Web-Based Green Products Life Cycle Management Systems:
Reverse Supply Chain Utilization

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Table of Contents

Section III
Supply Chain and Logistics Management

Section IV
Web-Based Management Technology

Detailed Table of Contents

Chapter III discusses the life cycle management from the sustainability viewpoint, and proposes a useful strategy to reach the global sustainability based on the continuous evaluation of numerous complex social, ecological, and economic factors. Thus, the article not only brings about the issues of sustainability in the framework of life cycle management, but also provides an approach to arrive at it with detailed illustration.

Chapter IV discusses the environmental criteria which should be considered in green product management and presents a method of environment impact assessment from MCDM approach. Therefore, not only can the environmental criteria be accessed from both the forward and reverse supply chains, but also the weights of their importance can be measured. A comprehensive case study of *a vacuum cleaner* is presented for illustration.

Chapter V is also a study which integrates the sustainability into life cycle management, while taking a system viewpoint toward environmental performance assessment. In particular, the chapter highlights the environmental issues in the framework of overall economic, geographical, and legislative factors so that the methodologies developed along this line have guidelines to reach system optimization.

Chapter VI introduces the concept of eco-efficiency, and in particular, provides two cases of European small and medium-sized enterprises for detailed illustration and demonstration. The article emphasizes the diffusion-oriented policy so that reducing environmental burden can be achieved by guiding the companies to improve their resource productivity and add production values.

Section II
Demand and Service Chain Management

Chapter VII

Chapter VII brings about a different and interesting view toward sustainability. Realizing the importance of marketing demand and customer response for green product development, this chapter presents a developed management game and concludes some propositions on the trust and sustainability in supply chains. The detailed description of the design of this game as well as the roles involved in this game along the overall supply chain have been provided, which facilitates practical implement. Also, further research along this line has been identified with a list of questions to be answered.

Chapter VIII

Chapter VIII presents a methodology of identifying target customers of green products for market expansion purposes. Based on a data mining technique, the customers can be classified according to their preference, purchasing behaviour, and demographical factors. Then, by a developed bi-objective mathematical model, pricing strategies can be developed from win-win perspectives, which is beneficial for both the producers and the customers. The rigors analysis provides a tractable approach for market analysis and pricing development.

Chapter IX

Chapter IX tackles a different but important issue related to green supply chain management, the facility location problem. Regarding the environmental impact, the issue is tackled by considering the undesirable

locations. Using fuzzy TOPSIS approach, the design of a group decision process is presented to find the criteria with their weights of undesirability. Measurement of conflict and vagueness among criteria and decision makers is presented with detailed illustration and numerical examples.

Chapter X presents an overall system for green service chain management, namely sustainable product service systems (S-PSS). By taking the factors of sustainability, resource productivity, and eco-efficiency into account, the article shows how the developing countries, in particular, can apply the system to trade off among these factors. Many practical cases are presented which provide significant references for both concept clarification and practical applications.

Chapter XI discusses the energy issues, in particular, green electricity and its renewability from historical development. Based on the literature review and the customer response, the article concludes a comprehensive approach toward green electricity utilization by identifying its development boundaries and past mistakes.

Section III
Supply Chain and Logistics Management

Chapter XII opens another door toward green supply chain and logistics management. A mathematical model in the form of a 0-1 integer linear program is developed for close-loop logistics of which optimal solution for determining the facilities of manufactures, distribution centers, and dismantlers can be found with minimum cost. Sensitivity analyses on the recovery rate and land-filling rate on the reverse logistics have been carried out for managerial purposes.