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**Middle Managers and the Environment:
The Perspective of the Purchasing and
Supply Function**

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Middle Managers and the Environment: The Perspective of the Purchasing and Supply Function

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ABSTRACT *Management literature and practice increasingly recognise that middle managers can make an important contribution to organisational success. For this, they often utilise a boundary-spanning role, which gives them access to knowledge held by external stakeholders. In order to distil factors that hamper or aid middle managers in contributing to organisational success, this study examined one subgroup of middle management with a salient boundary-spanning role, namely purchasing and supply chain managers and their involvement in environmental initiatives in the supply chain. The results of our study, however, contrast with the literature on middle managers generally, as the purchasing and supply chain managers were found to deliver a suboptimal environmental performance across key areas of managing supply. Such a conclusion has important repercussions for the literature on middle management as it calls for more attention to the conditions the individual manager is working under rather than generalising across this hugely diverse group.*

KEY WORDS: Environmental Protection, Manufacturing, Middle Management, Purchasing, Supply Chain Management

Introduction

Management literature and practice increasingly recognise that middle managers can make an important contribution to organisational success (Burgelman, 1991, 1994; Bartlett and Ghoshal, 1993; Livian and Burgoyne, 1997; Floyd and Wooldridge, 1997, 2000; King et al., 2001; Balogun and Johnson, 2003; Kanter, 2004). Middle managers can influence the design of organisational strategy by synthesising information for top management attention and by championing new ideas. They also play an important role in implementing strategy, as it is their role to translate strategic goals into concrete action, thus aligning organisational competencies. Middle management can furthermore play an integrative role by arbitrating between employee needs and corporate objectives.

Middle management, however, covers a multitude of organisational actors and some middle managers are more active in implementing change than others. In contrast to previous surveys which included a broad range of middle managers of different functions (Floyd and Wooldridge, 1997; Kanter, 2004), our study will focus on one group of middle managers, namely purchasing

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and supply chain managers in manufacturing companies. Supply chain managers perform a role of increasingly strategic importance to manufacturing organisations (Ellram and Carr, 1994; Pinkerton, 2002; Trent and Monczka, 2002). They also occupy an important boundary-spanning role, which offers great opportunities for mediating between internal and external stakeholders. It is in particular middle managers in such a boundary spanning role who were found to have a higher level of strategic influence than their colleagues (Jemison, 1984; Floyd and Wooldridge, 1997, 2000; Kanter, 2004).

A particularly appropriate area for studying the role of middle managers in organisational change is the natural environment. Stakeholder pressure on companies regarding their environmental performance is increasing, but it is still only a minority of companies that go (far) beyond compliance with legislation. In this predominantly reactive mode, addressing environmental challenges offers scope for committed individuals to undertake initiatives that go beyond the conventional – the kind of attitude and behaviour middle managers are praised for in organisational change more generally. Studying the role of supply chain managers in bringing about environmental initiatives should thus allow us to draw generalisable conclusions regarding the factors that support or hamper middle managers in implementing organisational change.

The Importance of Middle Management

Following Pugh et al. (1968; quoted in Floyd and Wooldridge, 1997), middle management can be defined as organisational members who link the activities of vertically related groups and who are responsible for subfunctional work flows, but not the work flow of the organisation as a whole. Middle managers have long been seen as the linking pins (Likert, 1961) between top management and the organisation's operational core. They connect the overall strategic direction with the day-to-day reality at the operations level. Based on their unique position in the organisation, they have knowledge of customer requirements, operating capabilities and top managerial intent. Rather than merely passing down executive level orders, middle managers interpret these, negotiate their implementation and mediate between different organisational interests (Bartlett and Ghoshal, 1993; Floyd and Wooldridge, 1997, 2000; Floyd and Lane, 2000; Balogun, 2003; Kanter, 2004).

In the past middle managers often suffered a bad press (Huy, 2001; Balogun, 2003). Their influence was interpreted negatively, as a potential to resist necessary change. They can indeed delay the implementation of top management strategy by giving it low priority and dragging their feet; they can redirect it by forming political coalitions across the organisation and even sabotage the strategy by deliberately creating 'road blocks' to show that it was an ill-conceived idea in the first place. Thus middle managers have been accused of protecting their own functional or personal interests to the detriment of the whole organisation (Guth and MacMillan, 1986). However, after the downsizing and reengineering waves of the 1980s and early 1990s the potential contribution of the remaining middle managers is seen in a more positive light (Huy, 2001, 2002, Fenton-O'Creevy, 2001).

The more recent literature on middle management hence stresses their ability to influence the evolution and execution of organisational strategy (Burgelman, 1991, 1994; Bartlett and Ghoshal, 1993; Floyd and Wooldridge, 1997, 2000; Hornsby et al, 2002; Kanter, 2004). They can influence strategy by synthesising information for top management regarding the feasibility

of new projects, changes in the external environment or activities of competitors or suppliers. By interpreting ambiguous information they influence the agenda of top management. Middle managers often have value-adding entrepreneurial ideas and propose new projects to top management. They act as vital catalysts for identifying and developing new organisational competencies. Middle managers can become “knowledge activists” (Nonaka and Toyama, 2002) by utilising their position at the intersection of vertical and horizontal information flows within and beyond their organisations.

Once a new strategy is adopted by top management, it is again middle managers who communicate it across the organisation (Bartlett and Ghoshal, 1993). It is their role to fill the broad strategic plan with detail by translating strategic goals into action plans and individual objectives. Building on formal and informal networks in the organisation, middle managers can sell top management initiatives to subordinates. This often requires translation skills, as they need to explain the changes proposed by top management in a language people at the shop floor understand (Huy, 2001; Balogun, 2003). Middle managers can foster employee commitment when they arbitrate in cases where organisational goals clash with employee needs. Thus middle managers play a role that not only aids the efficient execution of strategy but also increases the ability of organisational members to respond to and identify with change.

Middle managers also play an important role in fostering organisational adaptability. Due to their position, they have an unvarnished knowledge of their company’s products, services, processes, suppliers, customers and competitors. Such exposure to internal and, in particular, external stakeholders often leads them to recognise the need for change. Once such a need is recognised, they can encourage and support the development of autonomous initiatives well in advance of other organisational members. They hence play a buffer role between initiatives at operational level and top managerial scrutiny. It is the array of such projects across an organisation that provides the fertile ground from which successful projects emerge and in due course get adopted by top management (Burgelman, 1991; Bartlett and Ghoshal, 1993; Floyd and Lane, 2000; Kanter, 2004).

The role of middle managers in influencing strategy builds in particular on a boundary-spanning role many middle managers occupy (Jemison, 1984, Floyd and Wooldridge, 1997; Kanter, 2004). Exposure to demands of external stakeholders, especially those of customers and suppliers, can make middle managers recognise the potential value to the organisation of meeting these demands. They are also in a position to initiate initiatives that diverge from the current organisational wisdom to take account of such demands. In this sense, middle managers mediate between the uncertainty caused by external influences and internal organisational arrangements (Balogun, 2003).

It is furthermore noteworthy that many middle managers work under considerable constraints. They have a complex and demanding job as they are simultaneously expected to generate information on internal and external strengths and weaknesses, implement changes, adapt themselves and support their staff during these and keep the organisation functioning (Livian and Burgoyne, 1997; Balogun, 2003; McCann et al., 2004). Middle managers often lack time and support and constantly have to juggle priorities. Often they receive little recognition for their contribution to organisational success. Hence the perceived middle manager resistance to change may, in actual fact, stem less from deliberate obstruction and more from organisational

constraints, lack of time and support as well as from the fact that the less tangible parts of their role, such as giving support to front-line workers, are also less visible (Fenton-O’Creevy, 2001).

Many of the features ascribed to middle management in general terms apply in particular to purchasing and supply chain managers. Although it may be argued that their role is defined more by functional specifics than by providing a link between front-line workers and top management, they do connect the overall strategic direction of the organisation to its practical realisation at the operations level. This linking pin role has become ever more pronounced as purchasing and supply has developed from a clerical into a function of strategic importance (Ellram and Carr, 1994; Pinkerton, 2002; Mol, 2003). Purchasing and supply chain managers also spend a considerable share of their time interpreting, negotiating and mediating executive level orders.

Most importantly, purchasing and supply occupies the boundary spanning role that is often associated with middle managers. Indeed, supply chain managers are in a unique position to recognise threats and opportunities in the organisation’s supply base. They can foster the development and accumulation of supplier capabilities and make a strategic contribution to the success of their company by fusing supply base competencies with internal ones (Leenders and Blenkhorn, 1988; Ellram, 1995; Carr and Pearson, 2002; Trent and Monczka, 2002; McIvor and Humphreys, 2004).

Purchasing and supply chain managers have hence frequently been included in studies on middle management generally. For instance, the sample used by Floyd and Wooldridge (1997) includes managers from a wide range of organisational functions, including purchasing and supply. Kanter (2004) also reports a case of a purchasing manager who went beyond the traditional role of the function and reorganised her department into a cluster of user-oriented specialists. Thus on the basis of both theoretical justification and precedence in the literature, supply chain managers are taken here as proxy for middle managers generally. The remainder of this article will hence examine what we can learn from the way in which supply chain managers address environmental issues in their supply chains regarding incentives and barriers for middle managers more generally.

Supply Chain Management and the Natural Environment

Handfield and Nichols (1999: 2) define supply chain management as encompassing all the activities associated with the flow and transformation of goods from the raw materials stages to the final user, the associated information flows up and down the supply chain and the management of supply chain relationships with the aim of achieving a sustainable competitive advantage. The supply chain needs to be perceived as a system consisting of three interrelated elements: the actual organisations in the supply chain, their activities and the processes which link activities and organisations (Schary and Skjott-Larsen, 2001; similarly Lambert, 2001; Hakansson and Snehota, 1995).

The importance of supply chain management is illustrated by the fact that bought-in components and raw materials are by far the largest budget item for manufacturing companies. By 2000 the average US manufacturing company spent some 65% of total expenditure on bought-in components and materials (Burt, Dobler and Starling, 2003) and similar figures are reported for Europe. This level of expenditure provides supply chain management with a significant leverage

effect. An even greater contribution to company profitability may come from joint design initiatives with suppliers, where cost is reduced by changing the supplied item during the design stage. Due to its boundary-spanning role, supply chain management can furthermore act as an early warning system for its organisation and start adaptation processes in response to external changes. One mobile phone manufacturer in the sample for this study, for example, was informed by its suppliers of sharply rising prices for palladium and instigated efforts to replace it with an artificial material.

Purchasing and supply chain management has undergone a dramatic transformation in recent decades as a result of the pressures arising from globalising competition on the one hand and of advances in information technology and logistics management on the other. Emanating from a clerical function which did little more than expedite other departments' orders, its focus has widened to encompass external value-adding benefits, such as ensuring that the company's supply base provides appropriate technology (Ellram and Carr, 1994; Pinkerton, 2002). The function has changed from a tactical to a strategic orientation, which includes the integration of the supply strategy into the overall corporate strategy, the identification of threats and opportunities in the supply markets and involvement in the early stages of product design (Mol, 2003). Strategic management of the supply chain is linked to a longer-term perspective in the relationship with key suppliers, often referred to as partnership sourcing (Lamming, 1993; Schary and Skjott-Larsen, 2001; Gottfredson, Puryear and Phillips, 2005).

Given its growing importance in economic terms – which resonates with the general tenor of the literature on middle management – the question arises whether this economic role is matched by a growing contribution to environmental protection. Greener supply chain management could address three interrelated task areas, upstream, internal and downstream of the organisation (Lamming and Hampson, 1996; New, Green and Morton, 2000; Preuss, 2005a, 2005b). Upstream of the organisation, supply chain managers can address the environment through supplier assessment criteria and specifications for components; they might also be involved in joint environmental design activities with suppliers. Within its organisation, supply chain management can join cross-functional teams, which scrutinise a product in terms of a life-cycle analysis or establish an environmental management system. Downstream of the organisation supply chain management is often charged with disposal and sale of excess stock, including opportunities for recovery and recycling of materials.

Such environmental initiatives can require supply chain members to change their production processes or to reduce the amount of certain harmful substances that are used in the manufacture of a subassembly. The respective supplier would have to impose a corresponding requirement on its own suppliers, who in turn impose it on theirs, all the way along the chain. Once the investment in facilities of a higher environmental standard is made, the suppliers at the various stages could use their green credentials to mentor other potential customers. The environmental effect would hence spread into the supply chains of other manufacturers. Supply chain management could achieve a green multiplier effect all the way along – and beyond – the supply chain and become an agent of change that is more effective than any other function in the corporation (Preuss, 2005). Such a multiplier effect need not be limited to environmental issues, it could apply to any form of socially responsible buying.

The general possibility of greener supply has been confirmed in a number of case reports (Lamming, Warhurst and Hampson, 1996; Russel, 1998; Carter and Dresner, 2001). Companies,

such as Xerox, IBM or Ciba, have involved their supply chains in reducing their environmental impact. Equally there are examples of suppliers that have been able to improve the environmental performance of their customers. Yet the literature on environmental management in companies and their supply chains is not without its critics. It has been called “technicist” in orientation (Newton and Harte, 1997), because the successful change towards a more environmentally friendly organisation is presented as being just a matter of adopting the appropriate environmental technology and management system. While the benefits of adopting environmentally conscious measures are extensively spelled out, the disadvantages remain underexposed.

The availability of cleaner technology also varies between industries and companies. Some industries, especially mature ones, are operating near the theoretical limits of resource efficiency and would not have much scope for further improvement (Howes, Skea and Whelan, 1997). The success stories come also mostly from large corporations and from companies in some specific sectors, such as chemicals, which have been under intense environmental scrutiny (Hill, 1997; Russel, 1998). Such critique leads to a suggestion that environmental innovation may just pick the low-hanging fruits and the successful initial steps might not lead to a continuous improvement process. By extension, the optimistic conceptualisation of a middle manager role in organisational change might have to be scaled down too.

Methodology

This article seeks to unearth factors that enable or hamper middle managers in making a contribution to organisational success by focussing on one middle management group, namely supply chain managers and their involvement in environmental protection. In parallel to studies into middle management generally, previous research into greener supply has shown that purchasing and supply chain managers are able to use their role to influence the environmental impact of their companies. Most of these studies have, however, concentrated on individual companies or specific sectors (Green, Morton and New, 1996; Handfield *et al.*, 1997; Hill, 1997). By contrast, our study aims to cover a broad spectrum of manufacturing organisations within the national economy of the United Kingdom (excluding the food and drinks industry). Product classes were identified according to the *Standard Industrial Classification of Economic Activity 1992* (Central Statistical Office, 1992), and the actual companies were drawn from Kompass (2000) *UK Kompass Register* and Dunn & Bradstreet’s (1999) *Scottish business register*.

In total, purchasing and supply chain managers from 50 companies were approached for an interview, and 34 agreed to participate. Their companies represent industries ranging from electronics, chemicals and car manufacture through mechanical engineering to plastics, textiles and paper. The production processes of these companies are not unique to the United Kingdom and our results are hence broadly representative of manufacturing in industrialised countries. The interviews were conducted in three stages, a pilot stage of six companies during Summer 1998, the main study of 24 companies between Summer 1999 and Spring 2000 and a follow-up study of four companies during Spring and Summer 2004. The 16 companies that did not respond or declined to participate were mainly small enterprises, often with no full-time purchasing manager, or companies in extraordinary financial difficulties, which could not afford the time to

give an interview. The sample does still include a number of small and medium-sized companies, and the danger of bias from non-response is thus slight.

Interviews were generally held with a single respondent, except for two case of organisations with a particularly complex purchasing and supply function where two members of the purchasing team were interviewed together. To ensure that the position of the interviewees was comparable and thus to increase data reliability, repeat interviews were undertaken in four cases. The interviews lasted between 30 minutes and two hours. They were conducted on company premises, taped and later transcribed. The interviews followed a semi-structured format, so that important issues and topics were covered, but they also offered sufficient flexibility to allow respondents to present their own perceptions. Interview data were supplemented with information from company-internal sources, such as purchasing policy documents, vendor evaluation forms and environmental reports, or material provided externally by, for example, regulators and other government departments.

The data analysis used a three-stage method suggested by Eisenhardt (1989) and Miles and Huberman (1994) for building theory from case study data. First, a detailed case study write-up was produced after each field visit to allow data analysis within each case. In the second stage, cross-case patterns were developed by examining the data from many diverging ways. A separate data base was created to rearrange the data in a cross-case, variable-by-variable format. The relative rigidity of the variables as the new ordering principle reduced the danger of being overly influenced by vivid data or unconsciously dropping disconfirming evidence. In the third stage hypotheses were developed. The emerging relationships were verified by testing them against the data, with the result that some of the categories had to be dropped. The emerging concepts were then re-examined for their fit with the existing literature.

Managing Materials Transformation

Echoing case studies where middle managers were in a position to contribute to organisational success (see e.g. Kanter, 2004), our sample includes several companies that have addressed environmental issues in bought-in components or in supplier production processes. One manufacturer of electronic test equipment faced new legislation banning a heavy metal, which had been the standard treatment for the metal casing of its product. The company asked its sheet metal supplier to develop an alternative that satisfies the new legal requirements while still giving the necessary electronic insulation. Several chemical companies reported initiatives with major suppliers to replace one-way containers for hazardous chemicals with returnable ones, while some electronics corporations have been active in the replacement of cardboard packaging for incoming components with reusable plastic containers (for more details, see Preuss, 2005a, 2005b).

The question arises, however, whether such cases of greener supply represent more than anecdotal evidence from a few individual organisations. Since the aim of this study is to consider the spread of environmental initiatives across manufacturing, a more comprehensive approach is sought. To this end the three themes in the definition of supply chain management by Handfield and Nichols (1999) above are applied to environmental protection. Our study will thus examine how supply chain managers in manufacturing companies influence the environmental impact of their value chains through the way in which they manage 1) the transformation and flow of materials, 2) the associated information flows and 3) the relationships in the supply chains. In

terms of the first aspect, we will enquire how the transformation and flow of materials is influenced by the use of supplier selection and evaluation criteria that make explicit reference to the natural environment.

Supplier selection and evaluation criteria are an appropriate starting point for studying the impact purchasing and supply chain managers have on the environmental performance of their organisations and supply chains: If supply chain managers are serious about the environment, then environmental credentials of suppliers should emerge as one criterion that strongly influences the selection and evaluation of suppliers. In our sample, however, the assessment of suppliers was clearly dominated by conventional factors centring around quality, price and delivery. The environment was only included in the supplier evaluation criteria of ten of 34 companies. This subset includes all the paper makers and all the car manufacturers in the sample, making the paper and automotive industries the ones with the most consistent attention to the environment in their supplier assessment. The other companies were two electronics manufacturers, one petrochemical corporation and one manufacturer of linoleum and vinyl floor coverings (Preuss, 2005a).

Moving beyond the question of whether the environment is addressed at all, we need to ask how effective the inclusion of the environment in the supplier selection criteria is. The supply chain manager of one of the exemplary electronics companies could not cite any cases where the environmental performance of a supplier had been the reason for ending the relationship. The environment does, however, play a role in a more limited sense: “We probably have examples where we have not proceeded with an evaluation, because we didn’t like the processes or the control of the processes ... we have probably not selected someone because of their environmental performance, rather than taken them off.” In other words, the environment does serve as a threshold suppliers have to meet, but where several suppliers meet the requirements the selection reverts back to the conventional criteria of price, quality and delivery.

Our study of UK manufacturers once more illustrated that the environment is a complex topic. There are individual examples of companies addressing environmental problems in their supply chains, where they substitute hazardous materials, reduce the amount of packaging or require suppliers to reach a certain environmental threshold. Across the sample as a whole, however, the involvement of supply chain managers in environmental initiatives is rather more limited. Most companies in the sample select suppliers without reference to their environmental performance, while the few exemplary companies are concentrated in sectors that are in the limelight due to their public image as heavy polluters. Even in these cases environmental issues are only considered in the early stages of the supplier selection process. Where several suppliers meet the threshold, the environment does not seem to influence the relationship any longer. The chances that the credentials of an environmentally outstanding supplier are detected and that the materials flow is channelled in a more environmentally benign direction are hence limited. By extension, the contribution of middle managers to organisational success may be subject to similar contradictions.

Managing Information Flows

A second aspect in Handfield and Nichols’ (1999) definition of supply chain management concerns information flows in the supply chain or network. The opportunity for accessing information from external sources is also highlighted in the literature on middle

managers as an important base for their contribution to organisational change (Jemison, 1984; Floyd and Wooldridge, 1997, 2000; Kanter, 2004). Correspondingly, greener supply chain management must be concerned with the management of information on environmental issues in the supply chain. Hence we will ask in this section what purchasing and supply chain managers in the sample regarded as important environmental issues in their supply chains.

A small number of purchasing managers claimed that their supply chains do not present any environmental issues. However, the majority of supply chain managers were readily able to list a number of environmental issues in their supply chains which they see as important. Unsurprisingly, the cited environmental problems differ between industries and companies, but on closer examination similarities became visible and four general issues emerged as being referred to with regularity: packaging, waste, hazardous production materials and paints and solvents (see Preuss, 2005a, 2005b). Packaging was addressed in three different ways, by re-using, reducing or recycling. Prominent examples for the re-use of packaging came from large manufacturers in the electronics industry. For example, a mobile phone manufacturer replaced all cardboard packaging for incoming phone casings with returnable plastic containers. The initiative was undertaken primarily for quality reasons, as the packaging had introduced cardboard particles into the production process and caused a significant amount of reworking at the end of the line.

Re-use of packaging is, however, constrained by a number of industry-specific factors. It requires a relative proximity of supplier and customer, a regular logistics schedule and a significant volume of goods to be exchanged between companies. Furthermore there must not be any contamination of packaging material in the production process. These factors are met by the electronics industry, whereas other industries, like tyre manufacture with its larger degree of contaminated packaging, have shown a considerably lower profile concerning the re-use of packaging. Similarly, reducing packaging is not suitable to all industries and has limitations in itself that make a continuous improvement difficult. Some recycling is undertaken in the sample companies, but for the majority of companies recycling depends on the services of external providers and these have not been available in all cases.

Waste, the second most often cited issue in the supply chain, can also be avoided or recycled, although by definition not completely. Waste also differs between industries in terms of the overall amount and the difficulty of its handling. Among the most affected in the sample are again tyre manufacturers. Production materials, another often cited issue, present a challenge to purchasing and supply in a twofold sense. First, any danger of the item to be purchased to employees, the natural environment and potential customers has to be evaluated before the purchase. Secondly, after the manufacturing process supply chain managers have to find ways to reduce the impact of the remaining production materials by disposing of them in an environmentally safe way, whilst perhaps recovering some value.

Paints and solvents offer similar challenges, in that potential risks need to be known before the purchase. In some cases manufacturers can pass this risk to their component suppliers, which undertake the painting and coating processes. Where the customer is a branded manufacturer, however, the company cannot escape responsibility for the environmental performance of the product entirely as consumer pressure over a substandard environmental performance is unlikely to distinguish between the legally separate entities in the supply chain.

It should be noted that the issues cited most often – packaging and waste – directly concern neither the production processes of the supply chain nor the environmental characteristics of the finished product. They are also of relatively low financial importance and given that environmental initiatives are, at least partly, influenced by consideration of cost savings, supply chain managers might find it correspondingly more difficult to persuade top management to address these issues. Supply chain managers in the sample do show some awareness of environmental issues in their supply chains, but the application of this awareness has again led to suboptimal results. Hence one of the most important bases for middle managers to exercise influence within the organisation – the boundary-spanning role with its opportunity to gather information and to generate new ideas – is not utilised by the majority of purchasing and supply chain managers in our sample.

Managing Supply Chain Relationships

As supply chain management moves towards an increasingly strategic orientation, the relationship a company has with selected key suppliers should develop from the traditional arm's length or adversarial relationship into a more cooperative approach, which offers a longer-term outlook and a 'win-win' scenario (Lamming, 1993; Krause, Handfield and Scannell, 1998; Boer *et al.*, 2005). The call for a more cooperative relationship can be transferred to the way in which environmental issues in the supply chain are addressed. Apart from the option of not addressing the environment at all, a distinction can be made between an arm's length approach, where the customer dictates the desired level of environmental improvement without consultation of the supply chain, and a collaborative approach, where environmental issues are addressed in a joint effort of supply chain members. Such a proactive approach might even lead to a 'win-win-win' scenario, where all participating companies and the environment win (Elkington and Knight, 1991).

Examples for such a collaborative approach are provided by chemical companies which replaced one-way containers for hazardous chemicals with reusable ones. Since the containers are contaminated with the chemicals, they have become hazardous themselves, and the reusable alternative significantly reduces the need for disposing of them. A pigments and dyes manufacturer, for example, was able to save some 30,000 fibreboard kegs per year (for more details, see Preuss, 2005a). The technical complexity of such environmental initiatives usually has repercussions for both supplier and customer technology and therefore requires close cooperation. However, such a replacement of contaminated one-way containers occurred only in a few chemical companies. While they are examples of a collaborative approach, the range of environmental initiatives pursued by the chemical industry is, at the same time, much narrower than those offered, for example, by electronics companies.

Across manufacturing as a whole, environmental issues in the supply chain are more usually addressed in an arm's length mode, by stipulating minimum criteria the supplier must not fall below of. Such an arm's length mode is prevalent in electronics but is applied in other industries too, such as ship building and paper making. Analysing environmental initiatives in terms of an arm's length or collaborative approach allows once more to illustrate the complexity of environmental issues. A small mechanical engineering company has undertaken a number of environmental protection initiatives by improving its products. One recent example concerned the design of cleaning equipment for coke ovens in the steel industry. A more efficient cleaning

of the oven doors ensures that the doors fit closely and less pollutants escape into the atmosphere. This innovation is evidence of a collaborative relationship in the downstream value chain. However, its upstream supply chain is approached in conventional arm's length mode, as the purchasing manager states:

What we are buying in, if it is raw material, as long as it meets the proper standard or level of quality, and we check that by reason of seeing that we get the proper certification, if it meets that, normally, it would be on delivery time and price.

Our study concludes that an active collaboration on environmental issues involving both suppliers and customer is rare among manufacturing companies. The predominant mode of tackling environmental issues is an arm's length approach, where the buying company imposes criteria which supply chain members are not allowed to fall below of. A degree of environmental protection is achieved in this mode, but such an arm's length approach makes it unlikely that the middle manager – in this case the supply chain manager – would champion new projects based on tapping into external stakeholder knowledge.

Such a conclusion tallies with the earlier findings that supplier assessment criteria take little account of the natural environment and that the environmental problems referred to most often by purchasing and supply chain managers are of lesser concern when the whole life-cycle of a product is considered. In terms of all the three factors that constitute supply chain management – materials flow, information and relationships in the supply chain – the observed situation is hence sub-optimal. This finding echoes the discrepancy between the potential contribution of middle management to organisational success and the widely held perception that middle managers might in actual fact be resisting change.

Purchasing and Supply: A Reluctant Middle Management

Our results regarding the involvement of purchasing and supply chain managers in environmental protection contrast with the literature on general middle management. There the potential for a middle manager contribution to organisational change and in particular to shaping corporate strategy is emphasised (Bartlett and Ghoshal, 1993; Floyd and Wooldridge, 2000; Kanter, 2004). By contrast, the purchasing and supply chain managers in our sample – after all one subgroup of middle management – presented a more reactive approach to environmental protection, which is reminiscent of the earlier criticism that middle managers hamper change rather than shaping and driving it forward.

Such a conclusion has important implications for research into middle management. It seems, we have to supplement the bird's eye perspective of the entire organisational stratum with a closer focus on the individual managerial groups that make up middle management. We need to examine under what conditions the individual groups of middle management are working and what the incentives for and obstacles to a greater contribution to organisational change for each group are. Such a research programme concerns two distinct aspects, namely organisational and functional factors.

The impact of organisational factors, such as company structure and culture, on middle manager performance has been highlighted in the literature. Kanter (2004) found a strong association

between a middle manager contribution to innovation and a participatory management style, whereas rigidity of roles and lack of power makes managers more concerned with guarding their patch than collaborating with others to the benefit of the whole organisation. Fenton-O'Creevy (2001) sees a link between work intensification due to 'down-sizing' and middle managers having less time and energy available for employee involvement initiatives, while Hornsby et al. (2002) underline the importance of organisational resources, top management support and rewards structures for middle manager entrepreneurship.

The importance of the organisational context is confirmed by our study too, in particular the influence of product-specific factors is notable. The inclusion of the environment in supplier assessment was found to be concentrated in manufacturers of specific products, namely chemicals, automobiles, paper and electronics. All the paper makers in the same displayed a particularly comprehensive approach to environmental issues in their supply chains, with their instruments for supplier assessment ranging from questionnaires through site visits to support for industry-wide initiatives such as the accreditation scheme for sustainable forestry offered by the Forest Stewardship Council (Preuss, 2005a). It can be argued that the outstanding companies are all in industries that are in the public limelight over their environmental performance. Hence the relatively high degree of public pressure these companies experience translates into a situation where purchasing and supply chain managers can move beyond the more narrowly defined remit their colleagues in other companies work under.

While the middle management literature has pointed to the importance of organisational factors, it has seemingly not addressed the influence of functional constraints on middle management performance. Purchasing and supply chain managers do indeed work under specific conditions that are not shared by other middle management functions. The supply function is characterised by a reactive nature; it is a service function to the organisation, the task of which is to, first and foremost, avoid shut-down of the production line and, secondly, to deliver value for money.

The reactive nature of purchasing and supply is also illustrated by the fact that over half of the purchasing managers in the sample, while recognising the need for strategic work, were predominantly occupied with routine or reactive tasks. The share of such work often increases dramatically, in particular in times of high demand for the company's products. The reactive nature of the purchasing and supply function is furthermore amplified by performance measurement criteria that concentrate on economic targets rather than 'softer' variables, such as attention to the natural environment.

Purchasing and supply chain managers are also subjected to a wide range of constraints emanating from internal and external sources that do not apply to other middle management groups to the same degree (Preuss, 2005a). Supply chain managers have to meet economic targets stipulated by the Board. These may be targets to reduce total expenditure by a certain percentage each year or to reduce the input costs of a product below a certain threshold to aid its sales. Supply chain managers also have to meet the requirements of internal user departments. Engineers, for instance, may stipulate a component of a certain quality that may only be offered by a few specialist suppliers.

External constraints begin with regulation. For example, a recent EU Directive on end-of-life vehicles imposes stringent conditions on the recyclability of car components, and these need to be taken into account when the components are sourced. Purchasing and supply chain managers

are also hampered by requirements of their company's customers. In a more indirect fashion the range of options can furthermore be curtailed by competitors, where their adoption of a new product or production process compels the whole industry to follow suit. Given the multitude of such requirements and constraints, factors that are not specifically highlighted – like the environment – simply drop out of most supply chain managers' range of vision.

These insights into a supply chain manager's work illustrate once more that middle managers have complex and demanding tasks (Fenton-O'Creevy, 2001; Balogun, 2003; McCann et al., 2004). They often lack time and resources and have to juggle a multitude of important tasks. In terms of research into middle management, the point to be stressed, however, is that middle manager groups have differently complex and demanding tasks and lack time and resources in different degrees. As we have seen, the reactive service nature of purchasing and supply is not necessarily shared by other middle management groups; hence a more detailed investigation is needed regarding which groups within middle management can realistically deliver what contribution to organisational change.

Conclusions

Purchasing and supply chain management, for long a neglected management function in manufacturing organisations, is increasingly becoming a function of strategic importance. This growing importance is built, in particular, on the function's gate-keeper role, which allows purchasing and supply chain managers not only to determine which materials and components enter the organisation but also to tap into external stakeholder knowledge. However, its increasing contribution to the bottom line is not matched by an equally increasing contribution to environmental protection. Rather, our sample of manufacturing organisations across the United Kingdom revealed a sub-optimal approach to environmental issues in key areas of supply chain management.

In terms of managing the flow and transformation of materials, individual initiatives to replace hazardous materials or to reduce packaging contrast with a non-inclusion of the environment in the supplier selection and evaluation criteria for the majority of manufacturers. Of the issues referred to as environmental problems in supply chains, the most often cited ones – packaging and waste – do not significantly concern the environmental performance of the entire value chain and are of low financial importance. Where environmental issues are addressed, an arm's length mode prevails and the potential of a more comprehensive approach to the environment is often foregone. Hence the environmental initiatives observed in the supply chains of the sample companies amount to little more than 'light-green' supply.

Such a conclusion has important implications for research into the role of middle managers generally. A boundary-spanning role and access to external knowledge are generally cited as prerequisites for middle managers to make a contribution to organisational change, in particular to influence corporate strategy. Purchasing and supply chain managers demonstrate these characteristics, perhaps even more so than other middle management groups. Yet their use of this boundary spanning role to further environmental protection is only marginal. Instead of a bird's eye view of the entire organisational stratum, it seems, we need a more detailed analysis which displays a greater sensitivity to the differences in working conditions across different groups of middle management. Some of these differences – such as the influence of organisational factors

on middle manager creativity – have already been highlighted in the literature. Their importance is confirmed by our study too, as the environmentally most active companies are also those that are in the public limelight over their environmental impact.

What the literature has so far not discussed, however, is the importance of functional differences within middle management. In contrast to other middle management groups, purchasing and supply chain management is shaped by a reactive service nature. A large part of their work is dominated by short-term tasks of a fire-fighting nature. The function is also subject to a wide range of constraints that are internally imposed by the Board and internal user departments as well as externally driven by regulation and customers as well as competitors. These are conditions that can help explain the apparent contradiction of a middle manager group that is, more than others, in possession of a boundary-spanning role but does not seem to utilise it to bring about environmental innovation in the value chain. In other words, our study suggests that specific functional requirements need to be born in mind rather than generalising about middle management as a whole.

The results of this study have a number of implications for managerial practice. As has been argued for middle management generally (Floyd and Wooldridge, 1997, 2000; Hornsby et al., 2002; Kanter, 2004) purchasing and supply chain managers too need an organisational culture and structure that would enable them to make creative use of their boundary-spanning role in the interests of the entire organisation. To overcome the structural constraints and reactive outlook of purchasing and supply, the function incumbents should be allowed to make a greater contribution to corporate strategy. Perhaps they could even be offered a seat on the Board of Management, as is already the case for two companies in the sample. Such a move would in any case be justified on grounds of the increasing economic importance of purchasing and supply.

A more in-depth look over the organisational garden fence can also be fostered by novel ways of organising supply. The concept of product take-back, for example, requires purchasing and supply to address during the tendering process issues that normally become only relevant much later, namely when the customer eventually wants to return the product. Last but not least, traditional supply chain management knowledge should be challenged by new concepts. For example, the notion of an industrial ecosystem (Frosch and Gallopoulos, 1989; Korhonen, 2004) could serve as an inspiration for purchasing and supply chain managers to search for innovative sources and manufacturing processes that reduce the impact of their companies over the life-cycle of their products.

Middle managers can have a pervasive influence on organisational strategy and performance. This has been demonstrated once more by the environmental protection initiatives undertaken by some of the purchasing and supply chain managers of our sample companies. However, if middle managers do not utilise their special role in the organisation effectively, we should hesitate to put the blame on this managerial group alone. Instead, we need to look more closely at the web of managerial relationships within and beyond organisations and examine what organisational influences support or hamper managers in making a contribution to organisational success. This, however, requires diving deeper into the organisation and rather than theorising about middle management generally, we need to examine the specific conditions under which the individual middle manager groups are working.

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