




GREEN SUPPLIER DEVELOPMENT

FOR MANUFACTURING INDUSTRY



**WAN HASRULNIZZAM WAN MAHMOOD
MOHD YUHAZRI YAAKOB
RAHAYU TUKIMIN
NORHAFIZA MOHAMED**

GREEN SUPPLIER DEVELOPMENT FOR MANUFACTURING INDUSTRY

**WAN HASRULNIZZAM WAN MAHMOOD
MOHD YUHAZRI YAAKOB
RAHAYU TUKIMIN
NORHAFIZA MOHAMED**

**Penerbit UTeM Press
Universiti Teknikal Malaysia Melaka
2024**

© Universiti Teknikal Malaysia Melaka
ISBN: 978-967-2792-93-2

FIRST PUBLISHED 2024

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, electronic, mechanical photocopying, recording or otherwise, without the prior permission of the Penerbit UTeM Press, Universiti Teknikal Malaysia Melaka.

Member of the Malaysian Scholarly Publishing Council (MAPIM)
Member of the Malaysian Book Publishers Association (MABOPA)
Member of Clarivate Analytics

Editor and Proof Reader
Norani Nordin

Manuscript Editor
Mohd Hafizuddin Yusof

Book Cover Designer & Typesetter
Ahmad Masmuliyadi Mohd Yusof

Published and Printed in Malaysia by
Penerbit UTeM Press

Universiti Teknikal Malaysia Melaka
Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia.
Tel: +606 270 1241 Faks: +606 270 1038



Cataloguing-in-Publication Data
Perpustakaan Negara Malaysia
A catalogue record for this book is available
from the National Library of Malaysia :

ISBN 978-967-2792-93-2

TABLE OF CONTENTS



Preface.....	xi
Acknowledgement.....	xiii
List of Abbreviations	xv
Chapter 1 Sustainable Supply Chain Management:	
An Overview	1
1.1 Evolution of Sustainable Supply Chain Management	3
1.2 The Practices of SSCM in Manufacturing Enterprises	4
1.3 Strategic Environment Practices.....	6
1.4 SSCM Key Indicators	7
1.5 Summary.....	12
Chapter 2 The Concept of Green Supplier	15
2.1 The Needs of Green Supplier.....	16
2.2 Element of Green Supplier	18
2.3 Green Supplier Criteria.....	21
2.4 Green Supplier Success Factor.....	25
2.5 Green Supplier Assessment	27
2.6 Approved Supplier List	29
2.7 Summary.....	31

Chapter 3 Supplier Performance Measure	33
3.1 Supplier Performance	33
3.2 Relationships between Buyer-Supplier Performances ..	34
3.3 Supplier Performance Measurement	36
3.4 Supplier Scorecard	44
3.5 Step-by-step Development of Supplier Scorecard	48
3.6 Integrated Supply Chain	51
3.7 Base Line Concept in Supply Chain	52
3.8 Purchasing Process.....	55
3.9 Element in Green Supplier Related to the Supplier Parameter	59
3.10 Summary.....	61
Chapter 4 Green Supplier Development	63
4.1 Concept and Definition of Supplier Development.....	66
4.2 Supplier Development Practices and Activities.....	67
4.3 Outcomes of Supplier Development Initiatives.....	75
4.4 Supplier Development Program in Malaysia.....	78
4.5 Green Manufacturing Performance	80
4.5.1 Performance Indicator in Manufacturing Sustainability	81
4.5.2 Economic Performance	84
4.5.3 Environment Performance	87
4.5.4 Social Performance	90
4.6 Manufacturing Responsiveness.....	92
4.7 Summary.....	96

Chapter 5 Fuzzy Analytic Hierarchy Green Supplier Development Process Model	99
5.1 Development of Fuzzy Analytical Hierarchy Process Model	100
5.2 Evaluating Supplier Development Practices and Activities	109
5.3 Evaluating Manufacturing Sustainability Performance.....	129
5.4 Evaluating Manufacturing Responsiveness Performance.....	139
5.5 Summary.....	152
Concluding Remarks	155
Bibliography	159
Index	167

GREEN SUPPLIER DEVELOPMENT FOR MANUFACTURING INDUSTRY

In a manufacturing environment context, the performance of suppliers is crucial and plays a vital role in the sustainability and responsive performance of manufacturing enterprises. A good relationship between manufacturers and a competent network of suppliers is required. To ensure such relationship maintained, manufacturing enterprises may engage through the green supplier development program. There is an extensive number of supplier development practices and activities, particularly that concern with the sustainability and responsiveness aspect involved towards sustainable supply chain management. The book will be beneficial to the practitioners as it will guide in seeking the opportunity to implement an green supplier development program. This will enhance the capabilities of suppliers who contribute to the movement of the supply chain and eventually will result in the greater performance of manufacturing sustainability and responsiveness.



WAN HASRULNIZZAM WAN MAHMOOD, PhD, has just over 20 years of working experience manufacturing industry as a practitioner, trainer, consultant, and researcher. He is being a professional technologist for manufacturing and industrial technology under the Malaysian Board of Technologists (MBOT) and a chartered member of The Chartered Institute of Logistics & Transport Malaysia (CMILT), has various publications to his name in the fields of the lean manufacturing, supply chain management, sustainability development, quality and productivity improvement.



MOHD YUHAZRI YAAKOB, serves more than 15 years in academic and industry. He received his PhD from National Defence University of Malaysia in Mechanical Engineering (specialized in green material). He also a Chartered Engineer (CEng) and Professional Engineer (PE/Ir.) from Institution of Mechanical Engineers (IMEchE/BC) United Kingdom and Board of Engineers Malaysia (BEM) respectively.



RAHAYU TUKIMIN, PhD, has almost 10 years of working experience in the manufacturing industry which is directly involved in new product and supplier development. She is a Professional Technologist (Malaysian Board of Technologists - MBOT) and also a member of the Board of Engineer Malaysia (BEM) currently is a senior lecturer for Majlis Amanah Rakyat (MARA).



NORHAFIZA MOHAMAD, is a vocational training officer at the Kolej Kemahiran Tinggi MARA, Balik Pulau, Penang, Malaysia. She holds a PhD in Manufacturing Engineering and is a member of the Board of Engineers Malaysia (BEM). She actively published articles on supply chain management, operation strategy, and supplier development which mainly focus on improving green sustainability in manufacturing.



PENERBIT
UTeM
Press

Website : <https://penerbit.utem.edu.my>
Books Online : <https://utembooks.utem.edu.my>
Email : penerbit@utem.edu.my

ISSN 978-967-2792-93-2



05000

9 789672 1792932