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Green Supply Chain Management and Operational Performance: A Case Study at 5-Star Hotel in Bali

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Abstract. The purpose of this study is to examine the practices of environmentally friendly management carried out by the hospitality industry in greening the supply chain management and how these practices influence the operational performance. This is a quantitative and descriptive research with the case study approach used to validate the research framework. Data were purposively selected from 105 suppliers of food, beverage, chemicals, and Spa through observation, interviews, and questionnaires. The obtained data were analyzed using the Structural Equation Modeling and AMOS version 23, a data processing instrument. The results showed that there is a positive relationship between environmentally friendly supply chain practices and operational competence. The results also found that the adoption of environmentally friendly practices in supply chain management has a positive effect on operational performance. Green practices can be a key driver for raising environmental awareness for stakeholders and needs to be a priority in the tourism sector.

Keywords. Management, Green Supply Chain Management, Environment, Performance.

1. Introduction

The hospitality industry is defined as a broad category of fields within the tertiary industry, however, it affects the environment [1]. Companies play an integral role in the prevention of environmental impact, and based on that, customers tend to purchase eco-friendly products and demand that these establishments go green [2], [3], [4], and [5]. Environmental issues that occur due to the flow of materials through the supply chain is usually curbed with supplier management activities. They reduce waste, comply with ISO 14001, clean-up programs, eco

design, life cycle evaluation, reverse logistics, manufacturing, and reduce transportation costs [6]. Aside from ensuring the flow of materials through environmentally friendly practices, companies also need to increase the sustainability of basic supplies through two options: collaborating with suppliers to guarantee green practices or working with existing ones.

According to Abdulrahman [7], sustainability simply means managing the present resources without compromising the ability of future generations to meet their needs as well as having a negative impact on the environment, as generally stated by the law. Green supply chains aim at limiting waste in industrial systems to conserve energy and prevent the emission of hazardous materials into the environment [8]. It identifies the disproportionate environmental impact of the supply chain process in an organization. Green supply chain management (GSCM) is a summary of green purchasing, manufacturing, packaging, distribution, and marketing. The essence of its implementation is to eliminate or minimize waste either in the form of energy, emissions, hazardous chemicals, or solid wastes [9]. In addition to the rapid changes in the global manufacturing scenario, environmental and social issues are significant in the management of any business. GSCM is an approach to improve the performance of processes and products in accordance with environmentally friendly regulatory requirements [10].

The hospitality industry, which is considered as a tertiary industry, has an impact on environmental sustainability. It plays an essential role in the development of tourism in Bali. This industry is a potential sector that supports agriculture and food. Presently, numerous hotels are implementing environmentally friendly practices in their supply chain management, either due to government regulations or pressure from stakeholders. Therefore, there is a need to take necessary action to reduce the environmental impacts of the hospitality industry. Customers have started searching for environmentally friendly products to purchase and have demanded that companies go green. This is because they play an integral role in the prevention of environmental impacts by using green supply chain management as an eco-friendly approach.

Based on the description and support of previous studies' results, some problems are reported as follows (1) the extent or degree of environmentally friendly management practices carried out by the hospitality industry in accordance with operational performance. (2) to ascertain whether functional competence mediates the relationship between green supply chain management and various competitive priorities.

2. Literature Review

Presently, supply chain systems used in the hospitality industry tend to establish long term relationships with suppliers and completely trust them. A supplier is a party that provides input, in the form of goods needed in production activities [11]. Meanwhile, going green aims to help companies achieve a balance between economic and environmental performance, reduce the impact of products and services on the environment, and foster its image. This aims to reduce the negative impact on the environment [12] and [13].

2.1 Supply Chain Sustainability

Sustainability is not just about the environment or green activities. It refers to managing the present resources without compromising the ability of future generations to meet their needs. It regards products as disposable instruments that affect people in the future. Subsequently, the community has several shared assets such as air, sol, sea, forest, and mountains. In a bid to increase profitability as well as satisfy consumers, companies destroy these common assets. Sustainability emphasizes on issues that significantly affect future lives. Therefore, tenable decisions in supply chain management relate to more variables and various objectives [14].

Organizational sustainability consists of three aspects, namely the natural environment, society, and economic performance, besides from other characteristics such as transparency, culture, strategy, and risk management. Sustainability is an essential concept in operations and supply chain management. According to Carter & Rogers [15], sustainable supply chain management is defined as a strategic and transparent integration used to realize the social, environmental, and economic goals between organizations for long-term economic performance.

2.2 Green Supply Chain

Based on several literatures, the concept of green supply chain management has different definitions. This chain consists of all parties involved in meeting consumers' requests, such as suppliers, transporters, warehouses, and retailers, including the customers themselves [16]. Green supply chain management practices ensure that organizations assess their suppliers' environmental performance by demanding that they undertake measures that guarantee the environmental quality of their products and evaluate the cost of waste in their operational systems [17]. The definition of green supply chain ranges from green purchasing to integrated supply chain flow from supplier to manufacturer, customer, and reverse logistics. Zhu & Sarkis [18] stated that the reverse logistics viewpoint and green supply chain management includes recycling and remanufacturing.

Green supply chain management activities include green design, purchasing, manufacturing or processing, production, marketing, recycling, and sourcing materials [19]. However, comparing the definitions of the green supply chain and its management, it is evident that it involves integrating the manufacturing process and distribution to customers. Collaboration in the manufacturing of new green products, using preventive pollution technologies, reduces waste during energy usage activities.

2.3 Green Supply Chain Management and Competitive Advantage

The relationship between green supply chain practices and performance is analyzed from different aspects. Consequently, the procurement department plays a role in the competitive advantage aspect. The quality of goods produced by a manufacturing company is largely determined by the procurement department's ability to obtain quality raw materials and components or be a bridge in fostering existing suppliers with various improvement programs. In the context of supply chain management, realizing that all parties, including suppliers, determine quality is essential.

Subsequently, time is one crucial factor in determining the success or failure of the supply chain in a competitive market. Therefore, there is a need for the procurement department to certainly choose suppliers that can convey goods within a short period, without having to sacrifice quality and increase prices [11].

3. Conceptual Framework of Study and Hypotheses

3.1 Conceptual Framework of the Study

This study is focused on green supply chain management and operational performance. The following constructs were tested from the dimensions of the SCM model, as shown in Figures 1 and 2.

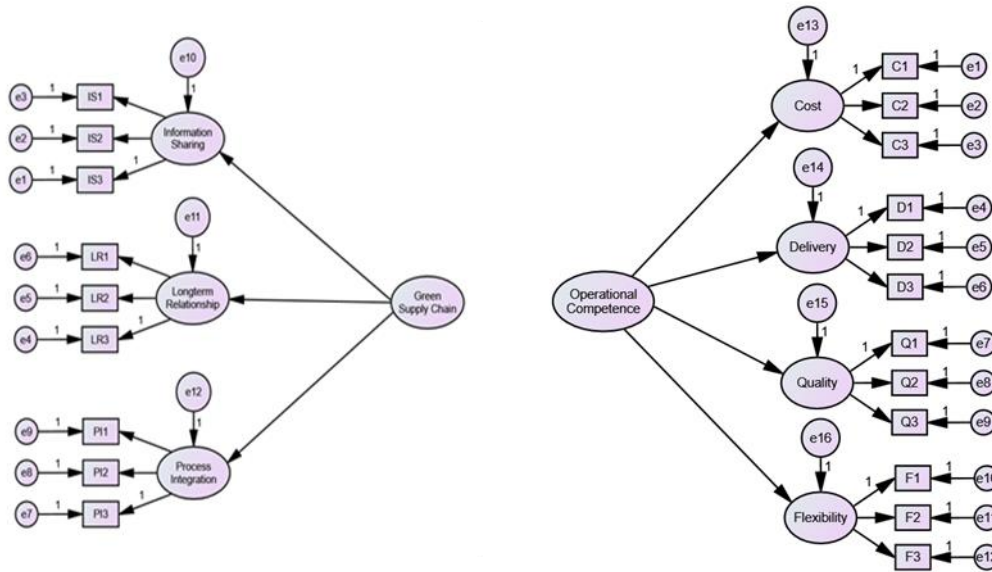


Figure 1: Conceptual Framework of the Study, first-order adopted from Miguel [20].

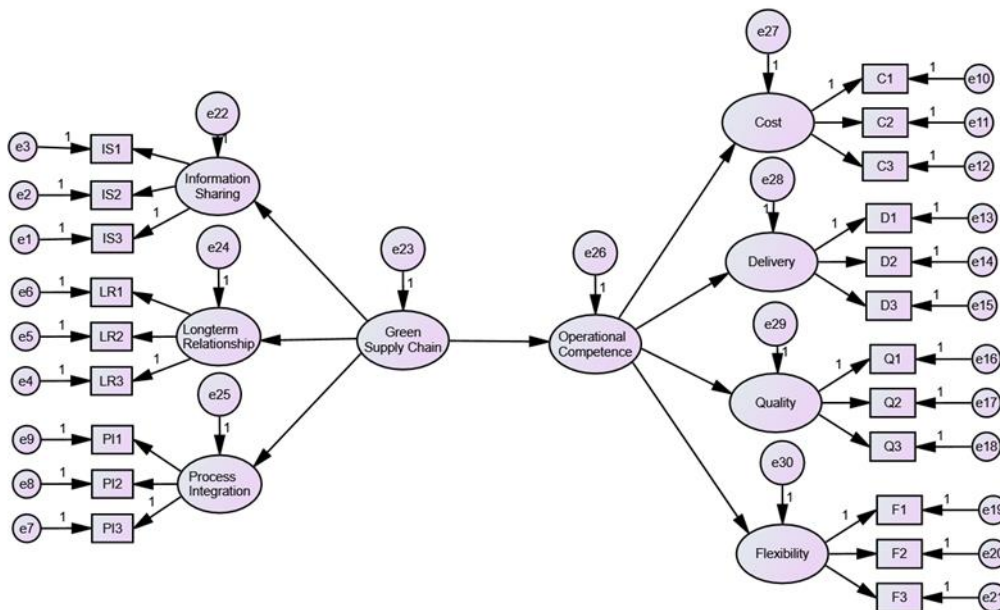


Figure 2: Conceptual Framework of the Study for Analysis, first order and second order

3.2 Hypotheses

Hypothesis 1: Green supply chain management is positively related to operational performance.
Hypothesis 2: Operational competence mediates the relationship between green supply chain management and different competitive priorities.

4. Research Methodology

Data collection was based on responses from 105 suppliers or respondents that deliver products and services such as room supplies, food & beverage, chemical, and Spa to five-star hotels. This was determined based on purposive sampling from 2019 to the middle of March 2020. The Green Supply Chain Management (GSCM) model adopted from Miguel and Brito [20] was

used as a theoretical framework for this study, and AMOS version 23 is a data processing instrument applied for further analysis.

The process of data collection is carried out by observation, interviews, and questionnaires of the selected suppliers. Constructs relating to GSCM are measured by a five-point Likert scale, ranging from strongly disagree to agree strongly. In accordance with the operational performance scales, the respondents were asked to evaluate their performance compared to their competitors, with a five-point scale ranging from very poor to very good.

5. Result and Discussion

The measurement results of the GSCM construct are shown in Figure 3.

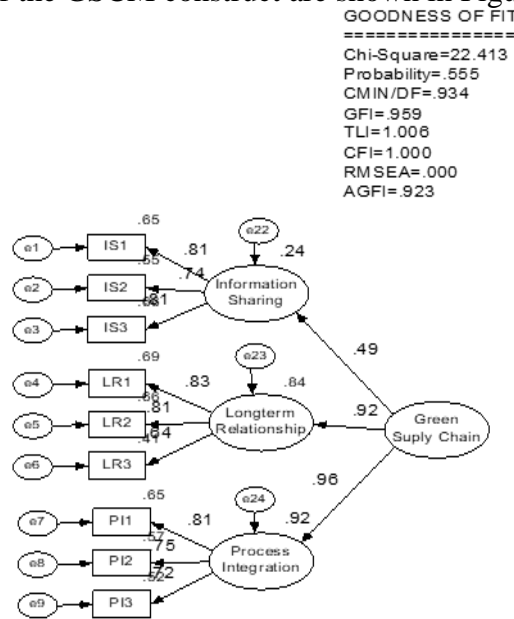


Figure 3. The measurement results of the GSCM construct

Figure 3 shows that the results from the measurements of the GSCM construct meet the goodness of fit test criteria therefore, they are fit. The estimated number of GSCM in each successive dimension is 0.49. The construct is formed by the information sharing dimension, 0.92 and 0.96 from the long-term relationship, and process integration dimensions.

The measurement results of the Operational Competence construct are shown in Figure 4.

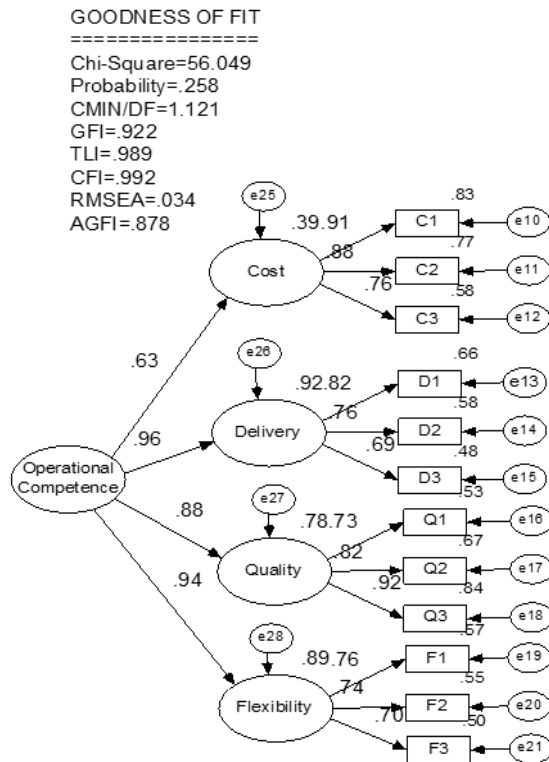


Figure 4. The measurement results of the Operational Competence construct

Figure 4 shows that the measurement results of Operational Competence (OC) construct meet the goodness of fit test criteria, therefore, they are fit. The estimated number of OC in each successive dimension is 0.63. The construct is formed by the cost dimension, 0.96, 0.88, and 0.94 from the delivery, quality, and flexibility dimensions.

Structural Model Estimation results are presented in Figure 5.

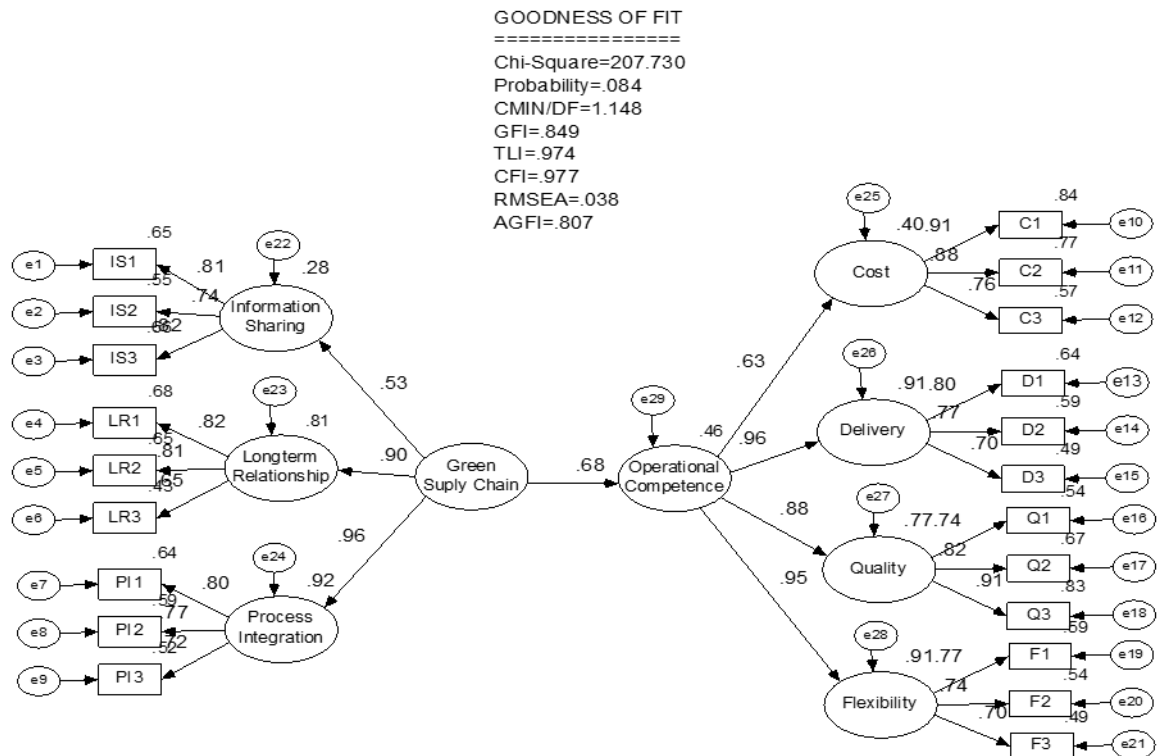


Figure 5. Structural Equation Model Estimation Results

Furthermore, the results from the structural model Goodness of fit index measurement are shown in Table 1.

Table 1. Fit index for the measurement and structural equations models

Goodness of fit index	Cut-off Value*	GSCM measurement model	O C measurement model	SEM-Result
χ^2 -chi-square	Expected to be small	22.413	56.049	207.730
Significant Probability	≥ 0.05	0.555	0.258	0.084
RMSEA	≤ 0.08	0.000	0.034	0.038
GFI	≥ 0.90	0.959	0.922	0.849
AGFI	≥ 0.90	0.923	0.878	0.807
CMIN/DF	≤ 2.0	0.934	1.121	1.148
TLI	≥ 0.95	1.006	0.989	0.974
CFI	≥ 0.95	1.000	0.992	0.977

*[21]

Source: processed primary data, 2020

According to figure 5 and table 1, the estimation results of the structural models GSCM, OC, and SEM met the goodness of fit test at 0.959, 0.922, and 0.849. The AGFI value is more significant than 0.8, while others are improved to meet the model fit requirements [22].

Table 2. Results of Test Validity and Reliability of Constructs

Construct	Dimension	Variable	Loading Factor	Reliability
Green Supply Chain Management	Information Sharing	IS1	0.81	0.83
		IS2	0.74	
		IS3	0.81	
	Longterm Relationship	LR1	0.83	0.81
		LR2	0.81	
		LR3	0.64	
	Process Integration	PI1	0.81	0.81
		PI2	0.75	
		PI3	0.72	
Operational Competence	Cost	C1	0.91	0.89
		C2	0.88	
		C3	0.76	
	Delivery	D1	0.82	0.80
		D2	0.76	
		D3	0.69	
	Quality	Q1	0.73	0.86
		Q2	0.82	
		Q3	0.92	
	Flexibility	F1	0.76	0.78
		F2	0.74	
		F3	0.71	

Source: processed primary data, 2020

Table 2 shows that the loading factor and reliability of the green supply chain management and operational competence dimensions range from 0.64 to 0.92. Hypotheses 1 affirm that a positive relationship exists between GSCM implementation and Operational Performance in terms of information sharing, long-term relationship, process integration, cost, delivery, quality, and flexibility. These are the basis for hypotheses H1, and it indicates the practical relevance of GSCM to performance variability. In addition, 92% of the observed variance during process integration is illustrated by GSCM, and the operational competence analyzes 92.8% of the observed variance in the delivery performance.

Based on a managerial perspective, GSCM is a source of competitive advantage, it reduces costs, improves delivery, quality, and flexibility simultaneously. In accordance with the prices, the results from this study are consistent with the research carried out by Amril [23], which stated that they are based on product quality in order not for consumers to feel disadvantaged by the costs incurred. Hypotheses 2 asserted the existence of construct mediating the relationship between GSCM and the competing priorities. This study's results support the findings made by Miguel & Brito [20]. GSCM has a positive effect on all competitive priorities, meaning the more competent the company is, the higher its performance in all the listed dimensions (cost, delivery, quality, and flexibility). It also positively affects operational competence development, as shown by the standardized load of 0.68 between these two constructs (p -value < 0.001).

6. Conclusion

This study accentuates the fact that the GSCM construct is formed by information sharing, long-term relationships, and process integration dimensions. This is verified by obtaining a loading factor greater than 0.05, which is one of the conditions for a representative construct. On the contrary, the indicators of operational performance are also shown to be formed by the construct of cost, delivery, quality, and flexibility with loading factors greater than 0.05. This study discovered that GSCM is positively related to operational performance, including all the competing priorities. Based on a managerial perspective, findings reinforced the importance of pursuing GSCM in emerging economies because it is a source of competitive advantage. Managers need to recognize the pursuit of competitiveness in one dimension. For example, in this study, it is the delivery with the biggest loading factor to serve as an inspiration for the management of 5-stars in Bali.

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