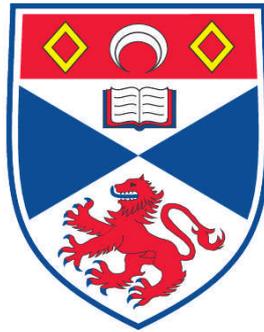


PROCUREMENT AND STRATEGY IN MANUFACTURING FIRMS

Gopal S. Iyengar

A Thesis Submitted for the Degree of PhD
at the
University of St. Andrews



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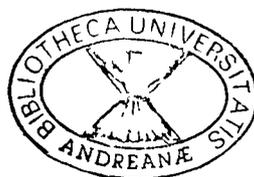
PROCUREMENT AND STRATEGY IN MANUFACTURING FIRMS

GOPAL S. IYENGAR

A Thesis Submitted for the Degree of Doctor of Philosophy
at the University of St. Andrews

Department of Management
University of St. Andrews

May 1993.



I, Gopal S. Iyengar, hereby certify that this thesis, which is approximately 100,000 words in length, has been written by me, that it is the record of work carried out by me and that it has not been submitted in any previous application for a higher degree.

Dated: 14/5/93

Gopal S. Iyengar

I was admitted as a research student under Ordinance No. 12 in October, 1987 and as a candidate for the degree of Doctor of Philosophy in October, 1987 (part-time); the higher study for which this is a record was carried out in the University of St. Andrews between 1987 and 1993.

Dated: 14/5/93

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I hereby certify that the candidate has fulfilled the conditions of the Resolution and Regulations appropriate for the degree of Doctor of Philosophy in the University of St. Andrews and that the candidate is qualified to submit this thesis in application for that degree.

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TO: JAYA AND MIKI

Abstract

The strategic role of the Procurement function in manufacturing firms has received increased attention in the literature over the past two decades. Before the 1970s, the supply environment was seen to be stable for most firms, with no particular strategic opportunities or threats. Procurement was treated as an administrative or service function. The oil crisis in the early 1970s changed the situation, bringing in its wake acute inflation and material shortages. The 1980s saw a revolution in manufacturing with the advent of JIT, increased automation and global operations. Theoretical researchers saw the potential for a proactive and strategic role for the Procurement function. This was, however, not reflected in empirical research, which failed to find consistent evidence of firms considering Procurement as strategic. This thesis addresses the gap between precept and practice evident in the literature.

A major criticism of the empirical literature is the treatment of the strategic (value) activities on the supply side and the activities of the Procurement department as synonymous. This thesis questioned that view and made a distinction between the two activities. A theoretical framework was built up from the literature to identify the contexts in which Supply considerations would be strategic. Propositions were generated which allowed for strategic Supply activities both through the Procurement department as well as outside it. The empirical work looked at 25 UK manufacturing firms through the case study approach. The cases were scrutinised for evidence of strategic activities on the supply side, as well as the strategic importance of the Procurement department.

The results confirmed that (1) Supply considerations were strategic for a majority of firms. (2) Strategic consideration of Supply depended on a number of contingent variables. (3) Strategic Supply activities were not necessarily reflected in the strategic importance given to the Procurement department.

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Abbreviations

CAD	Computer-Aided Design
CEO	Chief Executive Officer
CF	Clerical Function
FE	Functional Efficiency
HQ	Headquarters
JIT	Just-in-Time
MNC	Multinational Corporation
MRP	Materials Requirement Planning
MRPII	Manufacturing Resources Planning
OEM	Own Equipment Manufacturer
R&D	Research and Development
SC	Strategic Contributor
Sec.	Section
SF	Strategic Facilitator
TQM	Total Quality Management

Chapter 1

Introduction

1.1 Background of the Study

The last twenty years have seen a rapid transformation on the supply side of the manufacturing firm and this has increased the attention paid to the role of Procurement in the firm's strategy. In the period following the Second World War, and up to the oil crisis in the early 1970s, this role was largely ignored as the supply side posed no problem to the manufacturing firm (Pearson and Gritzmacher, 1990: 92). The aftermath of the oil crisis saw the supply scene, characterised as it was by material shortages and rising inflation, posing a threat to the firm's operations (Monczka and Fearon, 1974). The Procurement function became the focus of the firm's defensive strategic measures to safeguard its supplies. Furthermore, the 1980s saw revolutionary changes in the manufacturing scene with the advent of the Japanese manufacturing philosophy, increasing automation, rapid technological changes and global operations (Ferdows and Skinner, 1987; Haas, 1987; De Rose, 1991; De Toni *et al.*, 1992). The movement to 'lean production', described as the irreversible installation of just-in-time, total quality, total employee involvement, etc as a basis of global strategy (Lamming, 1993: 18), was seen as a real world phenomena, albeit in certain industry sectors. Industrial markets were also aligning in new ways with the concept of 'strategic networking' being an option to the traditional 'markets' or 'hierarchies' (Thorelli, 1986; Jarrillo, 1988). Attention focused on "competitiveness involving less of a concern with single relationships and more of a concern with competition *through* relationships" (Ford, 1990: 541). That network relationships, with the underpinning of trust, could lead to superior performance by increasing operational efficiency was increasingly recognised (Sako, 1992: Ch. 11). As these changes occurred on the supply as well as marketing side, opportunities for competitive advantage were opened up in Supply, and a proactive role for Procurement in the firm's strategy was perceived (Morgan, 1991; Burdett, 1992; Watts *et al* , 1992, in addition to the authors quoted above).

Academic literature over the last two decades is replete with the espousal and conceptualisation of this strategic role. However, empirical evidence from industry about Procurement's strategic role is sparse, and often negative (Monczka and Trent, 1991a, as a representative sample). Many reasons have been advanced for Procurement not having a strategic role (Schill, 1979b; Caddick and Dale, 1987; Finkin, 1988).

There is, therefore, much confusion at present about the precise strategic role of Procurement.

1.2 Objective of the Study

The lack of empirical support for Procurement's strategic role gives rise to the following pertinent questions:

- 1) Are there strategic opportunities (and threats) on the supply side for manufacturing firms?
- 2) Do manufacturing firms consider them in their strategies? Or are they losing out on a potential source of competitive advantage?
- 3) Is there a role for Procurement in the strategy process? Or is there a gap between theoretical precept and industrial practice?
- 4) If firms are not blind to the strategic aspects on the supply side, then why is empirical research unable to capture it?
- 5) Is there a need for a fresh approach to capture the reality of the industrial firm?

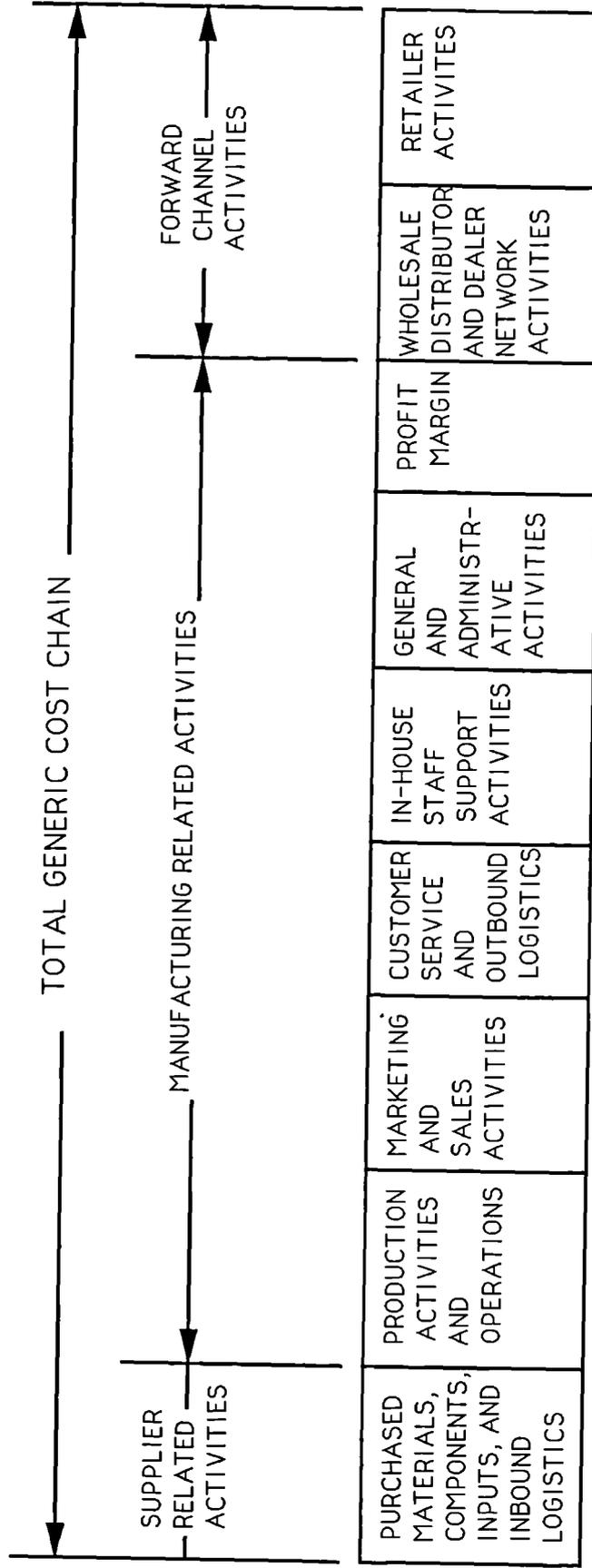
The objective of the study is to try and provide answers to these questions.

1.3 Definition of Key Concepts

Exhibit 1.1, adopted from Thompson and Strickland (1990: fig. 4-1), is a generic activity chain for a representative industry situation. The generic activities comprise the obtaining of input materials (supplier related activities), the conversion of inputs to the final product (manufacturing related activities) and the movement of the product to the customer (forward channel activities). These activities are built around the movement of materials along the Supply Chain, which is modelled as Supplier-Materials-Manufacturing-Logistics-Customer (Armistead and Mapes, 1992). In carrying out these activities, the concept of the Value Chain (developed by Porter, 1985) helps in identifying the activities which could lead to strategic advantage. This study focuses on the strategic implications of the supplier-related activities in the chain. Prior to commencement of the study, some of the key concepts that are used here need to be defined. These definitions are advanced below:

Exhibit 1.1

The Generic Activity Chain



ADAPTED FROM THOMPSON AND STRICKLAND (1990, FIG. 4.1)

STRATEGY - The definition proposed by Quinn (in Mintzberg and Quinn, 1991: 5) has been used as the guiding concept in this study:

"A strategy is a pattern or plan that integrates an organisations major goals, policies and action sequences into a cohesive whole....(helping) to marshal and allocate an organisation's resources into a unique and viable posture based on its relative internal competencies and shortcomings, anticipated changes in the environment, and contingent moves by intelligent opponents"

STRATEGIC CONTEXT - *The circumstances which impact an organisation's strategy.*

FIRM - *A distinctly identifiable business unit, irrespective of the degree of integration with other units in a Group. 'Firm' is taken to mean a *manufacturing* firm, which is the focus of this study.*

MATERIALS - *This always refers to direct Production Materials, to the exclusion of other categories like Consumables or Maintenance requirements or Capital Equipment. A synonymous usage is INPUT MATERIALS.*

SUPPLY - Used 'generically' to cover *all critical (strategic) considerations and activities which pertain to the supply/input side of the firm's operations*. This term is used to represent all the supply related value activities, independent of the organisational loci of occurrence. 'Supply', as defined here, is represented with a capital 'S' in this work. A synonymous usage is INPUT, represented with a capital 'I'.

It is important for this thesis to distinguish 'Supply', as used here to refer to critical activities on the supply side, from the activities of the Procurement (Purchasing) department, which is an organisational artifact to deal with the supply side. As Porter (1985: 59) points out:

"organisational units (departments) such as Purchasing and R&D frequently contain only a fraction of the similar activities being performed in a firm"

He further states (1985: 61) that managers of departments which are cast as 'support' activities do not have a clear view of their role in a firm's competitive position. As the Procurement activity is often classified as a service activity (Finkin, 1988) or an administrative activity (Caddick and Dale, 1987), it is possible that critical activities on the supply side need not be captured within the unit definition of the Procurement department activities. Hergert and Morris (1989: 181) reinforce this differentiation:

"There is no particular reason why the formal grouping of responsibilities in the organisation structure should correspond to critical activities as defined by Porter (1985)"

The implicit assumption in the views expressed by these authors is that often there is an underlying belief that the activities of the Procurement department represent the strategic Supply considerations addressed by the firm. The thrust of their arguments is that this belief is erroneous. This work accepts the possibility of a divorce between critical (strategic) Supply activities and the activities of the Procurement department. The definition of 'Procurement', as used in this thesis, is advanced below to emphasise this distinction.

PROCUREMENT - *A functional department, normally deemed to address Supply considerations of the firm.* The activities of the Procurement department could either encompass all, or only a part, of the strategic Supply considerations in the firm. **'PURCHASE'** and **'PURCHASING'** are used synonymously to mean the same functional department. These terms, as defined here, are always represented with a capital 'P' in this thesis.

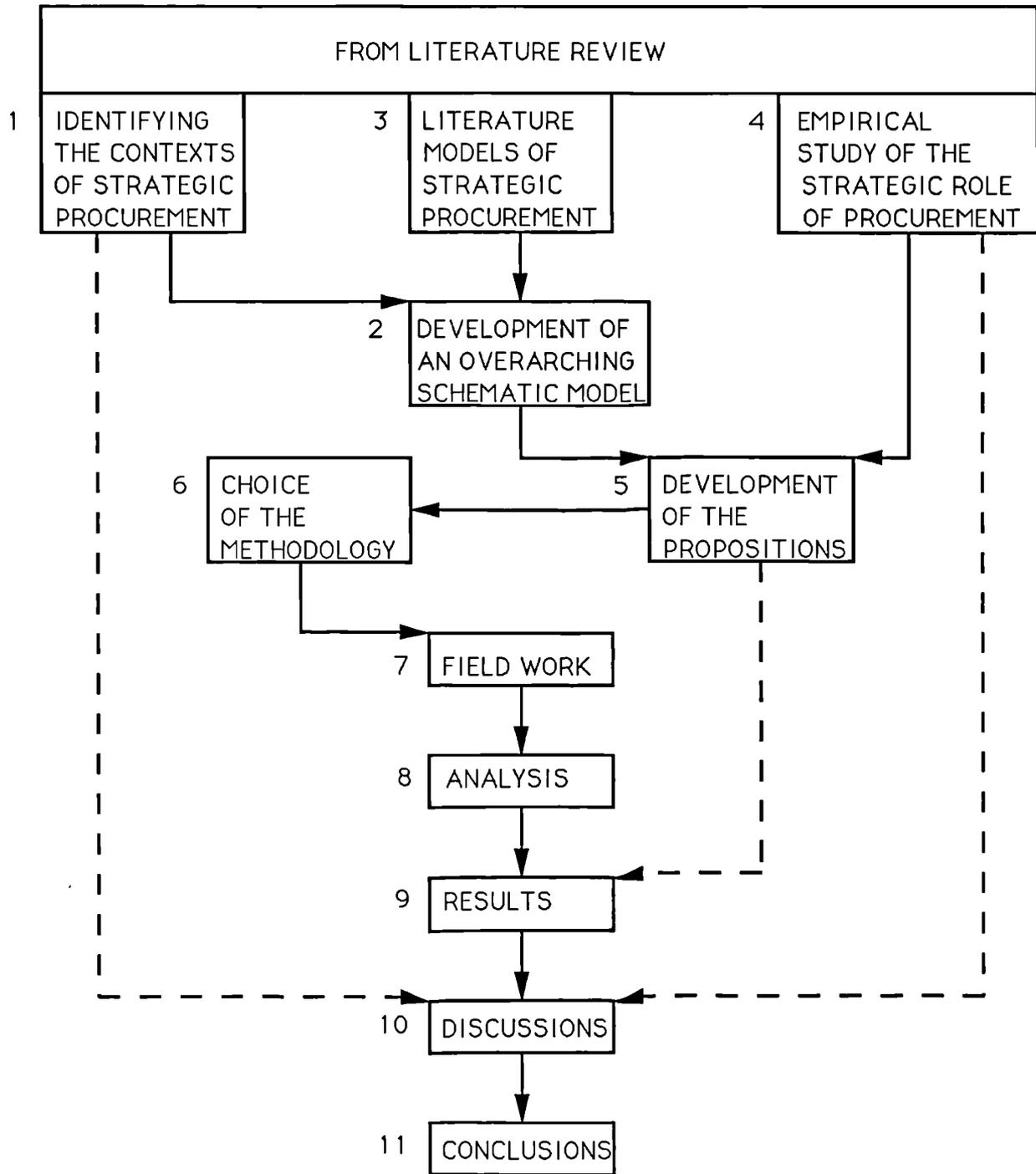
1.4 Structure of the Study

Exhibit 1.2 is a flow-chart of the progression of the thesis, as detailed below:

- 1) A comprehensive review of the theoretical literature to identify the various contexts for the strategic role of Procurement (sec. 2.2 and 2.3).
- 2) Development of an overarching schematic model, based on the theoretical literature, which captures the inter-relationship between strategic Procurement and the contexts, as also the reiterative influences amongst the contexts (sec. 2.4).
- 3) Placing, within the developed schematic model, the various attempts in the theoretical literature to model the context-strategic Procurement linkage (sec. 2.5), to identify clearly the changing strategic role for Procurement as conceptualised in the literature.
- 4) Review of the empirical findings of the role of Procurement in strategy (sec 2.6 and 2.7), to see if the reality in manufacturing firms matches the theoretical perceptions.
- 5) Drawing together the foregoing into the propositions underlying the study (sec. 2.8).

Exhibit 1.2

Flow Chart of the Progression of the Thesis



- 6) Determining the methodology for data collection (multiple case study) and analysis (content analysis) for testing the propositions (Ch. 3).
- 7) Sample selection, Data collection, interview methods and case write-up (Ch. 4)
- 8) Content analysis of the case write-up (Ch. 5)
- 9) Matching the results of the study with the propositions (Ch. 6)
- 10) Discussion of the results against the background of the literature (Ch. 7)
- 11) Conclusions of the study (Ch. 8).

Chapter 2

The Strategic Role of Procurement

2.1 The Strategic Role of Procurement - A Historical Progression

According to Kiser (1976), in the attempt to organise markets, buyers undoubtedly pre-date sellers. He quotes Alderson:

"Men went looking for materials and articles which they could use before it even occurred to them to make them or before the technical arts for this were adequately developed....(and) the practice of acquiring these items by trade originated" (1976: 3)

In the consideration of industrial procurement Zenz (1981: 5) records 1887 as the earliest instance of the written treatment of Procurement as an activity. Farmer (1981a: 23) notes that

"business history includes many examples of Input strategies being developed as an integral element of wider business strategies"

He goes on to illustrate them with examples of the Durrant-Dort Carriage Co. in 1885 and Morris in 1914. Further examples are given by Farmer (1981c: 55) of the cases of I.K. Brunel in 1850s, Fulton and Nielsen in 1854, Duke Cigarette Industries in 1881, NBC (a biscuit company) in the 1900s and Sears Roebuck in the early 20th century. However, these are 'isolated' instances and there is no historical evidence of a concerted consideration of Procurement in a firm's strategy. The reasons for this can be found if one traces the three-stage evolution of management thought in corporate development as shown in Parsons (1982: 5). Since the industrial revolution, firms had a production orientation. Efficient production and distribution was found to be sufficient to satisfy corporate objectives of profit maximisation. Later, as competition became a force in the markets, sales orientation gained primacy with the emphasis shifting to promotional techniques. At the third stage, the ability to open up and develop new markets at home and abroad gave a market orientation to the firm. The underlying assumption in this pattern of development, as relevant to Procurement, was the ready availability of material resources. Not surprisingly, therefore, the earlier studies undertaken in the area of consumer and industrial procurement was by Marketing researchers and practitioners to help them

"...develop more efficient use of Marketing resources and more effective solutions to Marketing problems" (Kotler and Levy, 1973: 55)

A summary of buying behaviour models as seen through 'Marketing eyes' can be found in Moriarty (1983: Ch.2).

The post World War II period was one of unprecedented stability and growth, conducive to the expansion of large enterprises. Interest in business strategy emerged in the late 1950s - early 1960s as a response to the problems of managing large complex organisations (Grant, 1991: 12). Systematic, long term corporate plans were used to seek efficiency, control risks and protect long-term investments. The supply environment was relatively stable for most industries before the 1970s (Pearson and Gritzmacher, 1990: 92). Procurement, therefore, did not merit much attention in a firm's strategy.

The oil crisis in 1973 changed the strategic conditions for the firm. The earlier macroeconomic stability gave way to a turbulent environment, forcing firms to abandon elaborate planning in favour of a more flexible approach to strategic management (Grant, 1991: 13). The stability in Supply was also greatly impacted by the oil crisis. Acute material shortages, soaring inflation, uncertain supply markets, industrial unrest, currency fluctuations and unstable national economies exposed the supply side to increasing risks. In this period, Procurement was seen as an area requiring strategic attention, at least for defensive measures. A flavour of the attention to Supply in this phase can be seen in Monczka and Fearon (1974) with the emphasis being on how to cope with Material shortages.¹

Increased international competition in the 1980s forced the strategic emphasis on to competitiveness in individual industries and markets (Grant, 1991: 14). Additionally, multinational and multicultural markets beckoned, adding new vistas to the corporate vision. Strategic management became a proactive/rapidly reactive mechanism of uncertainty reduction, opportunity exploitation and competitive measures. The manufacturing scene underwent changes with the advent in world manufacturing of the Japanese, deriving competitive advantage from their new just-in-time (JIT) manufacturing philosophy. This altered the concept of management of the supply chain. JIT manufacturing brought about

¹ This researcher, in a winning submission for the Maple Leaf Award, 1980 (IFPMM) also addressed the issue of supply strategy, in times of inflation and monetary instability, as being one of the concerns in that period (see Iyengar and Suresh, 1980).

"a new way of looking at supplier relationship that facilitates a more active Purchasing role in the corporate strategic planning process" (Watts *et al* , 1992: 3)

The rate of technological change and innovation also increased dramatically. Automation was increasingly adopted in seeking manufacturing flexibility and efficiency. Firms going global, with the opening up of new markets for investment, was also a driving force for synergistic relationship between the firm and the supplier (see Burdett, 1992). The industrial markets were themselves undergoing new configurations. 'Strategic networking'² was seen as an alternate to the traditional 'markets' or 'hierarchies', leading to alliances between firms and their suppliers. Such alliances, often brought about by forces like technical change (e.g. see Lamming, 1993: Ch. 4, for strategic collaboration arising from technical change and innovation) or interdependence in the global market place (Johanson and Mattson, 1990), necessitated an increased degree of integration between the firm and the supplier. Lamming (1993), in addressing the automotive industry, ties the trends of globalisation, technological changes and new configurations in the market place into a post-Japanese model of 'lean' supplier relationship with a potential for competitive advantage not only for the firm, but also for the downstream and upstream firms linked along the total value chain. In this changed setting, strategic opportunities could be seen in Supply leading to increased interest in the strategic potential of the Procurement activities.

2.2 The Strategic Context of Procurement

Exhibit 2.1 summarises, from the literature, the context of Procurement's role in a firm's strategy. The elements which make up the context have an influence in varying degrees on a firm's strategy as well as the Procurement activities. However, the incorporation of considerations affecting Procurement is not always on a strategic level. Cammish and Keough (1991) put forward a sequence of the development of Procurement's role, starting from being a service function to manufacturing, moving to realisation of low unit costs, then consolidating as coordinated purchasing of the requirement of different units through common contracts, and finally evolving as strategic purchasing in dynamic markets. They feel that differences in the development of Purchasing's role is apparent more across industries than between firms in the same industry. Reck and Long (1988), based on comprehensive interviews with Purchasing managers and executives in 15 companies, found the Purchasing significance to vary widely among firms, lying on a continuum from a 'clerical function' at one extreme to a

² Strategic networking is defined as "long term, purposeful arrangements among distinct but related for-profit organisations that allow those firms in them to gain or sustain competitive advantage vis-a-vis their competitors outside the network" (Jarrillo, 1988). See also Thorelli, 1986.

Exhibit 2.1

The Contexts of Strategic Procurement

The Context	Variables Associated With the Context	References
A: <u>THE SUPPLY ENVIRONMENT</u>		
A.1: <u>The General Environment</u>	<ul style="list-style-type: none"> 1 Economic effects (monetary trends, inflation, currency fluctuation). 1 Government action (intervention, regulation, tariffs, quotas, economic nationalism) 1 Political turbulence 1 Industrial strife 1 National bankruptcies 	Farmer (1972); Farmer and Taylor (1975); Adamson (1980); Davis (1985); Carter and Vickery (1988, 1989).
A.2: <u>The Supply Market</u>	<ul style="list-style-type: none"> 1 Material availability 1 Supplier (source) availability 1 Capacity/capability availability 1 Competitive conditions 1 Supplier-buyer power equations 1 Plans of suppliers and competing buyers 1 Mergers/acquisitions 1 Technological changes/innovations 1 Substitutes availability 	Farmer (1972); Monczka and Fearon (1974); Farmer and Taylor (1975); Meitz and Castleman (1975); Adamson (1980); Porter (1980, 1985); Spekman (1981); Kraljic (1983); Davis (1985); Elliot-Shircore and Steele (1985); Pearson and Gritzmacher (1990).
B: <u>GLOBALISATION TRENDS</u>		
	<ul style="list-style-type: none"> 1 Multi-country location/ manufacturing 1 Multi-country product market 1 Multi-country supply market 1 Global alliances/joint-ventures 1 Global logistics 	Arnold (1989); Carter and Narasimhan (1990); Monczka and Trent (1991a); Min and Galle (1991); De Toni <i>et al</i> (1992); Fawcett and Birou (1992)

Exhibit 2.1 (continued)

The Context	Variables Associated With the Context	References
C: <u>INTERNAL STRATEGIC CONSIDERATIONS</u>		
C.1: <u>Low Cost Strategy</u>	<ul style="list-style-type: none"> 1 Least cost inputs/least total cost 1 Technological buying 1 Participation in TQM 1 Value analysis/engineering 1 Contribution to design, research and development 	Oliver (1984); Hahn, Kim and Kim (1986); Finkin (1988); Burt (1991); Ellram (1992).
C.2: <u>Vertical Integration (Make-v-Buy)</u>	<ul style="list-style-type: none"> 1 Stage of industry evolution 1 Competitive conditions in supply market 1 Bargaining power of suppliers 1 'Proprietary' products of suppliers 1 Capacity availability in the supply market 1 Transaction costs 	Harrigan (1984, 1985a,b,c, 1986); Ford and Farmer (1986); Balakrishnan and Wernerfelt (1986); Walker and Weber (1987).
C.3: <u>JIT Manufacturing Philosophy</u>	<ul style="list-style-type: none"> 1 Total quality management 1 Involvement of suppliers in design, research and development 1 Long term supplier relations 1 Small supplier base 1 Low inventories 1 Frequent deliveries of small lot sizes 	Hahn, Pinto and Bragg (1983); Schonberger and Ansari (1984); Ansari (1986); Ansari and Modarress (1986); Lamming (1986); Burt (1989); Mitens (1989); Chan <i>et al</i> (1990); Monczka and Trent (1991b); Fawcett and Birou (1992).

Exhibit 2.1 (continued)

The Context	Variables Associated With the Context	References
C.4: <u>Cross-functional involvement</u>		
C.4.1: <u>Research and Development</u>	1 Early supplier involvement 1 Window on new components and technology 1 Value analysis 1 Procurability and Manufacturability 1 Standardisation	Burt and Soukup (1985); Dean and Susman (1989); Dowlatshahi (1992).
C.4.2: <u>Production</u>	1 Capacity investment 1 Inventory policy	Bishop (1979); Allen (1988).
C.4.3: <u>Quality</u>	1 Supplier certification of quality 1 Partnership/alliance with supplier for TQM	Berck (1972); Belev (1991); Hutchins (1992).
C.4.4: <u>Marketing</u>	1 Link to Product Life Cycle 1 Improved features in product 1 Access to new markets 1 Local content laws/countertrade	Rink (1976); Fox and Rink (1979); Ellram (1991).
C.4.5: <u>Finance</u>	1 Cost containment 1 Supplier credit as source of funds 1 Maximisation of profitability with respect to stocks	Allen (1979); Herbert (1984); Chapman <i>et al</i> (1984); Beidelman (1987); Busch (1988).
D : <u>STRATEGIC ROLE OF PROCUREMENT</u>		
	1 Supply considerations in strategy 1 Involvement of Procurement in strategy 1 Importance ranking of Procurement in strategy	Most sources quoted above and current researcher

'strategic contributor' at the other end. Exhibit 2.2 gives their 4-stage taxonomy of this continuum along with the strategic characteristics at each stage.³ Their study is purely descriptive and does not address the factors which place the function in a particular stage. However it does focus attention on the different roles of Purchasing in the strategic context.

The imperative for Procurement to be a major player ('Strategic Contributor') can be found in many writings, exemplified typically by Adamson (1980: 28) who sets the stage when he states:

"....there are features of procurement that have all the elements of strategic consideration; risk is involved, the firm's external environment is being considered, opportunities exist and an important resource to the individual firm is at stake".

The current industrial scene shows a tendency to contract out more complete assemblies, leading to greater reliance on suppliers (Burt, 1991). Changing technology and foreign competition shorten product life cycles, requiring Engineering/Procurement /Manufacturing to act concurrently rather than sequentially (De Rose, 1991). The advent of JIT has brought about a new manufacturing philosophy, with emphasis on integration of the supply chain (Ferdows and Skinner, 1987). All these factors contribute to raising the profile of the Procurement to that of a 'Strategic Contributor'.

With reference to exhibit 2.1, it is seen that the strategic importance of Procurement can be set within 3 major contexts:

- The external environment
- The globalisation trend in industry
- The firm's internal strategic considerations

2.2.1 The External Environment

A major component of a firm's strategy is its interaction with the external environment which interfaces with the supply (input) side in addition to the product (output) side. Thus the competitive stance of the firm is impacted by environmental forces on the Procurement activities also (Spekman, 1981). This view is reinforced by Farmer (1981a: 7) who asserts that

³ The continuum does not delineate where one stage ends and the next begins; however the 4 stages are distinctly identifiable by characteristics which are differentiated at each stage.

Exhibit 2.2

A Taxonomy for Procurement's Strategic Role

Stage	Definition
Passive (PASS.)	Purchasing function has no strategic direction and reacts to the requests of other functions.
Independent (IND.)	Purchasing function adopts the latest techniques and practices but its strategic direction is independent of the firm's competitive strategy.
Supportive (SUPP.)	Purchasing function supports the firm's competitive strategy by adopting techniques and practices which strengthen the firm's competitive position.
Integrative (INTEG.)	Purchasing strategy is fully integrated into the firm's competitive strategy and constitutes part of an integrated effort among functional peers to formulate and implement a strategic plan.

Characteristics	Stage			
	<u>PASS.</u>	<u>IND.</u>	<u>SUPP.</u>	<u>INTEG.</u>
NATURE OF LONG RANGE PLANNING	None	Commodity /procedural	Supportive of strategy	Integral part of strategy
IMPETUS FOR CHANGE	Management demands	Competitive parity	Competitive strategy	Integrative management
EVALUATION BASED ON	Complaints	Cost reduction & supplier performance	Competitive objectives	Strategic contribution
ORGANISATIONAL VISIBILITY	Low	Limited	Variable	High
BASIS OF RESOURCE AVAILABILITY	Limited	Arbitrary/ affordable	Objectives	Strategic requirements
PROFESSIONAL DEVELOPMENT FOCUS	Deemed unnecessary	Current new practices	Elements of strategy	Cross fun. understanding
<i>TAXONOMY</i>	<i>Clerical function</i>	<i>Functional efficiency</i>	<i>Strategic facilitator</i>	<i>Strategic contributor</i>

Abridged from Reck and Long (1988: 4, Fig.1 and : 5, Table 2)

"...the supply market is precisely the same external environment as the sales market"

and hence a source of opportunities and threats for the firm. Moreover, the complexity of the supply side environment is compounded by the supply market actually being a composite of several supply markets - one for each product range that is sourced - with different forces prevailing in each supply market (Caddick and Dale, 1987). The need for including the supply environment in strategic calculations is one of the rationales advanced for Procurement's strategic role.⁴

The factors in the external environment affecting the firm's strategy on the supply side can be categorised as those relating to the general environment and those which are specific to the firm's supply market.

2.2.1.1 The General Environment Factors

These are associated with environmental forces primarily out of the control of an individual firm and pertain to the prevalent economic, political and legal situations (see the listing under A.1 in exhibit 2.1). The impact of these forces has a bearing on the overall operations of the firm as well as influencing the operations of the suppliers to the firm.

2.2.1.2 The Supply Market Factors

Factors in the supply market such as material availability, availability of substitutes, competitive conditions, power equation between the firm and the suppliers, availability of capacity, rate of technological change, and mergers and acquisitions involving suppliers all have an effect on the operations of the firm. In order to ensure security of supplies as well as avail of opportunities on the supply side, the firm needs to incorporate these conditions in its overall strategy. These factors are listed under A.2 in exhibit 2.1.

2.2.2 Globalisation Trend in Industry

The globalisation trend in industry has opened strategic opportunities (and threats) on the supply side. Monczka and Trent (1991a: 3) define global sourcing as

⁴ See Pearson and Gritzmacher, 1990; Browning *et al* 1983; Farmer, 1972.

"the integration and coordination of procurement requirements across world-wide business units, looking at common items, processes, technologies and suppliers".⁵

Monczka (quoted in Morgan, 1991) says that Procurement's strategic importance will be driven by global firms beginning to identify and define their core technologies and examining the competitiveness of all businesses, leading to questions like should the business be sold and the component bought from outside. Entry into the market place of countries not formerly major players has given rise to Supply opportunities which facilitate the asking of such strategic questions. Firms are also seen to band together globally in strategic alliances back through the supply chain, requiring Purchasing to understand what really drives the business. Thus, says Monczka (*ibid* : 125):

" firms will slowly gain an understanding of how sourcing can be used for competitive purposes"

Global firms view their operations as not being bound by country segments but treat the global market as a single market with 'regional' variations. This raises the scope and importance of Procurement to the level of Firm A in country A buying from supplier B in country B for use at a manufacturing location in country C.⁷

International sourcing is resorted to by 'domestic' firms seeking advantage through off-shore purchasing. Some of the reasons⁶ for international sourcing are:

- a defensive move when domestic suppliers are unable to meet the competitive needs of a firm.
- a reaction to off-shore sourcing moves of competitors.
- a proactive move to gain advantage in cost, quality or technology
- decreasing risks of disruption due to industrial strife.
- taking advantage of currency differences.

It is not easy to differentiate between the reasons for global and international sourcing. However, whether one looks at international or global purchasing, it is clear that world-wide sourcing opportunities increase the scope for Purchasing to play a major part in a firm's strategy.⁸

⁵ They distinguish this specifically from international sourcing which suggests firms buying from foreign suppliers for use in the firm's domestic country.

⁷ Giunipero and Monczka, 1990: 5

⁶ From Monczka and Trent (1991a); Carter and Narasimhan (1990); Arnold (1989); Leff (1974).

⁸ Both international and global sourcing have common features for the development of this argument: hence they are treated as synonymous from here on.

Davis *et al* (1974) identify various factors which have a bearing on the decision to source globally - material category (raw materials/components/supplies and capital equipment), distance between the firm and the supplier, government policies and regulation, nationalism, market vs. product pressures, characteristics of the supply industry, and characteristics of the buying firm (including the degree of centralisation of Procurement in the corporate hierarchy). All these factors affect Procurement goals like price, quality, reliability, flexibility of the supplier to adjust to fluctuations in demand, and the ability to provide technical expertise. Most of these factors contain elements which affect the firm's strategy. Thus, the decision to source globally cannot be isolated from strategic decisions.

The extent to which a firm's Supply strategies are consolidated and driven from the corporate headquarters is tied into other strategic considerations. Arnold (1989) says a global strategy aimed at economies of scale through highly standardised products and services points to Procurement dominance by corporate headquarters, whereas a multi-centre orientation with a strategy of local adaptation will lead to decentralised Procurement but with greater demands for coordination between units to make the advantages of global sourcing available to the organisation as a whole. Giunipero and Monczka's (1990) study of multinational corporations (MNCs) found they continue to favour decentralised Purchasing. They point out that the congruence between the various units approach and the MNC's overall strategy determines the extent to which purchasing by the individual units is linked to the overall strategic posture of the firm, presumably requiring greater coordination as stated by Arnold above. Carter and Narasimhan (1990) however found that the trend is towards corporate international procurement. They state Corporate Procurement should evaluate the strategy and practice of buying abroad and

"purchasing dollars should be allocated among suppliers in accordance with corporate strategies aimed primarily at cost reduction, technological leadership and quality competitiveness"
(1990: 10)

The central theme in these arguments is that incorporation of (and hence the importance of) Procurement in the strategic process is driven by the competitive advantage perceived in the Procurement activities.

2.2.3 Internal Strategic Considerations

In the 'internal' strategic deliberations of the firm, the importance of Procurement can be discerned in 4 broad areas:

- Contribution to Cost Effective Strategy.
- Influence on the (Upstream) Vertical Integration and Make-or-Buy decision.
- Role in the adoption of JIT Manufacturing philosophy.
- Degree of cross-functional involvement.

2.2.3.1 Contribution to Cost Effective Strategy

For firms which, mainly, adopt a strategy of cost effectiveness,⁹ Procurement has an important role to play in the strategic posture. It is generally accepted that a high proportion of a manufacturing firm's revenue is spent on production (input) materials. Hadnam (1980: 9) says:

"It is not uncommon to find bought-out materials equating to 80% of direct variable cost or 60% of the cost of sales"

Though the constituent of materials' cost varies with the firm's activities and the industry in which it operates,¹⁰ a generally accepted figure of around 50% (of sales price) is found in the literature.¹¹ The increasing tendency to contract out sub-assemblies and to have a reduced vertical production structure leads to a higher figure of input costs:

"No longer do manufacturers limit themselves to the buying of materials and components; they also purchase many more complete assemblies" Burt (1991: 31)

Finally, as Hill (1972: 276) points out:

"More mechanisation and reduced labour costs per unit of product tends to make materials cost a higher percentage of total (costs)"

Where such a high proportion of a firm's resources are committed it is reasonable to expect that greater strategic attention should be paid to the activity that incurs the expenditure. In fact Finkin (1988) feels that a ratio of total purchases to total sales in excess of 0.20 is enough to warrant attention to Procurement as a potential source of important savings.

⁹ Porter (1980) postulates that firms adopt one of the following generic strategies as their competitive plank - cost leadership, differentiation and focus (cost leadership/differentiation). Details can be found in Porter but for this thesis it is sufficient to understand that cost leadership aims at cost effectiveness by being the lowest cost producer of the product on offer.

¹⁰ see Busch (1987) for representative figures across industries.

¹¹ Burt (1991), Little and Barclay (1986), Spekman and Hill (1980), and most Purchasing handbooks.

The traditional measure of Procurement's contribution to cost effectiveness (leading to profit enhancement or final product price reduction) has been the direct savings obtained through competitive bidding or negotiated contract,¹² and efficient inventory management. However various authors¹³ have advocated a greater strategic involvement of Procurement through the inclusion of a technological element in its activities, contribution in the design and research and development (R&D) stages, participation in total quality management (TQM) with the resultant elimination of in-house inspection of supplies, and membership in value analysis/engineering. The underlying rationale is that these activities have elements of cost directly attributed to Procurement and hence the association of Procurement would lead to greater effectiveness in cost reduction.

2.2.3.2 Influence on (Upstream) Vertical Integration - the Make or Buy Decision

"Vertical Integration involves a variety of decisions concerning whether corporations, through their business units, should provide certain goods or services in-house, or purchase them from outsiders instead" (Harrigan, 1985a: 397).

The vertical integration decision is of strategic significance for firms seeking diversification, competitive advantage, economies of scope, transactional economies, investment in specialised assets and protection of 'proprietary' know-how. Theories of vertical integration are summed up in Balakrishnan and Wernerfelt (1986) and the strategic dimensions of vertical integration are seen in a series of papers by Harrigan (1984, 1985a, 1985b, 1985c, 1986). Finkin (1985) describes how the make-or-buy decision could be a strategic weapon in a turnaround situation. Gardiner and Blackstone Jr. (1991) show, through a worked example relating to plant capacity, how a 'Theory of Constraint' philosophy could use revenue from sales as the attention focus in the make-or-buy decision.

The strategic choice is basically between committing a firm's resources to creating in-house facilities or deploying it in the supply market. According to Ford and Farmer (1986) three factors condition the make-or-buy decision:

- A clear understanding of activities in which the firm has competence.

¹² These are 'arms-length' relationships. However, Landeros and Monczka (1989) have also modelled how a cooperative buyer-seller relationship can support the strategic posture of overall cost leadership of a firm.

¹³ Pearson (1991), Burt (1991), Beidelman (1987), Farrington (1985), Oliver (1984), Hadnam (1980) among others.

- Relative profitability, long and short term, of the make-or-buy decision.
- Assessment of technologies or know-how which the firm must retain for future strategic operations.¹⁴

Where this analysis leads to reduction of activities carried on in-house (the 'shrinking organisation') the firm is enmeshed in a network of suppliers in support of its core activity.

A summarisation (from the writings cited in this section) of the Supply considerations that figure in strategic deliberations of the make-or-buy decision include:

- Stage of industry evolution
- Competitive conditions in the supply market
- Bargaining power of the suppliers
- 'Proprietary' products of the suppliers
- Capacity availability within the firm and in the supply market
- Transaction costs

The role of Procurement is considered to be important in providing inputs to these Supply considerations for the make-or-buy decision.

2.2.3.3 Role in the Adoption of the JIT Manufacturing Philosophy

Ferdows and Skinner (1987), in describing the "sweeping revolution in manufacturing", focus on three major areas that embody this revolution¹⁵:

- 1) Progression in the concept of inventory from cost optimisation (represented by economic lot sizes) to requirement planning¹⁶ (more accurate and timely flow of information to tackle inventories) to JIT manufacturing (addressing the removal of reasons for inventories).

¹⁴ The obverse can be added from Levy and Sarnat (1976) who point out that "patents, lack of know-how or other technological and legal barriers may preclude the firm from producing the component."

¹⁵ See also Attaran (1989) and Goldhar and Jelinck (1983) for similar views.

¹⁶ Materials Requirement Planning (MRP) and Manufacturing Resources Planning (MRPII) are systems evolution which represent the move to efficient inventory management through computerised information flow. While the aim was greater coordination of all functions to reduce inventory it was not till the next stage (represented by JIT) that the questioning of the reasons for inventory became the focus of strategy.

- 2) A new view of quality as a 'means for achieving higher total productivity' with reduction in total costs.
- 3) The movement from 'standardisation' to 'versatility' as the driving force of automation, without increased inventories (due to flexibility in manufacturing, quicker changeover and computer integrated systems). Thus 'economies of scope' as a concept can be compared with 'economies of scale'.

The JIT manufacturing philosophy is aimed at identifying, controlling and eliminating all forms of waste (Attaran, 1989: 83). Quality considerations are an essential element in this concept. Additionally, when shop floor automation and flexibility are added the 'sweeping revolution in manufacturing' is completed. Voss and Harrigan (1987) feel that companies considering automation and CIM should pursue JIT in advance of, or in parallel with, automation. Mayer (1987: 30) points out that

"the quality of incoming materials becomes more critical in an automated environment and shorter production runs need more frequent, smaller deliveries of materials. (This) team approach with suppliers provides substantial benefits in itself"

According to Lamming (1986: 27):

"Just-in-time operation, whilst not a technical change in itself, is closely aligned to the achievement of flexibility in manufacture"

In high technology industries the role of suppliers in achieving flexible manufacturing becomes highlighted. Haas (1987) states that advances in technologies make it uneconomical for companies to excel in every aspect of manufacturing and so they tap into suppliers' specialised capabilities for requisite flexibility. Viewed strategically, she says, decisions on suppliers' roles deal with getting best value from them through establishing long term working relationships so that

"decisions about how to work with suppliers become tightly linked to process design and product design decisions, organisational decisions, and sometimes systems decisions as well" (1987: 11)

This requires a re-focusing on relationships with suppliers to one of partnership mode. Because of the porosity between the firm and the supplier brought about by exchange of information and closely interlinked working, the concept of trust replaces that of opportunistic behaviour on either side (see Sako, 1992: 36-40, for a discussion of three types of 'trust' in a buyer-supplier relationship). Lamming (1993: Ch. 7) in fact posits

a model of supplier relationship, termed 'lean supply', that goes beyond 'partnership'. While 'partnership' refers to the collaborative relationship between a firm and the supplier/customer *at adjacent stages of the value chain* (and with the possibility of 'unequal power' not ruled out in the relationship), 'lean supply' sees a relationship of 'equals' which extends beyond the immediate (first-tier) supplier to encompass further downstream suppliers (second-tier and so on) so that different stages in the value chain (and even across value chain) are drawn together into the network. This model is developed in an industry (automotive) characterised by a high degree of automation, technical change and innovation, and globalisation.

Thus, automation, flexibility, quality, technical change and the JIT philosophy are seen as strongly linked together, enhancing the strategic scope of Supply, which is expected to reflect in the strategic activities of Procurement.

Firms not in a high technology industries nor in the forefront of automation but who have adopted (or are tending to adopt) JIT practices also need to pay strategic attention to Supply considerations. In the view of Lindberg and Trygg (1991: 53):

"Strategic competitiveness is created through activities within value chains as well as in the activities channelling products and services along value chains i.e. between value chains"

The output from the supplier's value chain is the input to the firm's value chain, the whole constituting the value system. Houlihan's (1985) description of the fundamentals of supply chain management includes using inventories as a balancing mechanism of last resort. The importance of eliminating wasteful inventories is also underlined by Stevens (1989: 3):

"The objective of managing the supply chain is to synchronise the requirements of the customer with the flow of materials from suppliers in order to effect a balance between what are often seen as conflicting goals of high customer service, low inventory investment and low unit cost"

He advocates the use of JIT techniques to achieve a "synchronised demand management" which embraces the supplier, the firm and the customer in one integrated system.¹⁷ Frazier *et al* (1988) have modelled the dynamics of the JIT exchange relationship. Viewed from the Marketing perspective and portraying the relation between own equipment manufacturers (OEMs) and component suppliers, it captures

¹⁷ See *ibid*: 7, Fig. 5 for the modelling of the progression towards JIT practices in an integrated system.

the strategic compulsions for a firm to enter into a JIT relationship with its suppliers. Presumably the involvement of Procurement, as the interfacing department with suppliers, is enhanced to a strategic level in the JIT philosophy.

A summary of Management expectations of Procurement in the context of JIT practices is reproduced in exhibit 2.3 from Mitens (1989) and is a representation of the consolidation of Supply considerations at the strategic level. The benefits to the firm of JIT purchasing are in the areas of quality, cost, productivity, response to design needs and administrative efficiency (Chan *et al* , 1990: 44).

When JIT procurement is combined with global procurement, the strategic importance of Procurement is seen to increase. Fawcett and Birou (1992: 3) state that

"because of their positive impact on the firm's competitive position, global and JIT sourcing practices have changed the way firms view sourcing activities - elevating sourcing to a position of strategic importance"

However, these two sourcing strategies are seen to be operationally incompatible in aspects like delivery time and quantities, inventories, and maintaining quality standards. The need to reconcile the differences in the current practices of these two strategies through logistical arrangements (staging materials in a local warehouse, consolidating deliveries of small batches from different suppliers, using air freight, using contract carriage) increases the strategic scope of Procurement's role.

2.2.3.4 Degree of Cross-Functional Involvement

Farmer (1981a: 5) states that the basic philosophy of systems thinkers is

"the dictum that compartmentalisation leads to inefficiencies; that most problems occur between departments rather than in them; and that the sum of the whole should be greater than the sum of the parts"

JIT ideally moves a firm to functional 'integration' and the importance of Procurement in this context has been outlined in sec. 2.2.3.3. However, many firms still operate at a level which is more towards functional 'interfacing'. This situation gives rise to hierarchies of importance in strategy. In such organisations, one measure of the importance of Procurement at a strategic level is its involvement in the decisions of the other functional departments.

Exhibit 2.3

Management Demands on the Organisation and Activities of the Procurement Function in JIT Manufacturing

- 1 Establish good relations and channels of communication.
- 1 Render potential problems visible
- 1 Obtain technical insight in and knowledge of the suppliers' manufacturing processes
- 1 Ensure expertise in commercial aspects concerning supplies from the respective supply markets
- 1 Contribute with technical and commercial assistance as required
- 1 Maintain a suitable circle of suppliers in respect of volume as well as technological level
- 1 Contribute towards development of new materials while at the same time keeping the growth of the number variants under control
- 1 Ensure a current level of development of quality level and functional properties

From Mitens (1989: 29, Fig. 2)

The influence of other functions in procurement decisions has been well recognised - as pointed out by Corey (1978b: 116), Supply is a shared function in that all areas of management are involved in procurement decisions. He goes on to show the role of Engineering, Production, Marketing and General Management in the procurement process. Some empirical studies of other departments' influence and relative power in procurement decisions can be seen in Cooley *et al* (1978) and Leigh and Rethans (1985). De Rose (1991) also recognises procurement as an integrated activity with the involvement of Engineering, Production, Quality and Cost Control in Procurement. Conversely, the increasing importance of Supply considerations in other functions highlights the increasing awareness of strategic advantages to be gained from the supply side. This advantage is visualised in the following areas:

DESIGN, RESEARCH AND DEVELOPMENT: The early involvement of Procurement in design, research and development is increasingly recognised with the prevalence of Concurrent Engineering.¹⁸ Dowlatshahi (1992) says that the concept of Concurrent Engineering requires the inclusion at the design stage attributes of manufacturability and procurability (amongst others). Dean and Susman (1989) state that effective manufacturers work from designs that have fewer parts, as many of them as standard as possible, and capable of easy assembly (without detracting from the product requirements). This effectiveness can be transferred down the value chain to suppliers if procurement factors are incorporated in design at an early stage. Involvement of Procurement at the design stage provides a window on new components that suppliers have developed, provides suppliers' suggestions for value analysis and ensures that components which can be procured without posing a threat to the firm's operations are incorporated in the design (Burt and Soukup, 1985). This is achieved through incorporating long term procurement considerations in the development of standards and specifications at the conception stage. Having a supplier base of technologically advanced and competent organisations, and keeping informed on alternate products in the supply market supports and increases the options for the firm's Research and Development (Sammons, July 1990: 21). Particularly in advanced technology industries, gaining access to new and rapidly changing technology, providing incentives (to suppliers) for technological development and sharing in risks associated with technological changes are strategic issues which involve Procurement (Schill, 1979a). He further asserts:

¹⁸ Voss *et al* (1991) describe concurrent (or simultaneous) engineering as a series of stages whereby the various activities of developing, marketing and bringing to the market are conducted in parallel rather than sequentially.

"The content and pace of the research-mix and development-mix of vendors, and of the entire supply market, is a key procurement issue in high technology companies" (1979a: 302)

The supply market opportunities also give flexibility to a firm's R&D to either create design capabilities within the organisation or avail it from the supply market. Barberis (1990), in his study of the automobile industry, sees it characterised by partnership relationships between the car manufacturers and suppliers where new components and complete systems are jointly designed:

"We can see a scenario where the vehicle manufacturer will transmit ideas and specifications (for components and systems) to various part-makers, stimulating competition in development" (ibid : 5-6)

This strategic relationship also involves an exchange of technical information, possibly of a proprietary nature, which would require agreements at the highest level to prevent premature diffusion to the competition. Procurement is seen to be the instrument for this strategic role.

MANUFACTURING/PRODUCTION: Probably the major strategic area of supply consideration in Manufacturing relates to installed capacity determination in the make-or-buy context.¹⁹ Corey (1978b: 120) points out that there are two types of make vs buy decisions - utilisation of existing facilities to make something currently supplied by vendors and the decision to build new capacity to make something that might otherwise be sourced outside. To this can be added the sourcing outside of components currently produced in-house, thereby releasing capacity for alternate use. Capacity decisions are

"structural or strategic (decisions) in nature because of their long term impact, the difficulty of reversing or undoing them once they are in place and their tendency to require substantial capital investment when altered or extended" (Wheelwright, 1984: 84)

Supply considerations, which present the alternate strategic choice, become crucial in this aspect. A knowledge of long term availability of capacities and capabilities in the supply market becomes an important input from Procurement in determining the optimum production capacity of the firm.

¹⁹ Procurement's comprehensive role in vertical integration is already discussed in section 2.2.3.2. The specific aspect of influence in Manufacturing alone is discussed here.

Procurement's role in strategic balancing of inventories in the production process has also increased, particularly in integrated operations. This aspect is addressed more as a systems integration of functions rather than as the input of one function (Procurement) to the decisions of another (Manufacturing). The systems integration is advocated at different levels of aggregation like Materials Management²⁰ or Logistics Management.²¹ The central idea is the balancing of the supply chain from the supplier through the organisation to the customers with minimum loss due to redundant inventories.²² The logical culmination of this integrative process is JIT, which has been discussed earlier (see sec. 2.2.3.3). An essential aspect of this balancing act is the cooperation and capability of the suppliers to tailor their inputs to the firm's system needs. This calls for a strategic, rather than a commercial orientation, to the Procurement department's activities.

QUALITY: Before the advent of the concept of TQM, Quality Control was treated as a separate function which 'inspected' quality into a product. Procurement was charged with getting in the 'right quality' material which was screened through incoming inspection for acceptance or rejection. This approach led to increased costs due to rejections and re-work (or replacement) lead times, without tackling the core process which generated the rejections. Responsibility for suppliers' performance was also diffused among Purchasing, Quality Assurance, Engineering and other departments leading to an un-coordinated working (Belev, 1991).

The approach of TQM is to 'build' quality into the product, making it the responsibility of the firm as a whole. TQM covers the process right from the purchased materials onwards and pervades the total value system which includes the suppliers' systems, irrespective of which definition of quality is adopted.²³ TQM is seen to be one of the competitive weapons in a firm's strategy.

Salvisberg (1989: 46) lists the following reasons for the increased importance of quality as a competitive issue:

- Internationalisation of competition.
- Environmental sensitivity issues.
- Legal requirements.

²⁰ Kathawala and Nauo (1989), Busch (1987), Oliver (1987).

²¹ Sharman (1984), Allen (1988).

²² See Bishop (1979) for a worked example of balancing demand, capacity and inventory.

²³ Perry and Perkins (1992) have summarised Garvin's five approaches and eight dimensions for alternate definitions of quality

- Shorter product life cycles.

He goes on to state that a firm needs to develop reliable suppliers who coordinate their activities with the aims of the firm. As Lascelles and Dale (1989: 15) put it:

"Suppliers have become an essential part of a quality improvement strategy aimed at improving the competitiveness of a buying firm"

They view the working as 'co-makership' which is an approach that:

"recognises the fact that buyers and sellers organisations are interlinked by the reality of the supply chain" (Bevan, 1987: 48)

This requires suppliers to study their customers' production processes to see how the materials are used and related to the finished product. Novack (1991) sees supplier certification programs, partnerships and strategic alliances leading to maximisation of the quality of input materials. A summary of the changing role of Purchasing in the concept of total quality can be seen in Hutchins (1992: Fig. 1). As TQM is increasingly linked to the philosophy of JIT, Procurement's role in Quality is enhanced by the adoption of JIT practices. Exhibit 2.4 reproduces from Schonberger and Ansari (1984) the effect of JIT purchasing on quality. It can be seen that most of these benefits can accrue if Procurement and Quality integrate their operations, even if a firm does not operate JIT.

MARKETING: Procurement's contribution to cost competitiveness in the product market through cost reduction and control has been dealt with in sec. 2.2.3.1. Other aspects of Marketing in which Procurement is involved are addressed here.

Farmer and Taylor (1975: 16) and Parsons (1982: 6) make the point that a close link with Procurement will ensure that Marketing develops markets for those products for which the firm is able to obtain the necessary materials (and manufacture the product) without exposure to its long term operations. Pearson and Gritzmacher (1990: 98) also support this view - they quote the case of a pharmaceutical company which, after three years of marketing effort, realised that no supplier could supply the main ingredient in the quality and quantity required by the firm. Additionally, Farmer and Taylor (*ibid*) point out that Procurement could support Marketing by bringing to the firm improved features developed in the supply market which could enhance final product performance.

Exhibit 2.4

The Effect of JIT Purchasing Practice on Quality

Purchasing Activities	JIT Practice	Effect on Quality
Lot-Size	Small lots, frequent deliveries	Fast detection and correction of defects
Supplier Evaluation	Evaluated on ability to provide high quality products	Suppliers emphasise product quality
Supplier	Single source in close geographical area	Frequent visits by technical selection people; rapid and better understanding of quality needs
Product Specification	Fully specify only essential characteristics	More discretion for suppliers in design and manufacturing
Bidding	Stay with same supplier, do value analysis to reduce price, no annual re-bids	Suppliers can afford long term commitment to meet quality requirements
Receiving Inspection	Supplier certifies quality. Receiving inspection reduced /eliminated.	Quality at source, more effective and less costly

From Schonberger and Ansari (1984: 4, Table 1)

Procurement also has the potential to help a firm in its international marketing efforts. Ellram (1991) lists the rationale for a firm seeking international partnerships. Some of the points made by her can be seen as areas where Procurement can have some influence. Access to new markets could be facilitated if Procurement is already operating in those markets. A knowledge of the local laws and operating conditions can be gained through the Procurement experience. Conversely a Marketing led entry could open up new supply markets in another country. Where local-content laws and other countertrade measures are in force, the two functions can be integrated. As Forker (1992: 18) says:

"(Countertrade contracts) have proven, in some cases, to be the "foot in the door" that allowed firms to market their products in that country later on"

A close involvement of Procurement in Marketing is seen as being beneficial to the objectives of the firm.

FINANCE: Procurement's contribution to the financial 'bottom line' through cost control is addressed by Ellram (1992). She quotes the findings of a report in the US that cost containment and cost reduction would be the number one opportunity for Procurement to contribute to corporate success. Her study goes on to explore the various dimensions of Procurement's involvement in cost savings in multifunctional projects. Dale and Powley (1985), in their study of 5 UK firms, discuss the various methods²⁴ of measuring Procurement's performance and contribution in the area of financial management.

An additional area of Procurement's contribution to the Finance function is in generation of short term funds through supplier credit management. Herbert (1984) states that credit taken from suppliers constitutes the single largest source of short term funds to UK companies. He goes on to explore the role of Procurement in financial operations of a profit seeking organisation. Chapman *et al* (1984) have modelled the impact of including credit considerations in determining order quantities under different agreements (relating to when the materials are used or sold) with the supplier.

Finally, Allen (1979) looks at the role of Procurement along with Production, Sales and Finance in maximising profitability of a company with respect to stocks. Thus, from the angle of the Finance function, Procurement is looked on as a source of profit (through cost minimisation of input prices), a contributor to cash flow management

²⁴ Standard Costs, Budgetary Systems, Inventory Costs, Profit Centre Accounting, MBO, Audits.

(through judicious inventory management) and a source of short term finances (through credit policies).

2.3 Top Management's Recognition of the Strategic Role of Procurement

The preceding sections highlighted the strategic context which give rise to the importance of Procurement. However, for Procurement, it is important that top management recognises these contexts as strategic vis-a-vis the activities of the department. As far back as 1972, Hill had maintained:

"We are on the threshold of a new managerial orientation which acknowledges that the maintenance of a competitive edge in the market-place and satisfactory profits will derive mainly from having the most effective supplies system" (1972: 281)

Bonfield and Speh's (1977) study indicated that the corporate role and scope of Procurement would expand and that top management did comprehend the importance and complexity of the function. Lamming (1986) states that the relationship between firms and their suppliers must reflect a strategic partnership and not purely a commercial one. The recent realisation (see Ford, 1990, introduction), that the firm-supplier relationship is one of ongoing 'interaction' and not 'action and reaction' in a series of single transactions, would require a strategic orientation to the activities of Procurement. Presumably such an orientation can come only with top management's acceptance of the strategic role of that department (Procurement) which deals with suppliers. Farmer (1981a) had argued that it is important to have a balance in strategic management which recognises the importance of the input function and its inter-relationship with other system elements of the firm. Likewise, Monczka and Trent (1991b) had found that the success of Procurement's involvement in cross-functional teams depended on top management's commitment. In the words of De Rose (1991: 87):

"Higher Management is now viewing its Purchasing as a basic business process rather than a narrow specialised function...(and) industrial purchasing is being influenced more by longer term strategic considerations than short term operational ones"

This strategic recognition of Procurement will have to originate from the importance that top management accords to Supply considerations. From this will derive the importance of Procurement, and will be evident in its participation in the strategy process of the firm.

Allowing for the essentiality of top management's recognition for a strategic role for Procurement, and drawing in the earlier identification of the strategic context of Procurement, it should be possible to bring the whole concept together in an overarching schematic model. Such a model is put forward and discussed in the next section.

2.4 Capturing the Contexts of Procurement's Strategic Role - A Schematic Model

"A 'model' is an imitation or an abstraction from reality that serves the purpose of ordering and simplifying our view of the reality while still representing its essential characteristics"
(Nachmias and Nachmias, 1982: 45)

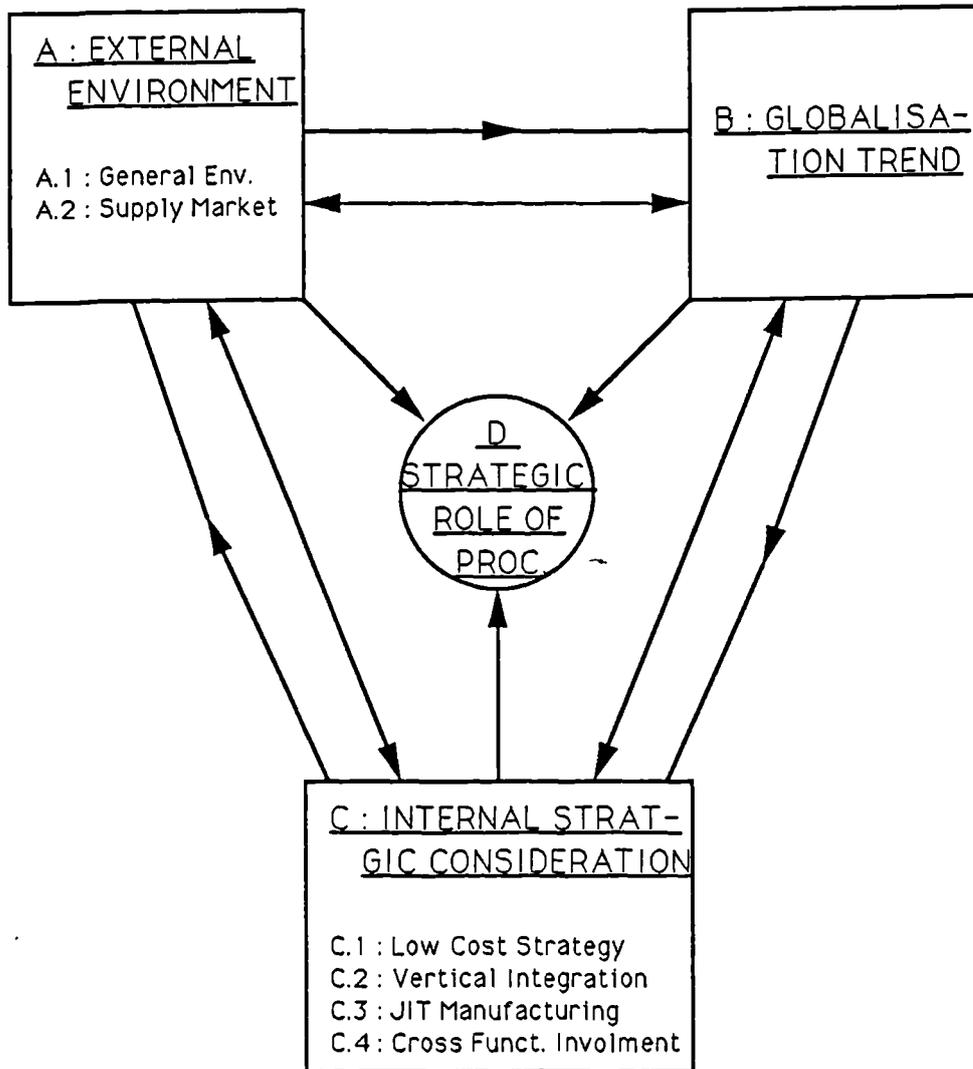
The foregoing discussion shows that the reality of the importance in strategy of Supply considerations and has had a fragmented representation in literature. It should, however, be possible to weld together this fragmentation to capture the whole reality. The result of the welding process is seen in exhibit 2.5, in the form of an overarching schematic model, to visualise contexts of the strategic role of Procurement. The three strategic contexts are identified as boxes A, B and C. The essential requirements for according a strategic role for Procurement, viz. top management's recognition of this role, is identified in box D. The direction of causality is shown by the direction of the arrowheads. Two-headed arrows between any two boxes show the relationship between those two boxes. Continuous arrows (not terminating at any box) show the linkages among the boxes which lie in its path. For the sake of convenience of representation, *these arrows are shown in only one direction but it is implicit that the sequence and direction of the linkages among these boxes is in as many combinations as possible.* The four boxes are iteratively linked together and these linkages are explained below:

LINKAGES A+D, B+D, C+D: Since the strategic role of Procurement (D) is seen as dependent upon the forces represented in contextual boxes A, B and C, the dependency relationship is shown by arrows from the contexts to the role of Procurement.

LINKAGES A+B, B+C, C+A: The contextual forces themselves could alter one another. For example, government intervention or legislation (A) could alter the 'global profile' (B) of the firm; a make-or-buy decision or a move in JIT implementation (C) could also alter the 'global profile' (B); a change in competitive conditions (A) could change the vertical integration decision of the firm (C). The two-headed arrows capture this interplay.

Exhibit 2.5

The Contexts of Strategic Procurement - A Schematic Model



LINKAGE A+B+C: This is the continuous relationship amongst the three contexts. For example, government legislation (A) could open up global opportunities (B) which could require a strategic cooperation between Procurement and Marketing (C). As stated earlier, the knock-on effect is not directional but could be in any sequence.

The forces represented in the 4 boxes are linked iteratively and dynamically, requiring a continuous review of the role of Procurement (and Supply strategies) with the changing context.

2.5 Relating Procurement to the Strategic Context - Previous Work in the Literature

A number of attempts have been made in the literature to capture the relationship between Procurement and the strategic context. These attempts take the form of schematic models, analytical models and just plain descriptions. Exhibit 2.6 identifies these attempts and tries to place them in the perspective of the schematic model of exhibit 2.5. The 'Relationship' column describes the specific aspect addressed by the authors and the 'Context' column places it in the perspective of the overarching model. The column 'Taxonomy' is an attempted classification of the significance and level of the relationship using Reck and Long's taxonomy (see exhibit 2.2). As the taxonomy lies on a continuum without a perfect point of placement/demarcation, the classification in exhibit 2.6 is the closest level of significance that is seen in a particular relationship²⁵

It is clear from exhibit 2.6 that, since the mid-1970s, Procurement has been visualised in all three roles (FE, SF, SC). The incidence of addressing Procurement's strategic role increases from 1981 onwards. The number of studies which can be classified as SF and SC is high from 1986 onwards. All this bears out the changes in the industrial scene (identified in sec. 2.1) which started opening opportunities for competitive advantage on the Supply side. Empirical findings through search in industry, however, are both sparse and conflicting in supporting the strategic role of Procurement.

2.6 Empirical Findings of the Strategic Role of Procurement

Exhibit 2.7 summarises the empirical work in searching for the strategic role of Procurement in industry. This exhibit does not attempt to bring together the various research on Procurement strategies which address the contextual factors (boxes A, B and C of exhibit 2.5), but only whether Procurement has a role of a Strategic

²⁵ Exhibit 2.6 has not looked at the representation of Procurement as a clerical function (CF), as this role is rarely in evidence since the mid-1970s.

Exhibit 2.6

Relating Procurement to the Strategic Context

Source	Relationship	Context	Taxonomy
Fisk (1979)	Vendor capacity planning and measure/control of delivery performance	A.2	FE
Jain and Laric (1979)	Negotiation strategy through determining buyer/supplier strength, evaluating purchasing needs and incorporating environmental conditions	A	FE
Schill (1979b)	Sources of Procurement Intelligence and information/decision flow in Procurement Management process	A+C	FE
Chapman <i>et al</i> (1984)	Incorporation of credit policy in order quantity considerations	C.4	FE
Little and Barclay (1986)	Technologists' role in Materials Management	C.4	FE
Beidelman (1987)	Considerations of Procurement as a profit centre	C.1	FE
Treleven and Schweikhart (1988)	Risk/benefit associated with single/multiple sourcing strategies	A.2	FE
Arnold (1989)	Characteristics of Global Sourcing	B	FE
Tulip (1989)	Procurement actions as influenced by Supply exposure, profit impact, and relative strengths of the firm and the Supply market	A.2+C.1	FE
Ramsay and Wilson (1990)	Sourcing (single/multiple) versus contracting (short/medium/long term) strategies	A.2+C.1	FE
Berenson (1967), Fox and Rink (1979), Ramsay (1988)	Relating procurement strategies and the product life cycle	C.4	SF
King (1973)	Linking Procurement policy decisions to corporate goals	D	SF
Davis, Eppen and Mattsson (1974)	Factors influencing choice of global v local suppliers, and centralisation v decentralisation of Procurement	A+B+D	SF

Exhibit 2.6 (continued)

Source	Relationship	Context	Taxonomy
Meitz and Castleman (1975)	Supply planning incorporating materials classification, external risk assessment and corporate strategic decision	A+D	SF
Levy and Sarnat (1976)	Make-v-Buy decision using Net Present Value	C.2	SF
Herbert (1984)	Relation between supplier credit policy and financial considerations of profit seeking firms	A.2+C.4	SF
Burt and Soukup (1985)	Linkages of Procurement in the design process	C.4	SF
Elliot-Shircore and Steele (1985)	Procurement strategies in the context of supply exposure/vulnerability and profit/value potential of Materials	A.2+C.1	SF
Houlihan (1985)	Information flow and supply chain management	C+D	SF
Davis in Farmer (1985: 62)	Internal and external factors influencing strategic purchasing	A+C.4	SF
Hahn, Kim and Kim (1986)	Impact of procurement strategies on the supplier's costs	A.2+C.1	SF
Bache <i>et al</i> (1987)	Profit impact of bad supply practices; systems approach to supplier development	A.2+C.1 +D	SF
Allen (1988)	Logistics integration of firm's supply chain	C.4	SF
Busch (1988)	Materials Management/Logistics contribution to organisational goals	C.4+D	SF
Gardiner and Blackstone (1991)	Make-v-Buy decision incorporating sales price and using 'Theory of Constraints'	C.2	SF
Dowlatshahi (1992)	Interfacing of Procurement and Design	C.4	SF
Perry and Perkins (1992)	Quality factors in Procurement decisions	C.4	SF
Farmer in Farmer and Taylor (1975: Ch.2)	Check-list of factors linking Procurement to corporate planning	A+B+C	SC

Exhibit 2.6 (continued)

Source	Relationship	Context	Taxonomy
Porter (1980, 1985)	Industry structure showing bargaining power of suppliers, value chain integration and sources of competitive advantage	A.2+D	SC
Farmer (1981c:38)	Factors in Supply market relevant to corporate planning	A+D	SC
Spekman (1981)	Incorporation of environmental analysis in strategic resource allocation based on market performance amongst SBUs	A+D	SC
Kraljic (1983)	Relating procurement strategies to complexity in Supply market, Strategic classification of Materials and relative buyer-supplier strength	A+C.4+D	SC
Harrigan (1984)	Dimensions of vertical integration strategies and factors affecting them	A+C.2+D	SC
Balakrishnan and Wernerfelt (1986)	Relating integration to competition and technical change (including Supply side)	A.2+C.2+D	SC
Lamming (1986)	Buyer-supplier relationship in advanced manufacturing technology industry	A.2+C.3+D	SC
Bevan (1987)	Buyer-seller relationship in the concept of co-makership	A.2+D	SC
Morgan (1987)	Supplier relationship v degree of centralisation of Procurement	A.2+D	SC
Walker and Weber (1987)	Make-v-Buy decision incorporating uncertainty of technology/volume and supplier market competition	A.2+C.2+D	SC
Frazier, Spekman and O'Neal (1988)	JIT exchange relationship in industrial markets	A+C.3+D	SC
Spekman (1988)	Buyer-supplier relationship	A.2+D	SC
Landeros and Monczka (1989)	Cooperative buyer-seller relationship in the context of overall strategic posture	A.2+D	SC
Stevens (1989)	Integration of the supply chain	C+D	SC

Exhibit 2.6 (continued)

Source	Relationship	Context	Taxonomy
Chan, Samson and Sohal (1990)	Concept of Japanese manufacturing techniques including flexibility, TQC and JIT	A+C+D	SC
Hahn, Watts and Kim (1990)	Linking Procurement and corporate strategy through supplier development program	A.2+D	SC
Lamming, (1990)	Post-Japanese model of supply markets (automotive industry)	A.1+B+C+D	SC
Carter and Narasimhan (1991)	Elements of International Purchasing	C	SC
Monczka and Trent (1991a)	Development of Global Sourcing	B+D	SC

Exhibit 2.7

Empirical Findings of Procurement's Role in Strategy

Source	Sample	Methodology	Focus of Study	Findings
Ammer (1974)	500 General Managers and 250 Purchasing Managers in the USA	Questionnaire/ Unstructured personal interviews	Why companies get less than optimum performance from Purchasing	<ul style="list-style-type: none"> 1 Managers accept 'passive purchasing' and refuse to take risks in Purchasing 1 Purchasing rarely affects company objectives 1 Top Managers and Purchasing Managers have differing perceptions of a successful Purchasing Manager
Bonfield and Speh (1977)	400 CEOs and 400 Purchasing Managers from industrial firms	Mailed Questionnaires	To assess opinions of CEOs and Purchasing Managers about Purchasing's mission and future direction	<ul style="list-style-type: none"> 1 Both groups agree that breadth and depth of Procurement will continue to increase 1 Corporate role and scope of Purchasing will expand 1 Top management accepts importance and complexity of Procurement job
Meinhart, Warde and Godiwalla (1980)	295 CEOs of US and Canadian firms	Mailed Questionnaire	Functional influence on corporate strategy for different types of production systems	<ul style="list-style-type: none"> 1 Procurement ranked last (out of 7 functions) in all instances
Spekman and Hill (1980)	92 members of Purchasing Management Association of Baltimore	Mailed Questionnaires	Difference between activities of higher and lower levels of Purchasing hierarchy	<ul style="list-style-type: none"> 1 No difference as Managers do not perceive Purchasing related activities as having potential strategic importance
Farmer (1981c: Ch.3)	Senior Purchasing executives in 120 multinational firms	Questionnaires and field visits	Corporate planning and Procurement in multinational firms	<ul style="list-style-type: none"> 1 Considerable evidence of trend towards greater appreciation of Supply market decisions in overall operations - motivated mostly by threat to supplies

Exhibit 2.7 (continued)

Source	Sample	Methodology	Focus of Study	Findings
Dale and Powley (1985)	4 private firms and 1 government firm	Case study	Study of current purchasing practices in the UK	1 Managerial philosophy aims at reducing administrative costs in Purchasing rather than cost savings through creative, sophisticated purchasing activities
Bilborough and Dale (1985)	One multinational engineering corporation	Case study	Role of Purchasing within a corporate structure	1 Factory Purchasing has a service role 1 Internal factors are more relevant to Purchasing than external factors 1 Flow of information is one-way into Purchasing - Buyers lack authority in dealing with suppliers
Caddick and Dale (1987)	European operations of an American multinational	Case study	Corporate Marketing and Purchasing objectives	1 Objectives and strategies are never properly articulated in Purchasing strategies 1 No formal systems to exchange information on functional strategies
Pausenberger (1980), IFO study (1981), DIHT study (1982), Briemann and Lawson (1984) - ALL QUOTED IN ARNOLD (1989)			Procurement consideration in foreign investment	1 All 4 studies showed Procurement considerations are secondary to market-orientated goals
Monczka and Trent (1991b)	i) Executive, Manufacturing and Purchasing personnel in 26 US firms ii) Purchasing and Materials executives from 40 firms	i) Face-to-face Interviews ii) Delphi survey	Linkage of Corporate and Purchasing strategy	1 Strong linkages did not exist between Purchasing strategy development process and corporate competitive strategy 1 Executive-level management recognises the increasing importance of Supply
Ellram (1992)	114 Purchasing Directors from NAPM, USA	Mailed Questionnaire	Role of Purchasing in Cost Savings	1 Purchasing plays a major role in cost saving (at the operational level) 1 Lack of top management's recognition of strategic importance of Purchasing - Purchasing expects to increase its role in cost savings at strategic level.

Contributor (box D in exhibit 2.5). The exhibit shows that there are not many studies, in the past two decades, which look at the strategic role of Procurement. Also the findings are often contradictory, even as late as 1991.

The assertion of Pearson and Gritzmacher (1990: 92), that strategic management literature does not identify any significant contribution of Purchasing to the development of competitive strategies, is borne out by the exhibit 2.7. They further state that:

"the Purchasing department's knowledge of supplier networks and capabilities can provide top management with the kind of information that enables the firm to define its future, rather than react or adapt to a future that is defined by the competition"

Evidence so far suggests that this perception is lacking in industry.

Over the past two decades, many reasons have been attributed for the lack of a strategic role for Procurement. Exhibit 2.8 summarises some of the more commonly stated reasons for Procurement's non-strategic role. Cammish and Keough (1991) state that the lack of a strategic role manifests as lack of seniority for the Procurement head, limited access to top management, limited perceived strategic impact and lower compensation for Procurement personnel. The meagre empirical work, as seen in exhibit 2.7, would seem to indicate that the reasons given in exhibit 2.8 are accepted as prevalent. The paradox - between the perceived strategic potential in Supply on the one hand, and the lack of evidence of addressing them through Procurement in the firm's strategy on the other - requires a fresh look to be taken at the whole situation.

2.7 The Dichotomy

The inability to distinguish between strategic Supply considerations and the strategic role of Procurement has plagued the quest to date for the strategic importance of Supply:

- 1) Theoretical researchers have been able to identify the increasing competitive opportunities on the supply side. However, the empirical search for whether firms recognise these opportunities and act on them has been limited by 'tunnel vision' - the belief that these opportunities should be addressed through Procurement. The logic seems to be that *the activities of the department which addresses the supply side would automatically be a barometer of the strategic importance of Supply*. The

Exhibit 2.8

Reasons Attributed for the Lack of a Strategic Role for Procurement

Source	Reasons Advanced
Caddick and Dale (1987)	Lack of contribution of Procurement to corporate objectives
Schill (1979b)	Lack of strategic identification of Procurement issues
Caddick and Dale (1987)	Widespread inadequacy of Procurement objectives definition
Ansoff, quoted in Schill (1979a)	Classification of Procurement as an administrative function
Finkin (1988)	View of Procurement as a service function and a requisitioning department
Schill (1979b)	Locating Procurement within Manufacturing
Schill (1979b)	Lack of inclusion of Procurement managers in strategy formulation and lack of development of them in strategic management practices
Finkin (1988)	Procurement not being staffed with top calibre people
Caddick and Dale (1987)	Perception of Procurement managers of their role as administrative and dealing with short term, ad hoc decisions

fact that this has not been so (as shown by exhibit 2.7) leads to the conclusion that firms do not recognise supply side opportunities.

- 2) Procurement departments evolved historically to cater to a functional need. With the increase in operational complexity, the status and responsibilities of Procurement increased proportionally. However, the strategic considerations on the supply side were seen only partly to overlap the activities of Procurement. In order to raise its sights to the strategic level, it was necessary for Procurement to 'mutate' to a higher level; *a mutation which required top management, if not actually to initiate it, then at least to support it.* The evidence of research findings seems to suggest that, in general, this support is not forthcoming. The immediate conclusion seems to be that firms are missing out on strategic opportunities on the supply side.
- 3) The almost total focus on the departmental activities has restricted empirical research more or less to determining the perception of Procurement's importance by executives of the firm. No attention seems to be paid to the *contexts* which require strategic consideration of Supply. As much of the theoretical work rightly identifies the different contexts for strategic Supply, empirical research can only be fruitful if the emphasis shifts from the department's role to the firm's contexts. *This is a void in current research which needs to be redressed.*
- 4) Viewing the Supply context of a firm would lead to identification of the strategic factors relevant to the firm, and the strategic action taken by the firm. *This insight is lost* once the departmental activities are taken as the barometer of *Supply's strategic* importance. Current empirical research is mired in this misconception.
- 5) A practical difficulty in empirically addressing the contexts is the multitude of variables which could have a bearing on the strategic importance of Supply. The 'role of the functional department' seems to be a proxy variable lending itself to easy measurement. This is questionable as the strategic role of a department is a reflection more of *how a firm organises itself to address strategic issues, rather than the strategic importance of those issues.*
- 6) Once the 'true' nature of strategic Supply is identified, it can form the springboard for evolving Supply strategies which contribute to the strategic posture of the firm. *The role of Procurement in this process is only of secondary significance,* to be of concern to the firm in the deployment of its resources.

In general, it is difficult to accept that what is obvious to observers of the industrial scene (the theoretical researchers) totally escapes the attention of the players (the 'captains of industry'), if one is to go by empirical findings. In order to get the true picture it is necessary to recognise the *dichotomy* between the activities of the Procurement department and Supply considerations. As Porter (1985: 59-61) points out, the identification of an organisational unit (e.g Procurement) may not recognise and reflect critical activities (e.g Supply). This is clearly visible in Monczka and Trent (1991b). Through their field work they identify a number of key Supply issues which shows that managing the Supply base has to be from a strategic perspective. Yet it is also their finding (see exhibit 2.7) in the same study that the involvement of Purchasing in establishing competitive strategies is only "somewhat" (*ibid* : 11). This 'contradiction' could be explained by the presence of a dichotomy visualised above. While it is true that Procurement is the department that deals mainly with operational supply considerations, *it is not necessarily true that strategic Supply issues are addressed by the firm through Procurement.* The recognition of this dichotomy formed the basis of the propositions of this thesis.

2.8 Research Propositions

The propositions of this thesis were based on the contexts identified from the literature and listed in exhibit 2.1. The propositions themselves were developed along two dimensions:

- propositions which pertain to Supply considerations, without reference to the mode of addressing them.
- propositions which look at the accepted mode (Procurement) of addressing the Supply considerations.

2.8.1 Propositions About Supply Considerations

Six propositions were generated, each addressing one specific context. It is not the contention of these propositions that the individual contexts can be isolated from one another. On the contrary, the reiterative influence of the contexts on one another is acknowledged in the schematic model of exhibit 2.5 and elaborated in section 2.4. What the propositions do highlight is that the presence of even one of the contexts could be sufficient to drive the strategic significance of Supply.

2.8.1.1 Propositions Related to the External Environment

The supply market forces in the external environment are represented by such variables like price of materials (Davis, 1985), material availability (Adamson, 1980; Elliot-Shircore and Steele, 1985), source availability (Elliot-Shircore and Steele, 1985), capacity availability (Kraljic, 1983; Davis, 1985), substitutes availability (Porter, 1980; Kraljic, 1983), currency fluctuations (Carter and Vickery, 1988, 1989), competitive conditions (Porter, 1980; Davis, 1985), power relations between the firm and the supplier (Adamson, 1980; Porter, 1980), and mergers/acquisitions as affecting suppliers (Farmer, 1972). Each of these variables, in isolation or in concert, have a bearing on the firm's strategy, supply security and opportunities for competitive advantage. Hence these forces would compel strategic attention to Supply. This led to proposition 1.

PROPOSITION 1: Importance of Supply considerations in strategy is seen in firms faced with uncertainties in the supply market, and the opportunities or threats perceived in them.

Technological forces in the industry could be subsumed under 'supply market forces'; however the nature and effect of technological forces are distinct from other supply market forces. Technological forces are pervasive across the whole supply chain, have a direct impact on the firm's product offerings and long term investment decisions. As Schill (1979a: 297) put it:

"The environment of dynamic, rapid technological changes within state-of-the-art operations causes problems both internal to the company and its relationship with the supply market"

Firms lack expertise to keep up with advances in all relevant technologies and so they position their manufacturing activities to get the best value from suppliers. Thus decisions of how to work with suppliers become tightly linked to process and product design decisions, organisational decisions and systems decisions (Haas, 1987). Changing technology leads to shorter product life-cycles which compresses the design-to-marketing period, requiring the activities of engineering, procurement and manufacturing to take place concurrently (De Rose, 1991). Generation of new or improved technological products frequently require the purchase of parts that are new to the firm; this (by implication) requires a firm to be aware of the changing technological capabilities in the supply market (Mogee and Bean, 1976). A fast response to technological changes is facilitated by a co-makership relation with suppliers which

helps reduce response time and effect changes smoothly (Bevan, 1987). The advent of CAD linkages with suppliers has brought about a progressive shift from stand-alone automation to integrated manufacturing (Barberis, 1990). Product innovation, arising from technical change, draws in Supply considerations through the sharing of value chain management between the firm and the supplier (Lamming, 1993: 92). Other important Supply issues arising from rapid technological changes relate to gaining access to new technologies, providing incentives for technological development and sharing the risks associated with change (Schill, 1979a).

It is seen that firms in industries characterised by rapid technological changes need to incorporate Supply considerations in their overall planning. Hence proposition 2 was generated to highlight this importance.

PROPOSITION 2: Importance of Supply considerations in strategy is seen in firms whose industry is characterised by rapid technological changes.

The forces in the general environment (economic forces, government action, political turbulence, industrial strife) relate to the firm's operations as a whole. They cannot be isolated specifically to the Supply side and their influence is felt in the modification of the variables listed under supply market forces. Hence no separate proposition was put forward to cover this context.

2.8.1.2 Proposition Related to the Globalisation Trend

The globalisation trend is reflected in the increased operations in overseas markets. International subcontracting has increased the firm's ability to tie in cheap component/raw material imports from overseas suppliers (Welch and Luostarinen, 1988). More sourcing options are opened up in areas of cost reduction, manufacturing flexibility, quality (Carter and Narasimhan, 1990; Monczka and Trent, 1991a), and in technology transfer across national borders (De Toni *et al*, 1992). Logistical considerations gain greater importance in the firm's planning (Monczka and Trent, 1991a; Fawcett and Birou, 1992). Strategies are affected by the requirements of 'local content laws' and counter-trade (Arnold, 1989; Ellram, 1991). Entry into foreign product markets is also facilitated by the knowledge gained of that region through earlier sourcing moves (Arnold, 1989). Supply considerations thus become a more integral part of the firm's strategy. This gave rise to the third proposition.

PROPOSITION 3: *Importance of Supply considerations in strategy is seen in firms with increased global operations.*

2.8.1.3 Propositions Related to Internal Strategic Considerations

The contribution to cost effectiveness from the Supply side is seen in least total cost purchasing (Hahn, Kim and Kim, 1986; Burt, 1991), low inventories through effective scheduling (Hahn, Kim and Kim, 1986; Oliver, 1987), quality considerations to eliminate wasteful rejections leading to the most cost effective decisions (Novack, 1991; Perry and Perkins, 1992), and participation in value analysis (Ellram, 1992). As material cost is in excess of 50% (of sales) for most manufacturing firms, Supply is seen as a major strategic plank for 'low cost' producers. This led to proposition 4.

PROPOSITION 4: *Importance of Supply considerations in strategy is seen in firms competing on a 'low cost' basis.*

The importance of Supply in JIT manufacturing is well documented. Supply is integrated in the firm's strategy in areas like long term supplier relations with a small base of suppliers (Ansari, 1986; Lamming, 1986), involving suppliers in design, research and development (Burt, 1989), participation of suppliers in total quality effort (Schonberger and Ansari, 1984; Monczka and Trent, 1991b), and synchronising of the suppliers' and firm's schedules to facilitate just in time delivery (Ansari, 1986; Mitens, 1989). Since the concept of JIT involves an integrated operation across the supply chain which implies a partnership relation with suppliers (Lamming, 1986), Supply considerations are crucial in a firm's strategy. Proposition 5 captured this importance.

PROPOSITION 5: *Importance of Supply considerations in strategy is seen in firms adopting a JIT manufacturing philosophy.*

Firms which are not operating in the JIT mode and where functional integration is not evident in their supply chain measure the importance of Supply by the impact it has on other functional considerations. The scope of this involvement in other functions like Design, Research and Development; Manufacturing; Quality; Marketing; and Finance is outlined in sec. 2.2.3.4. This gave rise to a general proposition for cross-functional involvement.

PROPOSITION 6: *Importance of Supply in strategy is seen in the incidence of its inclusion in other functional considerations.*

This thesis does not address one important context of Supply's strategic consideration viz. the vertical integration decision. This is because the importance of Supply can be ascertained only *within the decision process* of make-or-buy, while all the other contexts are 'external factors' which influence the importance of Supply. Vertical integration decisions are a form of cross-functional involvement in support of a strategic decision and is better studied through a study of the actual decision process. As this study was not designed for a specific decision, the vertical integration context was excluded from the propositions.

An important caveat attached to the six propositions is the assumption of *ceteris paribus*. As pointed out in sec 2.4, the contextual variables are dynamically linked and it would be impossible to isolate them from one another. However, the framework provided in exhibit 2.5 (on which the propositions are generally based) has the merit of drawing together all the issues to be considered in strategic Supply. This framework better relates the existing piecemeal assessment of strategic Supply to the totality of real life situations of firms. If the propositions can be tested holding *ceteris paribus* (no matter how 'artificially'), it could be a first step in the synthesis of the variables which really drive strategic Supply.

2.8.2 Propositions About the Strategic Role of Procurement

The previous six propositions looked at Supply and its strategic context in a 'generic' mode i.e. to the exclusion of the activities of Procurement. It is a moot point whether there is any relationship between the strategic consideration of Supply issues and inclusion of Procurement in the strategy process. However the possibility of the strategic importance of Supply being measured by the inclusion of Procurement in the strategy process cannot be ignored. Proposition 7 addressed this possibility.

PROPOSITION 7: *The strategic importance of Procurement is reflected in the incidence of its representation in the strategy process.*

The final proposition was derived from the underlying contention of this thesis viz. that strategic Supply consideration and strategic role of Procurement *need not be synonymous*. This is the dichotomy identified in section 2.7 and gave rise to the following proposition:

PROPOSITION 8: *Importance of Supply considerations in the firm's strategy is independent of the importance of Procurement in the strategy process.*

Chapter 3

Methodology

3.1 The Nature of the Propositions

The choice of research methodology, for data collection as well as analysis, was conditioned by the nature of the propositions of this study. The qualifications which influenced the choice of methodology are outlined below:

- 1) The propositions, following from the schematic model of exhibit 2.5, were of an overarching nature. Intuitively, it was evident that the contextual factors would vary from firm to firm. It was reasonable to expect that the importance of Supply would be contingent on the degree to which the firm specific contexts were perceived to impact its strategic posture. A highly focused search was therefore not apt for uncovering the propositions.
- 2) The dichotomy pinpointed in Sec. 2.7 was central to the theme of this study. The route normally adopted in literature, viz. the seeking of the importance of Supply in the role of Procurement was redundant for this study.
- 3) Another crucial element was the strategy process itself. The process is seen generally as systematic, incremental, plain 'muddling' through or a combination of the three.¹ The players in the strategy process also vary depending upon which of the three modes are in operation. In such a scenario, the search for the importance of Supply was not to be restricted by any self-imposed boundaries.

Given these qualifications, it was necessary to adopt a holistic approach, rather than focus the investigation on any specific aspect. The final choice followed the examination of the advantages and disadvantages of suitable techniques *in terms of the relevant situation and the specific questions being addressed.*

3.2 Choice of Research Design

"Social Sciences produce an accumulating body of reliable knowledge which helps to explain, predict and understand

¹ See Hart (1992) for a useful summary of the alternate strategy processes.

empirical phenomena that interests us" (Nachmias and Nachmias, 1982: 9)

This body of knowledge is cast in the framework of theories which are validated and modified by empiricism leading to modification of theories; the repeated cycle leading to accumulation of knowledge. According to Popper (1959: 59):

"Theories are nets to catch what we call 'the world': to rationalise, to explain and to master it. We endeavour to make the mesh ever finer and finer"

The review of literature in Ch. 2 revealed that there is no robust theory of Supply consideration in strategy. However, it brought together the prevailing, fragmented understanding which underlie the propositions enunciated in sec. 2.8. The overarching model of exhibit 2.5 was the welding together of the prevailing fragmented understanding into a 'net of finer mesh'. Furthermore this study, through empiricism, attempted to explain 'the world' of the industrial firm in a Supply setting, thereby adding to the body of knowledge. The effective casting of the net depended on the type of understanding being attempted and the choice of the appropriate research methodology.

3.2.1 Types of Theory

Nachmias and Nachmias (1982: 38-45) identify four types of theories: ad hoc classificatory; taxonomies; conceptual frameworks; and theoretical systems. The first two are primarily concerned with the creation or identification of categories which can be used for describing the relationship between categories. Conceptual frameworks systematically place descriptive categories within broad, explicit as well as assumed, propositions. Theoretical systems interrelate propositions in a way that permits some propositions to be derived from others, to provide a complete explanation of empirical phenomena. This study attempted a 'conceptual framework' in that it tried to identify the association of factors to provide a better understanding of 'reality', and on which further exploration could be built. The identification of the type of research being undertaken was the first step in the search for the appropriate research methodology.

3.2.2 Types of Research

According to Simon (1969: Ch. 4), research can be classified into 7 different types: descriptive search; classification research; measurement and estimation; comparison

problems; research of relationships; cause and effect research; and mapping systems. The present work can best be described as one of 'research of relationships' viz. whether or not two (or more) variables are closely associated with each other. The association sought was between the importance of Supply consideration (manifested, or not, in the importance of Procurement) and the various contextual factors. The research of relationship can be further focused when it comes to designing the research. Chisnall (1986: 21-22) identifies three approaches to research design which, though in the context of marketing research, was relevant in identifying the scope of this study.² His three approaches are: exploratory ("concerned with identifying the real nature of the research problems and, perhaps, of formulating relevant hypotheses for later tests"); descriptive ("stem from substantial prior knowledge of marketing variables.... questions designed to secure specific kinds of information"); and causal ("to identify factors which underlie marketing behaviour and to evaluate their relationships and interactions"). The design primarily suitable for this study was 'exploratory', bearing in mind the overarching nature of the propositions, and the perception of the dichotomy, which prevented the more precise formulations required by the other two designs. Causality is an implicit element in the propositions; however, the propositions were not generated to validate the causality. Rather, the propositions, through identification of association amongst the variables, could move towards identifying 'possible' causality. In Zikmund's (1989: 113) words:

"Exploratory research provides greater understanding of a concept or crystallises a problem rather than providing precise measurement or quantification"

This can be used for diagnosing a situation, screening alternatives and discovering new ideas. This study had the thrust of diagnosis and screening as a first step in the discovery of new ideas.

3.2.3 Qualitative Versus Quantitative Research

Zikmund's quote above led to the question of quantitative measurement as distinct from qualitative understanding.

"Technically, a 'qualitative observation' identifies the presence or absence of something, in contrast to 'quantitative

² There is some overlap in the types of theories, types of research and approaches to research. This is to be expected in the nature of progression from theory to research to approach. However the overlap is not strictly one-to-one and as such a conscious choice has to be made at each stage.

observation' which involves measuring the degree to which some feature is present" (Kirk and Miller, 1986: 9)

The identification of 'something' requires the observer to know what qualifies as 'that thing' while to measure it requires a knowledge of the relevant measuring instrument. However, as Crompton and Jones (in Bryman, 1988: 72) point out:

"In organisational research it is not a mutually exclusive decision between quantitative and qualitative measurement. In reality, it is very difficult to study organisations without using both sorts of methods"

The propositions of this study had identified the factors which were to be observed and, in an organisational context, these factors lend themselves to both qualitative identification and quantitative measurement. The choice depended on other aspects like feasibility and facility of the research method chosen and is dealt with later on.

3.2.4 Choice of Research Strategy

According to Yin (1987: 16) there are three conditions which decide the suitability of a given research strategy:

- The type of research question posed, which has been dealt with in the foregoing discussions (sec. 3.2.2 and 3.2.3).
- The extent of control an investigator has over actual behavioural events, a crucial condition which ruled out some research strategies for this study, as explained further on in this section
- The degree of focus on contemporary as opposed to historical events. This study was focused on contemporary events as it explored conditions in industry which have evolved quite considerably away from the conditions of even the last two decades.

To make the final choice of research strategy it was useful to turn to Bryman's (1989: 29) summary of the chief research designs and methods in organisational research, which is reproduced in exhibit 3.1. He distinguishes design, as the overall structure and orientation of an investigation, from methods, which is the collection of data and analysis within the design framework. This distinction was

Exhibit 3.1

Chief Research Designs and Methods in Organisational Research

Designs	Methods
D1 : Experimental	M1 : Self-administered questionnaire
D2 : Survey	M2 : Structured interview
D3 : Qualitative research	M3 : Participant observation
D4 : Case Study	M4 : Unstructured interviewing
D5 : Action research	M5 : Structured observation
	M6 : Simulation
	M7 : Archival sources of data

(Abridged from Bryman, 1989: 29, Table 1.2)

useful in narrowing down the choices. The experimental design (D1) and action research (D5) were not suitable for the following main reasons³:

- 1) This study was exploratory in nature. The primary thrust was to bear out, through identification, the association (between importance of Supply and the various contexts) in the propositions. As the aim was not to measure and evaluate relationships and interactions, the experimental and action designs were not suitable.
- 2) Both these designs would require the active involvement of the researcher in the strategy process of the firm, either to control the variables or be involved in the actual process. This was beyond the scope of the study, both by way of focused hypotheses and the practicality of cooperation from the firms.

The survey (D2), qualitative (D3) and case study (D4) designs are used widely in the study of business strategy. Survey research

"...entails the collection of data....on a number of units and usually at a single juncture in time, with a view to collecting systematically a body of quantifiable data in respect of a number of variables which are then examined to discern patterns of association" (*ibid* : 104)

On the other hand, qualitative research

"... tends to be on individuals' interpretations of their environments and of their and others' behaviour. The presentation of data tends to be sensitive to the nuances of what people say and to the contexts in which their actions take place. The emphasis tends to be on understanding what is going on in organisations in participants' own terms rather than those of the researcher" (*ibid* : 29).

Case study has a similar orientation as qualitative research and it is often difficult to distinguish qualitative from case study research (*ibid* : 30). The main differentiation as seen by Bryman is that all case studies need not be qualitative as they sometimes use quantitative research methods. For the purpose of the current study this differentiation was not valid and 'qualitative research' was subsumed in the case study research.

³ The designs and methods are not described here in detail as they are widely used practices, and described in a number of books beside Bryman (1989). The emphasis here is on the screening process to arrive at the final choice of research strategy.

The approach of the research design to understanding a problem can be empathetic (the understanding of others' view of reality) or predictive (logical empiricism applied to the social world) (Nachmias and Nachmias, 1982: 13-14). The survey method has components of both types of understanding while the case study tends predominantly to the empathetic. The exploratory nature of this study seemed to require an empathetic understanding of 'reality'. However, a brief look at the two designs helped to assess the suitability of each for this study.

3.2.4.1 The Survey Design

The survey is a method of primary data collection based on communication with a representative sample of individuals (Zikmund, 1989: 186). The type of survey could be causal-analysis ("to learn about causal relationships with the important distinction from experiment that the independent variables are not controlled and manipulated by the researcher....") or descriptive ("which attempts quantitative description of some aspect of a universe rather than discover relationships") (Simon, 1969: 244). It could be designed as a comparison survey (between experiment group and control group), a normative survey (constructing a model from existing data and survey another group to compare with the model), or a case control survey (choosing two groups with and without the condition being surveyed) (Fink and Coscoff, 1985: Ch. 5). The design can be cross-sectional or longitudinal. The current study lent itself to a descriptive, normative, cross-sectional survey.

3.2.4.2 The Case Study Design

The case study is appropriate for answering 'how' and 'why' research questions, as also the 'what' question, if asked in an exploratory context (Yin, 1987: 17). It can be useful in obtaining a wealth of detail which can give ideas for future research (Simon, 1969: 276). Moreover it is

"at the level of straightforward discovery that the case study comes into its own. This might mean a descriptive posture is adopted rather than an analytical one that can, in turn, lead to the formulation of hypotheses to be subsequently more rigorously investigated" (Dunkerley, in Bryman, 1988: 91)

As Bryman (1989: 173) puts it:

"The aim (of case study) is not to infer findings from a sample to a population, but to engender patterns and linkages of theoretical importance"

This study can be seen to have most of the characteristics which make a case study design suitable. The propositions were of an exploratory nature and required a broad span of data collection. Though there was an underlying model guiding the study, it was still a 'theoretical proposition' awaiting discovery through empiricism. Thus, both the case study and the survey were equally suitable for conducting this research.

Exhibit 3.2, drawing mainly from Bryman (1989), summarises the scope of the survey and the case study design alongside the requirements of this research. The choice between the two designs was made by investigating the methods associated with each design.

3.3 Choice of Research Method

The following methods (refer exhibit 3.1) were eliminated from consideration for the indicated reasons:

- Participant Observation (M3), as it necessarily restricts the number of units studied, whereas the propositions required a broad range of units.
- Structured Observation (M5), for the same reasons.
- Simulation (M6), which is more relevant for an experimental design
- Archival Source of data (M7), as the design of the study had a contemporary rather than historical focus.

Of the remaining three methods, self-administered questionnaire (M1) and structured interviews (M2) have a closer identification with the survey design and the unstructured interview (M4)⁴ is more relevant to the case study.

The questionnaire is a researcher designed instrument where the questions, their wordings and sequence are fixed and identical for all respondents. This requires great skill in designing it unambiguously to cover all the propositions addressed by the research. Where it is self-administered the respondent fills it out in the absence of the researcher. The disadvantage of not being able to seek immediate clarification

⁴ It is possible to have a semi-structured interview which could facilitate a conversation within broadly delineated boundaries, without robbing the process of its detail.

Exhibit 3.2

Comparison of the Survey and the Case Study Research Strategies
with the Requirements of the Study

	Survey Method	Case Method	The Study
1) Unit of Measure	People/Firm	Firm	Firm
2) No. of Units (Size)	Many	One/Many	Many
3) Sampling	Probability	Probability/ Convenience	Probability/ Convenience
4) Time Horizon	Cross-sectional/ Longitudinal	Cross-sectional/ Longitudinal	Cross-sectional
5) Participation of Researcher in field	Not close	Close	Close
6) Data Collection Instrument	Researcher Designed	Broad (Reports, Documents, Individuals)	Broad
7) Emphasis on Understanding	Researcher's View	Participant's View	Researcher/ Participants View
8) Treatment of Variables	Non-manipulative	Non-manipulative	Non-manipulative
9) Delineation of Context	Weak	Strong	Strong
10) Theoretical Under-pinning (Propositions/Hypotheses)	Strong	May be Absent	Overarching Propositions
11) Nature of Measurement	Quantitative	Qualitative/ Quantitative	Qualitative/ Quantitative
12) Generalisability	Probable	Doubtful	Exploratory
13) Causality	Difficult	Remote	Not attempted
14) Usual Methods	Questionnaire/ Structured Interview	Semi-structured/ Unstructured Interview	Semi-structured/ Unstructured Interview

from the researcher would tend to make it unsuitable for a wide-ranging, exploratory study.

This obvious disadvantage can be overcome by the structured interview where the questionnaire is used as the basis of conversation. Explanations and information can be provided to the respondent. However, the outline of the questionnaire is to be strictly followed. This would rob the answers of the context which is important for an exploratory study. No doubt this limitation can be obviated to some extent by open-ended questions but the over use of open-ended questions could rob the questionnaire of its sharp focus.

The unstructured interview lies at the other end of the spectrum. As Nachmias and Nachmias (1982: 190) describe it, there are no pre-specified questions, nor specified order of questions. No schedule is used and no direction is given by the interviewer:

"The respondents are encouraged to relate their experiences, to describe whatever seems significant to them, to provide their own definitions and to reveal their opinions and attitudes as they see fit"

While such a wide ranging brief is suitable for an exploratory study, it has the danger of dragging out into a 'fishing expedition'. A 'semi-structured' interview which broadly delineates the topics of discussion, while allowing free rein within this delineation, would be a desirable combination for an exploratory study.

There was some merit in each of these methods for the purpose of the study, but the researcher decided to use the 'semi-structured' method as being the most appropriate to capture the full extent of the contexts which would have a bearing on the propositions.

3.4 The Final Choice of Research Approach

Drawing together the foregoing discussions on research design and method, the final choice was settled as follows:

- 1) The case study design would be used, with the firm as a whole being the unit of study.

- 2) Data collection would be through the use of semi-structured open-ended interviews, guided by a broad agenda sheet and 'facilitated' by the researcher.
- 3) The interviews would be spread over as many senior executives as agree to be interviewed, cutting across functional lines. A case would be written for each firm, drawing in all the perceptions received.⁵
- 4) The case write-up would be validated for accuracy by the firm (through a nominated executive) before commencement of analysis.

3.5 Pitfalls of the Chosen Research Design and Method

In choosing the case study design and the semi-structured open-ended interview method, the following pitfalls associated with them were noted.

3.5.1 The Case Study

Yin (1987: 21-22) points out that there are three major criticisms of case study

- 1) A lack of rigour which allows equivocal or biased views to influence the direction of findings and conclusions. Views on which actions are based were central to the propositions of this study. Two methods were used to minimise the bias:
 - Assertions were critically challenged in the light of known facts about the firm and the context of the actual action taken.
 - Individual assertions were matched with alternate sources from within the same firm.
- 2) Very little basis for scientific generalisation. The answer, according to Yin, is that generalisation should be to theoretical propositions and not to populations or universes. Also the use of multiple cases increased the validity of any attempted generalisation.

⁵ In writing the case from interview transcripts, the researcher decided to use the hierarchically dominant perception in case of conflicting opinions amongst the executives of the firm.

- 3) Case studies take too long and result in massive, unreadable documents. Since this research undertook the case study of very specific issues, this criticism was not a major factor.

3.5.2 The Semi-Structured Open-Ended Interview

Moser and Kalton (1983: 298-301) identify four problems associated with informal interviewing (which is similar to the unstructured or semi-structured open-ended interview):

- 1) Interviewer skill - knowledge of the subject, intelligence, understanding and tact. This researcher had an informed colleague sit in, as an observer, in one of the interviews in the actual study. This observer assessed and gave feed-back on the conduct of the interview. Also the first couple of studies were written up and given for assessment by informed colleagues before proceeding with the full scale study.
- 2) Interviewer bias, intruding on the interview process. The final case write-up was sent back for re-validation by each firm. This was a cross-check on any interviewer bias that may have crept in.
- 3) The depth of the interview - the fear of the 'fishing expedition' mentioned earlier as well as an indulgence in inordinate detail not relevant to the propositions. A semi-structured interview format was adopted, with an 'agenda sheet' to guide the progress, in the hope of minimising this problem.
- 4) Analysis - the difficulty of summarising and quantifying the material. Descriptive, non-quantified interviews do not lend themselves to statistical analysis easily. If quantification is desired, coding must precede it, and this is relatively hard with descriptive interview material (*ibid* : p300). However there are methods available for coding and quantifying 'descriptive' material and this aspect is addressed in sec. 3.7.

3.5.3 Validity and Reliability of the Case Study Method

A final important aspect to be addressed in the choice of the case study is the validity and reliability of the method. Yin (1987: 36-40) identifies three validity and one reliability measures, and the way a case study design can accommodate them:

- 1) Construct validity deals with establishing correct operational measures for the concepts being studied. In the data collection phase he recommends the use of multiple sources of evidence, and establishing the chain of evidence which would allow an external observer to follow the derivation of any evidence from the research questions to the conclusions. This study used multiple evidence both from within a firm (interviews with cross-functional executives and documentary sources) as well as from multiple firms. The tapes of the interview as well as their transcripts, the first step in data extraction, are available to any external observer. In the composition of the case phase, Yin recommends the review of the case reports by key informants. This researcher had a sample of the cases reviewed by an informed colleague, while vignettes of all the cases are made available (refer appendix).
- 2) Internal validity is relevant for studies concerned with making normative statements of causal relationships. This was not the thrust of the current study and as such internal validity was not of major relevance. However, as suggested by Yin (1987: 38), the use of 'explanation building' as an analysis approach (described in the following sec. 3.6), strengthened the internal validity of the exploratory purposes of the study.
- 3) External validity requires the establishing of the domain to which a study's findings can be generalised. The propositions derived from the theoretical literature formed the domain for generalisation, and the evidence from multiple cases gave greater validity to the generalisation.
- 4) Reliability is concerned with demonstrating that the operations of a study can be repeated with the same results. The case study protocol and the case data were documented to ensure that, if needed, they can be repeated.

3.6 Analysis Approach⁶

The appropriateness of any analysis approach is conditioned by the study purpose and the research design. As it was decided to adopt the case study method for data collection, the types of analysis suitable for case studies were considered. Yin proposes a number of ways to approach case study analysis. Each of the methods proposed by him are specific to given conditions. Each method was scrutinised

⁶ This section is based on Yin (1987: Ch.5)

against the requirements of the study to arrive at the most suitable approach. A summary of the proposed methods and their suitability is shown in exhibit 3.3

Four methods were initially discarded from detailed consideration as not being relevant:

- 1) Time-Series Analysis - Applicable to longitudinal studies, while the current study was cross-sectional.
- 2) Embedded Units Analysis - Applicable for analysis which focus on sub-units embedded within each case. For example, if the current study had focused only on the supply market uncertainties as driving the importance of Supply, this mode of analysis would be relevant. However, as this study was looking at the case as a whole, and searching for any of a multitude of reasons for the importance of Supply, the concept of embedded units was not valid.
- 3) Making Repeated Observations - This has elements of the embedded units analysis as it focuses on one variable for which repeated observations are made longitudinally (over time for a single case) or cross-sectionally (across cases at a given point in time). The focus element made it invalid for this study.
- 4) The Case Survey - Analysis of cases already existing in the literature, using a close-ended coding instrument in a fashion similar to a regular survey. This study was not designed as a survey of existing cases in the literature and so this approach was not relevant.

The remaining two methods ('pattern-matching' and 'explanation building') seemed relevant to this study and were considered in detail to arrive at an acceptable method of analysis.

3.6.1 Pattern-Matching

Pattern-matching is used to compare an empirically derived pattern with a predicted one, and is relevant for studies involving pre-defined variables. Two types of pattern-matching are defined:

Nonequivalent dependent variables - This method is used to study dependent variables pattern. The requirements for using this method are:

Exhibit 3.3

Different Approaches to Case Study Analysis

Type of Analysis	Brief Description	Suitability for the Study
1) <u>Pattern Matching</u>		
1.1) Nonequivalent Dependent Variables	Predicting <i>multiple dependent outcomes</i> of one independent variable	<i>Not suitable</i> - the study looks at one major outcome (importance of Supply) based on a number of independent variables.
1.2) Rival Explanations as Patterns	Predicting one dependent outcome based on <i>mutually exclusive</i> independent variables	<i>Not suitable</i> - the independent variables do not lead to mutually exclusive patterns
2) <u>Explanation Building</u>	Explanations to reflect theoretically significant propositions	<i>Suitable</i> - see text, sec. 5.1.1
3) <u>Time Series</u>	Longitudinal analysis	<i>Not relevant</i>
4) <u>Analysing Embedded Units</u>	Analysis of sub-units in a case	<i>Not relevant</i> - the case is the holistic unit of the study
5) <u>Making Repeated Observations</u>	Multiple longitudinal or cross-sectional observation on a focused variable	<i>Not relevant</i> for an overarching study
6) <u>Case Survey</u>	Secondary analysis of cases from 'literature'	<i>Not relevant</i>

Based on Yin, 1987: Ch. 5

- 1) Multiple outcomes, representing different (nonequivalent) dependent variables are predicted from a particular event.
- 2) Case evidence is matched to see if the prediction is validated.
- 3) The case is scrutinised for all possible threats to validity (i.e. alternate events which could lead to the predicted outcomes)
- 4) Should any of the predicted outcomes not be present, or are attributed to alternate events, then the validation of the original prediction is not achieved and the predictions need to be re-cast.

This method was not suitable for the present study which primarily looks for one outcome (importance of Supply) arising out of a number of events (the contexts). Also, the propositions are not 'true predictions' because of the assumption of *ceteris paribus*.

Rival explanations as patterns - This method is used for independent variables, to provide alternate explanations (events) for one outcome. The essential requirement for applying this method is that the alternate explanations should arise from *mutually exclusive* independent variables; the presence of some independent variables in one explanation automatically precludes their presence in the alternate explanations. The cases are scrutinised to identify the correct explanation of the outcome, as well as to rule out the alternate explanations.

In this study, the contexts which provide the 'explanations' for the importance of Supply were made up of a number of variables (described in Ch. 5) which could not be said to be 'mutually exclusive'. For example, a variable like the importance given to inventory reduction reflect both the 'Low Cost' context as well as the 'JIT' context. Also, the contexts themselves are not necessarily exclusive - 'Globalisation' and 'JIT' could be attempted by a firm simultaneously. Hence this approach was not found to be suitable.

3.6.2 Explanation Building

Basically, the explanation building approach calls for an initial theoretical statement in the form of propositions against which the findings of an initial case are compared. In the light of the findings the propositions are revised and the findings

from a second case are compared with the revised statement. The process is thus carried out repeatedly and iteratively till a final explanation is arrived at.

This approach differs from pattern-matching in two respects:

- 1) Unlike pattern-matching which attempts to validate the case findings against pre-established outcomes, explanation building does not require the final outcome to be fully stipulated at the beginning of the study. Rather, the process is a refinement of ideas and the propositions can be revised in the light of the findings.
- 2) The explanation building approach also entertains other plausible or rival explanations. In this sense, it is not a close-ended search like the pattern-matching approach.

Both these characteristics made explanation building a suitable approach for the current study. However, the way it was adopted differed in one respect from the way it is advocated. Yin recommends an iterative process; viz. comparing the findings from one case with the proposition, revising it in the light of the findings, comparing the revised propositions to the findings of a second case and so on. This method would be acceptable as a refinement of a single proposition based on multiple cases. The current study covered a multitude of propositions, not all of which were expected to be found in all cases. Hence, while adhering to the principles of 'explanation-building', the *iteration* stopped at one.

Having chosen the explanation building approach, it was necessary to address the issue of extraction of variables on which the explanation would be based.

3.7 Variable Extraction

The choice of open-ended interviews for data collection automatically presaged the use of techniques which would translate 'verbal perceptions' into meaningful variables for use in subsequent analysis. The chosen technique needed to stand the test of 'objectivity' in the extraction of variables from what was essentially a 'subjective format' of data presentation. Two methods used in strategy research were considered - Cognitive Mapping and Content Analysis.

3.7.1 Cognitive Mapping

According to Eden (1989: 26):

"Cognitive Mapping is the label for the general task of mapping a person's cognition within the field of psychological research on perception"

It is a model which represents the way a person defines an issue in order to make sense of the world around him. That this 'subjective' definition of reality influences strategic actions is argued by Fahey and Narayanan (1989: 362). They say that strategic actions are the result of inputs (to a large extent 'rational') which are viewed through the lenses of decision makers and coloured by their beliefs and political interests before manifesting as outputs (strategic actions).⁷ The structure of causal inferences made by the strategist to make sense of the strategic environment can be revealed through cognitive mapping ("revealed causal maps" in their terminology). Dutton *et al* (1989: 379) also accept that decision makers apply implicit meanings in sorting issues:

"Classification of a trend as important or unimportant, certain or uncertain, economic or political, or some combinations of attribute imbues that trend with an interpretation"

Again in Porac *et al* (1989: 400):

"the material and cognitive aspects of an organisation's strategic activities are linked in a loosely coupled 'enactment process' in which each is determined partly, but not solely, by the other"

Since this research accepted that the role of Supply in strategy is determined by the 'coupling of material and cognitive aspects', and adopted a methodology of data collection which tapped this cognition, cognitive mapping was a logical route for analysis. The use of cognitive mapping to study strategy can be seen in Fahey and Narayanan (1989), Porac *et al* (1989) and Stubbart and Ramaprasad (1988). Eden (1990: 109) describes a methodology using cognitive mapping ('SODA') as a deliberate part of strategy development.

⁷ See also Stubbart (1989) for the role of the cognitive process in Strategic Management.

Cognitive maps are drawn from texts obtained through interviews⁸

"conducted in a relatively open-ended manner where the prompt for focusing discussion is simply, and only, the 'label' given to the issue" (Eden, 1990: 109)

Maps are then drawn as semantic networks. Stubbart (1989: 335) describes semantic network as

"an interconnected network of semantic nodes with paths, or arcs, running between them. Nodes can represent a wide range of phenomena: physical objects, or ideas, or acts, or events, or descriptors. Arcs represent the associations between various nodes."

The individually drawn maps can then be aggregated to different levels (say, the firm level made up of maps of the executives; the industry level made up of maps of the firms). The direction of the arcs between two nodes show the direction of relationship while the number of arcs shows the (perceived) importance of the relationship. Clustering of concepts can also be visually identified (see Eden, 1989, for development and analytical use of cognitive maps through the 'SODA' program). Thus the cause-and-effect of a particular issue can be identified through the 'maps' of the players involved.

3.7.2 Content Analysis

The early definition of Content Analysis is typified by Berelson, quoted by Marino *et al* (1989: 54):

"Content Analysis is a research technique for the objective, systematic and quantitative description of the manifest content of communications".

These authors point out that the technique has since evolved from the concept of *manifest* content to also one of drawing *inference* from communications. Janis' definition, quoted in Stewart and Shamdasani, 1990: 106) is more comprehensive:

**"any technique (a) for the classification of the sign-vehicles⁹
(b) which relies solely upon the judgements (which theoretically may range from perceptual discrimination to**

⁸ Maps can also be drawn from published articles, books studies, attended conventions and watched films - some of which were the sources for Stubbart and Ramaprasad's (1988) study. This researcher describes the interview method as that was the route adopted for this study.

⁹ "A sign-vehicle is anything that may carry meaning...."

sheer guesses) of an analyst or a group of analysts as to which sign-vehicles fall into which category, (c) provided that the analyst's judgements are regarded as the report of a scientific observer"

The technique builds in a number of tests (of reliability and validity) to make the process as objective and as scientific as possible. Like Cognitive Mapping, the source material is communications represented in texts, published articles, speeches or any other form which captures the essence of the communication.

The basic procedure of content analysis is to design categories that are relevant to the research purpose and to sort all occurrences of words or other recording units into these categories (Tesch, 1990: 79). The design of categories which is the process of data extraction from the text is crucial to the research. Marino *et al* (1989: 55) state:

"The categories in the schedule represent the theoretical information required to address the research questions. While clearly stated, theory-based research questions are desirable in any research setting, practical considerations make them a virtual requirement in content analysis. Because the documents of interest are usually lengthy, an unfocused extraction of data is neither efficient nor likely to prove fruitful".

An example (as relevant to this study) of category definition is given by Hart (1989). She says, in studying the industrial buyers' key purchase criteria, the broad issues (categories) could be price, delivery, quality and service. Within these broad categories are sub-categories (e.g. delivery includes lead time, regularity of delivery, just-in-time delivery). Comments in the text that relate to these areas are then identified for inclusion in analysis.

The use of content analysis in strategy studies is not as prevalent as in other social sciences (see Krippendorff, 1980: Ch. 1, for a history of the usage of this method). The discipline of Marketing has a greater prevalence of content analysis usage than other organisational disciplines - Wheeler (1988) has summarised its use in Marketing Research. However, the usefulness of content analysis to study other strategic aspects has been on the increase and some examples of empirical work in strategy using this method can be see in Lim (1987), Varadarajan and Johnston (1987), Calingo (1989), D'Aveni and Macmillan (1990), Varadarajan and Ramanujam (1990), Birnbaum-More and Weiss (1990), and Pilling and Zhang (1992).

Both the aforementioned methods have some similarities - as Stubbart and Ramaprasad (1988: 143) point out, most cognitive maps have been a form of content analysis, relying on published documents. Both methods identify the issues (through definition of categories or nodes) and then capture their occurrence in the text. Cognitive maps show relationships between issues through interconnectedness (the linking arcs) and the importance of relationship is shown by the number of linkages identified in the document. Clusters are visibly represented. Content analysis identifies occurrence through a count of categories and then uses other means (like correlation) to show the strength of associations. While both methods were valid for the current study the final choice was made based on 'convenience', as outlined below:

- 1) The nature of the propositions showed that the relationships expected to be found would not be concentrated in a few cases but spread out over a number of firms. It was feared that a large number of fragmented maps would have to be drawn, proving to be cumbersome. Content analysis would be more 'compact' in this instance.
- 2) The unit of study chosen was the firm. The case was written from individual interviews and the write-up validated by referring back to the firm for vetting.¹⁰ This required the final case to be aggregated in textual form. Once the individual 'maps' were discarded in this process, there was no great advantage to be gained in reverting to mapping.

According to this researcher cognitive maps can be more profitably employed for a more focused problem (than the propositions of this study) or, as shown by Eden (1989), to facilitate team work and group ownership in tackling specific problems. For an exercise aimed at studying organisational strategic practices in a wide ranging mode, content analysis is more relevant and was therefore adopted.

Having decided on content analysis for the extraction of variables, it was necessary to look at the reliability and validity measures of the method.

¹⁰ The interviews could have been vetted on an individual (interviewee) basis. But it was anticipated that identifying individual perceptions may lead to a reluctance on the part of the interviewee to cooperate in full. Also the logistics of chasing individual returns of vetted documents would be problematic. Finally, the aggregation of individual perceptions at the firm level would be more meaningful for the propositions as a cross-section of functional views would be presented in the total picture - making the case write-up more recognisable to the firm when it came to vetting.

3.7.3 Reliability and Validity of Content Analysis¹¹

The technique of content analysis systematically and objectively codes textual material into categories that conceptualise the portion of reality which gave rise to the analysed text (Krippendorff, 1980: 23). The quality of content analysis is dependent on the twin requirements of reliability ("systematic and objective coding") and validity ("conceptualisation of the portion of reality represented by the text"). Exhibit 3.4, reproduced from Krippendorff (1980: 158), shows the reliability and validity criteria for a quality content analysis. Each of these criteria are addressed below.

3.7.3.1 Reliability

Three types of reliability are defined by Krippendorff (1980: 130)

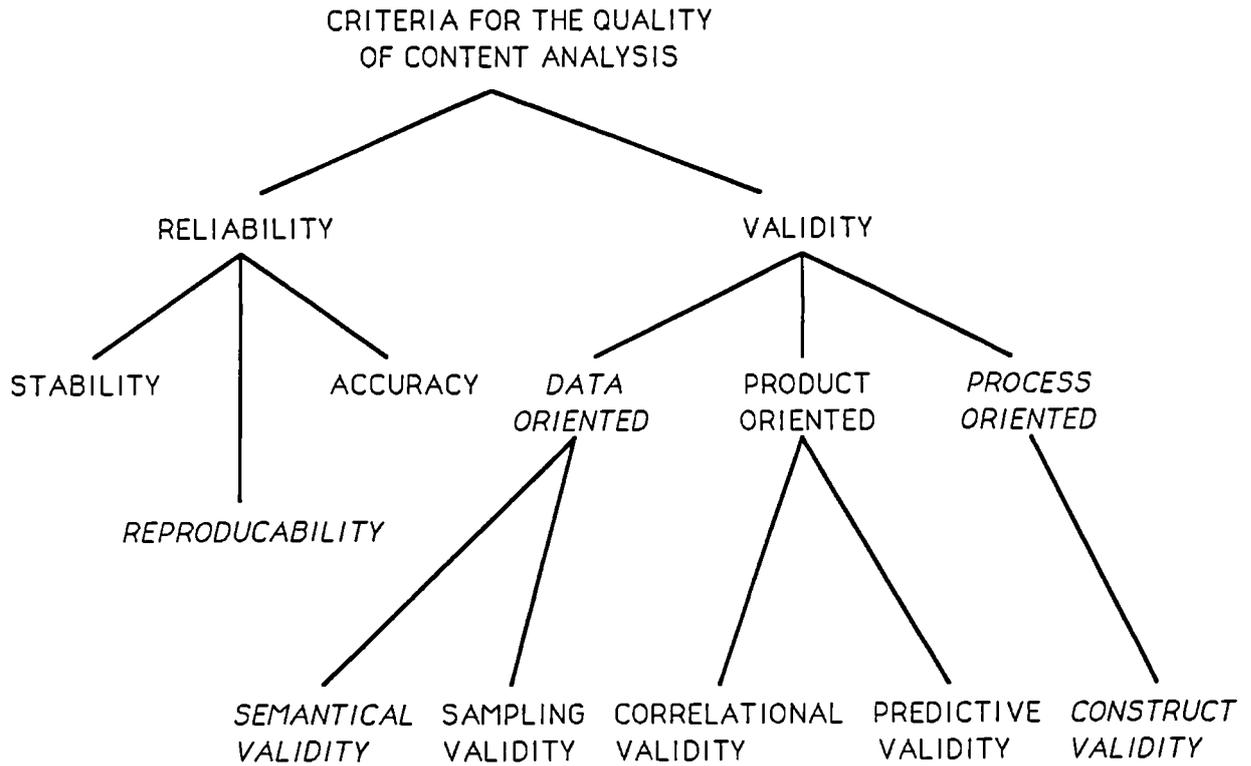
- 1) Stability, which is the degree to which a process is invariant over time. This is assessed by the test-retest method whereby the same analyst codes the same material at different points in time.
- 2) Reproducibility, which is the degree to which a process can be recreated under different circumstances, at different locations, using different analysts (coders). This is established under test-test conditions, where two or more individuals apply the same recording instructions to the same set of data. This establishes inter-coder reliability.
- 3) Accuracy, which is the degree to which the process conforms to a known standard. This is ascertained under test-standard conditions, where the results of coding are matched with what is known to be true.

According to Krippendorff (1980: 130-131), stability is the weakest measure while accuracy is the strongest measure. Accuracy measures were not suitable for this study as there were no known standards against which the coding results could be matched. Stability, beside being the weakest, would also require a greater time-span over which the process had to take place. The researcher did not have the necessary time to separate the test and retest periods meaningfully. Hence the measure of reproducibility was chosen as the reliability measure for this study. The quality of

¹¹ This section is based on Krippendorff (1980).

Exhibit 3.4

Reliability and Validity in Content Analysis



REPRODUCED FROM KRIPPENDORFF (1980, P 158, FIG. 22)

NOTE : The reliability and validity criteria met in this study are *italicised*

reproducibility was assessed by the calculation of the coefficient of inter-coder reliability.

Krippendorff (1980: 138) defines an agreement coefficient (α)¹² for assessing inter-coder reliability. The derivation of α is such as to eliminate the effect of chance agreements amongst independent coders. The value of α for each variable indicates the strength of agreement amongst the independent coders. Higher the value of α , greater is the agreement and, by implication, greater the objectivity in the identification of the variable in the text. Thus, for increasing the reliability of the analysis, variables with a lower value of α should not be included in further analysis.

Krippendorff further states (1980: 147) that variables with agreement coefficients < 0.7 tend to be 'excessively polluted by noise' and so correlation amongst them tend to be statistically insignificant. He cautions that

"standards for data reliability should not be adopted ad hoc, (but) must be related to the validity requirements imposed upon the research results, specifically to the costs of drawing wrong conclusions"

For exploratory studies, the level can be relaxed; but not so low that the findings are not taken seriously. He advocates a cut-off point of 0.67 for the agreement coefficient, for the purposes of drawing cautious conclusions from correlation analysis. This norm was adopted for the current study.

3.7.3.2 Validity

1) Data validity relates to how well a method of analysis represents the information inherent in the data. The data in this study (in the form of cases) was gathered within the framework of the propositions derived from the review of literature; the content analysis used variables defined predominantly from the same literature sources. Hence a satisfactory degree of data validity could be said to be achieved. This validity falls in the category of semantical validity:

"which is achieved when the semantics of the data language corresponds to that of the source, the receiver, or any other context relative to which the data are examined" (1980: 157)

¹² See exhibit 3.5 for calculation of (α). The complete derivation can be seen in Krippendorff (1980: Ch.12)

Exhibit 3.5 (continued)

$$d_{bc} = \begin{cases} 0 & \text{iff } b=c \\ 1 & \text{iff } b \neq c \end{cases} \quad (\text{for nominal scales})$$

$$d_{bc} = \left(\sum_{k>b} \frac{n_k}{rm} - \sum_{k<b} \frac{n_k}{rm} + \sum_{k<c} \frac{n_k}{rm} - \sum_{k>c} \frac{n_k}{rm} \right)^2 \quad (\text{for ordinal scales})$$

2) The agreement coefficient (α) is then calculated by the formula:

$$\alpha = 1 - \frac{rm-1}{m-1} \frac{\sum_i \sum_b \sum_{c>b} n_{bi} n_{ci} d_{bc}}{\sum_b \sum_{c>b} n_b n_c d_{bc}}$$

NOTE: 1) The formulae above are taken from Krippendorff (1980: Ch. 12)

2) A sample calculation for each type of scale is shown in exhibit 5.5 following the identification of the variables in the cases.

Sampling validity - the degree to which available data is an unbiased sample from a universe of interest - had not been sought in this study.

2) Product-oriented validity is seen in the degree to which the results of the analysis agree with what they claim to represent. This is established in correlational validity by matching the results of content analysis with the results of another method. This study did not undertake an alternate method of analysis and no correlational validity was claimed. Likewise, predictive validity - the agreement of the findings with directly observed facts - could not be established in this study. Hence product-oriented validity was absent in this study.

3) Process-oriented validity (or construct validity):

"is concerned principally with the nature of the analytical construct which is accepted or rejected on the basis of a demonstrated structural-functional correspondence of the processes and categories of an analysis with accepted theories, models, and knowledge of the context from which data stems" (: 158)

Process-oriented validity was strongly present as the collection (and analysis) of data was firmly rooted in contextual knowledge drawn from accepted works in literature. The acceptance (or rejection) of the analysis was through matching them with the theoretical propositions.

An overall summary, to recapitulate the final choice of the research methodology used in the study, is shown in exhibit 3.6.

Exhibit 3.6

Choice of Research Methodology

Stage	Type Used in This Study	Alternate Types	Reference
Theory	Conceptual framework	Ad hoc Classificatory, Taxonomy, Theoretical systems	Nachmias and Nachmias (1982)
Research Type	Research of relationships	Descriptive, Classification, Measurement and Estimation, Comparison, Cause and Effect, Mapping systems	Simon (1969)
Research Approach	Exploratory	Descriptive, Causal	Chisnall (1986)
Measurement	Qualitative	Quantitative	Kirk and Miller (1986)
Design	Case study	Experimental, Survey, Qualitative Research, Action Research	Bryman (1989)
Method	Semi-structured Interview (Unstructured Interview)	Self-administered Questionnaire, Structured Interview, Participant Observation, Structured Observation, Simulation, Archival Data	Bryman (1989)
Analysis Approach	Explanation Building	Pattern-Matching, Time-Series, Embedded Units Analysis, Repeated Observations, Case Survey	Yin (1987)
Variables Extraction	Content Analysis	Cognitive Mapping	Various (See text)

Chapter 4

The Field Work

4.1 The Firms in the Study

The 25 firms included in this study are listed in exhibit 4.1 along with the number of executives interviewed in each firm, their functional areas, the total hours spent in each firm, the total hours of taped interviews and whether the firm returned the record sheet¹ or not. This sample was arrived at through the process of deciding the sample size and the mode of sample selection.

4.1.1 Deciding the Sample Size

The first question addressed was the number of firms to be studied. It was decided to have as large a base of firms as possible in the study, conditioned only by constraints of time, logistics and resources. No numerical target to define 'large' was fixed in the first instance, but was left to the researcher's ability to get as many firms as possible to participate. The compulsion to study a large number of firms arose from the following considerations:

- 1) As pointed out in sec. 3.1, it was intuitively felt that the context underlying the propositions could not all be found in every firm. Hence, a large base of study would have a better chance of capturing most of the contexts.
- 2) Use of multiple cases would facilitate statistical analysis, thus incorporating the quantitative element in the study.
- 3) Multiple evidence would permit a more robust generalisation which could lead 'with greater validity' to testable hypotheses.

4.1.2 Mode of Sample Selection

The next question addressed was the mode of selection of the firms to be studied. Two routes were used to make the selection: entry access through contacts and a random selection.

¹ The record sheet is shown in exhibit 4.6 and introduced in Sec 4.2

Exhibit 4.1

I - The Firms in the Study

Firm	No. of Inter- viewees	Total Hours	Tape Hours	If Record Sheet Returned
<u>TEXTILE INDUSTRY</u>				
Don & Low Ltd., Scotland	7	5	3.15	No
Textile A, Scotland	1	1.30	0.30	Yes
Todd & Duncan Ltd., Scotland	5	3	1.15	Yes
Textile B, Scotland	2	3	2	No
Smith & Nephew Textiles, England	1	2.15	1.30	No
F. Drake & Co., Golcar, England	2	2.30	0	No
Jockey, Gateshead, England	3	3	2	Yes
Micrell (UK) Ltd., England	1	2	1.15	Yes
<u>PAPER INDUSTRY</u>				
Tullis Russell & Co., Scotland	4	6.30	4	Yes
Paper B, Glenrothes, Scotland	3	3.15	2.45	No
Donside Paper Co., Scotland	2	3	2	Yes
Sappi Graphics Transcript, Scotland	2	3	2.15	Yes
Paper A, Scotland	3	4	2.30	Yes
<u>ELECTRONIC/ELECTRICAL INDUSTRY</u>				
Elec. A, Scotland	4	3.30	2.15	Yes
GPT - Kirkcaldy, Scotland	1	2	1.15	No
IBM Greenock, Scotland	2	4	2.30	Yes
NCR Manufacturing Ltd., Scotland	3	4	2.15	Yes
Kinloch Electronics, Scotland	2	3	1.15	Yes
G.R.I. Electronics, Scotland	3	5	3	No
Elec. B., Scotland	6	7	4.30	Yes

Exhibit 4.1 (continued)

Firm	No. of Interviewees	Total Hours	Tape Hours	If Record Sheet Returned
GPT - Beeston, England	1	3	2	No
GPT - Maidenhead, England	2	2	1	No
GPT - Chorley, England	1	2	1.15	Yes
<u>AUTOMOBILE / SPORTS INDUSTRY</u>				
Rover Group, England	2	2	1.15	No
Swilken, Scotland	2	4.30	2.45	Yes
<u>TOTAL</u>	65	84	50.15	15

II - Summary of Position of Interviewees

KEY : CEO. = Chief Executive Officer/Chairman/Managing Director; Fun.D = Functional Director; Pl.E = Planning Executive; Mn.E = Manufacturing Executive (including Production, unless identified separately); Tc.E = Technical Executive; Mk.E = Marketing Executive; Mt.E = Materials Executive (including Procurement, unless identified separately); Str.Plg. = Strategic Planning; GM = General Manager; Prod. = Production; Tech. = Technical; Pers. = Personnel; Co.Dir. = Company Director; Comm. = Commercial; Proc. = Procurement.

Firm	CEO	Fun D	Pl.E	MnE	Tc.E	MkE	Mt.E	Other	<u>Total</u>
Don & Low Ltd.		Str.Plg Prod.	1			2	1	GM (Inds.)	7
Textile A	1								1
Todd & Duncan Ltd.	1	Prod., Tech.			1			Pers.	5
Textile B				1			1		2
Smith&Nephew		Co.Dir							1
F.Drake & Co.	1						1		2
Jockey	1	Prod.					1		3
Micrell (UK)	1								1

Exhibit 4.1 (continued)

Firm	CEO	FunD	Pl.E	MnE	Tc.E	MkE	Mt.E	Other	Total
Tullis Russell & Co.	1	Str.Plg Prod. Comm							4
Paper B	1	Prod.					1		3
Donside Paper	1						1		2
Sappi Graphics	1				1				2
Paper A	1	Prod.					1		3
Elec. A	1			1		1	1		4
GPT - K							1		1
IBM Greenock							2		2
NCR Manufacturing		Prod., Comm					1		3
Kinloch				1			1		2
G.R.I.	1			1		1			3
Elec. B.				2		1	2	Works Mgr.	6
GPT - B							1		1
GPT - M				1		1			2
GPT - C							1		1
Rover Group		Proc-2							2
Swilken	1			1					2
<u>TOTAL</u>	13	15	1	9	2	6	17	2	65

In order to ensure a reasonable sample size, *access to firms* was given a major weighting in the sample selection. This approach was deemed acceptable in the light of the following:

- 1) The aim of the study not being to infer findings from a sample to a population, a 'sampling logic' was not essential. The study tended more to the 'replication logic' in support of the theoretical propositions (Yin, 1987: 48-49). Hence, a strict random sample was not a pre-requisite. Rather, the 'sample' in this study would comprise "an assorted group of firms who have agreed to collaborate" (Pugh, 1988: 127), without detracting from the validity of the study.
- 2) The difficulty of ensuring adequate participation could, to some extent, be obviated through a selection based on top-level contacts to facilitate entry.
- 3) The constraint of time, logistics and resources would also place greater emphasis on 'guaranteed' entry.

The good office of colleagues and friends was used in the first instance to facilitate entry to the firms. Most of these contacts were at the top-level which increased the probability of cooperation, once the study started. The following 15 firms were selected through this method:

Textile industry ²	Don & Low Ltd., Forfar Textile A, Kirkcaldy Smith & Nephew Textiles Ltd., Brierfield F.Drake & Co. of Golcar Ltd., Golcar Jockey, Gateshead Micrell (UK) Ltd., Durham
Paper Industry	Tullis Russell & Co. Ltd., Glenrothes Paper B, Glenrothes
Electronic/Electrical Industry	Elec. A, Livingston GPT - Kirkcaldy ³ GPT - Beeston

² The industry classification used in the CBI-KOMPASS Directory, 1990-91, and shown in exhibit 4.2, is the basis for identifying firms along the industry dimension.

³ 4 firms from the GPT Group agreed to participate. These 4 firms operate as autonomous units of the Group and hence it was felt they could all be included in the study.

Exhibit 4.2

The CBI-KOMPASS Classification of Industrial Groups

The CBI-KOMPASS Classification uses a 4 digit number to identify the product group.

Example: 27 - 40 (i) The first two digits identify the *Main Industrial Group* . Here 27 identifies the Group as *Cellulose, Paper and Board Industries*.

(ii) The next two digits identify the *Individual Products* . In this case 40 identifies the products as *Paper and Paper Rolls for Technical Use*.

Two points are to be noted in classifying the firms in the study on the CBI-KOMPASS classification:

i) The firms could be listed under more than one *Main Industrial Group*, depending on the different units within the Group. For example, Textile B was listed under 23 (Textile Industry), 30 (Plastic Products), 38 (Precision Equipment....), and 42 (Chemical, Rubber and Plastics Plant and Equipment....). In this study, Textile B was classified under 23 (Textile Industry) as the unit of the Group which was studied pertained to textile products.

ii) The firm could have more than one *Individual Product* identification. For example, Tullis Russell (Main Group 27 - Paper Industry) had its products identified as 14 (Base, Backing and Body Paper), 20 (Printing, Drawing, Writing.....Paper), 40 (Paper and Paper Rolls for Technical Use) and 60 (Cardboard, Fibreboard). This level of product distinction was not relevant to the study. Hence, only the following Main Industrial Group classification was used:

23 - Textile Industry

27 - Paper Industry

37 - Electronic/Electric (Equipment) Industry

Kinloch Electronics, Port Glasgow
G.R.I. Electronics Ltd., Perth
Elec. B, South Queensferry

This brought the total number of firms to 25 with the split-up as follows:

Textile industry - 8 firms
Paper industry - 5 firms
Electronic/Electrical industry - 10 firms
Automobile industry - 1 firm
Sport and Leisure - 1 firm

Anonymity was requested by 6 firms while one firm (Sappi Graphics - Transcript Mill) agreed to be identified only for this report, but to be anonymous for any further publication.

4.2 The Interviews

The interviews were set up in two time blocks, to coincide with the periods this researcher was present in the UK - the first block between April 1990 and August 1990, and the second block in January 1991. Interviews were sought, at the minimum, with the Chief Executive Officer and the heads of Planning (if a separate Planning department was present), Manufacturing and Materials/Procurement. An average time of 1 hour with each executive was requested. A brief outline of the project proposal (exhibit 4.3) and an agenda sheet (exhibit 4.4) delineating the broad coverage of the interview was sent in advance to the firms, to be circulated to the participating executives. Permission to tape the interviews was requested, with the proviso that it could be dispensed with and substituted by notes if any executive preferred the latter.

At the time of the interview, an Interview Schedule Sheet (exhibit 4.5) was used to collect details about the interviewee. Data collection was in three modes:

- 1) The interviews, which formed the major source.
- 2) Any documentary evidence which the firm could make available.
- 3) A researcher generated Record Sheet (exhibit 4.6) which was left with the firm, in most instances, to be completed and returned. The Record Sheet attempted to collect

Exhibit 4.3

A Brief Outline of the Project Proposal

Procurement and Strategy in Manufacturing Firms

A review of procurement literature suggests a strong, proactive potential role for the function in the firm's strategy. This has its base in the view that procurement is a key function which commits a major portion of the firm's resources; an area impacted by an 'unstable' environment in which risks and opportunities exist that affects a firm's plans and performance. It would seem logical for supply strategies to be formulated and coordinated at the strategic level - a view continually emphasised in the writings of Farmer, Ammer, Spekman, Adamson, Monczka and many others.

However there is very little empirical support for this view, particularly in strategy literature where, to a great extent, procurement is viewed in a reactive, administrative role, having infrequent involvement and influence in strategy. The available empirical work addressing this issue is sparse and not definitive.

A basic flaw in the empirical work so far is the expectation that supply strategies are, or should be, addressed by procurement departments. Most procurement departments have evolved in a functional role and, as such, are rarely included in strategic planning. Supply considerations in strategy, as visualised in literature, need not be synonymous with the role of procurement in strategic planning.

This research sets out to explore the 'true' role of supply considerations in strategy through in-depth interviews with senior executives in industry. Through their perceptions, the researcher hopes to explain the nexus between supply considerations and strategy.

Exhibit 4.4

Agenda Sheet for the Interview

- 1 A brief description of the industry and the firm
- 1 What are the Critical Success Factors (CSF), Internal and External, of the firm.
- 1 What are the strategies/policies addressing the CSFs.
- 1 What are the Environment scanning/monitoring policies.
- 1 What are the planning mechanisms addressing CSFs.
- 1 Who are the main functional contributors to strategies addressing CSFs.
- 1 What is the basis of supply policy/strategy.
- 1 How are supply opportunities/constraints addressed in strategy.
- 1 What is the role of procurement in strategy - the nature of involvement, the areas of involvement and the mode of involvement.

Exhibit 4.5

Interview Schedule Sheet

1 Date of Interview

1 Name of the firm

1 Name of interviewee

1 Position of interviewee

1 Years in present position

1 Age of interviewee

1 Professional and other background

1 Previous experience

Exhibit 4.6 (continued)

- 5.4) Indicate the % of dual/multiple sourced items where over 50% supplies are from one supplier _____
- 5.5) What % of suppliers who are single sources, or who account for more than 50% (of any item), have linkages with the firm (subsidiary/joint-venture/etc.) _____
- 5.6) What % of single sourced items, or where over 50% is received from one supplier, are under active consideration for alternate source development _____
- 5.7) What % of suppliers have over 50% of their output (of any item) committed to the firm on long term basis _____
- 5.8) How many alternates (substitutes) items are under active development _____

'hard data' which covered information for the firm as a whole and not exclusive to an executive's individual perception. By separating out the 'hard data' into a format which could be filled in the absence of the researcher, it was felt that the 'perception' interviews could flow more smoothly, without losing out on the richness of the case.

As seen in exhibit 4.1, the response in the field was not uniform. The number of interviews varied from one per firm (6 cases) to seven (Don & Low Ltd.). The time spent in each firm also varied from a low of 1 hour 30 mins (Textile A) to 6 hours 30 mins (Tullis Russell & Co. Ltd.). Documents made available were mostly in the form of 'publicity' material put out by the firm and proved useful mainly for 'background information'. Only 15 firms returned the completed Record Sheet. While most of the interviews were conducted individually, some executives preferred to be interviewed as a group of two or more (in the case of Todd and Duncan, all the 5 executives were brought together for a consolidated interview). Most interviews were taped with notes being taken very sparsely - this facilitated a smoother flow of the conversation. 3 executives declined the use of a tape recorder - detailed notes were taken in these cases. The 'quality' of interviews also varied over the 65 executives. Overall, however, substantial information was collected to permit a meaningful exploration of the propositions.

4.3 The Case Write-up

The material from the tapes was initially transcribed for the individual executive. Then the transcribed material for the executives of each firm, the notes taken in the interviews, the documents made available by the firm and the Record Sheet (where returned) were consolidated in the form of a case write-up *at the firm level*. A uniform format was adopted for the case write-up, covering 5 areas:

The Firm

The Product Market

The Supply Market

The Firm's Strategy (including the planning process and the strategic factors/action)

The Supply Strategy (including the strategic factors/action)

A short summary of the importance of Procurement, as seen from the aforementioned evidence, was appended as the final section. This was the *researcher's extraction* based on the evidence gathered from the write-up for each case.

4.4 Validation of the Case Write-up

Validity stemmed from the following three steps taken:

- 1) The first interview was carried out in Swilken, St. Andrews. An informed colleague sat in as an observer and subsequently gave feed-back on the format adopted, the approach to the interview and the actual progression through the agenda sheet.
- 2) The second interview was carried out in Tullis Russell and Co. Ltd., Glenrothes. This case and Swilken were fully written and discussed with two informed colleagues. The format and the style of presentation were finalised based on the discussions. These steps ensured that a uniform approach was taken throughout the study and the process was as 'unbiased' as could be possible in a case methodology.
- 3) After each case was written for the individual firm, it was sent back to the firm for vetting for correctness of representation. The write-up was sent to the Chief Executive or to the executive nominated for this purpose. It was emphasised that this process was not to be used for 'censorship'⁵ but to confirm that the representation reflected the case correctly. Also, any 'hard data' of a sensitive nature which the firm would prefer not to reveal could be eliminated as long as it did not detract from the correctness of representation. The researcher was open to discuss any 'honest' errors that had crept in.

Exhibit 4.7 represents diagrammatically the results of the vetting process. Of the 25 firms, the write-up could be sent back to only 24 firms.⁶ 20 firms sent back the write-up with their comments, 3 firms (Micrell, GPT-Maidenhead and Rover) gave their verbal acceptance over phone while 1 firm (GPT-Beeston) did not send back the write-up despite repeated telephone reminders. Exhibit 4.8 gives representative quotes from the letters received from some of the 20 firms who returned the write-up with comments.

Most of the amendments suggested by 16 of the 20 firms were of a nature that did not pose serious concerns:

⁵ As a matter of fact, of the 6 firms who opted to be anonymous, 2 of the firms (Paper A and Elec. B) requested anonymity at this stage while the other 4 had wanted anonymity at the inception of the study.

⁶ The executive interviewed in GPT-Kirkcaldy unfortunately passed away shortly after the date of the interview.

Exhibit 4.7

Vetting Process for the 25 Cases

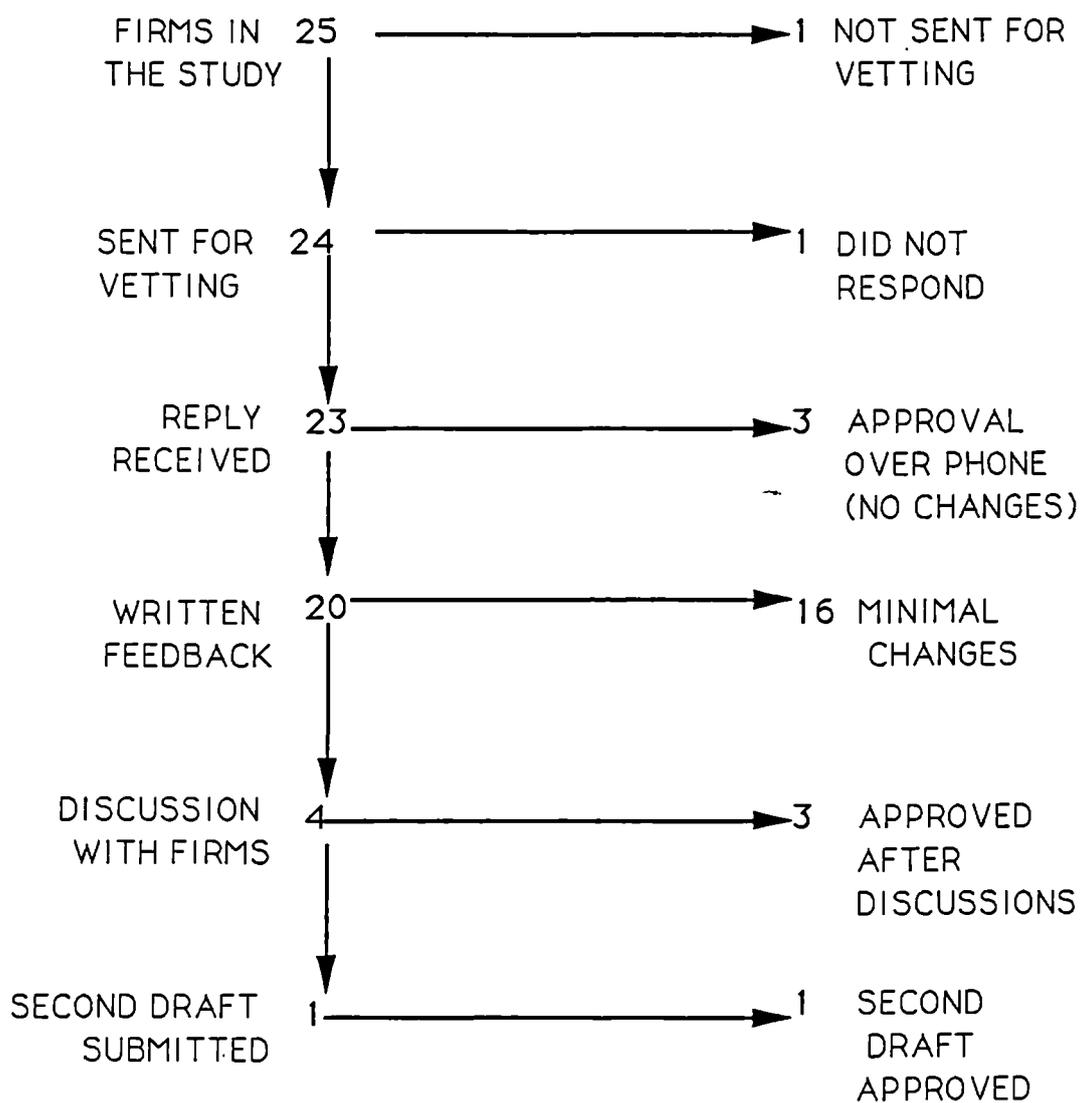


Exhibit 4.8

Representative Quotes from Firms' Letters

1 "... your report of our interview is substantially correct I would be grateful if our firm was not identified by name as our industry is very small and confidentiality is I think desirable" (Textile A)

1 "Some of the questions (in the Record Sheet) I have not answered as they are a little sensitive to us...". "Also enclosed....(is) your report which in general terms is factually correct but I have made 1 or 2 slight amendments" (Todd & Duncan Ltd.)

1 "I have added corrections or deletions as I felt appropriate. If you wish to discuss these with me I would be happy to do so" (Smith & Nephew Textiles Ltd.)

1 "... you seem to have summarised the situation well. In due course I would be very interested to read the conclusions of your thesis" (Jockey)

1 "As you will see, there are quite extensive alterations. I trust this will be clear to you" (Tullis Russell & Co. Ltd.)

1 "I very much regret that quite a lot of this information is not easily available and it is doubtful whether we would supply it anyway" (With reference to the Record Sheet) (Paper B)

1 "The case write-up is hereby returned to you with minor adjustments....We would wish to congratulate you on the content of the case write-up" (The Donside Paper Co.)

1 "I have gone through the report and deleted/amended the parts which were incorrect.... a change in policy which has recently been introduced by our parent company, whereby any report or trade article which refers to sensitive information must be cleared at the highest corporate level....I would ask you to refer to our company as "a UK subsidiary of an American company" (Paper A)

1 "The case report is a fair synopsis of our business at the time of interview"⁷ (Elec. A)

1 "We are generally comfortable with your draft document with a couple of small exceptions" (IBM Greenock)

1 "The information in your report is reasonably accurate" (NCR Manufacturing Ltd.)

1 "Delighted to receive your draft but request a further draft prior to approval as per corrections highlighted" (Kinloch Electronics Ltd.)

1 "I see no problems with your report, but have pencilled in a few corrections and amendments" (G.R.I. Electronics Ltd.)

1 "...we would make no comment regarding your presentation style...." (Elec. B)

1 "I have read through the report and in essence it seems satisfactory. I have no objection to you using our name in your work" (Swilken)

⁷ The executive nominated to review the write-up in this firm had left the firm by the time the report was sent. The response is by his successor

- Correction of mis-spelt names of executives/competitors/suppliers.
- Requests in some instances to delete hard data like sales shipment/projected turnover
- Anonymity to some of the customers' names
- Some future strategies considered as sensitive.

One of the firms (Kinloch) requested a second draft before approving the write-up but this was primarily to satisfy themselves that all reference, by name, to their major customer was eliminated. In the case of 3 firms (Smith and Nephew, Sappi Graphics and Elec. B), there was a need to re-discuss one or two points which were felt to be incorrectly represented. Mutual clarifications were incorporated in the write-up.

A vignette of each firm, based on the vetted write-up, is appended at the end of this report. This formed the base for the analysis detailed in the succeeding chapter.

Chapter 5

Analysis

5.1 Analysis Sequence

The variables used in the study are shown in exhibits 5.1 through 5.3 (described in sec. 5.2). These variables were coded and identified in the cases through content analysis. This formed the basis for the explanation-building analysis (see sec. 3.6.2) which identified the overall contexts giving rise to the importance of Supply. Exploratory statistical analysis was also carried out to see if there were causal links between any of the contextual variables and the incidence of Supply's importance. Initially, chi-square values were calculated to test for dependence between the importance of Supply and the independent variables (the contextual variables). Where a significant chi-square value was found, Spearman's correlation was calculated to assess the strength and direction of association. The statistical findings were then used to supplement the findings from the explanation-building process.

5.2 The Variables

The variables used in the analysis were classified into three categories

Dependent variables (exhibit 5.1)

Independent variables (exhibit 5.1 and exhibit 5.2)

Structural variables (exhibit 5.3).

These variables were generated in two ways:

- 1) Variables identified from literature sources within each context. The sources for each context are indicated fully in exhibit 2.1, hence not repeated here.
- 2) Variables which were generated by the researcher. These variables had a bearing on the propositions but were not found in that specific form in the literature. Some of these variables were in fact incorporated after the interviews. The

Exhibit 5.1

Variables Used in the Study

Variable name	Variable Definition	Scale	Source
<u>DEPENDENT VARIABLES</u>			
y601.	Importance of Supply considerations in strategy	0 = Not imp. 1 = Important	Current Researcher
y602	Whether Supply is ranked in top two strategic considerations	0 = Not ranked 1 = Ranked	Current Researcher
y603	Whether Procurement function is included in strategic planning process	0 = Not includ. 1 = Included	Current Researcher
<u>INDEPENDENT VARIABLES</u>			
<u>A.1 GENERAL ENVIRONMENT</u>			
o102	Rate of technological change in industry	1 = Rapid 2 = Moderate 3 = Negligible	
x203	Influence of 'fashion forces' in the industry	0 = No infl. 1 = Infl. present	Current Researcher *
x204	Influence of technology on the product life	0 = No infl. 1 = Infl. present	
x303	Currency stability as a concern in strategy	0 = Not a conc. 1 = Concern	
<u>A.2 SUPPLY MARKET ENVIRONMENT</u>			
o302	Competitive severity in the supply market	1 = High 2 = Moderate 3 = Negligible	
x305	Availability of supply sources as a concern in strategy	0 = Not a conc. 1 = Concern	

Exhibit 5.1 (continued)

Variable name	Variable definition	Scale	Source
x306	Availability of supplies (production material) as a concern in strategy	0 = Not a conc. 1 = Concern	
x307	Fluctuation in price of supplies as a concern in strategy	0 = Not a conc. 1 = Concern	
x516	Dependence on suppliers	0 = Broad base of suppliers 1 = Few suppliers	
x517	Power relative to suppliers	0 = Supplier does not have power 1 = Supplier has power	
<u>B GLOBALISATION</u>			
x103	Whether the firm is domestic (UK) firm or part of a MNC (Global firm)	0 = Domestic 1 = Global	Current Researcher
x201	Geographic spread of product market (of the firm)	0 = National 1 = Global	
x301	Geographic spread of supply market (of the firm)	0 = National 1 = Global	
<u>C.1 LOW COST STRATEGY</u>			
x402	Importance of cost considerations in strategy	0 = Not imp. 1 = Imp	
o403	Ranking of following factors as source of competitive advantage Scale economy (SE) Technological Advantage (TA) Power relative to customers (CP) Power relative to suppliers (SP) Service to customer (SC) First mover (FM) Product price (PP) Product Quality (PQ) Others	1 = Most imp. 2 = Next imp. and so on.	Current Researcher

Exhibit 5.1 (continued)

Variable name	Variable definition	Scale	Source
o505	Ranking of following considerations in supply strategy Price (PR) Quality (QU) Security of supply (SS) Long term supplier relationship (SR) Inventory (IN) Delivery (TD) Others	1 = Most imp. 2 = Next imp. and so on	Current Researcher
x524	Importance of 'competitive bidding' pricing	0 = Not imp. 1 = Important	Current Researcher *
x525	Importance of combined procurement of Group items (for volume leverage)	0 = Not imp. 1 = Important	
x526	Importance of reduction in variety of supplies	0 = Not imp. 1 = Important	
C.3 JIT MANUFACTURING			
x106	Dominant manufacturing 'philosophy' of the firm	0 = Non-JIT 1 = JIT	Current Researcher
x506	Dominant mode of inventory control	0 = Not JIT 1 = JIT	Current Researcher
x512	Need for suppliers in geographic proximity	0 = Not imp. 1 = Important	
x520	Importance of sole supplier/small supplier base	0 = Not imp. 1 = Important	
x521	Importance of long term relationship with supplier	0 = Not imp. 1 = Important	
x523	Importance of long term contract procurement	0 = Not imp. 1 = Important	
x528	Importance of quality certification by supplier	0 = Not imp. 1 = Important	

Exhibit 5.1 (continued)

Variable name	Variable definition	Scale	Source
<u>C.4 CROSS FUNCTIONAL INVOLVEMENT</u>			
x412	Importance of quality accreditation to BS5750	0 = Not imp. 1 = Important	Current Researcher*
x522	Early supplier involvement in R & D	0 = Not imp. 1 = Important	

NOTE: 1) Where the source column is blank, it is derived from literature sources listed in exhibit 2.1

2) * in the 'source' column indicates variables included *ex post* to the interview.

Exhibit 5.2

Independent ('support') Variables from the Record Sheet (all figures given as %)

KEY: r701n = National Suppliers; r701o = Overseas Suppliers; r702n = Procurement Value from National Suppliers; r702o = Procurement Value from Overseas Suppliers; r703g = Material availability considered Good; r703s = Material availability considered Satisfactory; r703p = Material availability considered Poor; r704s = Materials with Single/Dual Sources; r704m = Materials with Multiple Sources; r705 = Materials where over 50% of annual requirement is from one source.

Firm	r701n	r701o	r702n	r702o	r703g	r703s	r703p	r704s	r704m	r705
Donside	33	67	10	90	75	20	5	75	25	48
Jockey	95	5	93	7	60	30	10	90	10	85
Micrell	93	7	13	87	95	5	0	80	20	10
GPT-C	95	5	90	10	90	8	2	70	20	78
IBM	72	28	60	40	98	2	0	70	30	10
Swilken	95	5	50	50	25	50	25	60	40	70
Elec. B	73	27	70	30	98	2	0	10	90	-
NCR	80	20	65	35	98	2	0	-	-	-
Elec. A	93	7	-	-	75	20	5	95	5	85
Kinloch	98	2	-	-	98	2	0	70	30	37
Sappi	90	10	-	-	45	45	10	75	25	-
Text. A	83	17	-	-	98	2	-	-	-	-
Tullis.R	-	-	30	70	75	23	2	25	75	5
Paper A	-	-	40	60	90	10	0	2	98	-
Todd D	-	-	-	-	50	25	25	40	60	-
*Text. B	21	79	-	-	-	-	-	-	-	-
*Rover	-	-	90	10	-	-	-	-	-	-

NOTE: 1) - denotes data not available

2) * denotes firms who did not return the Record Sheet. Figures taken from interviews

3) The following firms did not return the Record Sheets: Text.B, Rover Paper B, F.Drake, Don & Low, Smith & Nephew, G.R.I., GPT-M, GPT-K, GPT-B

Exhibit 5.3

The Control Variables

Firm	Industry	No. of Employees		Annual Sales (£, million)	Annual Purchase (as a % of Sales)
		Firm	Proc.		
Micrell (UK)	Textile	35	-	4	43
Swilken	Sport	48	2	2	50
Textile A	Textile	85	-	4.5	80
F.Drake & Co.	Textile	120	-	-	40
Elec. A	Elec.	130	2	8.5	-
Kinloch	Elec.	150	4	5	65
Textile B	Textile	200	-	-	-
GRI Electronics	Elec.	210	-	5	-
Jockey	Textile	236	2	8	40
Sappi Graphics	Paper	272	2	36	60
Paper A	Paper	320	2	26	60
Todd & Duncan	Textile	400	3	40	60
Donside Paper Co.	Paper	460	5	60	60
Paper B	Paper	800	-	-	50
GPT - Chorley	Elec.	820	18	80	59
Elec. B	Elec.	850	21	-	-
Don & Low	Textile	940	-	-	-
Tullis Russell	Paper	1067	-	82	63
Smith & Nephew	Textile	1250	-	40	-
NCR	Elec.	1400	22	81	-
IBM - Greenock	Elec.	2,500	140	-	60
Rover Co.	Auto.	40,000	-	4,000	60
GPT - Beeston	Elec.	-	80	-	-
GPT - Kirkcaldy	Elec.	-	-	1,200	-
GPT - Maidenhead	Elec.	-	-	-	-

researcher generated variables are identified specifically under the 'source' column in exhibit 5.1.

The independent variables were sub-divided into two further categories - those shown in exhibit 5.1 were used in the content analysis of the cases while those listed in exhibit 5.2 were available from the Record Sheets. As only 15 firms returned the Record Sheet, this data was not complete. Hence, it was used only to support the findings of the main content analysis. Moreover, even the 15 Record Sheets contained many questions which did not elicit a response. The variables with sparse data on the Record Sheet are not listed in exhibit 5.2; however they were used, where appropriate, to support the findings. The structural variables were used to control the analysis for 2 dimensions, viz. industry and size (using number of employees in the firm).

5.2.1 The Dependent Variables (exhibit 5.1)

The study set out to understand the importance of Supply considerations in manufacturing firms' strategy. It is important at this stage to recall the differentiation between 'Supply' and 'Procurement' as used in this study¹:

SUPPLY - Used 'generically' to cover *all critical (strategic) considerations and activities which pertain to the supply/input side of the firm's operations*. This term is used to represent all the supply related value activities, independent of the organisational loci of occurrence.

PROCUREMENT - *A functional department, normally deemed to address Supply considerations of the firm*. The activities of the Procurement department could either encompass all, or only a part, of the strategic Supply considerations in the firm.

Unlike earlier studies, the propositions had consciously allowed for Supply considerations to be divorced from the role of Procurement. Hence, the dependent variables were generated by the researcher to reflect this separation. y601 and y602 captured the emphasis placed on Supply considerations by the firm. y603 looked for the specific inclusion of Procurement in the strategic planning process. This allowed for three possible scenarios:

¹ The basis of the differentiation is given in sec. 1.3

- 1) That Supply considerations were important in strategy and primarily addressed through Procurement.
- 2) That Supply considerations were important in strategy but not necessarily addressed through Procurement.
- 3) That Supply considerations were not important in strategy. This automatically excluded the importance of Procurement in strategy as the departmental importance can stem only from the importance accorded to Supply considerations in strategy.

5.2.2 The Independent Variables (exhibit 5.1)

Exhibit 5.1 shows the independent variables used in the content analysis. The researcher generated variables were of two types. Some of the variables were generated by bringing together concepts from literature for a specific measure relevant to the study. For example, the ranking of sources of competitive advantage (o403) brought together, mainly from Porter (1980, 1985), factors which give competitive advantage to a firm. If a firm were to rank scale economy or product price as the source of advantage, it would be one indication of a low cost strategy. Other variables were generated after the interviews, if they seemed to throw additional light on the propositions. As an example, x412 (the importance in strategy of quality accreditation to BS5750) was seen as a quality driver for many firms. This raised the importance of quality considerations in strategy. This measure was not found in the literature and was created by the researcher. The variables generated *ex post* are marked with * in the source column.

5.2.2.1 Uncertainty in the Supply Market

Uncertainty in the supply market was identified using the following variables:

- Competitive severity amongst suppliers (o302)
- Availability of suppliers (x305)
- Availability of production materials (supplies) (x306)
- Fluctuation in the price of materials (x307)
- Dependence on suppliers (x516)
- Power relative to suppliers (x517)

These variables pertained directly to the supply market. Adverse effects of these variables could pose strategic questions to the firm.

Some environmental forces which had an impact on the supply market were also included. These were the prevalence of 'fashion forces' in the industry (x203) and the impact of currency fluctuations (x303). If the industry is affected by fashion changes, which can be described as changes brought about primarily by 'image' rather than 'functional' needs, then it is possible to visualise a ripple effect all down the supply chain, reaching the supply market. Likewise, firms operating in regions prone to unstable exchange rates could face a concern about the price of supplies.

5.2.2.2 Technological Forces

Two variables were used to represent the technological context:

- the perception of the rate of technological change in the industry (o102)
- the impact of technological change on the life of the firm's materials and products (x204).

The variables used for the technological forces were only those which would affect the production materials of the firm. Since this thesis looked at strategic Supply considerations specifically related to production materials, other aspects of technological change (for example, change in process technology) were not addressed. This does not imply that changes in process technology have no impact on production materials. Where a change in process technology affects production materials, it would automatically be represented in variable x204 as defined above.

5.2.2.3 Globalisation

The variables used to identify the extent of globalisation were:

- whether the firm was a domestic (UK) firm or part of a multinational Group (x103)
- whether the firm operated predominantly in the domestic or overseas product market (x201)
- whether the firm operated predominantly in the domestic or overseas supply market (x301).

The *nature* of overseas operations were not distinguished. For example, if the firm were to obtain supplies from (or were to supply products to) a joint-venture unit set-up in an overseas location, it was considered as an overseas operation by the firm.

5.2.2.4 Low Cost Strategy

The variables used for the context of low cost strategy were:

- the identification in the firm's strategy of primacy given to cost considerations (x402)
- ranking of the importance of sources of competitive advantage to assess if scale economy or product price figured high (o403)
- ranking of the importance of considerations in supply strategy to assess whether price and inventory considerations figured high (o505)
- importance of competitive bidding as the basis of price determination of supplies (x524)
- combining the procurement of common Group items, leading to lower costs (x525)
- reduction in the variety of production materials, leading to standardisation (x526)

The two 'ranking' variables (o403, o505) were used to see if the firm placed emphasis on cost aspects in the *various options available for competitive advantage* and supply strategy.

5.2.2.5 JIT Operations

The variables used to identify the context of JIT manufacturing were:

- characterisation by the firm of its operations as being JIT (x106)
- characterisation of the mode of inventory control as being JIT (x506)²
- expressed need for suppliers in geographic proximity (x512)
- importance of single/restricted sourcing (x520)
- importance of long term relationship/linkages with suppliers (x521)
- importance of long term contract procurement (x523)
- importance of quality certification of purchased materials by the suppliers (x528)

² 'JIT mode of inventory control' normally meant frequent, small batch deliveries to the firms. Hence these two variables were not identified separately but taken to be implicit in x506.

The first two variables (x106 and x506) were important as firms operating on JIT do not necessarily place equal emphasis on all the other variables normally associated with JIT. Firms in different stages of the process of implementing JIT also do not necessarily address all the variables simultaneously. Hence the executives' perceptions of whether the firm was adopting JIT was essential, to be supplemented by the evidence from the other variables relevant to Supply.

5.2.2.6 Cross-functional Involvement

The variables for this context were difficult to specify *a priori*. In principle, the inclusion of Supply considerations in any other functional decisions could bear out this context. Therefore, while carrying out the content analysis, the incidence of cross functional involvement of Supply considerations was generally searched for in the cases. The following functions were eliminated:

- 1) Marketing. Supply's involvement in Marketing was seen specifically in the decisions regarding counter-trade and local content laws and, hence, was considered within globalisation.
- 2) Manufacturing. Because of the close operational relationship between Supply and Manufacturing, Supply's importance in all the other contexts (uncertainty in the supply market, technological forces, globalisation, low cost strategy, JIT) automatically influenced its role in Manufacturing considerations. Hence, this was not separately identified.
- 3) Finance. Supply's importance in Finance was not identified in the cases.

The only other instances where this context was borne out were then identified with the following variables:

- involvement in Design, research and development (x522)
- involvement in Quality (x412). This variable measured the importance of accreditation to BS5750 for the firm. As the accreditation required the involvement of suppliers in the quality process, Supply was automatically important for firms seeking this certificate.

5.2.3 The Independent Variables from the Record Sheet (exhibit 5.2)

The independent variables from the Record Sheet in exhibit 5.2 were used mainly to support, with hard data, some of the variables in exhibit 5.1. These linkages were as under:

- percentage number of national and overseas suppliers (r701n, r701o), and percentage procurement value from national and overseas suppliers (r702n and r702o) qualified, x301 (the geographic spread of supply market)
- percentage material availability considered good, satisfactory and poor (r703g, r703s and r703p) qualified x306 (the availability of supplies as a concern in strategy)
- percentage materials with single/dual sources and multiple sources (r704s and r704m) qualified x516 (the existence of a small/large supplier base)
- percentage materials with over 50% of annual requirement from one source (r705) qualified x517 (power relative to suppliers)

The independent variables from exhibits 5.1 and 5.2 were grouped together in the various contexts that determine the importance of Supply and Procurement. Exhibit 5.4 shows this grouping, and the linkage to the dependent variables, within the schematic framework of exhibit 2.5. For example, the measure of the globalisation context (B) is whether the firm is a part of a MNC (x103), the geographic spread of its product market (x201) and the geographic spread of its supply market (x301). Hence these three variables are grouped under 'globalisation'. This context is expected to drive the three dependent variables and this is shown by the arrows.

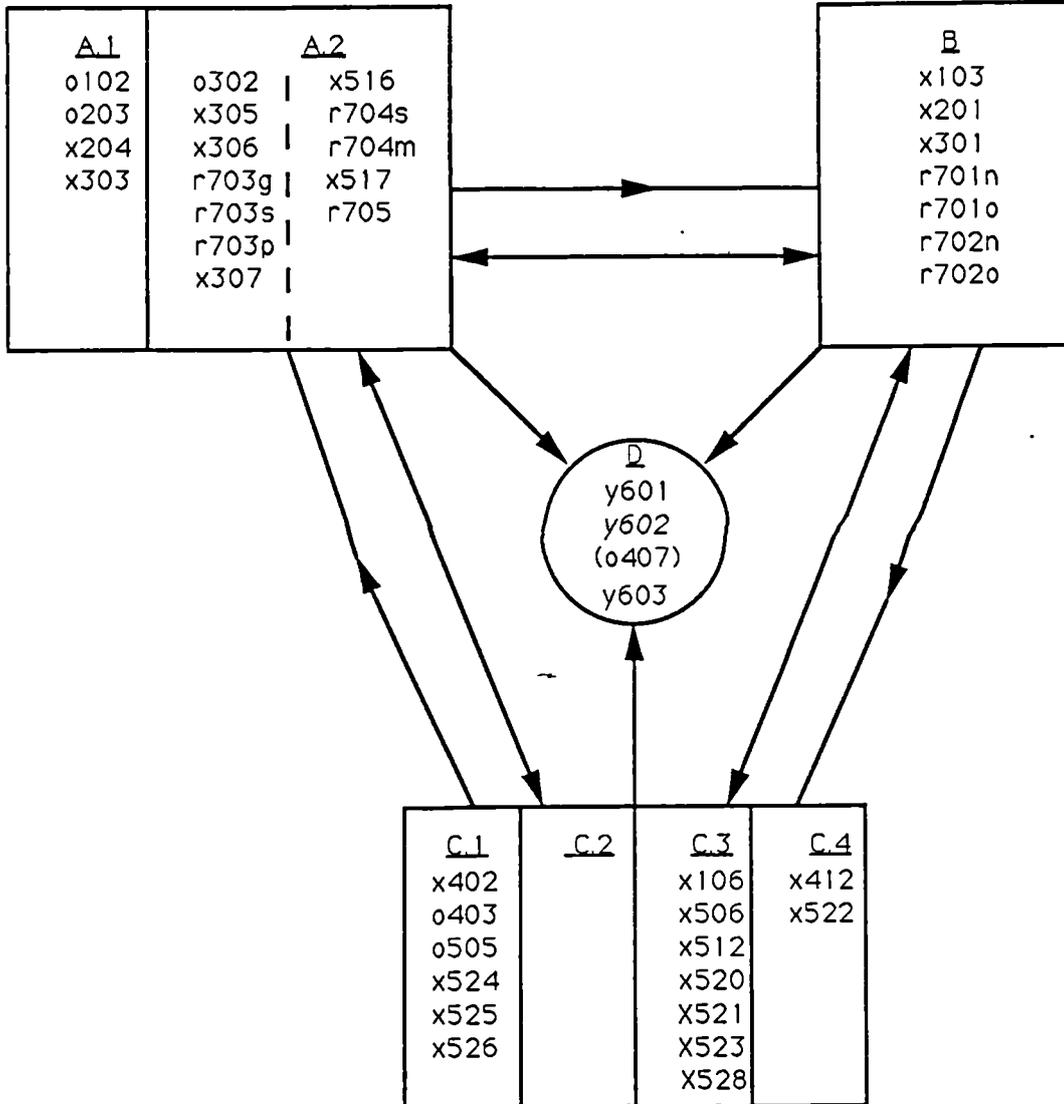
5.2.4 The Control Variables (exhibit 5.3)

These variables were used for stratification along two dimensions: industry and size. The industry classification used in the CBI-Kompass Directory, 1990-91 (see exhibit 4.2 for details of the classification) was the bases for identifying the firms along the industry dimension. The number of employees was used as a proxy for size.³ Annual sales, as a measure of size, was not used as the data was less complete than number of employees.

³ For three firms, the number of employees was not available. But two firms - GPT-B and GPT-K could be assessed as large firms based on other figures (80 employees in Procurement for GPT-B and £ 1200 m. turnover for GPT-K). Only in the case of GPT-M was size not established

Exhibit 5.4

Classification of the Variables
in the Schematic Model



- A.1 : General Environment
- A.2 : Supply Market Environment
- B : Globalisation Trend
- C.1 : Low Cost Strategy
- C.2 : Vertical Integration
- C.3 : JIT Manufacturing
- C.4 : Cross Functional Involvement

5.3 Scaling the Variables

Three types of scales were used in this study: ratio scales, nominal (binary) scales and ordinal (three point) scales. Ratio scales were used primarily for data collected through the Record Sheet (variables listed in exhibits 5.2 and 5.3, except for 'industry' which is a nominal identification) while the binary and ordinal scales were used for variables sought in the interview material (exhibit 5.1). Binary scales were used in the majority of variables for the following reasons:

- 1) The quantification of textual material, written predominantly through the perception of the executives of the firm, is possible only through nominal or ordinal scales.
- 2) Some of the variables were categorised by their 'presence' or 'absence'. As examples, whether the firm was a domestic (UK) firm or part of a multinational group (x103); whether Supply considerations ranked in the top two strategic considerations (y602); and participation of Procurement in the planning process (y603). Binary scaling was the natural choice for such variables.
- 3) Some of the variables could, however, be placed on at least a 3 point ordinal scale. As examples, rate of technological change (o102) could be scaled as rapid/moderate/negligible; and competitive severity in the supply market (o302) as high/moderate/negligible; However, as the study was primarily exploratory, using a replication rather than a sampling logic (see sec. 4.1.2), it was felt that an identification of the presence or absence of the variable would be sufficient to address the propositions. Hence, while some ordinal scales were used, a greater emphasis was placed on binary scales for most of the variables.
- 4) The use of binary scales could also increase the probability of the variables achieving a greater degree of inter-coder agreement (see sec. 3.7.3.1). As the variables were to be identified from textual material, a simple scaling would lend itself to easier identification and a higher agreement. The current study gave greater weight to the retention of more variables at the expense of greater potential for statistical analysis. The search was for the association of the dependent variables with the independent variables and not for prediction of the dependent variables from the independent variables. Therefore binary scales were used for most of the variables.

5.4 The Coding Process

The first step in the coding process involved the recruitment of independent coders, informed in the subject, to participate in the exercise. Initially, 5 persons (from universities/industry) were invited to participate. Only 2 agreed - a former Director of a textile firm in Scotland and a former Works Manager of a multinational tyre manufacturer in Scotland

Ideally, a three-coder assessment of all the 25 cases would have strengthened the analysis. However, time constraints on the part of the two external coders led to the decision to have only 5 cases (20%) assessed by three coders.

The following 5 cases were taken up for a three-way coding⁴

Jockey

Todd & Duncan Ltd.

NCR Manufacturing Ltd.

Kinloch Electronics Ltd.

The Donside Paper Co. Ltd.

An initial meeting was held independently with each of the coders to outline the project and to explain their role as coders. A brief outline of the study, the write-up of the 5 cases, and the list of variables (listed in exhibit 5.1 and used as the recording units of data) were made available to the coders. The purpose of the study was explained and the list of variables discussed in detail to remove any ambiguity about what each variable addressed, thereby ensuring conformity of understanding amongst the three coders. The coders were requested to search for the variables in the text as a whole and place them at the appropriate point on the scale. The coders were asked to look not only at the 'manifest' content of the text but also the 'latent' content in their search for the variables. They were asked to mark the portion of the text, using the variable name, based on which they scaled the variables. This had the advantage of focusing their search of the text as well being available as a ready reference for any discussions that may be needed. An example of an anonymous case previously coded by the researcher was made available to them for guidance. Given the industrial background of the coders and the detailed exposition in the preliminary meeting, it was deemed that the coding was being done by 'informed'

⁴ These 5 cases were chosen as they were the ones completely written up, after the vetting process by the respective firms, when the coding started.

coders. Finally a 'coding' sheet which listed the variables on the y-axis and the 5 cases on the x-axis was given to them and they were requested to place the scale points on this sheet. The coders then took away the material to complete the exercise in their own time.

One of the coders sent in his response through the post. No further meetings were arranged with him, though a couple of telephone conversations were held for minor clarifications where the coding was not clear to the researcher.⁵ The second coder requested a further meeting for clarification of some concepts as well as the method of scaling, before completing the exercise. On completion, the results were brought over in person for a third meeting to discuss a few lingering uncertainties. After clarifications, the few instances were incorporated on the coding sheet which was then handed over to the researcher. The researcher's own independent coding of the 5 cases completed the data set to ascertain the retention of the variables, through the mechanism of inter-coder agreement. A program was written in Minitab for the computation of α^6 . From the data of the 5 cases it was found that 4 variables had an agreement of < 0.67 . These 4 variables, listed in exhibit 5.6, were eliminated from further statistical analysis (though they were used in the explanation-building analysis, where relevant). The remaining variables with $\alpha > 0.67$ were then coded by the researcher for the balance 20 cases.

5.5 Statistical Analysis

The data was analysed using the SPSS package. The following statistics were calculated:

- 1) Frequency count of the variables: The result is listed in exhibit 5.7. The description of the scales can be seen in exhibit 5.1. The missing values reflect the fact that the variable could not be identified in some of the cases. The frequency count identified the degree of presence of the variables in the sample. This formed the first level of explanation of the findings.
- 2) Chi-square Test of Dependence(χ^2): The chi-square value for all pairs between each of the contextual variable and the dependent variable (y601) was calculated initially. A significance level of .10 was used and only 7 of the contextual

⁵ Additionally, this coder took the effort to put in writing some very constructive comments on the study as a whole as well as summarise his own understanding of the strategic role of Procurement in each of the 5 firms.

⁶ Sample calculations for one nominal scale and one ordinal is shown in exhibit 5.5.

Exhibit 5.5

Sample Calculation of Inter-Coder Agreement

The formulae for inter-coder agreement calculation is shown in exhibit 3.5. A sample calculation for each type of scale is shown below. (r = number of cases coded = 5; m = number of coders = 3).

1) Nominal Scale

Variable x521, whether long term relationship with the supplier is a factor in supply strategy

Scale: 1 = it is a factor; 2 = it is not a factor

	Jockey	Todd & Duncan	NCR	Kinloch	Donside	
Coder A	2	1	1	1	1	
Coder B	2	1	1	2	1	
Coder C	2	1	1	1	1	
n_{1i}	0	3	3	2	3	$n_1 = 11$
n_{2i}	3	0	0	1	0	$n_2 = 4$
						$rm = 15$

$$n_{bi} n_{ci} d_{bc} = n_{14} n_{24} d_{12} \text{ (all other terms being 0)}$$

$$= 2 \times 1 \times 1 = 2$$

$$n_b n_c d_{bc} = n_1 n_2 d_{12}$$

$$= 11 \times 4 \times 1 = 44$$

$$\alpha = 1 - \frac{15 - 1}{3 - 1} \times \frac{2}{44} = 1 - 0.318 = 0.682$$

Exhibit 5.5 (continued)

2) Ordinal Scale

Variable o302, competitive severity in the supply market

Scale: 1 = high; 2 = moderate; 3 = negligible

	Jockey	Todd & Duncan	NCR	Kinloch	Donside	
Coder A	2	3	2	3	2	
Coder B	2	3	2	3	2	
Coder C	2	3	2	2	2	
n_{1i}	0	0	0	0	0	$n_1 = 0$
n_{2i}	3	0	3	1	3	$n_2 = 10$
n_{3i}	0	3	0	2	0	$n_3 = 5$
						$rm = 15$

$$n_{bi} n_{ci} d_{bc} = n_{24} n_{34} \frac{(n_3 - n_1 + n_1 + n_2)^2}{(rm)^2} \text{ (other terms being 0)}$$

$$= 1 \times 2 \times \frac{15^2}{15^2} = 2$$

$$n_b n_c d_{bc} = n_2 n_3 \frac{(n_3 - n_1 + n_1 + n_2)^2}{(rm)^2} \text{ (other terms being 0)}$$

$$= 10 \times 5 \times \frac{15^2}{15^2} = 50$$

$$\alpha = 1 - \frac{15-1}{3-1} \times \frac{2}{50} = 1 - 0.28 = 0.72$$

Exhibit 5.6

Variables with $\alpha < 0.67$ and Eliminated from Statistical Analysis

Variable Identification	Variable Description
x307	Fluctuation in the price of supplies as a strategic concern
o403	Ranking by importance of sources of competitive advantage
o505	Ranking by importance of considerations in supply strategy
x524	Importance in supply strategy of 'competitive bidding' pricing

Exhibit 5.7

Frequency Count of the Variables

Variable Name	Variable definition	Scale				
		0	1	2	3	Missing
<u>DEPENDENT VARIABLES</u>						
y601	Importance of Supply considerations in strategy	10	15	-	-	-
y602	Whether Supply ranked in top two strategic considerations	22	2	-	-	-
y603	Whether Procurement function included in strategic planning process	18	7	-	-	-
<u>INDEPENDENT VARIABLES</u>						
<u>SUPPLY MARKET UNCERTAINTY</u>						
o302	Competitive severity in the supply market	-	11	11	3	-
x305	Availability of supply sources as a concern in strategy	20	5	-	-	-
x306	Availability of supplies (production material) as a concern in strategy	23	2	-	-	-
x516	Dependence on suppliers	13	12	-	-	-
x517	Power relative to suppliers	22	3	-	-	-
x203	Influence of 'fashion forces' in the industry	20	4	-	-	1
x303	Currency stability as a concern in strategy	19	6	-	-	-

Exhibit 5.7 (continued)

Variable Name	Variable definition	Scale				
		0	1	2	3	Missing
<u>TECHNOLOGICAL FORCES</u>						
o102	Rate of technological change in industry	-	10	8	6	1
x204	Influence of technology on the product life	17	8	-	-	-
<u>GLOBALISATION TREND</u>						
x103	Whether the firm is domestic (UK) firm or part of a MNC (Global firm)	8	17	-	-	-
x201	Geographic spread of product market (of the firm)	5	20	-	-	-
x301	Geographic spread of supply market (of the firm)	6	19	-	-	-
<u>LOW COST STRATEGY</u>						
x402	Importance of cost considerations in strategy	19	6	-	-	-
x525	Importance of combined procurement of Group items (for volume leverage)	16	9	-	-	-
x526	Importance of reduction in variety of supplies	24	1	-	-	-
<u>JIT OPERATION</u>						
x106	Dominant manufacturing 'philosophy' of the firm	17	8	-	-	-
x506	Dominant mode of inventory control	20	5	-	-	-

Exhibit 5.7 (continued)

Variable Name	Variable definition	Scale				
		0	1	2	3	Missing
x512	Need for suppliers in geographic proximity	24	1	-	-	-
x520	Importance of sole supplier/small supplier base	18	7	-	-	-
x521	Importance of long term relationship with supplier	9	16	-	-	-
x523	Importance of long term contract procurement	10	15	-	-	-
x528	Importance of quality certification by supplier	17	8	-	-	-
<u>CROSS FUNCTIONAL INVOLVEMENT</u>						
x412	Importance of quality accreditation to BS5750	18	6	-	-	1
x522	Early supplier involvement in R&D	12	13	-	-	-

variables were seen to be linked meaningfully to the importance of Supply at the level of .10 or less⁷. Subsequently, the chi-square value for all pairs between these 7 contextual variables and the variables y602 (high ranking of Supply in strategy) and y603 (importance of Procurement in strategy) were calculated. The rationale for using only the 7 contextual variables was that a linkage to the high ranking of Supply, and the importance of Procurement, can be meaningful only where there is a relation to the importance of Supply. A significant relation was seen only in the case of one contextual variable with y602. These findings are shown in exhibit 5.8.

The chi-square statistic helped to identify, across the cases, those contextual variables showing a dependency relation with the importance of Supply. However, the chi-square statistic does not give any information of the strength or direction of the relationship. To identify the strength of this association, and to arrive at a meaningful explanation of the dependency, the Spearman's correlation coefficient was calculated for these 7 variables and the 'importance of Supply' variable.

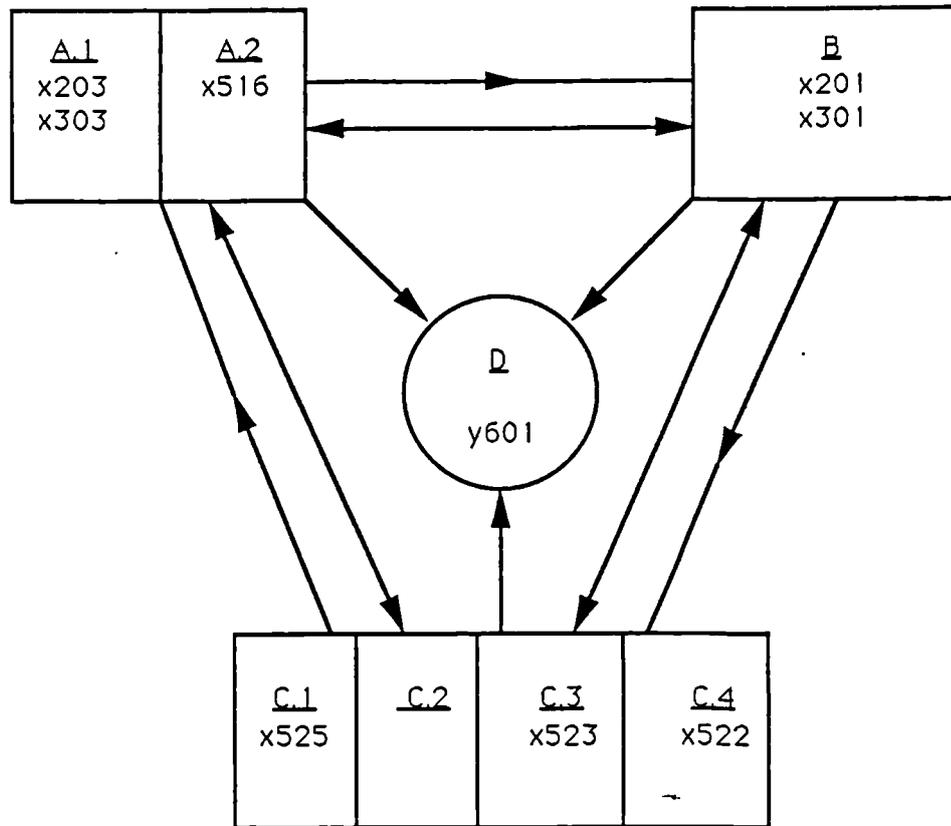
3) Spearman's correlation coefficient (ρ): Spearman's rank-correlation coefficient was used to measure the strength and direction of association between all pairs of variables listed in exhibit 5.8. This coefficient is accepted as a valid measure for assessing the strength of correlation for binary data (see Koutsoyiannis, 1988: 40). A one-tail test was specified as the direction of relationship between variables was established (from literature) prior to the study. Some of these correlations were rejected as they did not lend themselves to 'rational' explanations. The rejected pairs are listed in exhibit 5.9 along with the reasons for rejection. The remaining meaningful correlations are incorporated in exhibit 5.8. The explanations of the meaningful correlations are provided in exhibit 5.10.

A number of significant correlations were observed within the contextual variables. This was a pointer to the modifying effects of the 'within correlation' on any findings of dependency between the importance of Supply and the contextual variables. Though it was not possible to statistically partial out these intervening variables in the Spearman's coefficient, the explanation building incorporated these effects qualitatively.

⁷ One more variable, x516, was significantly linked to y601 but was discarded as the linkage could not be meaningfully explained.

Exhibit 5.8

Correlations Between Dependent and Contextual Variables



<u>Con-</u> <u>text</u>	<u>Variable</u>	<u>Chi-Square</u>	<u>Signi-</u> <u>ficance</u>	<u>Spearman</u>	<u>Signi-</u> <u>ficance</u>
A.1	x203	2.88	.090	.3464	.049
	x303	5.26	.022	.4588	.011
A.2	x516	3.23	.072	(Discarded, see exh. 5.9)	
B	x201	4.17	.041	.4082	.025
	x301	11.84	.001	.6882	.000
C.1	x525	9.38	.002	.6124	.001
	*x525	3.63	.056	.3892	.030
C.3	x523	2.78	.096	.3333	.052
C.4	x522	14.31	.000	.7566	.000

* Correlation with y602

Exhibit 5.8 (continued)

**Correlation Amongst the Contextual Variables Related to Importance
of Supply**

Contexts	Variables	Spearman's Coefficient	Significance Level
A.1 and B	x303 and x201	.2810	.087
A.1 and B	x303 and x301	.2753	.091
A.1 and C.1	x303 and x525	.3590	.039
within B	x201 and x301	.6556	.000
B and C.1	x201 and x525	.3750	.032
B and C.1	x301 and x525	.4215	.018
B and C.4	x201 and x522	.5641	.002
B and C.4	x301 and x522	.6340	.000
C.1 and C.3	x525 and x523	.2722	.094

Exhibit 5.9

Correlations Which Could not be Meaningfully Interpreted

Variables	Spearman Coefficient	Significance Level	Reasons for Rejection
y601 and x516	-.3595	.039	No meaningful interpretation as to why Supply considerations are not important when there is a greater incidence of single/restricted sourcing
x303 and x523	.2677	.098	Relates concern due to currency fluctuation to long term contract procurement
x303 and x522	.4981	.006	Relates concern due to currency fluctuation to the incidence of supplier involvement in R & D.
x525 and x522	.6648	.000	Relates the importance of combined procurement of Group items to importance of involving suppliers in Design, R & D.

Exhibit 5.10

Explanation of the Correlations Used in the Findings of the Study

Variables	Explanation
y601 and x203	Importance of Supply considerations is seen in firms operating in markets influenced by 'fashion forces'
y601 and x303	Importance of Supply considerations is seen in firms for whom currency fluctuations pose a concern
y601 and x201	Importance of Supply considerations is seen in firms with a global spread of the product market
y601 and x301	Importance of Supply considerations is seen in firms with a global spread of the supply market.
y601 and x525	Importance of Supply considerations is seen in firms combining the procurement of common Group items for volume clout
y601 and x522	Importance of Supply considerations is seen in firms where suppliers are closely involved in Design, Research and Development
y601 and x523	Importance of Supply considerations is seen where firms establish long term contracts for procurement of materials
y602 and x525	A high ranking of Supply in strategic considerations is seen where firms combine the procurement of common Group items for volume clout
x303 and x201	Currency stability is a concern for firms operating globally on the product side

Exhibit 5.10 (continued)

Variables	Explanation
x303 and x301	Currency stability is a concern for firms operating globally on the supply side
x303 and x525	Currency stability is a concern for firms combining the procurement of common Group items
x201 and x301	Firm's globalisation moves on the product and supply side are related
x201 and x525	Importance of combining the procurement of common Group items for volume clout is seen in firms with greater globalisation on the product side
x301 and x525	Importance of combining the procurement of common Group items for volume clout is seen in firms with greater globalisation on the supply side
x201 and x522	Involvement of suppliers in Design, Research and Development is seen in firms with greater globalisation on the product side.
x301 and x522	Importance of involving suppliers in Design, Research and Development is seen in firms with greater globalisation on the supply side
x525 and x523	Importance of combining the procurement of common Group items for volume clout is seen where firms establish long term contracts for procurement of materials

Chapter 6

Results

6.1 General Comments

The discussion of the results follows the sequence outlined in exhibit 6.1. Initially the overall findings of the importance of Supply is discussed (sec. 6.2), followed by a search for the importance of Supply within each context identified in propositions 1 through 6 (sec. 6.3). The within-context discussion is structured on the following lines:

- The importance of Supply in the total sample.
- Industry effect in the importance of Supply.
- Size effect in the importance of Supply.

The role of Procurement in strategy (proposition 7) is looked at in sec. 6.4. Finally, the linkage between Supply and Procurement as outlined in proposition 8 is addressed in sec. 6.5.

6.2 Overall Importance of Supply

Exhibit 6.2 lists the firms where Supply considerations were found to be important and where it was not. The industry and the size of the firms are also listed; size is defined as 'small' for firms with less than 500 employees and 'large' for firms with 500 or more employees. Also identified are firms where Supply considerations ranked high in strategic considerations and where Procurement was found to be important in the strategy process.

The incidence of importance of Supply was identified in 15 firms. The reasons for this importance have to be sought in the contexts and this is covered in sec. 6.3. However, all the 6 contexts identified in the propositions contributed to the importance of Supply in one firm or the other, showing that the current sample was able to capture all the propositions. Beside, the justification for a multiple case

Exhibit 6.1

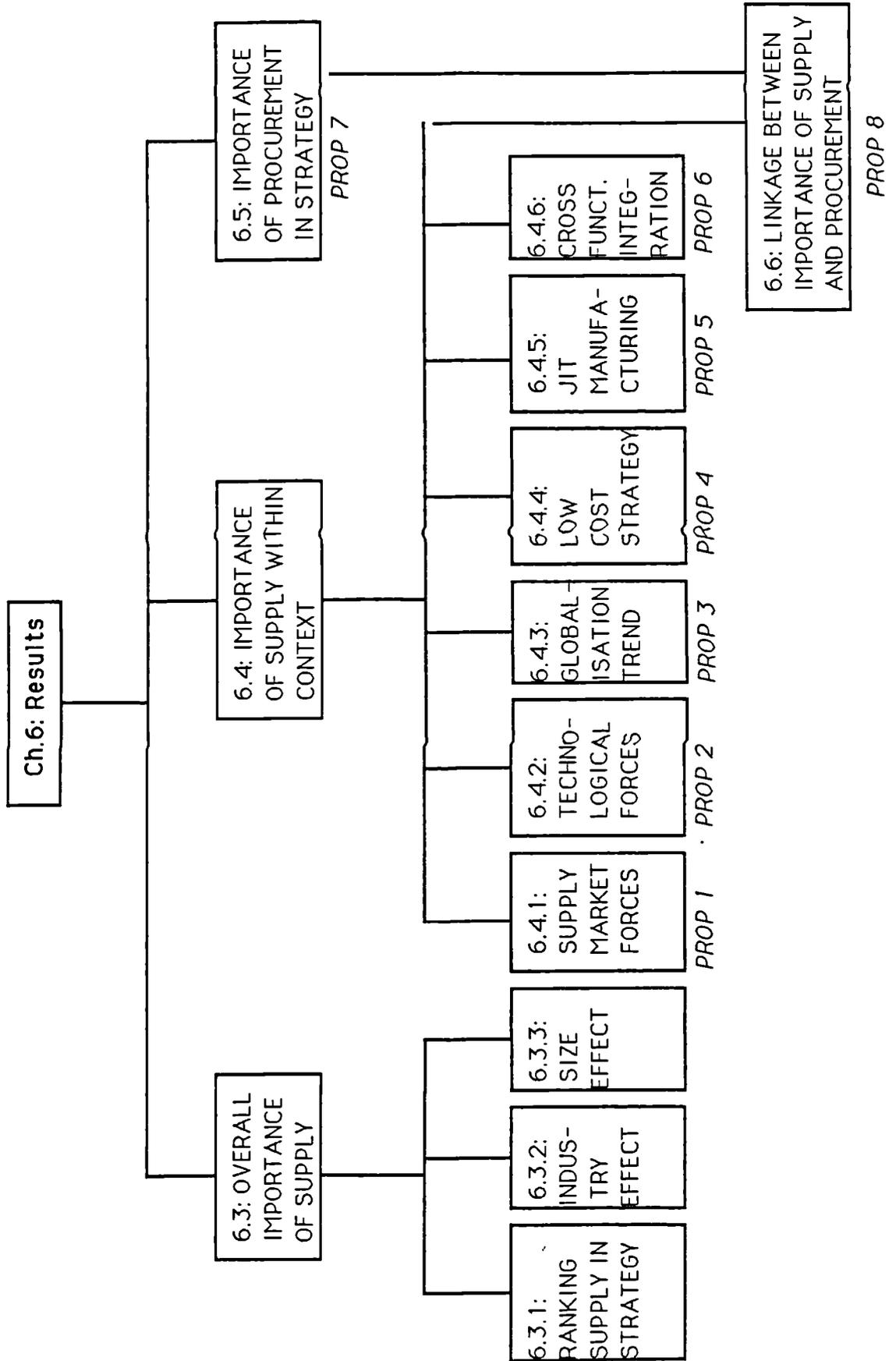


Exhibit 6.2

Categorisation of Firms According to the Importance or Non-importance of Supply

<u>Where Supply was Important</u>			<u>Where Supply was not Important</u>		
Industry	Firm	Size	Industry	Firm	Size
Textile	Textile B	S	Textile	Jockey	S
Textile	Todd & D.	S	Textile	Micrell	S
			Textile	Drake & Co.	S
			Textile	Textile A	S
			Textile	Don & Low	L
			Textile	Smith & N.	L
Paper	Sappi (#)	S			
Paper	Paper A	S			
Paper	Donside	S			
Paper	Paper B	L			
Paper	Tullis R. (#)	L			
Elec.	GPT - C	L	Elec.	Kinloch	S
Elec.	Elec. B	L	Elec.	GRI	S
Elec.	NCR (*, #)	L	Elec.	Elec. A	S
Elec.	IBM (*, #)	L	Elec.	GPT-M	?
Elec.	GPT - B (#)	L			
Elec.	GPT - K (#)	L			
Sports	Swilken	S			
Auto	Rover (#)	L			

KEY : S = Small size firm (<500 employees)

L = Large Size Firm (500 and more employees)

? = Size not known

* = Firms where Supply ranked high in strategic considerations

= Firms where Procurement function was important in the strategy process

study (see sec 4.1.1), to be able to capture all the propositions, was borne out by the findings. Additionally, the results gave rise to two crucial insights:

- 1) The importance of Supply can be driven by even one or two critical variables. This was seen in Paper B, where the importance of Supply was derived solely from the need to ensure procurement of acceptable quality materials at the lowest price. This showed that, while grouping the variables within contexts helps to systematise the study, the importance of Supply will have to be linked to the individual contextual variables.
- 2) The relevance of a context (or variable) to strategic Supply is conditioned by other firm-specific, intervening variables. Kinloch and NCR were both in an industry characterised by rapid technological changes, but Supply was not important for Kinloch while it was seen to be important for NCR. This was due to the lack of autonomy in Supply decisions imposed on Kinloch by its customers. Any study of the strategic consideration of Supply based on the contexts must allow for other firm-specific, intervening variables.

7 firms showed evidence of Procurement being important in the strategy process, as opposed to 15 firms according strategic importance to Supply. This finding supported the visualisation of the dichotomy, advanced in sec. 2.7, between strategic Supply considerations and the strategic role of Procurement. This is discussed fully under proposition 8 (sec 6.5). The insight into the reality of the dichotomy, as seen in these cases, highlights the need for a different conceptual approach in future studies of the strategic importance of Supply.

6.2.1 Ranking of Supply in Strategic Considerations

Of the 15 firms where Supply was seen to be strategic, NCR and IBM, both in the electronics industry, were the only 2 firms where Supply ranked high in strategic considerations. In the case of NCR, Supply ranked second after R&D, while in IBM it ranked second after Manufacturing.

NCR (Dundee) was an Engineering and Manufacturing unit of the NCR Corporation. It did very little marketing and the strategic focus was on product innovation, product development and new product design. In this process, the firm was seen to actively involve the suppliers (through the Early Supplier Involvement and Supplier Quality Management cells in the Materials department) in its design,

research and development. EDI linkages, long term supplier relations and JIT purchasing were important to the firm. The firm was primarily an assembler, with a heavy dependence on suppliers for parts and sub-assemblies. The Materials Director was a member of the team responsible for the firm's strategic planning.

IBM Greenock had a predominantly manufacturing role within the IBM Group - neither Marketing nor R&D were significant in its operations. Continuous Flow Manufacture was emphasised and suppliers had a major role in ensuring timely deliveries. Supply strategy was also orientated towards sourcing in geographic proximity to reduce lead times. Strategic partnerships with suppliers was emphasised in strategy.

It is not surprising, given the 'restricted value chain' in both these firms, to find Supply ranking high in strategic considerations. The important element was that both firms enjoyed sufficient autonomy to be able to avail of the opportunities in the supply market. Other firms with similarly restricted value chains (Elec. A, Micrell) were restricted by corporate policy of sourcing within the Group.

In the remaining 13 firms, Supply did not rank high in strategic considerations. It is safe to conclude that, while Supply could be seen to have increasing strategic significance, it cannot really be said to 'drive corporate strategy' as envisaged by Monczka (see Morgan, 1991)

6.2.2 Industry Effect

In the sample, 23 firms were distributed among three industries

- 1) The textile industry (8 firms): 6 firms were in the apparel and furnishing sector while 2 firms catered to industrial applications.
- 2) The paper industry (5 firms): all the 5 firms were basic paper manufacturers. 4 of the firms were in speciality papers while 1 firm catered to the mass consumption market.
- 3) The electronic industry (10 firms): the sample comprised 6 firms in telecommunications equipment, 1 firms in computer manufacture, 1 firm in equipment manufacture for the financial sector, and 2 firms who were contractors manufacturing sub-assemblies for other electronic equipment firms.

Additionally there was 1 firm each from the Automobile and the Sports industry.

6.2.2.1 The Textile Firms

Most of the textile firms (6) did not consider Supply to be of strategic significance. Different reasons could be adduced for this. Micrell was a wholly-owned upstream firm of a multinational Group and all aspects of Supply were controlled and directed from corporate headquarters. Likewise, Don and Low was tied to the parent company, Shell (UK), for a major portion of its raw materials (even though it was pointed out by the executives that they did have the freedom to operate in the market, if they chose). Textile A could be identified as a 'stagnating' firm in a market segment which was at the start of decline. This firm seemed to have reached a 'steady state equilibrium' as far as all its operations were concerned, with more or less fixed customers and suppliers. Jockey, and Smith and Nephew did not find very serious concerns in their Supply markets. Jockey however, at the time of the study, had just moved out of procuring materials from an upstream Group company into the open market, and showed signs of 'teething' problems in Supply. It is possible that this change could raise the strategic profile of Supply for Jockey in subsequent years.

The 2 textile firms which gave strategic attention to Supply did so for different reasons. Both were in industries influenced by fashion forces. In the case of Todd and Duncan, the main raw material (cashmere) was to be found only in one region world-wide (in Mongolia). The trade was controlled by the Chinese Government and quality of supply was of the highest ranking priority. Though processed cashmere was received from its sister unit in Bradford, the issue was crucial enough for the firm to play a proactive role in securing the source and ensuring the quality on a long term basis. At the time of the study the firm had just concluded a ten-year contract for supply of cashmere. Textile B had moved into textile operations with a 'high technology' membrane which formed a crucial layer in sportswear and protective clothing. To ensure compatibility of its product with the other layers, and also to seek out newer applications for its product, the firm was cooperating with both its customers and suppliers all along the supply chain. The closest matching to the 'integrated supply chain' seen in Stevens (1989) was evident in this firm.

The importance of Supply in the textile firms was seen to be driven by a number of different factors (scarcity of resources, integrating the supply chain, corporate

restriction on Supply policies and stable supply markets), none of which can be said to be really industry-specific. Thus, the industry effect was not visible for the textile firms in the sample.

6.2.2.2 The Paper Firms

All 5 firms from the paper industry considered Supply to be important in strategic considerations. Four of the firms (Sappi, Paper A, Donside and Tullis Russell) were in speciality niches and Supply was important for ensuring consistency in the quality of pulp (though most of them seemed to have the flexibility to vary the initial mix of pulp grades), quality and availability of other additives to give the desired property to their end products, and innovations from suppliers which could enhance the features of their speciality products. Three of these firms were seen to collaborate with the suppliers for joint development and testing of new product innovations. This was one factor that led to establishing long term relationship with suppliers, mostly of a contractual nature.

Paper B was operating in the lower end, bulk paper segments. Cost considerations were very crucial to its operations. Also, the firm had based its operations mainly on recycled paper (the firm emphasised this aspect to gain competitive advantage in the environment-friendly context). Quality of incoming waste paper was critical to avoid end product contamination and this added to the strategic stakes in Supply.

The findings indicate that two reasons drove the importance of Supply in paper firms:

- 1) Paper manufacture is primarily a continuous process, starting with a basic commodity (pulp). Quality of pulp is very important for two main reasons: firstly, to avoid bulk rejections during processing and secondly, in the case of speciality products, in determining the end product quality. The additives which determined the speciality properties also had to be of a high quality. Quality considerations were responsible for the importance of Supply in the paper firms.
- 2) Based on the evidence in the sample, it appears that the paper industry suppliers play a major role in innovations which enhance the features of the speciality end products. Thus, speciality paper manufacturers had a greater integration with their suppliers for R&D.

6.2.2.3 The Electronic Firms

The electronic firms were split almost evenly between giving importance to Supply (6 firms) and not considering Supply as important (4 firms). In the latter category, two of the firms (Kinloch and GRI) were mainly contractors, dependent on larger firms for business. In both cases there were dominant customers who nominated the suppliers for the firms and laid down procurement guide-lines. Elec. A and GPT-M obtained most of their supplies from upstream Group companies, leaving minimal scope for strategic procurement. Elec. A had greater autonomy from Group control for some products (which it marketed on its own). Here there was evidence of moving towards greater strategic Supply; however, at the time of the study, this was not a major part of the operations and Supply considerations were primarily focused on scheduling deliveries from the Group company.

The other 6 firms (GPT-C, Elec. B, NCR, IBM, GPT-B, and GPT-K) were all part of large multinationals. The products of all these firms were affected by rapid technological changes which characterised the electronic industry. Product life was shortened, requiring a flexible supply chain to respond quickly to changes. Innovations led to an almost continuous improvement in product features. All the firms had linkages with the suppliers for tapping innovations in the supply market and involving suppliers early in R&D. All of them were in different stages of JIT implementation and worked closely with suppliers to ensure flexibility in schedules and deliveries. Joint quality programs with suppliers were actively pursued by these firms. The GPT firms were working towards a coordinated supply strategy to have a common base of preferred suppliers with whom partnership relations could be established. IBM, NCR and Elec. B already had partnership with suppliers high on their agenda. Procurement in GPT-K was also seen to be active in the product market through the 'factor procurement'¹ program.

The importance of Supply for the electronic firms stemmed from the following factors:

- 1) Rapid changes in technology which were shortening product life and hence requiring a quick response.

¹ 'factor procurement' was defined as procurement of the firm's end product from competing manufacturers, to be marketed in the firm's name. See the case write-up for more details.

- 2) Involving suppliers in design, research and development to tap the innovations in the supply market.
- 3) Close working relations with suppliers to facilitate JIT operations and to have maximum flexibility to respond to changes.

6.2.3 Size Effect

Two sizes were distinguished - 'small' as having less than 500 employees, and 'large' as having 500 or more employees. The sample split quite equitably as 13 small and 11 large firms. In one case (GPT-M) data was not available to identify size as defined here.

Overall, size was not a main factor in according importance to Supply - 6 small firms and 9 large firms considered Supply to be strategically important. This seems reasonable as the importance of Supply considerations is dependent on contexts which span both small and large firms. The effect of size could be more visible in the way a firm organises itself to address Supply factors and this is discussed further on (in sec. 6.4).

Of the firms which did not consider Supply to be important, 8 were small firms and 2 large firms. A closer look at the individual firms showed that the reasons were due to other intervening variables - 6 of these small firms were actually shielded from the Supply context either due to corporate policy (Jockey, Micrell, Elec. A, GPT-M) or due to major customer power (Kinloch, GRI). It is possible that small size, within a Group, can constrain Supply strategies.

Two conclusions can be drawn about the effect of size:

- 1) Size is not a major factor in determining the importance of Supply for the autonomous firm. However, size could be a factor if the firm is part of a Group of companies.
- 2) The effect of size could be visible more in the instance of according importance to Procurement rather than in the strategic consideration of Supply.

6.3 Importance of Supply Related to the Contexts

The propositions addressed 6 different contexts in which Supply considerations were said to be of strategic importance to the firm - uncertainties in the supply market, technological nature of the industry, globalisation of operations, adoption of low cost strategy, adoption of JIT and cross functional integration. The prevalence of these contexts for a firm was identified through the presence or absence of variables associated with the contexts. Exhibit 6.3 shows the enumeration of the number of variables, under each context, found to be present for each firm. The findings for each of the propositions draws on this exhibit, the case write up shown in the appendix, and the analysis reported in Chapter 5.

6.3.1 Proposition 1: Uncertainty in the Supply Market

Importance of Supply considerations in strategy is seen in firms faced with uncertainties in the supply market, and the opportunities or threats perceived in them.

The importance of Supply deriving from the uncertainties in the Supply market was seen in 5 firms: Todd and Duncan, Swilken, GPT-C, Sappi Graphics and Tullis Russell.

In the case of Todd and Duncan, availability of supplies of cashmere, their main raw material, was restricted to only one region in the world. The trade was controlled by the Chinese government, introducing an element of uncertainty due to possible policy changes. Quality of raw material was vital and it was essential to control it at source in order to avoid costly transportation charges, if the rejection were to occur at the firm's site. As the suppliers were mostly traders dealing in cashmere as a commodity, and lacking the sophistication to ensure uncontaminated supplies (this was seen in the brief spell when the Chinese de-regulated cashmere trade), Todd and Duncan decided to set up testing facilities at Hong Kong. The firm also covered the uncertainty by entering into a long term (10 year) contract for guaranteed off-take. The firm continues to watch the situation closely for any changes (for example, policy changes by the Chinese Government) which might adversely affect its operations.

Swilken was a small firm manufacturing golf clubs and accessories. The number of suppliers manufacturing metal head castings was inadequate to meet the industry

Exhibit 6.3

Enumeration of Variables Within the Associated Context for Each Case

FIRMS WHERE SUPPLY WAS IMPORTANT

Firm	Contexts						
	Supply Market	Technology	Globalisation	Low Cost	JIT	Cross-funct.	Total
Textile B	2	0	3	0	1	2	8
Todd & Duncan Sappi	5	0	3	0	4	0	12
Paper A	3	0	3	2	0	2	10
Donside	1	0	3	1	2	2	9
Paper B	1	0	3	1	3	1	9
Paper B	0	0	1	1	0	0	2
Tullis R.	3	0	2	0	1	1	7
GPT-C	0	1	3	1	0	1	6
Elec. B	0	2	3	1	2	1	9
NCR	1	2	3	1	5	1	13
IBM	0	2	3	1	5	1	12
GPT-B	0	2	3	1	2	1	9
GPT-K	1	2	3	1	4	1	12
Swilken	5	0	2	0	4	1	12
Rover	1	2	2	0	5	1	11

Exhibit 6.3 (continued)

FIRMS WHERE SUPPLY WAS NOT IMPORTANT

<u>Firm</u>	<u>Contexts</u>						
	<u>Supply Market</u>	<u>Techn-ology</u>	<u>Global-isation</u>	<u>Low Cost</u>	<u>JIT</u>	<u>Cross-funct.</u>	<u>Total</u>
Jockey	1	0	1	0	1	1	4
Micrell	1	0	3	0	3	0	7
Drake & Co.	1	0	2	0	1	0	4
Textile A	1	0	0	1	2	0	4
Don & Low	2	0	2	1	2	0	7
Smith & Nephew	0	0	3	0	1	0	4
Kinloch	2	2	0	2	4	1	11
GRI	1	0	0	1	1	1	4
Elec. A	1	1	3	0	2	0	7
GPT-M	2	2	2	0	5	0	11

demand. Many wood head suppliers had closed down when 'woods' went out of fashion. But with the resurgence of 'woods' demand, the number of suppliers left in the industry could not cope with the industry requirements. Both these factors led to a tight supply situation which affected Swilken. The small size of the firm was also a detrimental factor, as larger competitors were given priority by the suppliers. Substantial purchases were being made from overseas sources; hence currency fluctuation was of major concern to the firm. Swilken responded to these uncertainties by giving firm guarantees to lift supplies and being prompt in payment to suppliers. The firm also held high inventory stocks for these items, though it tried to operate on JIT basis for manufacture and sales. The currency situation was closely watched and the firm switched purchases to regions of favourable currency exchanges where possible; however, this was secondary to ensuring availability.

GPT-C faced a situation of annual increase in the price of steel which impacted its purchase of fabricated parts. One of the metal parts (coin validator) was a crucial, supplier-designed component. Being a proprietary item, the threat to the firm was from the monopolistic situation as well as the price fluctuation. The firm was actively scouting for an alternate design to get out of the monopoly situation. In all the other metal parts, the competition amongst fabricators was high enough to ensure that the firm was able to purchase at the lowest price. Hence the upward trend in basic steel prices did not figure as a major strategic concern for the firm.

Sappi Graphics and Tullis Russell also faced uncertainties in the Supply market, but to a lesser degree. Both were in the speciality paper markets and faced cyclical fluctuations in the price and availability of pulp. Price fluctuations were compounded by exchange rate changes. Some special additives in their process had restricted sources, particularly clay which was a monopoly supply situation in the UK. This was an industry wide situation and the two firms showed strategic awareness of the uncertainties by closely monitoring the situation and meeting it through contractual strategies. (Surprisingly the other two speciality paper manufacturers in the sample, Donside Paper Co. and Paper A, did not seem too 'worried' by this situation). These 'uncertainties' merited strategic attention but, as is seen later on, other contexts had a greater impact on according strategic importance to Supply in these firms.

Some firms identified strategic aspects in their supply markets but this did not merit strategic attention due to other intervening factors. Kinloch and GRI, the two contractor firms in the sample, had all aspects of Supply pre-determined by their

major customers, leaving them little room for strategic manoeuvring. However, both the firms had set a strategic direction of moving into 'own' products. Kinloch was actively searching for a product to manufacture under its own brand - this was in fact a major objective of the newly appointed Business Director. GRI was currently manufacturing a 'Torrymeter' but it was a legacy from the past and formed an insignificant part of its operations. However, the firm was already in the advanced stages of planning for the manufacture of a personal attack alarm system under license from the NHS. As own product manufacture was at the project/inception stage for these firms, it is possible that the supply market uncertainties were being addressed as part of the overall project assessment.² In their current operations, they were 'shielded' from any uncertainties and hence Supply was not important for them.

Micrell, and Don and Low identified price instability as characterising their supply environment but their strategies were not affected by it. Micrell was restricted by its parent's policy to stick with the current suppliers while Don and Low was taking most of its requirements from the parent; the implication being that other corporate considerations over-ruled price concerns for these firms. Two other firms (Drake and Co., Smith and Nephew) also identified price instability in their supply markets but it did not unduly concern them.

All the other firms in the sample did not face uncertainties in the supply market.

The chi-square test and Spearman's correlation coefficient showed three significant relationships, between the importance of Supply and 'prevalence of fashion forces in industry', 'concern caused by fluctuating exchange rates' and 'dependence on suppliers',

The correlation between importance of Supply and prevalence of fashion forces was only partly relevant. 4 firms identified fashion forces as prevalent in their industry. Of these, the effect was exclusively on the product side for 2 of the firms (Todd and Duncan, and Textile B). Both these firms met these changes through the manufacturing process while the input material was constant. In the case of the other two firms (GPT-K and Swilken) the effects of fashion forces did filter down to the supply side. GPT-K's life-style products were affected by fashion forces which required the updating of product features. This required the firm to seek

² This seems to point to the importance of Supply possibly being greater at the project stage for the introduction of a 'own' product for the first time by a firm.

innovations in the supply market which could meet the needs of improved product features. The firm had covered this need by working closely (in a partnership relation) with selected suppliers and so did not feel a 'threat' from these changes. Swilken laid emphasis in customising its products based on design adaptation which required changes in the design of the input materials; hence, the firm worked closely with suppliers for design aspects.

Exchange rate fluctuations as a concern was seen in 6 firms (Sappi Graphics, Paper A, Donside, Tullis Russell, NCR and Swilken) - all of whom considered Supply to be important. Paper A was shielded to some extent by getting a majority of its requirements from the parent firm; Donside and NCR covered the situation through their global operations which balanced the effect of currency fluctuations on the supply side through sale of their products in different currencies. The other three firms all monitored the exchange rate carefully and modified their purchasing in line with the situation.

The Spearman's correlation coefficient showed a negative association between importance of Supply and dependence on suppliers. This could not be meaningfully explained because the expectation was that Supply's importance would increase when the firm depends on few suppliers rather than when there is a broad supplier base. However, looking at the intervening effect of 'firm autonomy', the negative correlation is more readily explained. 6 firms (Micrell, Don and Low, Kinloch, GRI, Elec. A, and GPT-M) were all constrained in one way or the other to a restricted supplier base. The choice of a restricted supplier base was not because of a strategic move by the firms but because of strategic decisions made outside their control. This situation influenced the finding of a negative correlation between importance of Supply and dependence on suppliers.

In conclusion, it was seen that uncertainty in supply markets were major drivers of strategic Supply only in three firms in the sample. In two other cases this context had a minor effect in driving strategic Supply.

6.3.1.1 Proposition 1: Industry Effect

No industry effect was seen in the association of supply market uncertainties with the importance of Supply. The 5 firms, where this association was seen, were spread out over 4 industries. The industry effect was absent in the context of uncertainty in the supply market.

6.3.1.2 Proposition 1: Size Effect

Three of the five firms (Todd and Duncan, Swilken, Sappi), where supply market forces were seen to be important, were small firms. Possibly because small firms do not have the clout to either exercise power over suppliers, or the resources to have a major influence in the supply market, they could be more susceptible to supply market uncertainties. However as 2 large firms were also seen to be affected by uncertainties in the supply market, the size effect cannot be seen in this context.

6.3.2 Proposition 2: Technological Changes

Importance of Supply considerations in strategy is seen in firms whose industry is characterised by rapid technological changes.

The technological context was identified as relevant in the case of 10 firms. Of these, 7 firms considered Supply to be important in strategy. Both the technological variables were identified as having an impact on the operations of 6 of these firms (Elec. B, NCR, IBM, GPT-B, GPT-K, Rover). The strategic action taken by these firms was to lock-in to specific suppliers for tapping state-of-the-art technology and for speed of response in implementing technological changes. CAD linkages were either in place (GPT-K, Rover) or being contemplated (Elec. B, NCR, IBM, GPT-B). The evidence from these firms was sufficient to show that technological forces were one of the drivers of strategic Supply.

GPT-C did not see its final products affected by the technological changes in its supply market. This was because electronics constituted only a small part (20%) of the materials in its end product. These were basic components and not subject to too many technological changes. Hence, the technology context was not important in its strategic consideration of Supply.

3 firms, where the technological context was present, did not feel its influence in Supply. 2 of these firms (Elec. A, GPT-M) were restricted to buying materials from upstream Group companies. Kinloch's Supply policy was dictated by its major customer. Presumably, the effects of technological changes were addressed at centres outside the firms' purview and the firms had only to incorporate those decisions.

6.3.2.1 Proposition 2: Industry Effect

Except for Rover, all the other firms which identified technological forces as being significant drivers of strategic Supply were from the electronic industry. This seems to suggest that the effects of technological forces were more evident in the electronic firms, leading them to consider Supply as strategic for their operations.

6.3.2.2 Proposition 2: Size Effect

The size effect was clearly visible in the case of the 10 firms identifying technological forces as affecting their industry. The 7 firms where Supply was important were all large firms while the three firms where Supply was not important were small firms. However, these small firms were all shielded on the supply side from the effects of rapidly changing technology. Hence, the importance of technological forces cannot be ruled out totally for autonomous small firms, based on the current sample. As lack of autonomy was seen only in the small firms in this sample, only a qualified conclusion can be drawn that the larger firms were affected more by technological forces.

6.3.3 Proposition 3: Global Operations

Importance of Supply considerations in strategy is seen in firms with increased global operations.

Of the 25 firms in the sample, only 3 firms (Textile A, Kinloch and GRI) were 'purely' domestic'. Textile A's global operations were minor while the other two firms were contractors to large electronic firms in the UK. All the 15 firms, where Supply was important, considered some aspect of their global operations as giving rise to this importance.

The *percentage value of procurement* from overseas suppliers only partly reflected the strategic importance of Supply. As can be seen from exhibit 5.2, only 4 firms (Donside, Swilken, Tullis Russell, Paper A) had 50% or more value of procurement from overseas suppliers while in 5 cases (GPT-C, IBM, Elec. B, NCR, Rover) it was less than 50%. From the same exhibit it can be seen that almost all the firms classified availability of supplies as not causing a concern. Other factors, representing both opportunities and constraints, gave importance to Supply considerations in the global context.

Firms which were part of a multinational Group were constrained by *corporate policy of combining the procurement of items common to Group firms* and placing corporate contracts with global suppliers. This 'forced' some firms to take supplies from overseas sources. This brought in the attendant problems of logistics and currency fluctuations, raising Supply to the strategic level. The firms where this was identified were IBM, NCR, GPT-C, Elec. B and, to some extent, Textile B. IBM would in fact have preferred to source closer to the UK to facilitate JIT operations but had to fall in line with corporate policy. In the case of NCR, there was no corporate compulsion for joining the corporate pool of suppliers but the firm participated wherever it could gain cost advantage. This affected its JIT operations to some extent.

Cost considerations figured in the overseas moves of some firms e.g. Swilken, GPT-K.

Non-availability of materials in the domestic markets required some firms to source globally. IBM found that the technology and the manufacturing capacity for some of its crucial components were available only in Japan and the Far-East. GPT-B saw the electronics manufacturing base shrinking in the UK/Europe/USA and shifting to the Far-East. There was 'near perfect' competition among the global suppliers and so GPT-B concentrated in the overseas market (this firm treated the situation not as a constraint, but a challenge for JIT operations). All the paper firms had to source pulp, the major input material, outside the UK. Additionally some other crucial additives like speciality clay (Sappi, Donside), polymer (Sappi, Paper B), and casein (Tullis Russell) were not available in the UK. The main raw material for Todd and Duncan (cashmere) was available only in Mongolia. Finally, the main input fabric for Textile B was based on proprietary technology of the Group and manufactured only in two Group locations in Japan and the USA.

Quality of supplies was the reason for Textile B to source some of its input fabrics overseas.

Some Multinationals had set up *joint ventures* in other countries for strategic reasons and their UK units were supplied from these locations (GPT-K, Elec. B).

Requirements of *reciprocal trade in some countries* tied-in the Supply strategy to the marketing operations of some firms. This was seen in Elec. B and GPT-K. The purchasing office of GPT-K located in Hong Kong was active in seeking marketing

opportunities both for marketing the firm's products as well as for 'factor product' procurement.

Whatever the reasons for firms to source globally, it affected other aspects of their operations like logistics, price fluctuation, quality and JIT operations. Thus global sourcing strongly influenced the importance of Supply in strategy.

It was noted that being a part of a multinational Group did not automatically raise the importance of strategic considerations of Supply. Jockey was set-up purely for national (UK.) operations and did not operate globally; Supply policies of Micrell and Elec. A were dictated by the corporate office, giving them no scope for changes; Don & Low, and GPT-M were tied-in to upstream Group companies. These firms were shielded from the effects of global forces in the supply market.

The chi-square value and Spearman's correlation coefficient were significant for 'global operations on the product side' and highly significant for 'global operations on the supply side'. One variable which influenced this relationship was the need for 'combined procurement of common Group items' which brought about global operations for some firms. Concern caused by exchange rate fluctuation could be seen as a natural fall-out to global operations. 'Involvement of suppliers in design, research and development' was also seen to be significantly associated with globalisation. However, the firms involving suppliers in design, research and development were seen to do so for both domestic and overseas suppliers. Hence the correlation of globalisation with 'involvement of suppliers in design, research and development' can only be treated as a 'chance' correlation.

Overall, the strategic importance of Supply was seen to be strongly derived from the globalisation context.

6.3.3.1 Proposition 3: Industry Effect

All the 5 firms in the paper industry operated in the global supply market and Supply was important in their strategies. Paper firms positioned at the upstream end of the paper supply chain, i.e. manufacture of paper from pulp, had necessarily to obtain pulp supplies from global sources. Additionally, special additives needed for the process had restricted sources, scattered over the globe. The final product features were dependent on these additives and so the firm had to go global. It is possible that paper converters, like envelope manufacturers or stationary

manufacturers, need not have a compelling reason to source globally; however, such firms were missing in the sample. The globalisation effect can be said to be strong for the paper firms, within the above qualification.

The electronic firms were strongly influenced by global sourcing. Scarcity of manufacturing capacity in domestic markets, the need to incorporate the latest technological advances and cost considerations seemed to drive the importance of global sourcing. The electronics industry itself is global in nature and supplier linkages across countries were seen in the sample firms. The 4 electronic firms where Supply was not important had other variables which took precedence over the globalisation context (Kinloch and GRI were contractors, Elec. A and GPT-M were tied to upstream Group companies). The globalisation context can be concluded to be strong in influencing strategic Supply considerations for electronic firms.

6.3.3.2 Proposition 3: Size Effect

Size effect was not visible in the association between importance of Supply and globalisation, as the association spanned both small and large firms. Only in the case of electronic firms was it possible to see that smaller firms did not consider global sourcing as important. However, as this observation was explained by a number of other intervening variables, the conclusion reached is that importance of Supply in the globalisation context was independent of firm size.

6.3.4 Proposition 4: Low Cost Considerations

Importance of Supply considerations in strategy is seen in firms competing on a 'low cost' basis.

The incidence of low-cost considerations driving the strategic importance of Supply was seen only in 2 firms. Paper B's low cost strategy was based on ensuring materials at the lowest cost - 'best value for money', as emphasised by their executives. Sappi Graphics also considered cost to be important in their strategy; however, they seemed to derive their cost advantage more from having put in place the latest production facilities ahead of the competition than from Supply considerations.

For the remaining 13 firms where Supply was important, though many of the low cost variables were present, it did not automatically presage the primacy of low cost supplies in the overall strategy. Tullis Russell, GPT-C and Swilken, though aware of low cost supplies as being important, did not shape their strategies on that consideration. Rather, it was considered more a *functional objective* than a strategic driver. Firms which were operating in supply markets characterised as competitive did not necessarily turn it to cost advantage through emphasising competitive bidding for low cost supplies; Textile B, NCR (where 80% of the manufacturing cost was bought-out materials), IBM, GPT-B, and GPT-K rather went the partnership route and de-emphasised cost as compared to other considerations.

Even where Supply was not strategically important, price of materials ranked high in functional strategies (Jockey, Micrell, Drake and Co., Smith and Nephew). Textile A, and Don and Low, receiving a major portion of their supplies from Group companies, ranked material price as important in their functional strategies. The emphasis on low cost materials, *ceteris paribus*, seems to be almost universally true for manufacturing firms. Kinloch and GRI considered low cost strategy as important, but not deriving from Supply (where they had no autonomy). They were looking for cost efficiencies in manufacturing.

The chi-square value was strongly significant for one of the low cost variable, 'combined procurement of Group items'. 9 firms in the sample were seen to combine the procurement of common Group items at the corporate level to derive economies of scale procurement; only one of these firms (Sappi Graphics) felt low cost was important in its strategy. Combined procurement was evident mostly in multinational firms operating in global supply markets. The strategy to consolidate the procurement of items common within the Group could be tracked to functional efficiency rather than a strategy of low cost operations.

Overall, the conclusions in the low cost context was that not many firms gave importance to Supply in the context of low cost operations. Cost advantages sought in Supply were more as functional efficiencies, and secondary to other strategic considerations.

6.3.4.1 Proposition 4: Industry Effect

No industry effect was seen regarding the importance of Supply in the low cost context

6.3.4.2 Proposition 4: Size Effect

No size effect was seen regarding the importance of Supply in the low cost context..

6.3.5 Proposition 5: JIT Manufacturing

Importance of Supply considerations in strategy is seen in firms adopting a JIT manufacturing philosophy.

The JIT context was addressed in two modes: firstly, whether the firms characterised their operations as JIT and secondly, the presence of the JIT variables. The characterisation of operations as JIT was evidenced in the following 9 firms:

- 1) Kinloch and GRI. These firms were operating JIT as a part of the efforts of their major customers to organise their (the customers') supply chain on JIT lines. Supply was not important in these two firms.
- 2) Elec.-B, GPT-B and Swilken were tending to operate on JIT but had implemented it only in parts of their supply chains.
- 3) Donside characterised the supply side as working on JIT deliveries (low inventories, daily deliveries, small supplier base, supplier linkages) but there was no evidence that the firm as a whole was operating on JIT. JIT practices on the supply side did not seem to be part of an overall JIT operation; rather, it seemed to be just 'good Supply practice'.
- 4) NCR, IBM and Rover were the only firms well advanced in implementing JIT all along their supply chain. The importance of Supply in this context was in evidence in these three firms.

The problem, seen in Donside, of distinguishing whether JIT Supply practices arise out of the JIT context or just 'good Supply practices' was evident when considering the variables making up the JIT Supply context. 16 firms considered long term relationship with suppliers as important and 15 firms operated procurement on long term contractual basis; yet only 5 firms claimed to be operating on JIT basis on the supply side. Todd and Duncan, Drake and Co., Smith and Nephew, GPT-M and

GPT-K mentioned supplier certification of quality as important but were not operating JIT. The instances of single/restricted sourcing driving the importance of Supply could, beside the JIT context, be attributed to factors like scarcity of sources (Todd and Duncan) or corporate policy (Micrell). Geographic proximity of suppliers was emphasised only in one case - IBM.

Hence, though a number of variables associated with JIT were found to be important to many firms in the sample, it was difficult to identify this importance as necessarily arising out of the JIT context.

A significant chi-square value was found only in the case of 'long term contract' being important to the firm. However, this variable was also correlated to the 'importance of combined procurement', which seemed to be having the greater influence on the importance of Supply.

The conclusion reached was that there was only weak evidence to link the importance of Supply to the JIT context.

6.3.5.1 Proposition 5: Industry Effect

There was some evidence to suggest that the importance of Supply in the JIT context was more prevalent in electronic firms. 4 of the 6 firms, where JIT was in place to some extent, were from the electronic industry. Some of the variables associated with JIT were also more prevalent in the electronic firms, e.g. long term contract procurement and partnership linkages with a small supplier base. Possibly the electronic firms, being in an industry characterised by rapid technological changes, seek greater flexibility in manufacturing in order to respond quickly to the changes. Low inventories, facilitated by JIT, would also minimise obsolescence. Also, locking-in to suppliers (through partnership working, long term contracts) possibly assures a quicker incorporation of innovations (this is seen more clearly, in the discussion of the involvement of suppliers in design, research and development, in sec. 6.3.6). This could explain the association between importance of Supply and the JIT context shown by electronic firms.

6.3.5.2 Proposition 5: Size Effect

There is some evidence to conclude that large firms were more liable to accord importance to Supply in the JIT context. 5 of the 6 firms operating on JIT to some extent were large firms. Larger firms were seen to work more closely with

suppliers, linking with them for design, research and development. It seems possible that large firms could 'dictate' to suppliers the operational philosophy to be followed. Conversely, suppliers would also prefer linkages with larger firms for stability as well as business volume. Hence it is reasonable to expect JIT relation with suppliers to be more prevalent in large than in small firms.

6.3.6 Proposition 6: Cross-Functional Involvement

Importance of Supply in strategy is seen in the incidence of its inclusion in other functional considerations.

As discussed in sec 5.2.2.6, only two variables were found relevant in this context: the 'early involvement of suppliers in design, research and development', and the 'importance of accreditation to BS5750'.

13 firms considered the early involvement of suppliers in design, research and development as being important; all of these firms also considered Supply considerations to be strategic. The chi-square value and the correlation coefficient were found to be the strongest for this variable. Firms involving suppliers early on in their value chain did so to ensure procurability was built into the design, to avail of specialist knowledge of suppliers and to incorporate innovations in the supply market. Furthermore, the involvement brought about close linkages with suppliers, including computer linkages for CAD. There was a strong association between supplier involvement and rapid changes in technology. The special relations required by the involvement also drove the firms to have a small base of preferred suppliers. Also, most of the firms adopting this strategy were members of multinational Groups. Thus the involvement of suppliers in design, research and development brought about close linkages with preferred suppliers, in turn leading to long term relationships and long term contract procurement. This evidence was quite strong in the sample.

3 firms which considered accreditation to BS5750 as having a priority in their strategies did not consider Supply to be strategic. GRI and Kinloch fell in line with their customers requirements to have suppliers with BS5750 certification. Jockey was sourcing from Group companies, though they were moving to open market sources at the time of the study (it was expected that Supply would become important for them in the future). Only Paper A and Sappi Graphics showed some

support for importance of Supply in Quality as measured by the importance of accreditation to BS5750.

6.3.6.1 Proposition 6: Industry Effect

The firms in the paper and electronic industries showed evidence of early involvement of suppliers in design, research and development. The three firms (Donside, Paper A and Sappi Graphics) from the paper industry were all in specialist niches. Early involvement of the suppliers was to improve the features of their current products and to introduce new products. All the 6 electronic firms, where Supply was important, showed this association. The 4 electronic firms, where early involvement of suppliers was not important, had other variables which removed this need for those firms. Overall, the evidence was quite strong for the electronic and the paper industries.

6.3.6.2 Proposition 6: Size Effect

Size effect was not evident as both small and large firms seemed to involve suppliers early on in their value chain.

6.4 Proposition 7: Role of Procurement in Strategy

The strategic importance of Procurement is reflected in the incidence of its representation in the strategy process.

The inclusion of Procurement in the strategy process was found in the case of 7 firms - Sappi Graphics, Tullis Russell, NCR, IBM, GPT-B, GPT-K, and Rover. In Tullis Russell, NCR and Rover, the department was headed by a director of the firm. In the case of Sappi Graphics, it was headed by a senior manager³ who was a member of the body responsible for strategy. Procurement in IBM, GPT-B and GPT-K was headed by senior managers who were part of the strategy formulating team in the respective firms.

The importance accorded to Procurement depends on the way a firm organises itself to address strategic issues of Supply. Hence industry effects do not really affect the

³ Formerly the Technical Director whose designation was revised to Senior Manager with the acquisition of the firm by SAPPI.

importance of Procurement (unlike the case of importance of Supply, where industry-specific contexts can be identified for strategic Supply).

The size effect is more markedly visible in the way a firm organises itself to meet the strategic considerations in Supply. 6 of the 7 firms (Tullis R., NCR, IBM, GPT-B, GPT-K, Rover) considering Procurement to be important were large firms while Sappi Graphics was the only small firm that accorded a strategic role for Procurement. Though the reasons for this were not clear in the sample, an intuitive explanation is advocated. Larger firms, because of their scale of operations, could set-up a separate specialist department (Procurement) to address these factors. In small firms, strategic Supply could be addressed by the CEO, or senior executives with multiple responsibilities, while delegating the functional activities to lower levels in the hierarchy. In such firms Procurement does not have a strategic role. Size can, therefore, be said to have an influence on determining the importance of Procurement.

6.5 Proposition 8: Strategic Supply and Strategic Procurement

Importance of Supply considerations in the firm's strategy is independent of the importance of Procurement in the strategy process.

15 firms indicated that Supply was important in their strategic consideration. 7 of these firms addressed strategic Supply through Procurement; this bears out the conventional view that importance of Supply is seen in the importance of Procurement. However, the remaining 8 firms, where Supply was important but Procurement did not have a strategic role, confirmed the reality of the dichotomy visualised in sec 2.7. The importance of strategic Supply considerations were derived from the contexts, while the strategic importance of Procurement was derived from the way a firm organised itself. It would definitely be counter-productive to try and understand the strategic importance of Supply through the strategic role of Procurement.

6.6 Summary of Results

Exhibit 6.4 summarises the results in two parts

- For the 15 firms where Supply was important, the contexts which drive this importance are identified.

Exhibit 6.4

Summary of the Findings of the Study

I THE CONTEXTS DRIVING THE IMPORTANCE OF SUPPLY IN INDIVIDUAL FIRMS

Firm	Contexts						
	<u>Supply Market</u>	<u>Techn-ology</u>	<u>Global-isation</u>	<u>Low Cost</u>	<u>JIT</u>	<u>Cross-funct. (R&D)</u>	<u>Total Context</u>
Textile B	-	-	x	-	-	x	2
Todd & D.	x	-	x	-	-	-	2
Sappi	x	-	x	x	-	x	4
Paper A	-	-	x	-	-	x	2
Donside	-	-	x	-	-	x	2
Paper B	-	-	x	x	-	-	2
Tullis R.	x	-	x	-	-	x	3
GPT-C	x	-	x	-	-	x	3
Elec. B	-	x	x	-	-	x	3
NCR	-	x	x	-	x	x	4
IBM	-	x	x	-	x	x	4
GPT-B	-	x	x	-	-	x	3
GPT-K	-	x	x	-	-	x	3
Swilken	x	-	x	-	-	x	3
Rover	-	x	x	-	x	x	4
TOTAL	5	6	15	2	3	13	

Exhibit 6.4 (continued)

II THE PROPOSITIONS OF THE STUDY

	<u>Total Sample</u>	<u>Industry⁴</u>			<u>Size⁵</u>	
		Textile	Paper	Elec.	Large	Small
Number of firms	25	8	5	10	11	13
Where Supply was important	15	2	5	6	9	6
Where Procurement was important	7	Nil	2	4	6	1
<u>IMPORTANCE OF SUPPLY CONSIDERATIONS WITHIN CONTEXT</u>						
<u>Context</u>	<u>Total Sample</u>	<u>Industry</u>			<u>Size</u>	
		Textile	Paper	Elec.	Large	Small
Supply Market	<i>Moderate</i>	Absent	Absent	Absent	Absent	Absent
Tech. Forces	<i>Moderate</i>	Absent	Absent	<i>Strong</i>	<i>Moderate</i>	Absent
Global. Trend	<i>Strong</i>	Absent	<i>Strong</i>	<i>Strong</i>	Absent	Absent
Low Cost Str.	<i>Weak</i>	Absent	Absent	Absent	Absent	Absent
JIT Manuf.	<i>Weak</i>	Absent	Absent	<i>Weak</i>	<i>Weak</i>	Absent
Cross - func.(R&D)	<i>Strong</i>	Absent	<i>Strong</i>	<i>Strong</i>	Absent	Absent

⁴ The two outliers, Automobile (one firm) and Sports (one firm) are left out of this table.

⁵ Size for one firm (GPT-M) not known and so left out.

- The overall findings with reference to the propositions are summarised.

Exhibits 6.3 and 6.4 need careful interpretation. The following points should be noted when viewing these exhibits:

- 1) The importance of Supply was not always associated with a greater frequency of the presence of contextual variables. For example, Paper B with only 2 variables identified as present and GPT-C with 6 variables present still accorded strategic importance to Supply. In addition to the presence of contextual variables, the impact they had on the firm's operations decided whether Supply merited strategic attention.
- 2) On the other side Micrell (7 variables), Kinloch (11 variables), Elec. A (7 variables) and GPT-M (11 variables) did not consider Supply to be important. The impact of the variables on strategic Supply for these firms was modified by other intervening variables, thereby shielding the firm from the effect of the contextual variables. GPT-M and Elec. A were tied by policy to upstream sister companies for critical supplies; Kinloch's Supply operations were restricted by the policies of their major customer; and Micrell followed a 'historic' practice, laid down by the parent, of single sourcing their critical input (though they were tending to move out of this arrangement at the time of the study). Thus, while the study identified the contextual variables important for strategic consideration of Supply, the actual impact of these variables could only be assessed at the individual firm level.
- 3) For firms where Supply was important, not all the contexts were necessarily critical. For example, though the JIT variables were present in Todd and Duncan, GPT-B and GPT-K, Supply in these firms did not derive importance from the JIT context.
- 4) The indication of a strong, moderate or weak association shown between the importance of Supply and any given context should be treated cautiously. The classification of strong, moderate or weak represents the judgement of the researcher grounded in the explanation building cross-case analysis and the evidence of the exploratory statistical analysis.

Chapter 7

Discussions

The discussion of strategy, Supply and Procurement in manufacturing firms can be centred around a series of questions:

- 1) What is strategy?
- 2) What is Supply?
- 3) Is Supply strategic?
- 4) Do firms recognise the strategic importance of Supply?
- 5) What is the role of Procurement in strategic Supply?

7.1 What is Strategy?

Grant (1991: 16) points out that the strategy literature is littered with a "multitude of alternative definitions of business strategy". In order to determine the definition of strategy most relevant to this study, two aspects of strategy were looked at - the overall characteristics of strategy and the level of strategy.

Hax and Majluf (1991: Ch. 1) state that strategy embraces the overall purpose of an organisation, and identify 6 dimensions that make up its definition:

- the pattern of decisions
- organisational purpose
- business definition
- the firm's environment and resources
- the firm's internal hierarchy
- contributions to stakeholders.

Johnson and Scholes (1989: Ch. 1) identify 3 levels of strategy:

- the corporate level, concerned with the scope of the organisation as a whole
- the business level dealing with how to compete in a particular market and hence concerned with a unit within the whole
- the operational level, concerned with how different functions contribute to the other two levels.

This study addressed the contribution of the operational level (Supply/Procurement) to the Business level of a firm. The scope of the organisation was accepted as given at the cross-section in time when the study was carried out. Hence, strategy as relevant to this study was adequately captured by the definition of Quinn (Mintzberg and Quinn, 1991: 5), advanced in Ch. 1 and reiterated below:

"A strategy is a pattern or plan that integrates an organisations major goals, policies and action sequences into a cohesive whole....(helping) to marshal and allocate an organisation's resources into a unique and viable posture based on its relative internal competencies and shortcomings, anticipated changes in the environment, and contingent moves by intelligent opponents".

7.2 What is Supply?

'Supply' was used to cover all considerations pertaining to Production materials. With reference to the supply chain (exhibit 1.1), Supply would refer to the point of interaction of the firm with external suppliers, either independent or from upstream Group companies. The scope of Supply activities would have two components. The external market activities include factors such as price of supplies, logistics, supplier relations, and scanning the supply market for opportunities and threats. The within-firm value activities include factors like contribution to inventory reduction, involvement in JIT and TQM, consideration in design, research and development, and participation in value analysis and cost reduction exercises.

To determine whether Supply is strategic or not, it was necessary to address whether Supply considerations are relevant to the elements that constitute strategy.

7.3 Is Supply Strategic?

"Competitive strategy is primarily concerned with the positioning of the firm's output, not of inputs. Outputs are what the customer buys....By contrast, inputs are the internal resources and tasks that go to make up what a firm offers to customers.The competitive positioning of outputs is where competitive strategy starts" (Mathur, 1988: 30)

This view can be characterised as 'myopic' in contemporary times. The literature evidence (Ch. 2) shows that rarely do strategists focus on only a part of the value chain to gain strategic advantage. Whether the input side is strategic or not can be ascertained by matching Supply considerations with the definition of strategy advanced above (sec 7.1).

All the elements of strategy mentioned in the definition are relevant to a greater or lesser degree in Supply considerations. Farmer (1981: 38, Fig. 1) identifies the environmental forces on the supply side which a firm should incorporate in its appraisal of the external environment. These include general economic effects, government legislation, political effects, industrial relations, mergers, new developments, competitors activities and plans, other buyers activities and plans, key suppliers activities and plans, and alternate suppliers activities and plans.¹

The strategic issues arising from the general environmental forces include inflation (Farmer, 1972; Farmer and Taylor, 1975), currency fluctuations, (Carter and Vickery, 1988, 1989), tariffs and quotas (Farmer and Taylor, 1975), counter-trade regulations (Arnold, 1989; Ellram, 1991), technological changes (Schill, 1979; Haas, 1987; De Rose, 1991), industrial strife and political turbulence (Farmer, 1981). Specific to the supply market the strategic issues relate to price of materials (Davis, 1985), availability of materials (Adamson, 1980; Elliot-Shircore and Steele, 1985), availability of sources (Elliot-Shircore and Steele, 1985), availability of capacity and capability (Kraljic, 1983; Davis, 1985), availability of substitute materials (Porter, 1980; Kraljic, 1983), competitive conditions (Porter, 1980; Davis, 1985), and power equation between the firm and suppliers (Adamson, 1980; Porter, 1980). Mergers and acquisitions could involve the firm's suppliers (Farmer, 1972; Lamming, 1990). Strategic moves in the supply market by competing buyers and major competitors could alter the supply conditions for the firm (Davis, 1985). All these forces, depending on the relevance to the firm, could pose threats or afford opportunities. Competitive advantage could be lost or obtained by strategic action on the supply side. Thus the "*anticipated changes in the environment and contingent moves by intelligent opponents*" on the supply side form an important constituent of strategy.

Supply considerations in the "*relative internal competencies and shortcomings*" figure in the firm's assessment of its core competencies. A firm would need to decide what value addition it would prefer to carry out in-house, either due to assumed superiority on performance or due to factors like secrecy (Lamming, 1993). This would determine (as well as be determined by) its core competencies. Identifying core technologies would then lead to the determination of what is to be bought from suppliers (Monczka in Morgan, 1991). This would require assessment

¹ An earlier book, jointly edited by Farmer and Taylor (1975: Ch. 2) gives a detailed check-list of the specific strategic issues arising from the environmental forces relevant to Supply.

of the supply market to meet the specific needs of the firm. Patents, lack of know-how or other technological or legal barriers may require the firm to obtain components from suppliers (Levy and Sarnat, 1976). The tendency to contract out more complete assemblies leads to greater reliance on the suppliers (Burt, 1991). The impossibility of keeping up with all state-of-the-art technology requires firms to position their manufacturing activities to get the best value from suppliers (Haas, 1987). Thus the identification of the internal competencies and shortcomings automatically draws Supply considerations in to the overall strategic deliberations.

Adamson (1980) points out that "...an important resource to the individual firm" features in issues related to Supply. According to Hadnam (1980) it is not uncommon to find bought-out materials equating to 80% of direct variable cost. This is accentuated by the greater tendency to contract out more complete assemblies (Burt, 1991), and mechanisation which reduces labour costs per unit (Hill, 1972). Vertical integration decisions involve a strategic choice between committing a firm's resources to creating in-house facilities and deploying them in the supply market (Ford and Farmer, 1986). Involving suppliers in JIT working leads to low inventory investment, thereby contributing to efficient resource utilisation. In the "*marshalling and allocating of an organisation's resources*" Supply has considerable importance.

An organisation's "*major goals, policies and action sequences*" drive all the factors mentioned above. The product portfolio, degree of integration, decision to automate and globalisation moves all have specific Supply components. Additionally, alliances and strategic networking are evident on both the supply and product side. An organisation, which makes a conscious decision to position itself in a strategic network with long term implications for Supply, must be prepared to invest resources in creating a base of trust, in order to "maximise benefits in relation to investment costs over a prescribed period of time" (Sako, 1992: 48). Such a view of Supply can only be addressed as a part of the overall strategy of the firm. Therefore strategy, "*the plan that integrates*", must address Supply within the overall '*goals, policies and action sequences*'.

7.4 Do Firms Recognise the Strategic Importance of Supply?

The literature is quite strong in identifying the various forces which give rise to the strategic importance of Supply. The forces can be grouped together under 6 contexts which drive strategic Supply:

- Supply market forces
- Technological forces
- Global operations
- Low cost operations
- JIT implementation
- Cross functional integration.

There is, however, very little empirical support reported in the literature for the strategic importance of Supply. Most empirical work in the area of Supply deals not so much with strategic Supply as with the activities of the Procurement department. As listed in exhibit 2.7, most of the findings are that Procurement has no strategic role. The uniform conclusion drawn from this is that Supply is not being accorded its due importance in a firm's strategy.

This conclusion was strongly questioned by the researcher. As pointed out in section 2.7, the strategic role of a department is a reflection of *how a firm organises itself to address strategic issues, and not the strategic importance of those issues*. In order to study Supply considerations in strategy, it was important to recognise that these considerations *could be* articulated and represented outside the activities delineated for the Procurement department. This crucial distinction led to the propositions of the study, linking strategic Supply to the 6 contexts as well as looking at the linkage between strategic Supply and the strategic importance of Procurement. The testing of the propositions in the field throw some light on whether firms recognise the Strategic importance of Supply.

It is worth recapitulating here the scope of the current study, so that the ensuing discussion can be viewed in context. The propositions had been welded together from diverse perceptions in the literature. As pointed out in sec 4.1.2, because of the diversity of the propositions, the study used a 'replication logic' in testing the propositions. Hence, the findings reported below should not be viewed as inference from a sample to a population. Rather, it should be seen as providing a base for hypotheses that could be tested in future research.

By concentrating on the linkage between strategic Supply and the contexts, the study found that Supply was strategic for 15 of the 25 firms. Correspondingly, only 7 of these firms considered Procurement to be of strategic importance, showing that divorcing strategic Supply from the strategic importance of Procurement was a 'real-world' phenomenon. It was also evident that the strategic

importance of Supply was rooted in the 6 contextual forces. The strategic contribution of Supply was seen in a number of areas:

- 1) SECURITY FOR THE EXISTENCE OF THE FIRM: Todd and Duncan's very existence depended on ensuring that no threats arose to its requirements of cashmere. Swilken's small size made it vulnerable in a tight supply market.
- 2) SECURITY OF SUPPLY FOR STRATEGIC MATERIALS: Sappi Graphics and Tullis Russell were faced with a monopoly supply situation in some additives crucial for their niche products.
- 3) LOW COST STRATEGY: Low cost materials were an important element in the low cost strategy adopted by Paper B.
- 4) TECHNOLOGICAL ADVANTAGE: Textile B's advantage in the product market was based on the unique technological properties of its input material.
- 5) STATE-OF-THE-ART TECHNOLOGY: Rover, GPT-K, NCR, Elec. B and IBM all had linkages with suppliers for speed of response in implementing technological innovations.
- 6) EARLY SUPPLIER INVOLVEMENT IN DESIGN, RESEARCH AND DEVELOPMENT: This was seen in 13 firms for the purpose of ensuring that procurability was 'built into' design, suppliers specialist knowledge was tapped and innovations in the supply market were incorporated in the firms' products.
- 7) GLOBAL OPERATIONS: Global sourcing contributed to a firm's strategy in a number of ways - cost contribution (GPT-K, Swilken), availing the latest technology (IBM), responding to a shrinking domestic supply market (GPT-B), in corporate joint-ventures (GPT-K, Elec. B) and facilitating marketing in countries with reciprocal trade laws (GPT-K, Elec. B).
- 8) JIT SUPPLY: This was integrated into the firm's policy of JIT operations (Rover, NCR, IBM)

For the remaining 10 firms where Supply was not strategic, the most prevalent reason was the *lack of autonomy* at the firm level - this was found in 7 cases. In 2 of these firms (GRI and Kinloch) Supply autonomy was restricted by powerful

customers while in 5 firms (Jockey, Micrell, Don and Low, Elec. A and GPT-M) Supply policies were decided at the corporate level. The locus of strategic Supply was situated at other parts of the Group's (or customers') supply chain in which these firms were members. The evidence from these 7 firms did not in any way detract from the findings of the strategic importance of Supply in the majority of firms. Rather, the negative finding was more a result of the limited scope of the study (looking at firms in isolation of their role within a Group) and the sampling (not weeding out contractors), than a true reflection of Supply's importance.

Only in 3 firms (F.Drake, Textile A, and Smith and Nephew) was no strategic importance seen for Supply. Textile A was a 'stagnant' firm - it had a fixed base of bespoke customer and was 'existing' in a state of low key, steady state equilibrium. A non-strategic orientation to Supply seemed satisfactory for the firm. F.Drake, and Smith and Nephew focused their strategic attention on the product side; Supply was treated as 'benign' as it did not seem to be giving them any distinct advantage or posing a threat to their current focus. Functional efficiency seemed to be acceptable to these firms.

These results confirm that firms do recognise the strategic importance of Supply, validating both the theoretical literature as well as the insight that Supply's strategic importance should be sought in the relevant contexts and not necessarily in the strategic role of Procurement. This broad generalisation can be made based on the study. However, some of the complexities that characterise the real world add the following qualifications to the general statement:

- 1) The six contexts used in this study were all derived from the literature. In practice, *it was difficult to assess one of the contexts - the cross-functional integration of Supply*. This context is really only relevant for firms where there is a 'compartmentalisation' of functions, which was not easy to determine in the current, generalised study. For example, though the 'involvement in design, research and development' of Supply was strongly evident in most of the firms, many of them (like Elec. B, GPT-B) had separate cells in Procurement working exclusively for this coordination. This does not match with the normal perception of 'compartmentalised' operations. It is possible that most present day firms have some degree of integration in their operations which casts doubts on the relevance of this context for modern-day firms.

2) *Not all contexts are of strategic significance to a firm.* As was seen in Paper B, only the low cost context and, globalisation to some extent, were of prime importance in its strategy and Supply was crucial to the firm in these contexts. Low cost in Supply strategy was sought through 'best value for money' procurement, and the supply market was competitive enough for the firm to not treat it as posing any uncertainty. Likewise, while quality of supplies was emphasised, the firm seemed able to control for it through in-coming inspection and through purchasing from reputed suppliers who were available in reasonable numbers. Globalisation was important only to the extent that its major material (pulp) was not available domestically. The other contexts were either absent (like JIT, cross functional involvement) or benign (supply market forces, technological forces). Likewise, most of the other 14 firms had varying combinations of context which gave rise to strategic Supply (see summary 1, exhibit 6.4). Thus, it is not the presence of a context but the relevance and impact on the firm's strategies which determines the importance of Supply for that firm.

3) *The degree of autonomy a firm enjoys within the supply chain determines whether Supply is strategic to its operations.* Elec. A, an electronic firm seemed to identify a number of opportunities in its supply market which could have been of strategic significance. But it was constrained by Group policy to take supplies from an upstream Group company. Kinloch and GRI were restricted by their major customers to getting supplies from sources specified by the customers. These three firms, where they had freedom of operation (like in 'own product' manufacture), were seen to give greater strategic attention to Supply. Group policies were also be an effective shield for a firm from threats in the supply market. Don and Low, being wholly owned by Shell and hence getting the bulk of its supplies from the parent, felt its 'security of supply' was assured in times of criticality.

4) *Some contexts could be more relevant to certain industries.* In the current sample, the technological context was seen to be almost exclusively in the electronic industry. Textile firms like Don and Low, and F.Drake switched their operations to synthetic applications brought about by technological advancements in polypropylene applications. Such changes were more in the nature of 'upheavals' than an almost continuous impact as seen in the electronic industry. In fact, as Don and Low pointed out, since new applications for polypropylene had peaked and hence the demand had saturated, polypropylene

producers like Shell acquired downstream firms (Don and Low) to ensure a market for their product. This implied that the technological change (brought about by polypropylene) was an 'historical' event for the industry.

- 5) *Size of the firm was not a major factor in the context-Supply linkage.* Size in fact had a greater effect in the linkage between Supply and Procurement and this is discussed in the next section (7.5).

- 6) The *ceteris paribus* argument was present in the propositions. In reality, it was difficult to maintain it and intervening variables provided quite a few clarifications. For example, Micrell identified price instability as characterising its supply market. However, as cost considerations were not important in its strategy, price instability in the market did not merit strategic attention. IBM would have liked to source supplies from geographically near markets to facilitate JIT, but the Group policy of corporate contracting for common items forced the firm into 'greater global operations' than desired. This brought on the attendant problems of logistics and currency fluctuations as a strategic concern for the firm. Combined procurement of common Group items was not necessarily for low cost procurement arising from scale economies. Most multinational Groups in the electronic industry had established strategic linkages with their suppliers to be better able to deal with rapid technological changes. As a part of this linkage, common Group items were purchased from these suppliers. A shrinking domestic supply market made global operations important for some firms, for example GPT-B. All the paper firms, and Todd and Duncan had to source globally because of non-availability of supplies in the domestic markets. Thus the global context was brought about in a number of firms by forces which are identified with other contexts.

These qualifying statements do not negate the overall findings of the strategic importance of Supply; rather, they are pointers to the further refinement of future studies. That these studies should focus on Supply considerations, and not the activities of Procurement, is borne out by the discussions in the next section.

7.5 What is the Role of Procurement in Strategic Supply?

The results of this study showed that out of the 15 firms where Supply was considered to be strategic, 7 firms accorded importance to Procurement in the strategy process. This is in line with the prevailing conception that the brief of

Procurement is to consider all aspects of Supply. It is the evidence from the other 8 firms that casts doubts on the conventional wisdom. These 8 firms were clear that strategic issues of Supply were primarily addressed at loci outside the Procurement department. In the case of Swilken, the strategic plan was originated by the Managing Director, aided by outside consultants. The CEO had the responsibility for long term plans in Paper B, aided by a committee of senior managers which did not include Procurement. A group of executives was responsible for strategic planning in each of Paper A, Donside Paper Co., Textile B, Todd and Duncan, and Elec. B. Procurement was not represented in the planning process in any of these firms. Finally, GPT-C had its plan handed down from the HQ at Liverpool. Strategic Supply issues in these 8 firms were formulated without a formal representation for Procurement, which implemented the formulated strategies at the operational level. The identification of the dichotomy, discussed fully in sec. 2.7, between strategic Supply and the strategic role of Procurement is borne out by these 8 firms. Yet, this dichotomy is not 'universal' as seen from the evidence of the other 7 firms. The conclusion is that strategic Supply could be addressed both through Procurement activities as well as outside it. The important implication is that empirical research which tests theoretical conceptions of Supply's strategic importance must avoid the trap of seeking it *solely* in the strategic role of Procurement.

It is possible to use the results of this study to predict, with caution, the circumstances in which the importance of Supply and Procurement are linked. Of the 6 small firms where Supply was important, only one firm included Procurement in its strategy process. Whereas, out of the 9 large firms where Supply was important, Procurement was important in 6 firms. Large firms, because of the scale of operations, are more likely to organise in different departments to address different components of the value chain. A coordinating mechanism would in all likelihood be set up to integrate the total operations. The representation in this coordinating body would arise from the importance of the function to the operations. In these circumstances, where Supply is important to a firm, it is possible to see Procurement represented in the strategy process. The reason for caution in using this as a predictor is the absence of this linkage in the other 3 large firms. No ready explanation was available in the study for this absence.

This study has shown that there is considerable replication in manufacturing firms of the strategic importance of Supply, as visualised in the literature. It is possible to

draw some cautious implications for academic researchers and industrial practitioners, and this is done in the concluding chapter.

Chapter 8

Implications

This study has a number of implications for managers, consultants and researchers. Even though these implications cannot be advocated with the same robust generalisation as a study conducted through a strictly random sample, there are still a number of cautious conclusions that can be drawn from a replication study. A replication study serves as an important intermediate step between hitherto largely untested theoretical propositions and statistical empiricism. For researchers, a replication study serves to strengthen theory so that testable hypotheses can be propounded. For managers and consultants, a replication study offers a glimpse of the experience of some firms against the backdrop of what is essentially untested theory. This should encourage them to 'test the waters' in their own situation, in the knowledge that theoretical conceptions have been shown to be replicated in at least some industrial situations. Keeping these caveats in mind, the following implications are drawn from the study.

8.1 Implications for Managers and Consultants

- 1) The study has identified, both from the literature and from cases in industry, that the supply side has strategic significance. The opportunities on the supply side availed by the firms in the study show that no longer can the supply activities be treated as only a support function, devoid of value addition. This study has identified the areas which are of strategic relevance to Supply. *Practitioners can view this study as a signpost in taking a strategic look at their supply activities.*
- 2) The empirical work reveals that many firms ignore the Procurement department when incorporating Supply considerations in their strategy. This may be the result of conventional wisdom which treats Procurement activities as a support function. The disadvantage to the firm could be that the specialist knowledge (of the supply market) nesting in the department could be lost to the firm. *Practitioners should address how the strategic profile of Procurement could be raised.*
- 3) Some of the strong reasons reported by previous researchers for Procurement not playing a strategic role is the lack of recognition by top management and the

low priority given to Procurement personnel for professional and personal advancement. This was consistent with the view of Procurement being a service/administrative function. This view has to change in the light of the findings of the current study. *If top management has to motivate its Procurement personnel to play a more strategic role, then the inhibiting factors should addressed.*

- 4) Multinational Groups can see how a tight control of their subsidiaries denies them possible advantages in the Supply market. Some of the sample firms expressed their inability to take proactive action in the supply market because of restrictive corporate policies. Once again this may have been a fall-out of the perception of Supply not being of strategic significance. This study has shown the conventional perception to be 'outdated'. *Corporate offices should review their current practices to see how their constituent firms could avail the opportunities on the supply side.*

8.2 Implications for Researchers

- 1) Theoretical literature has to date addressed the strategic importance of Supply in piecemeal contexts. This study has brought together the various contexts within a consolidated framework. The empirical work has also shown that the multiplicity of contexts have a real impact on the Supply strategy of the firm, with different contextual variables pulling the Supply strategy in different directions. *Future research now has a basis on which to build a framework of 'generic' Supply strategies, taking into account all the relevant contexts.*
- 2) Future research should also address the situational contingencies that surround the decisions about strategic Supply. The minimisation of *ceteris paribus* would make the research more meaningful to practitioners and assist them to better focus scarce time and resources in the difficult task of prioritising strategic action.
- 3) Future research addressing strategic Supply should shift attention away from the Procurement department. This study has shown that many firms consider strategic issues in Supply outwith the Procurement department. *The focus of future research should be at strategic issues in a firm rather than the formal structure of the firm.*

- 4) An interesting corollary could be the understanding of *why firms do not address strategic Supply issues through their Procurement department*, thereby losing some specialist knowledge vested in the department. The evidence from this study is that many firms still see Procurement in its past role of a support department. Conventional organisation structures which place it near the 'bottom of the pile' are still in place in these firms. That the Supply side has strategic implications is itself a recent realisation for these firms. However, the 'mind-set' about the role of Procurement seems to blind the firms to its strategic potential. A redefinition of this role, integrating it in strategy, could lead to a better utilisation of the specialist knowledge and skills.

- 5) This study has not addressed the issue of performance of firms. As Supply is definitely found to be strategic, performance variables should be affected by the different Supply strategies adopted by firms within a strategic grouping. *Research linking effective Supply strategies to performance would be of definite interest to managers and consultants.*

8.3 Limitations of the Study

The limitations of this study can be classified under three headings - scope limitations, methodological limitations and practical limitations.

8.3.1 Scope Limitations

- 1) The study was carried out basically to seek a replication of the theoretical assertions of the importance of Supply in strategy. As the aim was not 'sampling and statistical' validation, the *ceteris paribus* argument was strong in the propositions. While recognising that *ceteris paribus* rarely applies in reality, it was a necessary condition for gathering together, within one framework, all the piecemeal contexts identified in the current literature. Though the intervening variables were used in the analysis of each case, it is recognised that this study can lead only to limited, cautious generalisations.

- 2) The sample selection within industry is not truly representative of that industry. Hence, while the *identification* of contexts as specific to an industry can be extended to the industry as a whole, the *absence* of contexts within an industry cannot have the same generalisation validity.

- 3) The sample contained some firms which had membership in a larger Group. The whole Group was not studied. Yet, in the actual cases, *Group influence was substantially present in determining the firms' strategies*. These have been pointed out in the analysis where they occur.

8.3.2 Methodological Limitations

- 1) The schematic framework was developed around the contexts to help consolidate all the factors that could drive the importance of Supply. Each context was identified through the variables seen to be most relevant to that context. However, *some of the variables could represent more than one context*. For example, involvement in design, research and development represented both the instances of cross functional integration as well as JIT. The researcher's judgement about the context in which it had more relevance was used to 'force' the variables into the contexts.
- 2) Where more than one contextual variable was relevant to a firm, there was an inherent prioritising of the importance of those variables in the firms' strategy. *The prioritising of contextual variables* was ignored while analysing the cases. As the study was exploratory, and the analysis primarily qualitative, this was not felt to pose a problem. Hence no attempt was made to rank or weight the variables; all the variables which influenced the importance of Supply for a firm were reported 'uniformly'.
- 3) The scaling of the variables primarily as binary was helpful in the qualitative assessment. Statistical analysis had necessarily to be at an elementary level. Non-parametric correlation were used and this *precluded partialing out the modifying effects of the intervening variables*. However statistical analysis was not the major aim of this study and hence the identification of variables took precedence over statistical robustness.

8.3.3 Practical Limitations

- 1) The sample was primarily decided through ease of access. Still it *did not guarantee uniformity of cooperation* - in 6 firms, only one executive each agreed to participate. Thus the richness of cross-functional and cross-hierarchical perceptions was not fully captured in all cases.

2) The *time constraints on the part of the researcher* also contributed to the limitation indicated above. Interviews were set up in two time blocks to coincide with the researcher's presence in the UK. To the extent possible, return visits were made to firms where all executives could not be interviewed in any one day. But this was not possible for all firms.

3) *Time constraints on the part of external coders* also restricted reliability measures to be applied strictly to a percentage of the sample firms. Though it was not a satisfactory basis for accepting or rejecting variables (on the inter-coder criteria) based on 20% of the cases, it was the best possible in the circumstances.

8.4 Concluding Comments¹

The study of Supply and Strategy is poised for an exciting transformation in the future, bringing with it the challenge of 'new thinking'. Lamming (1993: 258) makes the point that

"there will be three key management tasks in the future: the management of change or transformation, the management of processes, and the management of relationships."

This assertion is based on actual re-configurations taking place, along the value chain, in the industrial world. Increased global operation, rapid technological change and diffusion both along and across value chains, horizontal and vertical sharing of innovation, automation and flexible manufacturing, and sophisticated electronic communication have all led to an altered view of competition to include collaboration as an important element. No longer is ownership of assets an overwhelmingly important element in seeking a competitive advantage; rather it is in the ownership of core competencies and powerful network relationships, which efficiently assimilate the aforementioned changes, that competitive edge is sought. 'Islands' of businesses competing in the individual market place would give way to 'clusters' of inter-related firms competing with other 'clusters' on the basis of advantage all along the value chain. Thus 'collaboration efficiency' becomes paramount within the cluster, leading to 'competitive efficiency' in the final market. The natural culmination of this process is the 'lean production' posited by Lamming (1993).

¹ This section largely reflects the personal observations of the researcher, grounded in the experience of this study, a background of industrial experience in the automotive and cement industry, and a perception of the general trend in the field of Supply and Strategy

In this scenario, the focus of a firm shifts from efficiently managing functions to efficiently managing relationships. The implication for Supply is the formulation of strategies shaped by the concept of interaction between the firm and the suppliers, rather than the formulation of functional strategies which interpret the suppliers/supply market in terms of the 'environment'. The recent emphasis on the concept of industrial networks is ideally suited for the understanding of cooperation and conflicts in interrelationships (Ford, 1990: 542). With the blurring of the interface between the firm and the suppliers, strategic Supply no longer becomes a separate issue to be addressed in the firm's strategy; rather, it becomes an integral element of the overall networking strategy. For the individual firm, the scope of Supply depends on the position that the firm occupies in the supply chain (from 'Mother Earth' to the final customer) and the way it configures itself in that value chain through the identification of its core competencies. The execution of Supply activities is then contingent on the strategic posture adopted vis-a-vis the changing opportunities in the interfaces, and the depth and intensity of relationship sought, with collaborative linkages being the guiding philosophy. The configuration of value chains as outlined here is evident to different degrees in different industries. Lamming (1993) identifies the automotive industry as configuring in this mode to a large extent. The electronic firms in the current study also showed elements of cooperative relationships in the Supply activities. Thus, partnership relations in technology, R & D, total quality, scheduling and pricing were replicated to some extents in the sample.

However, at the other end of the spectrum, there were firms (notably in the textile industry) which were far removed from the integrated operations outlined above. Markets were not global in the sense of global competition among the players. Technology was relatively static and innovations in product features were of a nature which could be largely managed by the individual firm with minimal involvement of a partner. Small sized firms, as well as firms occupying a 'restricted' position in the total supply chain, were invariably 'junior' partners in relationships with upstream units. Though the evidence of 'compartmentalised' functions within a firm was largely absent, there were instances of 'compartmentalised' firms within the total value chain. Firms embedded in a corporate Group also had a constraint on autonomy. Benign supply environments were treated as having no strategic potential by some firms. Strategic Supply in these situations had an entirely different connotation to what is visualised in the 'integrated' operations. In this paradox lies the excitement in the future study of Supply and Strategy.

The contribution of Sako (1992) in visualising a continuum of configurations between the two distinct approaches of Arm's-length Contractual Relations (ACR) and Obligational Contractual Relations (OCR) could be the theoretical framework to capture the range of possible relationships between a firm and its suppliers. As she points out (1992: Ch. 11), organisational efficiencies could be achieved in both types of relationships under relevant conditions. What factors would then impact the strategic choice of the type of relationships (ACR/OCR) for a firm with its suppliers? The answer would have to draw in a host of 'contingencies' (like the contexts identified in this study plus other factors like size, autonomy, the strategic importance of 'classes' of materials and so on) and the importance ranking of these factors to the firm. Thus, not only could different strategic Supply considerations be relevant for firms at different points on the continuum, but it is conceivable that there could be simultaneous implementation of different shades of ACR/OCR strategies by the firm. The unravelling of the conditions which influence the implementation of an ACR or OCR mode of interaction would be one of the major challenges of future research in Supply and Strategy.

DON & LOW LTD.

THE FIRM

Don & Low Ltd. is a member of the Group Don & Low (Holdings) which has two other subsidiaries - Don & Low Nonwovens Ltd. and Tay Textiles Ltd. (Recently there has been an agreement to sell Tay Textiles Ltd. to an international packing Group). Don & Low (Holdings) is wholly-owned by Shell UK. The present Non-executive Chairman of the Group is the Managing Director of Shell Chemicals UK. Ltd. Beside, the Finance Director is also a former member of the Shell Group. The relationship between the two (as enunciated by the Chairman) is to synergise the specific market knowledge of Don & Low and the technical and financial resources of Shell, together with access to Shell's international trading network. Operationally, the Group is viewed by Shell as a stand alone business.

The firm, Don & Low Ltd. is organised into 4 units according to product lines:

- 1) Floor Coverings Division: making primary and secondary carpet backings, and carrier scrims for needle punching and underlays. These are manufactured from polypropylene tapes using traditional weaving methods.
- 2) Industrial Yarns and Fabrics Division: making slit-film yarns supplied either twisted or flat, using extrusion and twisting process under computer control and finding use in curtain header tapes, artificial grass and woven carpets. Fabrics are also produced for industrial/non-industrial uses like packaging for agricultural/horticultural use, furnishing and upholstery, underlays, and base fabrics for carpet tiles. Also, high performance textiles are produced for flexible intermediate bulk containers and for use in packaging and transportation industry
- 3) Geotextiles Division: polypropylene permeable membranes used in civil engineering and construction to strengthen foundations and hold the ground for roads, railway and airfields. It also finds use in soil and coastal erosion protection.
- 4) Jute Division: Woven fabric for roofing and building industry.

Currently, 75% of output is in Floor Coverings but this profile is expected to change in the future with the increase in demand for industrial fabrics/geotextiles.

Historically, the firm was in the merchandising of jute products in the name of Low Bros. In the early 1960s, Low Bros. joined forces with the textile manufacturers Don to form Don and Low Ltd. Jute was still the mainstay with manufacture of jute being added to the merchandising activity. However, moving with the general trend, the firm shifted to the current activity of extruders and weavers of polypropylene, with jute being only a residual activity. In 1986 the whole Group was acquired by Shell UK.

The firm's Mission Statement is articulated as: "Production and Marketing of industrial textiles and related products as a major international business within the Shell Group". The core business is industrial textiles with emphasis on evolutionary development in future, generally in plastics.

The operations are highly capital intensive. Initially, the firm was exclusively a weaver with no expertise in extrusion and so investments were in weaving machines which used tapes from the market as starting material. But as it normally faced problems in sourcing for quality supply of tapes in adequate quantities, the firm moved into extrusion to secure its supplies. Capital investment is now in extrusion/weaving aimed at updating technology, increasing capacity and on computer-aided management

systems. In 1989, the firm saw the completion of an investment of £ 6 m. in equipment like a new carding machine, extrusion equipment and computer systems. Further capital spend in 1990 included £ 2.3 m. to double slit film capacity. Also in the pipeline is the commissioning of a new extrusion line and twenty new looms in 1990, to create additional capacity for all woven industrial textiles. The non-capital spend is in the range of £ 15-16 m. p.a. with polymer accounting for about 50% of this amount. All this has made the firm the biggest extruder and weaver in the UK. market and second only to Amoco in the continent.

The firm has 940 employees and produces 238 m. sq. mtrs. of fabric in a continuous process from polypropylene pellets. Polymer batches are dyed in the extrusion process (as the polymer in itself is not dyeable) and then woven or sold as yarn. For jute products, in addition to its own production, the firm also carries out merchanting operations to supplement its output. Merchanting is carried out through the Sales and Marketing dept.

Production is based on sales forecast made by Marketing and, to a lesser extent, for stocks. A minimum batch size is required for each run which acts as a constraint in the introduction of new products (the firm does not have a pilot plant for producing small batches for new developments). Within the overall continuous operation there is a batching process from the spool yarn to beam to looms to meet the minimum run requirement. The total cycle time is about 6 weeks. The factory operates 5 shifts over 24 hours, 7 days a week. Procurement is centralised for all the 4 product lines and the Purchase manager reports to the Manufacturing Director.

THE PRODUCT MARKET

The firm's product market is defined by the way its divisions are organised along product lines : tufted carpet backings, industrial yarn and fabrics, geotextiles and jute products.

CARPET BACKINGS: This constitutes the major portion of the firm's output (approx. 75% sales.) The firm is the second largest producer after Amoco. Another major competitor is Beaulieu of Belgium who, from being the largest carpet manufacturer on the continent, have integrated backward into backing manufacture and further into polypropylene production. The major markets are in the EEC community, the Middle and Far East, and Australia. 60% of the firm's production is exported. 10% of the Australian market is serviced by the firm - a market which is considered a 'protected market'.

The carpet industry is considered to be fairly mature with the growth rate in the range of 1-2% (this has been the trend since 1984). There is excess capacity in the market leading to low prices and profitability depending on lowest cost production. Mergers and acquisitions remove smaller players from the market. In fact it is anticipated that there will be a big shakeout leaving only 3-4 major players in the field. Carpet backing industry does not face a threat from cheap substitutes from the Far-East. However there is direct competition for backings from non-wovens particularly in certain geometric designs. Likewise German carpet styles are more demanding of primary backing, requiring higher shotings for stability which poses a problem for woven backings. The firm has a non-woven manufacturer in the Group and so is not overtly concerned in this aspect.

INDUSTRIAL YARNS AND FABRIC: Yarns find application in woven carpets, flexible container manufacture, geotextiles and furnishings amongst other applications. Fabrics find use in furnishing, upholstery, underlays for carpet tiles, bulk containers, transportation and packaging. Yarns business has a good potential as it is in a high growth market (geotextiles, upholstery). The fabrics market is perceived to be fairly

mature. The firm's products cater primarily to the domestic users with only about 5% exported (mostly yarns). Competition from Amoco, Scott & Fyfe, Godfreys, and Smith & Nephew is high but the firm sees itself as the leader.

Production of industrial fabrics is not characterised by high technology though there are some high technology applications for the fabrics. However the development of non-wovens is a technological advancement in which the sister firm is considered a leader. Some segments of the market, at the lower end, are threatened by cheap substitutes but this is not a major concern for the firm and it is not as extensive as in polyester fibre textiles. Margins in industrial applications are lower than in polyester textiles but are steadier. Hence the firm continues to concentrate on industrial applications only.

GEOTEXTILES: Don & Low is a leader in this field, manufacturing geotextiles for the construction and civil engineering industries. Applications include strengthening and stabilising ground work, drainage, and prevention of erosion and rock slides. The geotextiles market sees rapid growth at a rate of 10% p.a. (In fact, between 1980-1988, the firm's production increased 100% to 24 m. sq. mtr.). The firm expects to increase its production by 25% in 1990. Being a growing market, there is no fierce competition as there is 'room for all'.

JUTE PRODUCTS: Major applications of the firm's jute production is roofing felt/plasterers scrim where the firm has 35% market share. Other usage is found in furniture & bedding trade, and carpet backings (declining usage). Jute industry has been a dying one over the past 20 years due to substitution by synthetics. Its survival has been in special usage not substitutable by synthetics, or uneconomical for synthetics. There are 3 major manufacturers of jute products in the UK of which only Don & Low does not have any tie-up with importers. The market is affected by cheap imports of jute cloth, particularly from India. To counter this, the firm also goes for 'merchandising' operations by buying in cloth and carrying out only secondary operations before marketing it.

For carpets, jute is no longer in use for primary backing though it still is used in secondaries. This too is on the decline, being replaced by synthetics. For roofing, the traditional British way of construction seems to ensure its usage but this may change in 1992 when roofing standards are expected to be made uniform in the EEC. In furnishings, cheaper imported cloth is in use. The firm does not have a major stake in jute where sales do not exceed £ 2 m.

THE SUPPLY MARKET

The major raw material is polypropylene and the major supply market is the petrochemical industry. Polypropylene was a waste product of polyethylene which was initially burnt off till such time as usage was discovered for it in a number of applications. Since then the usage of polypropylene has burgeoned with an annual compounded growth rate of production of 7% p.a. over the last 20 years. In 1989 there were over 90 manufacturers in Europe itself. World supply (using name-plate capacity) in 1989 was 12 m. Tons, with 32% for fibres and textiles, and 15% for sheet and films for packing, cellophane and food wrap. However the demand for it is expected to taper in the nineties as the demand for substitution by synthetics has peaked.

Supply of polypropylene is adequate and never in shortage. However price fluctuations are high and cyclical, affected normally by the coming on stream of new capacities (which varies from 40,000 T to 120,000 T). Over the past few years price has fluctuated from a high of £ 650 p.T. to as low as £ 380 p.T. three years ago. Prices of the various manufacturers tend to converge as they are all based on the price of a barrel of oil. The usage of polypropylene in woven/non-woven textiles has tended to make them a downstream application for the manufacturers. Thus the major producers of

polypropylene like Shell and Amoco have all acquired downstream units. This tendency to integrate downstream could pose a problem of polymer availability for smaller firms but such has not been the case so far as polymer availability is in plenty, with new facilities coming on stream in France/Belgium.

Quality of polymer varies from supplier to supplier but not very drastically. So, though it may not be possible to substitute from the ends of the quality spectrum, there is a broad band within which substitution is possible. The firm, being wholly-owned by Shell, does have security of supply.

The other raw material is jute/cotton fibre. This is from India/Bangladesh over a long supply chain. The trade is in the hands of middlemen and hence the supply situation is unstable and speculative. The sources are unreliable and procurement has to be by bids through brokers who liaise with the mills. A similar problem also exists for procuring jute cloth for merchandising. The dealers also tend to divert stocks to the spot market, when prices are favourable, at the expense of contracts. All this poses supply exposure for the firm.

Another major purchase is cardboard centres which account for 15% spend but availability is not a problem. All suppliers are local. Similarly, procurement of dyes is also not a problem.

FIRM'S STRATEGY

THE PLANNING PROCESS

The planning process is formal, with a 5 year horizon and annual updates on a roll-on basis. The exercise begins in January and is finalised in July, linked to the planning cycle of Shell, who give the final approval. The responsibility lies with the Strategic Planning Director working with other Directors at Board level. The process is down-up, working with multi-disciplinary parties and coordinated by the Planning Director. The major issues addressed are competitor reaction, market share and new technology. Changes in the environment like integration moves and the polymer situation are assessed. Monitoring of the environment is "conscious and continuous" but not through any formal mechanism. The annual budget is the main tool of performance control.

The annual plan also looks at the profitability of all the lines, and decisions are made as to which products need to be slowed or dropped. This is particularly relevant for jute products whose continuance is decided on a yearly basis.

STRATEGIC FACTORS AND ACTION

The firm's objective is to grow in its current core business of industrial textiles, evolve in the future into plastics in general, take existing technology overseas through joint ventures and search for new technology to manufacture in Britain. In the core business, which is recognised as becoming competitive, it aims to build on profits and market share by being the highest quality, lowest cost producer in the industry. This is to be achieved by developing and expanding manufacturing technology. Simultaneously, the search will be on to find new opportunities to sell world-wide, lead in entering new markets and introducing specialist products, and work with foreign manufacturers to develop new products for local niche markets. The overall thrust is to get across as the 'people with the ideas', being innovative and leading in product development, and to be suppliers of technically advanced products with back-up technical services.

The firm's strengths are identified as having a high performance, automated manufacturing infrastructure (which is continuously expanded and updated through on-going capital investment), low cost manufacturing, good quality, aggressive

'commodity' selling in some mature markets and good customer relations. Search for new technology in the environment for adaptation is on a high profile while evolving in-house technology is at a low key (R & D outlay is only 0.4% of sales). In-house development is also hampered by the fact that there is no facility for small-batch runs as the production facilities require a minimum batch run. The philosophy is to have sufficient market research back-up to justify large volume samples. The search for new technology and new products is limited to the use of polypropylene as the starting material.

Because the firm services a varied product market, the individual strategies are geared to the specific needs of each market.

TUFTED CARPET BACKING: The carpet industry is mature with slow growth (1-2% p.a.). Also 42% of the market is taken by non-wovens. Of the balance, Amoco is the leading supplier followed by the firm. Hence the gaining of market share is only at the expense of other players. The strategy is to have low cost production which offers better quality without price premium, and to offer good technical and delivery support to the customer. Though the firm is primarily a carpet backing producer (75% sales coming from this division) the shift is now towards industrial/geotechnical market, offering high tech. application products. The emphasis is also on developing overseas markets in the Middle/Far-East.

INDUSTRIAL FABRICS AND YARNS: The fabrics market is mature. Exports are negligible. The strategy is sales driven - to market on high volume, low cost basis for furnishing and lower end applications. For flexible containers and other newer applications, the technological aspects are emphasised. Since different segments of industrial fabrics are in different stages of growth and the firm's presence in these segments is also varying, a three pronged strategy of penetration, gain and hold is adopted. Emphasis is placed on export drive through sales as well as joint ventures. There is also a move away from the lower end of the fabrics market which face threats from cheaper substitutes.

Industrial yarns are supplied for market applications which are growing. It's use is in fairly high tech applications like geotextiles, transportation intermediate containers and for high quality, woven carpets and furnishings. The emphasis is on increase in production, achieving technical superiority, expanding sales overseas and setting up joint ventures in export markets.

GEOTEXTILES: This is a fast growing market (10% p.a.) with newer technological applications being opened up. The firm has established leadership in this area and continues to follow that strategy. Also investment is a priority to increase capacity to meet the growing demand (The firm plans a 25% increase in production in 1990).

JUTE PRODUCTS: This is not a major part of the firm's operations. The demand for jute products is reviewed annually to decide whether to continue with production. If there is a downtrend; then the long term forecast is seen to ascertain if the drop is only temporary and a decision is taken whether to ride out the downturn or to drop the product. However no new investments or strategic moves are made in jute.

Once a product line is continued, then plans are made to hold onto its market. Merchanting plays a major part in order to fill any shortfall in meeting demand, in releasing long production runs for the main products and in meeting the threat of cheap imports from India. The firm buys the cloth from India and sells under its own name. These moves are aimed at holding on to traditional markets.

The firm has consciously stayed out of jute carpet backing as it has its own TCB substitute on offer. Also, jute carpet backings require the locking up of capital due to

the long logistic chain. Supply of jute is unreliable which could lead to loss of orders - a factor not present in TCBs.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The annual purchase is approx. £ 15-16 m. Of this 50% is on polypropylene. Jute accounts for \$ 1 m., centre cores for £ 2 m., haulage for another £ 2 m. and the balance is spread over 2000 items from 1000 suppliers - a lot of small orders which includes spares.

Annual quantity of polypropylene is 20,000 T. of which about 70% is from Shell, negotiated monthly. The item is handled as a commodity as it does not involve any detailed specifications. The balance quantity is obtained from the market on short term contracts. This is due to the fact that the price of polymer moves swiftly; availability is adequate and so exposure due to non-availability is not present. Should a critical situation prevail, the firm is assured of supplies from Shell due to the ownership pattern. Procurement of polypropylene is considered significant only in so far as price negotiation is concerned and this is handled by the CEO and the Manufacturing Director with no major role for Procurement.

Purchase of jute, though of a smaller value and for a non-crucial part of the firm's operations, requires greater monitoring due to instability of the sources. Jute is procured only from India/Bangladesh by placing bids through brokers who liaise with the mills. The supply chain is very long, lead time is 3 months, the terms of payment are CAD (Cash against Documents) which means two months in advance of receipts and a further 3 months before sales are realised. Also the sources are unreliable with possibility of default on delivery. Prices also tend to fluctuate widely. Thus procurement of jute is addressed as a concern at the Board level, as the decision to continue the product is dependent on its availability.

Jute price and supply is negotiated at the Purchasing Manager's level. Purchase is on agreements for futures shipment with bids in US \$. The purchase price is projected for a year which helps the overall planning. Spot purchases are also resorted to and there is a swapping of stock even among competing manufacturers. A minimum of 3-4 months stock holding of jute yarn is the practice of the firm.

Centre cores are of cardboard and aluminium. Supplies are not a problem and the firm operates a near-JIT system by getting in supplies twice or more weekly. Aluminium centres, used for extrusion, are recycled 20-25 times in their life while cardboard centres for weaving are used one off. All other items are of minor nature and pose no procurement problem.

The average inventory turnover is 18 times annually, which is considered tighter than industry norm. This is facilitated by the fact that polypropylene is kept in silos on the firm's premises by the suppliers and it is drawn out on consignment basis. Only jute distorts the practice.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Overall Procurement is not considered of strategic importance to the firm's operations. It plays a reactive role to the demands of Production. The Purchasing Manager reports to the Manufacturing Director. As security of supply of the major raw material arises from the ownership pattern, the assurance of supply is implicit in the planning of the major portion of operations. Currently Procurement is in the process of computerising its operations to match the computerised management systems of the firm and this has given the department a strategic attention for this exercise.

TEXTILE A

THE FIRM

The firm is a family concern manufacturing cotton and flax furnishings for converters who print them and then sell to the final consumer as decorative fabric. The firm also produces some fabric for industrial use. The firm has traditionally been 'be-spoke' weavers and intends to continue as such. The annual sales is £ 4-4.5 m. The company employs 85 people. The manufacturing method is a batch process and the method of inventory control is 'Stock Control' using ROL/EOQ.

THE PRODUCT MARKET

The firm produces woven products, primarily for the apparel and furnishing market and, in a smaller measure, for industrial applications. The fabric for furnishings is sold to converters who print/dye them and then sell as decorative fabrics. The firm terms itself as 'be-spoke' weavers, selling to relatively few customers of long standing. The firm does not deal with wholesalers/retailers but only with converters.

The market is not specialised but the number of players is small because of the 'small size of the cake'. Export sales are minor as exchange rates are not favourable and competition from cheaper producers from the Far-East is intense. There is an element of seasonality as off-take is seen to be higher during autumn/spring but there is no strong pattern to the seasonality. Industrial fabrics find application in areas like tarpaulins on containers, hatch covers on ships and mail bags. Synthetic fabrics have made strong inroads into these applications with only mail bags still using natural fabrics. The industrial part of the business is minor compared furnishings and apparel. Being be-spoke weavers, the customer base is quite stable and sustains sales at a steady level.

THE SUPPLY MARKET

The firm's suppliers are spinners of natural yarn like linen, cotton and jute. The suppliers are mainly from UK with a couple of suppliers being from other EEC countries. Yarn availability is not a problem and is not considered an area of exposure. In all, the firm deals with 12 suppliers for its total input.

FIRM'S STRATEGY

STRATEGIC FACTORS AND ACTION

Because the firm is in a stagnant/declining industry but with its own base of steady customers, there is no formal strategic planning. The strategy is aimed at producing what the customer wants, within the limits of capacity. Recently the firm increased its capacity in line with the firm indication of increased off-take by its customer base and is operating to that full capacity. Any further increases in demand will be catered to only through increased productivity/ increased shift working.

Much of the firm's thinking is guided by the aspect of its long-term relationship with the customer base. Design and production is geared to their expressed needs. The firm does not contemplate finishing its own fabric as it would bring it in direct conflict with the existing customers, besides requiring investment in sales and marketing. The firm also does not manufacture for stocks except in rare instances where the off-take of specific items has been historically steady. Hence it does not have a conventional sales force. Sales are mostly finalised by the Sales Director and the Managing Director. Advertising is restricted and only in trade magazines. There is no attempt to compete with volume manufacturers for market share. The firm's strength is in making small

batches of fabric requiring greater skills than volume produced goods. The firm also does not intend to diversify into synthetic fabric production because of the investment requirements of specialised machinery for synthetics production. Though it is technically feasible to modify the natural fibre weaving machines to produce synthetics, it would not be economical and the firm would not be able to compete with specialised synthetics producers.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The firm's annual purchases are in the region of £ 3-3.5 million, spread over 12 suppliers. Availability is satisfactory and none of the inputs are considered as 'critical'. The firm operates a stock control system based on ROL/EOQ. Average inventory holding is 3 weeks of production.

Procurement is predominantly based on contracts (85% of purchases are usually placed in blanket orders at a fixed price and off-take mutually agreed later). Supplier dealings are on long term basis though relationships are not very comfortable because the nature of the business requires the driving of hard bargains on price. Supplier selection is from among small suppliers who can supply economically and also be flexible enough to respond to any fluctuations in demand from the customer for a different type of cloth. Such demands have normally been met comfortably and there have been no exposures from the supply side on this account.

As a majority of the end products are predictable and steady in off-take, the firm finds it possible to 'speculate' by covering for larger quantities than required by specific sales orders, when the price of yarn is favourable. This gives the firm some scope for speculative cost advantage on the input side.

Consistency of quality in the supply of yarns is very essential as the downstream process of dyeing/printing of the fabric is tied to a specific quality of yarn. Any variations tend to affect the quality of the downstream process. The firm minimises this risk by staying with the same, long-term suppliers and carrying out strict quality evaluation of suppliers and testing of input materials.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

All major supply decisions are handled at the Managing Director's level with the Procurement cell handling the day-to-day operations. Being a small firm, decisions cover the complete manufacturing chain and supply factors get automatically included.

TODD AND DUNCAN LTD.

THE FIRM

Todd and Duncan is a part of Dawson International Plc. which has in its fold more than 20 companies, world-wide. The Group is organised into 4 divisions :

- 1) Cashmere Knitwear and Fine Yarns Division, comprising 9 companies dealing in products like luxury branded knitwear, fibre processors, spinners and dyers.
- 2) USA Division, comprising 3 subsidiaries in thermal underwear, knitted sportswear and shower curtains.
- 3) Spinning and Weaving Division, made up of 3 companies and 1 subsidiary manufacturing upholstery fabrics for aircraft and spun yarns for the carpet industry.
- 4) Fur Fabrics Division, made up of 3 companies in speciality fabrics like fleece. In addition, there is an Overseas Sales Organisation.

The firm, Todd and Duncan, is in the Cashmere Knitwear and Fine Yarns Division, carrying out spinning and dyeing of cashmere and other high quality yarn.

HISTORY: Founded in 1867 at Alva in Clackmannshire, Todd and Duncan acquired the Kinross mill in 1895. In 1906 the Alva mill was completely destroyed by fire. The company then consolidated in Kinross, where the present mill is situated. Up to world war two, the yarns produced were primarily for the weaving trade. After the war, the firm set up the spinning of fine cashmere and other speciality yarns for the knitwear industry. In 1960, the firm secured a controlling interest in Joseph Dawson Ltd. who were the suppliers of raw materials for Todd and Duncan. This was the beginning of the present Dawson International Plc. with its 20 companies world-wide.

THE PRESENT COMPANY: Todd and Duncan is the only speciality spinner (of cashmere) in the Dawson Group, supplying dyed cashmere yarn to the downstream knitwear company Ballantyne and high-quality yarn to another knitwear company, Pringle. The firm is also said to be the world's largest spinner of cashmere.

The firm employs a total of 400 employees and had a turnover of more than £ 40 m. out of the total Division sales of £ 149.2 m. (1989-90). The firm's volume of sales and profit were adversely affected in 1989-90 by the high cost of raw materials, the reduction of stock levels in the pipeline leading to some orders not being fulfilled and the lower cashmere sales by both Group and non-Group companies, to some of whom it supplied the yarn. The lower sales were due to milder winters everywhere and the turning away of focus from woollen knitwear in the world fashion cycle. It is expected that this trend will be corrected in the coming year.

The firm is headed by the Managing Director who is a member of the Dawson Group Board, with the functional Directors (Personnel, Production, Finance, Technical, and Sales & Marketing) reporting to him. The Raw Material Manager is placed below the Technical Director; however policy decisions for the procurement of cashmere as raw material is handled at the Managing Director's level. Only a part of the firm's output is supplied downstream within the Group; the remaining is sold to non-Group knitters and hence the presence of Sales and Marketing function at the top level.

The firm's capital investment is primarily to increase capacity - the latest being the installation of a Carding machine a couple of years ago. Capital investment to up-date technology was only in the introduction of electronic control of operations of existing machinery. This is because there is no radical advance in the spinning process technology of cashmere, which is still oriented to skills gained through experience. Production is basically batched according to the various shades and colours required in

the dyeing process. Quality control is carried out at the process level and also at the finished product stage, particularly for 'visual' and 'feel'. Quality standards for the finished yarn specify weight and strength (measured using test equipment), shade/colour variation (visually) and feel or 'handle'. 'Handle' is determined by feel of the yarn and is established only subjectively, through skill and experience.

THE PRODUCT MARKET

The firm's major products are dyed cashmere yarn and speciality yarn, primarily for the high-class knitwear industry. As it is only a spinning and dyeing firm, the demand-pull for its products is dependent on the demand for the high quality woollen knitwear garments, particularly in the leisure-wear sector. The main Group companies servicing this knitwear sector are Ballantyne and Pringle.

The major market for cashmere is in Europe (Italy and UK), Japan and the US. While 50% of the firm's production is sold to the Group companies, the balance 50% is sold to non-Group knitters. In Europe, Italy is the major market. The firm has 15% of that market. It is precluded from a bigger share because of the lag in response time to the market's demand, as dealers usually take yarn of slightly lesser quality rather than miss out on timely delivery. The firm finds the cost of stocking the whole range of its product at the Italian end to be prohibitive and hence is obliged to forego market share. The direct sale of yarn to Japan is not substantial because of the geographic distance (though the Japanese market is tackled by the downstream Group company, Pringle, opening a liaison and representative office for their knitwear and non-knitwear sales, while a joint venture was set up with a Japanese company to distribute Ballantyne cashmere). The nature of the cashmere market is such that the off-take could be of small volumes and large variety e.g. Pringle, who make about 40,000 sweaters annually, has over 60,000 design variations, sometimes produced in ones and twos. This requires the stocking of a wide range of yarns by Todd and Duncan, who hold £ 12 m in stock in various stages. As a result, the firm has the advantage of being able to service small, non-group knitters who cannot afford to hold large stocks themselves. The market being exclusive and fashion-led, a high price is paid for quick response.

These factors are one of the major barriers to entry in the cashmere market. The firm sees itself as having a dominant position in a segment which may not be populated by more than 5 major players. The only competitor of comparable operation in the UK is Hinchcliff in England. The others are much smaller than Todd and Duncan; Weensland, belonging to Courtaulds, produces about 25 T a year which is about 10% of the firm's output. In Europe, and specially in Italy, the competition is steeper particularly from Italian firms. Even though Todd and Duncan have a superior process (the introduction of colour in the raw material itself while the Italian firms hank dye i.e. manufacture white yarn and dye in pots) which gives a better consistency of shade from batch-to-batch, the inability to respond quickly in a distant market blunts this otherwise competitive edge. The market segment is not open to threats of cheap substitutes from the Far-East (even though the raw material comes primarily from China) because it is not a mass production market, the skills required to process cashmere are not found in the Far-East, the market shows strong preference for known brands and the inaccessibility of traditional distribution channels to outside producers proves a deterrence.

THE SUPPLY MARKET

The major raw materials are de-haired cashmere and high-quality wool. Both these raw materials are supplied 100% by the upstream Group company, Joseph Dawson Ltd. from Bradford. However as the procurement of raw cashmere/wool is very critical to the existence of the firm, Todd and Duncan plays a proactive role along with Joseph Dawson to secure supplies.

The source of fine cashmere of a quality acceptable to the firm is obtained only from Inner Mongolia in China. Almost 95% of world supplies come from here. While other regions like Iran/Afghanistan/Outer Mongolia also try to produce cashmere, it is of a coarser variety than China's and is suitable only for woven/open-knit cloth and not for fine knitwear.

Fine cashmere is the soft hair that is combed from the under-belly of the wild mountain-goat. This is usually done by the hill women and collected by traders who then sell to the agents of the manufacturers. Up to 1986, the trade was controlled by the Chinese Government for whom the sale of cashmere was a source of hard currency. Todd and Duncan were dealing with controlled traders and faced no problems with either quality or supplies. In 1986 the Chinese Government de-regulated the cashmere trade. This had many adverse effects on supplies: 1) A number of 'free-enterprise' traders rushed in, particularly from Hong Kong. These traders, with no previous experience of cashmere, tried to deal in it as a general commodity leading to a 'corruption' of the trade. 2) The newer traders also tended to mix cashmere with other wool, leading to large-scale rejections. 3) Some traders tried to part-process the cashmere (i.e. scouring/de-hairing) and charge an excessive price for the value addition. However they had neither the appropriate equipment nor the traditional know-how (which firms like Todd and Duncan had built up over a 100 years). This led to poor quality and declining sales. 4) There was an attempt by traders to hold back supplies to create artificial shortages and hike prices. This did not succeed as the new crop of cashmere started coming in irrespective of unsold stocks. Thus unsold stocks would pile up.

These factors led to a difficult supply situation from '86 onwards till in '89 the Government once more introduced regulations which eased the supply situation. Even though this is a restricted supply market, certain threats to the market like takeover of the sources by competitors is absent. There is also no threat of alternate use for the raw material. The possibility of the Chinese 'integrating forward' to convert the raw materials themselves does not exist because of the speciality nature of the final product. Thus, even though it is a very restricted supply market, there is an element of stability. However, the fact that the market is in the exclusive control of one Government and the fact that competition for this source is open world-wide makes it an area of strategic concern for all manufacturers.

For non-cashmere wool the sources are directly from farms in the UK and Australia, through agents. These sources are readily available and not a matter of concern to the firm. Likewise, dyes for the colouring of wool/cashmere are readily available from the chemical industry.

FIRM'S STRATEGY

THE PLANNING PROCESS:

The Strategic Plan for the firm is formulated by the MD and the functional Directors and matched closely with the Group's plans. The formal plan has a horizon of 3 years, driven by sales projections. Three years is considered a long period in the 'fashion' industry and the plans are kept flexible enough to react speedily to changing trends in the product market. Yearly business plans and the budget are then derived from the three year plan. The plan is constantly monitored and modified in line with actual and market trends.

STRATEGIC FACTORS AND ACTION

The firm's strategy has to be viewed in the context of the Group's overall strategy. The overriding aim of the Group is to compete successfully in the market through a specialised portfolio of products aimed at achieving a strong market share and having a potential for growth in the textile industry. In pursuit of this aim the Group has

developed a strong spread of high margin businesses, consolidated into 4 major Divisions. The Cashmere Knitwear and Fine Yarns Division, in which Todd and Duncan is located, has a premier presence in the world cashmere market (through Ballantyne Cashmere) and the leisure wear market through Pringle (knitwear and non-knitwear). These, and other market segments serviced by other Group companies, have the characteristic of being high value, niche markets with high entry cost barriers and potential for growth.

Todd and Duncan's objective is to support the Group through its speciality activity of dyeing and spinning of cashmere, and to carry out this activity to the best possible advantage of its stakeholders. The articulated policy is to serve customers effectively and efficiently, to maintain and improve its reputation as the producer of highest quality woollen-spun yarns, to maximise return on capital, and to follow good employment practices.

Product strategy is based on quality. This is addressed through building on the historically developed skills in spinning, through following a critical strategy of procuring quality raw materials and through closely monitoring the production process. Technological advancements in production process play a relatively secondary part. The firm adopts a large stock holding policy to cater to the small volume off-take of a large variety of yarns (differentiated in colour and shades). Marketing function is of strategic significance as nearly 50% of the output is sold in the open market outside the Group. Though the cashmere industry is fairly mature, product innovation is a key concern and takes the form of newer colours and shades to cater to (and shape) the fashion trend.

Technological changes affecting capital investments are not major and market fluctuations are addressed more through product innovations which basically use the same equipment. Capital investment is guided primarily by the forecast of overall market growth which may require capacity addition.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The major supply area of strategic concern for the firm is raw cashmere wool. The supply chain is geographically extended, there is only one region from which all manufacturers world-wide get their supplies, the trade is regulated by the Chinese Government and could be influenced adversely by any policy changes. As the firm is predominantly a spinner/dyer of cashmere, supply security is very crucial.

Quality of raw material is also very important as even minor contamination would call for rejection. This requires a major investment and effort to ensure quality. Therefore even though the firm gets its supply from the Group company at Bradford, it plays a proactive role in the raw material market. (The full requirement of Todd and Duncan's cashmere requirement accounts for 50% of Bradford's output)

To ensure long term security of supply and consistency of quality, the firm and the Bradford unit have finalised a 10-year agreement for purchase of raw cashmere from Inner Mongolia. This is said to be the first agreement of its kind in the industry. The agreement is subject to price review from time-to-time. The Bradford plant has also set up testing facilities at Hong Kong to check quality before shipment. Purchase from Bradford is on value-added basis and is open to negotiations.

Incoming supplies of semi-processed cashmere is accompanied by quality certificates and is also checked on a bale-by-bale basis at Todd and Duncan. Quality checks at 2-3 levels emphasises the importance of raw material quality for the firm. The firm requires the Bradford company to hold some finished goods stocks at their end to cover for any exigencies. While in normal course all supplies are received from Bradford, the firm

can contract out if it so desires but this has not happened so far (as the effort in ensuring quality and timely supply from any other source would be very high). Because of the crucial nature of raw cashmere supplies, it is handled directly by the Managing Director.

Non-cashmere wool is not considered as critical as cashmere because it is more readily available in the UK market, and also because it forms a smaller portion of the firm's operations. Here the purchase is both from Bradford and the open market on the basis of specification and negotiation. Supplies are negotiated on estimated off-take per year, with firm contracts for 3 months. An alternate possibility is to buy from Australia through agents. However, though the quality is comparable and the price is cheaper, the minimum quantities are high and hence this route is considered only in an emergency.

Other materials, like dyes, are not considered a problem. The firm works closely with dye suppliers in the development of newer colours and shades that aid in end-product innovation

ROLE OF PROCUREMENT IN STRATEGIC PLANNING:

Supply considerations for raw materials are important enough for the decisions to be taken by the MD. Procurement department however has only a functional role of implementing the strategic decisions and is not a direct participant in the planning process.

TEXTILE B

THE FIRM

The firm is a member of a world-wide organisation employing over 5000 people in 30 plants spread around the US, the UK, France, Germany, India and Japan. The organisation is in a number of fields like medical products, wires and cable, electronics, microwave coaxial cables, textile laminates, filtration membranes, fibres and sealants and industrial filtration. Started in 1958 from a marketing idea developed for specialised electronic wires insulated with polytetrafluoro-ethylene (PTFE), the organisation has grown to its present status due to technical innovation and a philosophy which aims at developing the individuals in the organisation to their fullest capacity. The organisation limits its manufacturing plant size to a maximum of 200 people, helping to improve personal commitment and allowing quick reaction to the market.

The various operations of the organisation are structured into Divisions (Textiles, Medicals, Electronics) with each Division having autonomous, manufacturing facilities in various countries. In the UK there are 2 plants of the Electronics Divisions (in W.Dundee and Dunfermline), 2 of the Industrial Products Division (E.Dundee and Livingston), 1 plant of Textile Fabrics Division (Livingston) and an office in S. England. The firm under study is the *UK plant of the Textile Fabrics Division at Livingston*.

The organisation's entry into textile manufacture arose from ongoing research into the characteristics of PTFE. In 1969, the current President of the organisation discovered that extruded PTFE shapes could be stretched at high rates to produce a very strong and porous material. PTFE is basically a very inert polymer which has good water repellent characteristics. By stretching it, a high degree of porosity (9 bn. pores per sq. inch) was introduced. This opened up the possibility of use in applications which could be waterproof (water in liquid form did not penetrate it) yet allowing 'breathing' (water in vapour form could 'escape through the pores). Combined with its basic rugged characteristic, this membrane became the foundation of the Textile Division.

The Textile Division world-wide has been in existence for about 20 years. The UK textile operations started as a small plant in Dunfermline about 10 years ago. The Livingston site was initially a Sales office for the US operations. It moved to manufacturing textiles about 6 years ago and currently does all the textile manufacture for UK with Dunfermline moving to Electronics.

The firm produces textiles for a variety of applications like rainwear, jogging suits, outdoor sports like skiing/mountaineering/canoeing, military wear and firemen's wear. The firm manufactures in-house only the membrane. It buys in suitable fabric, both woven and knitted, which is combined with the membrane on a Laminator. The basic construction of the textile is an outer fabric which is waterproof, then a middle layer of the PTFE membrane which keeps out the wind as well as allows body moisture to escape and an inner fabric which does not restrict movement of body moisture away from the body. The membrane is either bonded to the outer fabric or hangs freely between the outer and inner layer depending on the application. The finished textile is then trimmed, inspected, cut to length as per the order and sent to a bonded stores for final quality check before being released into the general stores. The firm works closely with garment manufacturers to arrive at the desired combination in the textile.

The process is a continuous process for making the membrane with batching as per colour and different application when it comes to lamination. The firm runs two shifts with a skeleton night shift to clean and reset machines for next day's start. The operations are partially computerised - process monitoring, feed control and statistical

process quality monitoring are computerised. TQM is also being implemented to some extent but final inspection is still manual. There is still a degree of subjectivity in what is or is not a fault and this is done by going through the material 'yard by yard'. However, where possible (like colour measurement), computerisation has been introduced and the attempt is on to try and reduce the subjective elements.

The firm operates autonomously, even in the area of sales and marketing. The total approach to quality and marketing is coordinated in a meeting of the different companies of the Textile Division but basically each company is free to follow its own policies. The companies are also free to order from others in the Division and sell in their area following an agreed method of transfer e.g. The Swedish unit which sells in Scandinavia could order textile from manufacturing units in UK/Germany/Japan.

The firm, in keeping with the organisational philosophy, is not organised as a hierarchical authority structure - the classical pyramid. The firm has a 'lattice' structure where each member is linked to other members directly as required functionally, without having to go through a path involving intermediate authority. Titles and authoritative positions are avoided as far as possible - the organisation works on 'voluntary commitments' rather than 'orders'. The aim is to create a special atmosphere and a basis for confidence which can be creative and productive.

THE PRODUCT MARKET

The firm's fabrics are primarily sold for glove and hat inserts, jackets, ski-suits and various other outerwear. The most significant end-use is in apparel for sports and leisure, industrial workwear, military clothing and medical garments and covers. The firm markets its fabric in the UK and Ireland, Commonwealth countries like Australia and New Zealand, S.Africa (0.01% of sales) and one special product to Canada (which is normally serviced for most of the fabrics from the US). Some sales are also made to Europe even though there are other sister units manufacturing in Europe. The firm does not sell directly to the garment retailers or to the public but works with garment manufacturers to whom the fabric is sold for conversion. In the case of glove and hat inserts alone, the firm finishes the inserts (in its cut and sew unit) and sells to the retailers. Even here the firm is looking for a manufacturer to do the conversion.

The application of the firm's fabrics is in the upper segment of the apparel market. The technological edge it enjoys allows it to price the product high without fear of attack by competition. The firm does not compete in the mass produced cheaper segments which are dominated by Far-East suppliers. The firm chooses to deal only with manufacturers who work in the upper market segment.

Sports and Leisure applications form the most significant portion of the firm's output and the firm is perceived as the leader in this field even by the competition. The leadership derives from its technological superiority in fabric manufacture - the laminates are the most technically advanced product in the market. Berghaus is the single largest converter for the firm in sports and leisure business in the UK. Berghaus in turn markets apparel made of the firm's fabrics overseas also e.g. ski-suits in Germany. In the UK the predominant sales is jackets. Besides Berghaus, the firm has 3-4 other significant manufacturers in sports and leisure. The significant converter for uniform and corporate clothing is Practical Uniform Co. Ltd. The major end-user of uniforms is the military.

The firm is not overtly dependent on any one converter/manufacturer, with the largest account being 10-15% of sales. The major competition comes from a new entrant, a Dutch Company manufacturing in Germany. Some competition also comes from Japanese fabrics but it is not considered significant. There is no danger of cheap Far-East fabrics substituting for the firm's product as the Far-East fabrics are popular only in the lower end of the jacket market and is not acceptable to the upper segment in

which the firm operates. The firm therefore feels its market is intact and growing as newer applications are discovered for its fabrics.

THE SUPPLY MARKET

The firm's major purchase is fabrics which constitutes 80% of purchase spend. The purchases are predominantly of synthetic fabrics with very little natural fibre fabrics for some special applications. The synthetic fabrics fall into four categories - PTFE membrane which forms the intermediate lining, woven fabric for the outer lining, some non-woven fabric for inner lining of tent material and knitted fabric for outer lining.

PTFE membrane is bought from other Group companies in the US and Japan. This is the proprietary technology fabric which gives the firm its competitive edge and its manufacture is in-house in order to safeguard technology. The transfer of the membrane to the firm is as per pre-agreed procedures in the organisation policy. All other fabrics are bought from synthetic fabric manufacturers in the market - the firm does no spinning or weaving.

Synthetic fabric is reasonably a buyer's market with suppliers 'beating a path to the buyer's door'. There is over capacity with very few exceptions, like in military fabrics during the Gulf War. The firm buys to stringent specifications as agreed with the apparel manufacturers who are its customers. Though this restricts the supplier base to those who can meet the specifications, it is still a situation of surplus availability. The only factor which may bring some instability is the big chemical majors like ICI and Hoechst who supply the synthetic yarn to the weavers/knitters. These companies could affect availability by their decisions to rationalise yarn production. Hence, even though they are two steps removed from the firm's direct supply market, the firm keeps a close watch on their moves.

Technological changes in the production of synthetic fabrics has not been much recently. The only changes are fashion changes in the final apparel market but the suppliers of fabric are responsive to the demands communicated by the firm. A recent innovation in synthetic fabric manufacture is the introduction of microfibrils as an alternate to coated PUs but this has no major impact on the firm's operations.

Other than textiles, the firm buys some chemicals needed in its process which is small in value and does not pose a problem of availability.

FIRM'S STRATEGY

THE PLANNING PROCESS

The firm has a formal planning process with a 3-year horizon which is found to be a fairly long period in textile industry (the Electronic Divisions plan for 5 years). The first year of the 3 year plan is detailed as the operational plan for the firm.

The plan is guided by financial targets set at Corporate level, which forms the objectives for the firm. The planning at the firm's level is carried out by a number of teams at two levels. The first level team comprises the Business Leader, the Manufacturing Leader and the Company Secretary to coordinate and oversee the whole process. The second level comprises a number of functional teams addressing their functional inputs to the overall plan. The composition of these teams includes a Materials representative, a Production representative and one representative from Sales and Marketing for each specific area like Military/Industrial/Sports.

The plan is initiated from the second level teams and is basically led by forecasts from the Sales and Marketing representative. The forecast is adjusted in view of Manufacturing/Materials constraints and the final plan is formulated. All the plans at

this level are then consolidated for the first level's approval and formulation of specific strategies. The whole process is interactive amongst the various teams involved.

STRATEGIC FACTORS AND ACTION

The major factor from which the organisation derives its competitive edge is the unique proprietary process of membrane manufacture and lamination which differentiates its products in the market. All strategies stem from maintaining this advantage and deriving the maximum benefits from it.

R&D is an important part of the strategy and this is handled directly at the Corporate level. However product application is handled by the firm through a constant search to find wider applications for its fabrics. In this search the firm works closely with the converters who form its immediate customers, and with suppliers who bring in innovations from the supply market.

The firm emphasises product differentiation and prices the product accordingly. Cost considerations are secondary to business growth. Hence the key function is Marketing and Sales; the firm does have some excess production capacity and inventories to take advantage of any increases in sales that may occur at short notice. Sales efforts are guided by Corporate guidelines that the firm should not compete in areas earmarked for other sister units. But the firm can push products which are unique to its manufacture in markets normally serviced by other units.

Fashion trends affect the firm's products - hence it does not hold too large a stock of finished goods. In fact, as the basic fabrics are more or less same for end product applications, the firm commits to a relatively larger level of 'greys' (undyed fabric) stock with the suppliers and then adds on value like dyeing/lamination as required. The firm classifies the end-products into two categories - fashion sensitive and fashion stable. The former are produced only to orders while some stocks are kept for the latter.

Manufacturing is a major player in meeting demand as well as keeping abreast of process technology. Actually only the lamination process is carried out at the plant while dyed fabric is bought from vendors. Hence the Materials function has to closely tie-in its operations with Sales/Manufacturing. However given the supply market situation, the plans generally assume material availability.

Capital investment decisions are normally taken at the firm's level, unless it is a major investment like the addition of another lamination line or a new building in which case it is referred to the Head Office in the US.

A major area of strength is the organisational philosophy which emphasises teamwork and commitment among the people in the firm. The fact that there is no hierarchical structure but a functional relationship amongst the people helps in building confidence and creativity.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The firm buys over 2 million meters of cloth annually, mostly woven or knitted synthetics. Fabrics constitute 80% of the value of purchases. The firm has 12 - 14 suppliers of whom 3 are in UK. The rest of the suppliers are from Scandinavia, Ireland and the rest of Europe. The firm does not buy from the Far-East because of quality considerations. Two of the overseas suppliers for the lining fabric are Group Companies in the US and Japan. Fabric buying is the most crucial aspect of purchasing and all procurement strategies are focused on it.

Availability of fabric and suppliers is not a problem - however the lead time along the supply chain is very long. From the yarn stage up to processing at the firm, lead time would typically be 20 - 26 weeks for standard fabrics and even more for special fabrics. Also the variety of fabrics purchased is high depending on the application and prevailing fashions which makes stocking of fabric expensive. The policy is to order 'greys' (undyed fabric) largely to forecast and then to dye according to bespoke orders so that inventories are held without high value addition. Invoicing is on dyed fabrics and not on greys and this helps in control of inventory. Certain standard colours not expected to be affected by fashion are ordered directly as per the sales forecast. Requirements of certain long-term customers (like the ministry of defence) with stable demands and not affected by fashion are also bought to forecast.

Quality considerations are important because the firm offers long term guarantees on its products. The firm has recently qualified for BS5750 which requires the firm to get certificates of conformity from the suppliers. The firm works closely with the suppliers to get it right first time on quality. The aim is to try and eliminate in-bound quality inspection at the firm's end, which could also contribute to cutting lead times. The firm has already achieved this with one supplier while inspection of supplies from two others has been drastically reduced to 10-20% level.

Even though the fabric market is a buyer's market, the firm works closely with a few chosen suppliers, preferring to have long-term contractual relationship with them. This is because the process of qualifying a supplier is very long. As the firm guarantees its end products for a long period, the ability to switch fabrics and suppliers without prolonged testing and proving is difficult. Secondly, fashion changes in the firm's product market require the suppliers to respond quickly to meet the firm's needs and this is better achieved with a smaller supplier base. However the firm prefers to have at least two sources for each fabric rather than work with one source, except where the volumes are small. Where requirements are over 100,000 meters the firm generally qualifies two suppliers.

The selection of suppliers is made after a quality audit carried out by Purchasing and Quality Control, a Dun and Bradstreet check for assessing financial stability, and assessing the supplier's interest in a long term relationship with the firm. To some extent the preferences of the firm's customers could influence the choice of the supplier, e.g. the military requiring that fabrics be bought from UK suppliers, but this is not the overriding criteria. The firm prefers not to deal with suppliers who also supply to their competitors.

The firm ideally seeks suppliers where 10 -15% of their output is committed for the firm. This makes the firm reasonably important to the supplier without an over dependency of the supplier on the firm. The firm also prefers to deal with suppliers who have greater autonomy than one with a large holding company, as autonomous suppliers are perceived to have greater flexibility in responding to the firm's needs. Quality, flexibility, continuity and long -term relationship guide the firm's choice of a supplier base. Once a supplier is established the firm works closely with them, exchanging as much as 6 visits annually for coordination and cooperation.

Because the fabrics are synthetic, prices are affected by the movement of oil prices. The firm's negotiation policy is not to emphasise lowest prices at the expense of quality. As the firm is selling a unique, quality product (having moved into textiles from an engineering and technology background), which commands a high price, cost is not the main criteria in the overall strategy. The firm normally negotiates a price structure for one year but is agreeable to six monthly reviews in times of oil crisis. The firm believes in fair dealings with suppliers that results in mutual benefit. It is expected that should the supply situation tighten, the firm will be preferred by suppliers because of their policies.

The firm seeks to involve the fabric suppliers in new design and development. The suppliers' knowledge of fashion trends, new fabrics, and new usage of existing fabrics is tapped by the firm and incorporated in its own innovative efforts. There is a close linkage amongst the supplier, Purchase, Marketing and Development. The firm does not have EDI linkages with suppliers but is working towards establishing the same.

This involvement of suppliers is one of the ways the firm monitors the textile environment for changes. This is one reason the firm focuses on long-term relations, to draw on the benefits of the supplier's experience. There are specific agreements with suppliers to have first option on new fabrics before it reaches the market place. The firm participates in industry conferences, seminars and exhibitions as other forums to monitor the textile industry.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

The function does not have a major role to play in formulation of business plans at the Corporate level. But it has a strategic role in implementation of the same. Quality and lead time management are crucial aspects of Purchasing's role. Also involvement of suppliers in development is of strategic significance to the innovation thrust of the firm.

SMITH AND NEPHEW TEXTILES LTD.

THE FIRM

Smith and Nephew is a world-wide Group primarily in Healthcare, Medical supplies and equipment, Pharmaceutical products, Textiles and Plastics. The Group operates through a network of wholly-owned subsidiaries and related companies. In the UK, the Divisions are Smith and Nephew Pharmaceuticals Ltd, Smith and Nephew Medical Ltd, Smith and Nephew Consumer Products Ltd, and Smith and Nephew Textiles Ltd. This study deals with the core activities of Smith and Nephew Textiles Ltd. - the Textile Division of the Group.

Historically the organisation had its inception in a small chemist shop set up by Mr. Smith and his nephew to sell cod liver oil and similar products. In addition to their own manufacture they bought products to supplement their range - one of the bought-out products was textile substrate. Around 1950 it was decided that they would manufacture textile substrates themselves on a farm land bought by the organisation for that purpose. By then the whole textile industry in Lancashire was in dire straits with a number of mills closing down. The firm decided not to proceed with constructing its own mill but to buy up mills which were faced with closure - they obtained 11 different mills in Lancashire. The mills were acquired for their site, equipment and appropriate products. In the process they acquired, as a package, a number of other assets. These diverse acquisitions were continued as activities and this led the organisation outside its core of healthcare into apparel and denims. This was considered a part of the firm's textile activity which was to be carried on as long as profitable. The entry into plastics (polypropylene) was as a result of the decline of cellular blankets usage in hospitals. The Rochdale site was converted to polypropylene manufacture in the 1960s.

Since then the Group expanded in the UK as well as overseas and classified its diverse activities into core activities (dealing with healthcare products) and non-core (like denims, coloured woven apparel and polypropylene). The Textile Division (Smith and Nephew Textiles Ltd.) was organised into six profit centres - three in the core activity (Medical Textiles, Surgical Dressings and Knitting Business) and three in the non-core activity (Polypropylene, Coloured Woven Apparel and Denims). In 1991 the Polypropylene and Coloured Woven businesses were disposed off.

Medical textiles makes fabrics for substrates, plaster of paris, finger dressing and bandages; Surgical dressings converts fabrics to swabs and bandages; and Knitting business manufactures knitted bandages and substrates for synthetic splints, as opposed to plaster of paris.

Each profit centre unit of the Textile Division is headed by a Director and General Manager. The exception is the Knitting business which reports directly to the Managing Director through a General Manager. Support activities like Personnel, Finance, Engineering and Purchase have Divisional heads as well as managers in each profit centre unit. Research and Development is at the Central Group level (coordinating for all the Divisions of the Group) with a Divisional component for technical development. Process technology is devolved to profit centre/site level. Quality Control is coordinated at Divisional level through the Central Divisional Laboratory. At the Divisional level, Technical reports directly to the MD, Personnel reports to a Divisional Director and Purchase reports to the Divisional Financial Controller who reports to the MD. The total reporting structure for the Textile Division has been organised based on the skills of the Directors as well as availability of time. The apex body for the Division is the Divisional Board comprising the MD, the Directors, Sr. Divisional Managers and General Managers of each profit centre.

Medical textiles employs 700 people and a sales turnover of £ 19 m. Surgical Dressings has 450 people and £ 16 m. sales, and Knittings has 100 people, £ 5 m. sales.

THE PRODUCT MARKET

The products from the core units are sold primarily to downstream Group companies for further processing before being sold to the final customer. As such the firm has a captive customer for its products within the Group. This is a result of a Board decision at Group level and shields the Division from direct market competition. Less than 30% of sales is made to a fixed customer base outside the Group.

Medical textiles market is quite profitable although there is pressure on the firms in the business to maximise their operational efficiencies. There is no major threat of substitutes for medical textiles - in fact the only move in the direction of substitution is the use of non-wovens in swabs in place of wovens. This substitution is also not universal and does not affect the firm which has both woven and non-woven processes. Likewise close knits are replacing open-knit cloth but the firm has the capacity to produce both types.

The firm sees itself as one of the market leaders in medical textiles manufacture - even some of the Group's competitors in healthcare end-product market buy the firm's textiles. The Division is the only major textile firm in the Group's world-wide activities.

THE SUPPLY MARKET

The major commodity purchased is cotton which is traded world-wide. The supply market for the firm is basically world-wide but the firm deals through a domestic-based broker who deals with different merchants world-wide. In general availability is not a problem and decisions are based on cost and quality. Being a natural fibre, each new crop depends on various factors like climatic and soil conditions which vary yearly and so the quality has to be continuously assessed. The suppliers have to submit a test certificate with each lot. In general the American market is perceived to be a sophisticated supply source while the Far-East sources are perceived to be inconsistent in quality and delivery.

The firm also purchases yarn to supplement its own spinning and the market situation is similar to that of cotton as regards quality and availability.

FIRM'S STRATEGY

THE PLANNING PROCESS

The Strategic Plans for the core businesses of the Division are formulated at the Group level and the Group strategies filter down as objectives for the Division. As such there is lesser planning autonomy at the Division level. The fact that Healthcare operations are world-wide and most of the textiles for all the Group companies is supplied by the firm makes Group coordination imperative.

Within the parameters laid down by the Group, the firm has to formulate its own long-term plans with a desired horizon of 5 years. This exercise is entrusted to the Divisional Board. The firm has been trying to put together a 3 year plan for some time now with Bradford University acting as external consultants/coordinators. The Directors go away for long weekends to hammer out a plan. It was found that a unified plan for the whole Division with its various profit centres was not feasible and so the plans are being formulated for each profit centre.

STRATEGIC FACTORS AND ACTION

The major policy guiding the working of the core units is the Group Board Decision that all Group companies should buy their requirements only from the firm. This 'captive' market gives some flexibility in the firm's strategy. Investment pattern is affected and is not as dynamic as if the firm were to operate in the open market. Investment in equipment is also geared to meet Group requirements. Expansion of activities are within the parameters of Group needs. Operational efficiencies are constrained by the available equipment.

The firm does no marketing and even sales to the open market are routed through Group Sales who indent their requirement from the firm. The firm's major strength is its manufacturing base and skill in weaving. Quality is a high priority and ensured by 'Good Manufacturing Practice'. Changes in weaving technology are not much and this helps the firm to maximise its application skills.

Research and Development is primarily at Group level in response to external needs. The firm's own Development concentrates on manufacturing processes and quality improvement.

The environmental factors for the firm are perceived to be stable. Product substitution in the healthcare market is not a major threat for the firm's textile operations. The only move has been the introduction of non-woven swabs for some applications. This was considered in the strategic review of the medical textile scenario at Group level and non-woven products were developed by the Surgicals unit of the firm. The firm thus has the confidence in its ability to respond to such marginal changes. Likewise narrow woven applications are increasing at the expense of broad weaves but the firm is equipped to meet this switch.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

Raw Cotton is the most strategic input for the core units. It is a high volume/high value purchase directly controlled at the level of the Managing Director. The procurement is done through a commodity broker who scans the market for the best deal and presents the picture to the firm every Friday. Negotiations are carried out by the MD and the Divisional Director and decisions are made on quality, price, quantity, and availability of new varieties. Though dealing through a broker the Directors keep abreast of the market in order to carry out informed negotiations.

Quality of raw cotton is very important for the end product quality and so the firm often resorts to forward buying to ensure availability of the right quality. Recently the firm has installed new equipment which gives it flexibility over a wider range of raw cotton quality but still the requirement is stringent. The firm has its own quality index expressed as a single number which gives weighting to cleanliness, fineness, strength and other factors for spinning, and a numerical range on the index is established as acceptable for spinning. This index gives the firm the flexibility to blend different grades of cotton so that flexibility is further increased in procuring the right quality. 'Blend' profile and 'Financial' profile are considered in the final ordering policy for raw cotton.

The Divisional Purchasing Manager has no major role in raw cotton procurement as it is the Group policy that high value/volume materials should be handled at the Managing Director's level. It is only recently that the Divisional Purchasing Manager is involved in raw cotton purchase, in the sense that he is kept up-to-date on the prevailing prices. This helps him to negotiate the purchase of yarn which is also bought in as an input

material in addition to raw cotton. Yarn purchase is much lesser in value and handled by the Divisional Purchasing Manager.

The third major purchase is rayon - a cellulose synthetic fibre used in surgical dressings. The annual value is £ 1.5 m. and this handled directly by the Divisional Director. It is purchased forward every 6 months and does not pose a problem.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Overall the impact of Procurement in strategic planning is minimal. The major material is directly handled by the MD. In all the units, cost considerations are secondary to some other factors and this is reflected in the relative non-importance of purchasing. The Divisional Purchasing Manager is not a member of the Divisional Management Executive Board.

F. DRAKE AND CO. OF GOLCAR LTD.

THE FIRM

F.Drake & Company of Golcar Ltd. is a part of the F.Drake Group, manufacturing polypropylene fibres and other textile products. The other member of the Group is F.Drake (Golcar) Overseas Ltd.

The firm under study (F.Drake and Company of Golcar Ltd.) operates from two sites set two miles apart - Manor Mill and Slaithwaite. The Manor Mill site was built in 1887 for production of natural dyes. In 1900, production of reclaimed fibres from old and new rags began for supply of yarn to local mills. In 1984 the site started production of polypropylene multifilament yarn. The Slaithwaite site was completed recently in two stages in 1988 and 1990. It is a single storey building of 5000 sq. mtrs. representing an investment of £ 5 m. It now forms the major production unit of the firm with 5 extrusion machines making the polypropylene products while the Manor Mill site manufactures traditional yarns and processes waste.

The major product is high tenacity polypropylene multifilament yarn (brand name 'Leolene') which finds application in making ropes and lashings, lifting sling assemblies, trailer straps, geotextiles, nets, harnesses, and a number of consumer applications like pull-cords, shoulder straps, hosepipes and harnesses. The product applications are numerous and are being further increased by the introduction of finer count yarns which can be used in knitted fabrics, filter fabrics and sewing threads. In addition, the firm also makes slubs and carded slivers in Acrilan and other synthetics for use in fashion influenced items like berber carpets, clothing and fine furnishings.

The firm is a family owned and managed business with one of the current owners being a direct descendent of the founder. It employs 120 people and turns out about 100 Tons of yarn per week. It is a continuous process operation, except for shutdown during summer and Christmas for maintenance. Most of the important functions like R&D and Sales are directly handled by the Managing Director. The firm is the recipient of a number of awards for export.

THE PRODUCT MARKET

The firm's major product is yarn which is used in various applications; hence the firm's customers are spread out over a broad range of industries 'from light pulls to liner hawsers'. Some of the customers are Hattersley (Narrow Fabrics) Ltd. of Keighley who manufacture webbing, New Tean Hall Mills Ltd. who make lifting assemblies, Post Office Postal Supply Dept. for bags, Don and Low Ltd. of Forfar for straps for their intermediate bulk containers and Bridon Fibres for making barrier ropes.

The firm's major market lies overseas in France, Israel, the US and New Zealand. About 70% of the production is exported. The firm perceives the market as an expanding one as newer applications for its yarn come on-stream. It sees the competition as not being severe with the major competition coming from Belgium. Technical expertise gives it an edge over other firms and makes it a market leader. Polyester and Nylon are direct substitutes for the firm's product but the firm feels this is not a threat as its yarns also make in-roads into polyester/nylon usage.

THE SUPPLY MARKET

The firm's major input material is polypropylene which is obtained directly from the petrochemical plants. As it is oil-based, the price fluctuates depending on oil prices and is known to change up to 50% in six months. Though the firm is restricted to certain

grades due to requirement of high tenacity, availability is not a problem as supplies are brought in from 4 sources. However there are phases when there is a tightness of supply due to the tremendous demand growth in polypropylene usage, particularly by the filament industry.

Pigments are procured from 4 chemical plants - Ciba, Sandoz, BASF and Hoechst. The requirement is small and prices are fairly stable. Price increases are significant for the firm's requirements. Availability is a problem at times as the pigments are made in monthly batches and so increased demand or rejected batches could pose a concern as additional stocks may not be immediately available till the next month's production.

UV stabilisers are available from Ciba-Geigy and two other suppliers, and is not a problem for procurement. Cardboard packing and cores are locally procured - price does pose a problem as only two suppliers are available locally.

FIRM'S STRATEGY

THE PLANNING PROCESS

The firm does not have any formal strategic planning. The Managing Director addresses all aspects of the firm's long term goals, new product applications and new markets to penetrate. The internal working revolves around an annual budget and the production schedule fixed on a weekly basis. This is monitored in the production meeting held each morning.

STRATEGIC FACTORS AND ACTION

The firm's strategic thrust is to maintain market leadership through technological innovation in the product and in its application, and through its expertise in the manufacture of polypropylene fibres and yarn. (It also trades world-wide through its sister company as consultants and suppliers of polypropylene extrusion machinery and related equipment). It was the first entrant in the manufacture of high tenacity yarn on a commercial basis and strives to build on this advantage.

R&D is an important aspect of this strategy and is handled directly by the Managing Director. This is focused on the current product and there is no attempt to move downstream to weaving as it is not seen as an area which will lend itself to technical edge.

Marketing strategy is to develop newer markets for current usage and also to develop newer applications for its yarn. The market is seen as an expanding one and so market share is not seen as essential for survival. New products and applications are explored through trials and small batch samples rather than through 'revolutionary' breakthroughs, adding improvements and expertise on incremental basis. The accent is on profits to reap the benefits of its technical advantage.

As it offers a technical product, quality is very important and is assured through stringent testing and the issuance of performance certificates. Testing is done on every batch while process quality is also monitored continually.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

Manufacturing is based on one major input raw material and other additives like pigments and UV stabiliser. Raw material costs make up 40% of the total sales price.

There is no major availability problem for polypropylene but prices tend to fluctuate with oil prices. The major effort is to anticipate this trend and buy at the lowest price. Quality of input is also of prime importance as it affects the final product performance directly and hence the grades are stringently specified. However there is no incoming inspection and the firm relies on performance certificate from the suppliers. Storage is in silos with 300 Ton capacity and delivery is taken on daily basis to top up the silos. Other materials are required in much smaller quantities and are not of much strategic significance.

The overall purchasing policy is to have multiple sources (minimum two suppliers at least) and to make purchases on monthly contracts. The firm does not have any buying leverage as its off-take is small compared to the general market requirements. Hence buying requires a continuous scouting for the best deal.

IMPORTANCE OF PROCUREMENT IN STRATEGIC PLANNING

Procurement function does not have a major strategic role in the firm's operations. Its main contribution lies in the area of cost reduction and ensuring quality of supply and so it has only an operational impact.

JOCKEY

THE FIRM

Jockey is a member of Courtaulds Textiles PLC which was recently created when Courtaulds PLC de-merged into Chemical, Industrial and Textiles interests. The firm is part of the Brands Group within Courtaulds Textiles PLC which includes other brand names like Gossard, Wolsey and Aristoc.

The firm manufactures branded underwear, primarily for the men's market but with a more recent move into the ladies' market. The brand name 'Jockey' was licensed from the American principals over 50 years ago. Originally branded underwear was manufactured as one of the products of Lyle and Scott (Scotland) along with other textile products. In the late 1970s the present firm was set up to autonomously manufacture the product. Though the firm is not a legally separate entity, it operates as an independent business and profit centre within the Group. In addition to manufacture of underwear, the current site used to house a number of the Group's sports companies (like Slazenger) which have now been moved out. This has left the site solely for manufacture of underwear with a surplus of space and equipment.

The shop floor layout consists of a cutting section common for all garments, and sewing lines dedicated by products (briefs, longjohns, singlets, etc.). However the machines/ people can be used flexibly amongst the products and, in the event of bottlenecks, some products can be shifted to a different line. Overall there is excess machine capacity on the shop floor, which allows the firm to cater to fluctuations in demand for any given product.

Manufacturing is not a technical process and requires manual skills. The overall production logistics from procurement to despatch of finished products is tracked by computerised systems aimed at making production a continuous flow. Basically the manufacturing method is a batch process and inventory control is by MRP.

The firm has annual sales of £ 8 m. (1990) and employs 236 people of whom 2 are in Procurement.

THE PRODUCT MARKET

The firm's product market is constrained geographically, by the terms of the license, to UK. Within UK the underwear market is made up of two segments - 85% of very large, own label retailers (like Marks and Spencer) and 15% of branded products. The firm sees itself as the market leader in the branded segment, accounting for a third of the sales i.e. 5% of the total underwear market. The majority of sales are in men's underwear with the firm having moved recently into the ladies market.

The UK market is seen to be mature and the retail base, though broad, is seen to be shrinking. The firm itself has between 2500 - 3000 retail customers. However most of the players are seen to be following a strategy of fighting to increase market share. In the branded sector, the firm perceives its competitors as having a rougher time than itself in these conditions. The advent of a common European market in 1992 does not offer any advantage to the firm because of the license conditions - it is in fact seen as scope for new entrants in the UK market without the opportunity for the firm to compete in the new entrants' domestic markets. The firm does manage to sell outside UK through other Group licensees who can procure in UK - about 12% of the turnover is thus sold to the Swedish/Nordic markets.

Though the firm is in the garments business, it is not driven by fashion trends which are not very important in underwear. The firm feels it can run a best selling style for over 5 years without any major design changes. Substitution by synthetic fabric products are also not a factor because of the strong belief that natural fibre garments next to the skin are healthier.

The firm concentrates on its own brand and does not seek any other contract customers. It currently has a MOD order but this is more an exception, and of a bespoke nature.

THE SUPPLY MARKET

The main input materials are knitted and dyed fabrics which are converted to underwear. In addition certain accessories like elastic and labels are required, but they are of minor quantities as compared to fabrics.

The firm used to get its fabrics from an in-house Group supplier until recently, when it switched to open market sources due to cost considerations. The availability of market sources is somewhat restricted, particularly for ladies fabric which require specific finishing by the suppliers. While the firm does go directly to the main knitters, it also operates through an agent who procures on its behalf. The supply market is categorised as moderate in service, good on quality and competitive on prices which vary with the price of raw cotton yarn. At present, suppliers are primarily in the UK though attempts are underway to develop overseas sources particularly from India, Pakistan and Turkey.

Dyeing facilities are in plenty in the market and do not pose a concern for the firm.

FIRM'S STRATEGY

THE PLANNING PROCESS

There is no long-term strategic planning in place at the moment. The firm used to have a 3-year plan but currently the only plan is the yearly operational plan and the yearly budget. The plan is initiated around July and finalised in Nov. for the succeeding year. The key issue addressed is profitability and cash generation. The plan also looks at medium term projects and the financial implications of the projects.

The operational plan is built around the sales forecast. Most of the production is for stock to meet forecasted sales trends, though there are some bespoke orders (like to the Swedish customer who places orders 3-4 months into the future). Besides sales figures, the other inputs to the plan include new developments from Development department and lead time of supplies.

The annual forecast is addressed by quarters in order to balance line capacity. Production planning horizon is 8 weeks as is also the procurement cycle. Production is planned to have a 4 week stock cover for finished goods.

STRATEGIC FACTORS AND ACTION

The firm is a small player in the Group with a turnover of £ 8 m. compared to the Group turnover of £ 900 m. and it is more of 'emotional' significance for the Group than strategic significance. Profitability is a prime aim to stay within the Group. The firm is a cash cow in the Group's overall plans. The firm also needs to support royalty payments, for brand licensing, on its own performance.

Sustaining brand leadership is the critical strategic thrust. The major function is Marketing, directly handled by the Managing Director. The firm concentrates on a few key national accounts and goes for trade marketing to push the brand. Though it has a large retail customer base, a few key accounts is the focus of its marketing strategy. Licensing agreements require the firm to invest a minimum percentage of sales in advertising. Being a small firm, and because of the small distribution share open to manufacturers' brands, it focuses advertising on down the line promotion rather than for national visibility. The focus is on promotional activity at point of sale. This, coupled with strong emphasis on brand premium, is the main competitive strategy followed by the firm. The aim is to secure trials by customers in the first instance - after which the product is seen to be sought out by the customers.

Being in a mature market the firm sees business growth only through fighting for market share. Growth is also seen as essential for continued ability to support critical mass. One way is seen as expanding the existing product range from being in the men's market to include the ladies market. The firm does not enter the sexy, frilly area which is already catered to by other brands in the Group (Gossard). It aims for daily wear, which is comfortable and appeals to the modern women in the day-to-day activity, and where technical aspects like 'no shrink' can be emphasised.

Opportunities for sales outside UK also exist but through intermediate licensees (as the terms of its license prevent the firm from selling directly outside the UK). Yet another opportunity for growth is seen in the development of a 'Eurorange' of products by the principals, for which the firm would be one of the manufacturing licensees. Though the firm is not prohibited by license from taking up other contract manufacture, it is not seen as a desirable route for growth as the firm does not want to lose the focused approach to manufacturing brought about by catering to a single brand. (The firm views its operations as an extension of its American principals). The firm prefers to avoid any possible conflicts between brand and contract priorities. Also, as it is geared to brand business, it is not cost effective when it comes to contract manufacture.

The firm gets some cost advantage from its location in a part of the country which has cheap labour, low building costs and some Government incentives. With the recent move to procure from the open market, some cost advantage is derived from Procurement. But these are minor compared to the primary thrust of brand sales.

The firm also derives advantage from the quality of the product - it is qualified for UK quality standard BS5750 as also the international standard ISO 9002. It emphasises the product features of good style, sizing, packaging and shades. Service also ranks high in its priorities. The professional skills of its employees is seen as giving the firm an added edge.

The firm does not derive much advantage from Manufacturing - which is not very cost effective (being orientated to brand sales, Manufacturing plays a secondary role in the firm's strategic considerations). It also does not derive any advantage from technology and in fact invests less than depreciation on equipment, most of which are not state-of-the-art. This ensures cash flow from the unit is not undermined. However the firm is careful not to fall so far behind the competition in manufacturing as to make it disadvantaged. Though the firm has a design consultant to advise on product designs, design development is not a major consideration in product strategy. Design concepts have to be checked with the US principals who have the power of veto. The product also does not lend itself to sustainable differentiation. Specification enhancement or addition of features are easily duplicated by the competition.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The main production materials are fabrics, elastic, thread and packaging. The major material is fabric valued at £ 2.2 m. and making up 70% of purchase value. Material constitution of the cost of manufacture is 40%. Fabric is purchased in a wide variety like combed and uncombed material, jersey material and thermal fabrics. Totally there are about 15-16 basic fabrics. With different colours and shades this is increased to about 50 categories. The fabric is bought in bales in several tube diameters. The purchase of men's fabric is treated as a semi-commodity but ladies fabric has more technical specifications and requires special treatment for no shrink property.

The firm has recently changed its strategy of fabric purchase on cost consideration. It used to buy from another Group company. Though the service and quality was good the cost was found to be high and so the firm moved to open market sources - a move not opposed by the Group since the firm operates as an independent profit centre. Moving to the market posed a problem as the firm had not consciously researched the supply market when buying from within the Group. Initially it resorted to using an agent who was aware of the open market but now it deals both with the agent as well as some knitters directly.

The number of knitters in the supply market is restricted. Quality is an important consideration in selection of sources as fabric specification is critical in ensuring comfort and fit. Hence the sources are restricted to the UK although markets in India/Pakistan/Turkey are being considered. In order to ensure quality the firm is also looking at the possibility of buying yarn and getting it knitted/dyed on contract basis from market sources under its coordination. Quality of knitted fabric is checked at knitters end before being despatched directly to dyers. Only the dyed fabric is brought into the warehouse.

Next to quality, cost is the prime consideration in procurement strategy. The firm seeks to achieve this by trying to establish long-term contracts with suppliers but, being new in the market, it is not yet fully successful in this strategy. However the firm does get some leverage from assuring constant orders to its suppliers as it manufactures own brand products and hence has a steady demand. The firm also keeps track of cotton commodity market to aid its negotiating strategy for fabric, but no formal price forecasts are made.

Yarn availability is not a concern as the firm's off-take is low compared to trade volumes. Lead times are typically 8 weeks and stock holdings are at 3 weeks, with an attempt to reduce it to one week.

The firm does not believe that strong ties with single sources are advantageous, as it cuts off the benefits of price competition. It has a few single sources but that is due to quantity restrictions. Where volumes warrant it, multiple sourcing is preferred. While the firm is contemplating going backward in the value chain to the purchase of yarn and getting it knitted, it does not contemplate integrating knitting/dyeing functions under its roof as it does not want to lose the flexibility it gets in a market operation.

Fabric purchasing is coordinated at the Operations Director's level. Other components are treated as non-strategic and handled at lower levels and purchased locally.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Procurement department in itself has no major role in the overall planning consideration. Quality and cost are the major criteria addressed for fabric input and it is dealt with at the Managing Director's level. Procurement's role is primarily operational.

MICRELL (UK) LTD.

THE FIRM

HISTORY: The present firm was originally owned by an Indian group (Bharadwaj) who had taken over a sick spinning unit in 1983. It used to produce texturised polypropylene filament yarn for knitting, primarily for the apparel segment and also for industrial applications like fishing nets. (The firm was an independent, intermediate stage between raw material and weaving). The firm was plagued by high labour turnover, absence of well qualified technical personnel, problems of sales in a market invaded by cheap imports from the Far-East and poor quality products. Also the popularity of knitted apparel from texturised yarn was on the decline, particularly amongst the male textile market. The option facing the owners was either to close down the plant or to lease it out. In Jan. 1990, the plant was bought by an Italian group (Velasia) as a part of their operations in the apparel (fashion) industry.

THE PRESENT FIRM: The firm, re-named "MICRELL (UK) LTD.", is a wholly-owned subsidiary of the Italian Group Velasia, operating as one of its "divisions". It has moved from texturised yarn to a new spinning process termed "micrell yarn". This change was facilitated by the new technology brought in by the parent, who is setting up a similar unit in the USA.

The plant is run as a continuous process with one input and one output. It is staffed 'lean' with operators performing more than one job. The firm employs 35 people and is headed by a Plant Manager. All the operations are driven top-down by the decisions of the parent. The firm has its own R&D section and a Quality Control section - with quality checks at the process and finished goods stage. The firm has recovered from its declining trend after the switch to it's current product.

THE PRODUCT MARKET

Micrell (UK) is a one product firm adopting a new spinning process which it has termed as 'micrell'. The firm now produces polypropylene continuous filament yarn which finds use in weaving for apparel. The 'micrell' process is said to give a product which is softer to feel (not unlike silk), amenable to the weaving process and capable of being mixed with other fibres like nylon/viscose/cotton/silk. The properties of finer feel, inter-weavability with other yarns and over-all appeal makes it a possible substitute for silk. While the present use of the yarn is in the apparel segment, the firm hopes to develop uses in the industrial segment also.

The product is sold to only one customer viz. the parent firm, who then passes it on to the weavers in the market. As such the firm faces no direct market competition. However, two indirect sources of competition are present:

- 1) In the weavers market, the parent faces major competition from the big mills, particularly German and Japanese companies. This pressure filters down to the firm in the form of regulated prices for the yarn transfer to the parent.
- 2) The presence of other units in the Group supplying yarn to the parent acts as a check on the efficiency of Micrell (UK).

These factors force the firm to be 'competitive' albeit in a protected, internal market.

THE SUPPLY MARKET

The major input material for Micrell's yarn is polyester chips (polyethylene terephthalene polymer). This is an output of the petrochemical industry. The chemical

properties of polyester chips are generally the same from all producers though there are variations in some properties which require adjustments in the spinning parameters. The European manufacturers of polyester chips can generally control the variations within limits that allows interchangeability. However supplies from Middle/Far-East have wider fluctuations, probably due to using outdated European machinery/technology e.g. Turkey.

Availability of chips is not a problem for the firm but the price tends to fluctuate. The firm's perception is that prices of the two important starting materials for chips manufacture (dimethyl terephthalene and terephthalic acid) are controlled by a cartel which, though making the input costs for chips manufacture the same for all producers, keeps the control of price out of the producers' hands. The price variations of dimethyl terephthalene due to competing uses in paint/pvc/plastic industries adds to the fluctuations in the price of chips. The final cost of chips to the firm is also determined by conversion and transportation costs incurred by the producers. The non-European producers gain an edge due to employing older technology and cheaper labour.

The other inputs for the firm are minor in comparison to chips and pose no problems in their supply markets.

FIRM'S STRATEGY

THE PLANNING PROCESS

As Micrell operates almost like a 'division' of the parent organisation, it does not independently articulate a strategy but is guided top-down by the parent's strategy. The only plans developed at Micrell are the operational plans like annual budget, production planning and scheduling, dictated by the parent's requirements.

STRATEGIC FACTORS AND ACTION:

The main strength of the firm is the technological advantage gained from the development of 'micrell' yarn with its fine feel, weaving versatility in combination with other yarns and its general appeal in the apparel fashion market. The organisation uses this edge by deliberately pricing high in order to appeal to the upper segment of the apparel market. Within this segment, the small size of the producing unit allows it to compare favourably with the big mills by being below their prices for equivalent products.

The firm emphasises R&D and works closely with weavers to develop newer applications for the product. It also has the aim of moving into the industrial applications market. The parent's strategy is to expand the base of in-house spinning by investing in new spinning units (in the USA). In the expansion strategy of the parent, Micrell (UK) has the role of supporting the parent's R&D and marketing thrust.

The firm's operational objectives are given as low-cost, quality production. It addresses these objectives by aiming for lean staffing and efforts to improve the production process. Being a fairly new unit (since Jan. 90) there is no strict deadline set for its objectives except to work towards it. Emphasis is placed on quality control to help maintain the organisation's competitive edge.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

Micrell(UK) is a one product, one input firm. The major raw material is polyester chips (polyethylene terephthalene polymer) which constitutes 33% by value of the product

sale price. The firm buys the raw chips from a single source in Italy (a large petrochemical complex in Sardinia).

The policy of single sourcing had been historically practised by the firm's predecessor for 6 years & has been carried forward. Another reason for operating on single source is that the spinning parameters could be stabilised on the properties of chips from a specific source. Micrell however is currently looking at developing a second source from Germany, which is compatible with all parameters of the Italian source. Trials are on to ascertain the suitability of the second source.

This requirement also rules out cheaper polymers from other sources, even though availability of polyester chips are plentiful in the open market. The higher price paid for better and consistent quality raw materials ensures that end product quality does not suffer on account of inconsistent inputs and helps the firm maintain its quality edge in the product market. The end product also commands a good price which allows some latitude in cost efficiency.

The firm operates on long-term contracts with its single source, negotiating prices on an annual basis. Supplies are called-off against this contract.

The only other major production material procured is an oil, used to make the yarn supple and processable during spinning. The availability is plentiful and procurement is on lowest cost basis.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING:

There is no major involvement of Procurement in the planning process of the firm which itself addresses only operational plans, as all strategic planning is carried out by the parent firm.

TULLIS RUSSELL & CO. LTD. (THE PAPERMAKERS)

THE FIRM

Tullis Russell - The Papermakers is one of four firms in the Tullis Russell Group of Companies - the other three being Britains (TR) Ltd, Coated Papers Ltd., and Watson Grange Ltd., While the whole group operates in inter-related areas in the paper industry, each firm operates autonomously.

The firm has been in operation since 1809 and is situated at Glenrothes in Scotland. It is a non-integrated, independent firm with the Russell Trust having 51% of voting shares. The employees also hold shares in the company, in line with its policy of being a "people's company". It produces a wide variety of speciality papers, coated and noncoated, selling them as own mill brand as well as brands of other distributors. Some of the major applications are in security papers, fine printing stock, technical grades for computer applications, business and greeting cards. Besides the Glenrothes site, there is a warehouse off-site in a nearby location. Sales activities are handled from an office in Birmingham. Exports are handled by TR (Exports) Ltd through a network of local agents in over 70 countries, with a sales office being recently established in Paris. Overall, the firm employs one thousand persons.

The firm has high capital investment base with six paper machines installed post-war. The last machine was installed in 1980 at a cost of £ 15m (1990 value of £ 25-30m). Total installed capacity is excess to production needs but investment was motivated by other considerations. On an average the firm invests £ 4-5m annually on updating, modifying and modernising equipment and systems - the latest being the installation of computerised production planning and W-I-P tracking system ("Millwide") at a cost of £ 1.5 m. The firm has a 25MW power station for its requirement of electricity and steam power.

The production process is a mix of batch and continuous process - the initial pulp mixing/fibrillation being in batches, with pulp being stored in "holding tanks". The actual paper making is a continuous process and the product is stored as rolls. Paper sizing (cutting) is then taken up in batches according to final requirements. Some special quality papers are run as batches right from start to finish. Speciality paper products do not lend themselves to use of recycled waste paper in the process, except for own mill waste on a grade-for-grade basis.

The firm is a profitable organisation with good market reputation and strong brand image. It is viewed as a prime acquisition prospect and gears its strategy towards maintaining its independent status.

THE PRODUCT MARKET

The firm serves the market niche of high value added, high quality, specifiable paper with strong branding where marketing has greater influence than economy of production. The products include coated/uncoated papers with speciality application like insulation paper, semi-conducting paper, gun cartridge paper and cheque paper. The firm has a strong presence in the UK with an increasing presence in Europe (Germany/France/Switzerland). New Zealand and Australia are also strong markets. The long term aim is to increase its presence in the US through uncoated papers, as the firm's coated products cannot be sold in the US due to licensing agreements. Coated papers is one of the firm's strongest niches where it enjoys technological advantage over its competitors through a process (obtained from Warren of US under a licensing agreement) which gives up to 23% weight advantage over the competitors' products.

The UK imports 40% uncoated requirements and 70% coated requirements of the market niche serviced by the firm. The firm itself exports over 25% of its uncoated production and over 50% of coated production. There are only a few manufacturers of premium coated paper in Europe, the US and Japan. Uncoated paper has relatively larger number of manufacturers. The main competitors in uncoated papers are Wiggins Teape Ltd and Sappi Graphics, both in the UK. In coateds the main competitor is Zanders of West Germany (who have recently been acquired by International Papers). Zanders is 4-5 times bigger (by sales) than the firm.

Competition however is severe due to relative smallness of the niches. Integrated mills (particularly Scandinavian) compete through low margins on paper, taking higher profits on pulp in internal transfers. e.g. MoDo, Stora and Kimmere. Acquisition by bigger players is a potential threat to the firm's existence as an independent firm. There is also an accelerating trend for distribution channels to merge (to exercise bargaining power over manufacturers) or be taken over (to deny channels to manufacturers). Merged channels with no manufacturing base, also introduce their own "brands" to use their marketing clout. The firm covers this position by supplying the channel "brands" in addition to their own mill brand products.

The paper market is cyclical, driven by forces moving GDP e.g. demand for high quality glossy paper is affected by demand for advertising. However, product prices are not as wildly fluctuating as the pulp cycle, particularly in the firm's niche. Fluctuating pulp costs have a lesser impact on the prices of speciality paper which are high value-added products. (pulp forms only 40% of the final price.)

THE SUPPLY MARKET

Wood pulp is the main raw material and is available in the market from independent pulp manufacturers as well as from integrated mills with independent manufacturers accounting for 20% of total pulp production. Major pulp suppliers are from Scandinavia, Spain, Portugal and South America.

Pulp availability is cyclical with high peaks and troughs in prices. Manufacturers tend to regulate production to maintain pulp prices but new manufacturers coming on stream, introducing half million tonnes at one stroke, distort the cycle. The past 3-4 years had seen a shortage situation in pulp availability but the position is seen to be easing. The coming on stream of Brazilian and other pulp mills is seen as ensuring good pulp availability for the next 5 - 6 years. Introduction of short fibre hard wood from Eucalyptus trees by the Brazilian mill is also expected to have a dramatic effect on pulp prices for the firm - dropping from a high of \$ 760 per tonne to about \$ 550. One factor which may affect the forecasted abundance of market pulp is if pulp manufacturers integrate forward, thus restricting market availability. Pulp prices are mostly quoted in US dollars giving rise to exposure from currency fluctuations. It is also perceived that pulp suppliers act in parallel in fixing prices. The firm covers currency risks partially through forward trading in dollars and partly through \$/DM revenues.

The firm, as an independent papermaker with an established market position, faces the prospect of takeover by pulp suppliers wishing to integrate forward. The use of raw material mix of 3-4 types of pulp diffuses, to some extent, this threat by avoiding reliance on only one type of pulp. However the firm closely monitors supply market both for pulp availability and predatory intentions.

The problem of lot sizes for a bulk commodity like pulp does not pose a problem to the firm as the suppliers use storage facilities at the continent ports (Rotterdam/Antwerp) from where there is a weekly call-off. Thus storage costs are absorbed by suppliers.

Other than pulp, the firm faces problems of supply in a few other materials. Casein, a product of milk output, which is used in coated papers is a cause of concern. Due to the EEC quota policy on milk, casein is not produced in Europe. The firm has to rely on the dairy industry in New Zealand for casein. Contractual agreement with the New Zealand Dairy Board covers this requirement.

Clay is a monopoly supply of English China Clay. Importing clay is not feasible due to high transportation costs. Similarly one other chemical (Satin White), crucial for a speciality coated product, is a monopoly supply of a small firm vulnerable to acquisition by a competitor. The firm itself had considered acquiring the supplier but discarded it as being a short term, defensive measure. The problem is now addressed technically by trying to change the formulation and eliminating the chemical totally.

In all other materials, no serious supply exposures are present as a number of suppliers are available.

FIRM'S STRATEGY

THE PLANNING PROCESS

Until recently, the firm did not have any formal strategic planning. Operational plans were drawn up on annual basis and implemented through budgeting. Long term investment plans were mainly formulated against the backdrop of prevailing tax structures, even though it meant carrying excess capacity over long periods. (e.g. entry into manufacture of coated papers, currently the firm's major strength was accidental. The firm invested in a machine to supply paper to a Scandinavian producer of coated papers. The withdrawal of the Scandinavian producer from the agreement left it stranded after the investment and so the decision was made to enter coated paper products). Business and personal policies were guided by the conditions of the Russell Trust (51% holdings) to be "a people orientated company, managed in the best interests of shareholders, employees and customers equally".

The first major strategic plan was drawn up 4 years ago at the initiative of the Group Chairman. A committee (comprising of the Chairman, the MD of Papermakers, the MD of Special Coatings and the Planning Director) was set up which identified objectives, carried out detailed SWOT analysis and worked out strategies. The John Argenti package of a do-it-yourself strategic exercise in 10 steps was used for the exercise. The exercise, with a planning horizon of 5 years, lasted one year and called for a progressive review of implementation after the first three years. This review is currently undertaken by a committee comprising of the Chairman, the MD of Papermakers, the Group Finance Director, the Marketing Director and the Planning Director. Formal reviews and reformulation are planned on a roll-on basis every 2 - 3 years.

STRATEGIC FACTORS AND ACTION

The main issues identified by the planning exercise were:

- To remain an independent firm, relying on market pulp for operations and avoiding integration with pulp manufacturers.
- To be a "people - company" in terms of the Russell Trust conditions.
- To concentrate on niche marketing of high value added, high quality, branded products.
- To maintain a minimum level of capital investment of £ 3 - 4 m. annually to remain competitive.

- To market internationally, competing in the back yard of major foreign competitors in the UK.
- To ensure minimum financial performance to be profitable, and achieve growth in real terms.

The strategic actions that were decided following identification of the main issues were:

- To monitor the industry, particularly the pulp manufacturers, for any signs of predatory moves
- To monitor the pulp market for any exposures due to lack of availability
- To reduce the risk of takeovers due to dependency on market pulp by
 - (i) Staying only in high value - added products where the contribution of pulp is relatively smaller
 - (ii) Spread raw material mix to reduce dependency on any single type of pulp / manufacturer.
- To assure long term availability of pulp through good procurement practices like emphasising good supplier relations, contracting for stable off-take, prompt payment and promoting the image of a strong reputable firm with whom suppliers would desire to associate.
- To monitor distribution channels for signs of drying up due to mergers/takeovers
- To aggressively market mill-branded products to make it sought after by distributors. Also to manufacture for other "brands" as another outlet for production.
- To modernise and up-date the substantial capital assets base through ongoing investment in updating technology.
- To address environmental issues, particularly of effluent, in keeping with societal needs.
- To monitor the economic environment for factors affecting product demand e.g. advertisement .
- To maintain a strong R&D programme, particularly in the formulations to eliminate single sources/scarce items.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

In support of the firm's objectives, supply strategies are addressed in three categories.

(1) In the Pulp Market

Constant watch is kept on pulp availability. Published figures are presented and analysed at monthly board meetings. Pulp availability is forecasted long term particularly when capital investment is considered by the firm. Long term contractual relationship with guaranteed off-take at prices negotiated on quarterly basis is established with key suppliers. Good relations are pursued with suppliers by being open with information, ensuring prompt payments and honouring commitments. Advantage is also taken of the desire of some suppliers to want to supply to the firm because of its good image. A good pool of suppliers with a varying percentage of business is built-up.

(2) Other materials.

Three materials cause concern to the firm either because they are single-sourced or in scarce supply : casein, clay and Satin White. Casein and clay supplies are ensured through good procurement practices - long term contracts, guaranteed off-take, prompt payments and open information. No other strategic moves seem possible and they continue to be items of concern. In the case of Satin White the strategic action is to seek a solution through R&D efforts to change the formulation. Meanwhile procurement is carried out on a 'watchful' basis.

In all other items the supply position is favourable. Chemicals, resins and dyes are areas of big spend. The firm has a strong image with suppliers as a reputable firm, but is not big enough to exercise buyer power. The thrust is on open relationship, long term contracts and careful scheduling to reduce capital tie-up. Some suppliers (like carbonates, pallets) are largely dependent on the firm to the extent of putting up plants nearby or on the firm's premises to ensure continued business.

(3) Contribution to Cost Efficiency

The main thrust here is in reducing inventory holdings. Pulp receipt is scheduled on weekly basis and is called from the bulk storage of suppliers at the ports. The target is to reduce inventory holdings to 2-3 weeks from the current 6-8 weeks. Price for pulp plays a secondary role to other strategic considerations. Overall the trend is to try and move to JIT practices.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Historically, Procurement had a low key role. It was placed under the Legal Director till about 10 years ago and had only an administrative role. Strategic issues of supply (particularly in capital investment projects) were handled by other agencies like R&D who identified suppliers for inputs. Negotiations to ensure availability of critical supplies were carried out at the highest level (Chief Executive or one of the Directors) with Procurement brought in only to implement the decisions.

However with the increasing importance of Supply (particularly from the pulp market) to the firm's strategic intents, Procurement gained in importance as being the best suited to monitor the environment and contribute to supply strategy. Procurement was moved under a Commercial Manager who reported to the Production Director. A year ago the post of Commercial Director was created with responsibility for strategic procurement. Procurement thus had direct representation at Board level.

Supply considerations play an important part in strategic plans with Procurement department being the action arm to formulate and implement supply strategies.

PAPER B

THE FIRM

The firm was founded in 1859 in a region in Scotland traditionally known for paper manufacture. The firm has 5 production plants employing a total of 800 people. The products include paper, paper bags, polythene carriers and envelopes. Sale is to the retail trade, the High Street for point-of-sale packaging and to other paper converters (like envelope manufactures). Printed packages are a major part of the Group's business. The firm manufactures paper from 100% post-consumer waste as well as from 100% pure pulp (for paper used in direct contact with food products).

The main paper plant has four computer controlled machines. These machines are fed by 7 pulping machines through conveyors, with each paper machine drawing from 2-3 pulpers depending on the product. The mills run continuously but production is basically in batches of different grades. The pulping machines feed both pure wood pulp and pulp made from recycled paper.

The firm has developed its expertise over 50 years in the re-use of waste paper and the de-inking process, and considers itself a leader in this field. Waste usage requires different processes : de-inking, centrifugal cleaning and special refining techniques. Waste processing technology has developed on sophisticated lines in the past 10 years and the firm has invested continuously in updating its facilities. Additionally, the firm has also invested in polythene recycling equipment. The company has in-house product development and technical liaison with consumers.

Sales and marketing for paper, paper bags and polythene bags is centralised for the Group under a Group Director. The envelope plant handles its own sales. Overseas sales is organised through independent agents.

THE PRODUCT MARKET

The product market is in different segments comprising a wide range of applications. Lower market applications include wrapping paper, printed paper bags, envelopes and ordinary grade stationery. Some speciality applications include flame retardant paper, food wrappers, coating base papers and lamination/impregnation layers for formica. The firm also supplies printed polythene bags. This gives the firm a flexibility to vary the mix of its output to suit the demand in each segment. Since the basic paper is the same with some process adjustments for different requirements, the large variety of end-products does not prove disruptive to production operations. Process adjustments give a wide range of porosity/strength/softness, to suit different end products.

About 40% of the production of paper is converted by the Group's downstream units (paper bags, envelopes, carrier bags and printed wrappers). The rest is sold to converters in the UK and the Continent. Sales to the US is not made as the cost of transport is prohibitive for these low grade papers. The firm, by having the flexibility of its own converting units, is able to counter any adverse competitive situations in the different markets.

In the usage of recycled paper the firm has an edge over the competition because of its expertise. The current environmental awareness has made it possible for recycled paper to command as good a price as pulp paper. In the production of polythene products also the firm uses recycled inputs.

THE SUPPLY MARKET

The firm buys three major raw materials from three different industries: wood pulp, paper waste and plastics. In addition, ink for printing is bought from the chemical industry.

Wood pulp is purchased from world-wide suppliers, even from as far as Chile, if the price is right. The Spot market in pulp is also considered by the firm. Pulp suppliers in general have bulk storage facilities at the ports (Montrose, Grangemouth, Edinburgh). The firm draws its requirements from the ports. As the firm's requirements are relatively small, and as it can accommodate a large variety of pulp quality in its process, the firm does not face any problem of availability of supplies. Pulp prices move cyclically but the effect is less severe for the firm due to the above factors, and also due to the fact that the firm can use waste paper as an alternate material in times of tight pulp situations.

Waste paper is traded as a commodity by dealers. The market is tending to become very competitive in view of the increased recycling of waste and the consequent increase in demand. Dealing in waste is complicated due to the need to segregate different types of waste for different uses. While most of the waste usage is for the lower end paper applications, the technology for the use of waste for superior quality paper is developing rapidly. The supply of waste is becoming increasingly specialised. The price of waste paper shows an increasing trend, loosely aligned to the pulp price cycle, but with a time lag. Quality is becoming an area of concern as the trade is not above unscrupulous dealers who tend to mix the grades in the bales.

Polymer for polythene production is from the petro-chemical industry. Supplies are primarily from the Continent (Holland, Belgium, Germany). Polymer supplies are affected by the world situation in oil and prices fluctuate considerably, sometimes on a weekly basis. The dealers are Multinationals who dictate the price trends, not influenced by the action of buyers whose individual requirements are small compared to the total polymer trade. Recent de-stabilisation of the oil market (due to Iraq's invasion of Kuwait) has had an unsettling effect on polymer prices.

FIRM'S STRATEGY

THE PLANNING PROCESS

Long term planning is the responsibility of the CEO aided by an executive committee of senior managers. The executive committee is also responsible for formulation of the annual budget. The budget is monitored by the committee in its monthly meetings.

STRATEGIC FACTORS AND ACTION

The firm's core business philosophy rests on the premise that the packaging industry is essentially a service type of industry to which the firm is committed to supply reliable, competitive, safe and environmentally balanced products. The strategy it follows is broadly enunciated as follows:

- To produce for the lower end segment of the market which does not require speciality applications.
- To maintain its current lead in converting waste paper and project the environment friendly aspect of its product.
- To have in-house conversion facilities which will, at least in part, utilise its paper and polythene production in downstream applications.

Recycling waste has been a fundamental business philosophy for over 50 years. The firm continually invests in recycling equipment and updates recycling technology like de-inking, researching ways of producing superior quality paper using waste and developing newer applications for recycled polythene. Quality standards are strictly maintained with a high proportion of recent investment being in modernising production and control systems. The brand names of the firm's products are chosen to keep its recycling and environment friendly aspects in the consumer eye. The image of a 'leader' is also emphasised to differentiate the firm from the newer entrants following the trend.

The emphasis on usage of waste has given the firm increased flexibility in varying the raw material mix, particularly in times of shortages in pulp availability. Since waste processing technology is not 'proprietary' the firm continuously updates its technology to stay ahead of the competition.

While the firm caters to some segments requiring pure pulp paper (like food wrappings), it stays out of speciality paper niches like security papers and high quality stationery as this would dilute its strength as a waste paper processor.

In-house downstream units account for 40% of its paper/polythene production. The aim is to increase the scope of in-house conversion and to this end expansion is planned in envelopes, bags, lamination and printing facilities. However, in times of demand surge for paper, the priority is to supply external customers so as not to lose them.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

Though the supply situation is of strategic importance from the cost angle, the general availability is not a concern, particularly due to the flexibility of switching between wood pulp and paper waste, and the switching amongst different types of pulp. Overall the firm is guided by the principle of best value for money. For pulp, the firm identifies the most reliable suppliers & negotiates the best deal. Within this policy a long term relationship is aimed for. Market fluctuation in pulp is monitored, though it is not a major consideration because of the relatively smaller volumes involved. Pulp is sourced from any region as long as it is competitive on landed cost. Pulp is also bought in the spot market. The firm has stayed out of pulp buying groups (formed by other paper manufacturers).

Recycled waste paper is bought from dealers in the UK. Waste buying proves to be more complicated than pulp because of the need to specify accurately for different product needs, like wet strength paper, polythene coated paper and latex impregnated paper. Each incoming bale has to be individually inspected for contamination. Reliability of supplies is very important and the firm buys from regular suppliers in whom the firm has built confidence. Negotiations are again on best price basis.

Polymer is bought from petro-chemical firms who are Multinationals in the oil industry. Quality is not a major problem but prices fluctuate dramatically, linked to the oil situation. Hence purchases are carefully timed to get the best deal. The price situation is closely monitored. Purchase of recycled polythene has problems similar to recycled paper and so the same practices as for waste paper are followed.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Supply considerations are important to the firm from the angle of cost effectiveness of its total operations. Raw materials form more than 50% of the total cost of the product and so is of strategic importance to the firm. Supply issues are therefore handled by a senior Controller who is a member of the executive committee. Procurement has only an administrative role in the firm's operations.

DONSIDER PAPER COMPANY LTD.

THE FIRM

Donside Paper Company Ltd. is a wholly-owned subsidiary of UK Paper which is headquartered at Kensley, Kent. UK Paper was recently acquired by Fletcher-Challenge, a \$ 6 bn. Corporation based in New Zealand with operations in paper, forestry products and the construction industry. Beside the firm, UK Paper has two other mills in Kent - one in coated papers (complementary to the firm's product) and the other mill for uncoated papers (stationary, scholastic books, photocopying paper, envelopes and writing paper). All the mills operate autonomously with only policy coordination from Fletcher-Challenge.

Fletcher-Challenge has a strong presence in Australia, New Zealand, US, Canada, Brazil and Chile. It was seeking a base in Europe to share in the opportunities of the European Common Market and felt the acquisition of a Company with a strong track record would further its aims. The UK firm was chosen also because of the language, factor rather than seeking mills on mainland Europe. The firm's track record in speciality papers gave Fletcher-Challenge access to a segment of the market which could added to its basic business of paper and forest products.

The firm manufactures 60,000 tons of paper per year with a sales turnover of £ 60 m. The firm employs 460 people mostly in production and related activities. The office staff, including personnel and purchasing, number only 10 - the total operations are controlled by a good computerised Management Information System (the firm writes its own software and designs its own systems for control). The firm's interaction with UK Paper is only for administrative purposes. All business operations are autonomously carried out within the firm with direct responsibility to the parent, Fletcher-Challenge. The firm's plans, budgets and strategies are coordinated by the parent as a part of their paper sector.

The firm has a strong internal management team comprising Directors of Finance, Personnel, and Research and Development. The other functions like Engineering, Production, and Sales and Marketing are headed by senior managers.

The firm operates in the upper segment of the paper market, making high quality coated papers. The firm considers itself a leader in innovation in the coated process as well as in product application. Manufacturing is a mix of batch (at the pulping stage) and continuous process (in the paper making stage). Coating is handled in large runs, keeping grade changes to a minimum. Coated paper is then polished and glazed after which it is slit into webs or sheets (the major portion of the business is in sheets). The firm adjusts batch sizes after the paper making stage to balance minimum finished goods inventory and economic runs.

THE PRODUCT MARKET

The firm manufactures coated papers for art/graphic usage (company accounts, high quality advertising brochures) and for labels (wraps for cans and bottles). Coated papers are in the upper segment of the paper market and command a good price premium based on quality and differentiation. Technology is an important aspect in coated production but innovations are more evolutionary than revolutionary. Entry cost into coated is fairly high due to the technological factor, even for existing paper mills in other segments, and this affords a degree of protection to the existing players. However, certain applications of the firm's products are under attack from commodity paper manufacturers who have improved the quality of their line of papers to offer an economical substitute for some coated applications.

Art/graphic applications require very high definition of printing and so the paper has to be of a technically superior quality. The firm is the leading UK manufacturer of coateds for art applications - the main domestic competitor actually dropped out of this segment recently. The firm attributes its technical know how for this situation. However imports have dominated this sector for over 10 years mainly due to the folding up of other British companies. German companies are acknowledged as market leaders but the firm is also well established in this product.

In the labels sector, the firm is the acknowledged leader for over 25 years. Domestic competition is very fierce and the firm has to constantly assess the competition's capabilities of quality, price and service. The firm does not enter the holiday brochure/catalogue market which is characterised by few customers with large orders. Instead the firm prefers the label business which is spread out over a large customer base with smaller requirements individually.

The firm exports 35% of its production. It has a good presence in the US and Canada and is planning to improve its position in Europe, particularly in Germany and France. For some categories of labels the firm feels confident it can establish an international presence. As its strategy is to concentrate more on exports, the currency situation is monitored carefully by the firm.

The firm markets its art paper through stockists and distributors who normally give a forecast and then take as per actual demand, requiring the firm to keep large stocks of finished goods. Labels are despatched directly to customers against actual specific orders, requiring a lesser level of stock holding by the firm.

THE SUPPLY MARKET

The basic materials are pulp and fillers like carbonates, clay, latex starch and other chemicals for coating. Pulp is the major purchase. It is obtained from Scandinavia as well as S.America. Scandinavian pulp is more expensive but superior in quality and suits the firm's end-product needs. Various pulp grades are mixed at the pulping stage to arrive at the final quality and this gives the firm scope to bring in different grades. Availability is never a problem though prices go through peaks and troughs. Generally the suppliers come to the manufacturers seeking business. Once a year (in November) all suppliers get together for a week and present their products in a 'fair' to the manufacturers and seek reservations. Once tentative indications are given the suppliers stock pulp in silos at the nearest port for the manufacturers to draw against production demand. Prices are negotiated on a quarterly basis. The firm used to draw its requirements exclusively from Aberdeen but when the oil industry in the North Sea boomed, Aberdeen closed its pulp silos and Montrose had to be developed. Now Aberdeen is once again trying to woo back the pulp business but the firm continues to take from Montrose as well (even though the haulage costs are marginally higher), as Montrose had helped them out in times of need.

Clay is the next important constituent and is a monopoly production (in the UK) of English China Clay. Unlike other paper manufacturers who are 'caught' in this monopoly supply situation, the firm gets only 20% of its needs from English China Clay - the balance being procured from Norway, the US and Brazil. Clay requirements of the firm are small volumes of special quality and so it can source outside the UK without transportation costs being overwhelming. Carbonates and other chemicals are readily available from UK manufacturers and do not pose a problem for the firm. The firm does not use waste paper from the market in its process.

Industry suppliers have played a substantial role in the technical progression of the industry, particularly for coated applications. Carbonates and other chemical suppliers come up with ideas for application of their range of products which could profitably replace an existing process. Similarly equipment suppliers also introduce newer

equipment which could be more efficiently used. Finally some raw materials suppliers come up with proposals for use of raw materials which they have already tied to some specific equipment. In this sense the paper industry is very open and the interactions help the firm in staying at the leading edge of innovation. However, by and large, the changes are more evolutionary than revolutionary.

FIRM'S STRATEGY

THE PLANNING PROCESS

Until 10 years ago, all planning for the firm was carried out by UK paper in conjunction with its plans for the other two mills - it was a Group plan for all the mills. Later on, because of the speciality segment of the firm and the need to be closer to the market and respond quickly to changes, the planning process was de-centralised to the firm. De-centralisation was emphasised even more when Fletcher-Challenge took over UK Paper and recognised the firm as a stand alone operation.

To-day, planning responsibility rests with the key members of the firm's management team - Directors or Senior Managers of Marketing and Sales, R&D and Production, with the Managing Director coordinating the exercise. Long-term planning horizon is yet to be finalised (to tie it to Fletcher-Challenge's global planning) but the basic plan is a three year plan with yearly updates. Considerations in the plan include what the firm can produce and sell, the state of the economy, growth in paper demand, how the sector is influenced by technological factors and competitors' moves. The first year of the three year plan is detailed out as operational plans and looks at projected sales, production factors like wastage, raw material price, variable cost and production rate. Planning is computerised using the firm's own software. All plans and the budget are submitted to Fletcher-Challenge for approval.

STRATEGIC FACTORS AND ACTION

The firm is in production of specialty coated papers and does not intend to diversify to other segments. The major strengths of the firm are its technological edge in coated and its long standing reputation of being a leading innovator in the field. The firm had one or two firsts in this aspect e.g. it was one of the first paper mill to "go alkaline" which improved quality, reduced costs and increased production. Many competitors tried to duplicate the innovation without success and the firm enjoyed a sustained edge for 10 years before the competition caught up. Another example of this innovative approach is that the current coating process of the firm is still 'proprietary' i.e. though the method of coating is known, the exact constituents are secret and the firm derives considerable advantage from it. The firm's strategy is to move quickly with innovations and harvest the benefits before the competition catches up.

To fully employ this strategy, the firm has to closely monitor its market segment and the competition. This specialty segment is small and sees more changes (along technical as well as fashion lines) than bulk paper markets. Opportunities in the market are quickly addressed by the firm's R&D and converted to a viable production proposition. The firm's R&D is very strong, stays independent of Group R&D and operates close to its market. Production is also in the forefront of technology - the firm applies considerably higher coat-weights than the competition, which differentiates its products as being superior. The firm adapts production features of the competition where it is found to be superior and works on further improving it. As an example, in the art sector, the Germans were acknowledged leaders but tended to stick to dated techniques. The firm fashioned its production along the German lines and added own innovation to catch up with them. The firm also innovates in its product applications with an eye to fashion, thereby increasing the demand for its products. The firm uses its market-share position as an indication of its premium position in the market.

The coated segment has a high entry barrier which affords some protection to the firm and its competitors. However the commodity sector is also innovating technically and offering some substitutes to the lower end coated at more economical rates. The firm is aware of this incursion and strives to place itself further away from the lower-end applications, again through innovations.

The firm also uses its suppliers' expertise to help its in innovations. Many of the suppliers have pilot coating plants to carry out their trials and the firm also uses them for its own trials. Supplier linkages of this nature help in the firm's plans.

The firm has a strong marketing function suited to identifying and supporting innovation activities. Being a speciality product, the firm sees opportunities to expand in the overseas market. The firm has a good presence in the US and Canada and the strategic thrust is to move onto mainland Europe, particularly France and Germany (from where its main competition comes in the UK art sector) The emphasis on Europe is also prompted by the recession in the US which affects the firm's market there. In seeking a bigger export market the currency situation has to be watched by the firm. Presently exports are affected by the artificially high pound while high interest rates cut into domestic demand - the firm is able to ride out the situation to some extent as it offers a value-added product which is not severely price sensitive. The purchase of pulp in dollars and purchase of German equipment in Deutsche Marks to some extent off-sets the currency risks of overseas sales. The firm also buys currency forward as an insurance against fluctuations.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

Pulp being the major raw material for all three mills of the UK Group, it is handled at the top-most level. 60% by weight of the final product is pulp and it accounts for 34% of sales price (Out of a total raw material content of 60% of sales price). The firm buys 36,000 Tons of pulp annually. Purchase of pulp is done as a central function by a team made of the Group Chairman, the MD of one of the mills and a Group buyer. The requirements of all three mills for softwood, hardwood and eucalyptus is consolidated and the buyer scouts the market for the best deal and refers it to the team for a decision. Though the purchase is centralised, it is cleared with each mill's MD who has a veto power over any decision that is found unacceptable. The clubbing together of requirements gives the Group volume clout in a commodity market.

Beside pulp, purchase of other materials are categorised according to value and importance to operations. Items of high value and criticality are again consolidated for the Group and handled at the MDs' level. Mill level purchasing (by the Purchasing manager) is done only for mill specific items and low value items like consumables. Purchase function is one of scheduling and follow-up.

The general policy is to keep the supplier base, particularly for pulp, to a small number - this is to ensure consistency of pulp quality, which is important for the end product. The firm can use only a limited number of pulp types, and changing suppliers leads to the need to change the recipe for each pulp batch mix. The firm has invested in new equipment which could process a wider range of pulp grades but this is not an open-ended feasibility and so quality of pulp grades is to be watched. Technical department plays a major role in deciding pulp grades.

Restricting purchases to a small supplier base affords scope for building long-term contractual relationship with pulp suppliers. The firm also operates in the spot market when commercially advantageous.

Pulp is normally called off from the suppliers silos at the docks on a consignment basis. The firm holds only 3 days stock on site, compared to 2-3 weeks stock a few years ago. Pulp price level is important but not as crucial as it is for bulk paper manufacturers. The major materials cost for speciality papers is not only pulp but also fillers, binders and chemicals.

For all other items the firm follows the same policy of buying from selected suppliers, though in general it has more than supplier for each item, wanting to avoid a single supplier situation. The firm has close operational linkages with the suppliers and involves them in its own research and development. In fact R&D normally carry out coating trials in cooperation with the suppliers at their coating plants. This interaction is seen to be of mutual benefit and is a key aspect of the firm's overall strategy. Suppliers also come up with their own development which supplements the firm's work. New materials for coating are developed in conjunction with suppliers.

Suppliers also seek exclusive linkages with the firm by sometimes putting in their own equipment on the firm's site so as to bind the firm to use their materials (e.g. mixers for fillers).

Normally, inventory levels are around 3-4 days requirement. Starch, carbonates and clay are almost on JIT basis with daily deliveries. A few items fall outside this rule as they have to be delivered in lorry loads which may last the firm about 4-6 weeks.

Monitoring the supply environment is not done consciously as the supply situation is favourable. In fact the suppliers themselves volunteer information on market intelligence and development trends. The firm does gather information through seminars, industry meetings and trade journals.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Overall, the role of Procurement department is not of a strategic nature - it is one of coordinating and communicating with suppliers. Strategic decisions regards pulp and raw material supplies are taken at the MD's level. Linkages with suppliers on development is through R&D and Technical department.

SAPPI GRAPHICS TRANSCRIPT

THE FIRM

Sappi Graphics Transcript is one of the 5 paper mills in Sappi (UK) Ltd. producing carbonless paper. Sappi (UK) was formerly called SAPPI Transcript until, in June 1990, the whole Group was taken over by the South African Pulp and Paper Industries (SAPPI) who also acquired 2 Finnish firms in coating papers at the same time. SAPPI is basically a timber based, pulp producing firm (owned by a mining corporation). Its major products are timber, pulp, bulk paper and coated paper. The European acquisitions gave it a base to enter the European market. The move also helped it to diversify its range of products into carbonless papers. While it is planned that the UK firms will be independent profit centres within SAPPI, the operations are being restructured in line with the new management philosophy. Hence the firm, at the time of the study, is in a state of 'flux'.

Historically the firm entered the carbonless market in 1969 when the original patent restrictions on carbonless process expired in the late 1960s. Carbonless paper, a pressure reactive method of producing multiple copies, was first manufactured by the firm in 1971 under license from Fuji Photo Co. The technological tie-up with Fuji has now been reduced as Sappi Graphics has developed its own expertise and has its own R&D for further innovation in the field.

Since 1986, the firm has completed a major investment program of expansion and modernisation of plant and machinery. The £ 16 m. investment has introduced 'state-of-the-art' facilities including new pulp preparation lines, a paper machine that coats on-line using a high-tech carbonless coater, a new robotic handling and storage system and a new mechanised warehouse. Process control and quality checks have been computerised. A computerised system for on-line data accessing to track orders and monitor the same has been installed. The coater can also use paper bought in from other manufacturers in addition to in-house paper production (the average mix is 2/3 own paper and 1/3 bought-in paper). This gives the firm some flexibility in production planning.

The firm stocks its products in a warehouse set up in Bristol and sales are organised from there. It also sells through merchants. A new depot has been opened in Holland to service Europe. The firm has sales agents in most European countries.

The firm is aiming to apply for British Standard 5750 by updating process quality control, carrying out quality audits and qualifying suppliers. The end products are controlled for safety of use, through tests by independent bodies, for oral toxicity, eye irritation, skin sensitisation and allergenicity. The tests are conducted against approved industry standards.

Waste paper is not re-cycled extensively by the firm as the quality of the end product requires a high quality input. Only high quality white waste is brought in from the market, mostly from other paper mills. The firm also re-cycles its own waste up to a particular stage in the process i.e. up to carbon capsule coating. The remaining waste generated is sold to waste-paper merchants. Any reactive components that are present in waste or any impurities which cannot be eliminated by processing impede the impregnation process, leading to poor quality products. Also the strength of recycled paper is not high enough for high speed coating operation.

THE PRODUCT MARKET

The firm's product is in the speciality paper segment of carbonless copy paper. Carbonless paper is the technologically developed alternative to carbon coated paper

and has replaced it in most uses. The requirement of the product is high quality of copies, good strength, ability to run at high printing speeds and safety for handling. Some of the uses of carbonless paper, in addition to printing, are in credit cards, weighbridge tickets, word processor sets, cheques, giro forms and legal documents.

The rate of market growth is estimated at 5% with the firm's growth outstripping the same. However the number of players are many in this market, with any technological advantage being quickly evened out. Competition is almost on the lines of a commodity product. Prices are seen to be stable due to increasing demand which is able to absorb the output of all the players. The firm ranks as the 5th or 6th player with less than 10% of the European market (though it has about 30% of the UK market).

The firm's customers are printers who take the product in reel/ream form. For some customers 100% of their carbonless requirement is supplied by the firm. About 75% of output is sold directly by the firm in reel form. The rest is sold in sheet form to smaller printers through paper merchants. The industry trend is for greater off-take of reels as continuous printing increases amongst printers, at the expense of sheet type printing.

As quality requirements are high in this segment, the use of recycled carbonless paper is restricted to 'lower end' uses. It does not seriously threaten the bulk of the carbonless segment. Recycled carbonless paper is produced by the smaller players using market paper and coating them on small, independent machines. The firm manufactures recycled carbonless paper only in small quantities, for specific customer requirements.

THE SUPPLY MARKET

The major input material is pulp, the availability of which is found to be adequate by the firm and hence not a concern. Pulp price tends to move cyclically every few years. However as the market price of all producers move together, the problem is common for all manufacturers. Companies dependent on market pulp do not get any specific advantage through proactive action in this respect. The practice of quoting pulp prices in US dollars brings about some instability due to currency fluctuation. The firm uses different types of pulp in varying proportion and so can adjust procurement to availability and price.

The basic coating material is a special clay, chemically treated to receive impregnation of polymers. There are only 3 suppliers world-wide - one each in the UK, Germany and Japan. The Japanese source was a monopoly supplier for a long time till the other two sources were developed. There is a minor difference in quality of the European and Japanese materials which can be accommodated by adjusting process parameters. Since the specially treated clay is only a small part of the suppliers' output, the firm feels no major moves will be made by the competitors which will cause any concern to the firm.

Colour formers, which are colourless dyes that react with clay to give colour, are produced by a number of firms. Some formers are proprietary products of a few suppliers. Hence the firms using these formers in their process are effectively in a single source situation. The firm is also in such a situation in some cases. However, in an emergency, the production parameters can be adjusted to take alternate dyes.

Polymers used for capsule production could pose a greater concern as there are only two European manufacturers of the polymer. These two suppliers have so far been able to meet market demand in full and so the situation is not viewed as critical by the firm.

FIRM'S STRATEGY

THE PLANNING PROCESS

The firm formulates formal annual plans using a committee headed by the General Manager and aided by the functional managers. Plans are based on annual sales forecast and are readied each January for the following year (commencing in March). Functional involvement is in formulating the budget and in cost cutting exercise.

STRATEGIC FACTORS AND ACTION

The firm's strategy emphasises quality, cost effectiveness and flexibility to meet market demand. Even though the product market is a growing one (5% p.a.) there are a number of manufacturers and competition is very high. Since quality is an essential requisite for survival, it is addressed continually and emphasised in the plans. However competitive advantage is also sought in being cost effective.

In order to meet the increased demand of a growing market and maintain its share, the firm invested heavily over the past 4 years in modernising its operation. The firm has also made the registration for BS5750 a priority. This will aid in projecting its quality standing to the market. The concept of Total Quality is emphasised in the working of the firm.

Cost effectiveness is attempted through process innovation which will extend the production capabilities of the plant equipment. Stock holding has been cut down and storage space has been reduced by half. Having got its major investment in place ahead of some of the competition, the firm hopes to reap the harvest by being a potential lowest cost producer.

As the market trend is for using reels, the firm concentrates on offering 'bespoke mass production' even though the margins are lower than sheets. The shift to mass production helps to achieve lower costs.

The firm believes it has a technical edge over the competition in its encapsulation process for impregnation which, even though it does not lead to differentiation, gives it a cost advantage.

The firm does not use much recycled paper in its production (except for some higher quality white waste) as both the process and the quality of the final product are affected by inferior inputs. Its own R&D efforts are geared to look at waste reduction rather than waste processing. It is able to offer products which are lighter without losing on strength parameters, thus reducing overall wastage.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

Pulp is the major item of purchase, constituting 40% of sale price. The requirements are clubbed with that of the two sister mills and the total quantity is procured, giving some degree of volume clout. Suppliers are selected on lowest cost basis, subject to quality approval. Anticipated annual off-take is indicated and prices are periodically negotiated each quarter. Requirements are drawn weekly on consignment basis from mill stock and payment is made based on actual monthly consumption. The inventory of stocks on the firm's premises is approximately two weeks. Pulp availability has not proved a major concern but price trends need to be monitored. The usage of different grades of pulp in varying proportions gives the firm some flexibility.

The firm also procures paper directly from the market for off-line production, to supplement the main line output. Normally sheets are produced off-line and the availability of market paper is adequate. Off-line production is kept to a minimum as value addition is lesser than for sheet production using the firm's own paper.

Basic coating clay is supplied by only 3 companies (in the UK, Germany & Japan). Being a restricted supply item, there is very little price competition and so not much scope for cost savings. The European supplies are directly interchangeable while the Japanese supply can be used with process modification. Availability has not been a problem to-date and the firm does not take any special action.

Colour formers are in a single source situation as the firm gets 90% of its needs from one supplier. Conversely the firm is also the major customer for the supplier and so it is a situation of mutual dependence. Alternate formers can be used by slightly changing the process parameters and so it never develops into a crisis dimension. The strategic action by the firm was to develop a source closest to home by moving from a Japanese single source to a UK single source. This helped to reduce delivery time and the total cost.

Polymer for capsule manufacture is an item of concern as there are only 2 sources in Europe. Unlike colour formers there are no alternates and so the firm ensures its supplies through long term contracts and holding higher stocks. The firm also actively looks for additional sources and alternative systems of impregnation.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Procurement is involved in various facets of the firm's strategy. It is represented in the planning process by the Technical Manager who heads the function. Some aspects of the extent and level of Procurement's role is as follows:

All negotiations for the major items are carried out by the Technical Manager who is responsible for procurement and R&D. Procurement input to R&D is crucial for the firm. Procurement's liaison role with the suppliers helps the firm to keep abreast of product innovation amongst suppliers. Quick incorporation of innovations gives the firm a technical edge over its competition and is an essential part of its plans. Suppliers are involved through Procurement in new product and process development. Procurement also has a major role to play in the firm's plans to seek BS 5750 registration. Coordination with suppliers ensures that their structure and systems meet the firm's specifications. Supplier assessment scores and audit are being evolved to ensure compliance. Finally, another area of Procurement's contribution is cost reduction.

PAPER A

THE FIRM

The firm is a wholly owned subsidiary of an American Company. It manufactures branded and bespoke fine papers (communication paper, document and security paper, and converter base paper). The annual production is 25,000 Tonnes, valued in excess of £ 20 m. The firm employs 320 people. Production is in small batches of 5-10 tonnes and caters to a large variety of customers and grades

All functional operations are located on site : sales, manufacture, accounts, purchasing and administration. Two other subsidiaries also operate from the premises: a company to export paper and a transportation company. The firm has a marketing office in London. International Sales covers Europe, Australia, the Far-East (Thailand, Singapore) and the Americas.

The firm has 3 papermaking machines with maximum outputs of 2.25 to 4 M.T. per hour. The machines are equipped with the state-of-the-art computer control for production and process quality control. Dual fired boilers (oil/gas) are used to produce the firm's requirement of steam.

Production is batch type. Inventory control is based on minimum stock control, replenished in EOQ. Quality Control is continuous process control with random destructive tests on end product. The firm achieved registration to BS5750 in November 1980 and is a member of the British Paper Manufacturers Federation.

Purchase is looked after by the Administration manager who reports to the Managing Director.

THE PRODUCT MARKET

The firm's products are placed in a speciality niche in the paper market. Security Papers are used in sensitive applications like cheques, tickets, identity papers and passport papers - requiring features like watermarks, durability, strength and optical characteristics. The off take is in small quantities and customer specific. This speciality niche is less competitive than the other niche markets.

The firm also supplies mill branded paper to the merchanting and printing trade. Distribution of these special quality printing papers is through merchants and, to a lesser extent, direct to the final customer. The end use is for fine printing and writing.

The firm's market is both in the UK and overseas. The UK market's demand is primarily met by domestic production (about 75%) of which a major part is supplied by the firm's competitors. The firm is not a major player but is able to hold its own market position. (There are only 3-4 manufacturers of special papers in the UK). Overseas competition is not major in the UK but is considerable in Europe which proves more difficult to penetrate for the firm.

This segment is not subject to price pressures and so competition is primarily by product differentiation. Hence there is a proliferation of branded products. Advertising plays a major role in this sector.

THE SUPPLY MARKET

The major raw material is wood pulp, comprising of hardwood, eucalyptus and long fibre. The mix of the different types of pulp in the product is not fixed and can be varied over a long range. This is advantageous during times of shortage of any one

type. Long fibre (Softwood) is available from Scandinavia and North America. Short fibre (Hardwood) is from America and the Iberian Peninsula. Eucalyptus is from South America and Australia. Generally, pulp availability in the market is not a problem.

Pulp supply is cyclical following the economic cycle of the different producing regions. This is not a serious problem for the firm as it deals in speciality papers which are not cost constrained and for which the pulp off-take is not voluminous. World-wide currency fluctuations have a greater de-stabilising effect than availability. When there is a tightening pulp situation, as was the case a year ago, the firm is assured of supplies from its parent company which is one of the major pulp suppliers in the market.

Waste paper is not used, except mill re-cycles, as quality requirements of the end product are very stringent and cannot be met by using commercial waste. Quality of wood pulp has to be strictly monitored at the firm's end as the pulp suppliers are not qualified to BS 5750. Pulp suppliers usually give only a certificate of conformance which is not sufficient for the firm.

Additives like starch/clay/dyes are bought from UK dealers and manufacturers. Clay supply is a monopoly situation with English China Clay being the only producer. Due to transportation costs, it cannot be imported and all paper manufacturers live with the monopoly situation. The supply situation has never deteriorated to a crisis proportions. Other items are available on a competitive basis in the open market.

Energy is a major input for the firm, which uses both oil and gas for generating steam. The boilers can switch between the two. Supplies are adequate from National Power, Scottish Power and Scottish Gas, with price being the determinant for supply.

FIRM'S STRATEGY

THE PLANNING PROCESS

Planning is a formal process with a 5 year horizon, updated yearly on a roll-on basis. Operational plans are derived from the first year of the Strategic Plan. The factors addressed in the plan relate to the markets, production technology, new products, and resources. Supplies are addressed only at the secondary level. The participants are the CEO with Sr. Executives (Sales Director, Technical Director and Finance Director). The parent company is represented by the Senior Vice President to whom the CEO reports. All plans are to be cleared by the parent. The group meets once in 2 months to continuously review actual against the plan. The whole process has been in place for the past two years.

Procurement is not a participant in the planning process. Only in the development of new products the input of the function is addressed viz. to involve the suppliers at the drawing board stage for technology and design.

STRATEGIC FACTORS AND ACTION

The firm's main objective is to service the niche market of high value added, speciality papers. The firm has no intention of entering the bulk paper market as it would involve heavy investment in paper machines for a market which is already 'crowded' and which is already being serviced by a sister concern in the Group.

The firm's strategy is to build a strong sales base in branded line products, differentiated along quality, innovation and service lines (small batches with individual watermark for security documents). The firm also makes merchant brands in quality printing papers. Marketing is the keystone of its strategy. The firm works closely with individual customers to meet their tailored needs. Competitive edge is derived along these parameters. Cost factors are a secondary consideration.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The firm has an annual purchase of £ 15 m. of which 85% is raw materials. Only one item, pulp, is purchased overseas from 12 suppliers and accounts for £ 10 m. The total number of items bought is 500 raw materials and 170 indirect (consumables) materials. Annual number of orders is 3600 and 20 long-term contracts. All deliveries are to the warehouse. Inventory control is by stock levels and replenishment by EOQ. Total stock level (supply inventory + WIP + finished goods) is 6 weeks. The total number of direct employees in the department is 2.

The firm considers over 90% of material availability to be good. About 10% items (by number) are considered critical for production and are closely monitored. Only one item is single sourced and only one item has dual sources - all other items have multiple sources. All suppliers are independent suppliers, save the parent firm. Supply situation is not considered a strategic concern.

Procurement strategies are aimed at securing pulp (as the single major input), energy and the single sourced item (clay). Pulp strategy is price driven as availability is adequate. 1/3 of purchases are from the parent firm which can be increased if there is a tight situation in the market. The balance requirement is spread over as many suppliers as possible. Within these parameters, long term relations are established with certain preferred suppliers. The pulp mix is flexible with certain minimum tonnage of each grade.

The firm is a member of a consortium of Scottish mills for purchasing pulp. The consortium gives volume clout to the mills whose individual needs are not high. Price is negotiated by the CEO with Procurement following up on schedules. Currency fluctuations have a major impact on ruling prices.

The quantities purchased from the parent are negotiated on a commercial basis depending on market prices. As the parent also trades in pulp not in its production range, this gives a stand-by source for the firm if any particular grade cannot be got by the consortium.

Pulp is purchased on credit terms of 60/90 days from the parent as well as the market. However the terms apply from the time of loading at the suppliers' port. Pulp is then stored at UK ports on the firm's account. Generally, minimum batches from the parent firm (2000 T) are much higher than from the market which skews the inventory holding.

Energy is another major area of commercial buying. The firm is able to use oil and gas interchangeably, giving it a degree of flexibility in the choice of fuel. As the switch over time between the two is not high, the firm can take advantage of price fluctuations even in the short term. Oil/gas is used to fire boilers for generating steam. Electricity is purchased from the grid. Energy procurement is on lowest cost basis (In 1989 £ 1 m. of oil /gas and £ 1 m. of grid electricity was purchased)

A wide range of other raw materials are procured, all but one on competitive bid basis. The exception is clay which is a monopoly supply in the UK - it is procured on long term contract with periodic price negotiations. Cotton linter does tend to get tight at times but is never serious as there are a number of sources and higher prices can be paid to ensure supply (cotton linter is a small part of the total cost). Dyestuff and bleaching agents, with an annual spend of £ 1/4 m. are readily available from the chemical industry, with Ciba Geigy being the main supplier.

The firm has a written supplier policy of close working relationship, communicating accurately needs and expectations to suppliers, building a preferred supplier base, ensuring continuity of supply and identifying suppliers to develop business partnerships in joint planning, information exchange, new product development and management development. Quality of supplies is very essential and emphasised in all transactions as it is a major factor in the speciality segment in which the firm's products are placed. A good supply policy is a major plank on which the firm's strategic move to seek BS5750 registration was based.

New product development is not affected by supply availability but supplier involvement, at the drawing board stage, is sought to secure long term availability, as also to take advantage of the latest technology in the supply market.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Supply aspects play a major part in some of the strategic considerations of the firm. But the Procurement department has only a reactive, functional role while strategic aspects are addressed at higher than the functional level. The function itself is not centralised in the organisation. Orders are placed in many instances directly by end-users with Procurement administration being involved only in price negotiations.

The major role of Procurement is order processing, scheduling and chasing. This situation is now changing in an 'evolutionary' way to one of greater involvement in supplier selection and price negotiations. However, it is not envisaged as being a major dept. in the firm.

ELEC. A

THE FIRM

The firm is a member of a US Multinational Corporation and is situated in Scotland. The Corporation is a leading designer and manufacturer of precision microcircuits and micro-electronics based systems for use in data acquisition, signal conditioning, measurement and control. The Corporation was founded in 1956, has 1500 employees and has manufacturing and technical facilities in the US, Scotland and Japan. Sales and distribution subsidiaries are in Europe, Japan and in the US (16 in the US and 19 in the rest of the world). It has over 800 products, about 18,000 customers and sales of \$180 m (1988). Some of its products are precision, linear microcircuits, DC/DC converter power supplies, microcomputer sub-systems, terminals and peripherals for data collection, and modems. Some of the uses are : industrial controls and automation, test and measurement equipment, digital signal processing, military and aerospace systems, and computers.

The Scottish unit was set up in 1982 as a distribution centre, to receive products from the US, re-package and sell to customers. In 1985 the firm entered into manufacturing, which activity was expanded such that in 1990 it is wholly a manufacturing unit and does no distribution. The products are primarily semi-conductors, of proprietary design, partly to supplement the US parent's production and partly with sole responsibility in some products for worldwide build and sales. The firm employs 130 people and had sales of \$ 12 m. in 1989. The firm is designated the European Components Division (ECD) by the Corporation.

The firm sells its products through the Corporation's sales subsidiaries. The firm's customers are actually the sales subsidiaries which are independent profit centres in the Corporation. The transfer of products from the firm to the subsidiaries is on a 'sale' basis - the firm does not independently sell to the final customers. Hence the sales subsidiaries form the customer base for the firm. The firm has a 3 man Marketing dept. which liaises with the sales subsidiaries to collect their annual forecasts that forms the basis of the firm's manufacturing plans.

The firm's production is batch-type and it follows the MRP system for production and inventory control. Materials management has the total responsibility for planning and scheduling, purchase, stores and customer service, and deals day-to-day with the sales subsidiaries for order schedules and status. The Materials Manager is a senior member of the management team and reports directly to the MD.

THE PRODUCT MARKET

The firm's products are sold in fast growing markets characterised by rapidly evolving technology and increasing applications. The firm however has no direct interaction with the market where its products are used but deals with the 19 sales subsidiaries of its parent Corporation. These subsidiaries are independent profit centres who 'buy' products from the firm on a commercial basis and then sell it to the application market. A price list is provided by the firm and the sales offices work out their own discount factors. As such the firm does not directly interact with the final customer except for servicing the products. However for the development of new products and for establishing them in the market, the firm has a more prominent market role, even though coordination is again through the sales subsidiaries.

The firm also supplements some of the production at the parent unit; in this transaction the parent is treated as an 'internal customer' of the firm and sale is effected through transfer pricing.

THE SUPPLY MARKET

The firm purchases 80% of its requirement from the parent plant in the US. The balance 20% is spread out over 200 national suppliers and 15 overseas suppliers.

The supplies from the parent are of two types - part of them are components or assemblies manufactured by the parent and shipped to the firm for final assembly while part of the supplies are components contracted with suppliers for direct delivery to the firm. The 20% bought directly by the firm are standard packages and semi-conductors which are readily available and pose no concern for its operations. In these instances the firm seeks sources in the Far-East where the standard electronic components are more cheaply available.

As such the firm does not have a major interaction with the supply market. The firm however keeps abreast of developments in the electronic market in general, so as to incorporate the latest trends in its own designs.

FIRM'S STRATEGY

THE PLANNING PROCESS

The firm formulates formal strategic plans through a team of senior managers (Materials Manager, Design and Quality Assurance Manager, Human Resources Manager and Co. Secretary) assisting the Managing Director. In 1989 the first formal plan with a 5 year horizon was formulated. Product development and manufacturing policies are autonomously addressed in the firm's plans, with an 'act and advise' rather than 'consult and act' relationship with Corporate office. However, Corporate approval is required for capital expenditure and recruitment (The Corporate office places a headcount cap). The planning team meets regularly to continuously review the progress of plan implementation.

STRATEGIC FACTORS AND ACTION

The parent Corporation bases its product strategy on putting out complete products (which combine most of the critical functions on the chip) with the latest technology and offering quality and reliability. The parent Corporation is organised into manufacturing units, producing components based on proprietary design through their own R&D. Sales is handled through subsidiary offices which operate as individual profit centres and independent of the manufacturing units.

The firm has also cast its strategy along these lines. Currently, the firm's production is classified along two lines : production to supplement the parent plant's output and production of the firm's own-designed products for which it has the complete build responsibility worldwide. Own designed products are built under the auspices of 'European Components Division' and is similar to the parent's products, but built to BS9000 to meet European needs.

The key thrust area is to emphasise the development of own-design products, to move away from dependency on the parent for 'business'. Hence the firm's R&D has a prominent role in the plans. The firm also projects quality and reliability, innovating in manufacturing technology and following systems approach to quality management.

Marketing activities are restricted to the development of new products, for promoting them with prospective customers. In developing new products, the firm involves the customers and suppliers to maximise the firm's service to the market. The firm does very little advertising, limiting it to new products only.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The firm procures about 500 items for production. 400 of these are obtained in the UK from about 200 suppliers while the rest are obtained from 15 overseas suppliers. 80% by value of all the purchased items are obtained from the parent plant. Availability is generally considered to be good with only 5% of the items posing a concern. However this 5% is not considered very critical for production needs to warrant strategic action. About 100 items are really critical for production, most of which is obtained from the parent plant, while the rest are readily available in the market.

The supplies from the parent are single sourced but the policy of the firm is not to seek an external second source for them. Active consideration of alternate sources is on for about 50 items, all of which are currently single sourced in the market, or there is an over dependence on one market source (more than 50% of volume being with that source). The firm has 2 buyers for market purchases.

The procurement from the parent is primarily a scheduling exercise. Schedules are indicated for 6 months in advance and updated monthly on a roll-on basis. Price is fixed on a transfer basis by the parent. For these items, there is no active role for the firm in market negotiations. The interaction with the parent is handled at the Materials Manager's level.

Of the market purchases, the major part by value (ICs and sub-modules) is from Korea. The open market procurement is done through competitive quotes - there are no long term contracts or special relationships because of the fairly low volumes. However where tooling are involved, the firm offers technical assistance to the suppliers. Some components are currently single-sourced where it is the supplier's proprietary design. In these instances the firm procures on contract basis.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Overall the procurement function is not of strategic significance to the firm's operations. Procurement does play an active part in R&D effort, but not as much in the external market as in coordinating with the parent plant.

IBM GREENOCK

THE FIRM

IBM United Kingdom Ltd. was formed in 1951 primarily to manufacture for the British marketplace. The first manufacturing facility was set up in Greenock's Battery Park - just 10 employees in a site occupying 7000 sq.ft. and assembling typewriters, keypunches, verifiers and sorters. Growing operations required IBM to lease a purpose-built factory at Spango Valley in 1954, which was purchased outright in 1958.

To-day the firm has about one and half million sq. ft. of office and manufacturing space spread over 3 sites in Greenock. The total number of employees is 2500 and it is IBM's key high volume plant in Europe, producing display systems, keyboards and the complete range of PCs including the PS/2 family of products announced in 1987. The market it services includes the whole of Europe, the Middle East and Africa.

The Greenock site represents an investment of over £ 100 m. It is at the leading edge of manufacturing automation. The recent major investment is in manufacture of Surface Mounted Technology circuit boards and a £ 20 m. Automated Materials Distribution Centre which handles 100 incoming vehicles per day, holds 24,000 pallets with a maximum load of 1 Ton each and has an automatic storage and retrieval system. A 2 mile long conveyor system feeds parts directly to the manufacturing lines, which employ robotics and automated manufacturing techniques. The plant won the British Quality award in 1986 from the British Quality Association. It also won other awards both externally and from within the IBM community.

The firm is headed by a Site Director to whom the managers of the following functions report : Product Operations, Technology Operations, Plans and Services, Quality and Product Assurance, and Personnel. Product Operations comprises of 4 Business Units (BUs), New Products, Network Management, and Supply and Inventory. The BUs are Keyboard, System Units, Displays and Custom Products. New Products is responsible for production after development stage, till the product is taken up for regular mass production. Network Management is responsible for implementing the principles of Continuous Flow Manufacture (similar to JIT) all along the manufacturing and logistics chain i.e. from suppliers to customers. Supply and Inventory is responsible for demand planning, coordination amongst the BUs to ensure production as per planned schedule, shipping to customers, and finished goods inventory both in-plant and at overseas stockists and warehouses in Europe (to meet the service level agreements for all products). W-I-P and component inventory is the joint responsibility of Supply and Inventory and the BUs.

Procurement is under the Plans and Services Manager with the responsibility to develop vendors and establish contracts against which the BUs call-off materials as per schedule. The BUs requirements are indicated as inter-plant orders, to be obtained either from other IBM locations or through Procurement. Procurement is a service function for the BUs but has a high degree of interaction and coordination with the BUs.

The Site Director has dual reporting relationships - to the Manufacturing and Development Director for UK, and also a strong 'dotted line' reporting to the Manufacturing and Development Director for all Europe (headquartered in Paris). Both the UK and Europe Directors (for Manufacturing and Development) report to the Directors in charge of UK Operations and Europe Operations respectively, with strong 'dotted line' reporting to the Corporate Director of Manufacturing and Development for IBM world-wide, located in the US.

The global IBM business is divided into independent lines relating to large processors (high-end range), mid-range processors and workstations. Each line is organised on different geographic sites to procure, manufacture and market within that specific geographic area. The firm's (Greenock) line of business is intelligent and dependent workstations to service the UK and Europe, Africa and the Middle East. Likewise there are 3 other sister plants manufacturing workstations for the Americas, Australia and Japan (for Japanese language machines). These sites are primarily for manufacturing only. Research and Development sites for each line of business is separate from manufacturing sites. However, development work for model upgrades are being increasingly delegated to manufacturing sites and hence the firm also carries out some development work.

The firm has no Sales and Marketing function - all its requirements are indented from the European headquarters who indicate the schedules according to which the firm ships the goods to an intermediate warehouse called Country Distribution Centre. This warehouse then despatches to retailers and other customers as required. The firm also has a finished goods warehouse on-site to meet any fluctuations in demand.

Quality Product Assurance is charged with quality aspects to ensure a total Continuous Flow operation. This involves the elimination of inward inspection (from suppliers) and also end-product inspection by devolving it to the shop-floor.

THE PRODUCT MARKET

The firm manufactures display systems, keyboards and the complete range of IBM Personal Computers including the latest PS/2 model. The firm is primarily a hardware plant, with the software being shipped from other IBM plants.

The targeted market for the firm's products (particularly the PCs) comprises individuals, small enterprises and large organisations for their personal computing needs. The geographic area serviced is UK, Europe, Africa and The Middle East. The firm does not have direct access to the end-users but ships the products to a central warehouse (Country Distribution Centre) from where it is despatched to retailers. Software is added at the retail end before delivery to the final customer. The firm deals only with IBM's Sales and Marketing Division in Paris.

The market is fast changing with advances in model upgrades and introduction of new models, led by technological changes. Application profiles also change rapidly with the incorporation of new features. Specific needs of the different geographic segments requires the PCs to be produced in different language versions and the firm's product is available in over 20 language versions.

Competition in PCs is very intense but IBM is the major player and hence the trend setter in many instances. However, the firm being a purely manufacturing unit, it's activities do not include market interactions.

THE SUPPLY MARKET

The major input materials are monitors, CRTs, disc drives, cables, electronic components, keyboards, power supplies, card assemblies (all from the electronic market), plastic parts and metal parts. By and large availability is not a problem except for a couple of components like CRTs and floppy/hard files which are made by restricted number of sources. The sources are in the UK and Europe, with a couple of commodities from the Far-East that are difficult to source in Europe. Very little procurement is done in the US, both for logistic and specification reasons. Supplies are received from open market suppliers as well as other IBM units.

CRTs for monitors pose a problem for sourcing in Europe as most of European CRT production is geared to meeting the requirements of the very large TV industry. Manufacture of CRTs exclusively for monitors is not considered feasible on a stand alone basis and it is generally a part of a TV tubes manufacturing plant. Hence CRTs are sourced in Taiwan, Korea, Singapore and Japan, which poses some logistic problems.

All the major floppy disc manufacturers world-wide are Japanese and hence sourcing had to be in the Far-East. With the opening up of Europe in 1992, this situation has changed as the Japanese firms desired to have a European Manufacturing base and so many of them are locating in UK/Europe (e.g Alps in Ireland and Y.E.Data in Scotland). The development of the Eastern Block also promises to bring more manufacturing facilities into Europe, which would reduce the logistics problem for the firm.

The supply market is dynamic in technological aspects - both in keeping pace with the development of the main manufacturers as well as in own innovations, which are adapted by the manufacturers. The market is a growing one with new suppliers coming on stream, giving more options to the manufacturers. At the same time predatory moves are quite prevalent, with suppliers changing ownership and new strategic alliances being formed. Supplier mortality is also a feature of the industry with quite a few suppliers going into receivership.

FIRM'S STRATEGY

THE PLANNING PROCESS

The firm derives the base assumptions from Corporate Manufacturing and Development, on product strategy and volumes, which are the key drivers of its plans. The responsibility for picking up the base assumptions and then driving and coordinating the planning exercise for the firm lies with the Industrial Engineering Dept. which is part of the Plans and Services Section. Decisions of make-or-buy, capacity requirements and yearly volumes are addressed by the firm in its planning exercise. Industrial Engineering coordinates with all functions within the firm and also with European and Corporate HQs. The formulated plans are then presented for approval to the Strategic Planning Committee which comprises of the 4 top managers on site (the Site Director as the Chairman, along with the Managers of Production Operations, Technology Operations, and Plans and Services). Industrial Engineering is responsible for monitoring the implementation of the plans and completing the feedback loop to Corporate Manufacturing and Development.

STRATEGIC FACTORS AND ACTION

Two major planning exercises are undertaken at the strategic level by the firm:

- 1) The "Plant of the Future" : Which develops the 'best judgement' of overall plant specifications required in 5 years i.e. space, people, skills, volume of shipments and number of models. Strategies are evolved to meet these business objectives within the cost and resource constraints.
- 2) The "Product of the Future" : Which attempts to describe and specify the product of 5 years hence in terms of technology, models commodities and number of part numbers.

All functions participate in the above exercises. Annual operational plans are based on the first year targets of the 5 year plan.

The annual requirements forecast for the firm is put together at the European HQ in Paris. This demand is addressed at the firm's Product Review Meeting (PRM) which considers inputs from the BUs about capacity availability and build problems for the current and new products. From the PRM a quarterly Installation Requirement is derived which is converted to a Product Build Requirement after considering the Service Level Agreements with customers.

The Product Build Requirements leads to the Parts Requirement Generation and Procurement's input, in terms of vendor availability and capacity, is considered at this stage. A final manufacturing schedule is decided after considering all the above factors. The whole review exercise is carried out monthly and results in firm requirements for the first three months and a projection for the succeeding two quarters. Thus the plan is continuously updated on a roll-on basis. Performance to plan is reviewed monthly at a Teams Meeting (comprising HQ representatives, Country representatives and managers from the firm)

The Strategic Planning Committee also addresses issues like the right size for the firm in terms of real estate and population. The vendor base size is arrived at based on this decision. All major assembly work done at the firm is also carried on at the suppliers' end on secondary basis - this gives the firm the flexibility to meet any demand surge at a relatively short notice, by using the vendor base rather than building excess capacity at the firm.

In keeping with the Corporate philosophy, the firm plays an up front role in the community. The firm provides secondments, donations and management expertise to support local enterprise; supports charitable, voluntary and educational institutes and has joint research projects with universities. The firm also advances educational prospects for its employees through an agreement with Strathclyde University that allows its employees to work towards qualifications through lectures held on site. This helps to keep manpower at the forefront of latest developments in the field.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The Procurement function has 140 employees (out of 2500 in the whole firm). It is headed by a manager who reports to the head of Plans and Services. The department is organised in a matrix form - the second level managers are each 'dedicated' to one BU with responsibility for procuring parts exclusive to that BU. and the third level is organised in commodity buying Groups (like Plastics and Metal parts) which cut across BU lines. Three purchasers are assigned to development sites outside Greenock (in the US, Singapore and Hensley in the UK). A manager (at the second level) is responsible for Control, Strategies and General Procurement Systems. Outside the plant there is a European Director of Procurement, with a staff of 5-6 people, who has a strictly staff function to advise on strategies and business behaviour like ethical principles, conflict of interests and separation of duties. At the Corporate level (in the US) there is a small Group of 4 people looking after contracts world-wide for items commonly used in all IBM plants.

The main objectives of the procurement function are:

- 1) Reduce lead time of procurement to facilitate Continuous Flow Manufacture.
- 2) Source all materials locally (in Europe) to reduce lead time and logistic problems.
- 3) Develop a working partnership with IBM Research and Development, and suppliers, to build good procurement practice at the design stage.
- 4) Build strategic partnerships with suppliers through long-term contracting.
- 5) Control and monitor IBM funds for all materials and services for Greenock.

The major long-term exercise in procurement is planning the "Vendor of the Future". This is closely associated with the two complementary 5 year plans of the firm and attempts to characterise the type of vendor required to support the plant in 5 years time, the strategies to be deployed in support of the supplier base and the desired interaction with the supplier. This exercise forms the long-term basis for all procurement strategies.

The early involvement of Procurement in design and development has two strategic connotations. The first is to ensure that design specifications do not lead to a situation where the part could be bought from only one source. Sourcing needs are built into the design stage - even if development of a part is contracted to a supplier the purchasing representatives ensure that the manufacturing rights are bought out by the firm, to give it flexibility when it comes to production purchases. Secondly, the involvement of the supplier at the drawing board stage ensures that the latest developments in the supply market are brought to the designer's notice. Early supplier involvement is a Corporate Policy and invokes a working partnership of supplier, Procurement and Design. This team approach also ensures that standardisation of parts is given a high priority and the number of unique parts for a product does not proliferate.

Procurement support to Continuous Flow Manufacture (JIT) is crucial and a major effort goes into reducing lead time. The thrust here is to try and source all parts within Europe to minimise logistical problems. Procurement constantly monitors the supply market to see the possibility of developing in Europe the parts it currently sources in the Far East.

The firm's policy is to have a working partnership relation with suppliers. The firm has no financial linkages with its suppliers. Joint ventures are not driven by procurement needs but by technical considerations e.g. joint venture with Toshiba on flat panels

Key components are mostly obtained from other IBM plants and the market vendors are used to supplement IBM supplies. As a policy the firm ensures that all major assemblies made by suppliers is also manufactured in-house e.g. keyboards, monitors, cards, surface mounted boards are made in-house as well by suppliers. This gives some flexibility to switch between make and buy. More complex work, or if a new technology is involved, is carried on in-house till a supplier is qualified at a later stage.

Policy requires that common electronic components be procured centrally for all IBM plants at the Corporate level. Two Groups - one for the US called CCP and the other for Europe called COMPACK - gather all common electronic parts requirements, source them and allocate contracts for the total quantity. The firm draws its requirements against the contract from the specified vendor. Also, informal Groups form within IBM plants to gain advantage in the procurement practices e.g. the firm being the major user of plastic parts in Europe, its buyer is designated European Procurement Representative for all IBM units in Europe. He/she coordinates the buying of all plastics requirements for other plants beside Greenock. These arrangements are of an informal nature and not governed by stated policy.

Procurement maintains a supplier profile of major suppliers - financial health, performance, non-IBM business, manpower & mergers. Each buyer is expected to closely monitor the major suppliers and make a supplier-profile presentation to the department. This is to avoid any unforeseen consequences due to supplier mortality, takeover or any other failure. The buyers are also expected to draw up contingency plans in case crucial suppliers should go out of business. The firm has had some suppliers being taken over or going into receivership but no major crisis has developed as the firm was well informed on the situation. Also, in most cases, the new management continued relations with the firm. But the firm is aware of the changes in the supply market and takes steps to meet any contingency.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Procurement function has a strong and important role in the overall planning of the firm in the areas of future plan development, implementing of JIT, research and development, and partnership relationship with suppliers.

NCR (MANUFACTURING) LTD.

THE FIRM

The firm is one of the Engineering and Manufacturing (E&M) units of the NCR Corporation headquartered in the US. The Corporation is structured as a number of autonomous E&M units world-wide, each having an independent charter to design, develop and manufacture a range of products. These products are then sold to NCR Sales and Marketing, which is an autonomous profit centre. Sales and Marketing sell to the final customer, who does not have any direct commercial dealings with the E&Ms. Corporate office coordinates the product plans of the different manufacturing units and measures their performance. The Corporation has totally 22 E&M units world-wide (UK, Europe, Japan, Brazil, Mexico, several in the US). The firm, NCR (Manufacturing) Ltd. at Dundee, is the sole unit in UK. Its charter is to design, develop and manufacture self-service electronic systems for banking and financial services. ATM Systems and Interactive Terminals for financial service systems are its major products.

The firm is established for 45 years. It has 2 plants - one in Dundee, employing 1400 people, which is the main unit making ATMs and service-type terminals; the other unit at Dunfermline is a small plant employing 50 people and assembling interactive video terminals. Top management and support services for the Dunfermline unit are located at Dundee. The UK operations are headed by a Vice-President who reports to the President of the Corporation. The firm has its own R&D, Product Engineering and Product Management to develop its exclusive range of products. Finance and Materials Management are also de-centralised to the unit. It has no marketing and sales function as it transfers its product to Corporate Sales and Marketing at a pre-agreed price. However, market research for product development is carried out by the firm's Product Management who also identify potential customers and establish the sale price. The sale price is then discounted and sale transfer is affected to Corporate Sales and Marketing at the discounted price. Product Management and Corporate Marketing interface closely when developing new products. For new products, the two work jointly to forecast requirements while for established lines, Corporate Marketing generates a sales forecast and places orders on the unit.

THE PRODUCT MARKET

The major market is the banking and financial sectors and the firm offers self-servicing electronic equipment that meets their needs. The major product is Automated Teller Machine (ATM) which incorporates features like CRT graphics, 8-function keys, menu-led diagnostics and quick release modules. The main customers for ATMs are banks and other institutions which provide for withdrawal of cash by their customers. Other self-service interactive terminals are used by financial institutions to provide facilities of credit-checks and funds transfer, to issue insurance cover and to make available a wide range of financial service packages. Interactive video terminals are a smaller part of the firm's product offerings.

The firm's products are sold world-wide, through Corporate Sales office. The major competitor is Interbold (a joint venture of IBM/Diebold) and Fujitsu, a Japanese firm. Much of the sales is in Dollars and this poses a problem for the firm when the Pound is strong. Demand is high and the market is not very competitive. The market is also expanding, with newer needs being added on and this requires constant innovation and new product introduction by the manufacturers. Technology and investment size act as barriers to entry, particularly by small firms. Overall the firm has seen a continuous growth in sales.

THE SUPPLY MARKET

The firm buys its requirements from 3 different supply markets : electronics, mechanical (fabrication) and plastics (mouldings).

Electronics forms a small part of the firm's needs (10%). However this is a crucial part of the operations. The market is technologically volatile and changes are rapid in components like memory capacity and microprocessors. New process technologies (like surface-mount) provide opportunities for innovation. The firm has to constantly respond to these changes to maintain a leading edge over the competition.

Mechanical parts and plastic mouldings are procured from local suppliers, often with the firm's own tooling. Availability of capacity in these markets is found to be adequate. The supply market is also flexible enough to support the firm in its approach to a JIT operation.

FIRM'S STRATEGY

THE PLANNING PROCESS:

The firm's formal strategic plan has a 4 year horizon and is updated annually. Financial plans are drawn yearly and monitored monthly for actual performance against the plan. Materials Management input to formulating the plan is considered important. The plans are formulated by the Vice-President and a team of senior managers. The plan is monitored at the Corporate level for performance, through quarterly reviews. The firm's plans are reviewed annually by the Group Chairman, President and the firm's Vice-President.

STRATEGIC FACTORS AND ACTION:

The firm's strategy revolves around development of products, to meet the increasing needs of banking and financial institutions to bring transactions increasingly to the mode of people-machine interaction. Beside new product development the firm's strategy includes continuous updating of machines to meet existing needs. The products are ergonomically designed considering all human aspects like height, reach, hand movements and privacy, to make the machines people friendly. Specific attention is given to hand-eye coordination.

New product design also takes into consideration the ability to source the various modules in the market. Procurement is involved right at the drawing board stage to liaise with suppliers and incorporate supply considerations in the design.

The search of the market, identifying of needs and coming up with a suitable product is handled by the Vice-President along with the Product Management manager. The exercise is coordinated with the Marketing dept. at Corporate level to provide for smooth introduction and handing over of regular sales. Potential customers are invited to the firm's plant where a full-scale banking centre has been installed for the customers to experience first-hand the capabilities of the products.

Established products are 'sold' to the Marketing dept. and so the firm has no role to play in marketing. As the price is already fixed, the firm has to monitor production costs to ensure profitability. Currency fluctuations are monitored to watch the strength of the Pound against the Dollar as all costs are incurred in Pounds while the sale price is fixed in Dollars. Materials Management plays a major part in keeping costs in control.

The large size of the Corporation (\$ 6 bn. turnover) helps the firm in its dealings with the market. The Corporation has a AAA rating in the US stock market which helps its standing, particularly with suppliers.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION:

New product development is a major thrust area for the firm and is addressed jointly by Product Management, Product Engineering and Procurement. Procurement is represented by a group called the Advance Materials Management team which was formally set-up two years ago. This group works up-front with Engineering and is made up of two cells: ESI (Early Supplier Involvement) and SQM (Supplier Quality Management). ESI plays an important part by constantly scanning the supply industry for what is currently available and for new technology, and providing the information to Engineering. Suppliers are identified based on their expertise and involved in product design right at the initial stages so that parts which can be procured effectively are incorporated in the design. This close cooperation helps Design to quickly integrate the latest advances and maintain a leading technological edge. SQM works on certifying suppliers according to expertise, ability to produce to the firm's standards, capability to invest in latest technology and willingness to operate as 'partners' of the firm. Certified suppliers form the bank of preferred suppliers with whom the firm develops on-going relationship. Early involvement with the product is the cornerstone of materials strategy.

Quality is addressed through careful selection of suppliers. The firm follows a focused approach in setting up its supplier base by having a few key suppliers on long-term contracts. Movement out of the existing supplier base is considered only when new requirements are generated which cannot be met by current suppliers. The firm has a strong supplier certification program (through SQM) which is the means to achieve quality. 15 out of 170 suppliers are certified and the aim is to increase the number to 50 in the next two years. Parts from certified suppliers are not subject to incoming inspection, which contributes to overall cost reduction. The supplier becomes a vital link in the total value chain.

Cost reduction is another area of procurement's active contribution. The stated target is for materials cost to be within standards set at the time of new product development. Early supplier involvement ensures that long-term cost considerations are addressed in the design stage. For existing products the aim is to achieve reduction in material input costs by 2-3% annually. 80% of product cost is direct materials and cost effectiveness is crucial for the organisation. The focused supplier base policy helps in this exercise as larger volumes per supplier and assurance of long-term relationship help in price negotiation. The firm also tries to schedule deliveries on JIT basis where possible. Suppliers have blanket orders and materials are called-off on production pull basis. Involving the supplier fully in the production plans (the firm is working on EDI linkages with key suppliers to link them directly to the firm's master schedule) ensures that the supplier can also operate JIT production, eliminating waste all along the line. Nearly 60% of the materials are in this category. Other parts are operated on MRP basis against pre-determined schedules. Through judicious inventory practice the firm has been able to increase production 4-fold in the past 5 years without corresponding increase in storage space. The firm has also managed to reduce the average inventory over the past 5 years from 75 days to the current level of 15 days.

Close association of procurement with engineering and product management also ensures that obsolescence due to design changes are practically negligible.

A small Purchasing Cell is set up at Corporate office to handle components which are used in common by the E&Ms. These are mostly electronic components. The Corporate Purchasing Cell consolidates the individual requirements of E&Ms and establishes favourable contracts with 2-3 suppliers, using the clout of volume. There is no compulsion on any E&M to participate in the consolidation exercise. However this does

give additional flexibility in the search for cost-effective procurement and the firm tries to maximise its participation in the Corporate level purchasing.

Threats to the firm's cost strategy arise from currency fluctuation of Pound v/s Dollar. Also, for components critical for production, the firm has a policy of dual sourcing which adds to costs (e.g. having to invest in duplicate tooling for some plastic parts).

ROLE OF PROCUREMENT IN STRATEGIC PLANNING:

The Materials function is of strategic significance in the firm's operations and is represented at the Board level by the Materials Management Director. It has a significant role in setting/changing production schedules (The Materials Director chairs the Schedules Committee), new product development, maintaining quality and controlling costs. Procurement plays a vital part in the firm's strategic plans.

KINLOCH ELECTRONICS LTD.

THE FIRM

Kinloch Electronics Ltd. is a member of the Kinloch Group. The other company in the Group is Carntyne Electronics Ltd. The Group is a contract manufacturer, supplying Own Equipment Manufacturers (OEMs) with a range of electronic modules and systems including cable harnesses and Printed Circuit Board (PCB) assemblies. The OEMs are in computers, banking, defence and telecommunications.

The Group was started by Mr. Kinloch and operates as a private company. Carntyne Electronics was set up first and has been in existence for 15 years. The present site of Kinloch Electronics was purchased from Kerr and Kerr of Scotland when they went out of business. The firm has been in existence for 8 years.

Initially the Group used to undertake all types of electronic contracts but has lately developed Cable and Wire Harness as the major product, accounting for 90% of sales. Surface mounted PCB manufacture is also being developed at both units. Additionally the Group is seeking to develop its own product to be sold under the Kinloch name. The total Group sales is £ 10 m. (about 50% from each site. The number of employees is 150 in each site. Though both units operate independently (reporting to separate works managers) there is coordination at Group level to ensure that the two companies do not compete with each other. While Manufacturing is separate, other functions like Procurement, Quality and Sales are coordinated at Group level. Orders are obtained by Sales and Marketing and then the Manufacturing Director allocates the company where it is to be produced.

The firm runs on one shift & has capacity for increasing production if required. Production is split into small batches to facilitate JIT operations - with batch sizes for C&Ws being between 50 and 100. This is facilitated by the fact that majority of the orders are from one major customer which standardises many of the parts. Production and delivery is planned on daily basis.

C&W assembly requires specialised skills - production is automated where possible but depends on highly skilled workers to a large extent. Quality checking is automated on sophisticated machinery. For the last 7 years the firm has been using a test equipment called 'Genrad' for its circuit testing of PCBs. The basic equipment costs £ 280,000 with add-ons annually (of £ 10,000 - £ 15,000) to increase sophistication. This has reduced manual downtime for the testing process from a day and half to a 5 mins. The Group has qualified for BS5750 for quality. The Group is financially comfortable and further capital investment is not a problem. The Group has recently hired a Business Director to advise on business expansion.

THE PRODUCT MARKET

The electronic contract industry has seen periods of boom and recession over the past 20 years. In the 1960s there were only two major manufacturers in the UK - Honeywell and Burroughs. In that period the industry went through a painful recession with a lot of lay-off. In the 1970s, as the boom period started, investment in UK increased and a number of new contractors came on the scene, till the competition became intense with 15-20 sources for cable and wire harness manufacture. But the business is also growing as more manufacturers off-load assemblies to contractors. Europe is also a potential growth market for all UK contractors. Recently the industry passed through a recessionary period but it has not affected the contractors drastically.

Technology has been changing rapidly, particularly in the field of surface-mounted boards. There are very few manufacturers who have the technical capability in surface-mount, at the same time being cost-effective. Capital investment for surface-mount is also very high. The firm hopes to be able to offer this capability very soon.

The firm has about 35 customers but 65% of the orders are from one OEM customer. The firm is correspondingly the major supplier of C&W harnesses to the OEM and has a good relation with them. The firm is ranked No.1 (S1 Status) in quality by the OEM after it was approved for BS5750. The firm is, however, seeking to get out of this 'dependency' and is looking for other companies who would also be long-term customers like the OEM. The firm also hopes to move into other electronic parts manufacture to serve a wider market.

THE SUPPLY MARKET

The supply market is primarily made up of wire, cables and electronic components. Overall the market is very competitive and the suppliers are supportive of the firm's needs on price, JIT deliveries and quality. The market however is cyclical (for demand) every 4 - 5 years period and so the tendency is to establish long-term relationship in order to ride out the cycles together. In the area of cables and wire, a major change is expected with the coming into production of Madison Wire, an American firm setting up a plant in East Kilbride. This is expected to trigger off a major price competition.

Until now the firm has had a minimal role in the supply market as its main OEM customer nominates the suppliers from whom the firm has to get the materials. Recently the OEM has shown a willingness to allow the firm more autonomy in this matter.

FIRM'S STRATEGY

THE PLANNING PROCESS

Until recently the firm did not have a formal business plan. Being a contractor, orders were brought in by Sales and Marketing which was transformed into a production plan depending on the required delivery schedule. Recently however, the firm has appointed a Business Director who has formulated an overall Strategic Plan for the firm which is being filtered down through the organisation. The plan includes a mission statement, objectives and targets, job description and responsibility allocation.

STRATEGIC FACTORS AND ACTION

The Mission Statement of the Group is "to manufacture, through constant endeavour, world-class customer-orientated modules and systems". Manufacturing should be of the highest quality and at the least cost. The objective is growth, both organic as well in new areas of manufacture on contract basis. The firm also would be seeking an own product for manufacture. Thus, growth is sought through increased level of business with current customers, adding on of new customers, branching out into new contract activity and seeking a product for own manufacture.

In its current activity of C&W Harnesses, the firm sees itself as in the top 3-4 manufacturers. Being a contractor, the firm focuses on customer service, flexible response, high quality workmanship, keeping abreast of technology through investment and training, and employing a skilled work force. The firm maintains close links with universities and colleges for Research and Development as well as development and training of personnel. As co-manufacturers, it sees itself as an extension of the OEMs it serves, building a partnership relationship. JIT operations and the firm's recent qualification for BS5750 are the keystone for the partnership relations. The firm at present feels beholden to one main customer for business and is actively

seeking new customers to dilute this dependency - new customers are being added on at the rate of 1 per month in the last 12 months.

Production function is the key focus area in operational strategy, as is expected of a contractor. Procurement has a minimal role as the customers dictate who should be the suppliers, or issue materials themselves. There is no in-house R&D and product development is sought through outside linkages (with universities). The assembly is labour intensive and the skilled work-force is an area of strength. The firm has adequate capacity for volume expansion.

New contract work is being undertaken in surface-mounted PCB manufacture. This is a technically advanced process which requires sophisticated equipment. It is seen as an opportunity for the firm to establish itself, as there are very few manufacturers in this field at the moment. The firm has the financial ability to invest in new machines and the necessary skills to manufacture PCBs. This will be the major area of strategic thrust in future.

As far as own product manufacture is concerned, the firm is scouting for a readily available product to take up for manufacture as the firm does not have a strong Research and Development department to develop its own product.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The Procurement department has 4 employees and has an annual purchase value of £ 3.1 m. amounting to 65% of sales billing. 97% by value is purchased from national sources from 150 approved suppliers. The firm has only 3 overseas suppliers. 20% of the materials are considered critical for production but availability is generally good. 10% of the materials are single sourced, 60% dual sourced and the rest have multiple sources. The total number of items purchased is 3600.

The majority of the items being procured from suppliers nominated by the customer, Purchasing role is one of scheduling and ensuring materials are delivered on JIT basis. Out of the 150 suppliers, there are only 4 major suppliers and hence the exercise of JIT scheduling is carried out easily. The shop floor already operates on JIT, drawing stocks from warehouse when required. Suppliers are willing to let the firm store components on site and pay only for the quantities drawn for use, but this blocks warehouse space for the firm. Hence more frequent (daily) deliveries are being pursued with the suppliers.

Recently the firm's major OEM customer has agreed to only nominate the source and let the firm negotiate prices; this has increased the commercial importance of Purchasing. *Seeking a broader customer base is expected to increase this importance* as more components get procured directly by the firm rather than having to draw them from customer-nominated suppliers.

In view of being restricted to nominated suppliers, the firm has built good relations with them. However the full benefits of the competitive situation in the supply market have not yet been realised and cost advantage is lost both to the firm and the customer. In anticipation of a bigger commercial role, Purchasing has put in place a policy of procurement which is primarily price-based, as the supply market is seen to be competitive. Suppliers would be chosen based on whether they have a standard accreditation (like BS5750 or MOD approval or BT approval) and whether they are approved by the firm's ultimate customer.

Quality of supplies is primarily based on supplier certification of performance, though the firm also carries out its own quality checks. The rejection rate is considered good at less than 3% but the firm is working with suppliers to reduce it to less than 1% to make JIT working more effective.

When the firm moves to manufacture of own product it is expected that the role of Purchasing will be more critical and of strategic value.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

At present, due to the contract nature of production, the role of Purchasing is minimal, being restricted to supporting the JIT working of Production. This role is expected to change and become crucial to the organisation as more customers are brought in on the basis of the firm buying materials for the contract. Also the role will increase in importance once the firm goes in for own product production.

GRI ELECTRONICS LTD.

THE FIRM

GRI Electronics Ltd. is a wholly owned subsidiary of GRI Group PLC. There are two other firms in the Group which are smaller than GRI Electronics - Craig-Alford comprising 6 employees selling imported products and Perenco for commercial activities. The parent organisation was created to make it possible to acquire smaller companies which might be suitable partners for the firm. The whole Group specialises in providing procurement and manufacturing services to the industrial and scientific instrument sectors of the electronics industry.

HISTORY OF THE FIRM: The firm was formed in 1966-67, by the present Chairman, in Surrey as GR Designs. It comprised 3-4 persons and concentrated exclusively on designing electronic products for customers. Soon the firm was being asked by clients to manufacture what it designed and so it entered manufacturing. When the need for increased space was felt, the firm moved to Perth in Scotland and was re-named GRI Designs (Perth) Ltd. Since then the firm has evolved into a full fledged contract manufacturer under the name GRI Electronics Ltd. In 1980 the firm went into receivership when it ran into difficulties in trying to develop a major new product. It was bought back from receivership by the Chairman and is now a profitable organisation.

The firm is now owned 41% by the chairman and the balance 59% is spread over 250 shareholders. Situated on a 50,000 sq.ft. site, it has 210 employees and has forecast a turnover of £ 5 m. for 1990-91. The major business is contract manufacture of printed circuit assemblies, modules and other products for blue chip companies in computers, telecommunications and industrial systems. It has BS5750 manufacturing approval from British Telecom. It has facilities like automatic component insertion, surface mount and through hole mount, flow-line hand assembly and computerised test equipment. The firm constantly invests in updating manufacturing methods to keep abreast of developments and to meet its customers' requirements. The total number of products contracted with the firm is over 50, each one unique to a specific customer.

The firm has only one product (Torrymeter - for measuring fish freshness) which it manufactures for direct sale. The firm has been producing it for 10 years under license from a laboratory in Aberdeen. It is made in small quantities and sold to Government establishments, Health and Safety inspectors in the food industry and to large food manufacturers. It is a small part of the firm's output and most of the production is exported. However the firm is currently formulating plans to manufacture a personal attack alarm system under license from the National Health Service which will launch it as a manufacturer of electronic systems in its own right.

In view of the move to own product manufacture the firm is increasing its number of employees, bringing in new managers for Manufacturing and Materials (which were currently coordinated by the MD). The shop floor strength is kept lean with spurt in demands being met from a pool of temporary workers, called up on 'as needed' basis. The firm runs a 8-hour shift with extension, through part-time employees, in the evening. Machine assembly and test equipment are the bottle-neck activities and are run in two shifts. Shop floor scheduling is carried out by Production Control in consultation with sales.

Quality inspection is carried out on all incoming materials, except where materials are issued by the customer. Quality certificates are issued for all finished goods.

THE PRODUCT MARKET

The firm is primarily a contract manufacturer and hence there is no specific product market for a major part of its operations. The firm assembles electronic products (PCBs, modules, other products) for blue chip companies in the electronics and telecommunications industries.

The electronic contracts market has an annual turnover of £ 300 m. Contract firms fall broadly in one of the following categories : large volume operators who are basically big manufacturers in their own right with excess capacity which is used for volume work for others; small volume players who are hand assembly firms with low overheads; and medium sized players who set up automated lines to specifically cater to contract needs. The firm falls in the last category. Some of its competitors are Philips of Dunfermline, Highland Electronics, SCI and AB Electronics. As technology to set up a contract shop is not proprietary and start-up investment need not be high, there are not many barriers to entry in the contracts business. The field is competitive and firms tend to establish a close relationship with some big customers and have long term dealings with them.

The personal attack alarm system, recently licensed for manufacture from the National Health Service, will be a major project and the firm expects sales to take-off well in a short space of time. The market seems quite large - old people's homes, children's playgroups and prison systems. At the moment the firm is targeting mental health institutes and prisons. As the firm will be one of the few companies offering this system, it expects a market which offers scope for sales growth. The firm has already installed one system which has been in successful operation for 18 months.

THE SUPPLY MARKET

The firm manufactures to customers' design, either using their materials or through its own procurement. As the contract work is electronic assembly, the firm goes to the electronic supply market for components like ICs, capacitors and resistors. The components are mainly standard parts and are readily available. The requirements of the firm being small, the firm primarily deals with distributors and only on occasions with manufacturers. There are many stable sources of supply. The market is competitive and so prices are under control. Supply poses no concern for the firm.

In many instances, the firm's customers qualify some suppliers from the market as suppliers meeting their standards and then ask the contractors to buy from them. This ties the firm to specific sources for many components. While this has the advantage of assuring quality of supplies, the firm loses the flexibility of price competition. However this seems to be the trend in the industry as a whole.

FIRM'S STRATEGY

THE PLANNING PROCESS

The firm is currently a contract manufacturer. However it has recently drawn up a Corporate plan to enter manufacture of its own product. The plan has a 6 year horizon in which period it wants to quadruple its current sales (£ 5 m. for 1990) with 50% being contributed by own products. The plan has originated from the MD, assisted by senior managers and approved by the Board. Business plans will be derived from it each year.

STRATEGIC FACTORS AND ACTION

Being a contract manufacturer, the firm bases its strategy on the following lines :

- To have a stable customer base of 15-20 blue chip firms in computer, telecommunications and electronic systems manufacture.
- To seek a reasonable volume of work from each so that the extremes of splintered volumes amongst many, and consolidated, large volumes amongst the few is avoided.
- To continually invest in updated manufacturing technology to service the customers' needs.

The long term objectives in contracts are to improve direct profitability of each contract, increase sales turnover and reduce costs through effective materials management.

The firm highlights the benefits to the customer of contracting out whereby the customer can concentrate on core business activities, be freed from having to invest in up-to-date machinery, pass on loads exceeding in-house capacity and avoid complicated stock controls. To this end, the firm aims to increase that business which requires it to procure materials on behalf of the customer.

The firm has also concentrated on building its own skills in technology. The firm has identified the trend in electronics as increasingly towards contracting-out by the main manufacturers and is building itself to take advantage of this trend. The firm does not seek to compete with large contractors who, because of their heavier investments, go for volume work. Instead the firm looks for the relatively smaller volumes of big companies. The 'comfortable' capacity of the firm is about 30,000 PCBs per week and the firm tries to get this load from a restricted range of customers who are chosen on the basis of their historic association with the firm, or newer customers with steady off-take and who have the potential to stay long term with the firm. The firm also derives the benefit of being up to date in the state-of-the-art through association with industry leaders as its customers. To meet its objective of sales growth, it prefers expanded business with its defined customer base rather than bring in a number of new, small volume customers.

The firm has capacity constraints on machine assemblies and testing equipment for which it runs two shifts. It also uses outside test house facilities when needed. Hand assemblies and other operations are run on single shifts with top-up being through overtime using part-time workers from a labour pool maintained by the firm.

Contracts are negotiated by the MD along with Sales, production schedules are fixed for 3 weeks and updated in weekly capacity meetings, and resource requirements are planned around it. Once contracts are fixed, Production Control liaises with customers to establish delivery dates. Some firms operate a JIT call up and the firm is linked with them through EDI. Finished goods stocks are kept low due to flexible scheduling, though raw material inventory is higher.

In the long term, the firm plans to shift to manufacture of its own products. A Corporate plan produced in 1989 with a 6 year horizon projects the business mix between contracting and own manufactured products to be 50:50 at the end of that period. The move to own manufacture is prompted by the need to reduce total dependency on other firms for existence, and by the availability in-house of infrastructure (technology and machinery) to make own products. The plan has clearly defined the market to be entered and the product to be manufactured.

The firm plans to make some immediate moves in support of the decision to go in for own manufacture:

- Research and Development, and Engineering is to be strengthened. As this area was not strong, licensing the first product was found necessary. In-house development is now found necessary to expand this base.
- Marketing is to be restructured. For the contract business it was possible to operate on customer-contact basis. Now the firm will need to market its products in a new segment.
- A new Manufacturing Manager is to be recruited. At the moment, the function is coordinated by the MD. Likewise, a new Materials Coordinator is to be recruited as that function will increase in importance.
- Manufacturing facilities are to be expanded.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

As a contractor, the firm faces three procurement situations:

- Where the customer nominates the supplier from whom the materials are to be procured.
- Where the firm is to procure the materials on its own.
- Where the customer supplies the material and Procurement's role is one of liaison with the customer to ensure availability according to schedule.

Some customers require the firm to procure from nominated suppliers at a fixed price or at a price to be negotiated by the firm. The customers generally certify the nominated supplier as part of their materials policy. The firm faces problems due to this arrangement when it finds some supplies not passing its inspection, or when the supplier delays delivery. The lack of flexibility requires the firm to plan receipts well in advance of actual production, increasing its inventory. The firm addresses this problem by asking for more than one supplier to be nominated for major items. The firm also attempts to get clearance for other suppliers it has located. However this situation is normally of concern for the firm.

Where the firm has to procure its own materials it has scope for implementing its strategies. The total procurement value is £ 2 m. The firm seeks to contract increasingly on this basis as supplier performance will then be under its control.

Most products are standard industry products and availability is not a major problem. The firm deals with distributors, normally on the basis of competitive bidding. There are a few items (about 6) used across customers' contracts which are procured by the firm on long term contract basis. Costs are constrained by the estimates given for the job, and economic buying is very important. Procurement has to closely coordinate with Production Control to schedule supplies as needed, without increasing inventory. Scheduling also has to be tight to avoid obsolescence due to design changes of the customer - this is another factor which restricts long-term orders.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Overall, Procurement's role is functional with cost effectiveness being the main aim. This is reflected in the business aims which calls for reduction of costs through effective materials management including effective purchasing. Procurement's importance is expected to increase when the firm starts to make its own products. The strategy for procurement is yet to be evolved for that situation.

ELEC. B

THE FIRM

The firm is a unit of a leading high-technology, Multinational Corporation in the field of computing and electronic measuring equipment. The Corporation employs 87,000 people world-wide, has 24 plants in the US, and research and manufacturing facilities in Europe, Japan, Latin America and Canada. It has 140 sales office in US plus 300 offices in 92 other countries. The annual turnover is \$ 10 bn. from more than 10,000 products in business and personal computing, software, technical computer systems, medical test and measurement systems and instruments, and medical products. The Corporation is committed to R&D, investing 10% of its revenue in the activity.

The Corporation. is organised into 4 sectors, 3 of which are part of the computer business and the fourth is in measurement systems. The measurement systems sector is further classified into Microwave and Communications Group, Electronic Instruments Group, Analytical Group, Medical Group and Components Group. The Groups in turn are made up of a portfolio of related businesses. The firm is a division of the Communications Test Business within the Microwave and Communications Group, set up to develop, manufacture and market test and measurement systems for the world-wide telecommunications industry.

The firm's products include portable testers, modems, terminal test sets, and remote access and test systems for networks. The products are used in circuit testing, signalling, mobile radio and cellular systems, transmission systems, lightwave and microwave networks.

Employing 850 people, the firm is headed by a Division Manager who reports to the Business Head. There is also a dotted line reporting to the Group Manager. The functional managers within the firm all report to the Division Manager but also have dotted line reporting to the respective functional managers at the Group level.

Manufacturing is organised in 3 units - Unit A for products for greater than 200 Mb/s applications, Unit B for lesser than 200 Mb/s and Unit C for network signalling. Each unit has its own dedicated R&D and Marketing Departments while the Materials Department services all 3 units centrally. An order processing unit centrally coordinates the schedules for the 3 units and is the key link amongst Production, Marketing and Materials.

Production is a batch process - there are 50 major products and many accessories. The batches are in sizes of 3-5 as the firm moves closer to JIT operations. The shop floor is organised into mixed model work cells, with each workable manufacturing more than one product. This allows for flexibility in production. Quality is the responsibility of the workable and the product is directly despatched from production. The workforce has been cross-trained for many different skills. Manufacturing is tending to move out of traditional work order situation to use of kanbans for pull-through working. This is within a Master Schedule that has an umbrella horizon of 70 weeks and is updated monthly along with Marketing. Production schedule is on a 12 weeks basis again updated monthly from the Master Schedule.

Sales are handled directly by Corporate Marketing and no direct sales are made by the Marketing Department. The responsibility of Marketing at the Division level is primarily in the area of identifying new product requirements, coordinating development and introduction through R&D, and liaising with Corporate Marketing for forecast of regular products requirements to feed into the firm's production schedule. Thus the firm is a 'supplier' to Corporate Marketing.

Materials Management services all the production units and R&D centrally. It is organised in cells along types of materials. Most of its policies are laid down by Corporate Materials which coordinates corporate contracting for supplies, document control, specification control and stock numbers. A fabrication shop is attached to the Materials Department and is basically used for prototypes and interim production of parts till they are sourced out.

THE PRODUCT MARKET

The firm supplies test equipment for circuit testing - analog and digital signalling; mobile radio and cellular system; and lightwave and microwave transmission systems. The firm has also combined its strength in computers and test equipment to introduce remote accessing and testing of networks. The firm also supplies random access switches, as OEM parts, built into exchanges to check the lines.

The main users are telecom technicians and engineers. Demand for the products arise as a part of the customers test plans. Hence the products are not off the shelf but built to specific orders. It is Marketing's role to tap & consolidate these needs into a sales plan. The customers are in 3 categories - manufacturers who make operational equipment, network operators and network users. Manufacturers look for speed of measurement and high throughput, network operators look to monitor performance from central locations (data recordings and alarms) and portable equipment to troubleshoot, while private users look for low cost, lower capability equipment. The needs and trends in each usage is different and the firm's strength is in the breadth of its product offerings to cover these needs.

The firm's product is dependent on developments in the telecom industry where the cycle from concept to trials is very short but from trials to installation takes a long time due to the huge investment requirements and problems of logistics. Test equipment are needed through out this cycle. Hence the life support demand from test equipment manufacturers is high (The firm offers a 10 year support for its systems).

As the industry sees rapid innovations and testing needs become more sophisticated, product innovations have to keep apace. The product cycle is short and suppliers tend to push in newer products to influence usage.

THE SUPPLY MARKET

The firm interacts with the supply market at two levels: purchase of electronic, mechanical and plastic components; and purchase of boards and assemblies through contractors. The supply market is not a concern as far as availability goes but, as is the case with the industry in general, it is a rapidly changing market where technological innovations are concerned. The firm constantly monitors the market to incorporate the latest innovations in its products as well as to avail of updated production facilities in the supply market.

Contractors and component suppliers are on the lookout for large volume corporate accounts and so much of the supply activity of the firm are dealt with at the corporate level for standardisation and volume clout. The market also has a number of distributors who supply small quantities where needed. Electronic components are fairly standard and any innovation is rapidly diffused throughout the market. Hence marketing plays a major part in the suppliers' strategy. This is advantageous for the firm as far as the overall supply situation is concerned.

FIRM'S STRATEGY

THE PLANNING PROCESS

Planning is on two levels - Strategic and Operational. The strategic plan for the firm is formulated annually on a roll-on basis and is prepared by April of each year. It is called the Business Strategy Summary (BSS) at the Division level. It has a horizon of 5 years and contains detailed projections for the firm's individual product lines, new developments in technology and products, and capital requirements. This is primarily a financial plan and is built on inputs of R&D, Marketing and Manufacturing. Materials is not directly addressed at this level as it is already considered in the inputs from R&D and Manufacturing. The BSS of various Divisions is consolidated at the Group level and submitted to the Corporate level in the form of a Business Strategy Review (BSR). At the Corporate level the BSRs are consolidated to form the Corporate direction for the organisation. The first year plans (of the 5 year strategic plan) forms the basis of the operational plans of the Divisions.

The operational plan is then detailed out by Marketing, R&D and Manufacturing to form the Production plan for the firm. While this is detailed out for a 12-month period, Production extrapolates it by a further 4 months and splits it on a weekly basis to form a 70-week production plan. The 70-week plan is the basis for the MRP document which details the monthly requirements of materials, capacity and people to meet the schedule. The 70-week plan is updated every month on a roll-on basis.

The Division reviews its performance of actual v/s the plan every quarter and revises its forecast for the next 5 quarters. The quarterly review and the fresh 5-quarter forecast is also the feed-back from the Division to the Group level. The Groups in turn feed-back the consolidated quarterly review of all its Divisions to the Corporate office as a measure of Group performance.

Materials Management plays an important part in the formulation of the 70-week production plan as well as in the 5-quarter forecast at the Division level.

STRATEGIC FACTORS AND ACTION

The firm is a low-volume, specialised products manufacturer whose main strength is an intimate knowledge of the complex needs of the telecom testing systems. This is coupled with aggressive corporate marketing to push the product and influence the demand pattern.

R&D for introduction of new products is a key factor in seeking a competitive edge. Technological advantages are short-lived and the firm's strategy is to quickly introduce new products, harvest and move on. To this end, it has targeted new product development and introduction not to exceed 2 years, as compared to the maximum of 5 years applicable earlier. At the same time, product service support is expected to be long in the telecom industry and the firm offers a 10 year service support for its systems.

R&D is organised in project groups along product/market lines. It is driven by market needs and works in close coordination with Corporate and Division Marketing in development of new products. It also works in close cooperation with Materials to be aware of product/process technology updates in the market and to incorporate the same in its design. The concentration is not on technology development but on adapting up-to-date technology for product development.

Marketing has a key role to play in product strategy. It has the responsibility to research market needs, coordinate with R&D to develop the product, and promote it. Sales of products is through Corporate Sales Organisation and the firm's Marketing plays a

major role only in development of new products. Coordination with Corporate Sales is very close during the new product stage. Market scanning is very important and is carried out by surveying customers for their future needs, getting feed-back from corporate sales force, and through trade journals and technical conferences. Advertisement is the responsibility of the firm but is tied in with corporate messages, for maximum visibility.

Manufacturing is secondary compared to R&D and Marketing. The focus is to have a flexible shop floor to make low-volume batches and to meet a broad range of needs. The flexible, mixed model work cells help it to service the breadth of the market needs, from large telecom firms to small private network operators. It is thus able to compete in every market niche.

The manufacturing policy is to purchase components and assembly kits from the supply market and carry out the final assembly and testing in-house. Some PCB technology is proprietary and the Corporation prefers to have it in-house i.e. developed and produced in PCB manufacturing Divisions which are consolidated at Group levels. The firm then buys these PCBs from the sister Divisions. The firm concentrates on electronics and off-loads its fabrication needs. The firm's fabrication shop is primarily used for prototypes.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The major role of Procurement in support of business strategy is its involvement in the R&D function. Procurement ensures that the designer is aware of the latest trends in the supply market and that the preferred suppliers are involved in product design at the drawing board stage. It also ensures that standard components are used in the design to the extent possible. A team of procurement engineers, designated the Materials Engineering Dept., is located in Design for this liaison role. Procurement also helps in identifying preferred suppliers with whom technology, as required by the firm, can be developed. To ensure the effective performance of this role the procurement engineers constantly scan the supply market for innovations through supplier seminars, feed-back from suppliers, technical conferences, journals and trade magazines. Feed-back is also passed on to Design by Sales through its own scanning effort.

Supplier selection policies are guided by quality considerations. The firm aims to have a small base of preferred suppliers who can work in long term 'partnership' with the firm, preferably at the corporate level. The preferred supplier base helps to reduce incoming inspection, facilitating the greater use of JIT practices. It is also easier to establish EDI linkages with a small supplier base. Suppliers are assessed on Technology, Quality, Responsiveness, Dependability and Cost (the TQRDC factor). The aim is to standardise parts/assemblies usage to those components that can be ordered from corporate suppliers, reducing purchases from suppliers unique to the firm to a minimum. Most of the suppliers are independent, except where the firm buys from other sister Divisions. When contracting assemblies, the firm directs the contractor to buy components from its own preferred suppliers who have already been screened through TQRDC. This assures the firm both quality and price control.

In support of production, Procurement has to get in materials according to the increasingly flexible, small volume, mixed work-cell schedules. This requires responding in a JIT mode, collapsing supply lead times and increasing on-line storage. Many components (resistors and ICs) cannot be handled and require point-of-use storage where they are peeled off from tapes by machines as required. At the moment, both on-line deliveries as well as warehouse deliveries are present. The necessary computer tracking and control of material usage, essential for JIT operations, is not yet in place. There is also a conflict between inventory and price-break volumes which has

to be overcome in implementing JIT practices. The firm finds that JIT practices are more applicable to Corporate contracted items which number 10,000 out of the 30,000 items used by the firm.

The remaining 20,000 items which are purchased from 600 suppliers are items specific to the firm and the maximum contributors to inventory. The current inventory holding is 5 months, of which 15-20% are non-active by usage. This is because the firm has a low volume, complex and optionised range of purchases, tied in with price-breaks and minimum order quantity requirements. This leads to a degree of over stocking in some parts.

Procurement is also responsible for keeping the level of obsolescence to a minimum. For this it liaises with Marketing to keep track of end-product demand. It also has to be aware of the suppliers phasing out parts which may still be used by the firm and make arrangements for one 'life-time' purchase till the part can be redesigned. Also it has to ensure that any parts obsolete for the firm can be resold to the market. For this purpose, the firm has decided to buy on industry standards rather than its own part number, to make its usage as generic as possible.

Procurement plays only a supportive role in Corporate Procurement policies. Procurement is restricted to ensuring that Design incorporates corporate parts to the maximum extent. Contract suppliers are also directed by Procurement to go to corporate suppliers for components. Procurement's responsibility is also to forecast accurately the annual off-take from corporate suppliers, as Corporate Procurement monitors the actual off-take against the forecast. Corporate contracting is guided by scale economies, uniformity of quality, preferred strategic suppliers and tie-in with Corporate Marketing to source in areas of the world where the Corporation hopes to sell its products, but which require reciprocal arrangements by local governmental regulations.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

The firm's plans are driven by R&D and Procurement's role is in support of these plans through Manufacturing. Supply policies are articulated at Corporate level and implemented at Division level by Procurement. The major Procurement support to the plans is the scanning of the supply market for technological innovations which can be incorporated in the firm's product design. At the operational level, the role is purely functional.

THE GPT CORPORATION

GPT (GEC - PLESSEY TELECOMMUNICATIONS) is a global Corporation jointly held by GEC and SIEMENS, with Siemens having 40% ownership. The Corporation manufactures the full range of needs in the telecommunications industry. The telecommunications industry has evolved into a highly 'intelligent', feature rich, globally integrated network which makes it possible to communicate 'any information, in any form, anywhere in the world'. GPT meets the full range of customer needs in this area.

The Corporation supplies advanced telecommunications technology and equipment to government, military and business in 113 countries. The customer applications profile includes public network operators (intelligent networks, broadband transmission and switching systems), business users (video conferencing, data networks, cordless PBXs), value added service providers (transport for video and data services, network applications) and private subscribers (mobile terminals, remote services, data and video terminals). The firm has identified the needs of the telecom industry as requiring large organisations responsive to changing customer needs, having technological prowess and operating internationally. It has structured itself to meet these requirements.

GPT is organised as 4 operational Groups which work independently (and together) to service the whole range of the market. The 4 Groups are supported by an international marketing Group and an advanced engineering Group. The 4 Groups are:

- 1) Telecommunications Systems Group: This has two units - switching networks and Stromberg-Carlson Corporation (in the US). The group supplies switching systems and networks to major telephone companies.
- 2) Business Systems Group: Comprises voice systems, data systems, voice and data networks, and a sales and service unit. It supplies PBXs, data communications systems, videoconferencing systems and secure communications systems to industry, government and military.
- 3) Network Systems Group: Produces fibre optics systems, automatic cross-connect equipment, digital radio and cables, and cable distribution systems. It services the transmission and network planning needs of administrations, connecting users and information sources.
- 4) Mobile Systems and Terminals Group (MS&TG): Comprising Telecom Products, Telephone Systems and Mobile Systems. It services 'lifestyle' needs of human interface products to respond to the communication requirements of 'people on the move'. The products include cordless handsets, intelligent payphones, cashless calling systems and integrated home services products.

(MS&TG is to be disbanded and a new Group called Enterprise Business Group is to be formed which will comprise smaller, start-up type of businesses without heavy Corporate overheads and structure. The start-up units will get the products made anywhere within GPT and market them on their own. Besides the present units of MS&TG the new Group will also draw in, from the Business Systems Group, the Data Systems and Videoconferencing units at Maidenhead, and the Computer unit from Dunstable. This re-structuring is expected to take place soon)

In this study, the following plants of GPT are included:

- 1) GPT-KIRCALDY: Situated in Scotland, it is a part of MS&TG, manufacturing 'lifestyle' products like mobile, cordless phones using CT2, payphones, small modular digit switching systems (like 2+4, 2 lines in and 4 out) for Telecom and

offices, terminals for telephones and high feature phones. Also on site is a Contracts Division which manufactures PCs on contract basis for Amstrad. Coin operated payphones, manufactured in Chorley, are managed from here.

- 2) **GPT-MAIDENHEAD:** Situated in South England it is part of Business Systems Group. The unit studied is the Video Systems Unit manufacturing teleconferencing equipment.
- 3) **GPT-BEESTON:** In Nottingham, it is one of the manufacturing sites of the Business Systems Group. The main products are digital business communication systems, network management systems and automatic call distribution systems. Contract work is also carried out in this unit for other GPT firms. R&D, and Sales and Services for communication systems are on this site while for the other products they are housed in Coventry.
- 4) **GPT-CHORLEY:** Located in Lancashire, it is a unit of MS&TG manufacturing a range of phones - outdoor and indoor phones, line or radio connected, and taking all forms of payments (coins, credit cards, pre-paid cards and tokens).

GPT - KIRCALDY

THE FIRM

The firm, a part of MS&TG, is situated in Kirkcaldy in Scotland. It designs, manufactures and markets mobile communication equipment and systems (including the latest CT2 range of products) and personal computers (for Amstrad). The firm also makes small modular digit switching systems (analog and digital), terminals for telephones, and standard and high feature tone phones - all as part of switching systems.

The firm was set up in Dec 1989. Prior to this period all the operations were concentrated in Lancashire. The present site is very large (0.25 m. sq.ft.) and was suited to the expansion plans of the Group. Most of the activity from Lancashire has been moved to this site, leaving behind a residual part at Chorley (for manufacture of phones).

The firm's operations are divided into two categories: own (standard) products and a contracts division. The contracts division makes PCs on volume basis for Amstrad. The current annual (1990) turnover is £ 1.2 bn., planned to increase to £ 5 bn. over the next three years.

Manufacturing is basically batch type, arranged as modular production i.e. sub-assembled kits are issued in batches for final assembly. The contracts division is also arranged in the form of cells: boards in one area, cables in another - all feeding into the final assembly area.

Though the firm has its own Design and Engineering teams, all activities for the MS&TG (of which the firm is a part) are coordinated at the MS&TG headquarters in Beeston, Nottingham. Likewise, Marketing is also directed from Beeston. Communications with Beeston (and amongst all the MS&TG units which include Lancashire and Coventry) are very crucial because of the geographic spread of decision centres and manufacturing activities. Initially, smooth communications was impeded by the fact that each of the 4 locations had different computer systems, increasing the cost of cross - communication. However, there is a move on to standardise these systems - already and Nottingham are in line and Coventry and Lancashire are to follow.

Procurement is de-centralised to each unit. Procurement reports to the site manager. However, there is a Group wide steering committee, comprising Purchasing managers from all 4 locations, which coordinates procurement operations across the Group.

THE PRODUCT MARKET

The major products of the firm (mobile communication systems) is in a market characterised as 'lifestyle products' which demands high features in compact sizes. It is fickle in demand which shifts rapidly, led by electronic technology development. The product life cycle is short and innovation is rapid. Functionality, styling and variety are all demanded of the product.

The main customers are telecom firms worldwide, with BT being the major customer. Additionally, switching systems are sold to business and industrial offices (particularly for multinationals). Payphones are not sold to BT but to other telecom operators. PCs represent a bespoke contract business to a single customer.

Competition is fierce and on a global scale. Mobile communications and switching systems face big players as competitors, while payphones are under attack by cheap imports from the Far-East.

THE SUPPLY MARKET

The main requirements of the firm are components commonly used by the electronics industry - printed circuit boards, plastic mouldings, cables and electronic components. Most of the components are standard parts in the industry and the supply situation is favourable on availability and price. The supply market is characterised by rapid innovations and short life cycle, and is influenced by 'fashion' led demands from the product market.

The supply market is global with products from the Far-East being cheaper than elsewhere. Standard, mass produced parts are procured from that region. Prices in general tend to fall rapidly over the life cycle of a given part.

FIRM'S STRATEGY

THE PLANNING PROCESS

Long-term strategic plans, dealing with the business to operate in and the areas of strategic thrust, are formulated at the Group level. The optimal mix of in-house production and bought-outs are decided by the Group and allocated to the different units. The firm's objectives are derived from these plans and deal with product and market planning at the operational level. The driving plan for the firm is the annual budget which is finalised around October for the following year.

STRATEGIC FACTORS AND ACTION

The firm's strategy is to supply the up-to-date needs of a rapidly changing market through state-of-the-art technology and at competitive prices. The firm also seeks to influence market needs by introducing innovations as a 'first-mover'.

The product market for the lifestyle products is seen to be rapidly expanding and the firm hopes to increase its sales from £ 1.2 bn. to £ 5 bn. in three years. Though the market is competitive in the sense of the number of players servicing it, the growth rate is able to accommodate the existing players. The firm sees the increase in sales coming not necessarily from fighting for market share but from the rapid growth of the market.

The firm's strategy is Marketing led with close coordination with R&D - to identify market trends and develop products to meet the changing needs. The firm competes in the 'lifestyle' market on the basis of products differentiated on styling, in a wide variety range and attuned to the 'fashion' forces in the market. R&D is a major thrust area to stay in the forefront of technology, as also to support the differentiation aspects of the products.

Production supports Marketing needs through organising itself to respond quickly to changes in the market. Modular production helps in flexibility and rapid response. The firm has identified its strength as being an assembler of bought-out kits and hence it relies heavily on the supply market. Additionally, the firm also buys fully assembled products (termed 'factor products') and markets under its own name, as a strategic support to its own production. (Factor product purchases range between £ 20 m. to £ 30 m.). Factor products are also directly branded in the customer's name (e.g. Telephone Rentals).

The contracts division for PCs is purely a sub-contract operation and is based primarily on cost-effectiveness.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The firm's Purchasing department sees itself as being actively involved in the formulation and implementation of the firm's strategic plans. The main areas of Purchasing involvement are:

- 1) Decision of make or buy
- 2) Technological information from the supply market
- 3) Cost reduction and control.

Make or buy involves two types of decisions - one regards the sub-assemblies and the other regards 'factor products'. In both cases purchase input is in providing prices and availability in the supply market and in helping to establish in-house production costs as a basis of the make or buy decision.

In the area of market technological information, Purchase works closely with R&D and the suppliers to make available to the firm the latest technological innovations in the market. Purchase also has the responsibility to identify and develop suppliers who can invest in up-to-date technology, respond in a 'partnership' mode to the firm's needs, have flexible manufacturing to respond to the changing needs (at possible short notice) of the product market and be willing to share innovations with the firm. Internally, Purchasing works with Engineering to standardise parts commonly in use by all GPT locations of the Group.

For new product development, purchasing is involved at the drawing board stage, involving the suppliers in design and working out short-term developmental and long-term production contracts (Suppliers capacities need to be 'tied-up' for the firm by contractual agreement even before commencement of production at the firm)

Purchasing constantly scans the environment through its trade network, professional meetings, journals and 'buyer intelligence' to keep abreast of technological developments. Its presence in the factor market also gives an idea of competitor activity which it feeds to Marketing.

Supplier development is driven by long-term, partnership concepts characterised by binding contracts, open dealings about business plans, guaranteed off-take and technological linkages. Suppliers are required to have CAD linkages for cooperation in product development and to invest in areas which the firm sees as the business of the future. Besides dealing with independent suppliers the firm has also developed joint-ventures (particularly in the Far-East) for supply of kits. The firm supplies the tooling for manufacture by its partner. Far-East activity is coordinated through a Purchase office in Hong Kong which looks for reciprocal trade opportunities in that low cost environment, besides the normal activity of sourcing for components and factor products. Because of the emphasis on partnership relationships, some of the items have only a single source of supply but the firm feels this does not affect its operations.

In addition to open market and joint venture sources, the firm also gets some items from Group companies (particularly Beeston). Likewise there are some items for which suppliers have set up manufacturing cells 'dedicated' to the firm. The firm does not believe in second sourcing items which have 'dedicated' single sources in the market.

Presently the firm operates an MRP system of stock control with increasing emphasis on shifting to JIT supplies. The supply base is well spread out but the attempt is to get to daily deliveries based on good scheduling and communications with the supplier. The aim is also to get the suppliers' production cycle to match the firm's needs so that there is a JIT operation along the chain. This would also facilitate the elimination of

inward inspection and the working of supplier certification, with delivery direct to the line.

While purchasing in each GPT unit operates autonomously within that unit, a Group steering committee is set up to cooperate in the overall purchasing policy of GPT. This committee comprises the Purchasing Managers of all the units and reports to the Group Operations Director. This helps the units to derive some clout in the supply market on a Corporate basis. It also helps in cross-supply between units in case of shortages at any one place.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

The Purchasing department is an active participant in the formulation of the firm's strategic plans. Its main contribution is in the area of make-or-buy decision, technological scanning of the supply market, evolving a partnership relationship with suppliers and being active in the firm's product market to the extent of purchase of factor products.

GPT (BEESTON)

THE FIRM

The firm (GPT-BEESTON) is one of the manufacturing sites of the Business Systems Group. The major products on this site are ISDX digital business communications systems (30-2400 lines), ISTX digital business communications systems (50-5000 lines), network management systems and automatic call distribution systems. Contract work is also carried out by the firm for other GPT units. The site houses an Engineering Centre, and a Sales and Services office, for the ISDX digital business communication systems. For the other products these functions are at the Coventry site.

The firm was initially made up of a number of small, fairly autonomous businesses which were basically entrepreneurial ventures in the areas which currently form the Business Group. Later on, all the activities were consolidated into the present form of two manufacturing areas - one for printed boards, wiring and assembly (PWA) for all the products on site, and the other for systems which takes the output of PWA and configures them into the final product, carries out system tests and packs the products for delivery to the customer. Manufacturing is fairly flexible, as it is made up of a large number of products, and is organised in dedicated flowlines for the larger volume products like ISDX (half a million lines per year), digital key systems and telephone products (for the unit). Computers, modems and videoconferencing equipment are made as fairly large batches. Manufacturing is both for stocks (ISDX) as well as against specific contracts (batch processed items).

Organisationally, GPT as a whole is going through the process of devolving corporate activities to the respective Businesses in line with the thinking of the new Managing Director (since Sept 90). In place of corporate bodies, new steering groups from amongst the businesses are being created for coordination in different functions like quality, information technology, purchasing and manufacturing. The firm is headed by a site General Manager to whom the functional managers report. Purchasing is headed by a Purchase Executive who reports to the General Manager. Purchasing is divided into 5 major sections and employs a total of about 80 people. Each section is headed by a manager who reports to the Purchase Executive.

THE PRODUCT MARKET

The firm's main products are PABXs and other switching systems, video conferencing products, modems and other data products, telephones and computer boards. The products are marketed globally through GPT Sales and Services Ltd. - a distribution company - and GPT International. In the UK, the main customers are British Telecom and UK distributors in the open market. Besides, it makes products against specific orders from other GPT units (Data products and modems for Coventry and Maidenhead, computer boards for Dunstable, telephones for).

While sales to other GPT manufacturing units are against specific contracts, open market operations are through forecasts. GPT Sales and GPT International have their own stock profile - they order modules for stock and then configure them according to customer requirements. The firm also holds finished goods stocks, to be able to service customers at short notice.

The UK Telecom market was opened up with the recent liberalisation of the sector, removing British Telecom's monopoly. The greatest effect has been in the segment of private operators, and GPT has moved in aggressively to meet the demand. The firm estimates that 70% of PABX in UK is now supplied by GPT. A large proportion of the private networks is also supplied by GPT.

The Telecom industry has moved rapidly away from traditional electro-mechanical and electronic components to silicon, with more functions being put into one square inch of silicon. This drives the unit price per bit of information downwards. Also, as more information goes into smaller space, the proportion of metal and plastic parts increases. These market changes have a direct impact on the firm's manufacturing and procurement practices.

The firm's computer and video products are subject to fast technological changes with short life cycles, requiring the firm to keep abreast of the latest technology in design and production. The firm has a strong liaison with the market for technological information.

THE SUPPLY MARKET

The electronic market worldwide is seen as a market with almost perfect competition, giving all manufacturers a wide choice. Availability is not a problem, the industry is well developed and most components can be procured in a short time. Two dynamics dominate the electronic supply market - technology, which changes so rapidly as to make product life cycles very short, and the shifting of the manufacturing base from UK/Europe/US to the Far-east. Prices in the electronic supply market tend to drift down considerably within a short period of the introduction of a component in the market.

The UK electronic components industry is considerably smaller than elsewhere and many companies are not seen as stable. The US/Continental Europe based companies are seen to have an edge on UK companies and so some firms like Philips Components (UK) are thinking of pulling out of certain areas of manufacture. These factors are partly responsible for the firm to turn to outside sources, including the Far-East. This situation is viewed not as a concern but a challenge, particularly in the area of implementing JIT operations.

Electronics suppliers are by and large equipped to have EDI linkages with the firm, which helps decrease logistical problems. However, EDI linkages have not been implemented fully as the firm has a different EDI system (Tradecom) while most of the suppliers have the international standard, Edifact. Though the firm feels Edifact is not as advanced as Tradecom, it is planning to shift to Edifact to facilitate linkage with suppliers. Some suppliers are reluctant to invest in EDI systems as no other customer seems to be ready for it.

Non-electronic supply for the firm is restricted to the UK market due to easy availability and comparatively larger size of the parts. The cost structure in the UK metal/plastic market is also favourable to the firm. While the national supply situation poses no problems, locally (in Nottingham) the firm has not located suitable suppliers who can meet its quality requirements. Hence it gets most of its metal parts from GPT Coventry (£ 2.3 m. out of £ 3.5 m. spent on non-electronic parts).

FIRM'S STRATEGY

THE PLANNING PROCESS

The firm, which until recently had only a one year operational plan, has now moved to a 3-year plan, with the first year representing the operational plan from which the annual budget is developed. The 3-year plan is currently formulated at the Corporate level. However, the aim of the new MD is to reduce Corporate activity and devolve them to the business level, with a number of functional steering groups being formed to coordinate amongst the various units. (It is expected that the planning responsibility will be placed at the firm level).

Currently the 3-year plan is driven by Marketing and put in place by the Director responsible for Corporate Planning for Business Systems Group. The firm contributes its own market forecasts and specific orders as inputs to the plan. The firm's objectives are then derived from this business plan.

STRATEGIC FACTORS AND ACTION

Two major Corporate factors influence the firm's plans. The first is the broad portfolio of the organisation which covers the range of Telecom applications. Not many organisations in the world can match it. Secondly, the link-up with Siemens and the broad delineation of responsibilities between Siemens and GPT. Siemens have taken responsibility for Marketing, Engineering and Manufacturing related issues while GEC is responsible for Management Control of GPT. Joint planning with Siemens involves dividing operations according to respective strengths without competing with one another.

The implications for the firm are to build on its areas of perceived strength through a strong manufacturing base and to keep abreast of process and product technology in its field. (Marketing is not a responsibility of the firm as it is with Corporate Sales and Marketing). The firm has strong manufacturing expertise in Voice Systems (including cordless telephones as part of PABX, which is outside the Siemens range), Data Systems (including Video, Modem and Computers), and Voice and Data Network Systems. This base allows GPT as a whole to aggressively provide what the customer needs in the liberalised market.

Technology is another area of strength for the firm and is developed in-house as well as brought in from outside. e.g. the buying of digital telephone exchange from California and adapting it quickly so that the firm is the first in the UK to have manufactured it. The firm attempts to keep the manufacturing of the hardware as constant as possible and try to bring in innovation through software.

Overall, the firm provides a competitive edge to the Group's operations through its strong manufacturing base, its expertise in certain areas and technological innovation.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

The Purchasing department has about 80 people and is divided into 5 major sections along the following lines:

- 1) Central Purchasing (5 people) for capital purchases, software and maintenance. This section is also responsible for providing support to purchasing in computer systems and analysis.
- 2) New Products (6 people) to liaise with Engineering and ensure that products are designed and specified correctly to be in line with purchasing strategy. It is also responsible for factor products purchase mainly from Far-East (Japan, Thailand, Taiwan and China), valued at £ 17-18 m.
- 3) Group Contracts Section (7 people) with the role of contract management of all commodity (non-custom) items like ICs, resistors, capacitors and connectors. Besides the firm, this section services other GPT units like Australia and a joint venture in China. A small group of 3 buyers in Hong Kong for Far-East sourcing also answers to this section. The Section is responsible for negotiating long-term contracts with major suppliers and managing them throughout the year.
- 4) Operations Purchasing Dept. (9 people) responsible for all order processing for custom products (unique to the firm). Also responsible for supply control i.e. expediting.

5) Quality Operations (42 people). Responsibilities include quality systems i.e. providing on-line quality data to all major suppliers (about 100), carrying out technical and quality audits of suppliers for major parts like semi-conductors, software and mouldings, and chairing quality reviews with suppliers. A team of engineers from this section carry out qualification work of components i.e. matching design specifications to the availability in the market and carrying out quality testing of components in burn-in/ environmental chambers. They also provide engineering support to the Quality function for testing of inward supplies, by designing programs to test different products.

The input materials include electronics, plastic and metal parts. Totally the firm has about 500 suppliers of which 43 suppliers (designated 'preferred suppliers') account for 68% by value, 100 suppliers account for 83% while the balance 17% is spread out amongst 400 suppliers. The total annual purchase spend is about £ 60 m. (of which £ 10 m. is metal parts and plastic mouldings).

The purchasing strategy for the firm is drawn up at the Corporate level by a steering committee made up of purchasing representatives from all GPT manufacturing units and chaired by a Corporate manager (from Coventry). The steering committee appoints a number of working groups to address Corporate issues e.g. Corporate cost of material ownership. The working group presents its recommendation to the steering committee which then lays down the policies based on the recommendation.

Purchasing policy is guided by the following Corporate guidelines: items unique to the operations of the firm are to be handled by the firm's Purchasing department while commodity items (ICs, resistors, capacitors) common to all GPT units are to be bought by a consolidated group made of representatives from the units and chaired by a corporate manager.

The firm's Purchasing has a major role in R&D and in the design of new products. The purpose of this involvement is to ensure that the product design and component specifications are in line with purchasing strategy, that design does not tie up procurement to a single source, that finalising a part takes into account the preferred supplier program of the firm and that preferred suppliers are involved at the design stage so that their expertise can be tapped. Early Purchase involvement also reduces the need for expensive cost-reduction exercises down the road, as cost considerations are taken into account at inception. Before Purchase involvement started in design the firm used to have a number of cost-reduction teams at work, all chaired by Purchasing. The further down the Engineering/Production road and the Product life-cycle the exercise took place, the more expensive it was proving to be. Hence the strategic decision to 'get it right, first time'. Purchasing input to design includes information on life-cycle profile of products, commercial information and latest technological developments in the supplier market. This involvement also gives Purchasing knowledge of the new products coming on-stream in the firm and allows time to prepare for procurement.

The supplier base strategy revolves on a preferred supplier program developed by the firm to rationalise the supplier base. The firm has a breadth of products which can be procured from a considerable choice of suppliers, particularly for electronic parts. The preferred supplier program aims to restrict the number of suppliers to a manageable level from whom the bulk of products can be bought. Currently the program has identified 43 out of 500 suppliers from whom 68% of purchases are made. Identification of a preferred supplier depends on three factors : 'Background', 'Criteria' and 'Requirements'.

'Background' addresses who are the current suppliers, their performance rating on quality (rejects in parts per million - PPM), delivery and service. 'Criteria' addresses strategic product portfolio of the supplier, manufacturing capabilities, established or predicted long-term business, commercial stability, cost competitiveness, commitment

to continued improvement and commitment to GPT as a preferred customer. 'Requirements' include continued satisfaction of 'Criteria' (one of the biggest concerns in this area would be any change in management/ownership of the supplier), acceptance of the firm's terms and conditions, demonstrated flexibility to suit the firm's operations, meeting specified requirements on a consistent basis (like max. 4 weeks lead time, 100% on time delivery within a window of 2 days either way, zero defects) and EDI operation.

There is a move afoot to draw together a preferred supplier program for GPT as a whole. Currently, most of the major units like Beeston/Liverpool/Coventry have their own preferred programs. To some extent the drawing up of a joint program is affected by the fact that each unit has a different 'in-house' computer system. However, it is expected that the computer systems will be soon standardised across the whole of GPT to facilitate networking. Also the preferred supplier program, at the moment, is slanted more towards quality and commercial considerations. However design considerations are also being increasingly included in establishing the list of preferred suppliers.

The effectiveness of the supplier program is monitored through meetings between the firm and the supplier every three months for quality aspects, and every 6 weeks for commercial considerations (like delivery). Contracts are signed for 2 - 3 years with price negotiations held annually. Price negotiations are on open-book costing basis. CAD links are established with preferred suppliers, to facilitate design involvement. The aim is to ensure mutual growth and benefit. The firm makes all out efforts to ensure continued business for preferred suppliers even if some of their products are phased out by the firm (e.g. when the volume of telephones manufacture decreased from 2.2 m. a year to 0.8 m., only one moulding supplier was needed as compared to 2-3 earlier. The firm compensated for the loss of business by development of other parts with the affected suppliers). The firm does not tie-in its preferred suppliers to supply exclusively to GPT, but expects to be a preferred customer in the supplier's business.

In addition to regular production materials, Purchasing is also called on to procure 'factor products' as required by Marketing. 'Factor products' are defined by the firm as some products normally made in-house but are purchased from the market at times for strategic reasons, e.g. to supplement the firm's production in case of sudden surge in demand. The firm's Purchasing department is thus involved in the firm's product market and the competition.

The firm keeps abreast of the electronic market changes (technology, suppliers, prices) by monitoring the environment formally and informally. Suppliers are themselves an important source of information. Conferences, seminars and exhibitions are other sources of information. Far-East intelligence is gathered by the firm's Hong Kong office. The firm subscribes to ICE and DATAQUEST - which are market information bodies. Steering Group meetings once in 3 months with Siemens are also good sources of information.

The firm is a member of STACK - a strategic alliance of 13 Computer and Telecom Companies like Olivetti, Nixdorf-Siemen, Itatel, BT, ICL, NCR, AGC-Essen and others. Purchasing Directors of the Group meet once a year and Purchasing Managers meet twice a year. There is a free exchange of information about reliability of suppliers, component qualification and quality audit of suppliers on a joint basis. Members also visit vendors across the world and share their findings.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Purchasing has a vital role to play in the planning of the firm. The specific areas of contribution are:

- 1) **Early Supplier Involvement** - The close coordination with design is a strategic role for Procurement as it builds in correct purchasing practices at the inception. This also allows the firm's preferred suppliers to coordinate with the firm right from the design stage.
- 2) **Lead Time** - The firm's attempts to move towards a JIT production with low inventory is primarily dependent on Purchasing's ability to get defect-free parts at required time and directly to the point of manufacture. This gives Procurement a strategic role in operational plans.
- 3) **Quality of input material.**

GPT - MAIDENHEAD

THE FIRM

The firm is the Video Systems Unit, a part of Data Systems which is in the Business Systems Group of GPT. It is situated at Maidenhead in South England. Besides Video Systems, the other units in Data Systems are Computers and Micro Scope, a private firm recently taken over by GEC. Data Systems is spread over three sites (Dunstable, Bournemouth and Maidenhead), with Video Systems being situated at Maidenhead.

The firm is mainly an assembly plant, putting together bought-out kits into systems configuration of the product. The product is teleconferencing video systems using the technology of video compression, which converts video pictures into digital signals to be transmitted through digital networks and 'decompresses' these signals at the receiving end in the form of pictures. The basic product is the 'codec' (for compression-decompression) accompanied by peripherals like terminals, graphic workstations, audio processor and control systems. Codec kits are bought-out from the sister plant at Nottingham while the peripherals are purchased as kits from local suppliers.

THE PRODUCT MARKET

The main products of the firm are teleconferencing systems, at the heart of which is the 'codec'. The codec is a standard system assembled from ready kits and around which the customer's specific needs are incorporated as peripherals. Besides teleconferencing, the codecs are also used in video surveillance.

The firm considers itself a market leader in codec technology. Recently it launched the second generation product (System 261) in video compression - the first firm to do so internationally. Its two main competitors are CLI and Pictoretel, both based in the US. Other main competitors are Philips in West Germany and Alcatel in France. The US manufacturers emphasise proprietary technology which robs them of universality. Thus, while they have together sold about 900 units in the US, their overseas sales is barely 200 units. Philips and Alcatel also have concentrated their efforts in their domestic markets, with Alcatel making devices only to special orders. Together, between them they have sold 400-500 units. GPT manufactures to international standard and operates globally. It sells in the UK domestic market through British Telecom while operating elsewhere as GPT. It has sold about 900 codecs in over 32 countries, establishing itself as a truly global player. In France it has installed systems for French Telecom while in Germany it is a co-supplier along with Philips to General Bundespost.

The main customers are big multinational corporations who set up videoconferencing networks to link together their international HQs e.g. BP Oil, a recent customer. Financial markets and telecom also take substantial quantities. The market is the outcome of a brand new technology which is rapidly evolving into greater sophistication. It is a fast growing market, both by increasing number of customers in the current user profile, as also newer uses. The competition is restricted to a few major players who are already in the telecommunications field. The scale of operations and access to technology are factors which restrict the number of players.

The 'teleconferencing market' covers video transmission in the range 56KHz - 2MHz, as defined in the new international standard H261. Videophones are at the lower end (56-64 KHz) while elaborate broadcast TV systems are at the top end of the transmission range. In videophones, the primary access device is mass produced and marketed as such. This is attracting mass producers at low cost. The firm's products

are in the whole spectrum of the transmission range - from the top-end of videophones through comprehensive videoconferencing systems to the 2 MHz range.

THE SUPPLY MARKET

The supply market is not of major significance to the firm as it gets most of its materials from the sister unit at Beeston. The codec system forms 80% of the output and it is received in the form of kits from Beeston. The firm goes to the market only for its peripherals, and for prototype development.

The supply market for the firm comprises local electronic and metal fabrication firms. They are mostly assembly contractors for the firm. Electronic parts bought by the firm are from dealers and manufacturers in the vicinity. The market is seen as stable for the firm's needs. Progress of technological innovation in the market is not of concern as the firm can pass on technological knowledge to its suppliers as needed.

FIRM'S STRATEGY

THE PLANNING PROCESS:

The Strategic Plans are formulated at the Business Systems Group level and passed on to the firm as objectives. Planning at the unit level is restricted to operational plans and product plans (through R&D). The plans at the firm's level are formulated by the General Manager, aided by senior functional managers.

STRATEGIC FACTORS AND ACTION:

The firm is a technological leader in videoconferencing technology and strives to retain this edge. Hence the emphasis is on R&D. The Project Group of the firm is responsible for research in coordination with the Central Engineering Group. The worldwide R&D network of GPT benefits the firm's R&D in the form of shared technology. The recent introduction of the second generation systems to international standard H261 strengthened its position as one of the industry leaders.

The firm projects the universality of its products on a global level by manufacturing to international standards. This gives it an edge over competition which offer unique, proprietary technology and the need to lock into specific networks, as happens with its competition in the US. The US products need elaborate interface mechanism in order to be able to talk to other units. While this caters to the view that videoconferencing is a private, internal system, GPT aims to change this view and expand the uses to inter-company conferencing in addition to intra-company conferencing. This allows access to suppliers and customers across borders in a totally 'transparent' system.

Technological leadership also gives it first mover advantage to reap the benefits before the competition catches up. The fact that it offers an international range (while most of the competition caters primarily to the domestic market) has established the firm as a leader in the field with a flexible product package.

The firm has a heavy backlog of orders which 'prevent' it from manufacturing for stock. Orders are against specific customer requirement and not a sales forecast. Marketing is handled by Sales and Marketing department at Maidenhead. The marketing emphasis is at the firm level (using its own brand name) though the GPT Corporate banner is used at fairs and exhibitions where new systems are first introduced to the market.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION:

The major portion of the firm's requirements are kits for the codec which are obtained directly from the sister plant at Beeston. The Business Systems Group is headquartered at Beeston and supplies are made to Maidenhead as a 'captive' customer for the codec kits. Purchase in the external market is only about 20% by value of the total requirements and is for the peripherals. In addition the firm goes to the open market for prototype production parts.

The firm orders sub-assemblies from Beeston on a monthly basis, scheduled as a batch production at Beeston. Receipts from Beeston are spread out over the month and taken directly for assembly and testing at the firm's plant. Restricting supplies from Beeston was a strategic decision at the Business Group level when defining the overall Group operations. The infrastructure (at Beeston) for the Maidenhead product includes test equipment, and the sub-assemblies are delivered with test certificates for use directly in assembly.

Though this a single source situation, the supply lines have been fairly well maintained. However a constant follow-up is required on the part of Maidenhead to ensure timely supplies. As Beeston supplies to all GPT units and Maidenhead's needs are fairly small, the firm needs to keep a high profile at Beeston (through monthly visits, weekly videoconferencing, and constant follow-up). The schedule of requirements is projected for 12 months, firmed up for 6 months and reviewed monthly. Transfer prices are negotiated yearly. The responsibility for contracting with Beeston lies with a team comprising of the General Manager, the Business Manager and the Manufacturing Manager. The day-to-day coordination is with the Manufacturing Manager.

Peripherals purchase is handled by individual buyers, one buyer being completely responsible for one product which includes buying the parts, kitting it and getting it assembled by suppliers. These sub-assemblies are then bought-in for final assembly configuration in the firm. There is no constraint in kits procurement which is fairly mechanical, operating on min-max levels, ROP & EOQ. The buyer is also responsible to prevent obsolescence and so coordinates with Development/Marketing to avoid over buying.

Procurement for R&D poses greater problems. The firm builds its own prototypes & pre-production runs of 5 units. As the quantities are small, securing timely supplies from Beeston for prototypes is a problem. The firm does have the option of going to the market for pre-production batches but faces the problem of suppliers having to develop the process from scratch. A dedicated purchasing team of 2 buyers work with R&D at the development stage to coordinate with Beeston and the outside market for timely supplies.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING:

Overall the function is not considered to be of strategic significance to the firm's operations. It is purely a support function with very little external market interaction. Supply is not an area of constraint or opportunity for the firm.

GPT - CHORLEY

THE FIRM

The GPT unit at Chorley is a part of the Mobile Systems and Terminals Group (MS&TG). It manufactures a range of phones for outdoor or indoor use, line or radio connected, and accepting all forms of payment - coin, credit card, pre-paid card and tokens. The products are sold through a GPT firm (Paytelco), directly to British Telecom and also to other telephone operators worldwide.

Payphone manufacture started in 1981-82 for British Telecom's development contract, when the telecommunication market was a monopoly of BT. Subsequently, due to liberalisation of the telecom market in the UK which allowed other operators to have their own network, the firm started to manufacture its own range of payphones for Paytelco and Mercury. Supply to the worldwide market is independent of the UK scenario.

The firm employs 820 people of whom 18 are in the Purchasing Department. The annual sales is in the range of £ 80 m. Manufacturing is a combination of large batches (tending to mass production) for the basic unit and then in smaller batches to suit specific orders for different customers in different parts of the world. The firm is headed by a General (Site) Manager reporting to the HQ at Liverpool. The Site Manager has a range of functional managers reporting to him, one of whom is the Materials Manager. Purchasing reports to the Materials Manager, along with Production Control and Contracts. Production Control is responsible for manufacturing schedules, preparing purchase requests, stores and despatch. Contracts liaises with Liverpool on aspects such as capacity and space requirements to meet demand. Until recently, Purchase was located at the HQ in Liverpool but was moved to site subsequently as it was the only part of operations not on site.

The firm's working is based on a Master Manufacturing Schedule, developed once a month by Operations and Marketing, which is exploded into a MRP list and a manufacturing plan. While Purchase can plan based on the MRP list, formalisation of authorisation (to buy) is through the purchase requests from Production Control.

While production is based at Chorley, first-off builds and pilot batches are based at Liverpool, leaving Chorley to carry out volume production. The Bill of Material (BOM) is also generated and updated at Liverpool.

THE PRODUCT MARKET

The firm sells its payphones to its sister firm Paytelco for installation on Mercury lines, to British Telecom and to other Telecom operators worldwide. In addition it also markets phones, through distributors, to private exchange operators and to the individual consumer. The firm designs its own range of phones as well as manufactures to customer designs (like British Telecom).

Sales to Paytelco is on 'monopolistic' basis and there is close coordination on design, engineering and trouble-shooting. This liaison enables the building of special features like credit card reader, volume control and hotline from which the ultimate customer, Mercury, hopes to gain an edge over British Telecom. The firm is however not prevented from taking manufacturing contracts from British Telecom for designs which may incorporate similar features. The Telecom market as a whole sees liberalisation as opening up competition in services and not in the product (phones) and so there is no conflict of interest for the firm.

The firm manufactures only medium to high value phones and does not enter the cheaper phones like table-tops. Even Paytelco has to order the lower value phones outside the Group.

The firm's major competitor in the sale of phones is Landis & Gyr with whom the firm competes for BT business in the UK market. The firm feels it had a technical edge over the competition a few years ago with its intelligent phones but this gap is perceived to have narrowed. Hence price has become an important aspect of competition. Sales and marketing are not the responsibility of the firm (which is basically a manufacturing site) but is handled directly by HQ at Liverpool.

THE SUPPLY MARKET

The firm's product consists of 80% by value of metal parts (fabrication, casting and assemblies) and 20% electronics. Of the fabricated parts, the most crucial is the coin validator which is purchased as a supplier-designed part. Other metal parts are of a general design nature and readily available in the market.

Coin validators were a proprietary item of a single source (Mars Electronics) since 1980, leading to a monopoly supply situation. However, recently, more sources have developed this item (with different design parameters) and this has eased the situation by allowing the firm to scout for a second source. Other than the validator, there is free competition in the metal parts market. As the parts of the payphones are fairly expensive, the firm investigates the market for the least expensive sources. The suppliers also offer their services up-front to the firm by being involved at the design stage itself. Most of the metal parts are purchased in the national market though there is a potential for overseas sourcing, particularly in the Far-East. Prices of metal parts generally show an increasing trend by as much as 8 - 9 % annually. Supplier competition is more on manufacturing efficiencies and service rather than on price.

The electronics requirements of the firm are fairly small, more so in comparison with the overall GPT requirements. Hence the firm combines its requirements with that of other GPT units (like Liverpool and Coventry) to gain volume leverage in negotiations. The electronics market is highly competitive and the Group as a whole enjoys a degree of buying power. Due to the fast technical changes in this market, there is a greater scope for introducing new parts in the design as also for effecting price reductions. One aspect of the electronic supply market is that components are normally proprietary supplies and this tends to balance some of the volume clout enjoyed by the firm. Hence suppliers involve themselves in keen competition at the design stage itself, to introduce their proprietary parts in the firm's end product.

FIRM'S STRATEGY

THE PLANNING PROCESS

Strategic plans are evolved at the HQ in Liverpool with the firm being a contributor of production inputs. Otherwise, there is no long term planning exercise on site. Purchasing is even more removed from strategic planning and does not even participate in marketing meetings which help decide the annual production plans for the firm. Senior plant managers hold monthly pre-production meetings where marketing input for any change in production plans are incorporated and then the monthly master schedule is prepared.

STRATEGIC FACTORS AND ACTION

The annual production plan is the basic plan for the firm and so all strategies are orientated to production plan requirements. Machine capacity and space requirements are the major concerns addressed by the firm. Quality is an important aspect and is

addressed by all departments as a team. Being a small site, teamwork is a major strength. The leadership of the Site Manager is seen as a positive contribution to instilling team spirit.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION

Direct materials constitute 55% of the cost of the phone. Annual procurement value is £ 47 m. spread out over 2300 items. The firm has 374 national suppliers and 18 overseas suppliers (overseas spend is £ 4 m.). Availability is generally considered to be good. About 35% of the materials (by number) are considered critical for production but they do not pose a supply concern. 75% of the materials are single sourced but this is only due to small volume constraints and not due to lack of availability, or policy.

The department has 18 people and is divided into 3 areas - Scheduling and Expediting, Buying, and Special Projects. Special Projects liaises with design engineers at Liverpool to involve Purchase right at the design stage. This is a crucial role for Purchase as it can build availability as well as cost in the beginning. Purchase brings in critical suppliers to meet the designers and give suggestions for ease of manufacture. This role is only of recent origin when the importance of supplier involvement was recognised.

The policy is to have multiple sources to enable competitive buying. This is restricted only by small volumes or excessive tool costs which does not permit making multiple sets. The firm provides all the tooling to the suppliers to ensure quality as well as to be able to control timely supplies. The firm also specifies to its suppliers the sources from where they should procure components for sub-assemblies - to control for quality.

Supplier selection is subject to vendor evaluation report by the Quality dept. and financial status as reported by Dun and Bradstreet. Every year the firm conducts a formal exercise to identify new sources of supply to keep the competition going - supplier development is an on-going exercise.

Negotiations are generally conducted by the firm as a part of the total GPT requirements. Every month all purchasing managers of the different GPT units meet to pool together the requirements and decide on purchasing strategy. The firm being a small buyer of electronics usually combines its requirement with Coventry and Liverpool.

Quality meetings are held monthly with key suppliers along with the Quality dept. Supplier performance is also discussed. Vendor rating is updated on a continuous basis.

Market survey and overseas development activities are not adequately attended to due to lack of personnel. This also affects long-term purchase planning. Market developments are tracked through seminars, exhibitions and information from suppliers.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING

Procurement has no role in the strategic planning exercise of the firm. Its main contribution is to cost effectiveness and in involving suppliers in the design of the product.

ROVER GROUP LTD

PURCHASING STRATEGY AT ROVER

NOTE : This interview discussed only the Purchasing Strategies in General and the write-up is restricted to the same.

INTRODUCTION

The Rover group manufactures 0.5 m. cars annually and has an annual turnover of £ 4 bn. The Group employs 40,000 people. Rover is owned 80% by British Aerospace and 20% by Honda. It is primarily an assembler of cars and this places strategic responsibility on the Purchasing function. Purchasing spend is about £ 2 bn. for production materials and £ 400 m. for services, facilities and capital expenditure. The firm has over 700 suppliers and 90% of the total spend is in the UK. The remaining amount is mostly spent in Japan and Europe.

The auto industry in general has seen a major shift in its working over the last 20 years. As affecting the Purchasing function, this represents a greater move to buying in components and higher order assemblies, with the car manufacturers concentrating on the final assembly; a tendency to work with a smaller network of preferred supplier base; involving suppliers at the product conception and design stage; having long-term relationship and contracts with suppliers; adapting developmental changes from the supply market to the product rather than exclusively designing in-house by the car manufacturer; working on very low inventories (JIT); having a greater linkages with key suppliers from technological and financial aspects to part or outright ownership.

Automation, technological changes and material substitution have been a feature of the industry. Plastic has made in-roads into what was essentially a metal product. In fact the predictions in the 1980s was that by 1990s there would be a lot of plastic in cars. But in reality the Steel industry rallied around by developing better coating technology to protect steel bodies, enhancing R&D to make available better usage of steel in cars, and closer working with the car manufacturers. Also oil prices started getting volatile, thus affecting the price stability of plastic. The Purchasing function in all car companies had a crucial role in ensuring that these trends were monitored and incorporated in the most advantageous way in the final product decision of the firm.

The UK supply market structure has also undergone a drastic change with the advent of the Japanese manufacturers. New suppliers have been brought in, some of the existing suppliers' capacities have been taken up, the buying leverage of the manufacturers has decreased due to greater competition for suppliers' services and logistics patterns have undergone changes as also the way of doing business with suppliers. Ownership patterns have changed with the Japanese tending to have equity participation in the suppliers' company or dealing primarily with wholly-owned subsidiaries. Even Ford who manufactures parts primarily in-house, and GM who has its own divisions to supply its parts, have been affected by the changes in the overall supply market. All these represent opportunities and risks for the Purchasing function.

The car industry goes through a regular cycle of boom and recession which causes supply capacity to be stretched or leads to the shedding of capacity in lean periods, both of which cause concern to Purchasing.

Rover Purchasing has an important role in the following strategic areas:

1) THE PLANNING PROCESS

Rover has a rolling 5 year and 10 year business plan which looks at future models, volumes, 'projected' state-of-the-art in the industry and resource requirements. A new model takes at least 3 years to move from conception to production and may have a run of 5 years thereafter. Purchase's strategic contribution is in nominating suppliers, at least 3 years in advance, who would be suitable for a long term involvement of at least 8 years. Purchasing also has to be aware of the technological trends in the supply market. Purchasing has to project future logistical arrangements, raw materials availability, long-term pricing, worldwide market opportunity and market stability. Purchasing, R&D and the supplier are required to develop a shared vision of the future. Some of the specific issues addressed by the firm's Purchasing include the potential Eastern European market and the working relations with Honda in evolving joint purchasing strategies.

2) DESIGN AND DEVELOPMENT

The role of Purchasing in R&D has changed since the 1970s when the practice was for the firm to design the car without involvement of the suppliers (except for a few proprietary parts) and 'toss over the wall' to Purchasing the components to be bought. The key change now is the early involvement of the supplier to 'build purchasing into the design'. Thus, well in advance of the actual production of the part, the supplier is decided, the method of manufacture is fixed and agreement reached on costing and pricing. In Rover, the approach to estimating product cost has changed from bottom-up, i.e. waiting for the design to be completed and then costing each part, to a top-down approach wherein the overall cost of the car is determined and then cost targets are apportioned to the parts. Early involvement of the supplier helps in working towards target costs. Purchasing requires 'strategic awareness' of the supply market to be able to nominate suppliers such that all objectives are met.

Cooperation amongst Purchasing, R&D and the supplier also brings the state-of-the-art practices to the firm. The trend in the auto industry is that R&D is increasingly being initiated by the supplier and the responsibility of designing parts to be cost effective falls jointly on the supplier and the car manufacturer. The firm, with a preferred supplier base, is also able to design more unique parts and systems from which the firm could derive differentiation advantage - Rover models are said to have very few standard parts.

3) MAKE OR BUY

Make or buy is a crucial decision in Rover which takes into account the firm's core skills, the capabilities in the supply market, logistic problems and cost effectiveness. The make or buy decision is also continually reviewed as the situation changes. As an example, one of the firm's core skills is in the manufacture of small engines (K-series) whose casting and machining are kept in-house. Logistically, out sourcing of machining of heavy parts like cylinder heads is a problem and so is kept in-house. Labour rates are generally higher in the firm and so it adds weight to the buy decision. Bumpers, as rolled sections, were being bought from suppliers. As plastic replaced steel and the bumpers became colour-keyed to the car and in various finishes, the variety of bumpers increased and lot sizes decreased. Hence the firm is looking at the feasibility of installing a 3000 T press close to the assembly line in order to get the desired flexibility, with minimum logistic problems.

Purchasing's contribution is an awareness of the supply market, not only in its current state but also in the future trends. Skills in the market which complement the firm's core skills have to be identified. Suppliers who are willing to have a long-term, partnership relations with the firm have to be enlisted. Commercial aspects have to be negotiated and logistic problems solved. At the same time arrangements have to be

flexible enough to allow the firm to avail of any innovations in the market. Purchasing, which represents the buy alternate to make, has a vital contribution to make in this decision.

4) PRODUCT COSTING AND PRICING

Most of the major purchases are on contract basis, with price being based on the open-book costing approach. The guiding principle in costing is one of target costing, with an upper cost limit being fixed for each part which Purchasing, Design and the supplier work jointly towards achieving without compromising performance and safety. Earlier on, when design was done in 'isolation', nearly 85% of the cost was determined on how the part was designed, leaving only 15% to commercial considerations. Current practice allows for the best manufacturing practice and the lowest cost to be built in. This approach to costing (adopted from Honda practices) has changed the Purchasing role to a techno-commercial one.

These costing principles guide the final price of the part to a negotiated figure rather than one based on 'competitive' bidding. The firm works towards a 'win-win' scenario where the both the supplier and the firm share in the financial benefits of the team approach. The firm does not believe in 'extracting the last penny' from the suppliers. Purchasing also monitors the market for trends in wage settlements, material price movements and changes in infrastructural costs (like power and transport) as a basis of negotiations, particularly in times of requests for price increases.

There is also a constant search for lowering actual costs in areas like scrap reduction, logistics and in updating manufacturing practices. Realised benefits are again shared with the suppliers. As purchases stand at £ 2 bn. (and constitute 50% of the final sales price) even a marginal reduction on unit prices contributes substantially to profits.

5) SUPPLIER RELATIONS

The firm aims for a small base of preferred suppliers with whom long-term, partnership relations can be built. The firm shares technology with the suppliers, helps in product and process development, has CAD-CAM linkages with them and shares in their R&D efforts. A close working relationship enables JIT operations which has reduced the extent of stock holdings in major parts to 3-4 hours of production. The problems associated with a 'lean production' are jointly monitored and addressed by the firm and the supplier. The combination of a preferred supplier base and JIT operations leads to some parts having single sources. However, it is not the firm's policy to actively seek single sourcing as a strategy.

The firm tries, to the extent possible, to buy sub-assemblies from its 'first tier' suppliers, leaving them in turn to deal with other component suppliers. This helps in the business growth plans of the supplier. The firm has a larger than desired supplier base because of the continuance of older models like the Mini (for 30 years) and the Range Rover (20 years) and its aim is to consolidate the supplier base further.

The firm does not have any financial linkages with the suppliers, unlike the majority of Japanese manufacturers. All linkages and relationship with the suppliers are based on 'business between two independent operators'.

SWILKEN GOLF COMPANY LTD.

THE FIRM

Swilken Golf Company Ltd. is situated in St. Andrews, the home of golf. The firm was established in 1963 to manufacture golf clubs and golf accessories. It has 2 manufacturing plants in St. Andrews and distributes its products worldwide.

The firm manufactures irons, putters, wood 'woods' and metal 'woods'. Additionally, the firm buys-in other golfing accessories like gloves, shoes, headcovers and bags, and markets them under its own logo. The firm operates a 'near-JIT' system of production. Scheduling is very flexible, particularly as the production time for different products varies widely (e.g. One wood head requires a floor time of 1 hour as compared to 6 mins. for a metal head). Production is organised on a pull-through basis in small batches against specific orders. Most of the purchased parts are delivered directly to the line. Finished goods stocks are held to the minimum required for display and advertising.

The firm designs its own products which are sold exclusively under the Swilken logo. Products are customised for specific users (like corporate customers and club professionals) and also standardised for sales through distributors. The product design incorporates precise engineering definitions like weight of the head, angle of contact, lie and swing-weight. However the tolerances are fairly loose, e.g. the tolerance for weight of the head could be 2 gms. Aesthetic aspects like contours, feel and colour are equally important in the product. Production is characterised more as a craft than technological production, and visual inspection of the final product is as important as inspection by instruments. Quality control is the responsibility of the shop floor operators, guided by a quality supervisor.

The firm has an annual sales turnover of £ 2 m. It has 48 employees and is headed by a Managing Director who looks after Design, Sales and Marketing. The second line managers head Production, Finance and Administration. Procurement is looked after by the Production Manager, assisted by two employees. The factory is small and labour strength is controlled. Fluctuations in demand are met by overtime/extra shifts. The firm does not lay-off employees but believes in retraining redundant employees in newer skills.

THE PRODUCT MARKET

The firm's product market includes golf clubs and golf accessories. The firm sells its products in the UK and overseas - Continental Europe, America and Japan. The UK market is small, being only 1/10 of the US market and 1/4 of the Japanese market. Competition is fierce and worldwide, with big players like McGregor, Wilson, Dunlop, Slazenger, Ping and Onyx competing globally. Swilken is a small player with only 3-4% of the market in UK and less overseas

The market is influenced by 'fashion' trends led by what is seen as the preferences of professionals. Wood 'woods' have seen a decline in demand from 90% to 20% in the last 20 years but is again showing signs of an up-swing. This is partly explained by the reverting to the 'traditional' image of wood 'woods' and the increased usage by professionals. The firm has placed its product in the speciality, upper-end, high price niche which is greatly affected by 'image' and 'fashion'. It closely follows the fashion trends in this niche (Aluminium heads, black finish, low profile and graphite shafts) and incorporates them into the product. The firm is too small to influence trends but quickly adapts its products to the prevailing demand.

While the worldwide demand for golf products is growing in general, the firm has felt a squeeze in its segment for the past few months because of high interest and mortgage rates which have eaten into spending on leisure. This effect is only in its UK market while the overseas market is not affected.

In a segment that is characterised by heavy advertising to push brand image, Swilken does very little advertising as it is found to be prohibitive for its size. Hence it is not inclined to 'buy' market share, relying instead on its distributor network (accounting for 60% - 70% of its turnover) to increase its sales.

THE SUPPLY MARKET

The main components for manufacture of clubs are: grips, metal shafts and heads, and wooden heads (mostly for putters). Metal shafts are reasonably standardised for suppliers to manufacture them in bulk. Hence the number of suppliers for this part are adequate. The supply of grips is also adequate with some constraints being felt only in the case of specially designed grips for exclusive customers. Wood head suppliers have closed down or diversified due to the steady drop in demand over the past 20 years. With the resurgence of usage of wood 'woods', there is a constraint in the supply situation of wood heads. Metal head requirements for the whole industry are quite small in comparison to the volumes required by casting/forging firms. Hence no supplier manufactures only heads. Also, the comparatively smaller off-take has restricted the number of heads suppliers and is a *general constraint felt by the industry, with frequent shortage situations arising.*

Suppliers to the golf industry are fairly active in projecting their own product designs and innovations to the manufacturers. However this is not a source of competitive edge to the manufacturers as these innovations are available industry-wide. The small size of Swilken allows it to liaise more closely with suppliers and hence incorporate their innovations at the earliest.

The supply market is dominated by Taiwanese/Korean/Japanese suppliers. In recent months, the exchange situation was unfavourable for purchase from this region and suppliers from UK/US have become competitive. The increase in the popularity of golf and the consequent growth of the industry has seen increased investment activity in the supply market; the firm feels this will lead to an easing of supply availability, particularly for heads.

FIRM'S STRATEGY

THE PLANNING PROCESS

The firm's plans are formulated by the Managing Director, with assistance from outside consultants. The plan horizon is 3 years with annual updates. Though formal, the plans are quite fluid and are used only as general guidelines without hampering short-term flexibility. Recently (since about a year) the firm has begun to work on an annual forecast basis to plan its production, particularly for its sales through the distributor network. This has facilitated its ordering of parts, particularly for long lead time items. However forecasting is kept tight, and continuously validated by actual off-take, to retain the essential pull-through nature of production.

STRATEGIC FACTORS AND ACTION:

The firm is a very small player in the golf industry. It has placed itself to service a small upper-end niche, leading by brand name, exclusivity and high price. The strategy is product-led rather than marketing. The emphasis is on design innovation, craftsmanship, quality and customised service. Production is restricted to small volumes. Capital investment is low as manufacturing is predominantly orientated to

skilled manual work. Small volumes and manual working also help the firm to quickly adapt to 'fashion' dictates of the segment. While the firm is not the trend setter, it quickly follows the lead of the big players.

The firm also derives advantage from being one of the few (3-4) manufacturers in the UK. It is able to cater to corporate accounts (like ICI and Bells) by incorporating their colours in the product.

Except for updating and upgrading design, which is handled personally by the Managing Director, there is no investment in R&D; this is not a constraint in view of the essentially follower strategy of the firm. Marketing is also a small operation with minimal advertising, as the product is not merchandised.

SUPPLY STRATEGY

STRATEGIC FACTORS AND ACTION:

The annual purchase value is about £ 1 m. 50% of the value is obtained from 6 overseas suppliers (mostly heads) and the balance from 120 national suppliers. Supplies are classified under four categories: 1) Essential items with sole suppliers - 10% of total items accounting for 40% by value. 2) Essential components with multiple suppliers - 50% of the items. 3) Items with no supply problems, short lead times and freely available - 40% of total items. 4) Incidental supplies, required occasionally and purchased on one-off basis. Most of the supply strategies are focused on category 1.

The firm finds itself in some situations of single supplier because of ordering parts on the basis of the supplier's brand or because there are no other manufacturers of that part. The firm's strategy to ensure supplies of these parts includes long-term commitment to lift supplies with schedules agreed every two months, maintaining good relationship through prompt payments and frequent communication of plans and schedules. The firm also provides its own tools to the suppliers to produce the parts. The fact that the firm does not have the clout of bulk volumes makes it vulnerable during times of shortages, requiring good relationship to obtain supplies. For the other items, particularly for nationally procured items, the firm is able to operate on a competitive bidding basis, with short call-off and frequent deliveries.

Inventory levels are at 30% of production value, mostly contributed by overseas supplied items because of the longer lead times involved. The aim is to achieve a stock turnover of 6 times.

Supplier involvement is sought at the design stage from the regular suppliers. Prototype development is normally slow as the firm does not have the leverage to push the suppliers for the small volumes, and it usually takes 3-4 months to receive samples. This is a problem for a firm which quickly tries to follow market innovations and trends. This situation is prevalent in heads, some specially designed grips and special shafts like graphite shafts.

Negotiations for overseas supplies which account for 50% of the purchases is carried out by the Managing Director. National purchases are negotiated by the Production Manager in consultation with the Managing Director.

ROLE OF PROCUREMENT IN STRATEGIC PLANNING:

The Procurement function has no role to play in the strategic planning of the firm. Most of the supply issues are addressed and acted on directly by the Managing Director. The Procurement department has only a functional role of implementing decisions passed top-down.

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