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SUPPLIER BASE MANAGEMENT: THE CONTRAST BETWEEN GERMANY AND THE UK

Fred Lemke,* Keith Goffin,* Marek Szwejcowski,* Colin New,*

Rolf Pfeiffer** and Bertram Lohmüller**

*Cranfield School of Management, Cranfield MK43 0AL, England

**Export-Akademie Baden-Württemberg, Alteburgstr. 150, 72762 Reutlingen, Deutschland

Abstract

Supplier base management is an important aspect of the management of manufacturing operations, as reducing the number of suppliers – the supplier base – is a key approach in many companies including the US and the UK. By having fewer suppliers, manufacturers have more time to work closely with each remaining supplier, for instance, on improving quality and product innovation. However, is this approach being adopted in Germany as fast as it has been in the UK? This paper describes research which addresses this question and which also investigates how German companies are managing contacts with their suppliers.

The study was conducted in two stages. Firstly, a survey of manufacturers in Germany and the UK identified the trends in the supplier base of companies in each country. Secondly, a follow-up telephone survey was carried through with purchasing managers at a random sample of 34 German plants to identify, for example, the advantages experienced by manufacturers, which had reduced their supplier base.

The findings show that German manufacturers have not reduced their supplier base by as much as companies in the UK. The second part of the research showed that German manufacturers, which have reduced their supplier base, perceive the benefits of this. However, other companies appear to have failed to take the opportunity to gain advantages from a reduced supplier base.

Keywords: supplier base management, supplier management, manufacturing practices,
supply base reduction, supplier selection process, supplier-manufacturer relationships

Introduction

The management of suppliers is a vital task for manufacturers as it can contribute to both the competitiveness and profitability of a company. This is so, because *supplier management* is concerned with “organising the optimal flow of high-quality, value-for-money materials or components to manufacturing companies from a suitable set of innovative suppliers” (Goffin et al., 1997: 422).

Effective supplier management starts with the selection of the most appropriate suppliers on competitive criteria such as ‘providing high quality parts,’ ‘aggressive pricing’ and ‘reliable delivery.’ Interestingly, many companies have found that it is advantageous to have a smaller supplier base (Christopher and Jüttner, 1998; Dorsch et al., 1998; Higginson and Alam, 1997). This step accords with the view that working with fewer suppliers enables manufacturers to increase volume discounts, reduce administration costs, improve quality, and co-operate on product development. Consequently, reducing the supplier base has become a common approach among manufacturing companies. There is much anecdotal evidence of this and some empirical studies confirmed this phenomenon in the UK (see, for example, Goffin et al., 1997; Lamming, et al., 1996). However, very little empirical research has been conducted in Germany, although this is a country with an important manufacturing sector. This is somewhat surprising, because the importance of supplier management to German companies has been recognised (see, for example, Becker, 1997). Therefore, this paper addresses this omission and presents an empirical investigation of supplier management in German manufacturing companies, contrasted with corresponding practices in the UK. A cross-country comparison adds an exciting dimension to supplier management research and Britain has been selected, as the authors recently completed a study on this issue in UK industries (see Goffin et al., 1997). The main aims of the current research are:

- To investigate the supplier base trends of German manufacturers compared to those UK companies employ;
and
- To explore the views of German managers on key issues on supplier management.

Supplier Management

In this paper, the literature review is focused on *supplier management* and will cover articles in both the management and academic literature in English, with a focus on identifying where empirical investigations have been conducted. In addition, relevant literature in the German language will be described.

From the literature on supplier management published in English, three main areas emerge: The importance of supplier management; supplier base reduction; and the selection of suppliers. Each of these will be described separately before the German literature and previous empirical research in Germany are discussed.

The Importance of Supplier Management

Suppliers play a vital role in helping manufacturers to achieve high performance and this has become widely recognised over the past few years. For example, a survey by Monczka et al. (1998) showed that whilst over 20% of purchasing and materials managers deemed supplier management to be ‘extremely important’ in 1995, 65% expected it to be on this exceptionally high level by 1997. Why is this the case?

Firstly, effective supplier management can take costs out of the supply chain (Christopher, 1997). In many industries, the management of suppliers can account for as much as 60% and 80% of manufacturing costs (Asmus and Griffin, 1993). Secondly, reducing costs is not the only advantage – there are many other potential benefits. These include on-going improvements in product and service quality by employing just-in-time delivery systems (Christopher, 1998), electronic data interchange (EDI) (Wang and Seidmann, 1995) and quality improvement programmes (Kolarik, 1995). Furthermore, product and process designs can be enhanced by involving selected suppliers in the earliest new product development (NPD) stages (Ragatz et al., 1997). Thirdly, a streamlined supply base allows partnerships to be formed with the remaining suppliers. The benefits result from “intercorporate closeness,” according to Leenders and Fearon (1997). By this, the authors mean that companies, which develop better communication links with their suppliers and are more effective at breaking down barriers between procurement, design, manufacturing engineering, achieve better results. In this vein, Asmus and Griffin (1993: 68) argued that “the [real] advantage comes when limited resources can be focused on a manageable number of suppliers, which can then receive the attention they need to achieve top performance.” Conversely, if the supply bases are too large, co-ordination and interaction becomes costly, time consuming and inefficient. As supplier relationships potentially influence the buyer’s performance, suppliers have to be well chosen.

Supplier Base Reduction

The term supplier base describes the total number of selected suppliers (Monczka et al., 1998; Goffin et al. 1997). One of the key trends in recent years has been for manufacturers to reduce their total number of suppliers (Christopher, 1998; Leverick and Cooper, 1998; Goffin et al., 1997). Moreover, a dramatic reduction in the near future is expected (Szymankiewicz and Canadine, 1994). Evidence for this trend comes from a number of anecdotal examples from individual companies.

For instance, certain multinational manufacturers have streamlined their supplier bases, as shown by Table 1.

Table 1: Reduction in the Number of Suppliers by Multinational Companies

Company	Number of Suppliers			Dates
	Previous	Current	%-Change	
Xerox	5,000	500	-90	Unspecified
Motorola	10,000	3,000	-70	Unspecified
Digital Equipment	9,000	3,000	-67	Unspecified
General Motors	10,000	5,500	-45	Unspecified
Ford Motor	1,800	1,000	-44	Unspecified
Texas Instruments	22,000	14,000	-36	Unspecified
Rainbird	520	380	-27	Unspecified
Allied Signal Aerospace	7,500	6,000	-20	Unspecified

Source: Adapted from Emshwiller (1991) as cited in Sheth and Sharma, 1997: 95.

Xerox reduced the supplier number dramatically by 90%. The reduction at Texas Instruments (36%) and at Allied Signal Aerospace (20%) also represent major reductions of the supply base sizes (i.e., total reduced number of 8,000 and 1,500 respectively). The original data source was in 1991 and Sheth and Sharma (1997) did not provide the dates when the changes in the supplier number occurred. Unfortunately, the original source cannot be traced, which hampers an accurate evaluation of the implicit trend without having the specific time scales. In contrast, Table 2 specifies the exact dates of supplier reduction with regard to certain British organisations.

Table 2: Reduction in the Number of Suppliers by British Companies

Company	Number of Suppliers			Dates
	Previous	Current	%-Change	
Fujitsu Telecommunications [*]	2,400	280	-88	1994-96
Caradon Mira [†]	633	220	-65	1991-98
Design to Distribution (D2D) [*]	726	307	-58	1988-94
Thorn Lighting Spennymoor [°]	580	260	-55	1990-93
Premier Exhaust Systems [°]	46	32	-30	1990-94

Source^{*}: Adapted from Wheatley et al. (1997).

Source[†]: Adapted from Wheatley et al. (1998).

Source^{*}: Adapted from Wheatley et al. (1995).

Source[°]: Adapted from Wheatley et al. (1996a).

Table 2 shows manufacturers who have streamlined their supplier number between about 30% and 90% – all have been recognised as being one of the market leaders in their particular industry sectors in Britain. According to both tables above, a general trend of supply base reduction could be speculated. Yet, whereas Table 1 is lacking in specifying the time scales, Table 2 consists of only a limited number of examples. Both findings prevent the generalisation to a wider population of manufacturers across industrial sectors.

Reviewing the literature, it becomes obvious that direct empirical evidence for the reduction in the supplier base is rare – and if it does, it comes mostly from the automotive sector. For example, Asmus and Griffin (1993) report that ‘world-class’ manufacturers in the automotive sector have reduced their supplier base typically by 50% and move to single-sourcing (one supplier per part). This might have much to do with a restructuring of the supply chain in the car industry where a number of former 1st-tier suppliers have become even ‘closer’ to manufacturers – these are now been described as 0.5-tier suppliers. In contrast, ‘traditional’ companies have made only small reductions. Narrowing the supplier base and single-sourcing are claimed to be key sources of competitive advantage. However, this research was conducted by a consultancy company and the sources of the data and the sample size are not specified. Therefore, this research must also be classed as anecdotal evidence.

In contrast, Goffin et al. (1997) made an empirical investigation of supplier base reduction – the first outside the automotive sector. This research was based on a survey of about 200 companies in four industrial sectors in the UK. As shown by Table 3, the top-three sectors streamlined their bases by around 35% between 1991 and 1995. The household industry, however, showed a relatively low reduction of 9%.

Table 3: Average Number of Suppliers for the Period 1991-1995

Industry Sector	Companies / Sample (n)	Supplier Number on Average			Percentage Reduction 1991-95
		1991	1993	1995	
Process	30	221	199	142	36
Engineering	63	496	400	316	36
Electronics	34	382	304	250	35
Household	74	107	99	97	9
Total	N = 201				

Source: Goffin et al., 1997: 429 (for a definition/categorisation of these sectors, see Appendix 1).

In moving towards a smaller supplier base, manufacturers need to select appropriate suppliers and to achieve this they need an effective *selection process*.

The Selection Process

The selection process is strongly tied to the evaluation of a supplier’s performance (Weber et al., 1998; Gallouj, 1997; Pearson and Ellram, 1995). Traditionally, three measures have been used for determining supplier performance: *price*, *delivery* and *quality* (Smith et al., 1963). These are also the factors typically applied in supplier selection (Weber et al., 1991), although *service*, as a fourth dimension, has for some years been used as a selection criterion (Stevens, 1978).

Manufacturers in the UK automotive sector, however, recently put great pressure on their suppliers in terms of cost and price cuttings – the price focus questions the suitability of the partnership approach and a

return to traditional supplier management practices became apparent in UK automotive. David (24 June 1999) introduced the results of an anonymous survey on supplier management at six UK component suppliers. The author (ibid.: 20-21) concluded “that UK suppliers fear that the distinctive culture of the industry, which owes much to the Japanese emphasis on quality, partnership-based relationships and high trust, is being ruined by the relentless battering of cost pressures.” Reporting the importance of *price* as being re-instated in selecting suppliers suggests that supplier management practices can come ‘full-circle’ in particular industry sectors.

Taking a broader industry picture as a background, it has been argued that focusing mainly on *price* is inappropriate as it is “perhaps one of the most defined characteristics of primitive purchasing” (Lamming, 1993: 148). Lamming did not suggest that *price* became unimportant, but the relative emphasis between the four factors (i.e., price, delivery, quality, service) has changed over time. Wilson’s (1994) research in the US, for instance, was concerned with large industrial buyers (sample: managers involved in purchasing decisions; questionnaire administered in personal interview; n = 88) and has shown that the relative rank in supplier selection is quality (1), service (2), price (3) and delivery (4). In addition, other factors are now becoming important. For example, one study in the US automotive industry explored the importance of 26 criteria on which supplier selection is commonly based (Choi and Hartley, 1996). These included 4 ‘soft’ relationship factors¹ as well as 22 ‘hard’ number-driven criteria. The study was based on a postal survey of 156 purchasing managers (a response of 21%). The results clearly showed not only the influence of ‘soft’ criteria in the supplier selection process today, but also the reduced importance of *price* (which was ranked amongst the least important factors).

Just as the role of price has diminished as a criterion in supplier selection in many sectors, so quality has become a more important factor. This results in the situation where the initial low price is no longer ‘above everything’ – rather, the total costs of the period of the contract matters more (including quality costs of dealing with suppliers). The supplier’s capability to reduce his price in the future and to further optimise his quality potential comes into play as well. In addition, the understanding of the concept ‘quality’ has been transformed. Quality no longer simply applies to the product itself but also applies to the service and other received aspects of the supplier-manufacturer relationship. For instance, a good relationship is a prerequisite to good problem solving and co-operation in product design.

In the drive to reduce the number of suppliers, the location of the vendor has a role. *Supplier location* can impact on, for instance, costs of transportation and response time for replacement orders. Another motivation might be to support the local or national economy and manufacturers may chose to buy in the country in which they operate, rather than overseas (Waller, 1999). The newer, wider spectrum of selection criteria incorporates several intangible factors. Choi and Hartley’s (ibid.) study suggested that the supplier selection process needs

¹ The following ‘soft’ factors were chosen: closeness of past relationship, likelihood of long-term relationship, communication openness and company’s reputation for integrity.

to be modified in order to account for the intangible side of the relationship. However, the question arises: how can intangible aspects, which are difficult to measure, be integrated into the decision process?

Boer (1998) argued that one quantitative selection criterion usually involves one decision maker, whereas quantitative and qualitative selection criteria require several decision makers. Consequently, companies now commonly use a team for supplier selection decisions. The cross-functional sourcing team typically consists of individuals who are knowledgeable about the particular selection decision faced (Goffin et al., 1997; Monczka et al., 1998). Hence, the team membership changes according to the selection problem. The purchasing manager, however, is always part of the team and based on the long standing experience in dealing with supplier relationships, the purchasing manager takes up the role as a ‘coach’ and ‘teampayer.’ The team approach should prevent purely subjective (ad-hoc) decisions being made best, at the same time, allows for a controlled degree of ‘subjective flexibility.’ Nevertheless, the best way to measure and deal with the soft factors of the relationship is still an open issue (e.g., Dorsch et al., 1998).

It appears from the literature that the structure of the sourcing team as well as the criteria used for selecting suppliers is changing. This is in response to the new challenge of selecting suppliers who have the potential to add long-term value to a manufacturer.

German Literature

It has been recognised that German manufacturing is comparatively slow to adopt new manufacturing concepts, such as lean production and business re-engineering (see, for example, Lay et al., 1996; Kinkel and Wengel, 1997). It could also be that best practices from supplier management have been slow to be adopted.

Reviewing the literature published in the German language, it quickly becomes apparent that most ideas are repeated from English publications and are conceptual in nature. It has to be noted that some empirical studies conducted in Germany have been published in English. These have merely focused on exploring the *best practices* of successful companies (e.g., Rommel, 1991; Kluge, 1997), but have identified supplier management as a key area. It is surprising that few authors conducted empirical investigations in Germany – an exception is Homburg (1995). It seems that German researchers have, to date, largely ignored the area of supplier management. Following the outline of the English literature review above, a brief summary of German publications will be presented covering the following three areas: ‘The importance of supplier management,’ ‘supplier base reduction’ and ‘the selection process.’

The Importance of Supplier Management

Many German writers have acknowledged the importance of supplier management (e.g., Nachtweh, 1998; Wehrli and Wirtz, 1996) and today, close supplier relationships are an emerging critical success factor (e.g., Boutellier and Locker, 1996; Snijder, 1996). The German automotive industry typically stands out as being well advanced in this respect. Interestingly, it has been reported that substantial knowledge transfer barriers exist between suppliers and manufacturers in the German automotive sector (Anonymous, 1998). However, in discussing German manufacturing industry as a whole, Friedrich et al. (1995) identified that partnerships between suppliers of manufacturers are unusual and that adversarial relationships are too common.

Recently, a German Delphi-Panel of experts made the prognosis for the years 2001-2005 that suppliers will become responsible for a major part of R&D activities, whereas manufacturers will predominantly focus on their core competencies (Cuhls et al., 1998). Thus, supplier management will become increasingly critical.

Supplier Base Reduction

Homburg's (1995) study of 5 industry sectors is particularly relevant, as it is the only previous empirical investigation of supplier base reduction in Germany.

Table 4: Expectations of Supplier Number Development

Industry Sector	Sample (n)	Expected Future Development of Supplier Number (in %)		
		Extreme Decrease	Stable / Insignificant Changes	Extreme Increase
Chemicals	48	10	83	6
Electronics	36	22	67	11
Metal Processing	33	12	85	3
Machine Building / Engineering	31	13	77	10
Motor Manufacturing / Engineering	17	24	65	12
Total	165	15	77	8

Source: Adapted from Homburg, 1995: 823.

The investigation was based on a 1993 postal survey of 165 manufacturing companies. The results indicated that the majority of German manufacturers intended to maintain their supplier base (77% on average across all sectors said that the supply base would remain stable). Interestingly, manufacturers sourced their production materials from 3-4 suppliers on average. Although not explicitly stated, it can be assumed that this number referred to the suppliers of each part and component – so, signalling a relatively large supply base in German manufacturing overall at that time. Against this background, Homburg pointed out that single sourcing is a rare occurrence in all five sectors.

It is unfortunate that Homburg displayed only a snapshot of the average supplier number for the year 1993. This prompts the question of whether manufacturers have narrowed their supply bases prior to 1993 and

intended therefore to keep the supplier number stable at the time when Homburg made his investigation. Given the two numbers from the mailed survey (i.e., current and expected supply base sizes), it is not possible to observe a general tendency within the industry sectors. Overall, an updated study is required which takes a wider time-horizon as a basis. If Homburg's result (i.e., to 'maintain the supplier number') would still hold true today, one has to get the impression that the selection of suppliers is not a critical issue in Germany.

The Supplier Selection Process

The selection process is not the responsibility of one individual (e.g., purchasing manager), but a group of decision makers. Whereas some authors argued that the purchasing manager has to team up with engineers for selecting suppliers (e.g., Strache, 1995; Layer, 1985), other authors had a complete cross-functional team in mind (e.g., Nachtweh, 1998). This team decides on the basis of the well-established selection criteria *price*, *quality*, *delivery* and *service*. Schulte-Rebbelmund (1992) suggested to weight these factors differently depending on the industry sector. Put simply, a scoring system analogous to ABC analysis (Backhaus, 1992) is most suited for basing the choice on 'hard numbers' rather than on subjective influences.

Whether to integrate subjective aspects in the evaluation process is debatable in Germany. For instance, although Fröhlich-Glantschig (1997) clarified that the selection procedures are based on object-related factors (i.e., with regard to the products/services provided), Nachtweh (1998) proposed to widen the focus and to allow 'soft' factors also to come into this process. Thus, a small circle of authors seriously considered *relationship value* as a potential selection criterion (Wehrli and Wirtz, 1996; Wehrli and Jüttner, 1996). Unfortunately, the value of the relationship has not been clearly defined, but the term might explain why the price should be considered last, depending on the supplier's package overall (e.g., Godefroid, 1995).

Conclusions

There is a large literature in English on supplier management, including many empirical studies. In contrasting the published literature in English to the German it becomes evident that the overwhelming majority of German authors base their arguments on anecdotal evidence alone. The sparse number of empirical investigations is surprising, considering the interest in supplier management. The review of the literature leads to four main conclusions:

1. Supplier Management has been recognised as a vital element for manufacturers. Although a smaller supply base can lead to competitive advantages, the current size of the base is not clear. Perhaps supplier numbers in Germany are already small? The typical supplier number at present as well as from previous years needs

to be determined. Furthermore, a prognosis of the future development of supply bases is needed in German manufacturing.

2. The lack of ‘up-to-date input from German practitioners’ into empirical work prompts the question of whether managers do not deem supplier management as being important today. Put differently, might there be a mismatch between theory, which advocates the management of suppliers as being vital, and practice?
3. Usually, it is argued that a variety of benefits result from dealing with smaller supply bases (e.g., cost reductions, increased innovation rates and improved quality levels). What are the advantages of working with a limited number in particular? What is the impact of a reduction on the financial situation of manufacturers?
4. A cross-functional sourcing team is now typically responsible for selecting suppliers. However, are such teams being used by German manufacturers? In this context it has not been investigated into the selection process itself. What are the typical steps taken? What are the current selection criteria?

The conclusions from the literature and the questions here raised prompted an empirical investigation of supplier management in German manufacturing industry, contrasted against practices in the UK.

Research Design

In accordance with the conclusions of the literature review, the goals of the present research were:

1. To determine the trends in size of the supplier base of German manufacturing companies.
2. To contrast the results in Germany with findings for comparable UK companies.
3. To investigate in detail the views of German purchasing managers on the important issues in supplier management.

To achieve the above aims, the methodology of Goffin et al. (1997) was extended and refined. This led to the adoption of two stages for the research: a postal survey followed by a telephone survey of purchasing managers. The combination of postal survey and telephone interviews was able to establish the trend in supplier management in the two countries and also an indication of supplier management practice in Germany.

Stage 1 – Postal Survey Data of German and UK Manufacturing Companies

Research Instrument and Survey Details

The research used information taken from the *Best Factory Awards* (BFA) database of UK manufacturing companies. Management Today (a leading UK manufacturing magazine) and Cranfield School of Management

have run the BFA programme since 1992. The detailed information collected from more than 200 organisations each year in various industries is the basis for benchmarking and research (for detailed information about the programme refer to New and Szwejczewski, 1995). Each plant completed a detailed 16-page, confidential questionnaire covering descriptive data (e.g., cost structure), performance data (e.g., delivery reliability), the products manufactured as well as management policies (e.g., market positioning), besides other issues. Currently, the UK-database contains high-quality data on the performance of over 1,000 manufacturing plants and includes details of supplier management. Previous Best Factory Award winners and finalists have been widely published, e.g., Wheatley et al. (1996b, 1997, 1998).

In order to arrive at comparable findings, the research used the *International Best Factory Awards Deutschland* (IBFA-D) database, which was launched in 1996. This database contains information on comparable German manufacturing organisations in terms of industry sector, product range, size, employee number etc. (New et al., 1998a; 1998b).

Purpose and Sample

Since most research dealing with supplier management has been conducted in the automotive sector, the current research takes a broader sample and extends beyond this industry (as did the UK-study by Goffin et al., 1997). The research examines the issue of supplier management in three industry sectors: *Engineering (including automotive), process, and electronics*.

The performance of 220 manufacturing companies (110 German; 110 English) in the selected industry sectors was analysed using the BFA Databases. Furthermore, information on supplier management including trends in the size of supplier bases was compared. Hence, it was possible to find the answer to the question whether manufacturers in both nations did reduce their supplier bases between the years 1993 and 1997 (refer to survey question in Appendix 2).

Stage 2 – Telephone Survey of German Manufacturing Companies

The second research stage focused on supplier management exclusively in Germany. The telephone survey was necessary in order to be able to investigate some of the more complex aspects of supplier management, which could not be effectively researched using the postal survey.

Research Instrument and Interview Details

The telephone questionnaire used was based on the one developed by Goffin et al. (1997). It was translated into German by a native speaker (one of the researchers) and was checked by an independent German expert in the

supplier management field. Five pilot interviews were conducted in order to check and optimise the questionnaire. The pilot interviews also helped to affirm that the interview structure, the individual questions, as well as the overall interview flow were relevant and applicable to German manufacturers.

The first pilot test was an in-depth face-to-face interview with a senior purchasing manager. As a result, some changes of the research instrument were necessary in terms of phrasing questions (i.e., incorporating typical business expressions of the respondent) and slight re-structuring of the order of the questions. The subsequent four pilot telephone interviews with purchasing managers helped in optimising the instrument (three pilots led to further minor amendments; the fourth, however, showed that the research design was absolutely suited for the current research purposes). Since these four interviews were with companies from the IBFA-D database (1998 entrants), the interview pilots were chosen for the representative of the final sample.

One individual researcher conducted all interviews (including pilots) in his native language in order to avoid possible errors resulting from multiple interviewers. Since the interviews were exploratory in nature, recording the conversation on tape was beneficial (Oppenheim, 1992). This procedure was followed in 32 cases, after obtaining the respondent's consent at the start of the interview. In addition, notes were taken during the interview process. In the cases of the 2 respondents who did not feel comfortable with the recording, the researcher made detailed notes and transcribed the conversation immediately after the actual interview. Overall, the interviews took 30 minutes on average and discussed in detail each company's approach to supplier management following a structured questionnaire.

Purpose and Sample

A *stratified sample with a random start* of the database population of the 110 German organisations that entered the IBFA-D in 1997 (i.e., in stage one) was created. The goal of the second research stage was thus to conduct interviews with a *representative sample* of the database and fifty companies were selected to be contacted. This number is deemed sufficient to ensure that appropriate numbers of organisations are drawn from homogeneous subsets of that database population (i.e., the three industry sectors).

All selected organisations were sent an initial letter explaining the research project. Our 'first contact' (as listed in the database; usually the Managing Director/*Geschäftsführer*) was asked to pass the letter on to the most appropriate manager dealing with the selection and management of suppliers (normally the purchasing manager). On the back of the letter was a pre-printed form for the manager responsible for suppliers to complete with his/her name and contact details. In addition to the first letter, a follow-up letter was sent three weeks later. After a further two weeks, one of the researchers (a native speaker) contacted the remaining organisations, which had not responded. In this final contact phase, the MD was called directly and asked if he was willing to co-operate. Through such intensive contact with companies, a 68% response rate was achieved.

As an incentive to all participating companies, respondents were offered the results of the study in return for their support.

Before each interview, it was vital to introduce the research personally in order to ensure that the manager was the *key informant* for the current research purposes. This step was important, as Cambell (Fall 1955) demonstrated, because knowledgeable individuals, when answering well-developed questionnaires within their area of expertise, generate high quality data. The conversation was mostly held with senior

purchasing/materials managers (see Table 5).

Table 5: Structure of Sample by Interviewee Function

Function of Interviewee	Proportion
<i>Senior Purchasing / Materials Manager</i>	20 (59%)
<i>MD</i>	9 (26%)
<i>Other</i>	5 (15%)

The managers contacted were responsible for supplier management in their organisation and the sample breakdown by industry is shown in Table 6.

Table 6: Structure of Sample by Industry Sector

Industry Sector	Companies Contacted	Interviews Conducted	Response Rate
Electronics	11	9	82%
Engineering	34	21	62%
Process	5	4	80%
Total	n = 50	n = 34	68%

From the original sample of 50 managers/organisations, 34 detailed telephone interviews were conducted (which yields a response rate of 68%).

Results

The discussion of the results starts by examining the survey data taken from the UK and German BFA databases. It then moves on to examine the results of the telephone survey.

Survey Results

Have German manufacturing companies reduced their supply base and if so, to what degree? The shifts in the number of suppliers between the years 1993 and 1997 for UK and German manufacturing plants in three sectors are shown in Table 7.

Table 7: Change within the UK and German Supplier Bases

Industrial Sector	Country	Sample (n)	1993	1995	1997	Change in % (1993-97)
Electronics	<i>UK</i>	28	472	341	253	-46%
	<i>Germany</i>	20	578	563	532	-8%
Engineering	<i>UK</i>	56	243	201	155	-36%
	<i>Germany</i>	78	240	234	228	-5%
Process	<i>UK</i>	26	332	297	260	-22%

<i>Germany</i>	12	124	138	143	+15%
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The table compares the average supplier base across the three industry sectors. In the *electronics sector*, UK plants have reduced their number of suppliers from 1993 to 1997 by 46%. In contrast, German plants have only reduced the supplier number by 8% over the same period – leaving them with, on average, twice as many suppliers (532 versus 253).

A similar trend to that seen in the electronics sector can also be observed in *engineering*. UK manufacturers have reduced the average supplier number of 243 in 1993 to around 155 in 1997. This represents a 36% decrease over 4 years. In the same period comparable German plants reduced their supplier base by only 5% (from 240 in 1993 to 228 in 1997).

However, the third sector *process* shows a different situation. Whereas UK manufacturers reduced their average supplier base from 332 (in 1993) to 260 (in 1997), the German plants actually increased their supply bases from 124 to 143 over the same period.

The results indicate that UK electronics and engineering plants have greatly reduced their supplier base whilst German plants made only small reductions. However, the question arises: were the manufacturing plants in the UK and German samples comparable? In order to verify this, a range of variables from other parts of the questionnaire was checked. These included plant size, types of product, product complexity, number of employees, etc. As presented in a previous paper, no significant differences between the UK and German plants were found on any of these variables in the electronics and engineering sectors (see New et al., 1998a). However, for the ‘process’ sector the situation is different: German and UK plants are not comparable because the German sample consists of only breweries and textile manufacturers whereas the UK sample comprises manufacturers of a great variety of product categories. This means that the result of the comparison for the process sector is not conclusive.

Telephone Survey Results

The Importance of Supplier Management

The respondents were asked if they considered the importance of supplier management to have increased over the last 3 to 5 years.

Figure 1: German Managers’ Perception of the Importance of Supplier Management

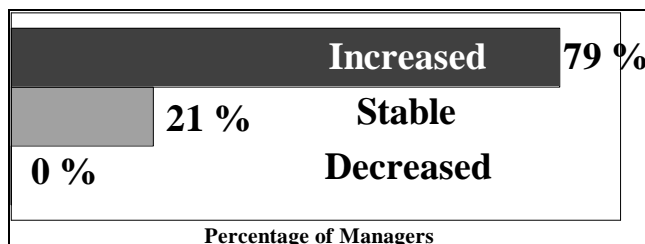


Figure 1 shows that although 21% of respondents perceived the importance of supplier management as being stable in their organisations, 79% of managers saw the importance increasing. None perceived supplier management as decreasing in importance. The reason for this strong confirmation is that “*purchasing is not a single-sided business but is underpinned by a bilateral supplier-customer relationship,*” as a purchasing manager in the engineering sector explained. A marketing manager in engineering stated that “*the relationship to the supplier is nearly as important as to the customer.*” These are typical answers underpinning the significance of supplier management. As a central purchasing manager (electronics sector) pertinently emphasised “*we are only as good as our suppliers are.*”

Further Supply Base Reduction

The respondents were asked about the future development of their supplier numbers; Table 8 shows their answers.

Table 8: Future Change within the Supplier Bases in German Manufacturing

Industrial Sector	Sample (n)	Increasing	Stable	Reducing
Electronics	9	0	4 (44%)	5 (56%)
Engineering	21	2 (10%)	11 (52%)	8 (38%)
Process	4	0	3 (75%)	1 (25%)
Overall	34	2 (6%)	18 (53%)	14 (41%)

Although some of the respondents intend to reduce the number of suppliers, the majority plan to keep the number stable. The table above indicates that whereas companies in the ‘process’ sector largely intend to keep the number constant, a greater proportion of the companies in the ‘electronics’ and ‘engineering’ industrial sectors intend to reduce. It is interesting to note that of the 14 companies, who intend to streamline the supply base in the future, 12 (ca. 85%) had already reduced their supplier number in the period 1993-97. This insight suggests that supplier base reduction is a long-term process.

Benefits of Reduced Supplier Base

In total, 15 of the 34 manufacturers surveyed had reduced their supplier base in the period 1993 to 1997. These respondents were asked about the benefits of reducing their supplier base – the following were mentioned:

Table 9: Benefits of Having Reduced the Supplier Number

Benefits	Percentage
Less resources / effort / (administration) costs required	53%
More power in negotiations / Increase importance to suppliers	53%
Advantages in Logistics / Fewer inspections	33%
Know-how transfer easier and quicker / Less risk spreading know-how to competitors / Earlier involvement in product development processes	33%
More intense and direct contact / Improvement of communication	27%
An opportunity to plan for the future	13%
Appointing more tasks to fewer suppliers (e.g., to <i>System Suppliers</i>)	13%
Employing KANBAN Systems	7%

Respondents referred to benefits mostly related to cost savings made by managing a smaller supplier base. In addition, manufacturers said that the focus on fewer suppliers increased their negotiating power with the remaining suppliers.

The quoted advantages are qualitative and quantitative in nature. This prompts the question of whether the benefits have been quantified by the organisations. Did the respondents gain a positive financial impact on the bottom line by having reduced the supplier base? It turned out that only 7 respondents have quantified the benefits of having a smaller supplier base to some extent. Hence, for the majority of companies the benefits were ‘experienced’ rather than quantified in terms of a clear financial benefit.

Supplier Selection Process and Criteria

All the respondents were asked separate questions relating to the supplier selection process. Virtually every respondent described the selection process as a team effort, involving a number of different functions. Table 10 outlines the main functions involved in the supplier selection process at the 34 companies surveyed.

Table 10: Typical Functions Involved in Selection Process

Functions	Percentage
Purchasing	79%
Quality Management	56%
R&D	41%
Engineering	32%
MD / Top Management	26%
Production Manager	15%
Factory Manager	6%
Marketing	6%

Project Leader	6%
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In 79% of cases, the purchasing department was involved, followed by quality management and Research and Development. Normally, three functions make up the team responsible for supplier selection. Surprisingly, of the 34 firms surveyed, only two manufacturers integrate the marketing function into the sourcing teams. Recently, Homburg et al.'s (1999) empirical work in German and US manufacturing indicated that marketing is a highly influential function in its classic tasks (e.g., advertising messages or measuring customer satisfaction levels) as well as to a lesser extent in decisions about strategic business issues. This, together with the results of the present investigation, suggests that marketing still takes a predominately *downstream perspective* in the supply chain. In other words, while it is actively involved in managing the manufacturer-customer relationship, it is not involved in the supplier-manufacturer interface in Germany.

Having identified who was involved in the supplier selection team, the interviews also covered the actual supplier selection process. Each of the companies were directly asked to describe their process and a general scheme of phases emerged. Although the procedures vary to some extent, they can be aggregated into the main nine steps outlined in Table 11.

Table 11: Typical Steps Taken in the Supplier Selection Process

- | |
|---|
| <ol style="list-style-type: none"> 1. <i>Engineering / R&D have an initial product idea or the end-consumer places an order for a particular product;</i> 2. <i>Purchasing manager enquires information/offers from potential suppliers or from specific suppliers (if required by the end-consumer or R&D);</i> 3. <i>The cross-functional sourcing team discusses the options;</i> 4. <i>The purchasing manager invites potential suppliers for first discussions;</i> 5. <i>Suppliers on the short-list deliver samples;</i> 6. <i>Quality manager evaluates the samples;</i> 7. <i>Purchasing manager negotiates with suitable suppliers;</i> 8. <i>Sometimes, an audit (before selection or shortly afterwards) will be conducted;</i> 9. <i>The team decides and purchasing manager places the order.</i> |
|---|

The selection procedure starts with an initial idea or specific customer order. It then involves the purchasing manager who seeks out potential suppliers and initiates the bidding process. The sourcing team discusses the options on the basis of the information received before inviting a limited number of suppliers for further personal discussions. After drawing up a short-list, suppliers are asked to deliver samples, which the quality manager evaluates subsequently. Then the purchasing manager negotiates the price and delivery conditions etc. Sometimes it is necessary to conduct an audit before the entire sourcing team enters into the final phase. Here, the group decides on which supplier to buy from and the purchasing manager places the order.

For selecting suppliers, the *price*, as it seems, becomes an issue in later stages of the selection process. What is the role of *price* in this situation? The telephone survey was used to clarify which criteria form the basis for selecting suppliers. The majority (30 managers) mentioned *price*, whereas 27 respondents referred to

product quality and 23 to *delivery performance*. Other criteria were mentioned somewhat infrequently, as Table 12 shows.

Table 12: Selection Criteria (Top 15)

Selection Criteria	Frequency
Price	30
Quality	27
Delivery	23
Service	4
Relationship History	4
Certificates	4
Volume	3
Know-how / Competence	3
Flexibility	3
Supplier's Equipment	2
Commitment	1
Communication	1
Size of Organisation	1
Trust	1
Technology	1

The top three selection criteria employed in practice are also those advocated by the German literature. Although the manufacturers interviewed did not mention the *location* of the supplier, it might be that it is one of the subconscious pre-selection filters. Thus, the *location* could ensure speedy delivery and direct communication links unconstrained by foreign languages and country specific interpretations about legislative issues. Unfortunately, the findings do not shed light on this possibility.

In general, some German companies surveyed favoured a combination of *price and quality* while others assessed *price and delivery* for supplier evaluation purposes. The majority, however, took all three factors into account when selecting a supplier. This explains, why *price* always plays a role in selecting suppliers, although it has to be emphasised that this factor is not the single most important criterion. A purchasing manager in the electronic industry described this situation as follows “*in the past, the price was most important and then quality came in. Yet, if the quality is not right or we do not get the promised component delivered, a ‘good price’ will not help us run our business.*” An MD in the same sector also made a similar point “*it is critical that products are of top quality. In addition, products have to be here on-time and only then does price become relevant. In fact, the price is the last issue to consider.*”

Examples like these clearly show that the understanding and approach to purchasing among German manufacturing companies has changed; the motto of the past ‘how much quality do we get for a given price’ has been replaced by ‘how much do we have to pay for obtaining a given quality level.’ The change of importance among the classic criteria confirms the observed trend in America described earlier (Wilson, 1994). Also here, quality has replaced price in terms of importance in supplier selection processes. In the U.S., this

condition may be understood as a first phase, before aspects of the business relationship become critical differentiators in the selection decision (cf. Choi and Hartley, 1996). In the future, will German manufacturing follow in taking softer relationship criteria into account when selecting suppliers?

The present investigation cannot answer this question, but it became apparent that softer issues, such as *cultural fit* or *problem solving capabilities*, are still rarely considered in the selection decision in German manufacturing today. As an exceptional case in the engineering sector, a purchasing manager pointed out “*our selection criteria are quality, reliability in delivery performance and the supplier’s ‘willingness to operationalise crazy ideas’ – and finally the price.*” From this quote, it seems that subjective issues can be blend into the selection process, albeit the classic factors enjoy priority.

Summary and Conclusions

It is evident that supplier management is critical to manufacturers today and quite likely to remain so for some time to come. If one compares the English and the German literature on this issue, one can see the similarities in both bodies of literature. This is understandable, since managers and researchers in Germany are well aware of discussions published in English. However, German researchers have largely repeated arguments from abroad – despite the growing attention being paid to supplier management by German managers.

By comparing the trend of supplier numbers of UK manufacturers with their German counterparts in the two BFA databases, a stark contrast came to light: UK manufacturers in the electronics and engineering industry sectors had made significantly greater reductions in their supplier bases than the German companies in the time period 1993-97. Previous research by Homburg (1995) indicated that German manufacturers expected their future supplier base size to stay unchanged. The empirical evidence from the present study goes beyond Homburg’s investigation and shows that there has been a slight reduction in the supplier base. Furthermore, the research indicates that an increasing number of manufacturers are planning to reduce their supplier base in the near future. However, a large proportion has not realised the potential of this.

Those companies, which have reduced their supply base, perceive advantages to it. These are mainly cost reductions of various kinds as well as other benefits resulting from an intensified supplier relationship. However, very few of the companies have actually quantified the extent of the benefits gained.

The research showed that the classic selection criteria (price, quality and delivery) are still the most popular ones for selecting suppliers in Germany. Commonalities exist also with regard to the steps taken in the selection procedure itself (Table 11), which can be described as a bidding process. It typically starts with an idea from in-house technical departments, on the one hand, or with a specific customer order, on the other. Then the purchasing manager solicits offers from potential suppliers and the procedure continues with various

evaluation stages. The cross-functional sourcing team, which often consists of three functions, selects the supplier together as the final step.

The findings have implications for researchers, who need to collect more evidence on supplier management in Germany. It is necessary to understand why some German manufacturers have reduced their supplier numbers albeit many have not. A qualitative approach, possibly using a case study design, might be more appropriate for exploring this issue in detail. This could be done in the manufacturing sectors chosen here as well as other industries.

Some related questions are worth exploring in future research: What is the appropriate strategy for suppliers to differentiate themselves from others? Also, does subjectivity influence the selection process by manufacturers or is it all objective – if yes, to what degree does the intangible ‘human factor’ play a role in it?

This research also has strong ramifications for manufacturers – it indicates that German companies could obtain a competitive advantage by reducing their supplier base. Starting to measure the benefits obtained from the reduction in the supplier base might be an eye-opener for some who merely perceive advantages. It would also be important data for companies considering supply base reduction – it would give them a clear view of potential savings.

However, the findings are not only relevant to manufacturers, they also have potentially strong implication for suppliers. If more German manufactures decide to implement supply base reduction, then suppliers need to be ready and understand the actions they need to take to ensure that the combination of materials, parts, components and services they can offer is attractive to manufacturers. Consequently, suppliers need to consider what is the most appropriate strategy for them to be one of the few selected.

Currently there is a very strong debate about the international competitiveness of German manufacturing industry (e.g., Kinkel and Wengel, 1997; Spur and Schröder, 1997) and this topic became generally known as the *Standort Deutschland* discussion (see, e.g., Brinkler et al., 1997; Henkel, 1997). The degree to which Standort Deutschland has been debated in the press is demonstrated by the fact that in the past three years well over 1,000 articles on this issue were published in the *Frankfurter Allgemeine Zeitung* and the *Süddeutsche Zeitung*.² Germany has a substantial manufacturing industry, accounting for 25% of Gross Domestic Product (GDP) as well as employing an equally high rate of the workforce in this sector (Anonymous, 1999). Yet, high taxes and labour costs are factors which are making many companies question whether to produce in Germany (Fischer and Allen, 1998). However, other issues are also important. For example, some researchers have noted that manufacturing management concepts, such as ‘lean production’ could also contribute to the cost competitiveness of German companies. Surprisingly, such concepts seem to only be slowly adopted in Germany (Kinkel and Wengel, 1997; Lay et al., 1996). One of these new concepts is supply base management and the results of the current study indicate that German companies have not yet grasped the opportunity to

optimise it. It will be interesting to see when this situation changes and when German manufacturers will realise that fewer suppliers can mean more effective supplier base management.

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² As determined by a search of the Financial Times *FTProfile* database.

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Appendices

Appendix 1: Definition/Categories of Industry Sectors in Goffin et al.'s (1997) Study

Industry Sector	Definition/Categories
Process	<i>Chemical, Pharmaceutical, Metal Manufacture, Man-made Fibres</i>
Engineering	<i>Heavy Engineering, Mechanical Engineering, Motor Vehicles and Parts, Other Transport Equipment, Instrument Engineering</i>
Electronics	<i>Office Machinery, Data Processing Equipment, PCs, Electrical Components and Electronic Equipment</i>
Household	<i>Rubber and Plastics Processing, Clothing, Furniture, Food/Drink and Tobacco, Printing and Publishing</i>

Appendix 2: Number of Suppliers

The main question in the 16-page Best Factory Awards 1997 questionnaire, which relates to the size of the supplier base, is given below. Note that the dates given change each year (i.e., they relate to the number of suppliers two and four years ago).

How many suppliers do/did you have for manufacturing purposes:

	Number
Currently	<input type="text"/>
In 1995	<input type="text"/>
In 1993	<input type="text"/>