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Improving SME logistics performance through benchmarking

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Abstract

Purpose – The purpose of this paper is to discuss the applicability of current benchmarking proposals for small and medium-sized enterprises (SMEs) and to suggest a condensed process for logistics benchmarking in SMEs.

Design/methodology/approach – The paper starts by outlining why the logistics function is of increasing importance for SMEs. It discusses the benefit of logistics benchmarking and typical SME restrictions in benchmarking. Available approaches to benchmarking are discussed and their weaknesses when applied to SME logistics benchmarking are analyzed. The paper develops a new benchmarking process framework for SME logistics benchmarking and reports findings of a case application in three German SMEs.

Findings – The paper suggests a conceptual framework for logistics benchmarking in SMEs. The framework was tested in three German case companies. Results suggest that the suggested process together with the employed benchmarking tools and templates provide valuable support for SMEs in a logistics benchmarking project.

Research limitations/implications – The conceptual framework developed has been tested in selected case companies only. Possible adaptations to specific industry needs or cultural differences need to be integrated.

Practical implications – The process framework developed provides practical guidance for SMEs that want to embark on a logistics benchmarking exercise.

Originality/value – The paper outlines weaknesses of current SME benchmarking approaches and provides practical support by outlining an adapted process together with specific implementation tools.

Keywords Performance management, Germany, Benchmarking, Logistics,
Small-to-medium-sized enterprises, Supply chain management

Paper type Research paper

Logistics performance as a benchmarking object

Logistics performance as key success factor for small and medium-sized enterprises (SMEs)

Nowadays companies are faced with increasing competition at a global scale combined with growing customer demands for product customization and supplier responsiveness (Chan and Qi, 2003, p. 209). Intensified price pressure must be offset by continuous gains in productivity and efficiency while at the same time maintaining customer-oriented, flexible, fulfillment processes. This development increasingly puts the logistics function into companies' focus: a high logistical performance level cannot only reduce costs (e.g. by lowering inventory levels), but at the same time contributes to customer satisfaction and acts as a competitive differentiator (Keebler and Plank, 2009, p. 786). The logistics function has a significant impact on the company's overall flexibility and its ability to adapt to customer requirements and customization demands. This effect can be further increased by joining forces with other partners along the value chain. In fact, more and more companies no longer compete as autonomous entities, but instead as

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integrated supply chains (SCs) (Lambert *et al.*, 1998). In its global Supply Chain Survey 2013, the consulting firm PwC identified flexible SCs that make use of latest technology and combine the strengths of individual partners as key to future company success (PricewaterhouseCoopers, 2013). Companies simply can no longer afford not to care about their logistics and SC performance. They will fail if the overall design and the available resources of their logistics and SC functions do not provide the capabilities to support the desired competitive strategy (Chopra and Meindl, 2010, p. 39). Literature argues that flexibility and adaptability are of even greater importance for SMEs (Garengo *et al.*, 2005, p. 441). On the one hand SMEs find themselves being part of comprehensive SCs that are dominated by bigger partners who set the rules for their smaller counterparts. On the other hand, SMEs are faced with reduced entrance barriers and new competitors even in smaller, local, markets that previously could serve as safe havens for small companies that were content with a limited, but stable base for doing business. This parallel development forces SMEs to face global competition and makes the logistics function a key success factor for them – which therefore should receive the attention it deserves.

Many companies, however, do not adequately measure their current performance in logistics and supply chain management (SCM). In a comprehensive empirical study, Keebler and Plank found usage rates for typical logistics KPIs ranging between 85 percent of all respondents down to as low as 20 percent. Even standard KPIs such as on-time delivery or days of sales outstanding were not used by one out of four companies surveyed (Keebler and Plank, 2009, p. 791). SMEs stand to gain a lot by measuring and managing their logistics performance, but currently lag behind their larger peers in doing so. Tools and methods are needed that help SMEs close this strategic gap.

Process improvements through benchmarking

Since its inception as a systematic management tool in the 1980s (Camp, 1989) benchmarking has evolved into a widely used tool to identify gaps and to initiate process improvements within companies. Benchmarking is a structured process to facilitate the improvement of current organizational standards by adopting superior practices from other companies (Moffett *et al.*, 2008, p. 369). Screening the many different definitions of benchmarking that have been proposed in literature Hong *et al.* (2012, p. 446) extracted continuity, measurement, comparison, improvement, and learning as the common features of all benchmarking approaches. In what is today widely seen as a seminal work in the field of benchmarking Watson (1993) highlighted three distinctive elements of benchmarking: the definition of an object of study, the performance measurement of that object, and the comparison to other, similar, objects in order to determine which one has the best capability and why it has this capability. The object studied can be a product, a process, a strategy, or even the competitive positioning of the company as such. Combining the studied object with the time frame of its first appearance in business benchmarking practice Watson (1993) distinguished five different stages or "generations" of benchmarking:

(1) first generation – "reverse engineering" (product oriented);

(2) second generation – "competitive benchmarking" (competitors' processes);

(3) third generation – "process benchmarking" (generic processes, not confined to competitors);

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(4) fourth generation – "strategic benchmarking" (strategies applied by business partners); and

(5) fifth generation – "global benchmarking" (extending to macro-variables such as culture).

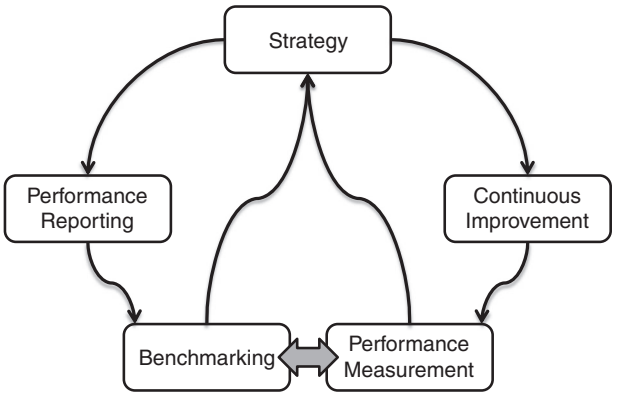
After a comprehensive analysis of the benchmarking literature from 2003 to 2010 Evans *et al.* concluded that Watson's five generational stages can still be used to categorize current benchmarking practices and no extension of the model is needed (Evans *et al.*, 2012). Although the benchmarking object may differ, the benchmarking purpose remains the same across all benchmarking types (see Figure 1) – namely, improving own performance by comparing oneself with the performance of others in order to initiate strategic changes if necessary.

Such a comparison promises the highest returns (i.e. the most valuable results) in business fields that are critical for company success. As outlined above, in more and more companies the logistics function has evolved into such a critical process. Benchmarking therefore clearly lends itself as a tool for improving own logistics and SC performance.

SME restrictions influencing benchmarking adoption

Numerous studies dealing with applications of benchmarking in business practice have identified typical implementation challenges and problems (Andersen *et al.*, 1999; Adebanjo *et al.*, 2010; Williams *et al.*, 2012). The most oftenly cited reasons for a failure to adopt benchmarking are:

- lack of resources within own company;
- lack of suitable benchmarking partners, failure to get potential partners' agreement to exchange of benchmarking information;
- lack of management commitment within own company;
- lack of knowledge how to plan and conduct a benchmarking exercise;
- uncertainty about the comparability of companies and processes;



Source: Adapted, Monkhouse (1995)

Figure 1.
Performance benchmarking model

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- inertia, lack of competitive pressure to change existing practices, resistance to change; and
- fear of negative impacts once changes are initiated (e.g. job losses).

While above problems are relevant for companies of any size and industry they are even more of a potential blocking point to benchmarking adoption in SMEs (see Table I).

SMEs per definition can draw on a smaller employee base only, making it more difficult to nurture all necessary expertise "in-house." In addition, fewer new employees enter smaller companies with knowledge of the latest techniques and theoretical approaches (Monkhouse, 1995). Due to limited financial resources, replacing the missing in-house expertise by external consultancy is a realistic option in very rare cases only. It is therefore not surprising that benchmarking efforts – if pursued at all in SMEs – are mainly focussed on easy to collect and widely known financial indicators. In their survey among British SMEs Cassell *et al.* (2001) found that financial indicators were the most widely used benchmarking objects among surveyed SMEs, but even these were used by only 42 percent of all companies surveyed. When SMEs embark on a benchmarking project, they often underestimate the time and the resources required (St-Pierre and Delisle, 2006). Unexpected delays or cost overruns then lead to a general feeling of dissatisfaction and potentially subsequent abandonment of benchmarking as "unnecessary" or "not worth the cost involved." This is particularly true in cases where the benchmarking object is difficult to define and/or SME management is not aware of its importance for company competitiveness.

The logistics and SC function is a typical case in point. In a recent study Vaaland and Heide (2007) note that SMEs lag behind their bigger peers in adopting and acknowledging the importance of SCM. They also rate the importance of tools and systems supporting SCM lower than large enterprises. Many SMEs do not have a dedicated SC or logistics strategy and struggle with insufficient knowledge and a lack of resources for doing so (Quayle, 2003). Their view on the SC and the logistics network connections between partners differ from large enterprises, because SMEs typically do not proactively manage their SC partners, but rather are managed themselves (Quayle, 2003; Thakkar *et al.*, 2009). Due to their resource restrictions, they often have a more short-term, cash-focussed view on partnerships along the value chain than larger peers (Thakkar *et al.*, 2009). SMEs try to specialize in market niches that allow a sufficiently high and sustainable profitability (Hong and Jeong, 2006). Serving a

SME characteristic	Derived strength	Potential weakness
Flat hierarchical structure	Fast communication, short decision-making processes	Less specialization, lack of expertise, unclear responsibilities
Low degree of standardization and formalization, people-dominated	Flexibility, breeding ground for entrepreneurial thinking	Difficulty in ensuring efficient processes, "gut feeling" instead of clear processes
Owner/manager with strong influence on company culture	High loyalty, high-work ethics	Lack of managerial skills, loyalty placed above expertise
Few decision makers	High commitment and sense of responsibility	Small-scale decision making, lack of vision
Limited human resources and capital resources	Career opportunities, sense of belonging together	Lack of knowledge, limited capabilities

Source: Adapted, Deros *et al.* (2006)

Table I.
SME strengths and weaknesses

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particular niche market, e.g. by specializing in a particular manufacturing technology or offering a particular range of specialized components, often drives SMEs into being part of more than one single SC – each one being dominated by one or several bigger players. It is for these reasons that the SME perspective on SCM and logistics differs considerably from large enterprises.

From the above discussion we can conclude that SMEs stand to gain considerably from benchmarking – in particular when being applied to the still often underestimated importance of the logistics and SC function. Standard benchmarking approaches, though, have a high risk of failure when being transferred to SMEs without taking into account SME characteristics and restrictions. This is all the more true for SCM and logistics management.

Approaches to SME logistics benchmarking – literature review

Conducting a benchmarking exercise requires mutual agreement on what is to be benchmarked (benchmarking object), how own performance can be assessed (performance measurement), and how a comparison with benchmarking partners' performance is to be conducted (benchmarking method). In the following these three basic questions are discussed looking at the benchmarking object "logistics and SCM in SMEs."

What to benchmark? – Defining the logistics and SC function in SMEs

The European Committee for Standardization CEN (Comité Européen de Normalisation) defines logistics as the planning, execution and control of the movement and placement of people and/or goods and of the supporting activities related to such movement and placement (European Logistics Association, 2005). In this perspective, the logistics function covers all tasks and processes that deal with developing and organizing the logistics system within the company and with subsequently applying the system for execution of individual orders (center circle in Figure 2). In an extended perspective the flow of goods is managed across organizational boundaries and logistics tasks are coordinated between partners in the value chain (inclusion of outer circles in Figure 2).

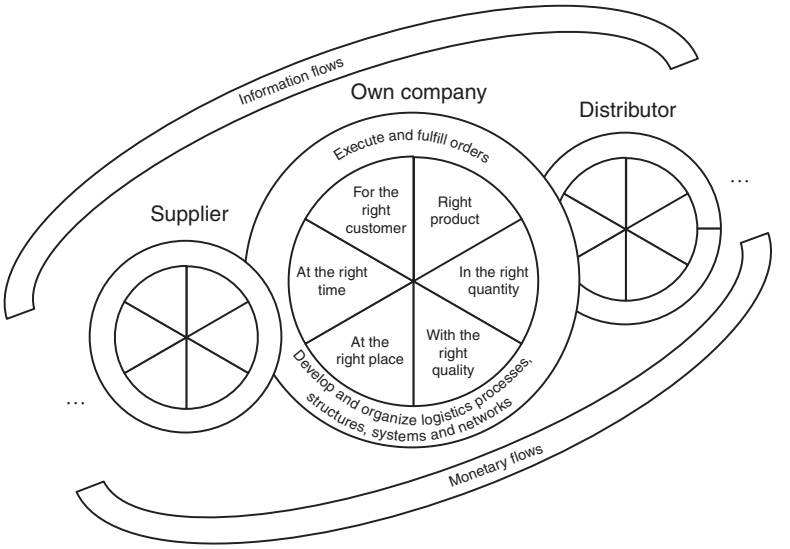

Figure 2.
Logistics and SC tasks

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The notion of SCM extends the scope one step further and adds information flows and monetary flows to physical flows of goods as further management objects. Coordination and information exchange (e.g. joint planning and forecasting) among SC partners as well as coordinated cost and revenue management complete the tasks of such an integrated SCM approach (Chopra and Meindl, 2010).

When benchmarking own performance an SME is free to take the perspective it considers most appropriate. This will inevitably have a major effect on all subsequent steps of the benchmarking exercise, most notably on the choice of performance measures selected for benchmarking. In addition, SMEs are often integrated in several different SCs and SC topographies vary between industries. It is immediately apparent, then, that there cannot be one single "correct" definition of the logistics or SC function for benchmarking purposes. Any logistics benchmarking model must allow for a company- and situation-specific delineation of the benchmarking object "logistics." In fact, defining the object must be an integral part of any benchmarking process model employed by SMEs.

How to measure logistics performance? – taxonomies of logistics benchmarking criteria

The second important question deals with measuring a company's logistics performance. Since the definition of the logistics and SC function is not clear-cut, measurement of its performance cannot be either. Indeed, many different performance measures and performance models have been suggested in literature (Ramanathan *et al.*, 2011; Sillanpää, 2015).

If performance is interpreted as the degree of goal achievement then logistics performance measures must determine the degree to which the logistics and SC function contributes to achieving company goals. One possibility to structure company goals and the logistics function's contribution to their achievement is the Balanced Scorecard (BSC). When surveying companies' SC performance measures in Singapore, Chia *et al.* found mostly indicators from the financial perspective being used. Indicators from the other BSC perspectives were much less common (Chia *et al.*, 2009). In fact, the generic BSC structure might not lend itself readily to logistics performance measurement since the impact of the logistics function on BSC perspectives is difficult to determine and potentially interferes with other factors.

Several authors therefore suggest a logistics performance model that is based on core functional logistics drivers or logistics process capabilities – thus avoiding overlaps with other functional areas of the company but at the same time making it more difficult to perceive indirect performance effects of the logistics function (i.e. effects of logistical processes on the performance of functional areas other than logistics). Thakkar *et al.* (2009) build a comprehensive SC performance model that spans SCOR levels 1-3 and links the derived measures to the generic BSC perspectives. Gilmour (1998) develops a model comprising 11 different "capabilities" (comprising process capabilities, technology capabilities, and organization capabilities) with each capability being measured in five different dimensions. Kumar and Banerjee (2014) build their model of SC performance with six dimensions. Chopra and Meindl (2010), in turn, distinguish three "logistical drivers" (facilities, inventory, transportation) and three "cross-functional drivers" (information, sourcing, pricing) of SC performance. Soni and Kodali (2010) tried to operationalize the drivers suggested by Chopra and Meindl and collected more than 70 single performance measures. All models mentioned consider logistics and SC performance a multi-attribute phenomenon that requires more than a single indicator to be adequately measured. Beyond this agreement, though, models have little in common. In a recent literature review Soni and Kodali identified 57 different SCM frameworks.

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They conclude that researchers neglect conceptual works previously done by other researchers and that many elements of the SC models are used in a very inconsistent manner (Soni and Kodali, 2013). Quite apparently the plethora of different performance models is not converging toward a uniform logistics and SC performance model that could be used by SMEs. Instead of defining one generic model of logistics and SC performance it therefore seems more appropriate to work with a situation-specific performance model in each benchmarking exercise. In this case, the definition of the most appropriate performance model and of suitable performance measures is not given, but must be an integral part of the benchmarking process itself.

How to carry out benchmarking? – benchmarking methods proposed for SMEs

With benchmarking having grown in popularity both among academia and business practice numerous benchmarking approaches have been proposed in literature – many of them generic in nature, but some also specifically intended for SME application. When reviewing the benchmarking literature between 2005 and 2010 only, Zeinalnezhad *et al.* (2011) found 36 different benchmarking models with nine models being explicitly built for use within SMEs. Benchmarking models and methods for SMEs can be grouped into two broad approaches (Garengo *et al.*, 2005): "Analytical" approaches are process based, whereas "synthetic" approaches are tool based.

The first group of methods focusses on clear step-by-step processes. These process models can accommodate typical SME restrictions or requirements in individual process steps and at the same time provide clear guidelines on how to conduct a benchmarking exercise. Many of these process models roughly follow Deming's PDCA cycle, but differ in how the phases are subdivided or further operationalized (Deros *et al.*, 2006). Some process models take a different route: Gomes and Yasin (2011) develop a five-stage process model comprising diagnosis, identification of objectives, definition of performance measures, negotiation of goals, and monitoring and benchmarking. Niemi and Huiskonen (2008) focus their benchmarking process model on internal benchmarking, which makes the methodology somewhat less suited for SMEs that typically lack the size to justify internal benchmarking between different company units. Maire *et al.* (2008) follow a plan-research-observe-analyze-adapt-improve sequence of benchmarking steps and target their process model explicitly toward SME usage. All approaches aim at providing a clear and stable referential frame of process steps to be followed, but the variety of process models proposed counters that very same intention: an SME wishing to embark on benchmarking for the first time has a plethora of process models to choose from. A common denominator can be extracted only at the very highest level of abstraction – which might not be sufficiently clear then to serve as process template or benchmarking guideline in the environment of an inexperienced SME.

The other group of models comprises tool-based self-assessment templates that provide a structured enumeration of different performance indicators that can be used both to rate the own company as well as subsequently compare own performance with benchmarking partners along these performance dimensions. Barcley (2005) developed a self-assessment model for assessing and benchmarking SCM best practices of SMEs based on ten key business core competencies that had been extracted from interviews with field experts. These core competencies were subsequently split into 66 so-called "statements of need" and implemented in an electronic self-assessment tool. Som and Kirner (2008) developed an online self-assessment tool for SMEs to evaluate and compare their degree of innovativeness. St-Pierre and Delisle (2006) follow a similar approach and develop a fully implemented expert diagnostic system which evaluates

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on a benchmarking basis the performance of SMEs. This group of models builds on the assumption that tool-based benchmarking facilitates data collection from peers (previous answers from other SMEs can be used for later benchmarking purposes). In addition, anonymity can be assured and methodological problems should be smaller, since the benchmarking logic is implemented in the tool itself and SME users can focus on interpreting the answers.

The review of current approaches to SME logistics benchmarking leads to the following conclusions:

(1) The benchmarking object "logistics" cannot be defined in a generic format. Instead, delineation of the logistics function is a main element of the SME benchmarking exercise itself.

(2) Logistics performance measures must be defined based on the benchmarking purpose. Unreflected adoption of generic performance models will not lead to the desired benchmarking results.

(3) The benchmarking process itself can be based on a variety of approaches that have their respective strengths and weaknesses. Given SME characteristics it might be advisable to provide SMEs with external support in selecting and implementing the most appropriate approach.

An adapted model for logistics performance benchmarking in SMEs

The approach for benchmarking SME logistics performance proposed in this contribution is based on the following considerations:

- Process models provide clear structure and help inexperienced SMEs apply benchmarking. But the number of process steps and the complexity of each process step must be limited.
- Tools and templates facilitate execution of the benchmarking exercise and are a useful element in SME benchmarking. However, total automation inhibits flexible adaption to specific SME needs. Instead, tool support should best be concentrated on selected elements and process steps only.
- Definition of benchmarking objects (logistics processes) as well as benchmarking measures (performance indicators) must be flexible enough to adapt to varying SME needs and know-how. Standardized approaches might inhibit benchmarking. The SCOR model, for instance, distinguishes five core processes that are split up into further categories at the second, configuration level. These configurations are translated into process flows in the third level (Theeranuphattana and Tang, 2008). SCOR suggests a large number of performance indicators that cover five main attributes (Chithambaranathan *et al.*, 2015): reliability, responsiveness, flexibility, costs, and asset management. Both the process categorization and the performance measure taxonomy can provide an initial guideline for structuring the benchmarking exercise, but can at the same time prevent a partner-specific adaptation of the benchmarking framework.
- A benchmarking approach that provides the necessary flexibility and adaptability to SME needs requires at least some support through third-party mentoring or coaching in order to offset the lack of know-how and manpower within SMEs. This has also been confirmed by a recent survey of Zeinalnezhad *et al.* (2014).

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Above measures should not only facilitate benchmarking as such, but also increase an entrepreneur's willingness to engage in SCM at all. SC orientation, i.e. an overall positive attitude toward cooperation with business partners, is a key influencing variable in SMEs (Schulze-Ehlers *et al.* 2014). The perceived ease of use of a SCM benchmarking process will increase the willingness to engage both in SCM as such as well as in measuring actual SC performance.

Just like any other process model the proposed approach is intended to be used as a "map of action and behavior" (Spendolini, 1992) that provides a generic framework, but allows the necessary flexibility within that framework while providing tools and coaching assistance where appropriate (see Figure 3).

Step 1: benchmarking partner selection and assessment of partner comparability

Identifying potential benchmarking partners and motivating them to participate is a very individual process step that can hardly be automated or supported by benchmarking tools. Tool support and external coaching are of help, though, in determining the degree of similarity between benchmarking partners. Benchmarking can provide benefits to the SME only if appropriate partners have been identified and their comparability with the own company has been assessed. Appropriateness is not directly linked with "similarity," since benchmarking can also be performed between dissimilar companies from different industries and value chains (Camp, 1989; Garengo *et al.*, 2005). However, the degree of comparability must be known when interpreting benchmarking results. Are different practices simply due to different industry necessities or a sign of truly superior performance? To what degree are ideas and solutions transferable to the own company and to what extent are adjustments required? To answer these questions, structural differences between benchmarking partners must be assessed and comparability of partners be documented (Razmi *et al.*, 2000). This comparability assessment can be based on defined frameworks as suggested for instance by Sennheiser (2004). His framework for assessing the similarity of company logistics comprises 26 different key characteristics which are used to differentiate four company types and can be implemented in a questionnaire-type tool.

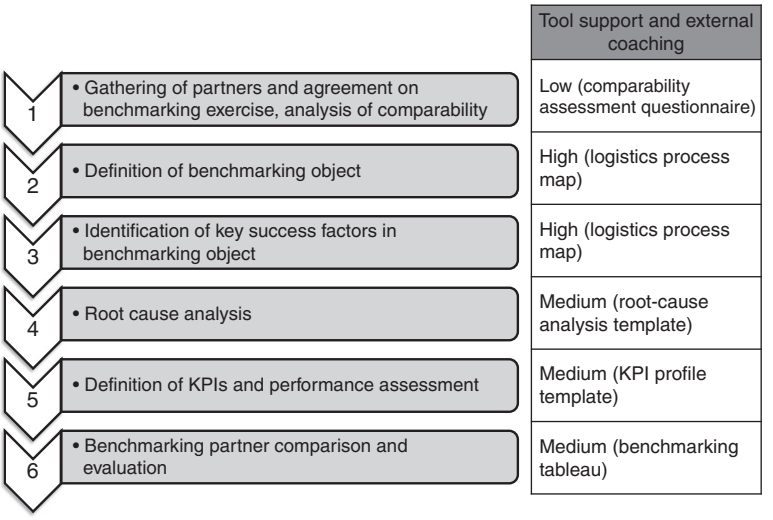

Figure 3.
Adapted logistics benchmarking model

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Step 2: definition of benchmarking object

In the second process step the benchmarking object "logistics" has to be defined. This step comprises two elements. First, the scope of the logistics function has to be defined: Are both inbound and outbound logistics to be analyzed? Are related functions such as planning or warehousing considered part of the analysis? The second element concerns the relevance of considered tasks and process steps. Chopra and Meindl (2010) stress the fact that there must be a strategic fit between the company strategy and the SC (or logistics) strategy. Company strategy and goals determine the main performance dimensions of the logistics function: Is logistics performance to be measured in terms of reliability or rather cost? Is responsiveness more important than process cost? Definition of appropriate logistics performance measures depends on expectations brought forward to the logistics function from company management which in turn are derived from company goals and company strategy. The process and the performance dimension can be combined in a "logistics process map" (see Figure 4).

Step 3: identification of key success factors

The process and the performance dimension of the logistics process map define the potential analysis area of the benchmarking exercise. However, benchmarking can usually be confined to a small set of elements in the map with the highest influence on overall performance. In order to identify these key success factors, the individual attributes (tasks, performance dimensions) are rated as regards their importance for overall SME performance. These ratings are valid for an entire column (task) or row (performance dimension) of the map, respectively.

The importance of an individual cell in the map is then determined by simply multiplying the importance ratings of the respective column and row. The cells with the

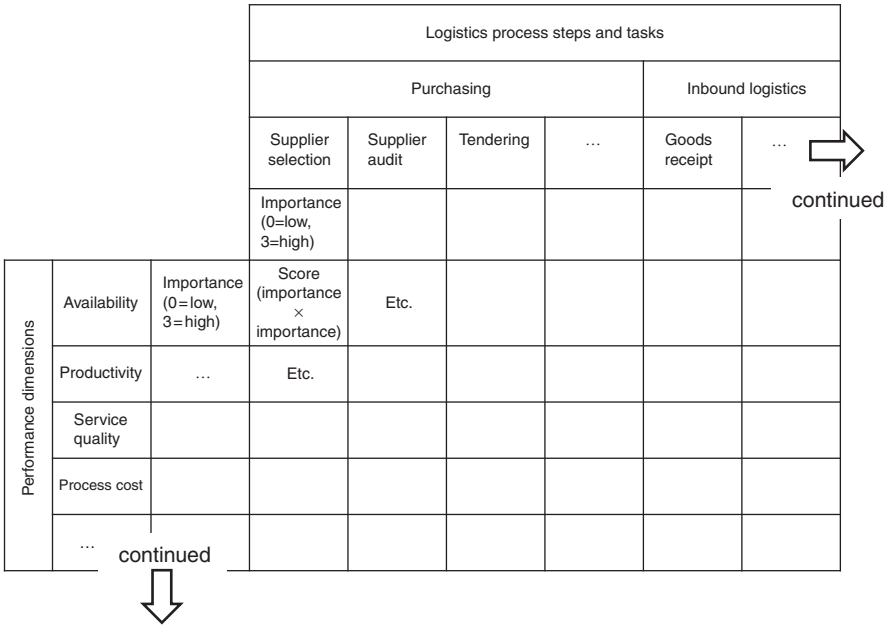

Figure 4.
Logistics process map

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highest net rating depict the "key success factors" which have the highest influence on overall logistics performance. The elements that are identified as "key" in the map constitute the main benchmarking objects in the following process steps.

Step 4: root cause analysis

Elements with the highest score in the logistics process map constitute the benchmarking focus areas. High performance in these process steps or tasks (with "performance" denoting a high degree of fulfillment of the respective performance dimension) will have the most direct effect on overall logistics performance of the SME. However, the analysis should be extended one step further, since the key elements in the map are themselves the result of the interplay between different measures and constraints. Suppose that productivity of the picking process in the finished goods warehouse has been identified as one of the key elements in the logistics process map. In order for the SME to explain the reasons for its own current performance level as well as to understand possibly superior practices of its benchmarking partners the key element (task) has to be further analyzed in a root cause analysis. In order to fully understand possible improvement options the "predecessor practices" (Davies and Kochhar, 2000) must be identified. The root cause analysis creates a layered tree of influence factors for a given outcome (here: a key success factor). The current level of training among picking staff might be considered an important influence factor. In the next logical layer the reasons for the current training level are asked for: lack of training budget, missing staff development plans, etc. Theoretically, the root cause analysis can be extended across an indefinite number of logical layers. It reaches its natural end when the same causes repeat themselves or when external factors that cannot be influenced by the SME are identified as root cause.

Step 5: definition of KPIs and performance assessment

Once the key success factors and their underlying root causes have been identified the SME can define the most appropriate indicators for measuring own and benchmarking partners' performance in these factors. Care should be taken, however, that performance indicators are not only output-oriented ("lag" measures), but that also input ("lead") measures are benchmarked (Moffett *et al.*, 2008). The root causes identified in step 4 serve as indicators for selecting the most appropriate performance measure: factors that appear several times and at different layers of the root cause tree are a natural target for being measured, since they exert the highest degree of influence on the given success factor. Similarly, if the root cause tree has very few layers only with a big number of elements on these layers the performance indicator should measure the key success factor itself, since there is no single underlying root cause.

Once the decision has been made on what is to be measured an appropriate performance indicator (KPI) has to be defined. Literature abounds with suggestions and lists of possible logistics KPIs. It is therefore of utmost importance that the SME clearly defines all important measurement parameters of the selected KPI. This is best done using a KPI profile template. The template should cover at least the following elements: purpose (which success factor is to be measured), calculation formula, data sources used for KPI input data, calculation intervals, responsibilities for KPI calculation. Once the KPI profile templates have been filled for all indicators the actual performance measurement and subsequent comparison with benchmarking partners' performance can be conducted.

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Step 6: benchmarking partner comparison and assessment

Comparisons between partners should not be confined to actual KPI values only. In fact, best practices can be identified in a number of critical management variables that are best collected in a benchmarking tableau (see Figure 5).

A comparison of logistics KPI values between benchmarking partners can reveal hints for superior performance in terms of efficiency (goal achievement with smaller amount of resources or higher degree of goal achievement with similar amount or resources). However, superior performance can also be attained in logistics effectiveness (logistics function is a direct enabler of company goal achievement), completeness (logistics performance assessment takes other company functions and SC members into account), and process quality (measurement of logistics performance is in itself effective and efficient). All benchmarking partners should be assessed using these four assessment perspectives of the benchmarking tableau. Each partner's key performance attributes can be summarized in a separate column of the tableau with a final column being filled with lessons learned and best practices identified from benchmarking partners' examples. The filled benchmarking tableau constitutes the final output and the concluding step of the proposed benchmarking process.

Once the tableau has been filled SME management can further elaborate required implementation steps for adopting the identified best practices in the own organization. This task is no longer considered part of the actual benchmarking exercise in the proposed process model.

Model application

The proposed process model for benchmarking SME logistics performance has been tested with three German manufacturing SMEs. The focus of the test was twofold: while participating companies were interested in actual benchmarking results (identifying best practices), the researcher was focussing on methodological issues (suitability of benchmarking process model). All three SMEs have international operations (manufacturing sites, distribution offices), but are active in different industries (no direct competition) and are of different size (see Table II).

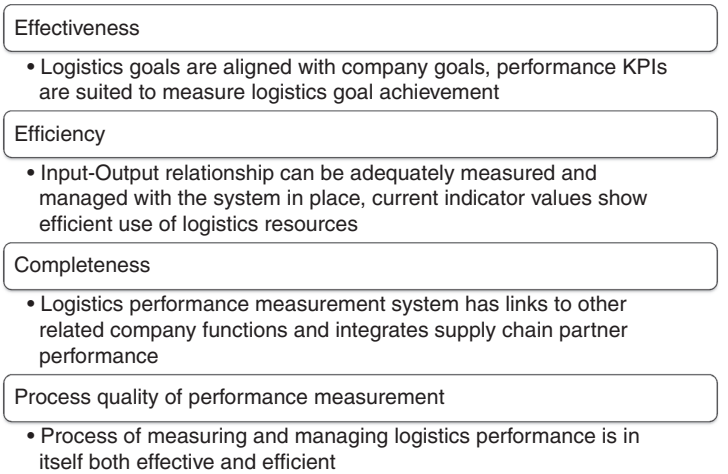

Figure 5.
Dimensions of benchmarking tableau for best practices identification

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	Company A	Company B	Company C
Industry	Precision hand tools	Medical equipment and accessories	Refrigeration and air conditioning
Size	Approx. 750 employees worldwide	Approx. 850 employees worldwide	Approx. 3,400 employees worldwide
Company structure	Family owned and family managed, headquarters in Germany, manufacturing sites in Europe and Asia, sales offices in Europe, North America, Asia	Family owned and partly family managed Headquarters and manufacturing in Germany, 13 sales subsidiaries worldwide Internal supply chain essential (manufacturing sites → sales offices)	Family owned, external managers Headquarters in Germany, manufacturing and sales subsidiaries worldwide
Company strategy	High quality, independence, customer focus	Innovativeness, development of system solutions for customers	High-quality products, but no system solutions, customer satisfaction and high product availability in focus
Role of logistics/SCM function	Logistics function must support quest for quality and reliability	Internal supply chain must be flexible and reliable	Logistics must support availability claim while at the same time minimizing costs

Table II. Overview of case companies

Although the case companies were of different size and were active in different industries, they showed a remarkably high degree of similarity. Despite their size they were all explicitly run as "family businesses" with a high emphasis on independence, continuity, and reliability. Since the case companies were active in different industries, their degree of comparability was assessed in order to allow proper interpretation of benchmarking results. Companies completed a questionnaire based on the typology developed by Sennheiser and Schnetzler (2008) to determine the predominant manufacturing type of each company. Questionnaire results revealed a sufficiently high degree of similarity between companies.

Company A manufactured a very high number of small, standard products with a relatively low value. Fast and reliable order fulfillment was of high importance, demand was fairly stable and showed no seasonal cycles. Direct material accounted for a relatively large share of product costs, manufacturing followed a make-to-stock concept with relatively large production lots and high levels of finished goods inventories. Company B also manufactured a wide range of different products and product variants, but products were bigger and of a higher complexity than in company A. Make-to-stock concepts were mixed with customer-specific make-to-order flows. Since exact product variants ordered by customers were not known in advance, company B had to maintain a higher degree of resource flexibility than company A. Company C again slightly differed from the other companies, since accompanying services (such as repair and maintenance) were of higher importance. Customer demand was rather erratic, forcing the company to maintain a large inventory of basic components that could be assembled into customer-specific product variants in a short time. The differences between companies were deemed to be sufficiently small by the researcher as well as by the companies themselves to allow meaningful benchmarking.

The initiative for the benchmarking exercise originated from the researcher, companies agreed to participate, but were not actively involved in benchmarking

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partner selection. During the entire benchmarking process company identities were not disguised. It was only at the closing meeting and after explicit consent of all participating partners that company identities were communicated and a final face-to-face meeting between all companies was organized.

The entire benchmarking process was coordinated and structured by the researcher. The overall concept of benchmarking was known to participants, but no clear expectations as regards process steps or benchmarking instruments were prevailing among participants. It therefore proved very helpful and indeed indispensable to closely guide companies through the process. A series of separate on-site meetings was organized with each partner, researcher inputs and explanations alternated with interactive, workshop-style, sessions. The entire process took several months to complete, since participants had to perform the benchmarking on top of their daily operational tasks.

Filling the logistics process map proved to be an unfamiliar and somewhat challenging task for all three companies. This step would not have been manageable for the SMEs without external guidance by the researcher, but provided participants with many valuable insights and triggered intensive discussions among members of the same organization about company goals and the logistic function's contribution to their achievement. One of the three SMEs embarked on an extensive root cause analysis and visualized the result in a comprehensive table that was the basis for further discussions with management. All three case companies put great emphasis on productivity – a performance category that is not explicitly covered in the SCOR model, for instance. This stresses again the importance of employing a flexible process framework that is not confined to pre-determined performance categories only.

All three SMEs were using various KPIs for measuring logistics performance. The structured benchmarking process revealed that these KPIs were not directly related with logistics key success factors identified in the process map. All three SMEs were lacking clear KPI descriptions, since the set of KPIs was the result of a historical development rather than the outcome of a management process. Filling the KPI profile templates therefore proved valuable in all three cases.

The final benchmarking tableau was compiled by the researcher and was discussed in the concluding face-to-face meeting. A condensed summary of the final benchmarking tableau is presented in Table III.

Participants presented their strengths and weaknesses in a very open and productive atmosphere and derived numerous hints and ideas for improvement from other participants in return. Best practices as perceived by the companies are highlighted in italics. As can be seen in the final benchmarking tableau, the lessons learned by participating companies were mostly of a process and organizational nature and less about individual performance indicators or their exact definition.

Conclusion

The present paper has reviewed approaches to SME logistics performance benchmarking. Based on identified gaps and weaknesses of present approaches a modified benchmarking process model has been developed and subsequently been tested in a field test with three German manufacturing SMEs. The main lessons learned from this model test can be summarized as follows:

(1) A self-administered process or a fully automated benchmarking tool is not deemed possible, since SME participants often lack the know-how that is needed to perform the benchmarking process in an effective and efficient manner. At least a minimum

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amount of external mentoring seems to be advisable in SME benchmarking ventures that do not restrict themselves to a mere comparison of logistics KPI values.

(2) Less experienced SME participants stand to gain a lot not only from actual benchmarking results, but also from the insights gained during the process as such. Neglected relationships between company strategy and the logistics function or unclear KPI definitions are easily detected during the process and constitute valuable input for SME management.

(3) The extension to a true SC benchmarking process model is difficult. Although SMEs often talk about "SCs," most often they still think "logistics." Inter-company performance is not yet in the focus of SMEs and benchmarking of SME SC performance in the true sense is still to be realized. According to Näslund and Hulthen (2012) this limited, more rhetoric, view of SCM can also still be found in much of the academic literature on SCM for SMEs.

The present piece of research is subject to a number of limitations. First, generic benchmarking models always need individual adaptation. The model developed in this paper can therefore be a general guideline for action only. Second, the case SMEs in the model test were all of considerable size. Application of the proposed process model to smaller companies might be subject to even more pronounced resource constraints that necessitate further process adaptations.

Both the literature review and the field test have confirmed, though, that benchmarking is a potentially powerful management tool for SMEs that can be applied to the logistics function. With logistical tasks becoming ever more important, SMEs should no longer hesitate to make use of the concept in order to improve their competitiveness in the global marketplace.

	Company A	Company B	Company C
Effectiveness	Logistics goals directly derived from strategy Many different KPIs (grown over time) *Active involvement of top management in KPI definition*	*Separate logistics strategy has been developed and communicated* *Has implemented an online dashboard for selected KPIs (not only logistics)*	Logistics KPIs mainly focus on availability, quality is not explicitly covered (mismatch with strategy) Top management is aware of KPIs, but makes selective usage only
Efficiency	Costs of logistics/SCM function are not tracked in detail	Sporadic analysis of logistics/SCM costs only (low variations over time)	Cost KPIs are available. *Comprehensive system of cost KPIs currently being developed, directly fed from ERP system*
Completeness	No external stakeholders or SC partners considered *Company-internal KPIs span all sites and locations*	High autonomy of subsidiaries, KPIs focus on main site only No external partners considered	KPIs for separate locations only No external SC partners considered
Measurement quality	*Close alignment between management and functional departments* Performance measurement with Excel only, no comprehensive tool	*Company dashboard in regular use* KPI measurement by management accounting, analysis by functional departments	KPI measurement with Excel, no comprehensive tool No alignment of performance figures across functional departments

Table III.
Condensed benchmarking tableau

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