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**Supplier Performance Evaluation:
Lessons from a Large Multinational Organisation**

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Biographical Notes

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has much experience in the supply chain arena where he has successfully implemented numerous process improvement initiatives.

Supplier Performance Evaluation: Lessons from a Large Multinational Organisation

Abstract

Purpose – Progressive organisations are developing proactive supplier based strategies in order to integrate key suppliers in to their processes and systems. An approach is presented that helps to identify best performing suppliers and eliminate those that do not add value in order to improve the efficiency and effectiveness of the materials supply chain.

Design/methodology/approach – This case study focuses on the development of a supplier performance rating tool for a large multinational organisation. The paper presents a profile of the organisation, the problems encountered, the development and implementation of the supplier rating tool and the lessons learned.

Findings – The implementation of the tool resulted in a 2.9 fold reduction in the number of suppliers from 23,225 to 8,024 and a 2.6 fold reduction in the value of inventory held from \$15.24 million to just over \$5.86 million.

Practical implications – Reducing the number and improving the quality of suppliers resulted in increased quality, reduced lead time and a reduction in the number of errors and defects. Best performing suppliers are more closely integrated and can add their knowledge and experience to development initiatives, potential problems can be anticipated in advance and process changes and modifications can be made earlier.

Originality/value – The paper presents a successful application of a supplier performance rating tool in a complex and demanding environment.

Key words: Supply Chain Management, Supplier Performance Evaluation, Case Study

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1. Introduction

Manufacturing organisations can no longer be considered as independent, isolated entities; they must be regarded as players in a wider more complex network of interdependent organisations (Browne and Zhang 1999, Boardman and Clegg 2001, Waller 2004). Competition today is no longer between individual companies but between dynamic supply chains and networks (Nadler and Tushman 1999, Walters and Buchanan 2001, Voss 2003). Manufacturing organisations must therefore focus their attention not only on their customers but also on their customers' customers. Similarly they can no longer simply focus solely on their immediate suppliers; they must also attempt to integrate and manage their suppliers' suppliers.

The concept of understanding, managing and integrating supply chains is not new. It has received much attention in the literature and there are many definitions and typologies available to help our understanding of the area. For example, Tan et al (1999) define the supply chain as "*the simultaneous integration of customer requirements, internal processes and upstream supplier performance.*" New and Payne (1995) also highlight the importance of enterprise integration and state that the supply chain "*links each element of the manufacturing and supply process from raw materials through to the end user*". Raghavan et al (2001) focus on co-ordination in the supply chain. They consider supply chain management to be "*the coordination of the activities of all the companies involved in procuring, producing, delivering and maintaining products and services to customers located in geographically different places.*" Many authors describe supply chain management in terms of a process (see Andersen et al 1999, Beamon 1999, Raghavan et al 2001, Kotzab and Otto 2004, Lockamy and McCormack 2004). For example, Beamon (1999) defines the materials

supply chain as “*an integrated process wherein materials are manufactured into final products and then delivered to the customers.*”

Upon analysis of these definitions we can see that supply chain management is a complex process involving the integration of many activities and functions across many organisational boundaries. The seamless integration of supply chain functions can improve product offerings and service to the final customer while simultaneously reduce costs for all the key stakeholders (Timmers 2000, McAdam and McCormack 2001, Braganza 2002, Cousineau et al 2004, Wu et al 2004). Progressive manufacturing organisations consider suppliers to be virtual extensions of their factory (Browne and Zhang 1999, Kemppainen and Vepsäläinen 2003) and are beginning to integrate them in their production processes. According to Monczka et al (1998) “*A typical manufacturing firm’s suppliers are increasingly critical for product and market success, both currently and in the future.*” Well managed supplier involvement can lead to better supplier performance, increased inventory turns, improved manufacturing, and product and process advancements that in turn enhance customer satisfaction and organisational performance (Shin et al 2000).

One of the competencies essential to successful supplier integration is an effective materials management or purchasing function (Giunipero and Brand 1996). This function has changed over the years and according to Kemppainen and Vepsäläinen (2003) will continue to do so into the future. Purchasing personnel today have evolved to become “*relationship managers*”, facilitating decision-making by bringing together the relevant parties internal and external to the organisation (Cooper and Ellram, 1993). They select preferred suppliers in an attempt to meet system wide goals as opposed to minimising piece price (Degraeve and Roodhooft 1999). They also

aim to develop and maintain long-term strategic alliances with those suppliers (Anderson and Lee 1999, Talluri and Narasimhan 2003). Many benefits are lauded to accrue to organisations that develop close relationships with a small number of critical suppliers. For example, re-scheduling activities can be simplified, volumes can be consolidated and discounts negotiated, chosen suppliers can dedicate capacity and reduce lead time and the cost of logistics can be minimised.

There is a wealth of literature available that describes best practice and models for evaluating and measuring supplier performance (see Tan et al 1999, Neely 1999, Anderson and Lee 1999, Tracey and Tan 2001, Çebi and Bayraktar 2003, Gunasekaran et al 2004). High performing organisations tend to place less importance on unit price as a selection and evaluation criterion; they select and evaluate suppliers on the basis of good quality, delivery reliability and product performance (Gunasekaran, et al 2004). They also involve their key suppliers in the decision making process and successfully involve them in continuous improvement programmes (Tracey and Tan 2001). When evaluating suppliers it is important to identify parameters and metrics that are objective and relevant to the organisation at all levels. For these metrics to be truly effective they must be separate from personalities and aligned to core processes. They must also be measurable, realistically attainable, adequately resourced and timely. Supplier performance measurement tools can be developed to measure and manage potential preferred suppliers against a set of defined performance criteria such as on time delivery, quality and the cost of doing business. Such tools should allow suppliers to be integrated more into the organisation's supply chain network, provide acceptable quality material on time and provide a flexible service to cater for changing customer requirements.

This paper presents a case study of a large multinational manufacturing organisation in its quest to objectively measure and manage the performance of its suppliers. To do this, a supplier performance measuring tool is designed, developed and deployed. The tool is based on best practice and designed to meet the needs of the subject organisation. The overarching goal is to improve the efficiency and operation of the materials supply chain. This is achieved by objectively assessing the supplier base, eliminating redundant and poor performing suppliers and developing stronger collaborative relationships with a group of key preferred suppliers. Suppliers that show potential for improvement can also be identified and resources can be justifiably allocated to them as part of a supplier improvement programme.

2. Profile of the Organisation

This large multinational organisation develops global end-to-end uninterruptible power supply (UPS) products and services that provide protection against many of the primary causes of data loss. The company targets four strategic application areas; (a) home and small office, (b) business networks, (c) access providers and (d) data centres and facilities. Its corporate office is located in the USA. Manufacturing facilities are based in the USA, Ireland, Switzerland, Philippines, China, India, and Brazil and sales offices are located throughout the world. Product offerings are shipped to nearly 120 countries. In 2003, 55% of the company's revenues were generated in the Americas (North and Latin America), 29% in Europe, the Middle East and Africa (EMEA) and 16% in Asia. The company employs approximately 5,400 full-time people worldwide, with a turnover of \$1.3 billion dollars.

The organisation has been in business for over twenty years and consequently has built up an extensive list of approved suppliers. There has always been reluctance to remove suppliers from the approved manufacturing list (AML) once a supplier has been audited and approved as it gives the organisation the security of having alternatives should an unforeseen situation arise. Moreover, it is expensive and time consuming to qualify a new supplier or to qualify an existing part number from a new supplier. Furthermore, in order to cater for contingencies there is a specific purchasing requirement to have at least one additional supporting supplier for all parts except for proprietary and single sourced parts. This has resulted in an average supplier to part number ratio of between 6.8 suppliers for each part number. As a result, the number of suppliers on the organisations AML has become difficult to manage effectively.

After an initial investigation it was found that some of the suppliers on the list had not done business with the organisation in over two years. It was also found that a sizable proportion of suppliers on the AML had approval to deliver material for products that were now obsolete. Furthermore, some suppliers on the organisations AML had ceased trading. To complicate matters further, other manufacturing companies were acquired and consequently integrated their associated inventory and approved suppliers. This has resulted in having too many suppliers on the AML, generating too much inventory and consequently the organisation was carrying large associated costs. At the start of this study in October 2000 the organisation had 23,225 suppliers and carried on average \$15.24 million worth of inventory and the purchasing function was struggling to manage the materials supply base. There were not enough resources within the purchasing and quality assurance departments to effectively manage the large number of suppliers on the AML. A method was

required to help rationalise the number of suppliers used by the organisation. The decision was made to downsize the AML by removing the suppliers that had ceased trading together with the suppliers of part numbers that were obsolete, and improve the efficiency of the materials supply chain by developing closer relationships with a core group of preferred suppliers. After removing old and obsolete suppliers from the AML, a method was needed to objectively assess the performance of the remaining suppliers in order to identify those that best meet the needs of the organisation. These would enable closer relationships with key suppliers in the organisations' material supply chain. The aim was to reduce the average number of suppliers for each active part number on the AML from 6.8 per part to 2.

In order to do this, a supplier performance rating tool was developed. The tool was designed specifically for the purchasing, quality assurance and supply chain functions to assist them to objectively measure and manage the performance of their suppliers. It was hoped that the implementation of this tool would have an impact on the organisations' key performance indicators. More specifically, it was hoped that the tool would help to reduce inventory carrying costs, shorten the material delivery lead time, increase supplier technical support, improve supplier flexibility and provide material of the desired quality to manufacturing when it is required and at the best possible price.

3. Research Approach

Research strategy refers to the particular approach chosen by the researcher to undertake research (Yin 2002). Following on from this, specific research designs and data collection methods can be formulated. Such research methods are determined not only by the type of research to be investigated but also the required outcome (Grønhaug and Olson 1999). Creswell (2003) describes three different approaches to data collection and analysis namely quantitative, qualitative and mixed methods. The quantitative approach is one in which the researcher uses to “*measures in which numbers are used directly to represent the properties of something*” to develop knowledge (Hair et al 2003). The strategies employed include experiments and surveys where data is collected on instruments that produce statistical data. With the qualitative approach the researcher uses socially constructed meanings with the intent of developing a theory (Lee 1999, Kaplan and Maxwell 1994). Some of the strategies of enquiry that are used include words, pictures and ethnographies where the researcher collects open-ended data without assigning numbers directly (Hair et al 2003). Qualitative analysis helps researchers to understand and explain why people have different experiences. The mixed methods approach is one in which the researcher bases knowledge claims on pragmatic groups (Creswell 2003, Hair et al 2003). In this case, a problem is identified for which there may be a range of possible solutions. The most appropriate solution must then be determined taking into consideration the specific requirements of the context under study. The mixed methods approach adopts strategies of enquiry that involve the collection of data in order to understand the situation that exists. Here data collection involves capturing numeric as well as textual information. In other words, both quantitative and qualitative methods are employed.

The approach that is adopted in this study is that of a case study using mixed methods where data is collected sequentially. Here the organisation in question is a community that has identified a problem i.e. the ability to effectively manage the supplier base and the associated materials supply chain. In order to resolve the problem the stakeholders must be involved in designing the solution. This involves aspects of action research (Greenwood and Levin 1998) where the affected community is involved in resolving their problem, which they have identified. The method adopted is similar to that described by Harrington and Lambert (1991). The initial step involved interviews with the key stakeholders, i.e. purchasing, manufacturing, quality assurance and supplier engineering to identify the specific problems and agree a common specification. From this analysis critical supplier performance criteria for the organisation was identified and agreed. Literature reviews were then carried out to identify best practice for developing a supplier performance-measuring tool. Findings of this review were presented to representatives of the stakeholders to determine what may best meet the requirements of the organisation. Based on this review a prototype was developed for measuring supplier performance. It was then tested using specific company data. The findings of the test data processed by the tool were analysed with the stakeholders to “sanity check” the output with their real life experience. This analysis provided an opportunity to review some of the supplier acceptance criteria and refine certain values to produce data that could be managed by the team. Once a satisfactorily operating tool had been agreed implementation teams were formed. These comprised representatives from the stakeholder groups as well as representatives from sales and marketing, logistics and warehousing. These teams were resourced and supported by the senior managers of the key stakeholder departments and trained to capture the data to be processed by the tool. All suppliers

were informed and the tool was rolled out. The performance of the supplier base was then measured and assessed.

4. Development of the Supplier Rating Tool

The tool was designed to provide the organisation with the ability to measure suppliers with respect to three key criteria. These are (a) on time delivery, (b) quality and (c) total cost (based on the cost of quality). The rating system is based on inventory items only and each metric is combined using a weighted average. For example, on time delivery had a weighting of 40%; quality accounted for 40% while total costs had a lower weighting of 20%. In other words, the chief emphasis of the tool is on quality and on time delivery with a lower emphasis placed on cost. By highlighting quality and on time delivery the organisation expected to reduce the suppliers associated cost element. Each of these indicators is explained in more detail.

4.1 On Time Delivery (OTD)

A supplier's on time delivery (OTD) metric is a comparison of the promise date and the actual date the material or part is received. The acceptance tolerance is on time and up to five days late. Five days late is allowed to compensate for weekends and holidays, allowing the organisation time to enter the receipt on the system and to compensate for promise date maintenance. OTD is weighted at 40% of the total supplier score.

For example

If 1,000 parts are due on 2nd May against purchase order number (PO#) 001 then the valid receipt window is from 2nd May to 7th May (i.e. on-time and up to five days late).

If 1,000 pieces are received in total and the actual receipt history is:

Take in Table I

Formula:

$$\text{OTD} = \frac{\text{Number Parts Received On Time}}{\text{Number of Total Parts Expected}} \times 100\%$$

Thus,

$$\text{OTD} = 850/1,000 \times 100\% = 85\% \text{ for PO\# 001.}$$

An individual supplier's OTD is a straight average of all OTD results for each individual PO line Item. Thus, if

$$\text{PO\# 001} = 85\%$$

$$\text{PO\# 002} = 82\%$$

$$\text{PO\# 003} = 67\%$$

An individual supplier's OTD = $(85+82+67)/3 = 78\%$ for the total purchase orders. So the total supplier score for on time delivery over a range of three purchase orders is 78%.

4.2 Quality

A supplier's quality indicator is a percentage of the number of parts returned to the supplier (RTS) compared to the number of parts received from a supplier, or any other issue that would initiate a supplier corrective action request (SCAR). The result is reported on a part per million (PPM) basis and the final points are awarded using a part per million (PPM) conversion table (see Table II). Part per million is the average number of defects per unit observed during an average production run, divided by the number of opportunities to make a defect on the product under study during that run, normalised to one million.

Take in table II

The quality indicator accounts for 40% of the overall score. Data is captured from all inventory purchase order types. Purchase order costs are used to determine receipt costs and returned to supplier (RTS) costs. More specifically, data is captured in the report if the receipt transaction date and promised date (or need by date if promise date is blank) is within the date range specified or the monthly window. Data is also captured in the report if the RTS transaction date is within the specified date range. It is important to note that RTS data can only be captured if the "Defect Description" field is empty, or if the field contains "External Supplier Error" (see Table 2). This is to ensure that only external supplier error data is included. Some RTS transactions are performed as a result of internal causes such as overstocking, incorrect part specification, parts that are damaged by production. These errors should not be attributed to the supplier.

Take in Table III

For example:

If the total parts received for the period is 4,937, and the total parts RTS for the period is 50. Then the PPM = $(1,000,000/4,937) \times 50 = 10,128$ PPM. The PPM must then be rounded up to the highest PPM level and converted to points awarded based on the table 1. The point awarded in this instance is 10,128 PPM which translates to a 3.75 sigma, or 8 points. The points' column is already scaled to achieve a 40% weighting. This aligns with the weighting allocated to supplier quality for the tool. This means that for this example 8 points are awarded to the supplier for quality.

4.3 Total Cost

A supplier's total cost metric is derived from a ratio of total cost of quality dollars divided by the total dollars worth of materials received for the period. The cost of quality can be described as a method of expressing the cost of poor quality in terms of what it is costing the company in the form of prevention costs, appraisal costs and failure costs. Examples of prevention costs would be in process audits, parts qualification and preventive maintenance. Appraisal costs occur in the form of first off part inspection, supplier audits and sample-incoming inspections. Examples of failure costs would include scrap, rework and corrective actions. These costs are totalled and can be expressed as a percentage of a key metric that is used by the organisation e.g. expenditure on the purchase of materials, total sales or operational costs such as materials, labour and overheads or a given time period such as, a month, a quarter or a year. The total dollars received is determined by querying the receipts falling into the date range and using the part cost on the purchase orders. The cost of quality dollars charged to a supplier is determined by querying the cost of quality general ledger account code in the accounts payable module in the

organisations enterprise resource planning system. This metric carries a 20% weighting of the supplier's overall score.

For example:

If the total receipts amount to \$652,000 and the cost of quality is \$65,000.

$$\text{Total Cost} = (1 - (\$65,000/\$652,000)) \times 100\%$$

$$\text{Total Cost} = (1 - 0.09969) \times 100\% = 90.03\%$$

This indicates that for a total of \$652,000 received from this supplier, it caused the organisation to incur a \$65,000 cost of quality charge or approximately a value equivalent to 10% of the received material for the time period under investigation. This results in a 90.03% score being awarded to the supplier for total cost.

4.4 Total Supplier Score and Supplier Ranking

If all the data used in the examples above is amalgamated we can see that the supplier is awarded a score of 78% for on time delivery and this has a weighting of 40%. The supplier is awarded a PPM defect rate of 10,128 for quality performance. This also has a 40% weighting and translates to 8 points from table 1. Finally, the score awarded to the supplier for total cost is 90.03% with a 20% weighting. Now the total supplier score can be calculated

$$(\text{OTD}\% \times 40\%) + \text{Quality} + (\text{Total Cost} \times 20\%)$$

$$= (78 \times 0.40) + 8 + (90.03 \times 0.20)$$

$$= 57.3$$

Based on this example the supplier has a total supplier score of 57.3. This score can now be used to rank the performance of each supplier relative to others. If two suppliers have the same total supplier score they may receive the same rank.

For example:

If there are six suppliers for part number ADF56G and they received the following scores:

Supplier AB1 = 44

Supplier CD2 = 30

Supplier EF3 = 52

Supplier GH4 = 50

Supplier IJ5 = 52

Supplier KL6 = 58

Then the following ranking system will be used:

Rank 1 = Supplier KL6 = 58

Rank 2/3 = Supplier EF3 = 52

Rank 2/3 = Supplier IJ5 = 52

Here suppliers KL6, EF3 and IJ5 would be considered to be preferred suppliers and the other suppliers (i.e. AB1, CD2, and GH4) would be removed from the organisations' AML.

5. EMEA Requirements for the Tool

This tool was implemented across all the organisations regions. It helped to objectively assess the organisations supplier base and consequently the organisation succeeded in rationalising the number of suppliers on its approved manufacturing list (AML). However, the purchasing department for the EMEA region determined that only 477 suppliers had been used in the previous six months with an expenditure of over \$23,162,000. It was also identified that 34 of these suppliers accounted for 77% of this expenditure and all of these were JIT suppliers¹. In other words, at EMEA level JIT suppliers comprised 77% of the local purchasing expenditure and less than 10% of the local active supplier base. Therefore, it was decided that the supplier performance-measuring tool had to be refined and adapted to incorporate JIT suppliers.

In order to identify JIT suppliers in the EMEA region that could be removed from the AML as part of the improvement programme a set of rules for measuring supplier performance was drafted. The procedure for determining this supplier target group focused on material that was returned to suppliers (RTS) within a defined time period. A time period would typically be three to six months. These rules are:

- If the number of parts returned to the supplier (RTS) in a specific time period is greater than 10,000 pieces the part is investigated further with the supplier.
- If the RTS figure is greater than 10% for a part number in a specified time period the part is investigated further with the supplier.

¹ JIT suppliers are excluded from the OTD calculation for the tool because they are purchased using a blanket order that has a promise date that may be up to a year in the future. These shipments would appear too early using the purchase order promise date. To accommodate for this, a local definition of a late delivery for a JIT supplier was developed. Late deliveries for these suppliers are defined as "*part-number stock-outs in their assigned stock locations, or the incorrect part being delivered to the stock location*".

- If the total value of the parts that have been returned to the supplier in a time period is greater than \$5,000 the part is investigated further with the supplier.
- If the value of parts returned to the supplier in a time period is greater than 0.5% of the total value of the parts received the part is investigated further with the supplier.

Targeted suppliers are then contacted and informed of their RTS performance and a supplier corrective action request (SCAR) is issued. Suppliers must respond with an effective resolution to the SCAR within an agreed time period, usually ten working days.

If there is no response to the SCAR within the agreed time period, or the proposed resolution to the SCAR is unsatisfactory or ineffective, the option lies with the European supplier management team to re-audit the supplier or commence the disqualification procedure for the part number sourced from the supplier.

If the response to the SCAR by the supplier is not satisfactory, it may be returned to the supplier for further work. The organisation may propose targets for improvement and work with the organisation to develop an acceptable methodology for improvement.

If the supplier corrective action is received and acceptable within the agreed time limit the next step is to determine the scope of the improvement. It is important to ascertain whether other facilities use the supplier. If the targeted suppliers are located in other regions e.g. North America, South America, or Japan Asia Australia the improvements should be carried out from there. A list of the concerned suppliers

in the target group is forwarded to the quality and purchasing departments in the respective regions, so they can work locally with the improvement process from there. This is to optimise the local knowledge of the supply base. The responsibility for implementing and monitoring this tool lies with the quality assurance and purchasing departments in the appropriate region.

Suppliers are also provided with an extensive training programme. This involves establishing a meeting with each supplier in the target group where the following items are covered:

- The organisation's supplier management process
- Results of quality history analysis for each supplier and how they are positioned in their peer group
- Proposed targets for improvement (subject to negotiation)
- Methodology to be used in achieving the required improvement (the supplier should lead this item, but the organisation will assist where required)
- Expectations in terms of responsiveness and issue closure
- Schedule audit requirements (if necessary)

Suppliers who pass the test are designated "Preferred Suppliers" and provided there is a future requirement for their parts further business is allocated to them.

6. Outcomes and Benefits Arising

The process of assessing and rationalising the number of suppliers has had a significant impact on the organisation. The process resulted in a three fold reduction in the number of suppliers. This represents 2.4 suppliers for each part number. The

organisation aims to have an average of two suppliers for each part number on the AML. Over the three year period local inventory costs in EMEA were reduced from a high of just over \$15.42 million to just over \$5.86 million, a reduction in value by a factor of just over 2.6. The reduction in the amount of inventory that is carried by each manufacturing location has resulted in significant financial savings for the company. Specifically, there has been a significant reduction in direct storage costs. These costs relate to the costs of holding items in inventory and include product depreciation, obsolescence and deterioration as well as costs associated with product spoilage and breakage. The company has also witnessed a significant reduction in rented offsite and internal warehousing facilities which also impacts on the cost of heating, lighting and security.

By selecting a smaller group of suppliers, closer relationships with key suppliers were developed. In many instances the preferred suppliers have taken on the responsibility of automatically replenishing the stock of inventory held. To do this, they have established inventory material supply hubs close to each of the company's manufacturing facility. The organisation no longer has to carry the inventory and maintenance costs of the material until it is required, as it remains the property of the supplier until the organisation consumes it. Furthermore, many activities relating to inbound logistics are greatly reduced or eliminated e.g. transactions such as processing purchase orders as well as receiving and inspecting parts. This also generates considerable savings for the organisation.

The lead time for new product development is significantly reduced by having closer associations with preferred suppliers and integrating them in to the company's processes. Key suppliers can envisage and begin pre-production work to reduce the

total development time. They may also anticipate potential problems in advance and process changes and modifications can be made earlier to meet the needs of the new product. They can add their knowledge and experience to development initiatives. For example, they can provide insight into the production process required for the purchased part and can optimise design around feasible production processes to reduce cost and manufacturing cycle time. They may also have the necessary design and technical expertise to manufacture certain items thus reducing the need for the purchasing organisation to allocate these resources.

The organisations' preferred suppliers have also benefited from this process. Integrated suppliers have more visibility and they can determine the organisations materials requirements in advance. This visibility allows suppliers to better plan their own production efforts and gives them forewarning of changes in the organisation's plans. It also enables them to better coordinate deliveries of materials with other suppliers in the supply network. It reduces their need to carry excessive inventory and improves the material quality by providing exactly what manufacturing requires when it is needed. This has a direct impact on their costs, quality and flexibility.

7. Conclusions

Progressive organisations are seeking to optimise their supply chains in order to gain and maintain competitive advantage in turbulent markets. To do this they must create alliances with their supply chain partners in general and suppliers in particular. They must also be selective with whom they form close business relationships. They must identify the best suppliers that will satisfy their specific requirements, provide high levels of operational performance and complement their competencies in order to advance their market position.

This paper presents a detailed case study of a large multinational organisation that aimed to improve efficiency and effectiveness in the materials supply chain. The goal was to reduce the number and improve the quality of suppliers on its approved manufacturing list (AML). It also hoped to establish closer relationships with a core set of critical suppliers. To do this a supplier evaluation method and tool was developed. The tool was specifically designed to objectively measure supplier performance by evaluating them against three key metrics or critical success factors namely quality, on time delivery and total cost of quality. The tool was implemented across the organisation and adapted to accommodate Just in Time suppliers in the European, Middle East and Africa region.

Reducing the number of approved suppliers on the approved manufacturing list has resulted in reduced inventory and significant savings for the company. Quality is increased, lead time is reduced and reduction in the number of errors and defects. By identifying the best performing suppliers with which to form closer relationships it can be possible to integrate them more closely in to the organisation and enable them to assist with organising the delivery of component parts to arrive when they are required. Key suppliers can add their knowledge and experience to development initiatives, potential problems can be anticipated in advance and process changes and modifications can be made earlier to meet the needs of the new product.

Methods or tools developed to assess the performance of suppliers must be based on best practice and adapted to meet the requirements of the environment in which they are deployed. It is also important that the organisation evolves to accommodate the tools and implemented management systems. The end users of the tool should

be closely involved with its development in order to ensure the tool meets their needs. Specifically, they should participate in the problem identification phase from the outset. This significantly contributes to their ownership, understanding and operation of the tool. End users can also offer insightful observations on the tools features and operation. The data generated by the performance measuring tool must be validated against the day-to-day experiences of its users. This is a crucial requirement, but one that is sometimes overlooked with embarrassing results.

Furthermore, it is imperative that the development and operation of the tool is adequately resourced by ensuring there are sufficient personnel available with the correct skills for its development and execution, that they are adequately funded and that they have the correct tools and materials in the form of access to accurate data and data processing tools. Finally we learned that senior management must have a strong commitment to the initiative as a means for continuous improvement in the supply chain. Without the backing and support from the top management team any supply chain initiative is destined to fail. Such initiatives must be driven by example at a senior management level.

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