SUPPLY CHAIN INTEGRATION OF THE HEALTH SUPPLEMENT INDUSTRY IN MALAYSIA: A CASE STUDY OF BIOALPHA HOLDINGS BERHAD

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ABSTRACT

This thesis explores the effects of Supply Chain Integration (SCI) on operational and financial performance within Malaysia's health supplement industry, focusing specifically on Bioalpha Holdings Berhad. The study addresses the critical issue of how integrated supply chain processes contribute to business efficiency and strategic positioning in a rapidly evolving market environment. Employing a qualitative case study approach, the research included in-depth interviews and observations with executives and supply chain professionals at Bioalpha. These interviews were analyzed using ATLAS.ti to systematically identify themes related to the influence of SCI on business operations. The research reveals that SCI significantly enhances operational efficiencies, reduces operational costs, and heightens market responsiveness, leading to improved financial performance and a strengthened competitive position. The study underscores that strategic supply chain management, supported by detailed data analysis through ATLAS.ti, is crucial for firms operating in volatile markets and facing intense competition. The thesis contributes to the field of supply chain management by elucidating the benefits of integration strategies in enhancing operational and financial outcomes. In an attempt to recommendation to improve supply chain integration capability, and based on findings, the researcher has proposed PrICE model, with an acronym for Brand Positioning, Integrated Information and Capability Expansion. This model represents the novelty of the study. The findings provide valuable insights for industry practitioners seeking to utilize SCI for competitive advantage and for researchers interested in the intersections of supply chain practices and business performance.

Keywords: Supply chain integration (SCI), operational performance, financial performance, health supplement

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfilment of the requirements for the degree of Doctor of Business Administration

The student has been supervised by: **Dr. Swa Lee Lee** and co-supervised by: **Dr. Lawrence Chu Jan Tow**

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This thesis was submitted to Asia e University and is accepted as fulfilment of the requirements for the degree of Doctor of Philosophy.

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Associate Professor Dr. Oo Yu Hock
Asia e University
Chairman, Examination Committee
8th July 2024

DECLARATION

I hereby declare that the thesis submitted in fulfilment of the Doctor of Business Administration degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

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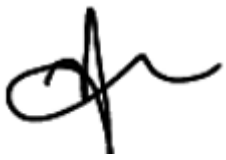

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LIST OF ABBREVIATION

ROI	Return On Investment
ROS	Return On Sales
SCI	Supply Chain Integration
SSC	Smart Supply Chain
VCM	Value Chain Model

CHAPTER 1

INTRODUCTION

1.0 Chapter Overview

Consumer health items like vitamins and nutritional supplements are becoming more and more popular among Malaysians, who believe that taking supplements may help them live healthie and happier lives. Given the large variety of supplements available and the presence of well-known worldwide brand names, Malaysian consumers are truly spoiled with choices when it comes to health supplements (Yap & Wan, 2016). This has intensified the rivalry among the players within the market. Because of severe competition, rapid changes in customer preferences, globalisation, shorter product life cycles, and unpredictable client satisfaction, the present business climate is more complicated than ever. Businesses are increasingly under pressure to address these concerns properly. Furthermore, the Covid-19 pandemic (Zhou & Wang, 2021) and the Russia-Ukraine war (Jagtap et al., 2022) have had a significant impact on the global supply chain.

The hunt for better strategies to acquire an advantage in order to stay relevant or outsmart the competitors is evolving due to the rising degree of competition in the global economy. In order to improve supply chain performance, lower costs, and shorten lead times, supply chain managers and professionals have begun to consider integration as a potential technique for developing strategic alliances (Pearcy et al., 2008). Supply chain management (SCM) improves enterprise performance by integrating internal functions (development, purchasing, manufacturing, etc.) and external functions (supplier management, customer management, etc.) of supply chain (Awasthi & Grzybowska, 2014).

The capacity to adapt, reconfigure, renew, and create resources and skills to handle internal and external elements in a changing environment is referred to as dynamic capability (Teece et al., 1997; Li et al., 2006). Supply chain agility refers to the capacity to enhance efficiency within the supply chain network in order to respond quickly to possible suppliers and consumers in a changing environment (Chen, 2019). Furthermore, supply chain flexibility is a process that enhances the capacity of internal and external entities to quickly build alternatives and better systems for reacting to unforeseen market scenarios (Shekarian et al., 2020). As a result, Supply Chain Integration theory has grown in importance in recent years, both in academia and in practise (Derakhti et al., 2023; Danese et al., 2020).

1.1 Background of Study

Supply Chain Integration is one of the solutions that has been widely advocated and implemented for effective business management in disruptive environments (Huo, 2012; Siagian et al., 2021). Supply Chain Integration develops ability to adapt rapidly and flexibly to environmental volatility (Ankaya, 2020) and improves business performance (Hendijani & Saeidi Saei, 2020) through establishing strong connections with supply chain partners. Supply Chain Integration can also serve as an underlying facilitator of resilience and robustness, two crucial dynamic characteristics required for a firm's performance in turbulent times (Gori & Castellini, 2023; El Baz & Ruel, 2021; Piprani et al., 2020; Chowdhury & Quaddus, 2017; Zhang, 2010). Supply Chain Integration is one of the practises that has been widely employed in supply chain management (Mackelprang et al., 2014). It refers to the strategic coordination and collaboration of supply chain members to efficiently and effectively manage processes both within and outside the company with its external partners (Oubrahim et al., 2023; Khan et al., 2020; Pakurar et al., 2019).

Supply Chain Integration has greatly increased enterprises' competitive edge. It has been strongly suggested as a vital technique for successful supply chain management (Perales-Prieto & Martin-Pena, 2023; Mackelprang et al., 2014; Yu et al., 2013). The integration can help to simplify and enhance operations like as material procurement, product manufacturing, innovation, and new product development. Supply Chain Integration has the potential to improve organisational performance for enterprises involved in supply networks. Supply Chain Integration is defined by Flynn et al. (2010) as "the level of a manufacturer's strategic collaboration with its supply chain partners and collaborative management of intra- and inter-organization processes.

To deliver the greatest value to the client at the lowest possible cost and with the greatest possible speed, it is important to create effective and efficient flows of information, money, and decisions (Salamah et al., 2024; Flynn et al., 2010) In order to consolidate their supply chain as a whole and increase long-term performance, enterprises can use supply chain integration to reorganize their resources and capabilities both internally and externally (Horvath, 2001; Huo, 2012). According to numerous studies Chen et al. (2020), Flynn et al. (2010), Frohlich and Westbrook (2001), Vickery et al. (2003), Zailani and Rajagopal (2005), and Zhao et al. (2013) mentioned Supply Chain Integration is essential for achieving performance and competitive advantages. Even though organisations attempt supply chain integration in the expectation of improving their performance, literature shows that there is discrepancy in the findings on the integration-performance link (Flynn et al., 2010; Huo, 2012; Zhao et al., 2013). There is debate on whether the relationship between Supply Chain Integration and business success is universal or dependent on external circumstances or corporate strategy.

The universalist position proposes that certain forms of Supply Chain Integration are more beneficial than others in boosting business performance (Ristyawan et al., 2023; Frohlich & Westbrook, 2001; Flynn et al., 2010; Huo, 2012). According to Flynn et al. (2010) from a universalist viewpoint, internal integration is more closely related to performance than supplier and customer integration. The contingent viewpoint, on the other hand, posits that the degree of contingent factors impacts the efficiency of Supply Chain Integration categories (Wong et al., 2011). Even though most studies in the area of supply chain integration concluded that it improves firm performance, it is critical to adequately appreciate the appropriate business environmental factors in order to clearly understand the relationship between supply chain integration and firm performance. This is required because the business environment is always changing, exposing supply chains to various types of risks and disruptions (Tang, 2006) which can have an impact on supply chain performance and overall firm performance.

Strategic management experts have identified cost leadership, distinctiveness, and market focus as scopes of competitive strategies relevant to Supply Chain Integration (Porter, 1990; Miller, 1988). Porter (1980) developed these three general methods (cost leadership, differentiation, and focus) for the application of a firm, essentially at the level of the business unit, to produce benefits greater than the average performance in business. According to Porter (1980) the three recommended general competitive strategies may be employed effectively to affect a firm's power in counteracting challenges in the business environment. In essence, the link between Supply Chain Integration and Performance is dependent on the strategy used by individual enterprises to compete in the economic environment.

1.2 Statement of the Problem

For the past two decades, Supply Chain Integration has become one of the hottest topics in the operations management field. Studies on Supply Chain Integration have been published in many top-tier journals (Machado et al., 2024; Perales-Prieto & Martín-Peña, 2023; Flynn et al., 2010; Perols et al., 2013; Wiengarten et al., 2014). Numerous firms, such as P&G and Wal-Mart, have gained competitive advantages through implementing Supply Chain Integration. As the environment becomes more uncertain and the competition among supply chains (SCs) is much fiercer, firms are increasingly relying on Supply Chain Integration to acquire external information and coordinate supply chain resources (Yang et al., 2021).

The majority of past research has been on the effects of various forms of Supply Chain Integration (e.g., internal and external integration) on business performance (Saeed et al., 2020; Huo et al, 2014). A classification of Supply Chain Integration in this manner is too vague to convey the essence of the efficacy of diverse Supply Chain Integration approaches. This categorisation could be one of the primary causes of discrepancies in prior Supply Chain Integration and company performance research.

Iyer et al. (2009) and Wong et al. (2011) for example, discovered that environmental uncertainty had varied effects on the efficacy of internal and external integration. As a result, it is required to investigate the influence of Supply Chain Integration on firm performance in greater depth, as well as its effectiveness in increasing firm performance under diverse competitive strategies (Zeng et al., 2023; Huo et al., 2014). The necessity to build competitive capabilities to reduce the constant risk of supply chain disruptions from numerous variables, such as pandemics, economic uncertainty, environmental and natural disasters, has become even more critical to the Bioalpha's survival. It was envisaged that by enabling its businesses to

effectively manage their supply chains, reduce risks, and adjust to shifting market conditions, supply chain integration was essential for fostering self-reliance and self-sustainability. Through supply chain integration, Bioalpha businesses could become less reliant on outside partners or suppliers. This lessens the possibility of disruptions brought on by outside variables like natural disasters, geopolitical conflicts, or changes in the economy. Through integration, businesses may more effectively manage the whole supply chain process, from locating raw materials to shipping the finished product to clients. They were able to quickly adapt to changes in the market or in demand due to this control, which also helps them manage inventories and streamline procedures.

Amidst these financial difficulties, Bioalpha experienced a notable financial reverse, suffering a loss of about RM 2 million (Bioalpha, 2021). Bioalpha used this financial setback as a wake-up call, which led to a strategic reorganisation of its supply chain management practices. After realising how crucial visibility and agility were to reducing these risks, Bioalpha made the decision to put in place a thorough supply chain integration system. The objectives of this system are to improve real-time inventory and shipment tracking, improve supplier collaboration, and streamline operations. Through the utilisation of cutting-edge technologies and data analytics, Bioalpha aims to construct a more resilient supply chain that can withstand potential interruptions in the future, protecting its financial stability and guaranteeing uninterrupted client service.

Similar study environments are rare; most studies focus on the impact of technology from the standpoint of supply chain management (Hussein Zolait et al., 2010) and the influence of information on supply chain integration (Tan & Manjit, 2022). Businesses may become interested in improving their skills in order to obtain a

competitive advantage as a result of all these challenges. Henceforth, there is a need to investigate the impact of Supply Chain Integration capabilities on company performance, in particular Bioalpha, under various competitive strategies, notably in the health supplement market.

Porter (1980) also advocated for the identification and strategic exploitation of linkages inside a firm's value chain (i.e., horizontal linkages) as well as linkages between the firm's value chain and the value chains of its suppliers and consumers (i.e., vertical linkages). The basic objective of supply chain integration is to optimize linkages between value activities, particularly vertical linkages. Superior performance should result from such integration (e.g., Perales-Prieto & Martín-Peña, 2023; Flynn et al., 2010; Tan et al., 1998; Frohlich & Westbrook, 2001). A growing body of literature suggests that the greater the degree of supply chain integration, the better a firm performs (see, for example, performance; Stevens, 1989; Lee et al., 1997; Metters, 1997; Narasimhan & Jayaram, 1998; Lummus et al., 1998; Anderson & Katz, 1998; Hines et al., 1998; Johnson, 1999; Frohlich & Westbrook, 2001).

According to Eloranta and Hameri (1991) most empirical research has focused on either upstream or downstream integration to the exclusion of the other. However, Ristyawan et al. (2023) and Frohlich and Westbrook (2001) recently investigated simultaneous upstream and downstream integration. However, there is no known study that being conducted to assess impact of Supply Chain Integration within the healthcare sector (Sarmiento & Karwowski, 2024). This forms the second objective for this study. Organisations must concentrate on boosting supply chain agility and flexibility in order to meet these goals (Chan et al., 2017). Additionally, supply chain flexibility is a process that improves internal and external entities' capacity to develop better options and systems more quickly in response to unforeseen market scenarios

(Machado et al., 2024; Shekarian et al., 2020). Additionally, this research may offer some insight into how Supply Chain Integration affects the company's performance and how it might give them a competitive edge through differentiation and cost leadership. With this information, the business is better equipped to deal with internal and external demand as well as market conditions that are unpredictable.

Bioalpha wants to provide its customers with complete solutions, from product conception and design to product manufacture. Being a seasoned producer of health supplements with extensive technical knowledge, Bioalpha's R&D experience enables them to create cutting-edge, successful products that are grounded in research and made using the best materials and most up-to-date production methods. As far as the researcher is aware, no other Malaysian company with a comparable setup and collection of competencies exists; other businesses concentrate on either upstream or downstream capabilities. This idea provided another justification for selecting Bioalpha as the primary case for investigation. Using Bioalpha Holdings Berhad as the case study, this research aimed to fill a vacuum in the literature, particularly on the topic of Supply Chain Integration in the Malaysian health supplement business.

1.3 Research Objectives

This research was conducted to study the process of Supply Chain Integration (SCI) as practiced by Bioalpha and how SCI impacted the operational performance and financial performance of the company which ultimately allowed them to enjoy competitive advantages in terms of differentiation strategy and cost-leadership strategy in the health supplement industry. Specifically, this research attempted to achieve the following objectives:

i. To investigate how Supply Chain Integration affected Bioalpha's operational performance in the health supplement industry.

ii. To investigate how Supply Chain Integration affected Bioalpha's financial performance in the health supplement industry.

iii. To assess how Supply Chain Integration affected Bioalpha's differentiation strategy in the health supplement industry.

iv. To assess how Supply Chain Integration affected Bioalpha's cost leadership strategy in the health supplement industry.

1.4 Research Questions

This study seeks answers to the following research questions:

i How did Supply Chain Integration affect the operation performance of Bioalpha in the health supplement industry?

ii How did Supply Chain Integration affect the financial performance of Bioalpha in the health supplement industry?

iii How did Supply Chain Integration affect Bioalpha's differentiation strategy in the health supplement industry?

iv How did Supply Chain Integration affect Bioalpha's cost leadership strategy in the health supplement industry?.

Table 1.1: **Alignment of statement of problem with research objectives and research questions**

Statement of Problem	Research Objectives	Research Questions
(1). There is a need to investigate the impact of Supply Chain Integration capabilities on company performance.	(1) To investigate how Supply Chain Integration affected Bioalpha's operational performance in the health supplement industry.	(1). How did Supply Chain Integration affect the operation performance of Bioalpha in the health supplement industry?
(2). Under various competitive strategies, notably in the health supplement market; there is no known study that being conducted to assess impact of Supply Chain Integration within the healthcare sector (Sarmiento & Karwowski (2024).	(2) To investigate how did Supply Chain Integration influence Bioalpha's financial performance in the health supplement industry.	(2). How did Supply Chain Integration affect the financial performance of Bioalpha in the health supplement industry?
(3). There is limited research being done similar to this research environment conditions, where most research has been focusing on influence of information on supply chain integration (Tan & Manjit, 2022) and technology from the perspective of supply chain management (Hussein Zolait et al., 2020). All of these difficulties may pique the attention of businesses in increasing their skills in order to gain a competitive advantage. (4) A qualitative research utilising the case study approach has been employed to examine a social unit, in this case Bioalpha for gathering data in the setting of real-world occurrences (Yin, 2014, 2009; Creswell, 2014).	(3) To assess how did Supply Chain Integration influence Bioalpha's differentiation strategy in the health supplement industry?	(3). How did Supply Chain Integration affect Bioalpha's differentiation strategy in the health supplement industry?
	(4) To assess how Supply Chain Integration affected Bioalpha's cost leadership strategy in the health supplement industry	(4). How did Supply Chain Integration affect Bioalpha's cost leadership strategy in the health supplement industry?

1.5 Significance of the Study

This research is intended to contribute to the paucity of literature especially on the Supply Chain Integration in health supplement industry in Malaysia, using Bioalpha Holdings Berhad as the case study. There is limited research being done similar to this research environment conditions, where most research is focusing on influence of information on supply chain integration (Tan & Manjit, 2022) and technology from the perspective of supply chain management (Hussein Zolait et al., 2010). All of these difficulties may pique the attention of businesses in increasing their skills in order to gain a competitive advantage.

Besides that, with the constant risk of supply chain disruptions from various factors such as pandemic, economic uncertainty, environmental and natural disasters, the need to develop the competitive capabilities to minimise these factors have become even crucial to the survival of the company. Furthermore, the Covid-19 pandemic (Salamah et al., 2024; Zhou & Wang, 2021) and the Russia-Ukraine war (Jagtap et al., 2022) have had a significant impact on the global supply chain. A dynamic corporate environment necessitates the development of supply chain capabilities that emphasise speedy delivery in order to minimise lead times, cut costs, and prioritise customer happiness.

To achieve these objectives, organisations must focus on increasing flexibility and supply chain agility (Chan et al., 2017). Furthermore, supply chain flexibility is a process that increases the ability of internal and external entities to quickly build alternatives and better systems for reacting to unanticipated market scenarios (Machado et al., 2024; Shekarian et al., 2020). This research could also provide a glimpse into the influence of Supply Chain Integration to the performance of the company, as well as how it would help them to achieve the competitive advantage in