



*Mario Binder
Ben Clegg*

SUSTAINABLE SUPPLIER MANAGEMENT IN THE AUTOMOTIVE INDUSTRY

Leading the 3rd Revolution through Collaboration

Transportation Issues, Policies and R&D

Novinka

Copyright © 2010 by Nova Science Publishers, Inc.

All rights reserved. No part of this book may be reproduced, stored in a retrieval system or transmitted in any form or by any means: electronic, electrostatic, magnetic, tape, mechanical photocopying, recording or otherwise without the written permission of the Publisher.

For permission to use material from this book please contact us:

Telephone 631-231-7269; Fax 631-231-8175

Web Site: <http://www.novapublishers.com>

NOTICE TO THE READER

The Publisher has taken reasonable care in the preparation of this book, but makes no expressed or implied warranty of any kind and assumes no responsibility for any errors or omissions. No liability is assumed for incidental or consequential damages in connection with or arising out of information contained in this book. The Publisher shall not be liable for any special, consequential, or exemplary damages resulting, in whole or in part, from the readers' use of, or reliance upon, this material.

Independent verification should be sought for any data, advice or recommendations contained in this book. In addition, no responsibility is assumed by the publisher for any injury and/or damage to persons or property arising from any methods, products, instructions, ideas or otherwise contained in this publication.

This publication is designed to provide accurate and authoritative information with regard to the subject matter covered herein. It is sold with the clear understanding that the Publisher is not engaged in rendering legal or any other professional services. If legal or any other expert assistance is required, the services of a competent person should be sought.

FROM A DECLARATION OF PARTICIPANTS JOINTLY ADOPTED BY A COMMITTEE OF THE AMERICAN BAR ASSOCIATION AND A COMMITTEE OF PUBLISHERS.

Library of Congress Cataloging-in-Publication Data

Binder, Mario.

Sustainable supplier management in the automotive industry : leading the 3rd revolution through collaboration / Mario Binder, Ben Clegg.

p. cm.

Includes bibliographical references and index.

ISBN 978-1-61668-675-8 (softcover)

1. Automobile industry and trade. 2. Business logistics. 3. Strategic planning. 4. Business networks. I. Clegg, Ben. II. Title.

HD9710.A2B526 2010

629.222068'7--dc22

2010013740

Published by Nova Science Publishers, Inc. † New York

Transportation Issues, Policies and R&D

**SUSTAINABLE SUPPLIER
MANAGEMENT IN THE
AUTOMOTIVE INDUSTRY:
LEADING THE 3RD REVOLUTION
THROUGH COLLABORATION**

TRANSPORTATION ISSUES, POLICIES AND R&D

Public Transit Issues and Developments

Calvin B. Lang (Editor)

2009. 978-1-60692-689-5

Railway Transportation: Policies, Technology and Perspectives

Nicholas P. Scott (Editor)

2009. 978-1-60692-8639

Yacht Modelling and Adaptive Control

Chengmo Xiao and Sing Kiong Ngung (Authors)

2009. 978-1-60741-430-8

Aeropolitics

Ruwantissa Abeyratne (Author)

2009. 978-1-60876-102-9

High Speed Passenger Rail: Viability, Challenges and Federal Role

Augelli Biocchetti (Editor)

2010. 978-1-60741-985-3

Wireless Technologies in Intelligent Transportation Systems

*Ming-Tuo Zhou, Yan Zhang
and Laurence T. Yang (Editors)*

2010. 978-1-60741-588-6

Automotive Industry: Technical Challenges, Design Issues and Global Economic Crisis

Gordan A. Maxwell and Stuart K. Drummond (Editors)

2010. 978-1-60876-143-2

Congestion Pricing in Traffic Control

Marco D. Sheehan (Editor)

2010. 978-1-60741-963-1

Motorcycle Safety and Crashes

Joseph Da Corte (Editor)

2010. 978-1-60741-884-9

Revitalizing Transportation Decision Making and Investment

Sofia A. Virtanen (Editor)

2010. 978-1-60741-991-4

**Automobiles: Performance, Safety Assessment,
and Energy Consumption**

Matin F. Kody (Editor)

2010. 978-1-61668-218-7

Bus, Motor Carrier and Trucking Safety Issues

Samuel B. Metzler (Editor)

2010. 978-1-60876-755-7

Head Restraints and Whiplash: The Past, Present and Future

Ediriweera Desapriya (Author)

2010. 978-1-61668-150-0

Airport and Aviation Security

Amelia K. Voegele (Editor)

2010. 978-1-61668-583-6

**Sustainable Supplier Management in the Automotive Industry: Leading
the 3rd Revolution through Collaboration**

Mario Binder and Ben Clegg (Authors)

2010. 978-1-61668-675-8

PREFACE

Global economic pressures have had a dramatic impact on the global automotive industry. It has increased the need for another great automotive revolution. The 1st great revolution was all about ‘mass-production’ and was principally led by the US. The 2nd great revolution was focused on ‘mass-customisation’ and was principally led by Japan. The ideas proposed in this book suggest that the European automotive industry will lead the 3rd great automotive revolution; which will probably be achieved via mass-collaboration and sustainable supplier management practices.

This book discusses current trends in the automotive industry, theoretical perspectives about strategic thinking, new case studies and new pragmatic management frameworks. The key messages in this book are that collaboration between car manufacturers and their suppliers need to occur earlier on in the product development process, thinking based on competence rather than cost issues is required, and the creation of value between organisations needs to be rethought. These key factors, along with others explained in the book use the established academic theory, new case studies, methodologies and novel management tools to provide the reader with coping skills and radical insights into how the industry may change over the forth-coming decades. This radical thinking could help pave Europe’s way towards successfully leading the 3rd automotive revolution.

This book will be of interest to students, scholars and practitioners of strategic management. It will be particularly interesting to those aiming to influence the future of the automotive industry, and those wishing to learn about innovative supplier management practices.

ACKNOWLEDGEMENTS

Extensive thanks is given to all the companies, interviewees and questionnaire respondents from the German automotive industry who have greatly contributed to the facts and results reported in this book with their expertise. For reasons of ensured confidentiality they remain anonymous.

We would like to thank Aston Business School for supporting the underlying empirical research. Specifically, we would like to acknowledge our colleagues from the Operations and Information Management Research Group for their continuous input and inspirations.

Last but not least, we would like to express our deepest thanks to the editorial team of Nova Science Publishers for their constant support on all sorts of matters.

LIST OF ACRONYMS

AE	Autonomous Enterprise
BMW	Bayrische Motorenwerke
CAD	Computer Aided Design
DC	DaimlerChrysler
DCV	Dynamic Capabilities View
EE	Extended Enterprise
GM	General Motors
GTM	Grounded Theory Method
IMP	Industrial Marketing and Purchasing (Group)
IO	Industrial Organisation
IT	Information Technology
LE	Linked Enterprise
NPD	New Product Development
NVivo	NUD*IST (Nonnumerical Unstructured Data Indexing Searching and Theorising) Vivo
OEM	Original Equipment Manufacturer (car manufacturer)
PDP	Product Development Process
PE	Partner Enterprise
QSR	Qualitative Solutions and Research (International Ltd.)
R&D	Research and Development
RBV	Resource Based View
RDT	Resource Dependency Theory
SCM	Supply Chain Management
SOP	Start of Production
TCE	Transaction Cost Economics
TM	Trademark

TQM	Total Quality Management
U.S.	United States (of America)
USA	United States of America
UK	United Kingdom
VDA	Verband der Automobilindustrie (Association of the German Automotive Industry)
VE	Virtual Enterprise
VIE	Vertically Integrated Enterprise
VW	Volkswagen

CONTENTS

Preface	ix	
Acknowledgements	xi	
List of Acronyms	xiii	
Chapter 1	Introduction	1
Chapter 2	The Collaborative Economy	5
Chapter 3	The Need for Sustainable Inter-Organisational R&D Collaboration in the Car Industry	11
Chapter 4	Theoretical Perspectives of Inter-Organisational Relationship Governance	23
Chapter 5	An Empirical Study on Inter-Organisational R&D Collaboration in the Car Industry	41
Chapter 6	A Conceptual Framework for Sustainable Supplier Management	59
Chapter 7	Practical Implications – Leading the 3 rd Revolution	85
Chapter 8	Conclusion	95
Glossary		99
References		103
Appendix		123
Index		137

Chapter 1

INTRODUCTION

“If we did not carry in us the basic biological urge to cooperate with our fellow men, we would never have survived as a species” (Morris, 1969; p. 26).

The 1st great automotive revolution in the automotive industry was the move towards mass-production from a craft-based industry (e.g. Fordism); the 2nd great automotive revolution was the move from mass-production towards mass-customisation (e.g. Toyotaism). The 3rd great revolution may be happening right now, and we suspect it is a move towards mass-collaboration. Mass-collaboration is the next logical next step for the automotive industry to take and would build upon the first two revolutions as a matter of necessity. This is because mass-collaboration is essential for the industry to deliver what customers now expect in their vehicles; namely that of low cost, often achieved through mass-production, and high customisation, achieved through mass-customisation. These consumer demands are at conflict with one another in terms of organisational strategy and operational practicalities. Without close and intense collaboration between all types of organisations within the industry, these conflicting demands are unlikely to be able to be met sustainably. We will explore the implications of the 3rd great automotive revolution in this book.

The current global economic crisis is also contributing to the changing ways in which the automotive industry strategises. As rarely does a day go by without news that a major OEM (original equipment manufacturer) such as GM, Chrysler, Toyota, Daimler & Co. has downsized, made huge losses or gone bankrupt. As a result, many workplaces are in jeopardy and political agendas are being reviewed. Some governments have been keen to intervene

and support their automotive industries through direct financial packages (e.g. the USA) or other more creative initiatives such as the use of a 'scrapping bonus' when a new car is bought and an old one is scrapped, which was initiated by the German government, and has since been emulated by other European countries (e.g. UK).

However, many people will ask themselves with good reason if pumping billions of Euros into ailing automotive companies hides much more deeper-rooted problems in their underlying processes and business models, that have emerged from gross miss-direction of the industry over recent decades? In our opinion, the current crisis has just accelerated the need for a radical paradigm shift that began some time ago; this is a shift towards smaller and cheaper cars that can be mass customised quickly, use less fuel and can be equipped with alternative propulsion concepts (e.g. hybrid engines etc.); this requires a fundamentally new awareness of the customers and suppliers. This emerging change has temporarily created a strong imbalance within the product portfolios of the OEMs because they have not factored it into their long term production programmes. As a result, capacity problems in the upstream supply chain for producing smaller and cheaper cars will occur even more so than in the past. Whilst at the same time having over-capacities for cars in the premium segment; this will lead to bottlenecks in material supply in some areas and a loss in turnover and profit in others. Overall, these conditions paint a turbulent and uncertain future for the car industry.

Economic success for the automotive sector, like most others, is based upon a mixture of competitive advantages gained from reducing production costs or increasing innovation, which in turn should result in more attractive value propositions for end customers. This is more likely to occur if reliable production facilities are readily available and innovative thinking in and around new product and process design happens between collaborating organisations. This practice requires a paradigm shift to occur, as managers need to move away from traditional reactive management actions towards more proactive, flexible and sustainable supplier management practices driven by early and intense collaboration. This is what we term the 3rd great revolution in the automotive industry; which is characterised by moving away from adversarial ways of doing business towards mass-collaboration in a post-supply chain era.

However, this shift is difficult to achieve because the main factors emanate from the early stages of the supply process, and so effective sustainable supplier management has to be applied right at the start of the product development process, when strategic sourcing decisions and product

and process innovations are taking place. This new way of thinking requires very high levels of foresight and trust between participating organisations, which is difficult to achieve, especially in turbulent economic situations.

For instance, Audi has demonstrated that more effective group-wide capacity planning and supplier management can be achieved if their key suppliers are included in their initial planning and coordination phase of new product development. This means that potential capacity problems can be identified earlier on, resulting in better programme stability and a more economic supply of materials (Krog and Lochmahr, 2006). However, newly emerging cost cutting initiatives, which have been initiated in response to the current economic crisis, show that many automotive companies are still not focused on long term sustainable supplier management practices. For industry insiders this already indicates a fallback to the once adversarial Lopez era 15-20 years ago in which car manufacturers (e.g. the OEMs) gained significant cost savings at the expense of their suppliers which led to deep-rooted mistrust between manufacturers and suppliers.

Hence, it is vital that the integrative and collaborative aspects of automotive development are visible accounted for and measured appropriately so that companies do not continuously fall into the trap of making poor reactive decisions in response to bottleneck crises or cost-cutting tactics for short-term process improvements. We believe that a more intense collaboration between car manufacturers and their suppliers earlier in the product development process is necessary. Based on *competence* rather than *cost* issues, as well as the right proportion of value adding activities devolved towards suppliers, which will encourage overall long term time-scale reduction and greater innovation. Which in turn, may finally realise the 5-day-car vision from order to delivery (Parry and Graves, 2008), and hence lead the way towards the 3rd revolution.

However, none of the existing approaches to supplier management appears entirely adequate for managers who face the practical problems of creating and operating sustainable supplier management. The collaborative framework presented in this book aims to overcome this deficiency by supporting managers in their strategic and operative decision making process within the context of inter-organisational collaboration for sustainable supplier management.

In Chapter 2 the term collaborative economy and its meaning are introduced. We argue that many industries move away from vertical integration towards virtual integration; which not only leads to a rethinking of

the economic model of an organisation, but also to a change in focus from the organisational level to the inter-organisational level in a post-supply chain era.

In Chapter 3 the need for sustainable management of R&D projects, based on collaboration within automotive supply networks, is explained. It is shown that an increasing percentage of competitive value in the car industry is generated by suppliers through their innovative power which forces the OEMs to adopt innovative tactics for dealing with suppliers in R&D projects.

In Chapter 4 the current state of knowledge on inter-firm relationship governance is investigated from a theoretical point of view, and the topic is embedded in a wider interdisciplinary body of knowledge which includes Organisation Economics, Strategic Management, Organisation Science, Industrial Marketing and Supply Chain Management.

Chapter 5 describes the research objectives, point of departure and research approach of a detailed empirical study on inter-firm R&D collaboration conducted in the German automotive industry. A Grounded Theory Method approach was adopted using semi-structured interviews, self-administered questionnaires and focus groups. The chapter concludes with the novel findings that were gained during this three year in-depth study based on the detailed analysis and codification of the data. Findings show that current practice in the German automotive industry does not apply mechanisms and concepts for sustainable inter-firm collaboration although ironically it is actually considered necessary to achieve sustainable competitive success.

Chapter 6 introduces a novel competence based contingency framework for the sustainable governance of inter-organisational R&D relationships within the automotive industry, which is referred to as *Collaborative Enterprise Governance*. The elements of the concept are described and a step-by-step approach for its application is given to support automotive managers who may wish to practice it.

In Chapter 7 discusses the practical implications of the framework's application for sustainable supplier management. Recommendations for OEMs and suppliers are given on how to lead the 3rd revolution in the car industry in order to support the creation of a distinct European governance model that is based on partnership-focused collaborative relationships.

In the final Chapter 8 the main aspects of the previous chapters are summarised, it also explains the limitations of the novel concept, as well as ideas for future research that seem vital for an automotive industry in crisis.

Chapter 2

THE COLLABORATIVE ECONOMY

“The greatest change in corporate culture, and the way business is being conducted, may be the accelerating growth of relationships based not on ownership, but on partnership” (Drucker, 1996).

New industrial circumstances, such as hypercompetition (D’Aveni, 1994; Ilinitich *et al.*, 1996) and clockspeed (Fine, 1998), are leading to a vertical disintegration or disaggregation of companies and a stronger involvement in activities that are outside their traditional company boundaries (Gittell and Weiss, 2004; Miles and Snow, 1986). In order to adapt to the resulting changes in nature and locus of competition in a globalised ‘information age’ (Sampler, 1998) connections, i.e. strategic relationships nurtured by collaboration, with specialised companies are crucial for the ‘21st century corporation’ (Davidow and Malone, 1992) or ‘fifth generation organisations’ (Savage, 1990).¹ These ideas all endorse the increasing need for alliance between organisations. Gulati (1998) defines alliances as:

“voluntary arrangements between firms involving exchange, sharing, or co-development of products, technologies, or services” (p. 293).

Similarly, Das and Teng (2000) view alliances as:

“voluntary cooperative inter-firm agreements aimed at achieving competitive advantage for the partners” (p. 33).

¹ The underlying philosophy of work specialisation is rooted in the original work of Adam Smith (1776), and later Charles Babbage (1835) who transferred the idea from manual work to intellectual work.

As such they can be subtly distinguished from joint ventures (JVs). Kumar and Seth, (1998) define JVs as:

“independent organisations formed by the pooling of resources and sharing of equity by two or more firms”.

Thereby, partnerships, whether alliances or JVs can provide access to specific assets and resources an organisation does not possess or cannot develop itself and can also provide the opportunity to leverage its existing capabilities into more significant strategic positions via the ‘relationship capital’ generated through collaboration without further investment (Hamel, 1991; Hamel *et al.*, 1989). Partnerships are sometimes considered to be the ‘supply chain’s lifeblood’ (Liker and Choi, 2004) or ‘Marketing’s fifth ‘P’² (Dull *et al.*, 1995) and should become routine for many companies, rather than an optional choice for organisations (Hamel *et al.*, 1989), as “finding a strong partner to complement an area of weakness gives an organisation an island of stability in a turbulent world” (McFarlan and Nolan, 1995; p. 11).

Over the past years, collaboration with partners outside the traditional organisational boundaries has become a more integral part of business life, and is now amongst the most dramatic and visible manifestations of new strategies for sustainable competitive advantage at a corporate level (e.g. Dyer, 1996a and 2000; Dyer and Ouchi, 1993; Dyer and Singh, 1998; Hines, 1994; Kanter, 1994). IBM’s recent Global CEO Study (2006), conducted with 765 business leaders of 20 different industries, revealed that almost 40% of respondents consider business partners to be the most significant source of innovation; and an even higher percentage (75%) of respondents thinks that collaboration and partnering are of great importance (IBM, 2006).

Inter-organisational collaboration is justified by serving as a ‘competitive weapon’ that adds value to the organisations and their customers, e.g. improving performance, delivering savings, and allowing focus on core activities by engaging in partnerships and cooperation with various players (Drago, 1997). The combined effects of these factors have stimulated the emergence of a new business model in which competitive advantage is based on the development of relationships with partners (Hamel *et al.*, 1989; Walters, 2004). The success of the resulting webs of complex and dynamic relationships (Harland and Knight, 2001) depends on the ability of the partner companies to intermediate their internal core competencies into collaborating

² The four other marketing “P’s” are considered to be Product, Price, Place and Promotion.

companies' value streams and simultaneously strategically outsource their own peripheral activities to companies that can perform them quicker, cheaper, and more effectively (Hakansson and Snehota, 1989; Quinn and Hilmer, 1994). In other words, the peripheral activities of one company must be complemented by core competencies of a partner company within a collaborative venture.

In this context, the traditional market (buy) and hierarchy (make) dichotomy represent endpoints on a continuum of inter-organisational strategies. This could mislead managers and researchers to overlook the possibilities of intermediate alliance or partnership strategies (hybrids) as a sustainable source of competitive advantage. An alliance may combine the advantages of vertical integration and transactional contracts, whilst overcoming some of their disadvantages (Dyer and Hatch, 2004; Jarillo, 1988; Jones *et al.*, 1997; Thorelli, 1986). However, there is also a 'dark side' to close relationships, characterised by opportunistic behaviour of the partners, which are a degree of lock-in due to a lack of alternatives and predictable path dependency in relationship behaviour, etc. (Anderson and Jap, 2005; Bruner and Spekman, 1998; Rossetti and Choi, 2005). Companies need to be aware of this and should not only focus on their internal transformation activities but also on inter-organisational structures, processes and transactions, because collaboration is particularly difficult when appropriate internal processes and structures are not present (Chesbrough and Teece, 1996).

This has led to an increased focus on new value structures, beyond linear value chains towards more hub and network-based structures (Cousins and Crone, 2003). In other words, the previous relatively simple vertical business-to-business relationships, conducted at arms length, are becoming embedded in complex inter-organisation networks (Harland *et al.*, 2003). Similarly, Bowersox *et al.* (2000) and Hamel and Prahalad (1994) acknowledged that many industries move away from vertical integration toward virtual integration. This leads to the rethinking of the economic model of a traditional organisational form, from firm-centric, that is focused on transformation within firm boundaries, to network centric, that is focused on interaction across firm boundaries. This is shown in Figure 1. The 1st revolution saw a change in the scale of economies from a craft based industry to a mass-production set-up. Both of these practices still relied heavily on the single individual firm operating independently. The 2nd revolution saw a move from mass-production to mass customisation; it gave a dramatic increase in the economies of scope, which was achieved through more outsourcing and developing long chains of suppliers. The 3rd revolution has been instigated by