BUSINESS STRATEGIES FOR ENHANCING THE COMPETITIVENESS OF THAI AIR CARGO SUPPLY CHAIN MANAGEMENT.

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ABSTRACT

This qualitative research aims to evaluate and optimize the various business strategies for enhancing the competitiveness of Thai air cargo supply chain management and to determine the appropriate operating model. It pursues to improve the efficiency of the air cargo supply chain and to provide more information to the decision-makers to optimize their fields. The methodologies included documentary analysis and depth interview with 20 management executives of human resources, air cargo operation, training department, ground service, corporate communication, and public relation and customer service department who are in management positions, role in the policy management of freight and mail commercial department of Thai Airways International Public Company Limited. The guideline has been developed from PEST analysis, 5 force model and SWOT analysis. The results found that the majors affecting Thai air cargo supply chain management were global business competition, safety and security, one-stop service, deregulation of international business, open sky policy of commercial airlines, growth of online technologies and consumer behavior changes. Therefore, the air cargo supply chain management has to develop the multi-skills of their human resource, particularly air transportation and logistics technology, such as applying WMS, ERP system and EDI. Moreover, the Thai government needs to support the air cargo company in terms of loan allocation, revenue, and taxation and essential infrastructure related to the air cargo business.

Keyword: Business Strategies, Air Cargo, Supply Chain Management

INTRODUCTION

With increasing globalization, the air cargo industry has continued to serve as a key facilitator of world trade and has doubled in volume every 10 years since 1970 [1]. Goods transported by air account for 36% by value of all goods traded globally [2]. Worldwide, air cargo transport has grown about 50% faster than passenger transport during 1995 and 2004 [3] and continues to grow in recent years. Air cargo transport is becoming a significant revenue source for airlines [4, 5], whose profit has climbed to 40% in average in 2009 from about only 5% in 2000. Boeing (2014) [6] forecasts that the air cargo market will continue to grow by 4.7% per year and will triple in revenue by 2033 from 207.8 billion revenue ton kilometers (RTKs) in 2013 to over 521.8 RTKs in 2033. This growth is largely attributed to the expansion in Asian markets, particularly in China [7]. Several factors drive this dramatic growth, including the rapidly growing global trade, the high demand for fast and timely delivery, and firms' efforts to keep a low inventory through frequent replenishments [8, 9].

World air cargo traffic is forecast to grow 4.2 percent per year in the next 20 years. In terms of RTK growth, air freight, including express traffic, is projected to grow at a rate of 4.3 percent per year while airmail will grow at a slower pace, averaging 2 percent annual growth through 2037. Overall, world air cargo traffic will more than double in the next 20 years, expanding from 256 billion RTKs in 2017 to 584 billion RTKs in 2037.

Asia will continue to lead the world in average annual air cargo growth, with domestic China and intra–East Asia markets expanding 6.3 percent and 5.8 percent per year, respectively. Supported by faster-growing economies and growing middle classes, the East Asia– North America and Europe–East Asia markets will grow slightly faster than the world average growth rate. Middle East and Latin America markets connected to Europe and North America will grow at approximately the world average. In the more established and mature trade flows between North America and Europe, growth will be below the world average [10].

Air cargo transport involves a series of services from origins to destinations to move cargo through a shipper, a forwarder, a road transporter (or trucker), an airline (or carrier), and a consignee [11]. The shipper needs the commodity to be sent anywhere in the world at a low cost and at the required service level. The forwarder acts as the "middle man" between the shipper and the airlines. The road transporter provides the ground transportation services before and after air transport. The airline receives, stores, transfers, tracks, loads and unloads cargo, and assigns and manages capacity. The consignee receives the shipment, depicts the air cargo transport processes [12].

Two types of airlines are involved in this service supply chain: integrated express carriers and passenger and cargo combination airlines. Combination airlines may carry air freight, express packages, and mail in the belly space of passenger aircraft and operate dedicated freight aircraft. Some combination airlines may also run "combi" aircraft whose cargo capacity is adjustable through the removal or addition of passenger seats. All-cargo carriers consist of integrated express carriers (e.g., FedEx, UPS, and DHL) and non-integrated freight carriers1. Integrated express carriers mainly sell capacity to shippers directly (direct channel market), but they also sell excess capacity to freight forwarders (indirect channel market). In the indirect channel market, integrated express carriers and non-integrated ones share the same supply chain structure, and they face mostly the same decision problems. In the direct channel market, the decision problems for integrated express carriers are mostly centralized, and no games on pricing and capacity allocation are played between airlines and forwarders as in the decentralized case. Thus, the decision problems for integrated express carriers are considered relatively simpler than the decentralized decisions for non-integrated carriers. We focus our discussion on the case of combination airlines, which are representative when discussing the air cargo industry.

Airlines (or carriers) provide freight forwarders and shippers with services, including consultation, capacity booking, pickup, receiving, packaging, sorting, loading, transportation, dispatching, and cargo tracking and tracing. Air cargo service is classified into different levels according to the priority level2 (e.g., speed and reliability) required by the shipper. Rates vary according to service priority and cargo type, such as dangerous goods, live animals, perishable foods, and high-value items [4]. A typical service flow of air cargo transport consists of several key processes [4]. It begins when cargo is delivered by forwarders (or the shippers themselves) to the origin airport cargo terminal by trucks in containers or as bulk cargo. The cargo is unloaded and sorted according to its destination and other information on the shipping documentation, such as weight, dimensions, number of pieces, and type of freight. The airline computes tariffs and prepares a waybill that is used to verify the items in subsequent handling. Bulk cargo is consolidated into a container or stacked on a pallet covered with a net and straps. Direct flights are not always available for

every destination, so the cargo can be shipped to a hub airport and then unloaded, sorted, and reloaded at the freight terminal before being sent to the destination airport. Once it reaches its destination airport, it is verified and moved to a warehouse for delivery by local freight forwarders or pickup by consignees.
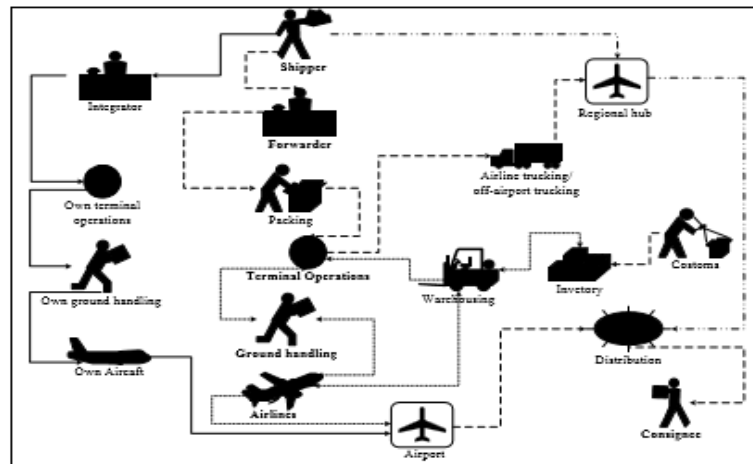

Figure 1: A Landscape of Air Cargo Operations

OBJECTIVE

1) To evaluate and optimize the various business strategies for enhancing the competitiveness of Thai air cargo supply chain management
2) To determine the appropriate operating model of Thai air cargo supply chain management

LITERATURE REVIEW

Air cargo transport is a widely researched area with methodologies from conceptual to empirical to modeling. Studies on air cargo before the mid-1980s mainly focused on the description of systems, the operational process, and industry development. Since then, an increasing number of studies have examined quantitative decision methods for air cargo operations in response to the dramatic growth of the air cargo market and the emergence of computer-aided decision-making techniques. In particular, the number of studies has sharply increased in the last decade. This study focuses on research that involved mathematical models and were published during the last two decades. Our search found about 100 closely related articles, which were classified from the perspectives of airlines, freight forwarders, and service supply chains, with clear definitions for each type of decision problem addressed in the literature

The literature indicates that airlines are clearly the dominant players in the air cargo industry. The operational decisions addressed in the literature consist of mainly four types of problems: revenue management, terminal operations, fleet routing and flight scheduling, and aircraft loading.

Air cargo service supply chains involve complex decision-making processes, including outsourcing, integration, coordination, and competition, which have been investigated only

sparsely in the literature. Zhang and Zhang (2002) [13] employed a multi-market oligopoly model to examine the effect of cargo liberalization on the competition between all-cargo carriers and combination carriers. They found that the optimal operation requires dedicated cargo carriers and airlines with committed freighter fleets. However, in real businesses, especially in Asia, most passenger carriers have substantial cargo businesses and operate combination fleets. Zhang et al. (2004) [14] further investigated the effect of alliances, in which partners offer passenger service but jointly provide integrated cargo service by using passenger aircraft and routes. Their findings suggested that such an alliance contributes to joint profit and also benefits passengers. From the perspective of a service supply chain, Zhang et al. (2007) [15] examined the effect of multi-modal integration on the rivalry in a supply chain that consists of integrators, forwarders, and airlines. They found that a forwarder–airline alliance in multi-modal integration will improve the output of the alliance and reduce the output of the integrator. Chang et al. (2007) [1]   provided a fuzzy group decision-making method to evaluate the alternative strategies proposed for the development of a national air cargo industry. In addition, some studies relate to service improvement in air cargo supply chains. Khan (2000) [16] used a case to demonstrate the application of business process reengineering (BPR) techniques to improve an air cargo handing process at airports. Leung et al. (2000) [17] presented a framework for a third-party e-commerce community network to enable the agents of the air cargo industry to develop and engage in online integration of transactions. Li and Shue (2003) [18] proposed a systemic architecture for air cargo information and developed a prototype system to support cargo tracking.

The air cargo supply chain is responsible for articulating the flows, both physical and documentary, of the air freight. One of the characteristics of the air freight is the impossibility of directly associate the goods as users. Therefore, the user of air freight transport is understood as anyone who requires transporting freight by air. For nomenclature purposes, the loader represents the user at the origin and the consignee at the destination as shown in Figure 2.
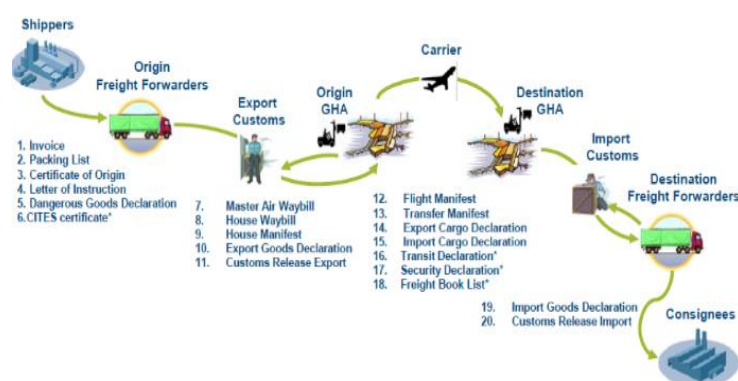

Figure 2: International Air Cargo Transportation Supply Chain Management [19], http://www.thailandindustry.com/onlinemag/view2.php?id=770&section=5&issues=74)

METHODOLOGY

The methodologies included documentary analysis and depth interview with 20 management executives of human resources, air cargo operation, training department, ground service, corporate communication, and public relation and customer service department who are in management positions, role in the policy management of freight and mail commercial department of Thai Airways International Public Company Limited. The criteria for the selection of data providers are as follows:

1. Professional skill by experience relevant aspects of not less than 3 years.

2. A person who has a position, duty, and responsibility directly related to the subject being studied.

3. People who are recommended by the data provider

The tools used to gather this data were in-depth interviews. By the question used in the interview created from the details of each issue. That comes from the search for additional literature used in the interview, with the main question used in depth interview consistent with the research objectives.

Collections of information from 20 people are as follows:

1. Send an appointment letter to request an interview that is sold by the categorized person, the department, prom documents and the interview guidelines.

2. Enter the face-to-face interview with key informants.

3. Conduct record data by taking notes and using digital data recording tools, including data integrity checks immediately end each interview.

4. Gather the summarized information for processing.

The support of in-depth interviews can be classified as the types of tools used for data collection are

1. Form for recording interview questions created to record the number of predefined questions for the benefit of ongoing questioning. In order to gain more depth and resolution, as well as to help the question to be completely relevant to the point, by establishing the question that has been set up theory and concepts from the literature review.

2. Digital data recording tools for collecting data from people. This method can gather a lot of information and can be brought back to reproduce or re-review the content in order to assist in the analysis of the content according to the objectives research.

The researcher validated the data using the triangulation method whether the data obtained by the researcher is correct or not. With a triangular inspection method for data collection using an in-depth interview along with checking examination from the questionnaire at the same time, at the same time, it has also been studied data from the document.

Qualitative data analysis has the following step

1) Bring the interview tape from all interviewees to remove the tape thoroughly

2) Bring the information from the interview to read, review and analyze the data by dividing data according subject types studied using theory, concepts, and related research into a framework for data analysis in order to enable systematic analysis and covers the research objectives.

RESULTS

Comments on the management of air freight services and parcels of Thai Airways International Public Company Limited found that;

1)   Performing services that strive for excellence in accordance with the quality policy of the organization by giving priority to customer satisfaction first

2)   Personnel development should be create a conscience about service quality with efficiency, speed, accuracy, and safety

3)   Should pay attention to the technology used to manage service quality in cargo and air transportation

4)   Improved service quality continuously and sustainably

5)   Service management is carried out according to the company's regulations, international regulations, laws and international standards

The guideline has been developed from PEST analysis, 5 force model and SWOT analysis. The results found that the majors affecting Thai air cargo supply chain management were global business competition, safety and security [21] one-stop service [20, 22, 23, 24], deregulation of international business, open sky policy of commercial airlines, growth of online technologies and consumer behavior changes. Therefore, the air cargo supply chain management has to develop the multi-skills of their human resource, particularly air transportation and logistics technology, such as applying WMS, ERP system and EDI [25, 26]. Moreover, the Thai government needs to support the air cargo company in terms of loan allocation, revenue, and taxation and essential infrastructure related to the air cargo business.

CONCLUSION AND FUTURE WORK

A SWOT analysis of the air cargo industry highlights a number of very significant weaknesses and challenges which must be addressed in order to further leverage the industry's strengths and successfully secure the opportunities that will arise.

STRENGTHS	WEAKNESSES
-Speed (relative, compared to other modes) -Safety -Security (secured mode of transport, no theft) -Reliability -No path congestion -Low land occupancy -Best mode for land-locked countries -No competitor for high value goods in the long ranges	-Over-capacity -Perceived as not price competitive -Value proposition not explained/understood properly -Perceive as not green -Not intermodal -Spatial mismatch in the door-to-door chain -Weak economics of most carriers -Lack of investments to modernize, adapt, innovate -Complexity (processes, stakeholders, regulations) -Security (compliance to multiple security regulations) -Lack of transparency and communication between stakeholders -Lack of relationship with end-customer (shipper/consignee)

OPPORTUNITIES	THREATS
-e-Commerce growth need to be supported by fast-delivery solutions	-In-flight cargos fires
-Bali Agreement: special provision given to air cargo only (for expedited customs clearance)	-Unregulated supply chain participants
	-Increasing competition with other modes
-Liberalization of the market	-Fuel cost fluctuation
-Growth of economy and trade	-External shocks
-Globalization of procurement, production and distribution	-Terrorist threats and inadequate security requirements
-New logistics concept	-Increased regulatory oversight on aircraft loading
-Capacity increase in extra-European airports	-Trade protectionism
-Urbanization (mega-cities)	-Airport congestion
-Unregulated supply chain participants	-Ground infrastructure
	-Night restriction
	-Ground waiting times (clearance)
	-Under-representing of the Cargo sector in policy making processes
	-Crowd shipping
	-On-shoring, near-shoring trends

Figure 3: A SWOT analysis of the air cargo industry

As mentioned previously, our industry must adapt as market and customer evolve. Therefore, air cargo must transform itself into a lean, adaptive and innovative industry centered on increasingly sophisticated customer demands. The air cargo industry cannot afford to be complacent. To address the competitive pressures facing air cargo, the industry challenged itself to meet an important objective: seeking to optimize the air cargo supply chain for every commodity type transported by air to provide shippers with greater transparency, reliability and predictability.

Such industry optimization will help to not just protect the value proposition of air cargo, but will enhance it. One goal of supply chain optimization could be the reduction of the average end-to-end shipping time by 48 hours, where the customer so demands. To meet this goal, air cargo must modernize its processes, improving quality and reliability, and widen the range of services offered. Key factors of success are data integration, process integration and supply chain partnerships based on common and mutually beneficial scenarios as shown in Figure 4.

Business Strategies

Governance bodies
Cargo Committee, Cargo Services Conference, Cargo Agency Conference, Cargo Network Services Board

10 industry priorities

Enhancing Safety	Enhancing Safety
Protecting Cash	Driving Efficiency with Global Standards
Facilitating Trade	Improving Quality
Strengthening Partnerships	Strengthening Air Cargo's Value Proposition
Modernizing Air Cargo	Building Sustainability

Stakeholders (at global, regional and local levels)

Figure 4: The appropriate operating model of Thai air cargo supply chain management

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