selected were: working within the department to observe how the processes worked and gather practical experience of the routines. Interviews were planned with key staff to gather opinions and ideas this also helped to build the flow process diagrams and gap analysis. Finally to demonstrate the extent of the situation within the Materials Department data was carefully selected and collected.

3.3 Involvement

Working within the Materials Department enabled the author to learn the culture of RML, the resources that are available, the nature of the processes in place and understand the core competencies of the company. The aim being that the recommendations and conclusions will be more meaningful to, and workable for RML.

3.4 Interviews

The departments are the richest sources of information about their requirements and expectations. They are also the most aware about their future needs from the materials department. To obtain the most relevant information the interviews were structured to ask open-ended questions and refrained from any critical statements. The structure allowed the departmental representatives to describe their perspective freely. Some interviews were done formally and some were informal chats and opinions.

The main points that arose or striking statements from the interviews are as follows, and interviewee's confidentiality has been respected:

- Purchasing focus too much upon cost and time scales, these are important of course but quality control gets put aside. (This statement was substantiated towards the end of the build of the P22 road car, one example being when manifolds with scratched kephos were allowed to go on the car because of the limits on time.)
- RML are poor at project planning
- Engineering is too involved in choosing suppliers. Perhaps we could ease this situation by having a member of the purchasing team sat with the engineers so as they fully understand our requirements when they select a supplier and purchase the component or service.
- RML rely too much upon the experience of suppliers, without knowing their capabilities thoroughly, and we don't supply them with enough information. For example CTS are very capable but the former supplier Somers to the P20 was not so good because they didn't have the appropriate level of skills. A similar comment was we don't understand the limits of our suppliers.
- The biggest complaint by our suppliers is that we are a faceless company.
- It would be useful to know if suppliers really find the drawings unambiguous also if they could accept a CAD drawing. Then they would be looking at the same thing as us.

- The production engineer was brought in to fill the gap between engineering and purchasing. However this role is not really fulfilled because he has been given so many other responsibilities.
- We spend too much time fire fighting rather than being genuinely proactive.
- We tend to use our suppliers in fads, I don't really know why.

3.5 Review of Supplier Appraisal forms

The literature available from the Materials Department was in the form of supplier appraisals. These did not give a great deal of information. The forms were good because they showed an effort to communicate with suppliers through visiting them, but the visits happened infrequently and informally. The forms were often filled out several weeks after the visit had taken place which meant that current information was not available to the rest of the department immediately. Also the approval of a supplier appeared to be that if the company supplied a Formula One team then they were satisfactory. However this does not guarantee that RML are getting the same quality of service.

3.6 Observation

Observation is a useful analytical technique as it looks directly into existing conditions. However it is important to substantiate any points that are made. First of all it was important to understand the processes which were taking place so the author spent time building process maps. Observation helped to clarify: the logical flows of processes; the lengths of different steps and the value added by each step in the process. This information that was gathered is represented in flow process charts (Appendix X).

Observation allowed the author to see RML's actual response to problematic suppliers. Cases this includes were: Brembo mixing up the brake callipers; Ideal Impressions closing down; Davron Finishing whose quality rapidly deteriorated; Alan Davies failure to machine uprights on time due to personal problems; BT Precision who drilled the holes in the floor of the road car poorly and CTS who delivered badly scratched honey comb panels. These problems certainly did not display the message of total quality that RML have come to expect of themselves. The message that RML expect "right first time", a

philosophy that is central to developing total quality relationships with suppliers is not being communicated clearly.

The list above were all fairly major problems but the minor ones help to show how people respond or communicate such as the incident when the mop heads were not suitable for the cleaners or the latex gloves which were of such poor quality compared to the normal brand. In both instances it caused a lot of friction between departments which was completely unnecessary if the problems has been dealt with when they were first brought to notice. The findings from this section can also be found in the SWOT analysis (Appendix 12.2).

3.7 Daily Use of KPI's

The performance measure that the author interacted was the delivery response. The arrival times of the components were recorded on the delivery notes, this was compared to the estimated arrival time on SYMIX. The results were recorded on a specially prepared sheet, weekly. Maintenance of the measure did have several inadequacies which were identified.

The measure was susceptible to a degree of human error. It was easy when stores was busy to forget to take the date and grade the delivery note appropriately. Perhaps in time SYMIX can be adjusted to collect this type of data for RML. An accurate report at the end of each week could then be run off, reducing the amount of effort by human resources in producing this measure.

The grades that could be given to each of the suppliers painted a biased picture. The measures for goods that came early were all categorised as "A". However, when goods arrive late the scores are divided up between "C", "D", and "E", thus giving a better picture of the supplier's results. This emphasises the seriousness of late deliveries to be displayed. Goods arriving early, as RML acknowledge, is as much an element of poor performance. It would be useful to measure early and late performance to the same degree. If not unfair criticism may occur, for example Arrow Supplies Ltd were asked to

do better after repeatedly being late with deliveries. This improvement has occurred, Arrows now supply repeatedly on time, or only one or two days early or late. This does not show up in the results. The results only show that Arrows have supplied early, for this they might be reprimanded. This type of performance is better than some of the suppliers, such as X-trac, who had orders given to them that were staggered so the goods arrived in co-ordination with the car builds on P22. However they sent all the goods in one delivery which were then all invoiced. Why did RML not return them at X-tracs' expense? By receiving them and paying for them the company told X-trac that this type of performance was acceptable.

Measures taken on internal suppliers. RML Production and RML Electrical also have discrepancies. Many of the results from RML production were cleared the day the components came in for inspection. However if the component and job card sat on the inspection shelf over night and were cleared the next day it looks as if it was a day later than it was. These are only small discrepancies but they add up.

To aid motivation it would be better if the job cards were marked in the moment they come through the hatch. To keep it simple perhaps a laminated card kept above the hatch which can be marked throughout the day as components come through the hatch. Each day the results can be transferred to the record sheet and the card cleaned. It was difficult to gather the results from electrical since their parts did not come through stores. Therefore perhaps RML Electrical can keep control of their own results which could be transferred at the end of each week.

Finally, the performance measure was not reviewed in six months. Some companies on the sheet no longer supplied RML. Others that supplied RML regularly and were not monitored. It would be beneficial for RML to monitor the following companies:

1. B G Motorsport
2. Buck and Hickman
3. City Electrical factors
4. Clarendon

5. Hydrastar
6. RS Components
7. Servo Electronics
8. Würth

Discrepancies such as the ones described may be occurring across the companies KPI's; therefore it would be useful to review all the performance measures.

The KPI meeting involved members of the Materials Department. Development of KPI's and other measures are being taken more seriously and an area that they would like to be developed measurement of Internal Customer Satisfaction.

3.8 Building Flow Process Charts

The information gathered through observation was plotted on flow process charts. They do not include time, the charts provide information purely about the processes in chronological order. It has been done only in chronological order to clarify events, so it is possible to analyse the links in the process chain. This is described under gap analysis.

Appendix 12.3 covers the flow process chart of how the purchasing interacts within RML. In order for the Materials Department to fulfil their responsibilities, the department must actively cooperate with other departments, not only to provide a service, but also to give and receive information so that the service is efficient.

Appendix 12.4 covers the process between the Materials Department and the Suppliers. Along side this flow chart would be important issues such as extra communication with the supplier such as expediting activities. Expediting is a planned, proactive task. It is used to describe the process of attempting to ensure that delayed supplies of materials, does not cause problems for the car builds. Extra communication is necessary since this is one of RML's main channels of communication with the outside world.

3.9 Gap Analysis

Gap analysis is an evaluation technique (Speller, S Course Notes 1999) that looks at what is concealed behind each of the links in a process so the process can function effectively. It meant asking RML how they did certain manoeuvres. The technique assesses the gaps that matter to the current discussion. Stores and purchasing are largely interdependent, and any inefficiency or lack of co-operation on either side is soon reflected in the other. To cope satisfactorily with the whole supply problem in modern conditions, a complete analysis of the materials functions is essential.

It would not really be appropriate to discuss the supplier because it is not aimed at any particular one. Considering the findings, particular attention has been paid to the Materials Department relationships with suppliers. The flow process chart that visually portrays the gaps appears in Appendix 12.5. The descriptions of the most important gaps appear as follows:

Gap1 - From point 1 to 23. This covers the entire process as it is written. This is the bare bones of the process as it was observed. The gap analysis here is very general but important. It asks whether the materials department has an adequate procedure. Procedures are well established at RML but don't appear to be properly documented. This leaves the procedures open to change on a whim, without being thought through properly. This happened several times even on the goods inward location. For example the sudden decision to record every piece returned duplicated the work on inspection or miscellaneous receipting. This was taken back to the management after it was used incorrectly because its use had not been documented clearly. Also employees, as in any organisation, are very keen to service their own working environments, taking components without checking their correct job card allocation was a constant battle.

Gap 2 - From point 1 to 8. This section covers all the Purchasing Departments' activities until the time when the supplier takes over the manufacture of the item. It was disclosed that there was no set procedures for purchasing, an integral activity in materials management.

Gap 3 - From point 2 to 21. This gap asks whether the received component matches what was required. This looks for results from the Quality Inspection Department which keeps track of all passes, reworks and scrapped components. It would be useful if these results were broken down per supplier, identifying how well the Materials Department satisfies their internal customers, which is not currently measured.

Gap 4 - From point 2 to 9. This was chosen to assess whether RML knew the capabilities of their suppliers. In the supplier appraisal file some supplier details contained the company's capabilities but it did not detail whether or not they had compatible CAD/CAM systems. Without thorough knowledge of critical suppliers capabilities it is not possible to know if RML are using the suppliers full potential.

Gap 5 - From point 2 to 3. How does purchasing translate the requestors needs and how do they choose the list of potential suppliers. Currently suppliers are chosen through experience or the Yellow pages. This process would be best described under a purchasing procedure.

Gap 6 - From point 4 to 6. This travels from supplier evaluation to selection. This is the time when there would be a lot of supplier assessment and external communication. How is this managed? Assessment of suppliers appeared to rely upon knowledge of past performance, fads, or recommendation. The current process also relies heavily upon what the supplier cost and their delivery lead time. Notably, there does not appear to be a definition on what level of quality is acceptable.

Gap 7 - From point 2 to 7. This considered the perceived requirements by Purchasing from their internal customer and how this was translated to the supplier. It was aimed at finding out the level of communication. This is a difficult area to assess considering the Engineering Department often discussed their requirements directly with the supplier. It should be decided at what level external communication should come from each department or increased communication between the two departments. For example John

Thompson spent all his time with an engineer during his visits to RML rather than anyone from Purchasing who had originally placed the order.

Gap 8 - From point 6 to 20. This was planned to research whether the selected supplier actually delivered to goods inwards on time. On Time Delivery was measured by RML and has previously been described. The results are located in the data collection section of this chapter.

Gap 9 - From point 7 to 9. This looked at external communication again. Some suppliers found the drawings that they were given to be ambiguous. There was no measure of how often this occurred.

Gap 10 - From point 9 to 21. Gap 9 was too difficult to trace properly. Therefore gap 10 was introduced. It looks at if the supplier correctly translated RML's needs. This was measured sufficiently through inspection measures and a new system to monitor returns was implemented.

Gap 11 - From point 9 to 22. Gap 11 extends on gap 10. This includes the item going to its correct location in stores after it has arrived. Not a very relevant gap in terms of the supply chain.

Gap 12 - From point 16 to 21. Inspection is a critical activity within the materials department. Many companies send inspection certificates with the components delivery/advice note. Where inspection occurs at the supplier's premises technically none or at most only a limited check is necessary when they arrive at RML. However RML no matter what the time pressures never depend on these documents although they keep them as a record. This is because there is little faith in supplier's inspection procedures; another sound reason for better communication and monitoring of suppliers. If RML could take advantage of supplier's inspection skills, material could be put away directly at goods inward and double inspection would be eliminated.

Gap 13 - From point 20 to 21. This process was from when the goods arrived, packed, and moved through to inspection. This process contained numerous sub-tasks, such as booking in, linking inspection parts to purchase orders, taking on time delivery measures etc. These also need to be written in as a procedure because the tasks are critical to stock accuracy. Mistakes in this area mean that accounts are affected and cannot pay the invoices, car build planning is affected because the on-hand BOM is not up to date.

Gap 14 - From point 20 to 23 is an extension of gap 13. From goods inwards the parts have to reach their correct job card allocation. This is difficult to ensure due to poor security on the stores doors. Employees also asked for parts to be handed across the hatch before they ought to have been. It is difficult on the spot to know whether the part should be despatched or wait until it is kitted to a job card.

In summary the gap analysis highlighted several weak areas, such as the lack of a procedure that would provide the department with clear boundaries for better decision making. Also, similar points such as communication and security arose several times.

3.10 Data Gathering

It was necessary to see the problem from the supplier's point of view. How difficult was it to build a relationship with a company when they had no idea when, if and how much the next order might contain. To investigate the variability that the suppliers face Appendix 12.6 contains graphs which show the variability faced by eleven random suppliers over the last two and a half years. The data was collected from 1414 invoices, which gives substance to the results. As patterns in the results emerged, a snapshot of how RML operated towards a broad cross section of their suppliers was revealed.

Some of the suppliers are very small, and work out of a small unit with only a few employees, for example Alan Davies. For these suppliers the impact of irregular work will be harder since without constant work they cannot survive. RML will not always have work to give these suppliers but they could communicate better, less fads, tell suppliers whether or not there is a car build imminent and RML could reduce their

supplier base and improve relations with a critical few. Overall it will be more profitable for both RML and their suppliers.

The results in Table 1 show extreme ranges between months, for each company we can show this by looking at the largest and smallest expenditures.

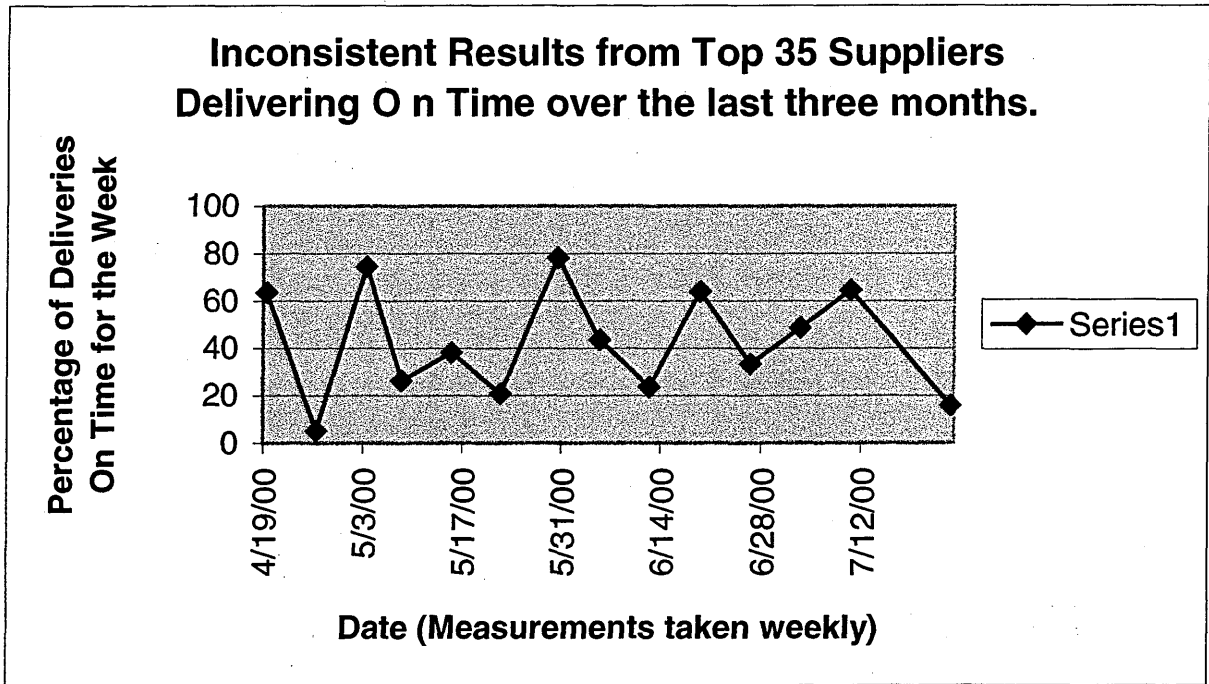
Company Name	Lowest amount £	Highest amount £
Able Metal	0	10,792.37
Aim Composites	0	6,121.75
Alman Engineering	0	5,376.16
Arena Stock	0	5,279.19
Alan Davies	0	5,634.13
Davron Finishing Industries	0	869.50
Premier Bearings	5.78	1389.72
Proweld Alloys	0	424.46
RS Components	137.82	4386.86
Technical Resin Bonders	0	2714.25
X-trac	0	71,947.19

(Table 1 - Range of Monthly Expenditure for 11 Suppliers)

The reasons for the large spends were described in a meeting to discuss the results. This commentary is with the graphs in Appendix 12.6. Even so the Materials Manager was still surprised by the amounts that were spent.

Data was collected from the on time delivery KPI weekly from April 19th until the 24th of July. The number of on time deliveries per week is displayed below in the graph. The graph contains the results from the data collected, it does not account for the degree of error found earlier in the use of this performance measure. The results show that the process is not in control. There does not appear to be any low point where upon the

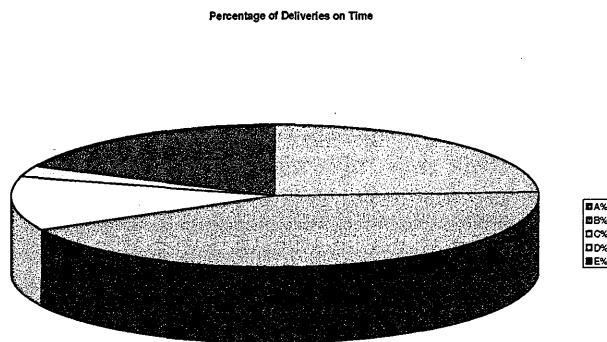
Materials Department contact all suppliers and let them know that the standard generally is unacceptable or the opposite that performance is going well.



(Figure1 - On Time Delivery Results Weekly)

This second diagram shows the overall results over the three months, with the same errors that were described earlier through the collection of the data. The pie chart shows the overall distribution of results and the magnitude of the problem. To conclude it shows that the suppliers are not delivering on time frequently enough.

A	Early
B	On Time
C	1 - 2 Days Late
D	3 - 7 Days Late
E	Over 7 Days Late



(Figure 2 - All Delivery Results over Three Months)

3.11 Summary of Chapter

The use of several strategically chosen tools during the methodology appears to have accurately collected a very clear picture of the current situation.

The interviews done at the very beginning of the project really portrayed that there could be more of an internal issue about the approach to suppliers and the level of information that RML have about supplier capabilities and capacities.

Chapter 4

Discussion of the Initial Conclusions

4.1 Introduction to the Chapter

This chapter consolidates the results from both the Literature Review and the Methodology section. The findings are placed into a SWOT because this tool helps people to understand the areas which are both in need of improvement and important to the effective operation of the Materials Department. The findings are then discussed in terms of how they affect the Materials Department and consequently the supply chain. The most critical or frequent areas for improvement are highlighted and these will form the basis for the new strategy.

SWOT Analysis

SWOT analysis is an analysis of the strengths and weaknesses present internally in the organisation, coupled with the opportunities and threats that the organisation faces externally. In appendix 12.2 a SWOT analysis is used to sum up the findings in the methodology. From the SWOT analysis there appear to be numerous minor areas that could cause problems or be improved upon. However from the SWOT, collectively there appeared to be at least six major areas that troubled the Materials Department. These were; communication, lack of procedures, security, performance measures, supplier selection and supplier development.

4.3 Areas Identified for Improvement

Communication - Internally information did not always flow well, to or around the department. Either people got busy and forgot to mention an issue that had been raised, or secondly someone was told a message but the person told was not the right person therefore the problem was not avoided. External communication was not as easy to monitor, however some suppliers made it clear that they would appreciate more.

Lack of procedures - It is possible to see in the gap analysis how often the lack of any type of procedure causes problems. Confused, undefined boundaries and as a consequence it creates problems. Without creating an overly regulated environment boundaries should be established. After it has been established it is easier to implement reviews and continually improve.

To operate any department, not just Materials, some discipline and routine is inevitable. Instructions ought to be given about procedures. Verbal instructions have obvious limitations and a certain amount of written guidance is a necessity. Procedures do need to be maintained, at some stage it will become necessary to revise, extend, standardise and arrange all the existing instructions. These procedures can be put together as a comprehensive document called the Materials Department Manual

The gap analysis shows that the lack of procedure could be affecting bottom line profits. Many companies stress the need to sell in order to increase profits. These companies have grown basically because of their emphasis on marketing and sales. However reducing costs could be a more effective way of making savings and consequently improving the bottom line. For example the three window edging strips for the P22 road car, it was designed to fit requiring four metres of each type. Purchasing was satisfied to buy one hundred metres of each when told by the supplier it was the minimum order they would accept. No attempt was made to find a more obliging supplier or negotiate a deal that would have given RML some cost saving. A procedure that sets the boundaries for expenditure might give reason to this kind of spending.

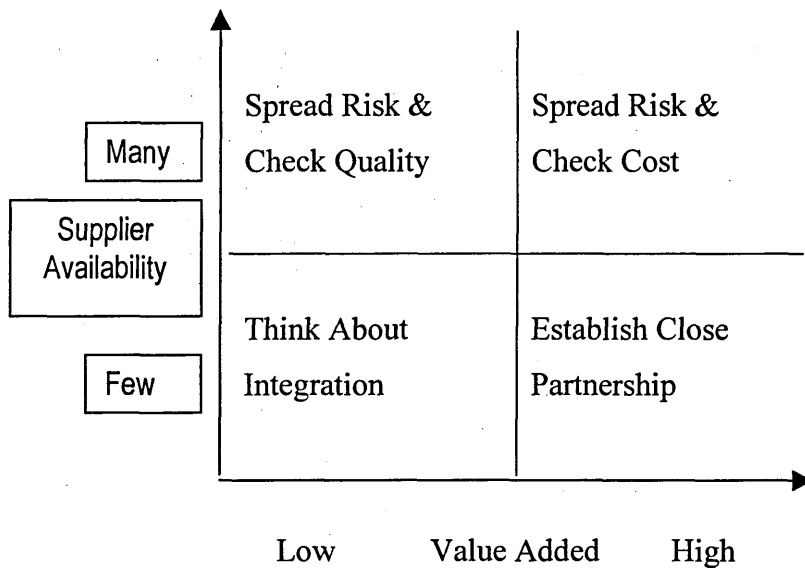
Security - Security was a problem only as far as Stores was concerned, the author is not making any reference to the entire facility which was highly secured. The Stores area was prone to being used as a through way, or worse, for components to be collected by staff before they allocated to job cards correctly. The accessibility of Stores to so many people also meant that when deliveries of new parts arrived, staff came into look. Staff trying to book in and get the stock to inspection found it difficult to be sure if everything had arrived with so many people milling around one delivery. The Stores staff performance

was hindered by this level of accessibility. It is the authors understanding that the Stores areas has already been quoted a price for an extension of the swipe cards, therefore there is no need to really discuss this point further.

* **Performance Measures** - Effort has clearly gone into implementing the performance measures. But acceptance on the shop floor is not so convincing. Commitment is often lacking where the measures take extra effort from staff. For measures like delivery response the situation could be improved by SYMIX collecting the data when the items were booked in and producing a print out at the end of the each week, this would improve the accuracy problems that were discussed in the methodology.

The main highlight from the Materials Department regarding performance measures was the desire to introduce a measure for Internal Customer Satisfaction. This was discussed in a departmental meeting and would really give the Materials Department a feeling for how well they are performing. It also ought to open up channels of communication and ultimately improve the service provided by the department. It is a measure with a lot of potential and will be developed later in the project.

* **Supplier selection** - The process of selecting the correct supplier was described in the literature review as one of the most important jobs that the Purchasing department undertakes. It also needs to be given a more formalised approach so as to improve the quality, cost and delivery decisions. The following is a model that could help RML to categorise their suppliers and understand the type of relationship that would be best with the supplier. Obolensky wrote that once the value added of your suppliers is established, various options can be studied by checking the availability of suppliers. The suppliers can be plotted onto a standard matrix as shown in figure 3 (Obolensky, N 1994)



(Figure 3 - Supplier Availability Versus Value Added Model)

Obolensky continues by suggesting that purchasing decisions regarding suppliers should be revisited if the value added is low and the supplier availability is limited. Integration remains an option. However if there are many suppliers then either quality or cost (depending on the value added) would be the primary concern, and it is worth spreading the risk to guard against supplier failure. Therefore, the more information collected about the various suppliers in the market, especially those of critical components, the better. This will form the basis of an Approved list for suppliers to RML and also aid contingency planning when unforeseen problems are raised during car builds.

Supplier development

RML understands that the boundaries of the company are best kept permeable since an organisation must include more than just their own employees. It is important to have include other stakeholders as part of the organisation. Stakeholders are defined as the customers, employees, agencies that regulate the industry (FIA) and suppliers, effectively any person or body who has an interest in the company.

Many successful companies have been able to extend their competitive advantage by integrating the supplier into the corporate organisation. These forward thinking

organisations have adopted the concept of the extended organisation. This type of organisation incorporates all suppliers and sub-suppliers into the supply chain of the organisation. The extended organisation considers suppliers to be partners in the future of the organisation. This thinking would best be described as the ultimate target that RML would like to achieve in the long term, with regard to the supply chain.

The good of the organisation as in the number of successful championship bids, which allow RML to grow, will become the good of the supplier as they will grow with RML and vice versa. However, it has been made clear that supplier development would only be possible after the other topics had been improved and it would take a lot of commitment. The benefits of building relationships with suppliers of critical components would by far outweigh the difficulties of implementing such a scheme which will be discussed later.

4.4 Summary of the Chapter

The findings have raised six main areas which have each been discussed. In the next chapter the approach to the new strategy will be developed which will organise four of the main topics for the Materials Department. Communication will come into each section and security has already been discussed. The four main topics of procurement procedures, performance measures, supplier selection and development, all contribute in a big way to the RML supply chain and can be improved through quality management techniques.

Chapter 5

Introduction of Analysis: Building the strategy

5.1 Introduction to the Chapter

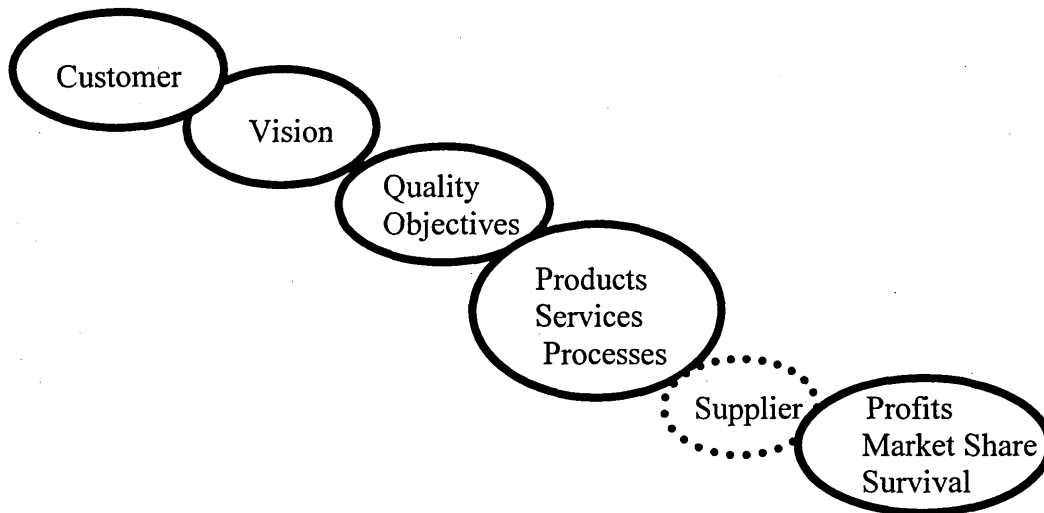
From the areas that have been identified, suggestions as to the solutions can be suggested. This will be developed as a new strategy for the Materials Department. Its development had the aim of addressing as many of the identified problems as possible. Since a number of supporting documents and techniques will be suggested the strategy will be set out in four major parts, some sections ought to be addressed immediately and other suggestions are more long term, with future development of the supply chain in mind.

5.2 Reasons for Making Suppliers an Extension of RML

In order for RML to improve on the current situation that hinders the supply chain and communicate effectively with suppliers they need to be brought inside the loop rather than treated as outsiders. If a company comes across as if they consider their suppliers to be servants who must meet their requirements as stated; often end up under utilising the creative talents of their suppliers by alienating them.

↳ The supplier is one of the most critical links to profit, market share, and survival. Companies know that the quality of their products and services is directly related to the quality of their suppliers and the products and services that they provide. This is depicted in Figure 4 on the next page.

Figure 4 is described as portraying "the missing link" (Fernandez 1995), this article says that when the supplier is not totally integrated into the company chain, the chances of success are drastically diminished. Internal processes cannot be adequately improved without considering the effect of incoming materials or services. These become a major source of variation, which must be dealt with in order to improve overall variability and to gain control of the overall process.



(Figure 4: The Missing Link - Fernandez 1995)

For the strategy to achieve the right balance a level of formality is essential for the efficient and effective running of an operation. RML's integration of its purchasing and supply management goes as far as, it is all processed within the same department. Integrating the purchasing and supply management with other key company departments such as accounts and engineering allows a closely linked set of production processes to be formed. RML ought to consider this as it allows organisations to deliver products and services to both internal and external customers in a more timely, effective manner. As found in the last chapter, RML need their new strategy to go further than organising their processes in a formalised documented procedure.

Further, it would be useful to exploit the competitive advantages associated with integrated processes, many organisations have adopted a much more strategic approach to managing other elements of the supply chain. This includes: measuring, monitoring and reviewing performance; companies are forming strategic selection procedures, increasing alliances with suppliers and following through further by developing the relationship away from adversaries.

5.3 Summary of the Chapter

X The reasons behind wanting to improve the appraising and control of purchasing and supply performance are basically: increasingly stringent competition; extreme emphasis on quality in today's era and the push to get vehicle to the customer on time. The changing relationships between buyer and supplier needs to be carefully cultivated and managed so as to bring continuous improvement to the company.

So the new strategy clearly separates into four major sections. The first section needs to answer the needs of the Purchasing department. The second section builds upon this with supplier selection and evaluation. A third part considers performance measurement through several selected techniques and finally the fourth part looks to the long term future through supplier development.

Chapter 6

Analysis Part 1 - Procurement Strategy, Procedures and Guide.

6.1 Introduction to the Chapter

This chapter is the first of the developed Materials Department strategy. It sets out the needs of procurement, of course it is not an exhaustive list but it provides an outline from which to work. A procurement strategy is personal to a company and the department members must choose what is to be included.

6.2 Procurement Strategy

Procurement needs a strategy. This like the Vision that RML has produced needs careful development because now more than ever there is a need to spend RML's money wisely. The RML procurement strategy ought to help staff maximise value for money by setting out the best practise over the whole procurement cycle.

When discussing strategy it is useful to consider the situation in the Materials Department from another point of view. The following scenario clarifies the point. Suppose a syndicate made up of everybody in the Materials Department was to win the lottery and nobody returned to work? A new set of employees would be brought in. Would they be able to understand how the department worked, how it interacted with other functions at RML or even how suppliers were selected and what was the suppliers past performance history? At present the learning curve would be very steep and very long. By setting down the wealth of knowledge and experience held by current RML employees maintaining records in a more formal and consistent manner it would be readily available to share. Once knowledge is shared this is the beginning of being able to continuously improve.

6.3 The Need for Procurement Control

Most businesses spend a significant proportion of their turnover buying materials, equipment and services. It is common for the suppliers of engineering equipment to

spend as much as 60% of their selling price on purchased items to be incorporated into the finished product. The bought out material and equipment for a major capital construction e.g. a power station or a steel mill, can comprise a similar proportion of the total cost. For this reason the procurement functions in many companies exert a strong influence on the company's operation. It follows also that lack of quality in this area is likely to have a significant adverse effect on the quality and profitability of the company's total operations. (Cranfield University Course Notes Jan 2000)

The objective of a quality management system to cover purchasing in a manufacturing organisation is to ensure, as far as possible, that the supplier provides the quality of goods or services that the purchaser needs to satisfy his own contractual liability. (Cranfield University Course Notes Jan 2000)

6.4 Needs of Procurement

It has been established why procurement strategies are so important. Now, it is necessary to understand what a department such as RML purchasing should be looking to include in a written procedure:

- Is the procurement process fast?
- Are levels of authority clearly defined?
- How well do you communicate with your internal customers about what is required?
- Is price considered, what about quality?
- Are lead times kept up to date
- Are all affected parties involved in major procurement decisions?
- What is the rationale behind our current supplier selection process?
- How are suppliers evaluated or appraised?
- Does the supplier have up to date procurement systems?

6.5 The Needs of Stores and Inspection

Although purchasing is the starting point for writing procedures the Materials Department really needs to look at writing procedures for both the stores and inspection

as well. This will ensure the effectiveness and efficiency of all three areas. It would be useful if these procedures were written together so as to harmonise the communication techniques and standardise any forms or reporting techniques that are used.

6.6 Procedures

Procedures are instructions and rules on how the work of the stores function, or any function, is to be carried out. Procedures must be:

- Written
- Based on standard methods of work
- Be in a logical sequence
- How to do it
- What to do
- What documents, tools etc are required

When looking at an individual process such as locating a product into stores you have to consider and then document:

- What is actually done, is it necessary?
- Why is the activity necessary?
- Where is it being done, is it suitable?
- When is it done, need it be done then?
- Who is doing it, could it be done better by someone else?
- How is it being done, could it be done better?

6.7 Guide

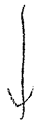
These guidelines, strategy and procedure would be best laid out in a formal document that contains every procedure for the materials department. This covers purchasing, quality, inspection and stores. Just as an example the Stores since it is the most familiar area to the author will be described. Its section of the department manual is aimed to define the limits within which the stores procedure operates, and will convey authority to the stores department to act within these limits.

Compared to other companies who have such documents it would need to cover the following:

- Introduction, explaining why the stores strategy is necessary.
- Stores Strategy itself, setting down the aims and objectives and how they are to be achieved.
- Overall procedure on stores
- What are all the processes of goods inwards
- Stores performance measures
- Method of stock checking
- How to deal with stock losses
- How receipts will be controlled
- How job issues will be controlled
- How job card picking will be completed
- How consumables will be booked out through the hatch
- How project products are to be located
- How items are located into the stockroom
- How to control and deal with unwanted materials and scrap
- Stock control by quantity
- Security in stores
- Records of damage to stock in stores and how
- How to arrange transport for goods out
- Packaging and documentation for goods out, e.g pro forma invoices for non EU countries.
- How to deal with rejects.
- How to bring unused stock back into stores if it is not used

Chapters might be organised like:

- General Instructions
- Quality statement

- Procedure in Stores
 - Stock recording
 - Stores accounting
 - Stock control by quantity
 - Stock Checking
 - Performance measures
 - General stock management - Including target stock levels
 - Specific project stock
 - Consumables
 - Stationary stock
 - High value items stock management
 - Electrical items stock management
 - Fixed assets withdrawn from use
 - Obsolete and redundant items
 - Scrap
 - Packaging
- 

6.8 Summary of the Chapter

The author is aware that the Materials Department has been considering its procedures over recent months. This is why the chapter does not go to the depths of presenting a full laid out procedure as well as the fact the staff know the ins and outs of the department better. The chapter also expressed the serious needs for procedures, they offer security in the form of formality and boundary definition.

Chapter 7

Analysis Part 2 - Supplier Selection & Evaluation

7.1 Introduction to the Chapter

Unless supplier selection is a strategic decision, purchasing is responsible for choosing the suppliers. Purchasing is also responsible for monitoring the suppliers and should have an idea of:

- Overall commercial and manufacturing capabilities of the supplier in order to decide on its suitability.
- Current capacities of the supplier
- Efficiency and performance of the supplier

This chapter aims to provide ways of increasing the communication between buyer and supplier, ensure that RML have the potential to collect as much current information from suppliers as they can usefully use. It also discusses the reasons for supplier selection procedures and why site visits are effective for building supplier relationships.

7.2 Authority for Selection

It has been made clear that selection is the essence of the purchasing process, for every company not just RML. Therefore it is imperative that the final authority rests with the Purchasing Department. This does not aim to take away the freedom enjoyed by the Engineering and Design departments to discuss components with suppliers prior to an order being placed, but it does mean that their wishes must be communicated properly to the Purchasing department. If selection is improper, goods and services run the risk of being inferior and the user department will end up sharing the blame. Under these circumstances a large measure of control over purchasing is lost, competition decreases, friction develops, morale suffers and costs rise. These are all symptoms that were observed during the build of the P22 road car. Through heavier involvement of the Production Engineer in communicating what is required and proper source selection decisions being taken by the purchasing personnel the situation might be improved.

7.3 Selection Procedures

The time effort and cost devoted to an appraisal of a supplier will depend on several factors. First, the value and complexity of the order. Second, the buyer's knowledge and experience of a supplier, such as their reputation or references. Third, the prevailing economic, industrial or political climate and the constraints that may affect a supplier's performance, such as a materials shortage or transport strike. Fourth, the financial consequences of the supplier not meeting its obligations. Finally, the time available. Price is often of secondary importance when selecting a supplier. A good supplier should not only provide the right quality consistently but also be receptive to changes in need.

Source selection starts with determining all potential suppliers and continues with elimination on various grounds until the number has been reduced to a workable few. This is why a questionnaire has been devised. By distributing the questionnaire to current and future suppliers RML will gather a picture of what resources are available and at what cost. The procedure aims to search and sort - searching for all potential suppliers and then sorts for those with whom to do business. Although it must be acknowledged that source loyalty will lead to a retention process. This all takes time, and so the heaviest emphasis must be placed on the firms that are likely to be supplying the best and most important products and services

It would be useful for RML to prepare a prospective supplier list, to benefit contingency planning and respond faster to changes in the market. For the next car build, this technique is probably best suited to a project as big as the P22 road car, where the parts are very specialist. But it could be developed for a car that is competing in an ongoing championship such as the Astras or P23 even though the list would be smaller because more of the parts are standardised. The effort expended depends on the importance of the business to be transacted. It is up to Purchasing to weigh the value of orders to be placed against the cost of this step. It is then also the responsibility of Purchasing to contact each of the sources and evaluate their potential. A criteria set by senior management will aid this decision making.

Experience is where RML has a wealth of knowledge stored within its own employees. Purchasers are often making decisions based upon the suppliers past performance. When a new item is under consideration, a buyer usually determines whether present or past suppliers are likely prospects. However, within RML the information has not been collected or referenced anywhere so it can be shared amongst all the employees. It is vital to gather these important facts and put them on SYMIX. Other companies keep records that include such additional data such as reliability of the supplier in meeting commitment dates (delivery response), research and development facilities, and defect or reject ratios on past shipments.

After the potential suppliers have been determined and located, a qualitative evaluation and elimination process ought to be used. This process compares suppliers in terms of their ability to provide the desired quality, quantity, price, and service. Quality here, refers to the suitability of an item for its intended purpose; therefore quality must be evaluated by considering how the product is to be used.

When developing a policy for choosing suppliers it raises several other issues that need to be considered. These issues include location, reserve capacity, technical assistance, quality control procedures, production assurance, and labour and financial stability. These all have different weightings of importance to RML but it is important to assess these as relations are improved with the suppliers.

7.4 Development of Pre-Qualification & Supplier Questionnaires

The purpose of the pre-qualification questionnaire is to promote strong competition by producing a shortlist of organisations which are most likely to meet the requirements and discarding those which are unsuitable. This also avoids wasting likely contenders time and resources, enabling them to focus their efforts. RML may find that pre-qualification questionnaires too much for consumables. However it is useful to have up to date information on all your suppliers and it portrays an image of professionalism and seriousness to the supplier.

Where several suppliers are options to provide critical and/or expensive components, then on the basis of the pre-qualification questionnaire several potential suppliers can be rejected, not just on the basis of cost. Therefore RML will be supplied more information with which they can make a more informed decision when spending money. Generally in numerous industries this type of information is gathered through questionnaires. These are normally designed to allow self-assessment of the potential suppliers suitability, including commercial, financial, technical and other track records.

Areas that the questionnaires normally cover according to those identified in the literature review are as follows:

- Background information on the organisation
- Finances - copies of the last three years annual reports; audited accounts and turnover
- Litigation - details of involvement in court actions and industrial tribunals over the last three years
- Professional indemnity insurance cover
- Staff - average annual staffing for the previous three years and details of staff involved in the provision of the services in question
- Experience - in providing similar services
- Track record - over the past three years in similar areas and referees that can be called upon to vouch for performance
- Quality - details of accreditation, documentation and procedures, including human resources procedures, when relevant to the performance of the contract

The decisions about content of the supplier questionnaire so they were validated, came from several sources.

- Source 1 - pre qualification documents distributed by public and private organisations. This includes Canadian government, MichCon , Rover, ADtranz and two who prefer to remain anonymous.
- Source 2 - academic studies of the supplier section and tender process [Ward N, 1998] [Liu Wei Chung, 1992]
- Source 3 - Conference paper, Troy Michigan August 1997

The research of these sources resulted in a list of characteristics the questionnaires ought to include regarding supplier selection and the suitability of a potential supplier to manufacture a component. Consider the process map that portrays the relationship between the supplier and RML's Materials Department.

One questionnaire has been developed but with two front covers. One questionnaire for pre-qualification (Appendix 12.7) and the second for current suppliers and monitoring yearly (Appendix 12.8). After the pre-qualification questionnaires have been appraised, site visits can be made to existing or previous customers of potential suppliers in order to obtain a clearer view of their suitability. The questionnaires include a Health and Safety questionnaire as this is in line with other industries that were researched.

7.5 Site visits - Validity of a Potential Supplier.

A site visit gives the buyer the opportunity to meet and observe the people and premises of the potential supplier. It allows the buyer to clarify any unclear aspects of the application; the buyer will also sense the atmosphere within the organisation and find out if the supplier is healthy.

When a company has the choice of several suppliers the uncertainty about the consequences of the choice that the selection made brings will heighten the anxiety or stress. Some years ago Hawes and Barnhouse (1987) examined how purchasing executives handle personal risk. They found nine important tactics in use for handling perceived personal risk. The foremost tactic mentioned was "Visit the operations of potential vendor, to observe its viability first hand." In addition to reducing buyer stress, visits to the plants of suppliers are an important means of initial evaluation and periodic examination of existing vendors. This will be considered in the final point in this section. Companies in the past have identified that it is desirable for a representative of the Production and/or the Engineering departments to accompany the buyer on such trips, especially if the components are highly technical. Technical associates (i.e. RML's Production Engineer) enable the buyer to make a sound judgement of the equipment and capabilities of the supplier.

It would be very difficult to compile a list that would cover all the factors to be considered on all site visits. But it is possible to indicate major areas of concern which should be observed and examined.

- 1 Facilities - Walk around and get a feel for the work being carried out, this will show up the production facilities and overall plant layout. It might be useful to check a few of the areas such as receiving, inspection, shipping, internal materials handling system, offices, stores and tools rooms. Another important aspect is evidence of attention to health and safety issues around the site.
- 2 Personnel - The degree and type of supervision should be observed, how they communicate with one another and the state of the employees morale should be evaluated. These are all useful insights into relations between workshop staff and management. The degree of technical competence shown by individuals whose work has any bearing on the purchased goods should be determined.
- 3 Housekeeping - Plant maintenance and general cleanliness are useful clues to the efficiency and reliability of output that may be expected. It also shows how much pride is taken in their work, is it up to the standard required by RML?
- 4 Procedures - It would be wise to study how the supplier processes an order, from the time it is received until the shipment leaves the plant. Such an analysis will reveal the level of efficiency that is maintained and indicate potential procedural problems that could affect their service toward RML. Due to the strict rules imposed on the cars that RML build by the FIA special attention should be paid to quality control procedures, traceability, damage etc...
- 5 Production specialisation - The buyer should determine, during a site visit, the kinds of production in which the supplier tends to specialise. The supplier may be most effectively utilised as a source for such specialised products. RML ought to aim at using suppliers resources to maximum effect. To know what capabilities the supplier has RML must look to discover the suppliers strengths.

Site visits are performed by the EFQM auditors when they are assessing a company for a major award. As a result they have developed very tried and tested guidelines for

performing site visits. The EFQM recommend that prior to the site visit that RML personnel visiting the supplier put together a plan. This was not done during a supplier visit to Alman Engineering. A precise plan of:

- Why the visit is necessary
- Who will be involved
- What information is needed
- How will questions be asked and of whom
- Assure confidentiality
- Try to meet a cross section of staff

(EFQM 1999)

This type of approach will yield more information than an informal chat that was previously known as the supplier appraisal.

7.6 Summary of the Chapter

The chapter discussed why supplier selection procedures were necessary and by whom. The most important three contributions that the chapter makes are the two questionnaires that are thoroughly prepared and ready for use, they ask a wide range of questions which inform RML about the supplier and how the supplier views RML. Finally the chapter discussed the benefits to be gained by visiting the supplier and seeing first hand where RML's components are potentially going to be manufactured.

Chapter 8

Analysis Part 3 - Performance Measurement

8.1 Introduction to the Chapter

To fully understand and appreciate how RML is performing it is necessary to measure, investigate causes and finally continually improve. To do this, different functions respond better to different investigative techniques. Three specific techniques, the first performance measurement is a development on what is already in place. It also considers a internal customer satisfaction KPI that was discussed within the company. The second, the internal self assessment is a new technique developed specifically for the Materials Department to use once every six months. Finally the internal audit process is suggested as a regular event, especially for understanding the situation in stores.

8.2 Performance Measurement

Performance measurement systems are a tool of good management. A measurement system should be designed to support the department, not hinder. The degree of sophistication that has been developed in the system is based on the specific needs of RML. What is to be achieved by a few well defined measures is information about the performance of the Materials Department and identification of areas for improvement.

In a study that looked at the extent to which tracking of supplier performance had any value, respondents were asked whether they monitored any of six supplier related measures which were:

- Number of suppliers
- On-time delivery of purchased parts
- Percent of acceptable incoming deliveries
- Percent of single sourced items
- Percent of suppliers certified
- Total cost of purchased parts.

(Tan, K C, 1998)

These measures make it possible to identify if there is a relationship between, for example, tracking the number of suppliers, and changes in the number of suppliers used, on-time delivery and so on. Results to the study were that over 70 percent tracked on-time delivery, 69.6 percent tracked the percent of acceptable materials, and 63.9 percent tracked the total number of suppliers used (Tan, K C, 1998). One measure that was discussed with RML was stock movement. It is probably inappropriate to try to develop this measure until more tried and tested measures like the above are in place and operating effectively and efficiently.

Some suggested measures for purchasing, used by other companies, that might be useful for development by RML in the future are:

- Frequency of purchase order size
- Number of rush orders issued per period
- Number of change orders during a period
- Purchasing processing time report

Characteristics that were collected by researchers who wanted to advise performance measurement designers found that the three most common pieces of advice were:

- The most relevant metric should be used
- Metrics should be derived from strategy
- Metrics affect peoples behaviour (Johnson A et al - No Date)

These are aspects that need to be considered when developing the measures.

The methodology highlighted some of the problems that the current measure face in data collection. Also during the methodology one measure that was agreed upon within the department was to how measure internal customer satisfaction. This measure has been fully developed with operating instructions (Appendix 12.9), although once it is in place it will need review to ensure it keeps up to date with company needs.

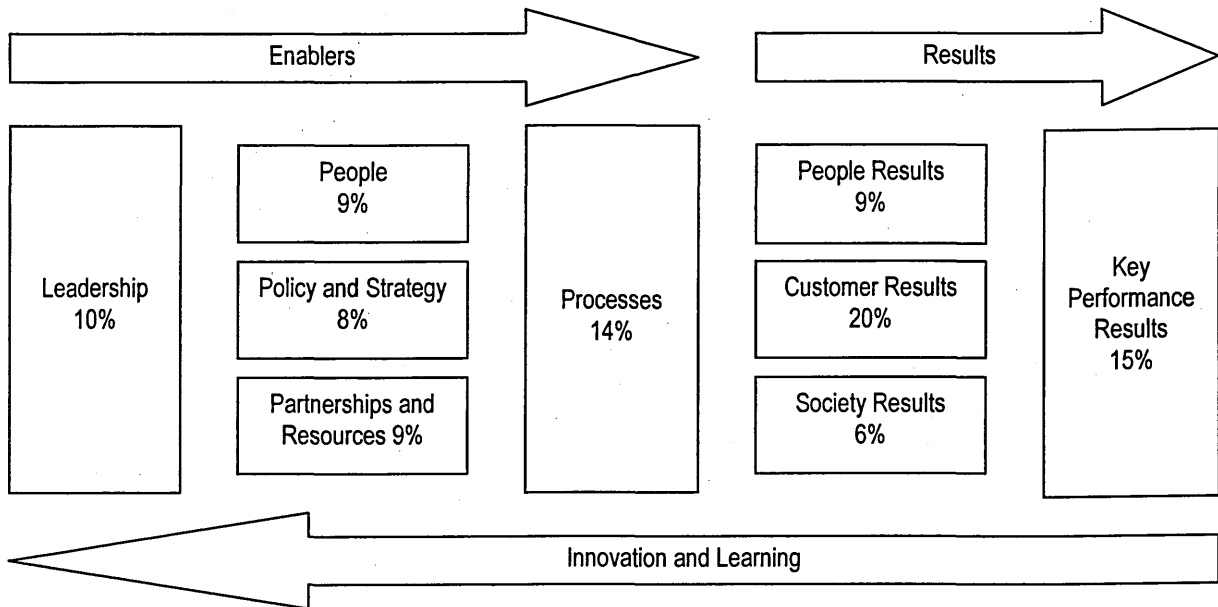
8.3 Monitoring

The purpose of monitoring is to verify whether or not the solution has been effective. Has the implementation of the performance measures, or internal audit or procurement policy created the expected results? To know whether there has been change in the right direction it is important to have set targets so the progress is measurable. The actual result could then be compared to the target value. All results irrespective of whether they are good or bad should be recorded. This information can be helpful in the future.

8.4 Internal Self-Assessment

The ISO 8402 definition of quality assessment is: systematic examination of the extent to which an entity is capable of fulfilling specified requirements. Self-Assessment is about being proactive and researching how the department is performing and how it can be improved. An effective method for understanding internal assessment is by introducing the EFQM self-assessment model. The EFQM Excellence Model is a non-prescriptive framework based on nine criteria seen in figure 7. Five of these are Enablers and four are Results. The Model recognises that there are many approaches to achieving sustainable excellence in all aspects of performance, is based upon the premise that: Excellent results with respect to Performance, Customers, People and Society are achieved through Leadership driving Policy and Strategy, People, Partnerships, Resources and Processes (EFQM, 1999).

The proposed use of the model is like the Internal Customer Satisfaction KPI but to a greater degree. The model has proved useful in terms of understanding and visualising the management issues of the whole business. Its real strength has been in its use as a diagnostic self assessment tool, which enables an organisation to quantify its progress in improvement and also to benchmark with other organisations. Self assessment against the model is part of the strategy adopted by many well known organisations (e.g. TNT, BT, Unilever). Awareness and use of the model by smaller companies is still relatively low.



(Figure 5 - EFQM Excellence Model, 1999)

Each of the boxes above has its own set of guidelines against which a company can assess itself and use the results to continually improve. So as the Materials Department can use the model which has world-wide recognition, the recommended guidelines have been adapted. Appendix 12.10 contains this information with a full explanation of the scoring system.

8.5 Internal Audit

Audit is defined in ISO 8402 as " A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are so suitable to achieve objectives."

Making this type of random, objective check of the way that a process is operating will provide the proof that the system is adequate or alternatively, exposes inadequacies and deficiencies according to the defined requirements. Follow up procedures are

recommended as they will deal with any deficiencies found, which is essential to continuous improvement.

Audits are carried out for different reasons and by different organisations. However they if done correctly they will all have several common features:

1. Persons or groups from outside the department/company being audited should always carry out audits. The only exception would be in self-audits, which are used as effectiveness audits.
2. Audits are random checks of the system. They cannot be expected to find all defects in the system. They are designed to uncover "type" faults, for example, poor documentation control, lack of understanding of the system, inadequate training.
3. Audits are carried out in an objective manner, i.e. demonstrable, factual evidence and not subjective impressions is the basis for audit.

(Cranfield University Course Notes November 2000)

The findings from the methodology section established that RML rarely audited. Occasionally a stock count was done with poor results, primarily due to lack of security on the stores doors and the unit measures on SYMIX. During the author's time within the company none of the performance measures or their processes within the Materials Department underwent a review. In terms of the Materials Department perhaps more frequent small internal audits would assure the department that the systems in place were satisfactory and being followed. Regular internal audit of processes is especially important after parts 1 and 2 have been deployed. Such audits need to be frequent with fast follow up action and the actions need to be recorded and documented. The records of the audits and the follow up action may be necessary to demonstrate to outside organisations that the process is working. According to one article audits are often the best method of prevention; they can help the department really understand how well they are performing (Purchasing Today - May 1999)

The scope of the internal audit will also determine the resources required for the audit, it would be important to keep it simple and small to begin with. It is an important

implementation issue to keep the audits regular so as they become a company "norm", a part of the every day culture. It is suggested that internal audit is focused to begin with on stores. Stores would gain the most out of internal audit so they can get a grip on stock accuracy, loss, obsolescence and damage.

Again for future development of internal audit it might be useful to consider the following type of scope issues for an audit of purchasing activities, including supplier selection is as follows:

- Are financial limits being adhered to?
- Are the appropriate personnel conducting given transactions?
- Are supplier's references and performance records being checked?
- Are purchasers responding in a timely fashion to end-user inquiries?
- Are other departments (as required by policy) being co-ordinated with other appropriate departments?
- How often does the item received match the one ordered (with the standard being the contract or PO)
- Are items that have not been received followed up on?
- Are competition requirements being met?
- Are FIA regulations well documented and is the department kept well informed?
- For larger projects, how good is the forecast; how close was the actual price to the budgeted/quoted figure?
- Are the best/cheapest transportation methods being used?

During the audit of the purchasing function it might be useful to check and see if the electronic system i.e. SYMIX is also working properly, generating the correct data, and that the reports that are compiled, such as the BOM requirements, are accurate. Therefore it would be a useful exercise to design some tests for the system. This is since the input from Goods Inwards did not always reach Accounts. For example, the Goodridge order where the sticker had printed to say the goods had been received but it appeared on screen in accounts as if it had not been booked in. The system needs to be checked occasionally with real data.

8.6 Summary of the Chapter

The chapter introduces for technique which will encourage planning, checking acting and monitoring. It is important for the Materials Department to understand clearly how they are performing. The performance measures in place had suggestions recommended during the methodology, this chapter suggested some simple measures to improve the level of information about suppliers. A full working document for the Internal Customer Satisfaction measure is in the appendix, which compliments the Internal self-assessment document. Finally the chapter illustrated the importance of frequent review and checking to aid continuous improvement.

Chapter 9

Analysis Part 4 - A Process Map for Supplier Development.

9.1 Introduction to the Chapter

Sourcing is a major part of RML's manufacturing operation. This enables the company to focus on its core competencies of machining and fabrication. As the company takes on ever more challenging projects they are increasingly expecting their suppliers to deliver innovative and quality products on time and at a competitive cost. During the time that the author spent with the company several suppliers appeared to be incapable of meeting the needs of the P22 project (strangely it appears to have come mainly from long standing suppliers, such as Alan Davis and Davron Finishing Industries).

Therefore in order for a car build to proceed the buyer is left with three alternatives:

1. Bring the outsourced item in-house and produce it internally
2. Change to a more capable supplier, or
3. Help improve the existing supplier's capabilities

All three strategies can work. The choice often depends on price, volume, or the strategic nature of the procured item. For low value added, non-strategic commodities, ie consumables shelves (latex gloves saga), the cost of changing to a new supplier is low, and switching may be the best option. At the other extreme, when an under-performing supplier provides an innovative product or process technology (that may be of sustainable long-term advantage to the buyer), the buyer may wish to protect this potential advantage and bring the work in-house by acquiring the supplier. In those cases that lie between two extremes, and even at times including those extremes, the best option may be "supplier development" (Sloan Management Review - Winter 2000).

The strategy that has been chosen takes into account the size of RML and the extent of the resources that would be available for supplier development. Supplier Development requires both firms to commit financial, capital, and personnel resources to the work; to share timely information and sensitive information; and to create an effective means of

measuring performance. The strategy will provide a challenge to both parties. Supplier development can be the beginning of a properly integrated supply chain. Since a lot of the work is out-sourced during projects, suppliers have an impact on the quality, cost, technology, and delivery of RML's own products and services, and thus on its profitability. The direct effect of supplier performance on RML's bottom line highlights the importance of optimising supply-chain performance. Therefore the overall aim for RML will be to achieve continuous long-term improvement of supplier performance based upon the following agenda.

1. Identify where value is created in the supply chain
2. Positioning the buyer strategically in line with value creation,
3. Implement an integrated supply chain management strategy to maximise
4. Measurement and Review

However it is clear that RML are not yet in a position to develop a long term strategy in detail until they have laid down a procedure for purchasing and selection of their suppliers which is in line with their overall business strategy. It is advisable that for RML's level of available resources that they limit supplier development to those who are crucial to car builds i.e. CTS, Alan Davies and Aim Composites.

9.2 A Process Map for Supplier Development.

This model was developed by four researchers, Handfield, Krause, Scannell and Monczka and first published in the Sloan Management Review (Winter 2000). Before the model was developed they scanned supplier development strategies used in more than sixty organisations and collected together the findings. The following seven-step generic process map was developed, and has been adapted for use by RML.

Step 1: Identify Critical Commodities

It is acknowledged that not all companies need to pursue supplier development. Some may already be sourcing from world class suppliers because they have made effective sourcing decisions and supplier selections. Or their purchases may be so small in proportion to total costs or sales that investing in suppliers is neither strategically nor

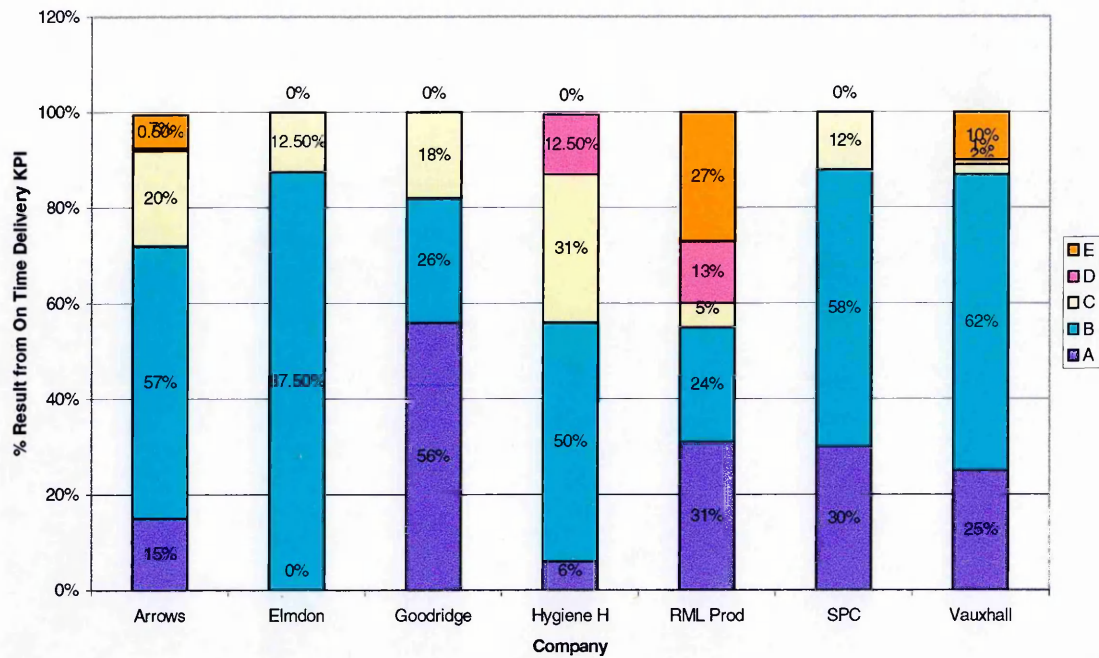
financially justifiable. Therefore, managers must analyse their situation to determine whether supplier development is warranted, and if so, which purchased commodities and services require the most attention.

This assessment will help RML to build up a portfolio of "critical" commodities to a car build such as P22 (the products which are essential for success of the car build). This assessment ought to be seen as an extension of the company's overall strategic planning and should include participants from the functions affected by sourcing decisions (purchasing, production, design, engineering and accounting). The suppliers that are identified ought then to become the targets for further research by a dedicated team.

Step 2 - Looking at Past Performance

The RML team must look closely at how well the supplier has been performing. This ought to be helped by the measurements that have been taken through Key Performance Indicators. The measurements within the Materials Department that can be used will be cost, quality and delivery times. To determine which supplier to develop a useful quality management tool is Pareto analysis. Pareto charts are a method of organising errors, problems, or defects to help focus on problem solving efforts. Thus, Pareto analysis is useful in identifying suppliers with potential for development, as well as those that are underperforming suppliers. The following Pareto analysis is based only on the results for on time delivery (see data collection) for six companies that supply RML.

Pareto Analysis to Show the Potential of a Company for Supplier Development



(Figure 6 - Pareto Analysis of Delivery Results)

The results in the graph above represent only RML Production that could be categorised as critical, since they built the chassis for P22 and do a lot of work on the Astra's. A supplier development project might be worthwhile because their on time delivery ability averages at 24%, more deliveries were very late at 27%. This result is not very healthy compared to some of the external suppliers. Elmdon Metals deliver raw materials, and Goodridge provided specialised hoses for P22. These are both important suppliers, Elmdon Metals performance is excellent and Goodridge is good with a bit too much stock coming early but considering the nature of car builds this is not a bad thing. Vauxhall provide for the Astra's well although they could improve, just like Arrows and SPC. However the results for Hygiene Higher are not as good. None of these suppliers appear to be poor, so it would not be worth considering sourcing elsewhere. However, this situation might change in the future.

It might be useful for RML to see the results of important/critical suppliers such as Dynamic Suspensions, CTS, BT Precision and Aim Composite.

Identifying poorly performing suppliers requires systematically analysing of supplier performance data. Many leading companies monitor supplier performance on a plant by plant basis, ranking suppliers from best to worst. They target suppliers that fail to meet minimum performance objectives in quality, timely delivery, cost, technology, or cycle time for analysis and eventual supplier development. The buying firm meets with supplier representatives to determine the cause of the problem(s) and the required corrective action(s). If supplier development is warranted, both firms must harness the resources to drive the improvements. If improvement is not forthcoming, the item(s) may be sourced from an alternative supplier.

Step 3 - Develop the Project Team

Before approaching suppliers to ask for improvements, a buyer must first develop internal cross-functional consensus for the initiative. Such consensus shows the supplier a "unified front" and ensures that all buyer functions send the supplier consistent messages. However in order to be able to influence a supplier to make improvements RML must have their own house in order, which is why the procurement action plan has been recommended as the first action. This would optimise supplier contributions, as they would see the buyers supply chain strategy and roles of procurement so that RML's business objectives are clear and then the supplier can see what they are trying to achieve as well.

Step 4 - Meet with the Suppliers Management

At this point there are three objectives that need to be established through this meeting:

1. Strategic alignment
2. Measurement
3. Professionalism.

Strategic alignment requires buyer-supplier alignment that focuses on each customer's requirements throughout the entire supply chain, which will change depending on the type of car build. Supplier measurement has already been discussed. However it is important to communicate what is expected. The supplier measurement requires a total

cost focus as well as credibility and participation of purchasing and other key functions (such as engineering, quality, information systems, and manufacturing) in both organisations. Approaching a suppliers top managers with a good business case for improvement sets a professional tone that reinforces the relationship, fosters communication, presents RML as an organisation with a face, provides a very specialised service and develops trust.

Step 5 - Identify Key Projects

After identifying promising opportunities, managers must evaluate them in terms of feasibility, resource and time requirements, and potential return on investment. The goal is to decide whether they are achievable, and if so, what the goals should be. Additional criteria used to evaluate opportunities include willingness and ability of supplier (and buyer) to implement changes, duration of project/service life, strategic importance of the product/service and its impact on the business, return on investment, impact analysis, and standardisation.

Step 6 - Define Details of agreement

After identifying a potential improvement project, the parties need to agree on the specific metrics for monitoring its success. The metrics may include percent of cost savings to be shared, percent of quality improvement to be achieved, percent of delivery or cycle time improvement desired, key product or service performance targets, technology availability, and system implementation targets. The agreement must also specify milestones and deadlines for improvement as well as the role of each party - who is responsible for the project's success, and how and when to deploy the allocated resources. Upon reaching agreement the project can begin.

Step 7 - Monitor Status and Modify Strategies

To maintain momentum in the project, managers must monitor progress and constantly exchange information. Revisiting objectives after attaining a milestone may bring to light the need for new or revised objectives. The parties may need to modify the original plan

because priorities may change and additional resources may be needed. In short, the strategy must be revisited to stay in sync with events.

9.3 Summary of Chapter

The chapter introduced the final part of the strategy aimed for future use. After the other parts are in place and working effectively the company will probably have grown and have more resources to perform this type of project. Even so, initiating supplier performance improvement is not an easy task. The objective is to transform suppliers so that continuous improvement becomes an integral part of their capabilities. It takes a lot of time and patience. Some of the implementation points in the next chapter may be useful to keep in mind.

Chapter 10

Implementation Issues

10.1 Introduction to the Chapter

Implementation is the hard part of any plan, it is the doing part. Implementing a new supply chain strategy is a complex and awesome task (Easton 1999). The strategy spans material and product flows from suppliers to the final customer. The process encompasses an array of different organisations, employees doing different things, making different decisions and performing in different ways. But at the end of it all they must all share the same vision.

The following techniques are suggested to aid the changes that could take place if the strategy goes forward. People provide the route to fast and effective management of change. To achieve change, people must know what to do, why, and how; they must have the correct resources to make changes; they must be motivated and guided.

10.2 Create a Map

The complexity of supply chain change can lead to confusion and failure. The suggested strategy contains numerous areas for improvement. Therefore, it would be useful to create a map of supply chain wide (Materials Department included) initiatives and compare these with goals, performance measures, and resources. A map can identify the array of change initiatives and projects, reveal conflicting time and resource priorities, and point out change goals that have not been addressed or reviewed. The map is useful for scheduling, setting priorities and initiating regular reviews. Since concurrent initiatives can lead to confusion, an integrated approach to change is essential.

10.3 Pilot Schemes

Often people find it helpful not to make a full-scale implementation. Instead a limited, pilot implementation is usually appropriate. It gives people the opportunity to see whether the solution that was selected was truly as effective as expected before spending

the time and energy required for the full version. Therefore, one of the first parts of this step is to determine the scope of the pilot test. It should be broad enough for the effectiveness of the solution to be measured, but narrow enough to be feasible. Note that for a small solution with minimal impact, a pilot test may be overkill.

An action plan, including answers to what, who, when and how for each of the implementation steps, needs to be developed. Training may be necessary for personnel who are affected by the pilot test. Finally, the solution should be implemented, making sure that the appropriate means for monitoring the selected solution have been well established.

10.4 Resources

A new scheme needs adequate resources. Since RML is an SME resources are limited for major new projects. Therefore if the project's worth needs to be evaluated and can it be carried through a car build when resources are stretched this will require flexibility and responsiveness.

10.5 Communication

Some of the most important points to remember during a new project are simple but effective, they also nearly always come back to communication.

Initial improvements are kept simple by setting small goals and progress milestones

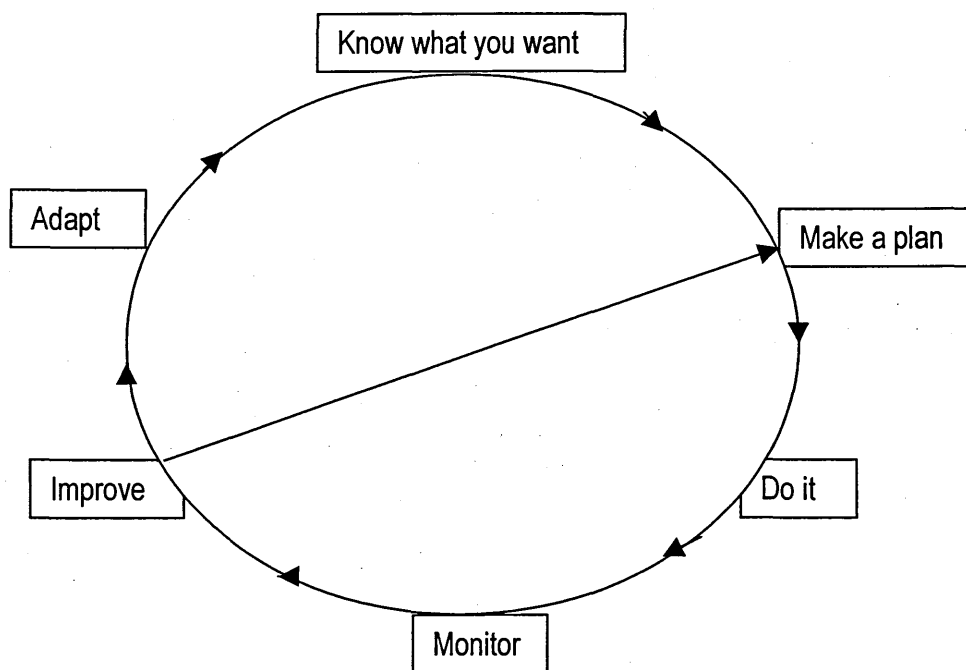
As the projects are implemented, especially external ones in the future, it would be useful to offer personnel support and discuss training techniques. Ensuring follow up and review through a supplier champion. Minimising legal involvement and even try to tie the business relationship to performance improvement.

It is crucial to maintain top management commitment, supplier commitment, therefore show them where they stand. Next talk to people informally; let them know what you are doing and why. Eliminate unsupportive managers from the project. Then so everybody can see the progress, display the results as publicly as possible.

Finally if all goes well there should be an understanding between buyer and supplier of trust. Incentive schemes are also effective at getting people's attention, for example, offer repeat business on future car builds. For RML keep a long-term focus and illustrate the benefits, for example, the celebration points in the monthly meeting for employees.

10.6 Continual Change

Sometimes people fear continual change because they don't like the idea of getting settled in one routine and then having all the upheaval and uncertainty that is involved. However, outside circumstances change and it is necessary for RML to stay in touch with its customers and competitive environment. This is not the same as what is achieved by the marketing function or part of the hierarchy, like the main board. Continual change is about every individual being empowered to act in a controlled way, to instigate and make the changes the organisation needs to delight customers. It should help with motivation and achieve synchronicity with suppliers. Figure 7 was adapted to give a clear and simplistic approach to continual improvement (Obolensky N, 1994).



(Figure 7 Continuous Improvement, Obolensky 1994)

10.7 Summary of the Chapter

Several aids and issues for implementation have been highlighted, but non beat plain and simple planning before doing. It is important to keep in mind all the time the overall objectives and vision of RML and to make changes in line with this and the needs of the departments customers.

Chapter 11

Conclusions and Recommendations

The foremost aim of the project has been to find ways to improve and aid RML's supply chain. Numerous areas were highlighted as areas for improvement and the four part strategy's aims to be immediately effective and develop RML's approach toward their supply chain. Therefore in respect of the project aims, the project has been a success.

A full picture of the way that the Materials Department relate, to their internal and external customers was gathered. The objective to understand the way RML operate showed first and foremost the potential of RML to be able improve on the way the supply chain is approached. The most important point is recognising the impact that Purchasing has on the company's bottom line and reflecting this by formalising and controlling the methods used to conduct business. In no way should the Purchasing Department feel that their hands are tied but they must realise the potential that they hold as a department is unprecedented. Proactivity in communicating with suppliers and building relationships through site visits, during quiet times between car builds is of paramount importance.

The Literature Review showed that the subject of SCM has been completely opened up over the last couple of years and currently there is an abundance of information, reviews and models. It was important to disseminate the information to a level where the best and most appropriate information which would be useful to the project.

The Materials Department now possess a new insight based on a variety of reputable sources and tools that they can use to develop both the department and the supply chain giving RML a more organised and professional prominence. This starts with a finding a degree of formality which is currently lacking in the procedures. Procedure writing is recommended to RML as it organises the processes and areas for improvement become apparent.

Performance measures were assessed and reviewed. Improvements have been suggested to the current measures in the department and one new measure that looks purely at Internal Customer Satisfaction was developed. If this is implemented fully it ought to provide useful information about how the department is viewed. On the same subject internal self-assessment has been suggested and a full working document provided adapted for RML from the EFQM. To further gather performance information the Internal Self-Assessment programme was developed.

The final topic, the suppliers was addressed. This looked at their selection and produced the Pre-Qualification and Supplier questionnaires, these were to gather relevant information about the suppliers so RML are fully aware of their capabilities and capacities. This also allows evaluation of the suppliers, and if new suppliers are approached to provide the same information then RML can build up a portfolio of different supplier options should their current supplier fall short. The final part of the strategy looked at supplier development, looking to the future it suggested a generic process to develop stronger ties with suppliers whose components are critical to car builds.

Finally, the various aspects of the strategy, even if not all are chosen for implementation by the Materials Department it will be able to understand the reasons behind their suggested use. Each of the strategy topics fulfils the aim of the project because they give the Materials Department the ability to improve their supply chain, used together they have the potential to take the

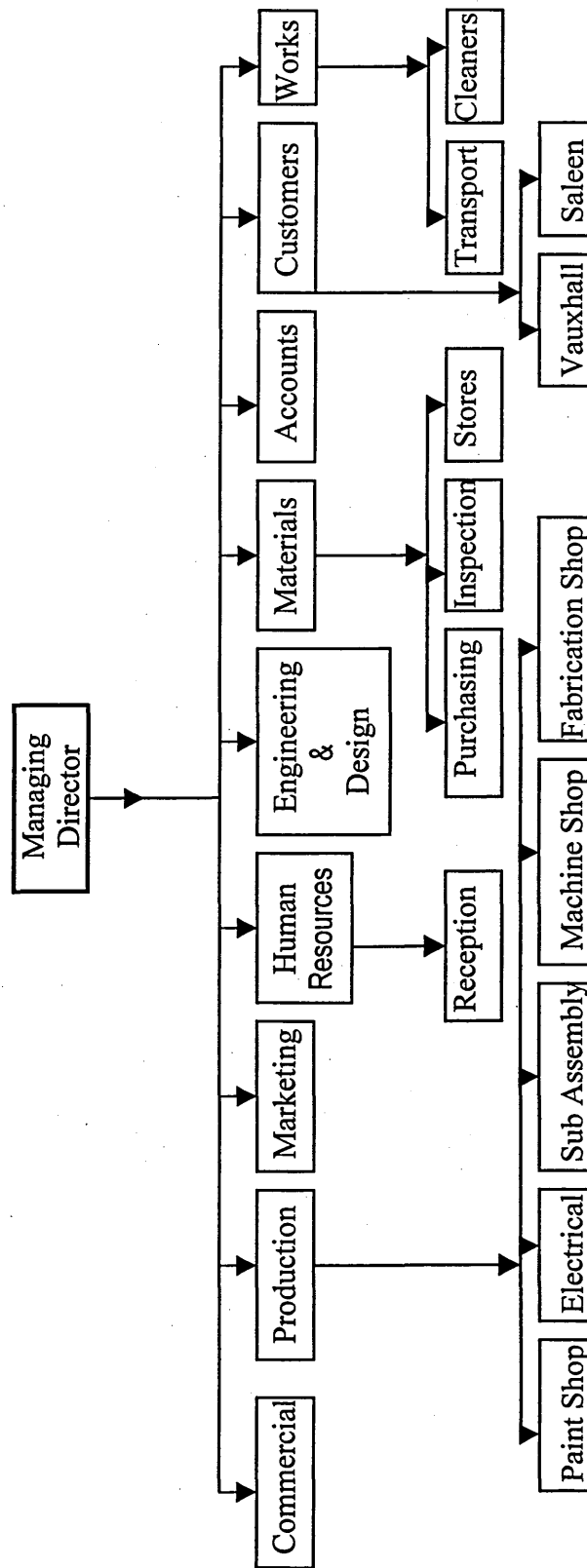
Potential Further research would be first and foremost to implement and develop upon the strategy. Beyond that it might be useful for the Purchasing Department to attempt the HEFCE Procurement Process Benchmarking exercise. This gives useful information as to their current situation and shows the department how well they are meeting their aspirations

Chapter 12

Appendices

Appendix 12.1

RML Organisation Structure



Appendix 12.2

Strengths

Motivation
 Culture
 Inspection
 Relationships between staff
 Commitment to project

Weaknesses

Variability of Car Builds
 Limited Resources
 Flow of Information
 Supplier Selection
 Supplier Evaluation
 Lack of formality
 Decision Making
 Communication with suppliers
 Review
 Monitoring Supplier performance

Opportunities

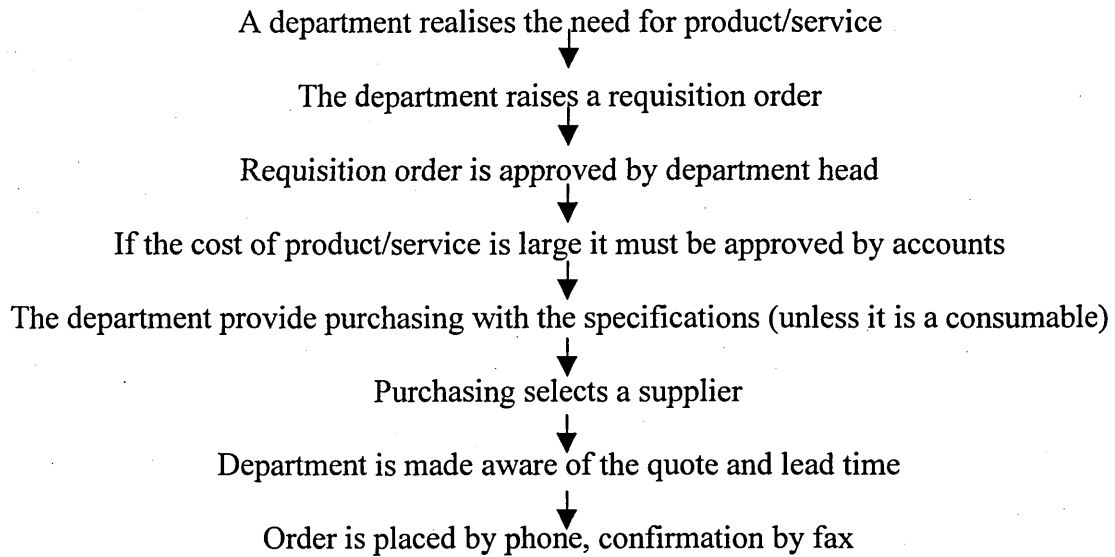
Communication
 Performance Measures
 Supplier Development
 Improving Delivery Times
 Continuous Improvement
 Remove physical barriers in Materials
 SYMIX Expansion
 Remove redundant/Obsolete Stock
 Information sharing about suppliers

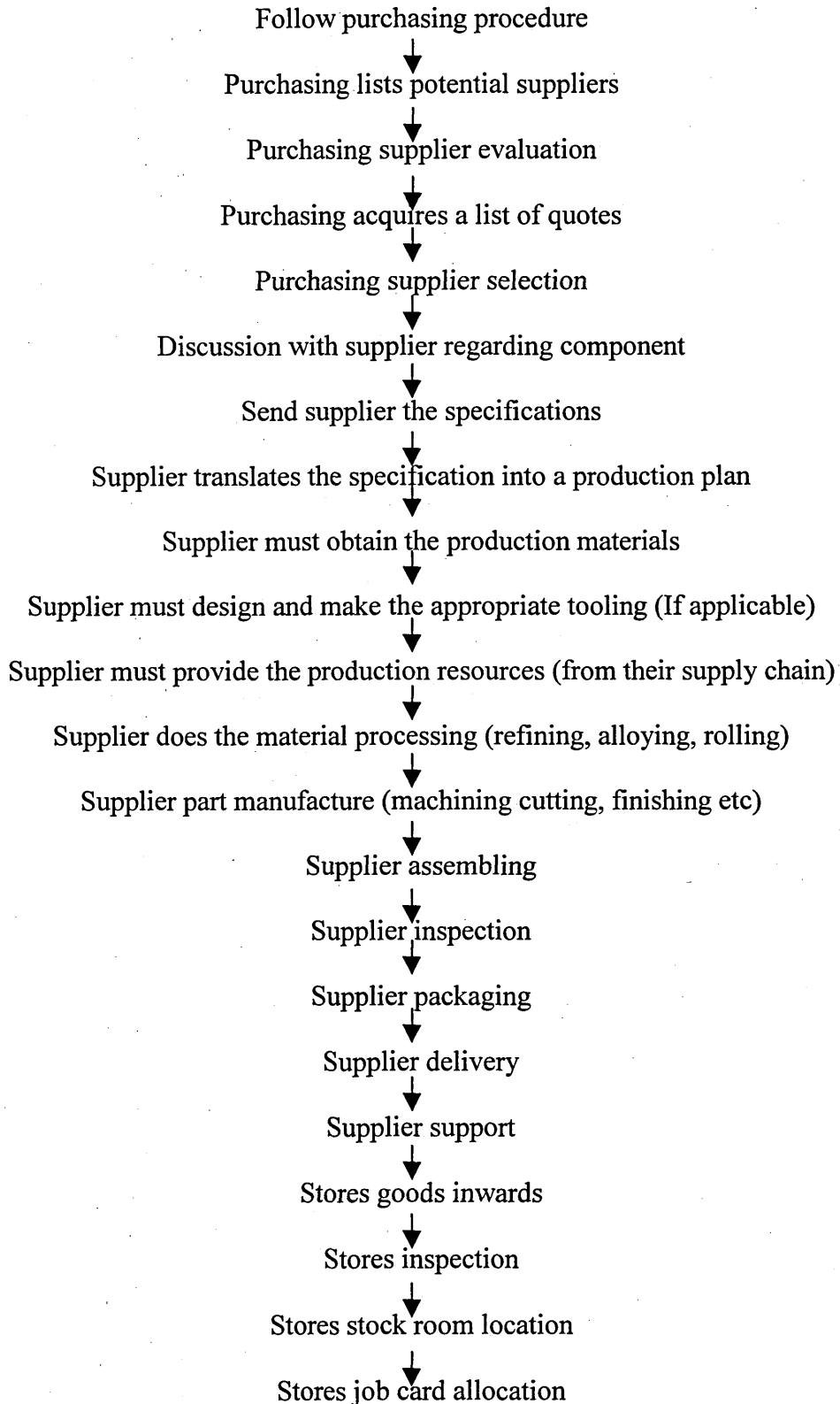
Threats

Lack of Procedures
 Lack of Appraisal
 Under performing suppliers.
 Fire fighting versus proactivity
 Stores security
 Stock accuracy
 Lack of space in Stores for new stock

Appendix 12.3

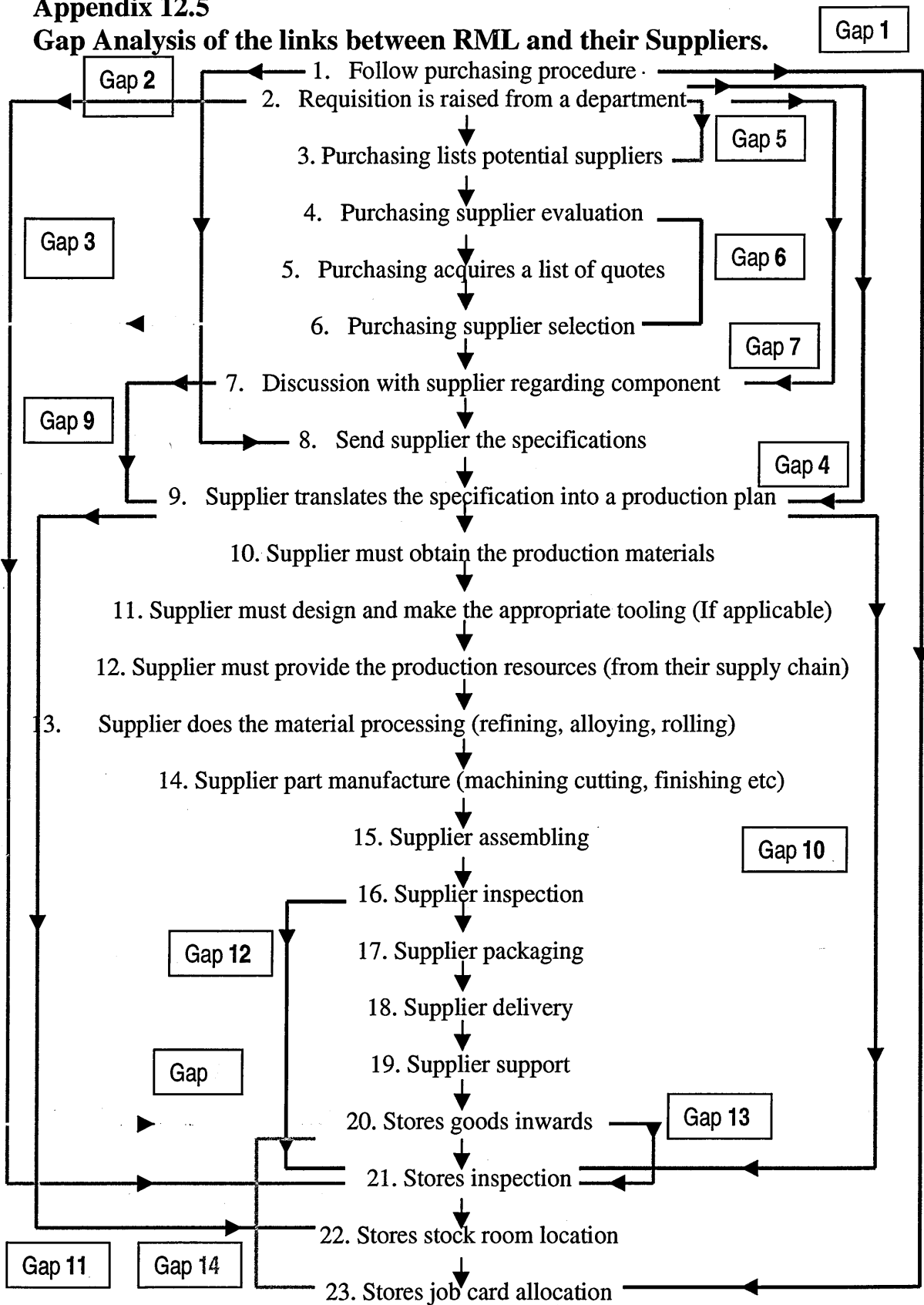
How the Materials Department interacts with Other Department



Appendix 12.4**Process Map for Processing of an Order - RML and Supplier**

Appendix 12.5

Gap Analysis of the links between RML and their Suppliers.

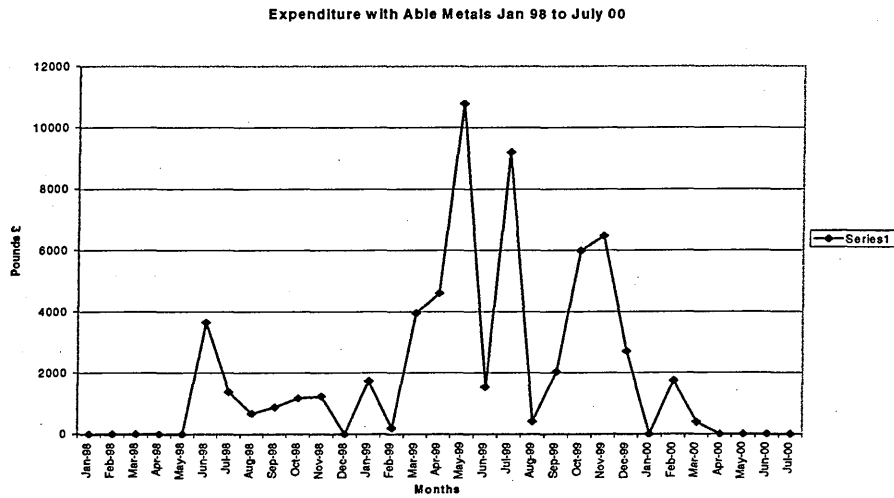


Appendix 12.6



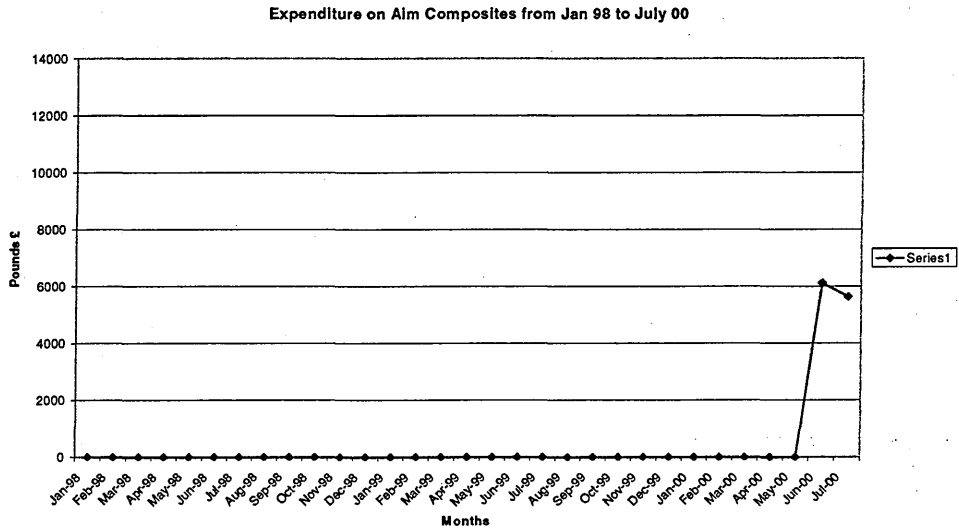
Graphic Results of Data Collected for Expenditure on Eleven Random Suppliers.

Graph 1



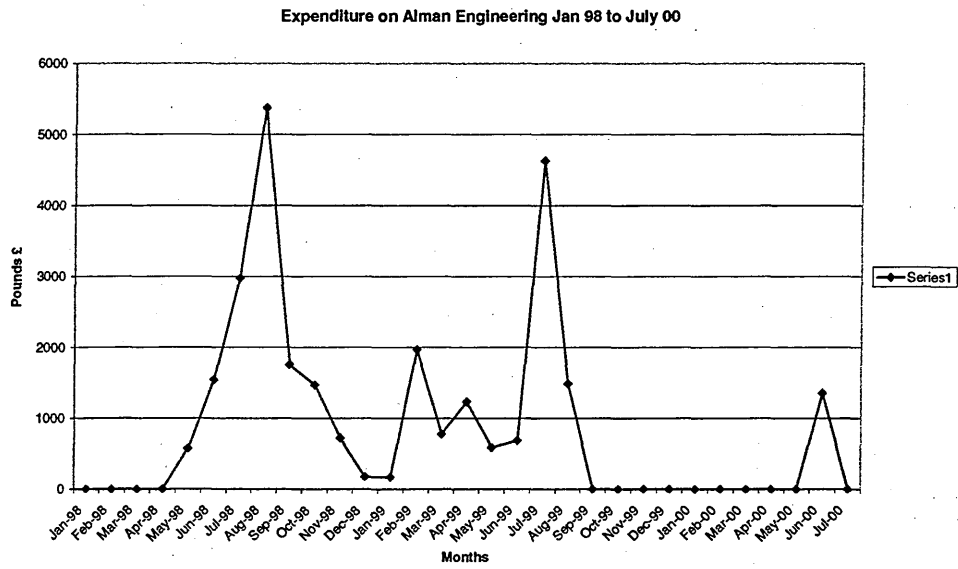
Able Metals have experienced a great deal of variation. The large expenditures between March 1999 and August 1999, were down to the car builds for Nissan and Vauxhall contracts. The next peak is down to car11, Vauxhall. However, it is notable that they received no business at the beginning of the sample nor the end this was because this is one of RML Purchasing fads, a new company is now used for metal deliveries

Graph 2



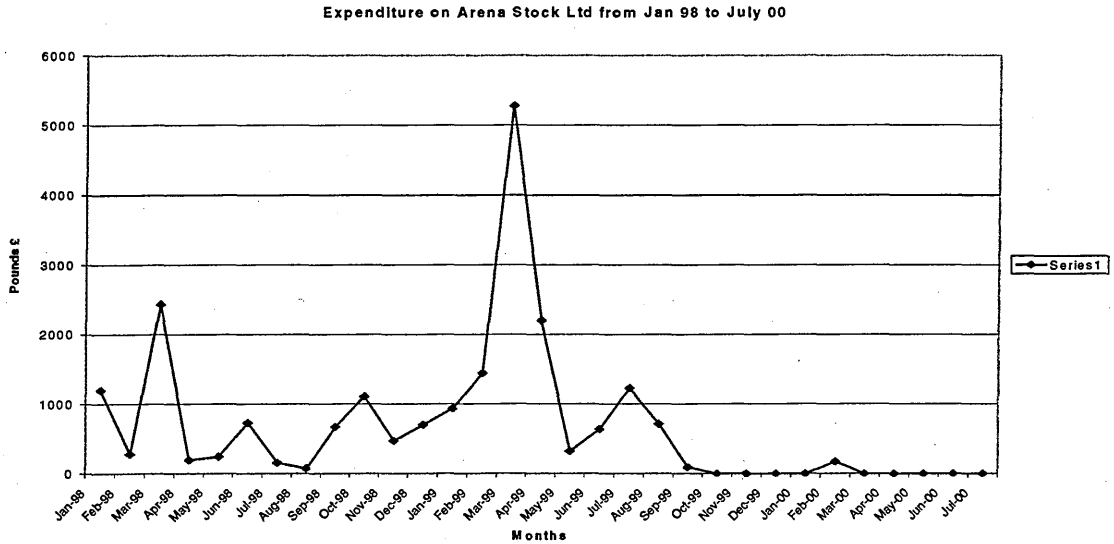
Aim Composites are a new supplier to RML selected through a word of mouth recommendation. They have produced the honey comb panels for P22 and replaced Technical Resin Bonders as a supplier. They were doing a good job until some of the panels arrived scratched. However they are a larger company supplying panels to the aerospace industry and can deal with RML's fluctuations.

Graph 3



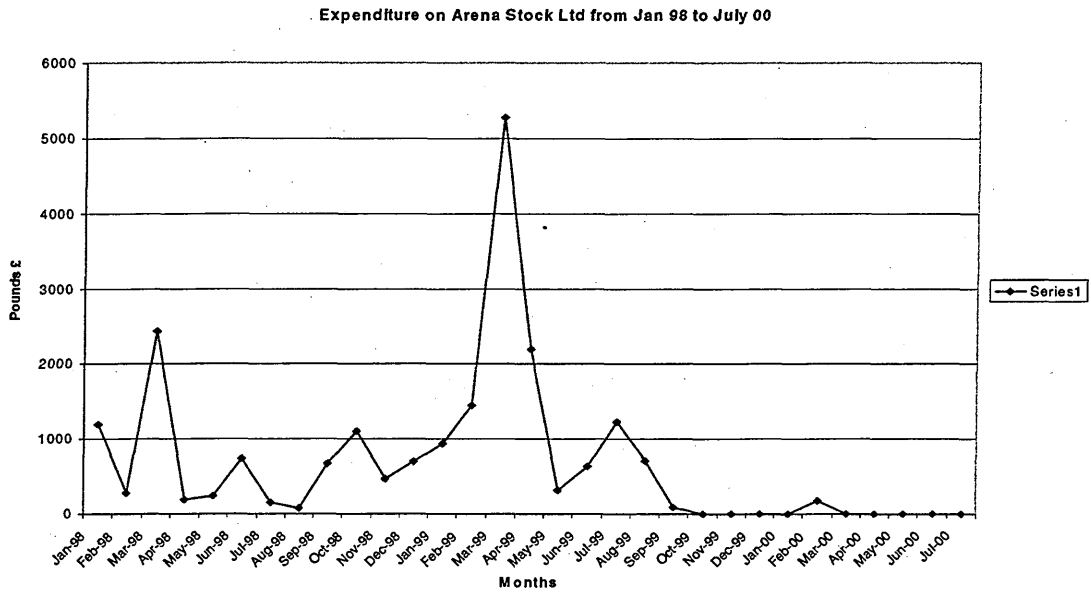
Alman Engineering Ltd is used when the parts can not be manufactured by RML production, primarily when they are too busy. In the two peak periods above RML production had been concentrating on building two chassis?.

Graph 4



Arena Stock supplied to raw metal materials to RML for a long time with good reputation. However a defective batch where the quality had suffered caused a problem. Although previously there had been a good relationship but they were not helpful so the supplier was changed. As a consequence of this RML enlarged their supplier base so as they could spread their expenditure to a number of companies who specialised in particular materials.

Graph 5

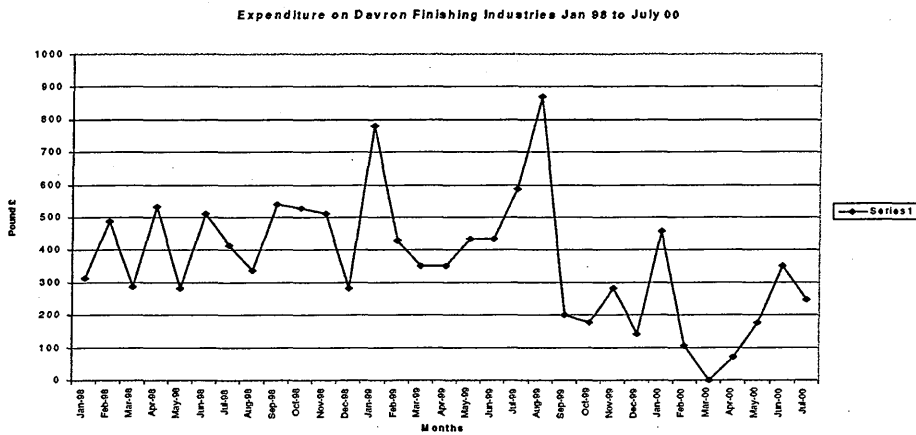


Alan Davies has an excellent reputation for the high quality machining he has done for RML. Therefore his work has been involved in a number of builds, peaking in 1999.

Although recently it looks as if he has had very little work it is a deceptive picture. There are plenty of orders with Alan Davies but due to his personal situation (that could not be anticipated) the quality of his work has not been good or on time. Therefore no invoices have been paid which is the data that was collected.

The problem left materials in a dilemma since there was no immediate contingency plan. It would be difficult to change supplier because of the very high tooling charges associated with the components.

Graph 6



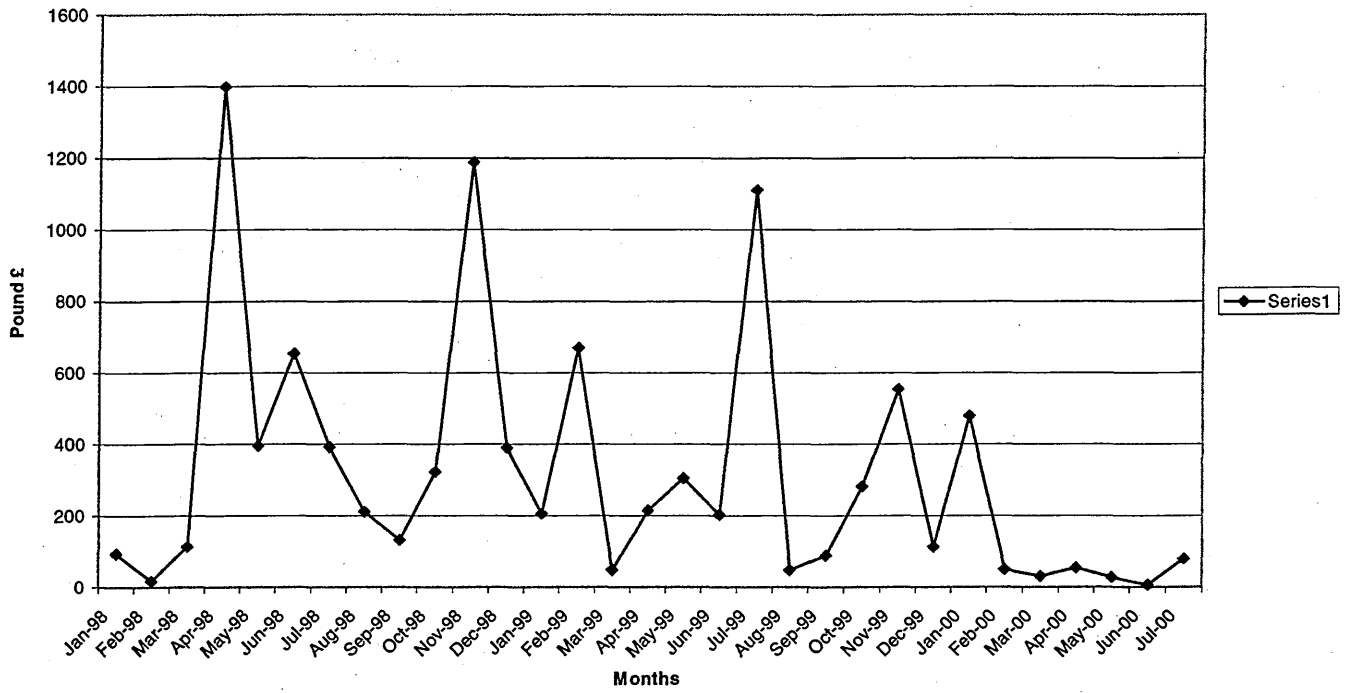
Davron Finishing Industries has been a regular supplier for over seven years.

Since they specialise in finishing they fit in with all car builds and spares requirements.

Davron are not so exposed to irregular orders. It is possible to see a correlation between Davron and Alan Davies. This is because all the machined parts produced by Alan Davies after inspection go directly for the finishing process.

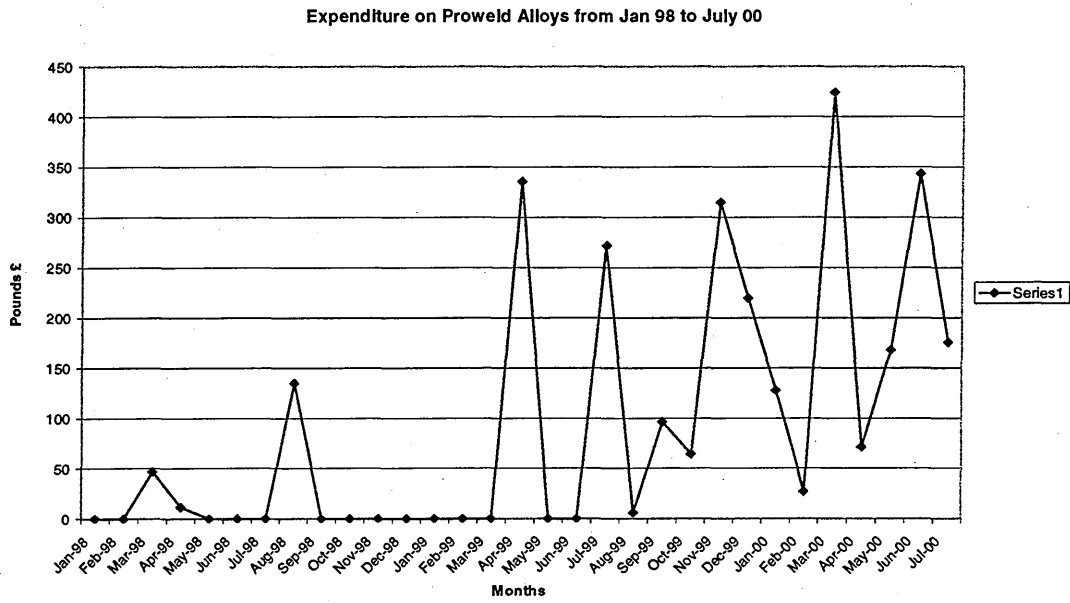
Graph 7

Expenditure on Premier Bearings from Jan 98 to July 00



Premier Bearings is a reliable supplier that has been subject to a lot of variability. This is a good example of the variability that motor sport suppliers face.

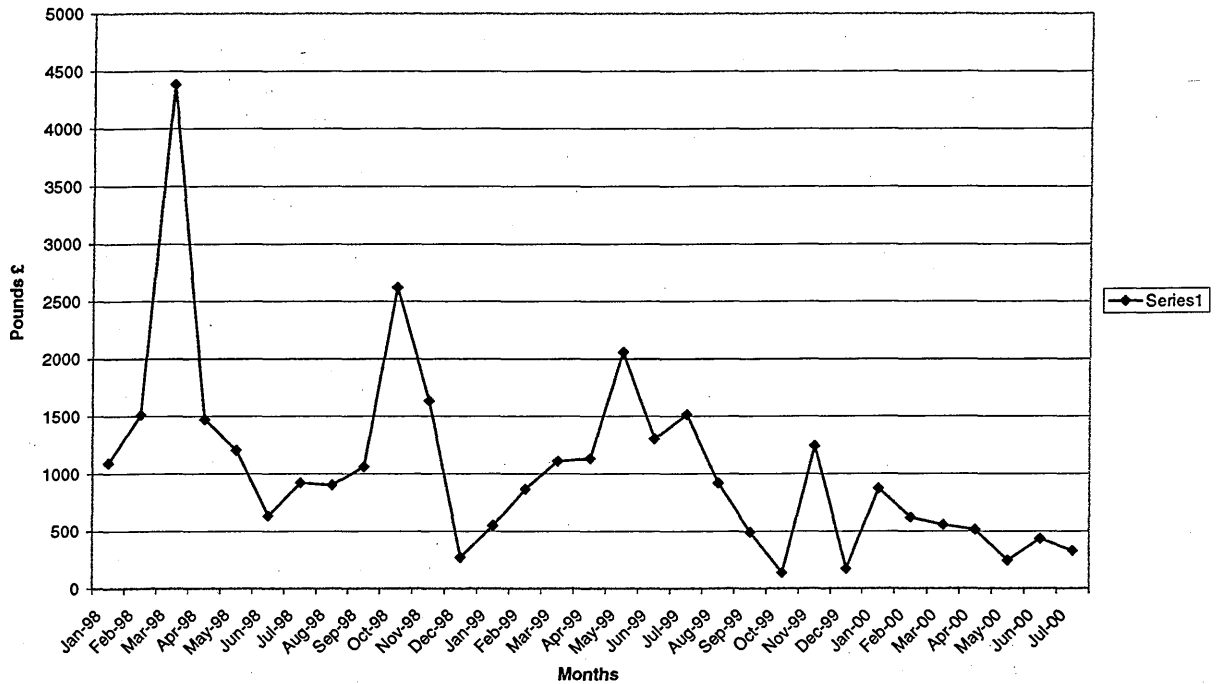
Graph 8



Proweld Alloys had little work at the beginning of the period this was during a period of supplier consolidation for welding consumables. Since then Proweld has experienced an increase in business, variable business.

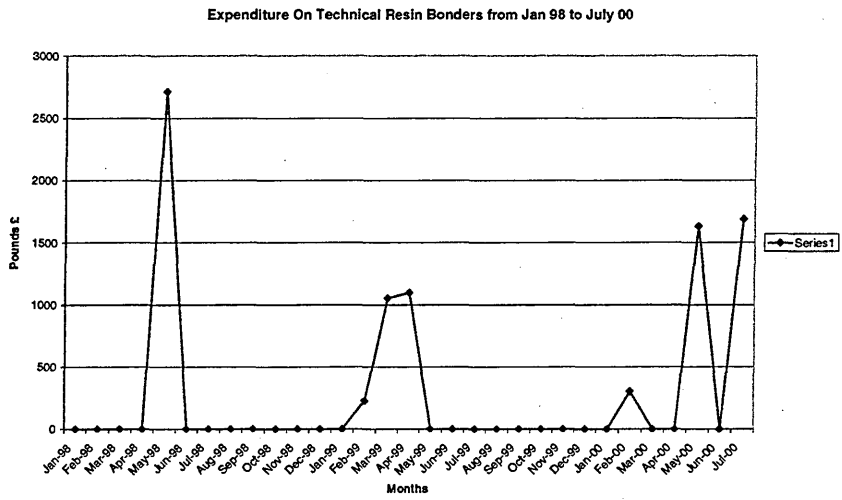
Graph 9

Expenditure on RS Components from Jan 98 to July 00



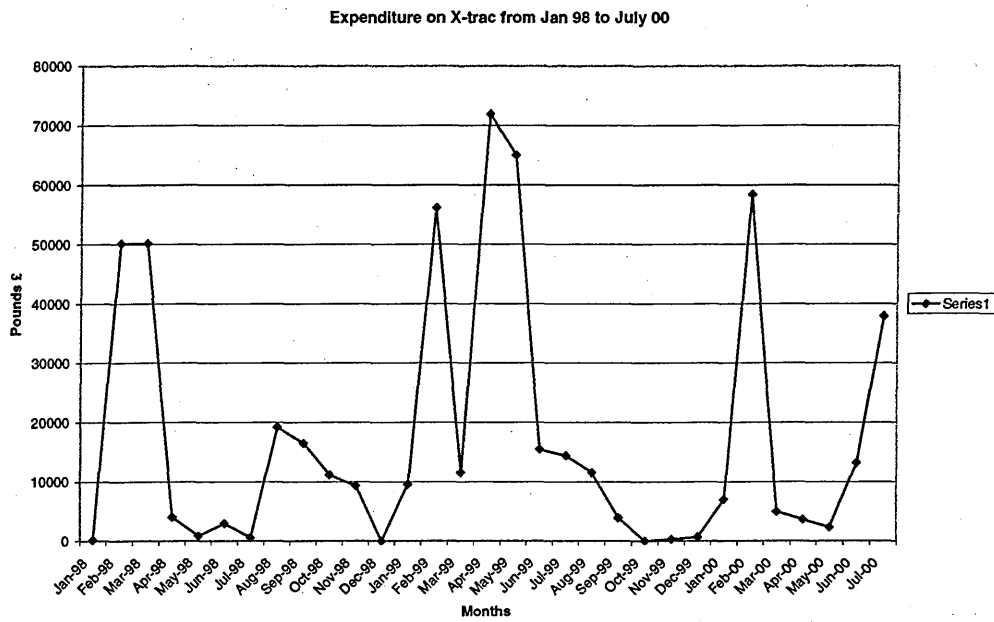
RS Components have several peaks but generally the trend is downward. The first peak was when the Nissans crews pit equipment was purchased. The second was work done on the transporter trucks. The third was for pit equipment for the Vauxhall rally team and the fourth small peak was again truck work.

Graph 10



Technical Resin Bonders were the exclusive providers on car builds of honeycomb panels. They would set up the flat floors for the Nissan and Vauxhall projects. However due to being uncompetitive on price Aim Composites have been awarded the business.

Graph 11



X-trac is a well known supplier to the motor sport industry. RML use X-trac's services with a high degree of variability. The first major peak were two gearboxes and spares for the car builds. The second smaller peak was when a new set of ratios, different sets were needed for the Vauxhalls since they race at both gravel and tarmac events. The next major expenditures were gearboxes and spares. The final major peak were tooling costs for one off development work which X-trac undertook.

Data for Graphs.

Data collected of Expenditure on Eleven Random Suppliers to RML from January 1998 to July 2000.

Month	Able PO	Able £	Alm PO	Alm £	Alman PO	Alman £	Arena PO	Arena £	Davies PO	Davies £	Davron PO	Davron £	Premier PO	Premier £	Proweld PO	Proweld £	RS PO	RS £	TRB PO	TRB £	X-trac PO	X-trac £	
Jan-98	0	0	0	0	0	0	0	1198.39	2	1631.49	9	312.84	6	93.38	0	0	15	1092.8	0	0	0	153.64	
Feb-98	0	0	0	0	0	0	4	260.46	0	0	6	487.07	2	17.11	0	0	16	1514.17	0	0	6	50175.59	
Mar-98	0	0	0	0	0	0	0	2451.86	4	2125.57	7	288.02	2	112.54	1	47	31	4386.86	0	0	14	50180.21	
Apr-98	0	0	0	0	0	0	3	194.98	2	3416.9	14	532.1	3	1386.72	1	11.75	24	1475.67	0	0	5	4059.61	
May-98	0	0	0	0	0	0	1	246.36	1	887	6	284.14	9	365.3	0	0	16	1204.79	1	2714.25	4	850.07	
Jun-98	3	3646.39	0	0	0	0	5	731	1	1630.9	11	511.45	6	653.86	0	0	16	635.85	0	0	0	2958.65	
Jul-98	1	1386.52	0	0	0	0	4	158.39	3	2068	14	414.09	2	392.83	0	0	15	923.31	0	0	2	579.82	
Aug-98	1	878.5	0	0	0	0	2	73.56	3	1179.7	6	337.23	5	211.18	3	135.12	13	904.88	0	0	0	19231.49	
Sep-98	1	881.25	0	0	0	0	4	672.29	1	2068	7	540.5	5	131.78	0	0	16	1060.42	0	0	0	16497.9	
Oct-98	1	1175	0	0	0	0	6	1107.36	0	0	6	528.75	6	322.82	0	0	10	2821.95	0	0	0	11760.99	
Nov-98	1	1242.35	0	0	0	0	4	472.12	1	1057.5	11	512.83	11	1188.79	0	0	16	1637.38	0	0	0	8357.99	
Dec-98	0	0	0	0	0	0	1	176.25	2	2565	3	282	11	390.63	0	0	4	271.08	0	0	0	0	
Jan-99	1	1738.15	0	0	0	0	6	935.76	3	1484.03	7	761.38	5	205.63	0	0	9	549.83	0	0	0	9556.49	
Feb-99	1	189.81	0	0	0	0	3	1444.55	2	1818.9	5	428.98	19	669.4	0	0	16	869.18	1	227.95	12	56175.06	
Mar-99	2	3951.53	0	0	0	0	16	5279.17	2	959.98	4	352.5	5	48.22	0	0	14	1109.24	1	1052.8	17	11571.86	
Apr-99	1	4611.88	0	0	0	0	9	2200.16	2	2144.73	3	352.5	7	214.87	1	335.81	17	1135.28	1	1099.8	21	71947.19	
May-99	3	10792.37	0	0	0	0	2	323.01	2	4142.23	10	434.75	4	305.2	0	0	19	2058.93	0	0	13	85007.04	
Jun-99	2	1551.01	0	0	0	0	5	636.5	3	3516.76	10	434.75	2	202.46	0	0	20	1307.45	0	0	0	15473.14	
Jul-99	3	9200.84	0	0	0	0	5	1228.44	2	2925.75	10	587.5	9	1110.62	1	272.18	24	1519.05	0	0	15	14453.96	
Aug-99	1	411.25	0	0	0	0	2	714.29	1	1656.75	22	869.5	2	47.4	1	5.87	21	920.53	0	0	16	11571.56	
Sep-99	1	2038.63	0	0	0	0	1	93.03	1	1493.43	6	199.75	1	87.79	1	96.58	13	492.47	0	0	0	3920.5	
Oct-99	1	5988.56	0	0	0	0	0	0	0	1	317.25	4	176.25	2	202.43	1	64.48	2	137.82	0	0	1	10.34
Nov-99	1	6471.31	0	0	0	0	0	0	0	1	1656.75	7	282	2	554.21	3	315.02	13	1245.02	0	0	1	289.67
Dec-99	1	2708.38	0	0	0	0	0	0	0	0	3	141	2	112.8	2	219.72	2	173.33	0	0	3	870.03	
Jan-00	0	0	0	0	0	0	0	0	0	0	12	458.25	6	480.07	3	127.96	7	873.59	0	0	8	6986.3	
Feb-00	1	1750.75	0	0	0	0	1	172.71	11	5634.13	2	105.75	2	50	1	27.14	9	620.21	1	304.33	20	58422.92	
Mar-00	1	399.51	0	0	0	0	0	0	1	258.5	0	0	1	30.84	2	424.46	11	556.06	0	0	9	4976.13	
Apr-00	0	0	0	0	0	0	0	0	1	2068	0	0	3	71.53	0	0	7	512.78	0	0	14	3847.5	
May-00	0	0	0	0	0	0	0	0	0	0	5	178.25	1	27.5	2	168.12	7	245.7	1	1634.43	6	2341.46	
Jun-00	0	0	0	0	0	0	0	0	3	1292.5	6	352.5	1	5.78	2	343.5	8	435.13	0	0	10	13240.67	
Jul-00	2	5639.84	0	0	0	0	0	0	0	0	7	246.75	3	175.83	3	175.83	11	328.6	1	1692	10	37926.58	
	28	60624.98	4	11760.59	100	27509	111	21295.5	56	50119.77	230	11461.53	145	9877.31	29	20842.07	426	32817.33	7	8725.56	278	555404.38	

Appendix 12.7


RML
 Ray Mallock Limited

Pre-Qualification Questionnaire

Please complete this questionnaire and return to Ray Mallock Ltd, 6-10 Whittle Close, Park Farm Industrial Estate, Wellingborough, Northants, NN8 6TY, to the person named in the covering letter.

Completion of this questionnaire does not guarantee our approval or an invitation to tender for any business.

1. Full Company Name:

Head Office Address:

Telephone No:

Facsimile No:

E-mail Address:

Registered Office:

(if different from above)

Telephone No:

Facsimile No:

E-mail Address:

2. Date of Registration:

Registration No:

Type of Company:

(private, Ltd, plc, etc)

Did company previously trade under another name? (If so attach full details) Yes/No

Does the company form part of a trading group? (If so attach full details) Yes/No

Is your company VAT Registered? Yes/No

Appendix 12.8



Supplier Questionnaire

To maintain RMLs effort towards improving relationships with suppliers for the future we would appreciate your time in supplying to us the following information. Upon completion of this questionnaire please return it to Ray Mallock Ltd, 6 - 10 Whittle Close, Park Farm Industrial Estate, Wellingborough, Northants, NN8 6TY to the person named in the covering letter.

1. Full Company Name:

Head Office Address:

Telephone No:

Facsimile No:

E-mail Address:

Registered Office:

(if different from above)

Telephone No:

Facsimile No:

E-mail Address:

2. Date of Registration:

Registration No:

Type of Company:

(private, Ltd, plc, etc)

Did company previously trade under another name? (If so attach full details) Yes/No

Does the company form part of a trading group? (If so attach full details) Yes/No

Is your company VAT Registered? Yes/No

3. Brief description of company activities:
(please attach a list of capabilities, machinery, CAD/CAM systems, technology etc
in detail)

4. Executive and Key Personnel:

Chairman/CEO :

(Owner, Partner, Managing
Director)

Company Secretary:

Sales Director/Manager:

Finance Director/Accountant

Other Contacts

Please attach an organisation chart.

How long has existing set up been in
operation?

5. Membership of Federations/ Professional Associations:

6. Number of Employees:

(Break down into functions, part time or full time)

7. Normal working hours/shifts:

8. Approximate size of plant/offices leased or
owned:

9. Extent of product and public liability
insurance:

10. Extent of professional indemnity insurance:

11. Principle customers/clients

12. Last three years turnover: (Please attach annual report/audited accounts for last three years.)

Year: _____ Amount: _____

13. List of regional offices:
(if based at more than one location, please attach lists of applicable addresses, telephone numbers etc)

14. Please attach your normal trading terms and conditions.

15. How many sub-suppliers do you employ?

16. Do documented guidelines exist for the acquisition of products and services, especially raw materials? Yes/No

17. What system do you have in place to maintain traceability?

18. How are sub-suppliers evaluated?

(please attach a sheet if the space is to limited)

19. How are sub suppliers managed and their performance reviewed?

20. Please list the quality accreditation's your company have attained from National Bodies.

21. Please describe what performance measures do you have in place:

(please attach a sheet if the space is to limited)

22. Does your organisation have a company wide plan for process development and improvement activities?

23. Do you have a complete quality manual? Yes/No

24. Please outline your Inspection and quality assurance activities:

25. Do the buyers with whom you do business have a satisfactory knowledge of the items they purchase?

26. Do we place too many rush orders with you? Yes/No

27. Do we expect services that are reasonably justified? Yes/No

28. How could we make better use of your firm's know how and experience?

29. Do you always receive fair treatment in your dealings with our purchasing personnel?

30. RML have measures to follow the performance of their top suppliers. Would you appreciate the findings being communicated? Yes/No

31. We would appreciate any additional comments or suggestions (please attach a sheet if the space is to limited)

Date of Completion:

Information supplied by:

Position:

Signature:



Purchasing Department

Supplier, Health & Safety Self Assessment

Company: _____

Details of person completing this section:

Print Name: _____

Position in Company: _____

Signature: _____

Date: _____

Please answer all the questions.

- | | |
|--|--------|
| 1. Does your company have a health and safety policy? | Yes/No |
| 2. Is it signed by the Senior Manager? | Yes/No |
| 3. Is the health and safety policy: | |
| a) Clearly displayed at the organisation head office? | Yes/No |
| b) Clearly displayed in the work shops/offices? | Yes/No |
| c) Included in the company rule/hand books? | Yes/No |
| d) Distributed to all employees? | Yes/No |
| 4. Does your company have someone appointed to manage health and safety | Yes/No |
| 5. Is a suitably qualified person designated at each factory to supervise health and safety? | Yes/No |
| 6. Does your health and safety arrangements include: | |
| a) Management of health and safety at work regulations? | Yes/No |
| b) Safe systems of work arrangements? | Yes/No |
| c) Provision and use of work equipment regulations? | Yes/No |
| d) Keeping the work place in a safe and clean condition? | Yes/No |
| e) Maintenance of equipment, i.e. tools and ladders etc? | Yes/No |
| f) Maintenance and proper use of plant, machinery and guards? | Yes/No |
| g) Regular testing and maintenance of lifts, hoists, cranes etc? | Yes/No |
| h) Maintenance of electrical systems? | Yes/No |

- | | | |
|-----|--|--------|
| i) | Safe storage, handling and where applicable, packaging, labelling, and transport of dangerous substances? | Yes/No |
| j) | Controls of hazardous activities? | Yes/No |
| k) | Personal protective equipment? | Yes/No |
| 7. | For which of the following elements have written standards been developed: | |
| a) | Leadership and administration? | Yes/No |
| b) | Planned inspections? | Yes/No |
| c) | Management training? | Yes/No |
| d) | Safety training? | Yes/No |
| e) | Accident investigation and analysis? | Yes/No |
| f) | Employer communications? | Yes/No |
| g) | Organisational rules? | Yes/No |
| h) | Health and hygiene? | Yes/No |
| 8. | Have the health and safety/loss control responsibilities for every Manager and Supervisor been defined in formal job descriptions and reviewed with each Manager/Supervisor? | Yes/No |
| 9. | Is there a procedure which ensures safety committee recommendations are received, considered and properly addressed? | Yes/No |
| 10. | Is there a written follow up procedure to ensure that reported hazards and concerns are properly addressed? | Yes/No |
| 11. | Does your company have a formal system in place to ensure your own emergency plans, procedures and related programs are reconciled with those of your client? | Yes/No |
| 12. | Has an emergency plan been developed and communicated to appropriate personnel which addresses all foreseeable emergencies? | Yes/No |
| 13. | Does your company have a formal process for the control and release of information to the public in the event of an emergency? | Yes/No |
| 14. | Is there a formal process which new employees receive induction training to your company's health and safety program? | Yes/No |
| 15. | Is formal health and safety training conducted for: | |
| a) | Senior management? | Yes/No |
| b) | Supervisory and middle management? | Yes/No |
| c) | Employees and others? | Yes/No |
| 16. | Indicate if the following are accurately and frequently computed and communicated to management: | |
| a) | Lost time through injury? | Yes/No |
| b) | Injury severity? | Yes/No |

-
- | | | |
|-----|---|--------|
| c) | All injury frequency? | Yes/No |
| d) | Fire? | Yes/No |
| e) | Property Damage? | Yes/No |
| f) | Incidents/near misses? | Yes/No |
| g) | Is there a process which investigates the reasons and recommends corrective actions? | Yes/No |
| 17. | Is there a procedure for the induction of new/transferred employees to a new work place or where a change of activity increases the risk to the employee? | Yes/No |
| 18. | Indicate which of the following subjects are covered in the orientation/induction? | |
| a) | Safety systems at work? | Yes/No |
| b) | Unique premises and activity hazards? | Yes/No |
| c) | Overview of the work to be done? | Yes/No |
| d) | Emergency response? | Yes/No |
| e) | Specific safety rules? | Yes/No |
| f) | Personal protective equipment? | Yes/No |
| g) | Accident/incident reporting? | Yes/No |
| h) | Hazard reporting? | Yes/No |
| i) | Security? | Yes/No |
| j) | Risk assessment? | Yes/No |
| k) | Who to seek advice from in the event of an emergency or if the work is outside the employees experience? | Yes/No |
| l) | Your company structure, organisation, brief responsibilities of management processes and controls applied? | Yes/No |
| 19. | Do all employees receive a pre-employment general physical examination which is suitable and appropriate for their activity? | Yes/No |
| 20. | Is there a process in place which ensures the health and safety documents are up to date and any updates are communicated to all employees? | Yes/No |

Appendix 12.9



Pilot KPI

Internal Customer Satisfaction

Internal Customer Satisfaction

Aim:

A headline KPI for RML, that is designed to assess whether the materials department is satisfying its internal customers.

Objectives:

- The KPI will help the materials department gather information on their performance.
- Active searching for customer satisfaction improvements will aid continuous improvement.
- Measurement will flag up early any warnings of dissatisfaction.
- Any trends such as dissatisfaction during car builds will soon show in the results.

Internal Customer Satisfaction was one of the possible measures discussed at the KPI meeting in August. By using this KPI internally in the first instance, it can be developed and improved before it could be used externally.

The KPI is measured on a monthly basis. Each month the Materials departments will fill out the results criteria form in anticipation of the results that the customer will produce. At the same time the form is distributed to each department. The results from each department including materials are then compared, and differences highlighted. Through this analysis of the score, strengths and areas for improvement in the materials department can be identified and any inadequacies worked upon. By recording the monthly score the materials department will have a clearer picture of how the department is performing.

The similarity of the forms with the internal assessment is designed to help with consistency. A standardised form means less learning and consequently it will aid implementation.

The analysis of the KPI, like the internal assessment will use a modified version of the results criteria, from the EFQM model. But not the enabler criteria.

The Radar logic is used again although the terms used for the results criteria. These differ from the enabler criteria (Appendix A). Also a slightly different scoring matrix is used (Appendix B). The filling in of the forms ought to be done by the department manager who asks the opinions of their staff. The measure will not be useful if the input comes purely from management staff, this is reflecting the fact that the materials department is so accessible to everyone.

The score summary sheet also changes. For the Customer Satisfaction KPI, just one criteria is used, therefore, the overall score will be between 0 – 100. This is the benchmark score. This ought to be submitted to the directors as a headline KPI, graphically with a short commentary of strengths and areas for improvement (Appendix C – RML Score Sheet).

The main benefit being that the company is in better informed as to how well the customer is being satisfied. It also allows materials department an opportunity to rectify any of the customers' problems before they grow out of proportion and it ought to instigate continuous improvement

Internal Customer Satisfaction Guidelines

Criteria

Customer Results – How the materials department is able to achieve the quality level of service needed to satisfy their internal customers. Identifying the areas for improvement enabling the department to address points that are and not adding value to the business.

Customer results cover the following four sub-criteria:

6a - The customers' perception of the material department (image, is the department helpful?).

Guidelines are:

- Responsiveness.
- Accessibility.
- Communication.
- Flexibility.
- Pro-active approach to the customers needs and demands.
- Delivery.

6b - The products and services offered by the materials department.

Guidelines are:

- Quality of the product and service.
- Value for money.
- Reliability.
- What was asked required.

6c - The support offered by the materials department staff.

Guidelines are:

- Advice and support.
- Technical support and assistance to queries.
- The overall response time.
- Handling complaints
- Capabilities, knowledge and skills of the employees

6d The overall level of dependability the customer feels about the months work from the materials department?

Guidelines are:

- The intention to allow materials to repurchase, everything rather than order yourself.
- The willingness of materials department to get the job done.

Appendix A

The RADAR Card Guide

The following is some explanation on the meaning of the words used in on the RADAR cards.

Results criteria. - Modified for Internal Customer Satisfaction.

Results measure the excellence and scope of what the materials department is delivering in terms of value to its customers, effectiveness and efficiency. Achievements are measured against the customer's perceptions. The materials department owns the targets and external comparisons.

The words "Trends", "Targets", "Comparisons", and "Causes" each relate to the excellence of the results presented.

Trends

"Trends" refer to collections of data over time, relating to various parameters used to measure results.

A positive trend is one showing general improvement over time. Thus 3, 6, 10, 9, 12, 11, 14 would constitute a positive trend. Of course, performance against some parameters may already be good at the start of the trend. In these cases the department will seek to sustain the good performance already achieved.

Targets

"Targets" refer to the projects own internal targets. For each trend of results presented, the internal target should be specified - also as a trend over time.

The information presented in the results criteria should indicate the reasoning behind the targets set so that a judgement can be made on whether the targets are challenging or

break-through. It should also be possible to link targets to the enabler criteria as the KPI develops.

Favourable comparison with target results means generally achieving or exceeding the trend of targets presented.

Comparisons

"Comparisons" refer to comparisons with other internal departments - against specific departments, organisations, industry averages or acknowledged 'best in class' projects.

'Best in class' indicates that results achieved are the best of their kind.

Causes

"Causes" refer to the extent to which results occur as a consequence of a specific enabling approach or approaches. Linking results back to the enablers will enable a measured view to be taken about the cause and effect relationship.

The word "Scope" relates to scope of the results presented.

Scope

The "Scope" of the results covers the extent to which they address relevant areas. Results need to be segmented eg by department, by employee group, and provided for all who are within the boundary of the assessment. In addition, the scope needs to embrace all relevant aspects of the criterion.

Appendix B

Results

Elements	Attributes	Score	0%			25%					50%					75%					100%		
Results	Trends: <ul style="list-style-type: none"> Trends are positive and/or there is sustained good performance Targets: <ul style="list-style-type: none"> Targets are achieved Targets are appropriate Comparisons: <ul style="list-style-type: none"> Comparisons with external organisations takes place and results compare well with industry averages or acknowledged 'best in class' Causes: <ul style="list-style-type: none"> Results are caused by approach 	Score	No results or anecdotal information			Positive trends and/or satisfactory performance on some results					Positive trends and/or sustained good performance on many results over the last month or contracted period					Strongly positive trends and/or sustained excellent performance on most results over the last month or contracted period					Strongly positive trends and/or sustained excellent performance in all areas over the whole contract thus far		
			No results or anecdotal information			Favourable and appropriate in some areas					Favourable and appropriate in many areas					Favourable and appropriate in many areas					Excellent and appropriate in most areas		
			No results or anecdotal information			Comparisons in some areas					Favourable in some areas					Favourable in many areas					Excellent in most areas and 'best in class' in many areas		
			No results or anecdotal information			Some results					Many results					Most results					All results. Leading position will be maintained		
Total			0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Elements	Attributes	Score	0%			25%					50%					75%					100%		
	Scope: <ul style="list-style-type: none"> Results address relevant areas 	Score	No results or anecdotal			Some areas addressed					Many areas addressed					Most areas addressed					All areas addressed		
Total			0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Overall Total			0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

Appendix C

Score Summary Sheet

Customer Satisfaction Results

Criterion Number		%
Criterion Part	a	
Criterion Part	b	
Criterion Part	c	
Criterion Part	d	
Score total		
	/4	
Overall Total		

The score awarded is the arithmetic average of the percentage scores for the sub criterion.

Appendix 12.10



Pilot Internal Assessment

RML Materials Department

Contents

Aim

Objectives

Introduction

RADAR Logic

RADAR Scoring Matrix

Consensus

Consensus Procedure

Materials Department Criteria Guidelines

Criteria:

1 - Leadership

2 - Policy and Strategy

3 - People

4 - Partnerships and Resources

5 - Processes

6 - Customer Results

7 - People Results

8 - Society Results

9 - Key Performance Results

Implementing the Internal Assessment Process

Key Steps for the Assessment Process

Managers Responsibilities

The RADAR Card Guide

Matrix Score Card

Score Sheet Summary

Internal Assessment Program.

Aim:

This program is designed to determine whether or not the materials department has any weak areas that need to be worked upon to enable the department to work more effectively and efficiently.

Objectives:

- To introduce into the department EFQM self-assessment through an adapted version of the EFQM excellence model.
- To provide a picture of the current situation in the Materials Department that goes deeper than an objective audit.
- To instigate continuous improvement through regular usage and review of the results.

Introduction

The reason for using the EFQM Excellence Model is because it crosses industries regardless of sector, size, structure or maturity. The SME Model provided by the EFQM is a practical tool to help organisations measure where they are on the path to Excellence. However, because the model is aimed at organisations as a whole, it has been modified significantly for analysing the functionality of the materials department.

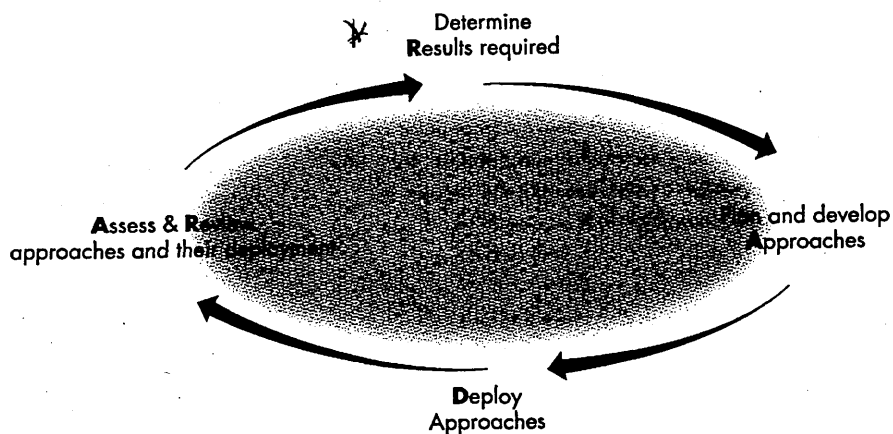
Internal self-assessment will allow the department to locate their own strengths and areas for improvement. It will require several people to be involved one person from each department will ensure that there is a variety of inputs, manager, purchasing, inspection, stores and quality. The exercise ought to take place at least once every six months.

The EFQM Excellence Model provided the basis for establishing the criteria guidelines in each section. The EFQM keeps their guidelines relatively generic so as it can be adapted into any industry. Therefore more specific guidelines have been detailed in the following document. The guidelines are written to aid the Materials Department.

The proposal for this internal assessment is that it will ask a number of explorative questions to materials staff who work in the area daily. It will follow up these findings and assess the results through the consensus process. The self-assessment is not a negative activity, it is to gather feedback on performance and improve communication.

RADAR Logic

Before the guidelines are detailed it is important to understand the scoring technique that is recommended by the EFQM. Starting with RADAR logic:



The team will work through the criteria individually using Radar logic.

RADAR consists of the following elements:

Results

Approach

Deployment

Approach and

Review

The logic states that the materials department needs to:

- Determine the **Results** it is aiming for as part of its aims and objectives, strategy making process. These results cover the performance of the work package, both financially and operationally, and the perceptions of its stakeholders.
- Plan and develop an integrated set of sound **Approaches** to deliver the required results both now and in the future.
- Deploy the approaches in a systematic way to ensure full implementation.
- **Assess and Review** the approaches followed based on monitoring and analysis of the results achieved and ongoing learning activities. Finally, identify, prioritise, plan and implement improvements where needed.

The circular format shows how the exercise will not aid RML if it is done as a one off it needs to be developed and used continually.

RADAR Scoring Matrix.

After the initial assessment of the guidelines and a score for each section has been decided upon (see consensus section) it is recommended, for clarity, that the scores be filled out on to a RADAR scoring matrix. The scoring matrix is a widely used European scoring technique. The score of each criteria should not be considered for a long time it should be the impulsive response, this exercise should not take hours. The score will be marked by a cross as shown on the example at the back of the documents.

The first step to scoring is to use the RADAR scoring matrix to allocate a percentage score to each sub-criterion. This is achieved by considering each of the elements and attributes of the matrix (At the back of this appendix) for each of the sub criteria described below. The scoring summary sheet (Later in Appendix) is then used to combine the percentage scores awarded to the sub-criteria. For example, there are four sub-criteria under Leadership. They will each be allocated a percentage score. This must be averaged in order to give an average score for the criteria. These totals will be added

up to give an overall score on a scale of 0 - 1000 points overall. This could be the benchmark figure with external companies if the technique was developed through RML.

As each score is allocated to each criterion it is useful for team members to note the strengths and areas for improvement. This will aid the members during the following consensus meeting.

A recommendation for future development is that each enabler is given weighting according to importance, which will make the scores more accurate. But for initial implementations sake it is best to keep the calculations simple.

Consensus.

The next step is for the materials team to come together after they have assessed the department individually. The team must reach consensus over their results. The process they might use to come to an agreement on the results is written in detail (see Appendix D). This consensus meeting will highlight the most important strengths and areas for improvement as well as provide the benchmark figure. The score concluded for the department by the team, is the figure for the department to beat on the next occasion.

Consensus Process - General procedure:

1. Assessing team consider the departments performance over the past six months.
2. Each assessor must complete their independent assessment, completing
 - Scoring matrix
 - Strengths
 - Areas for Improvement
3. The senior assessor combines strengths and areas for improvement for each criterion. Common points can be combined to reduce the length of the list.

4. The senior assessor sends to each member of the team these combined lists prior to the consensus meeting.
5. The senior assessor may ask each member of the team to take the lead in discussing a Criterion.
6. At the consensus meeting the senior assessor (or an assigned team member) will lead in reaching consensus on the strengths and areas for improvement.
7. Re-scoring individually of that Criterion then should take place, only after that, a consensus score agreed.

The senior assessor will ensure that those Criteria having most impact on the overall score will be dealt with first at the consensus meeting.

Materials Department Criteria Guidelines.

Criteria 1.

Leadership - how leaders develop and facilitate the achievement of the mission, vision, develop values required for long term success and implement these via appropriate actions and behaviours, and are personally involved in ensuring that the materials departments management system is developed and implemented.

1a. Department leaders develop the mission, vision and processes needed for the long-term success.

Guidelines are:

- Developing the materials departments aims and objectives
- Review and improve the aims and objectives
- Being personally and actively involved in the improvement activities
- Stimulating and encouraging collaboration within the materials department

1b. Department leaders are personally and actively involved in ensuring the company management system is developed, implemented and continuously improved.

Guidelines are:

- Aligning the department with the company's overall aims in order to support delivery of its policy and strategy
- Ensuring a system for managing and updating processes within the department
- Ensuring a process for the measurement, review and improvement of key results are developed and implemented

1c. Department leaders are involved with the team members.

Guidelines are:

- Meeting, understanding and responding to the needs and expectations
- Establishing and participating in partnerships or joint improvement activities
- Recognising individuals and teams for their contribution to the department

1d. The proactive approach made by department leaders to encourage, motivate and support the team members.

Guidelines are:

- Leaders personally communicating the organisations, plans, objectives and targets to staff
- Being accessible, actively listening and responding to department staff
- Helping and supporting department staff to achieve their planned objectives and plan milestones to aid improvement
- Encouraging and enabling people to participate in improvement activity

Criteria 2.

Policy and Strategy – How the organisation implements its mission and vision via a clear stakeholder focused strategy, supported by relevant policies, plans, objectives, targets and processes.

Criteria 2a – Policy and strategy are based on the present and future needs and expectations of stakeholders.

Guidelines are:

- Gather and understand information to understand the business environment
- Understanding and anticipating the needs and expectations of customers, employees, partners, society and shareholders as appropriate
- Understanding and anticipating developments in the market place.

Criteria 2b – Policy and strategy are based on information from performance measurement; research, learning and creativity related activities.

Guidelines are:

- Collecting and understanding output from internal performance indicators
- Collecting and understanding output from learning activities
- Analysing the performance of competitors and best in class organisations
- Understanding social, environmental and legal issues
- Identifying and understanding economic indicators.
- Understanding the impact of new technologies
- Analysing and using stakeholders ideas

Criteria 2c – Policy and Strategy are developed, reviewed and updated.

Guidelines are:

- Developing policy and strategy consistent with the work packages mission, vision, and values and based on the needs and expectations of stakeholders and information from learning and innovation activities
- Balancing the needs and expectations of stakeholders
- Balancing long and short term pressures and requirements
- Developing alternative scenarios and contingency plans to address risks
- Identifying present and future competitive advantage
- Aligning the projects policy and strategy with partners policy and strategy
- Reflecting the fundamental concepts of Excellence in policy and strategy
- Identifying critical success factors

- Reviewing and updating policy and strategy

Criteria 2d – Policy and Strategy are deployed through a framework of key processes.

Guidelines are:

- Identifying and designing the framework of key processes needed to deliver the company's policy and strategy
- Establishing clear ownership of the key processes
- Defining the key processes including the identification of stakeholders
- Reviewing the effectiveness of the framework of key processes to deliver policy and strategy

Criteria 2e – Policy and strategy are communicated and implemented.

Guidelines are:

- Communicating and cascading the policy and strategy, as appropriate
- Using policy and strategy as the basis for planning of activities and the setting of objectives and targets throughout the organisation
- Aligning, prioritising, agreeing and communicating plans, objectives and targets
- Evaluating the awareness of policy and strategy

Criteria 3.

People - How the company manages, develops and releases the knowledge and full potential of people in the department. How the activities are planned that support the overall project strategy, by communicating the needs of the project through the correct channels.

3a. Department leaders plan and manage the resources.

Guidelines are:

- Developing human resources policies, strategies and plans for the successful operation of the department

- Aligning the human resource plans with the framework of the key processes
- Ensure two way communication for feedback and recognition
- Continually searching for innovative methodologies to improve the overall management of the department

3b. Department leaders identify the knowledge and competencies needed for the effective operation of processes.

Guidelines are:

- Identifying, classifying and matching peoples knowledge and competencies with the company's needs
- Develop and using training to help ensure people capabilities match the need
- Develop team skills and dynamics
- Aligning individual and team objectives with the department targets
- Appraising and helping work department staff to improve their performance

3c. Department leaders involve and empower the team members.

Guidelines are:

- Promote participation in improvement activities;
- Providing opportunities and encouragement, which stimulate involvement.

3d. Department leaders ensure the needs are consistently communicated.

Guidelines are:

- Identification of communication needs
- Developing communication channels based on needs
- Sharing knowledge.

Criteria 4:

Partnerships and Resources - How the department plans and manages its internal/external partnerships and internal/external resources in order to support company objectives and the effective operation of its processes.

4a External partnerships are managed.

Guidelines are:

- Structuring partnership relationships to create and maximise value;
- Forming value adding supply chain partnerships;
- Ensuring cultural compatibility and the sharing of knowledge with partner organisations;
- Supporting mutual development
- Creating synergy in working together to improve processes and add value to the customer/supply chain.

4b Finances are managed.

Guidelines are:

- Using financial resources to support aims and objectives
- Developing and implementing financial strategies and processes
- Ownership any maximising use of department budget includes quality of components for money
- Effectively manage budget allocation

4c Buildings, equipment and materials are managed.

Guidelines are:

- Managing the maintenance and utilisation of department space, equipment and materials to improve their total lifecycle
- Managing the security of assets
- Implementing damage prevention techniques

- Measuring and managing any adverse effects (including health and safety)
- Optimising material inventories
- Actively reducing and recycling waste
- Making decisions about removal of obsolete or redundant items to keep stores clear for current projects

4d Technology is managed.

Guidelines are:

- Exploit existing technology.
- Identify and replace 'old' technologies.

4e Information and Knowledge are managed.

Guidelines are:

- Assuring and improving information validity, integrity, security and reliability.
- Providing appropriate access on Symix for department users
- Seeking to acquire, increase and use knowledge effectively.

Criteria 5.

Processes - How the department designs, manages and improves its processes in order to support, plus fully satisfy its aims and objectives and generate increasing value for its customers and other stakeholders.

5a Processes are systematically designed and managed.

Guidelines are:

- Designing and plan the processes for execution
- Establish a process management system
- Implementing process measures and setting performance targets
- Resolving interface issues within the work department, company or with external partners for the effective management of end to end-to-end processes

5b Processes are improved, as needed, using innovation in order to fully satisfy and generate increasing value for customers and other stakeholders.

Guidelines are:

- Identifying and prioritising opportunities for improvement
- Using performance and perception results and information from learning activities to set priorities and targets for improvement and improved methods of operation
- Establishing appropriate methods for implementing change
- Communicating process changes to all department staff and appropriate managers
- Ensuring people are trained to operate new or changed processes prior to implementation
- Ensuring process changes achieve predicted results

5c Products and services are produced, delivered and serviced.

Guidelines are:

- Products and services are bought in line with customer needs
- Delivering products and services to customers on time
- Anticipating customer needs, especially on car builds
- Finding out about product developments from suppliers and communicating findings to appropriate departments
- Servicing products and services where appropriate

5d Customer relationships are managed and enhanced.

Guidelines are:

- Acquiring products and services in line with developments
- Determining and meeting internal/external staff day to day contact requirements
- Handling feedback received from day to day contacts including complaints.
- Proactive involvement with internal/external staff in order to discuss and address their needs, expectations and concerns.

- Manage meetings effectively from preparation and giving notice through to managing the length of time for the meeting.

Results Section - Remember to use the results matrix scoring card.

Criteria 6

Customer Results – How the project is able to achieve the quality level of service needed to attract the clients. Also identifying the areas for improvement enabling the project to address points that are and not adding value to the business.

6a: Perception Measures

The customers' perception of the Materials Departments image.

Guidelines are:

- Responsiveness.
- Accessibility.
- Communication.
- Flexibility.
- Pro-active approach to the customers needs and demands.
- Delivery.

The products and services offered by the materials department

Guidelines are:

- Design innovation.
- Quality of the product and service.
- Value for money.
- Reliability.

The sales and after sales support offered by the materials department.

Guidelines are:

- Advice and support.
- Technical support and assistance to queries.
- The overall response time.
- Handling complaints
- Capabilities, knowledge and skills of the employees

The level of dependability the customer has with the materials department with a view for further work.

Guidelines are:

- The intention to allow materials to repurchase, everything rather than order yourself.
- The willingness of materials department to get the job done.

6b: Performance Indicators

The customers' perception of the Materials Departments image.

Guidelines are:

- Number of satisfied customers

The products and services offered by the materials department

Guidelines are:

- Competitive price
- Defect, error and rejection rate
- complaints

The sales and after sales support offered by the materials department.

Guidelines are:

- Response rate to complaints

The level of dependability the customer has with the materials department with a view for further work.

Guidelines are:

- Number of complaints and compliments

Criteria 7

People Results - What the department is achieving in relation to its staff

7a: Perception Measures

People perception measures may include those relating to:

- | | |
|----------------------------------|-------------------------------|
| - Motivation | - satisfaction |
| Communication | Organisation's administration |
| Empowerment | Employment conditions |
| Equal opportunities | Facilities and services |
| Career development | Health & Safety conditions |
| Involvement | Job security |
| Leadership | Pay and benefits |
| Opportunity to learn and achieve | Peer relations |
| Recognition | The management of Change |
| Target setting and appraisal | Working Environment |
| Training and development | |
| Organisation's vision and values | |

7b: Performance Indicators

Internal indicators for people in the department overall may include those relating to:

Performance

- Competency requirements versus available
- Productivity
- Success rates of training and development to meet objectives

Motivation and Involvement

- Involvement in department
- Contribution to improvements

- Recognition of peoples work

Satisfaction

- Absenteeism
- Accidents
- Staff turnover

Criteria 8

Society Results - What the Materials Department is achieving in relation to local society.

8a: Perception Measures

Guidelines are:

- Disclosures of information relevant to the community
- Voluntary work
- Noise
- Choice of transport
- Reduction and elimination of waste and packaging
- Usage of utilities

8b: Performance Indicators

Guidelines are:

Dealings with authorities on issues such as:

- Certification
- Import/Export
- Planning

Awards and number of celebration points

Criteria 9

Key Performance Results - What the organisation is achieving in relation to its planned performance.

9a: Key Performance Outcomes

Guidelines are:

Financial outcomes

- Meeting budgets
- Number of cost savings

Non financial outcomes

- Success rates

9b: Key Performance Measurements

These measures are the operational ones used to monitor, understand, predict and improve the departments performance outcomes.

Guidelines are:

Processes

- Performance
- Assessments
- Improvements
- Cycle times
- Defect rates

External Resources

- Supplier Performance
- Supplier price
- Supplier development
- Value added

Information and Knowledge

- Accessibility
- Integrity
- Relevance
- Timeliness
- Sharing and using knowledge

Implementing the Internal Assessment Program

Finally, the following is an outline for the overall assessment process. It follows the progression from the beginning where individuals fill in their response forms, to the consensus meeting, through to where the Operations/Department Manager collates the results.

Key steps for the Assessment Process.

1. After six months the department assessors will individually score the materials department based purely on their own experience. It is important that this is done honestly therefore criticism should be accepted and kept constructive.
For each of the criterion parts in the assessment model, the assessor independently lists the strengths and areas for improvement, and uses the matrix to determine a score.
2. Assessor team goes through the consensus process (detailed earlier)
3. Assessors analyse the results.
4. Assessor team conducts investigation on any major issues highlighted. The investigation into major issues, has several objectives:
 - to verify the findings
 - to clarify understanding
 - to re-score

5. Operations/Materials Manager feeds the documented information from the matrix back to the Department.

Managers Responsibilities

1. Department Manager collects the data from staff involved and reads the accompanying short commentary of strengths and areas for improvement.
2. Department Manager prepares the feedback on the departments performance to find the common trends.
3. The findings from the feedback are then reported to the department and top management.

The RADAR Card Guide

This section provides more explanation on the meaning of the words used in the RADAR card.

Enablers criteria

Approach refers to the objective(s) and direction for each sub criterion, along with the definition and development of the most effective process (es) to achieve them.

The words "Sound" and "Integrated" each relate to the excellence of the approach presented.

Sound

"Sound" covers the extent to which the approach:

- Addresses the relevant aspects of the sub criterion concerned;
- Has a clear rationale, for example, by the provision of a statement of objective (s) and direction;
- Is focused on the needs of relevant stakeholders and the results that are being sought, with well-defined and developed process (es) for achieving these.

Integrated

"Integrated" covers the extent to which the approach used supported the policy and strategy and is linked to other approaches, where appropriate.

Deployment represents the translation into practise of what is defined in the approach.

Implementation in an aligned and systematic way gives body to the project policy and strategy in the day-to-day deployment of approaches, at all levels of the project.

The words "Systematic" and "Implemented" each relate to the excellence of the deployment of the approach described.

Systematic

"Systematic" covers the extent to which the deployment of the approach is managed in a structured way.

Implemented

"Implemented" covers the extent to which the approach has been implemented in relevant areas - through the appropriate levels and subdivisions of the project

Assessment and Review refers to how the measuring and monitoring of the approach is carried out, how the organisation learns, and how the results of these activities are analysed in order to identify, prioritise, plan and implement improvements.

The words "Measurement", "Learning" and "Improvement" each relate to the excellence of the assessment and review of the approach described.

Measurement

"Measurement" covers the extent to which regular measurement of the approach, deployment of the approach and the results it achieves, is carried out, as appropriate. The measures used would normally be shown in the relevant results sub criteria.

Learning

"Learning" covers the extent to which learning activities such as benchmarking, appraisals and assessments are used to help identify and share best practises and improvement opportunities.

Improvement

A key output of the Assessment and Review step is improvement actions to enhance strengths and improve weaknesses that have been identified. "Improvement" covers the extent to which measures, and information from learning and creativity related activities, is analysed and used to identify, prioritise, plan and implement improvements.

Improvements should reflect innovative thinking, where appropriate.

Results Criteria

The words "Trends", "Targets", "Comparisons", and "Causes" each relate to the excellence of the results presented.

Trends

"Trends" refer to collections of data over time, relating to various parameters used to measure results.

A positive trend is one showing general improvement over time. Thus 3, 6, 10, 9, 12, 11, 14 would constitute a positive trend. Of course, performance against some parameters may already be good at the start of the trend. In these cases the department will seek to sustain the good performance already achieved.

Targets

"Targets" refer to the projects own internal targets. For each trend of results presented, the internal target should be specified - also as a trend over time.

The information presented in the results criteria should indicate the reasoning behind the targets set so that a judgement can be made on whether the targets are challenging or break-through. It should also be possible to link targets to the enabler criteria as the KPI develops.

Favourable comparison with target results means generally achieving or exceeding the trend of targets presented.

Comparisons

"Comparisons" refer to comparisons with other internal departments - against specific departments, organisations, industry averages or acknowledged 'best in class' projects.

'Best in class' indicates that results achieved are the best of their kind.

Causes

"Causes" refer to the extent to which results occur as a consequence of a specific enabling approach or approaches. Linking results back to the enablers will enable a measured view to be taken about the cause and effect relationship.

The word "Scope" relates to scope of the results presented.

Scope

The "Scope" of the results covers the extent to which they address relevant areas. Results need to be segmented eg by department, by employee group, and provided for all who are within the boundary of the assessment. In addition, the scope needs to embrace all relevant aspects of the criterion.

Matrix Scoring System.

Enablers.

ents	Attributes	Score	0%			25%					50%					75%					100%		
each	Sound: <ul style="list-style-type: none"> Approach has a clear rationale There are well defined and developed processes. Approach focuses on stakeholder needs. 		No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
			No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
	Integrated: <ul style="list-style-type: none"> Approach supports policy and strategy. Approach is linked to other approaches as appropriate. 		No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
Total			0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

ments	Attributes	Score	0%			25%					50%					75%					100%		
ployment	Implemented: <ul style="list-style-type: none"> Approach is implemented 		No evidence or anecdotal			Implemented in about 1/4 of relevant areas					Implemented in about 1/2 of relevant areas					Implemented in about 3/4 of relevant areas					Implemented in all relevant areas		
			No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
	Systematic: <ul style="list-style-type: none"> Approach is deployed in a structured way 		No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
Total			0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

ents	Attributes	Score	0%			25%					50%					75%					100%		
ssment review	Measurement: <ul style="list-style-type: none"> Regular measurement of the effectiveness of the approach and deployment is carried out. 		No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
			No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
			No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
	Learning: <ul style="list-style-type: none"> Learning activities are used to identify and share best practise and improvement opportunities 		No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
	Improvement:: <ul style="list-style-type: none"> Output from measurement and learning is analysed and used to identify, prioritise, plan and implement improvements 		No evidence or anecdotal			Some evidence					Evidence					Clear evidence					Comprehensive evidence		
Total			0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

Overall Total			0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
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Results

Elements	Attributes	Score	0%					25%					50%					75%					100%																																			
Results	Trends: <ul style="list-style-type: none"> Trends are positive and/or there is sustained good performance Targets: <ul style="list-style-type: none"> Targets are achieved Targets are appropriate Comparisons: <ul style="list-style-type: none"> Comparisons with external organisations takes place and results compare well with industry averages or acknowledged 'best in class' Causes: <ul style="list-style-type: none"> Results are caused by approach 	No results or anecdotal information No results or anecdotal information No results or anecdotal information No results or anecdotal information	Positive trends and/or satisfactory performance on some results					Favourable and appropriate in some areas					Comparisons in some areas					Some results					Positive trends and/or sustained good performance on many results over the last month. Favourable and appropriate in many areas Favourable in some areas Many results					Strongly positive trends and/or sustained excellent performance on most results over the last month. Favourable and appropriate in many areas Favourable in many areas Most results					Strongly positive trends and/or sustained excellent performance in all areas over the last month. Excellent and appropriate in most areas Excellent in most areas and 'best in class' in many areas All results. Leading position will be maintained																									
																																						Total																				
																																						0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

Elements	Attributes	Score	0%					25%					50%					75%					100%				
	Scope: <ul style="list-style-type: none"> Results address relevant areas 	No results or anecdotal	Some areas addressed					Many areas addressed					Most areas addressed					All areas addressed									
																							Total				
0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100							
Overall Total																											

Score Sheet Summary

Enablers Criteria

Criterion Number	1	%	2	%	3	%	4	%	5	%
Criterion Part	1a		2a		3a		4a		5a	
Criterion Part	1b		2b		3b		4b		5b	
Criterion Part	1c		2c		3c		4c		5c	
Criterion Part	1d		2d		3d		4d		5d	
Criterion Part			2e		3e		4e		5e	
Criterion Part										
Sum of parts	/4		/5		/5		/5		/5	
Score awarded										

Results Criteria

Criterion Number	6	%	7	%	8	%	9	%
Criterion Part	6a	X 0.75	7a	X 0.75	8a	X 0.25	9a	X 0.5
Criterion Part	6b	X 0.25	7b	X 0.25	8b	X 0.75	9b	X 0.5
Score awarded								

The score awarded is the arithmetic average of the % scores for the sub criterion.

Calculation of total

Criterion	Score Awarded
1. Leadership	
2. Policy and Strategy	
3. People	
4. Partnerships and Resources	
5. Processes	
Enabler Total	
6. Customer Satisfaction	
7. People Results	
8. Society Results	
9. Key Performance Results	
Results total	
Overall Total	

6b. Strengths

Many results show improving trends over 4 years.

Many results compare favourably with European averages and some are best in Europe e.g. speed of call answering.

Performance against targets for internal measures is favourable in most areas.

EuroCom's corporate reputation has increased in line with target over the last three years. Performance is supported by benchmark data.

Media coverage is analysed independently and average results are notably better than the main competitors since 1995.

6b. Areas for Improvement

No comparisons are made with world class companies making it difficult to assess the extent of the opportunity for improvement.

The link between measures presented and key processes is unclear.

No information is presented about loss of business and little information is given for other loyalty indicators.

The rationale for some targets is not clear e.g. static targets for figures 6.30 - 6.33.

The scope of the data is limited in terms of the number and segmentation of the measures presented.

6b. Site Visit Issues

Clarify the rationale for target setting.

Look at segmentation of results.

Research Definitions

Definitions

Capacity - The maximum output that can be achieved from a system in a given period.

Cause and Effect Diagram - A schematic technique used to discover possible locations of quality problems in manufacturing; also known as an Ishikawa diagram or a fish-bone chart.

Critical Components - A product or service that has high population in the equipment; and/or it has a single source of supply; and/or it must function to special, tight limits and/or it has not been proved to the reliability standard (i.e. there are no test data or usage data are insufficient.)

Customer - The recipient or beneficiary of the outputs of work efforts or the purchaser of products and services. May be either internal or external to the company.

Customer Requirements - The statement of needs or expectations that a product or service must satisfy. Requirements must be specific, measureable, negotiated, agreed to, documented and communicated.

Flow process chart - A flow chart that describes the step of a process.

Gantt Chart - Planning chart used to schedule resources and allocate time; developed by Henry L. Gantt in the late 1800's.

Generic - The guidelines that will be developed will be generic so they can be applied to a number of different situations faced by RML, i.e. to a car competing in a championship or a one off build such as the GT road car. So the final strategy can be shared by or include a whole group or class of cars. The strategy will not be made over specific to any one type of car build.

ISO 9000 - A set of quality standards developed by the European Community.

Kaizen - The Japanese word for the ongoing process of incremental improvement.

Lead times - In purchasing systems, the time between placing an order and receiving the component ready for assembly or retail.

Materials management - An approach that seeks efficiency of operations through the integration of all material acquisition, movement, and storage activities in the firm.

Material resource planning II (MRP II) - A system that allows, with MRP in place, inventory data to be augmented by other resource variables.

Pareto Chart - Based on a concept of focusing on a few critical items as opposed to many less important ones developed by Vilfredo Pareto, an Italian economist. The concept manifests itself in a chart in descending order from the most frequent occurrence to least frequent occurrence.

Purchasing management - The management of inventory, plus the transportation, availability of supply and quality of suppliers.

Reliability - For the purposes of the project, reliability takes on the meaning, of reliable delivery of sequenced components to the point of use before installation. A company that can achieve this level of reliability can, may be persuade its customer to use it as a single source of components. Otherwise it means the probability that parts will arrive on time and function properly for a reasonable length of time.

Reserve capacity - The level

Resource allocation (gearing) - A decision to allocate resources, capital and people to support specific operating plans, tied to the budget process.

Strategies - The principles that show how an organisation's major objectives or goals are to be achieved are over a defined time period. Usually confined only to the general logic for achieving the objectives.

Supplier appraisal - Continuous reviewing and checking, of the suppliers capacity and capabilities.

Supplier capability - The level of effectiveness and efficiency at which the supplier can perform. This level may be determined through measured performance.

Supplier development - A long term project to improve and strengthen the relationship with a supplier.

Supplier evaluation - Looking at a suppliers potential. This involves assessment and audit.

Total Quality Management - Management of an entire organisation so that it excels in all aspects of products and services that are important to the customer.

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