

Erik Hofmann
Patrick Beck
Erik Fuger

The Supply Chain Differentiation Guide

A Roadmap to Operational Excellence

 Springer

The Supply Chain Differentiation Guide

Erik Hofmann · Patrick Beck
Erik Füger

The Supply Chain Differentiation Guide

A Roadmap to Operational Excellence

Erik Hofmann
Kerkhoff Competence Center
of Supply Chain Management
Chair of Logistics Management
University of St. Gallen
St. Gallen
Switzerland

Erik Fügler
Inova Management AG
Wollerau
Switzerland

Patrick Beck
Chair of Logistics Management
University of St. Gallen
St. Gallen
Switzerland

ISBN 978-3-642-31935-8
DOI 10.1007/978-3-642-31936-5
Springer Heidelberg New York Dordrecht London

ISBN 978-3-642-31936-5 (eBook)

Library of Congress Control Number: 2012943972

© Springer-Verlag Berlin Heidelberg 2012

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Foreword and Acknowledgements

The *Supply Chain Differentiation Guide (SCD Guide)* at hand is the outcome of a long-term research project conducted by the Chair of Logistics Management at the University of St. Gallen and several practicing partners from Switzerland and Germany. The project started at the end of 2009 and lasted until the end of 2011. It was funded by the Commission for Technology and Innovation (CTI) located at the Federal Department of Economic Affairs (FDEA), Switzerland (<http://www.evd.admin.ch>). The CTI promotes projects in the areas of R&D, knowledge transfer, and business formation and establishment. Our project was located within the CTI Enabling Sciences, which contribute to knowledge transfer from research institutions to companies.



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Eidgenössisches Volkswirtschaftsdepartement EVD
Kommission für Technologie und Innovation KTI
Förderagentur für Innovation

Conceptual and integration partners:

- Inova Management AG, a consultancy specialized in supply chain management, was the implementing partner and supported the research project with their almost 20 years of experience in supply chain management projects.
- GS1 Switzerland, the leading association dedicated to the design and implementation of global standards and solutions to improve efficiency and visibility of supply chains and demand management. GS1 Switzerland was the project's disseminating partner.



- Mercuri Urval GmbH (Germany) ensured that special requirements in supply chain management with respect to human resources were taken into consideration in the project.



The consumer goods industry was represented by Emmi AG. The companies Bühler AG, Reichle & De-Massari AG, Soplar sa and Wild & Küpfer AG represented the machinery and plant engineering industry.



In addition, the logistic service providers Damco Germany GmbH and the Sieber Group participated in the project. Mega Verbund AG also supported the project with its knowledge in commerce.



Besides the project just introduced, a further reason for publishing the present *SCD Guide* is our strong conviction that the “one-size-fits-all” approach does not satisfy the modern requirements of supply chain management. Several internationally active firms in industry and consulting report their efforts or the efforts of their clients to differentiate their supply chains. Support from academia, however, has been lacking. The *SCD Guide* is a first step to bridge this gap. It offers a comprehensive approach, starting with customers, aligning all value adding steps and suppliers to serve customers according to their specific needs.

We would like to thank all our partners for their constructive collaboration and support. Furthermore, special thanks go to the students and interns who supported the development of this book.

St. Gallen, Switzerland, September 2012

Erik Hofmann

Zurich, Switzerland, September 2012

Patrick Beck

Erik Fügler

Preface

The supervision of value adding networks involving several companies has been drawing a lot of attention in research and practice for over a decade, under the concept of supply chain management. There appears to be a broad consensus with respect to the central guiding principle of supply chain management, which encompasses the integration of materials, goods, and information flows across multiple value chains, and the alignment of all value adding activities with the requirements of consumers. However, in companies of different sectors and sizes, there is still considerable potential for reducing costs, increasing performance, improving quality, increasing flexibility, and improving risk management by means of supply chain management. A major reason for the discrepancy between the perceived and actual relevance of supply chain management can be seen in the challenge of identifying and selecting which initiatives as well as actions should be executed in the supply chain management context. This is especially the case for small- and medium-sized companies. However, a trend that affects multinational companies as well as small- and medium-sized enterprises is the rapidly changing and diversifying character of customer needs. Some companies in the consumer industry, nowadays, offer customization approaches even for goods perceived as commodities by most customers. Furthermore, enterprises in the plant and machinery building industry are forced to invent new business models, since their customers demand the opportunity to purchase the production capacity, know-how, and innovation instead of buying an investment good. Modern supply chain management offers a solution for such a market requirement: supply chain differentiation.

Supply chain differentiation means the simultaneous operation of several supply chains for effectively and efficiently dealing with customer needs. It is an undeniable trend, especially in supply chain management practice. While some market leaders already have implemented a differentiated supply chain, many other companies struggle in even identifying suitable approaches for analyzing whether or not a differentiated supply chain is an appropriate solution for their company. The work presented here, *The Supply Chain Differentiation Guide*, offers approaches for investigating such issues in a holistic and integrated manner. The book covers a wide range of subjects and provides an overview of topics relevant to supply chain management as well as supply chain differentiation. The Inova

Management AG has already successfully applied the *Supply Chain Differentiation Guide* in its consulting practice. I am confident that the *Guide*'s readers will find suggestions and inspirations for improving supply chain management in their own companies.

St. Gallen, Switzerland, September 2012

Wolfgang Stölzle
Chair of Logistics Management
University of St. Gallen

Contents

Part I Conception of the Supply Chain Differentiation Guideline

1	Introduction	3
1.1	Why do We Need a Supply Chain Differentiation Guideline?	3
1.2	Supply Chain Assessments: What is Currently Available? . . .	9
1.2.1	The Supply Chain Scan Approach	9
1.2.2	The Supply Chain Diagnostic Tool	10
1.2.3	Supply Chain and Operations Audits	12
1.2.4	What is Missing?	13
1.3	Principles and Advantages of the Supply Chain Differentiation Approach	14
1.4	The Structure of the SCD Guide	16
1.5	Scalability of the Approach	22
1.6	The Morphological Box for Supply Chain Differentiation . . .	23
1.7	Exemplary Cases	26
1.8	Challenges of an Application of the Supply Chain Assessment and Differentiation Guideline	29
	References	31

Part II Phase 1: Description of a TO-BE Supply Chain

2	SCD Guide Preparation	35
2.1	Internal Analysis: Company Strategy	35
2.1.1	Elaboration of Vision, Mission and General Principle	35
2.1.2	Portfolio Analysis of Products and Product Groups in the Supply Chain	35

2.1.3	Product Life Cycle Position	36
2.1.4	Description of Generic Strategy in the Supply Chain	37
2.2	External Analysis: Company and Environment	38
2.2.1	Evaluation of the Environmental Factors	38
2.2.2	Industry Structure Analysis	38
2.2.3	Analysis of Strategic Groups in the Market	40
2.2.4	Examination of the Strongest Competitors	41
2.2.5	Core Competency Assessment	41
2.3	Summary of Strategic Internal and External Analysis	42
2.4	Application Example and Possible Output of Company Strategy Analysis	43
	References	45
3	CM1: Customer Segmentation and Supply Chain Strategy	47
3.1	Goals of Content Module 1	47
3.2	Customer Requirements and Segmentation	47
3.2.1	Customer Requirements Categorization Based on a Hierarchical Structure	47
3.2.2	Customer Segmentation	50
3.2.3	Customer Segmentation Through Qualitative Analysis	54
3.2.4	Customer Segmentation Through Quantitative Analysis	56
3.2.5	Geography as a Descriptive Dimension	61
3.3	Assignment of Supply Chain Strategies to Customer Segments	64
3.3.1	Customer Segment Characteristics and Supply Chain Strategies	64
3.3.2	Customer Segment Requirements and Supply Chain Strategies	67
3.3.3	Adjustment of Business Unit Strategy and Supply Chain Strategies	68
3.3.4	Choosing the Right Supply Chain Strategy for a Customer Segment	69
3.3.5	Customer Order Decoupling Point	71
3.4	Application Example of SCD Guide CM1 and Possible Output	74
3.4.1	Customer Segmentation	74
3.4.2	Strategic Supply Chain Orientation	76
	References	78

4	CM2: Manufacturing Strategy and Supply Chain Management	81
4.1	Goals of Content Module 2	81
4.2	Product Modularization	82
4.2.1	Principle of Product Modularization	82
4.2.2	The Process of Product Modularization	85
4.3	Modularization and Deciding the Value of the Real Net Output Ratio	86
4.3.1	Process for the Outsourcing Decision	88
4.3.2	Outsourcing Procedure	88
4.3.3	The Execution of Outsourcing	91
4.4	Alternative to Modularization: The Formation of Material Groups	92
4.5	Manufacturing Strategies	93
4.5.1	Make-to-Stock	94
4.5.2	Assemble-, Make- and Build-to-Order	95
4.5.3	Engineer-to-Order	96
4.6	Manufacturing Strategies and Supply Chain Strategies	96
4.7	Supply Chain Strategies and Customer Order Decoupling Point	98
4.8	Application Example of SCD Guide CM2 and Possible Output	101
	References	103
5	CM3: Supplier Segmentation and Supply Strategy	107
5.1	Goals of Content Module 3	107
5.2	Buyer–Supplier Relationships	107
5.2.1	General Classification of Suppliers	108
5.2.2	Distribution of Power in Buyer–Supplier Relationships	109
5.2.3	Combination of Buyer–Supplier Relationship Types with the Distribution of Power	110
5.3	Implications of Buyer–Supplier Relationships on the Sourcing Procedure	111
5.3.1	The Merging of Item Categorization and Buyer–Supplier Relationship Types	113
5.3.2	Purchasing Portfolio Matrix	114
5.3.3	Integrated Supplier Relationship Management Procedure	115
5.4	Supplier Management and Supply Chain Strategies	117
5.5	Alternative Approach to Managing Suppliers: The ABC Analysis	119
5.6	Application Example of SCD Guide CM3 and Possible Output	121
	References	122

6	CM4: Activity Allocation and Supply Chain Process	
	Definition	125
6.1	Goals of Content Module 4	125
6.2	Producing Internationally	126
	6.2.1 Different Ways of Operating in an International Context	127
	6.2.2 Internationalization and Supply Chain Strategies . . .	128
	6.2.3 Structuring the Network Design Decision	129
	6.2.4 Allocation of Supply Chain Processes to Respective Geographical Regions	131
6.3	Implications of Manufacturing Strategies for Supply Chain Processes	132
	6.3.1 The SCOR Framework	132
	6.3.2 Aligning Supply Chain Processes With Manufacturing Strategies	133
6.4	Supply Chain Processes in a Differentiated Supply Chain Context—The case of Dell	135
6.5	Application Example of SCD Guide CM4 and Possible Output	137
	References	140
7	CM5: Supply Chain Governance	141
7.1	Goals of Content Module 5	141
7.2	Supply Chain Governance Structure	141
	7.2.1 Supply Chain Governance Typology	142
	7.2.2 Relationship Management Framework	143
	7.2.3 Customer Relationship Management	145
	7.2.4 Supplier Relationship Management	146
7.3	Information Sharing in Supply Chains	147
	7.3.1 Characteristics of Information Sharing in the Supply Chain	148
	7.3.2 Different Levels of Information Sharing	149
	7.3.3 Supplier and Customer Relationship and Information Sharing	149
	7.3.4 Positive Effects of Information Sharing	150
	7.3.5 Negative Effects of Information Sharing	151
	7.3.6 Enabling Information Sharing via IT Systems	152
	7.3.7 Information Sharing in Practice	152
7.4	Application Example of SCD Guide CM5 and Possible Output	154
	References	156

8 CM6: Supporting Activities—Project Management and Human Resources 159

8.1 Goals of Content Module 6 159

8.2 Supply Chain Project Management 159

8.2.1 The Project Management Maturity Model 160

8.2.2 Challenges of Supply Chain Management Projects 163

8.2.3 Inter-Organizational Boards 163

8.3 Human Resources in Supply Chain Management 165

8.3.1 The Role of Human Resource Management in Supply Chain Management 165

8.3.2 Human Resource Risks in Supply Chain Management. 166

8.3.3 Prevention of Human Resource Risk in Supply Chain Management 167

8.3.4 Human Resource Planning in Supply Chain Management. 169

8.3.5 Human Resource Development and Training 170

8.3.6 Supply Chain Manager Development and Training. 171

8.3.7 Employee Competencies in Supply Chain Management 172

8.4 Application Example of SCD Guide CM6 and Possible Output 175

References 176

Part III Phases 2 to 5: From the AS-IS Analysis to the Selection and Implementation Preparation of Specific Corrective Actions

9 Phase 2: Identification of AS-IS Supply Chain and Analysis. 179

9.1 Goals of SCD-Phase 2. 179

9.2 Content Module 1a: Analyzing the Customers 180

9.2.1 Customer Segmentation 180

9.2.2 Customer Characteristics and Customer Requirements 183

9.2.3 Distribution Channels 185

9.3 Content Module 1b: Analyzing the Supply Chain Strategy. 187

9.3.1 Fundamental Aspects of Strategic Supply Chain Orientation 187

9.3.2 Determining the Supply Chain Strategy. 188

9.4	Content Module 2: Analyzing the Manufacturing Strategy . . .	191
9.4.1	Fundamental Aspects of Manufacturing Strategy . . .	191
9.4.2	Product Modularization	193
9.4.3	Outsourcing	194
9.4.4	Determining the Manufacturing Strategy and Decoupling Point	195
9.5	Content Module 3: Analyzing the Suppliers	198
9.5.1	Fundamental Aspects of Supplier Management.	198
9.5.2	Categorization of Modules and the Classification of Suppliers	200
9.6	Content Module 4: Analyzing Supply Chain Processes	202
9.6.1	Geographic Process Allocation	202
9.6.2	Configuration of Source, Make and Deliver Processes	204
9.7	Content Module 5: Analyzing the Supply Chain Governance.	208
9.7.1	Relationship Management and Level of Information Sharing: Customers	208
9.7.2	Relationship Management and Level of Information Sharing: Supplier Side.	211
9.8	Content Module 6: Analyzing the Supporting Activities in the Supply Chain	211
9.8.1	Project Management Within the Supply Chain Context	212
9.8.2	Human Resource Perspective	214
9.9	Approach for Key Performance Indicators Selection	215
9.10	Application Example of SCD-Guide SCD-Phase 2 and Possible Output	225
	References	228
10	Phase 3: Supply Chain Gap Analysis in the SCD-Guide.	231
10.1	Goals of SCD-Phase 3.	231
10.2	CM1: Customer Segmentation and Supply Chain Strategy . . .	232
10.2.1	Customer Segmentation and Customer Requirements	232
10.2.2	Derivation of the Supply Chain Strategy	233
10.3	CM2: Modularization and Vertical Range of Manufacture . . .	233
10.3.1	Service Offerings Per Customer Segment	233
10.3.2	Specification of the Different Modules Within a Product	236
10.3.3	Make-Or-Buy Decision Per Module and the Vertical Range of Manufacture	236
10.4	CM3: Supplier Segmentation and Supply Strategy	236
10.5	CM4: Allocation of Supply Chain Activities	238

10.6	Functional Supply Chain Processes	238
10.6.1	Plan Process	238
10.6.2	Deliver Process	239
10.6.3	Make Process	239
10.6.4	Source Process	239
10.6.5	Return Process	240
10.7	CM5: Supply Chain Governance	240
10.7.1	Customer Relationship Management and Information Sharing	240
10.7.2	Supplier Relationship Management and Information Sharing	242
10.8	CM6: Supply Chain Project Management and Human Resources Perspective	243
10.8.1	Supply Chain Project Management	243
10.8.2	Supply Chain Process Management: Human Resources Perspective	244
10.9	Collection of Corrective Actions	245
10.9.1	Corrective Actions: Plan Process	245
10.9.2	Corrective Actions: Source and Make Processes	245
10.9.3	Corrective Actions: Deliver Processes	252
10.10	Supply Chain Resources	255
10.11	Application Example of SCD-Guide SCD-Phase 3 and Possible Output	257
	References	260

11 Phase 4: Supply Chain Prioritization and Selection

	of Corrective Actions	261
11.1	Goals for SCD-Phase 4	261
11.2	Prioritization Procedure for Corrective Actions	261
11.3	Step 1: Goal Prioritization	262
11.4	Step 2: Identification of Corrective Actions	264
11.5	Step 3: Pre-Selection of Corrective Actions	266
11.6	Step 4: Evaluation and Prioritization of Corrective Actions	268
11.6.1	Existence of Prior Experience	268
11.6.2	Extent of Intra- and Inter-Organizational Implementation	268
11.6.3	Interdependencies and Logical Hierarchies	269
11.6.4	Weighted Score Method	269
11.6.5	Analytic Hierarchy Process	272

11.7	Application Example of SCD-Guide SCD-Phase 4 and Possible Output	276
11.7.1	Identification of Corrective Actions	276
11.7.2	Pre-Selection of Corrective Actions	277
	Reference	281
12	Phase 5: Preparation of Implementation of Supply	
	Chain Differentiation	283
12.1	Goals for SCD-Phase 5	283
12.2	Step 1: Project Conception.	284
12.2.1	Description and Content of the Phase	284
12.2.2	Methods.	285
12.3	Step 2: Project Specification	288
12.3.1	Description and Content of the Phase	288
12.3.2	Detailed Descriptions and Methods.	288
12.4	Step 3: Project Planning	292
12.4.1	Description and Content of the Phase	292
12.4.2	Methods.	293
12.5	Application Example of SCD-Guide SCD-Phase 5 and Possible Output	301
	References	303
	Appendix	305
	Index	337

Part I
Conception of the Supply Chain
Differentiation Guideline

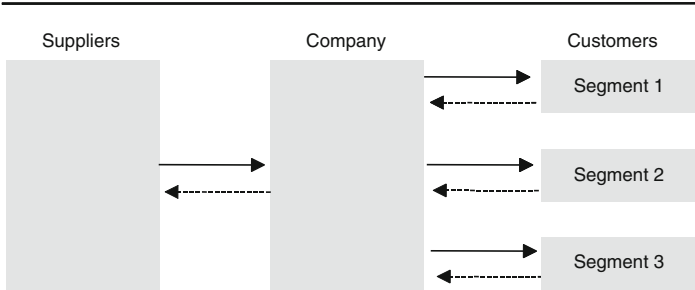
1.1 Why do We Need a Supply Chain Differentiation Guideline?

The awareness of the importance of supply chain management has increased significantly in recent years. In most industries and sectors, supply chain management has climbed up organizational agendas. One reason for this development results from the increased complexity of supply chains due to the outsourcing trend in recent decades. In the late 1980s for example, outsourcing in U.S. industries contributed to nearly 60 % of total production costs. However, the development of supply chain management is, in addition to such internal motives, also driven by various external factors including the constant growth of globalization, decreasing international trade barriers, improvements in information availability, and government regulations such as the establishment of a single European market (Gunasekaran et al. 2004).

The overriding objective of supply chain management is the generation of revenue and, if possible, the increase of market share during the integration of procurement, production, distribution and logistics functions across company borders. More precisely, to generate revenue the organization and its affiliated supply chain partners must provide a product or a service to the customer (Childerhouse and Towill 2000). In other words, in current-day business the success or failure of supply chains is defined in the marketplace by the end customer. The development of a strategy which meets the requirements of the supply chain and the end customer is only possible if the needs and constraints of the markets are understood. Thus, customer satisfaction and marketplace understanding are crucial when elaborating a new supply chain strategy (Christopher and Towill 2001).

However, in recent years, the focus of supply chain management lay significantly on cost optimization, which is legitimate as logistic costs have increased in recent years and are expected to continue to do so. Thus, it is crucial to prevent supply chain expenditures and the tying up of working capital including inventories. However, in order to ensure the sustainability or improvement of a

Not segmented supply chain



Segmented supply chain

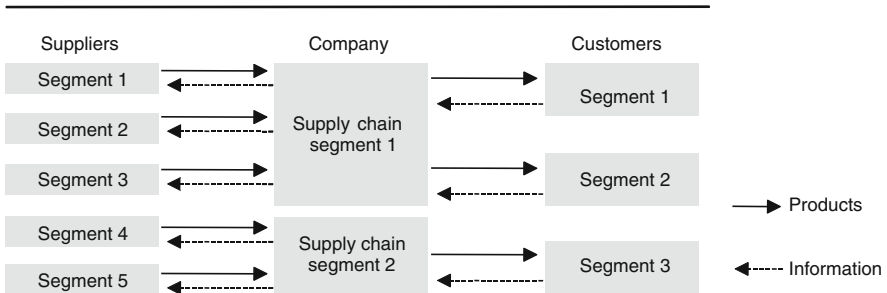


Fig. 1.1 Segmented and non-segmented supply chains

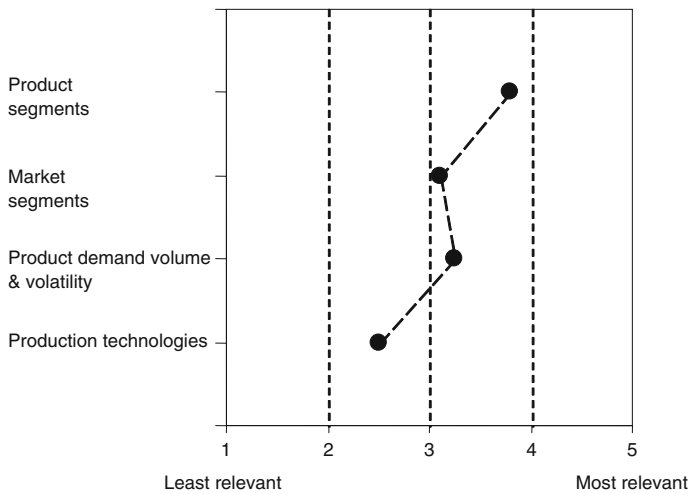
company's competitive position, the enhanced customer requirements in terms of supply availability, delivery reliability, and delivery lead time must be taken into account. This trade-off between reducing costs and satisfying customer requirements has to be resolved, something that has gained importance as the shape of the economy has become less stable (Mayer et al. 2009).

With regard to the importance of an increased focus on customer requirements, it is crucial to differentiate between different customer segments. Satisfying customer requirements in many cases cannot be achieved by one single supply chain as customer requirements differ and vary across various marketplaces.

If a “one-size-fits-all” approach is applied, then not only are all customers of an organization treated in a similar manner, but all suppliers are also managed in a similar way. These factors lead to ineffectiveness in supply chain management. Hence, a clear focus of supply chain management should be the satisfaction of the various customer requirements accomplished by a segmented supply chain; here compare Childerhouse and Towill (2000) as depicted in Fig. 1.1.

The relevance of supply chain differentiation, which encompasses supply chain segmentation, has also been confirmed by a 2009 study. Companies segmenting their supply chain instead of applying a “one-size-fits-all” supply chain are clearly more successful. More than two-thirds of the companies in the sample already

Relevance of supply chain differentiation criteria



Superior supply chain performance through differentiation

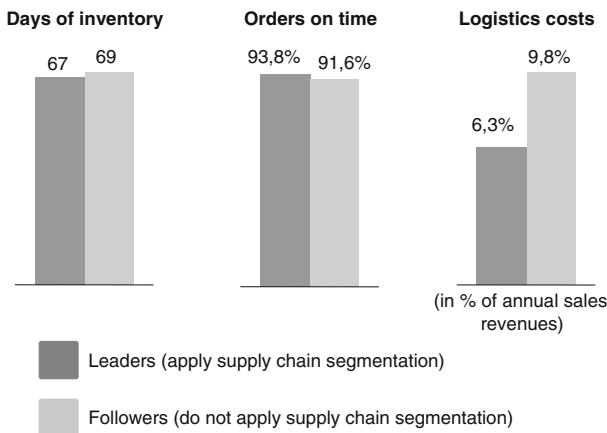


Fig. 1.2 Superior supply chain, performance supply chain performance through differentiation (Mayer et al. 2009)

make successful use of a differentiated supply chain. On the one hand, the study analyzed whether companies employing a segmented supply chain achieve a better supply chain performance. The results revealed a better supply chain performance

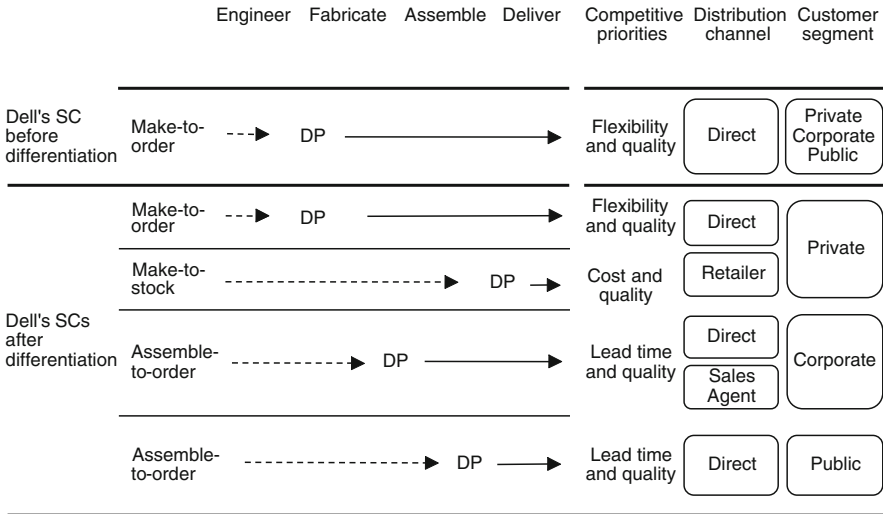


Fig. 1.3 Supply chain differentiation of Dell before and after the consideration of customer requirements. *DP* decoupling point, *SC* supply chain

for companies applying clear segmentation logic with subsequently customized processes and structures. Due to segmentation according to criteria regarded as important for product and market segments, companies can offer a better delivery service at lower logistics costs by keeping inventory low. Hence, the superior supply chain performance in terms of the categories “days of inventory”, “orders on time” and “logistics costs” of companies applying segmentation compared to companies taking a “one-size-fits-all” approach is depicted on the right hand side of Fig. 1.2. Segmentation by “product segments” and “product demand volume and volatility” plays an important role. Segmentation by “production technologies” is considered less relevant as illustrated on the left hand side of Fig. 1.2.

A prominent example of a differentiated supply chain approach is the case of the popular computer manufacturer Dell. The company was faced by decreasing margins over a number of years. By analyzing the problem, Dell observed that not all of its customers require and value Dell’s complex make-to-order strategy which allowed its customers to purchase a product customized to their specifications. After analyzing its customer requirements in detail, the company realized that public and corporate customers appreciate predictability and reliable delivery in contrast to private customers who value multiple sales channels and low price options more. In addition, public customers demand less variety of product variants than corporate customers. The private customers, however, demand a rather high diversity of product variants (Davis 2010). Based on this insight, Dell developed a differentiated supply chain strategy based on the three identified customer segments. Every supply chain is designed to meet the requirements of a specified customer segment as depicted in Fig. 1.3 (for simplicity’s sake, only four

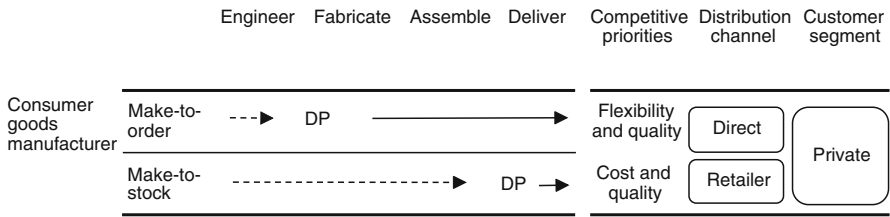


Fig. 1.4 Supply chain differentiation of a consumer goods manufacturer

of the six different supply chains established by Dell are illustrated). Thus, the supply chain strategy differentiates according to the specific requirements of a customer segment. If, for example, flexibility and quality are the main requirements, a make-to-order approach is suitable which implies the positioning of the decoupling point (DP) fairly far upstream in the value chain. The decoupling point is traditionally defined as the point in the value chain where a product is linked to a specific customer order (for a more detailed description of the decoupling point, please see [Chaps. 3 and 4](#)).

By differentiating the supply chain configuration in alignment with identified customer requirements, Dell was able to provide its products to its customers as demanded. Moreover, the company was able to reduce complexity as the configuration of its products was reduced in the supply chain. Furthermore, Dell was able to lower its operational costs by approximately \$1.5 billion from 2008 to 2010 (Davis 2010).

The case of Dell is a good example for illustrating on a simplified level the impact and benefits of a differentiated supply chain. Regarding present-day business, getting the right product at the right time and price to the right customer has become the key to competitive advantages as whole supply chains compete against each other instead of just individual companies (Christopher and Towill 2001). Thus, a “one-size-fits-all” approach is no longer sufficient for differentiating a company from its competitors.

In consumer goods manufacturing, there are various companies such as Adidas, Nike and Oakley which are already successfully performing supply chain differentiation. As can be seen in [Fig. 1.4](#), the supply chain of consumer goods has changed over time. Due to the low price of consumer goods, companies have made greater use of make-to-stock approaches. The successful implementation of supply chain differentiation by prominent consumer goods manufacturers has shown that it can be applied to that area as well. It affirms that supply chain differentiation is relevant for all price ranges of products within manufacturing companies.

Table 1.1 Overview of supply chain assessment approaches

Author(s), year	Methodology of definition put forth
Brun et al. (2006)	An information system for advanced planning/scheduling and supply chain management with a focus on supply chain value assessment.
de Vries (2007)	Systemized and integrated approach toward analyzing inventory management systems and a conceptual framework which aims at assessing and redesigning inventory management systems.
Foggin et al. (2004)	A supply chain diagnostic tool to determine problems, inefficiencies, or needed improvements in a client's, or a potential client's supply chain that the third party logistics provider can effectively address.
Gunasekaran and Kobu (2007)	The key performance measures and metrics to manage logistics and supply chain operations.
Kannan and Tan (2002)	Effective supplier selection and assessment for companies and the identification of relationships between criteria and a buying firm's business performance.
Naim et al. (2002)	A guide for conducting Quick Scan, a supply chain oriented business diagnostics.
New (1996)	A conceptual framework for analyzing supply chain improvement.
Payne and Peters (2004)	The product supply characterization model assesses the alignment of the type of product clusters with the type of distribution channels delivering the products.
Rajala and Savolainen (1997)	Two different ways of coping with process variations through simulation modeling or value analysis (VA). Radical improvements can be achieved when applying VA to business process re-engineering.
Fahmy Salama et al. (2009)	Supply chain and operations audits represent a fundamental step for systematically capturing market changes and for adequately supporting improvement projects in this way.
Naim (2000)	Supply chain assessment methodology based on the supply chain proficiency model that can be used to set realistic supply chain objectives.
Verma and Pullman (1998)	The study examines the difference between managers' rating of the perceived importance of different supplier attributes and their actual choice of suppliers using the Likert scale set of questions and a discrete choice analysis.
Wei et al. (2007)	A framework with three main phases for selecting an adequate supply chain management project that incorporates the strategies and operating routines of a supply chain, including a strategic objective analysis phase, a systems analysis phase, and group decision making phase.

1.2 Supply Chain Assessments: What is Currently Available?

Supply chain assessment is a crucial part of the supply chain differentiation process. In the following an introductory overview will be given, which includes the most important approaches to supply chain assessments. Three methods will be discussed in further detail in order to provide a picture of the scope of operations following the implementation of these methods. The Table 1.1 as well as the following description of selected approaches does not intend to be exhaustive, but only to give an overview regarding currently available supply chain assessment approaches.

1.2.1 The Supply Chain Scan Approach

The approach taken by Naim et al. (2002) is a guide for performing a supply chain oriented business diagnostics called Quick Scan. Quick Scan is the first step in identifying change management opportunities in the supply chain.

Before implementing information and communication technologies, the author underscores that it is important to thoroughly analyze the supply chain via the quick scan process. This supply chain diagnostic approach collects and synthesizes qualitative and quantitative data from the supply chain. The objective of the quick scan implementation is to advise companies of the direction and magnitude of change required in their supply chains at the start of a change program.

Different factors can be taken into account in the quick scan analysis, such as material flows, information flows and information and communication technology (ICT), measures of performance, organizational structures, and relationships and attitudes. The data collection and analytical techniques are used to evaluate how well the supply chain processes of the company meet end customer requirements. In the following a comprehensive overview of the different steps involved in the quick scan process is presented. Figure 1.5 shows the different tasks which have to be performed during the process, starting with identification of the supply chain business process and getting a buy in of the business champion, followed by the conducting of the actual quick scan via data collection techniques and analysis of the findings.

It's stated that a complete quick scan process can be finished within a two-week period. Once this is done, a feedback presentation is conducted during which opportunities and improvements are discussed. The quick scan is therefore of importance, since it helps in fully comprehending the current state of the supply chain and in determining those actions that will yield maximum benefit which can be implemented before or with the automation process. The approach however, is not sufficiently strategic, can only be seen under operative circumstances and does not explicitly mention supply chain differentiation.

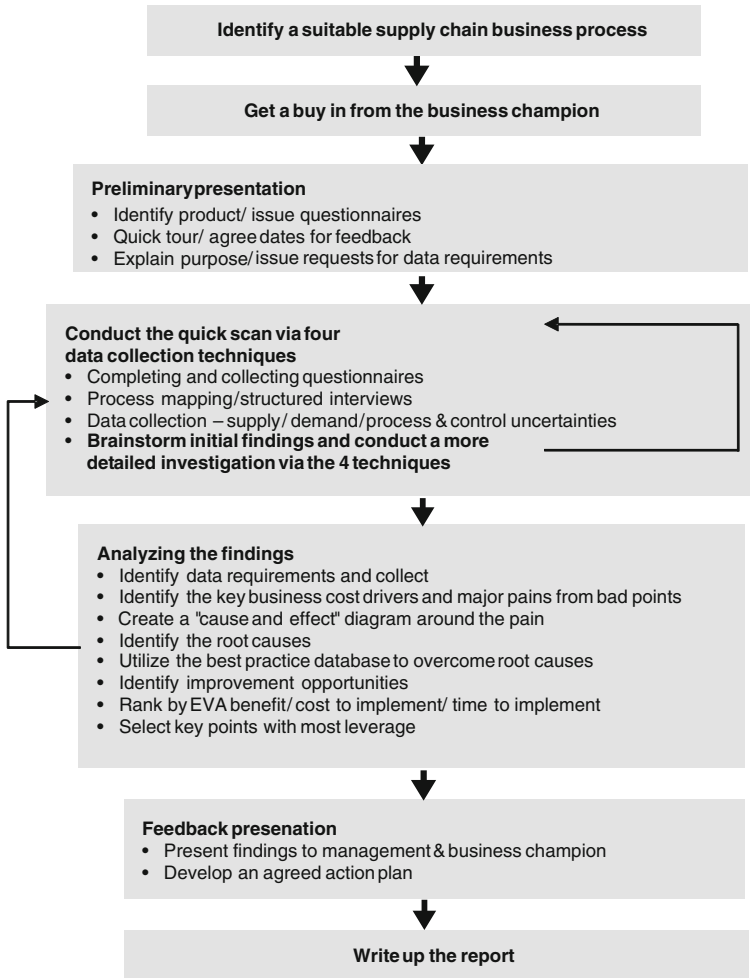


Fig. 1.5 Supply chain scan analysis, according to Naim et al. (2002)

1.2.2 The Supply Chain Diagnostic Tool

The supply chain diagnostic tool put forth by Foggin et al. (2004) determines the problems, inefficiencies, or needed improvements in a client's, or a potential client's supply chain that the third party logistics provider (3PL) can effectively address. Most tools describing the problems of supply chains are too large, time-consuming or quantitative. The approach employed by Foggin et al. (2004) is a much quicker qualitative method for analyzing areas of inefficiencies.

3PL–client relationships are fraught with risk and have a high failure tendency. The most common reason for this inefficiency is nonperformance. There are

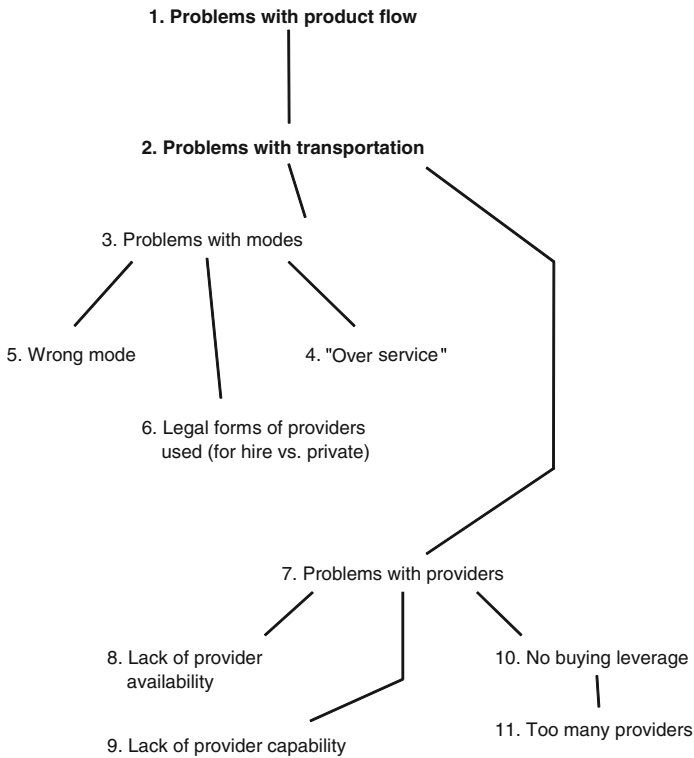


Fig. 1.6 Identifying key inventory issues with the supply diagnostic tool, according to Foggin et al. (2004)

continuous reports of various failures and breakdowns in 3PL–client relationships. Two-thirds of 3PL–client relationships fail within the first 5 years of the relationship. As a result of these failures, companies either find new contracting partners or decide to bring the competencies back in-house.

This shows the need for a diagnostic tool which can help to examine the customer supply chain in an early stage of the relationship. The distinct separation of customers who do not need help, who cannot be helped or customers who will potentially turn into a viable relationship needs to be undertaken before more cost-intensive and time-consuming measures are taken.

The diagnostic tool developed by Foggin et al. (2004) is easy to handle and is structured to be completed within an hour. It solely involves data that can be easily obtained. The method is thereby qualitative in nature. The supply chain diagnostic tool is a questionnaire that helps to quickly identify problems and diagnose the current problems existing in a potential customer’s supply chain. The following overview (Fig. 1.6) shows an approach to the areas of interest to identify key issues within inventory management. It is thereby only an abstract of the full

questionnaire and shows an example of the chain of cause and effect given within the supply chain diagnostic tool.

The questionnaire includes different areas of interest starting with general questions about the nature of the supply chain, inventory issues, customer service issues, organizational issues, system/information issues and product flow issues.

It is a relatively quick, effective and comprehensive tool for diagnosing the potential client's supply chain problems and for detecting the overall ability of the 3PL–client relationship to solve those problems. The ability to diagnose potential 3PL–client relationship problems beforehand will lead to a more efficient process at a later point in time and will help eliminate inefficiencies at an early stage of the relationship. This approach is, however, only operative and does not take the strategic approach into account. Furthermore the approach does not sufficiently consider supply chain differentiation.

1.2.3 Supply Chain and Operations Audits

Fahmy Salama et al. (2009) introduce a tool to improve supply chain and operations by conducting supply chain and operations audits. Organizations today face highly dynamic markets which are characterized by agility, adaptability and alignment. The authors suggest that a rising need for supply chain and operations audits becomes apparent. Supply chain and operations audits support improvement projects and can be carried out in two different approaches. One focuses on the problems found as its starting point and the other starts with prospective solutions or enablers.

The diagnostic stage is the central element of the auditing approach. Here assessment is aimed at the interaction between an organization and its “others” (whether people, processes and technology) as it affects market-driven performances. The identification of causal relationships is a fundamental step for project success. The diagnostic stage considers the following steps: defining the scope of analysis; identifying market drivers and competitive positions; creating causal relationship maps; investigating critical processes; and tune, weigh and validate causal relationship maps. It uses predefined master causal relationship maps based on current best practices to identify the as-is situation. The final result shows a qualitative mapping of the as-is situation and the gap between it and best practices. Thus, the most important output of this framework is the development of an explanatory causal relationship map.

Figure 1.7 shows a simplified version of the master best practice relationship map to give an example of the methodology's diagnostic process. The results of the diagnosis stage then help to identify “enablers” or “solutions” (technology- or management-related solutions) which tend to change continuously over time. The lack of identification of causal relationships forms a major threat to the project's success, regardless whether an approach is taken aimed at finding the pains or one aimed at identifying the solution and its enablers. The weak aspects of this

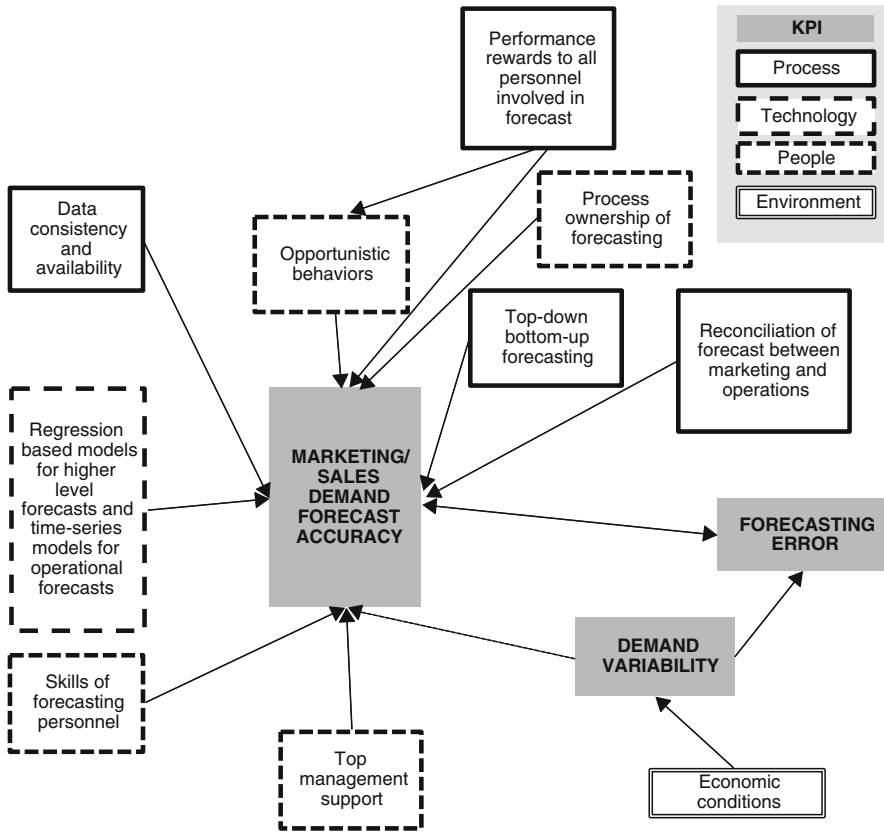


Fig. 1.7 Supply chain and operations audit, according to Fahmy Salama et al. (2009). KPI key performance indicators

approach are its missing operative approach, its less strategic approach and the fact that differentiation as such has not been explicitly recognized.

1.2.4 What is Missing?

As the heading of this subsection already indicates, the approaches presented by Naim et al. (2002), Foggin et al. (2004) and Fahmy Salama et al. (2009) are purely of operational nature. Furthermore, the approaches neglect supply chain segmentation/differentiation as a means of dealing with varying customer needs and requirements while operating each supply chain in an efficient manner. The supply chain assessment and differentiation guideline introduced in this book addresses this deficiency, this gap, and, by doing so, presents a holistic and customer-oriented approach to supply chain management.

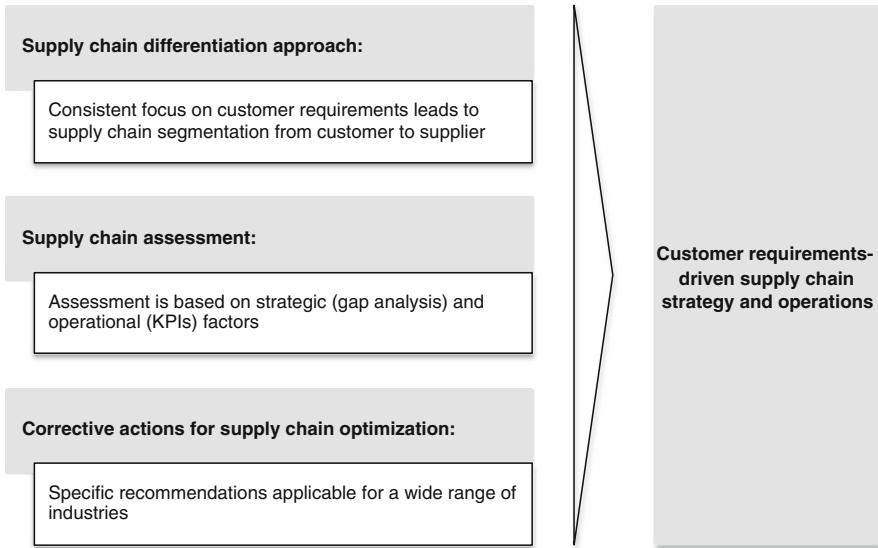


Fig. 1.8 Principles of the SCD Guide

1.3 Principles and Advantages of the Supply Chain Differentiation Approach

The overarching goal of our guideline is to execute supply chain management based on customer requirements by applying a **supply chain differentiation approach**. Thus, as depicted in Fig. 1.8, the consistent focus on customer requirements throughout the approach leads to a supply chain segmentation from the customer to the supplier. This is realized by elaborating first a TO-BE supply chain configuration based on defined customer segments and their corresponding requirements such as product quality, product availability, price, service, or service response time, to mention just a few. Furthermore, the AS-IS situation is identified in order to gather structured information about the current configuration of the supply chain, a process which is equally based on identifying an organization's customer segments and their requirements. The impacts of these requirements on the supply chain strategy for each customer segment, its product modules, process allocation and definition, as well as on the suppliers are ascertained in order to come up with a consistent supply chain differentiation strategy and mode of operation.

Moreover, to reveal the possible improvement potentials of the prevailing supply chain, a **supply chain assessment** based on a gap analysis and a self-benchmarking based on adequate key performance indicators (KPIs) is conducted. The gap analysis as a strategic factor results from the deduced TO-BE configuration compared to the AS-IS situation of the supply chain. Just like the gap

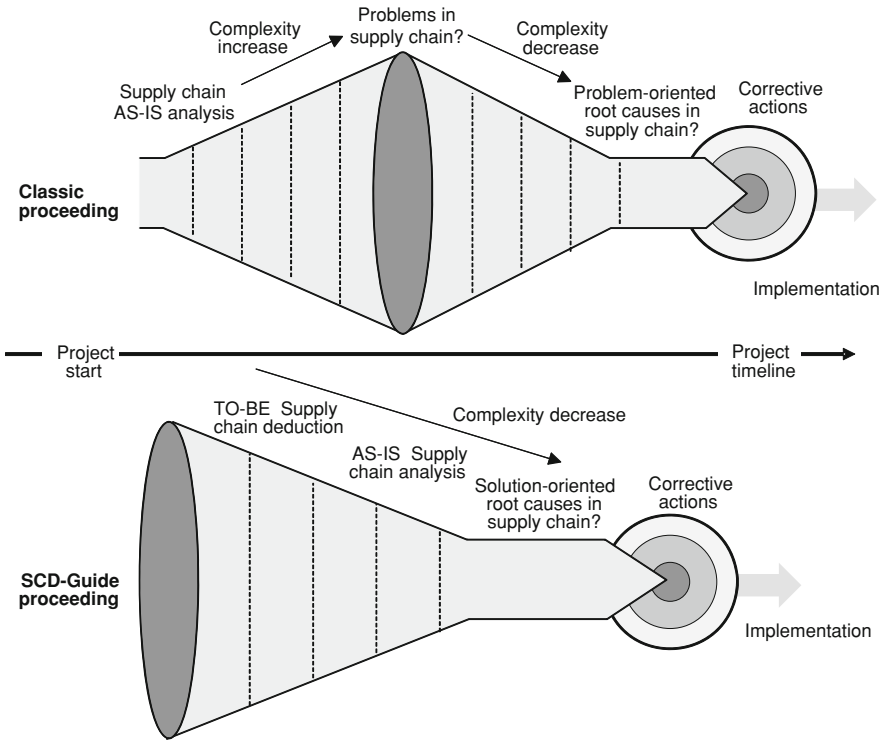


Fig. 1.9 The SCD Guide versus the classic approach

analysis, self-benchmarking as the operational factor, which is based on the organization’s strategic supply chain orientation and its desired competitive priorities such as quality, cost, lead time, and flexibility, reveals differences between the desired and the actual state. The **corrective actions for supply chain optimization** that result from the gap analysis and self-benchmarking allow for specific recommendations which are applicable to a wide range of industries, since these corrective actions are generic in character.

The main advantage of the SCD Guide compared to classic procedures is its solution-oriented approach. Right from the beginning the guideline focuses on the formulation of a TO-BE supply chain. The derivation of such a desired supply chain, accomplished in the first phase of the methodology, leads to a clear **solution-oriented** focus. This allows one to bypass time-consuming problem and AS-IS analysis and not lose sight of available resources and solution potentials. While classic approaches increase complexity in the initial analysis until the problems are identified, the SCD Guide starts off with a higher level of complexity, since the user has to learn and transfer the structure of the SCD Guide to his or her case example. In this way the SCD Guide approach yields corrective actions faster than classic approaches, as depicted in Figs. 1.9 and 1.10.