

DRIVING SUPPLY CHAIN INNOVATIONS IN SMALL AND MEDIUM COFFEE ENTERPRISES IN NORTHERN THAILAND

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Introduction

Coffee has been a popular agricultural product in Thailand for over ten years. Coffee has been grown mostly in the Southern and Northern of Thailand. According to Angkasith (2002), coffee has mostly grown in the south where around 16,800 tons are produced annually from the total of 70,796 Acre (Office of Agricultural Economics, 2018). Whereas, in the north region of Thailand, the office of Agricultural Economics of Thailand (2018) reported that only 8,879 tons of coffee bean has been produced from around 28,308 Acre, which is primarily the provinces of Chiang Mai and Chiang Rai. Thailand has exported approximately 550 tons of coffee products for over the last 5 years (Office of Agricultural Economics, 2018). There are two main types of coffee that have been grown in Thailand, Robusta coffee is primarily grown in the south while Arabica coffee is grown in the north. Thailand mainly exports 70% of Robusta coffee products, while another 30% are used for soluble, roasted ground and canned coffee in the domestic market. On the other hand, Arabica coffee is mainly used for roasted and ground coffee in Thailand Marketplace.

Focusing on Arabica coffee, it has become more popular with Thai farmers due to the support from the Royal project (Angkasith, 2002). Arabica coffee is mainly grown in the highlands located approximately 800 meters or more above sea level. This landscape is suitable to give a high-quality coffee bean. Growing Arabica coffee provides a greater income to the farmers and reduces the problems of traditional slash-and-burn shifting agriculture (Angkasith, 2002). Because of the policy of natural resource conservation, as well as the limitation of land in Northern Thailand, the highland and the hill—tribe farmers grow coffee not only to support their livelihoods but also able to sustain the local's natural resources on the highland. There is also a high demand for coffee beans because many coffee shops have been opened all over Thailand, especially in tourist destination cities such as Bangkok, Phuket and Chiang Mai. There are over 2,000 Coffee shops across Thailand according to TripAdvisor.com in early 2018.

There are large numbers of coffee shops and coffee producers in Chiang Mai. In the coffee's supply chain, coffee shops are defined as downstream and coffee producers are defined as upstream. After conducting the 1st research phase, the interviewing of 30 target samples, the research team found out that there are significant problems regarding communication and the sharing of information among the stakeholders in Thailand's coffee supply chain. The success of supply chain management could increase the greater business operation and give competitive advantages in a highly competitive environment.

This research project was funded from the Industrial Promotion Center Region 1, Department of Industrial Promotion of Thailand. They focus only industrial promotion for the northern region of Thailand. Hence, this research targets the coffee industry and discusses the coffee supply chain in the northern region by using Chiang Mai as a case study. Even though Thailand has a large number of coffee shops and coffee producers, it is rarely a strong relationship created between the stakeholders in coffee's supply chain in order to develop a business relationship. Most of the individual stakeholder has never been concerned to manage the value chain in their business, especially the small and medium businesses. Therefore, this study aims to develop a web application to illustrate the coffee supply chains' cluster in the north of Thailand. It also purposes to introduce the webpage which might deliver value activities into the chain. This new webpage developing purposes to develop business relationships and alliances, as well as to improve the overall management of the supply chain for small and medium coffee entrepreneurs.

Literature Review
Value Chain

Every organization makes decisions that affect the competitive position and profitability. Strategic planning helps the firm position itself in the marketplace against its opponents in the pursuit of competitive advantage. According to Porter (2001), value chain analysis can be a useful approach in developing business strategy and gain a more competitive advantage to all firms. The value chain can be used to formulate competitive strategies by understanding the sources of competitive advantage and identify or develop the linkages and interrelationships among each activity that create value.

Value Chain activities can be grouped into 2 main different activity groups, which are the primary activity and support activity. The primary activity group covers inbound logistics, operations, outbound logistics, marketing and sales, and customer service activity. The support activity group includes a firm structure, human resource management, technology development, and procurement, as illustrated in Figure 1. Value creation creates added value which leads to a competitive advantage. The firm may earn a higher profitability when it considers applying and analyzing the value chain of their business operation for each activity performance.



Figure 1: Porter's Value Chain
 Source: Poter (2001)

Additionally, Horvath (2001) explained that in an effect of global markets, competition no longer takes place between individual businesses, but between entire value chains. A collaboration through business networks will provide the competitive edge that enables all the alliances in a value chain to prevail and grow together.

Supply Chain Management

In today's competitive environment, most business management has entered the era of internetwork competition. Moreover, the ultimate success of the single business will depend on management's ability to integrate the company's intricate network of business relationships. Lambert and Cooper (2000) explained that the management of multiple relationships across the supply chain is being referred to as supply chain management (SCM). They also mentioned that the supply chain is neither a chain of businesses with one-to-one nor relationships between business-to-business, but a network of various relationships and businesses. It can be explained that Supply Chain Management (SCM) is the integration of main business processes from end users through original suppliers that deliver products, services, and information that add value for customers and other stakeholders in the chain. (Lambert & Cooper, 2000).

Additionally, SCM offers an opportunity to capture the synergy of intra- and intercompany integration and management, which allows the members under the same chain exchange some

resources or information among themselves as a business alliance (Bowersox,1997). Furthermore, Lambert, Cooper, and Pagh, (1997) explained that SCM deals with all business process excellence and represents a new way of managing the business and relationships with other members of the supply chain. All the activities of SCM aim to satisfy customers which include 4 main stakeholders; suppliers, manufacturers, distribution centers and retailers or customers (Chan and Paulraj, 2004). The success of SCM needs to manage not only in the logistics activities of materials financial and information flows but also the planning and controlling activities for both internally within a company or externally between companies (Chan and Paulraj, 2003).

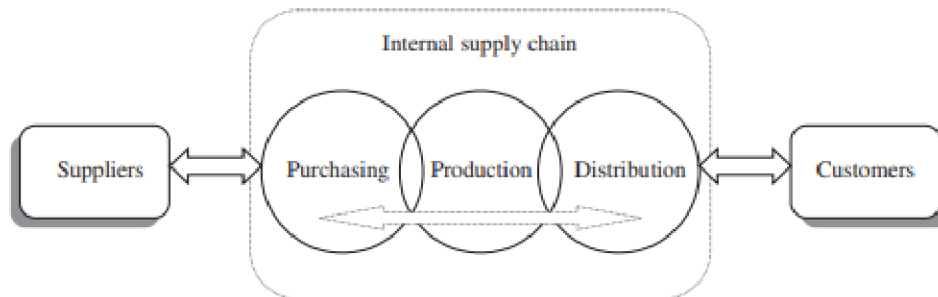


Figure 2. Supply chain management
Source: Chen and Paulraj (2004)

Furthermore, there are many strategies in SCM to increasing business's competitive advantages. The two different processes in manage supply chain to develop a great relationship and satisfied customers are a pull model and push model. In the pull model, it is related to the just-in-time school of inventory management that minimizes stock on hand, focusing on last-second deliveries. Under these strategies, products enter the supply chain when customer demand justifies it. With a pull strategy, firms should concern about the cost of carrying inventory that may not sell or they might not have enough inventory to meet demand (Wong, Arlbjørn and Johansen, 2005). For a push strategy, Wong et al., (2005) explained that a push model in the supply chain management is projected or forecasted customer's demand. Under a push model, all firms are allowed to plan production to meet their needs and gives them time to prepare a place to store the stock they receive. Moreover, the competitive advantages from SCM need a success of business relationships which will be developed from a great trust from all alliances and a long-term mutually beneficial to all chain's members.

Research Methodology

This study follows the advantages of qualitative research techniques by focusing on the small and medium of the coffee industry in Chiang Mai, one of the well-known destinations for all coffee lovers in Thailand. The research project was divided into 2 different phases and was conducted from August to October 2018. The 1st phase of this research adopted a focus group for brainstorming and discussing the strong and weak points in the supply chain of coffee businesses. 30 target samples were selected by following a convenient sampling technique, divided as 10 coffee shops (Upstream), 10 roasted shops (Midstream) and another 10 from coffee producers or coffee farmers (Downstream). The step aims to explore the ideas and analyze the data of the coffee business's supply chain management.

For the 2nd phase, this study was conducted by interviewing 400 potential samples in order to collect data regarding their supply chain, three most popular menus, contact detail as well as their location. All the collected samples were placed into the web application in order to increase the business relationship within the coffee industry and to improve their overall performance. The web database shows all stakeholders in the supply chain. They are mainly producers, roasters and coffee shop owners. The database is accessible via a webpage, which was developed based on the waterfall model which is one of the techniques of the Software Development Life Cycle (SDLC). The waterfall model is a sequential design process and it is mostly used in software development processes, in which progress is seen as flowing steadily downwards through the phases (Balaji & Murugaiyan, 2012).

There are 6 steps in the waterfall model, as is presented in Figure 2. The process begins with analyzing the users' requirements, then designing the website based on their requirements. After that, the system or webpage is developed following the requirements and then testing the system or webpage with the users. Then, listening to the feedback from the users and the developers will solve all errors in the system and adjust them until the systems or webpage satisfy users' requirements. Implementing the systems to public and lastly, keep maintaining the systems.

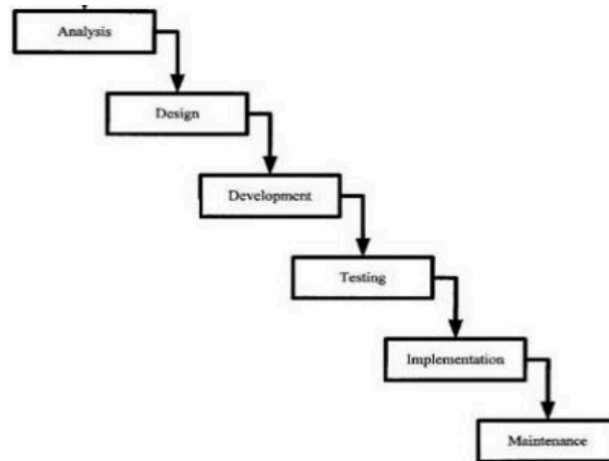


Figure 2: Waterfall model life cycle

Source: Balaji & Murugaiyan (2012)

However, in the testing process, the research team tested the system with 50 sample group which included the coffee producers, coffee roasters and coffee shop, owners. After step 5th, the implementation, every participant will be informed about the information the webpage and the manual book of the system.

Research Findings and Discussion

From the study in phase one, the research team found out that more than 80% of participants agreed that the coffee industry in Chiang Mai has come to the maturity of its life cycle. Even though, there are many strengths and opportunities to keep the business growth; such as the unique menu, location (close to the coffee farm), beautiful decoration, there were some weak points and threats from the marketplace (e.g. lack of digital marketing knowledge and supply chain relationship management, a highly competitive environment and standardize of its teste).

After analyzing the value chain of the coffee supply chain, the findings are evaluated and summarised based on the primary and support activities of each stakeholder, as explained in Figure 3. Furthermore, the findings exposed that the shortage of information among members in the chain is significantly concerned from 22 out of 30 participants.

“Even there are more than 300 coffee shops in Chiang Mai, we don’t know each other. Our marketing distribution is still shortage and did not reach the target market. I think ICTs and digital marketing is necessary as a useful tool to sales and promote. It might create awareness of our brand to the target customers.” Midstream #2

“I think a clustering group of people in coffee industry is very helpful. We will know who are existed in the market and can do business together.” Upstream #5

"I also want to reduce the cost of logistic. At the same time, I need a roasted coffee bean with great quality. Therefore, I have been searching for the supplier who will roast coffee for and match with my standard because it leads to my customer satisfaction." Downstream #6

"I think if we have a web or application that provide the information about all members in the coffee chain should be nice. Everyone will search for the information and contact each other easier. We also have more opportunity to develop business relationship and partnership." Downstream #1

Upstream of the chain	Primary Activity	<ul style="list-style-type: none"> The farmers should improve their knowledge regards to the coffee plantation. Coffee producers should study and acknowledge themselves about marketing trends and customer behaviour. The farmers increase their sales' volume and maintain the relationship with their customer.
	Support Activity	<ul style="list-style-type: none"> The farmers should create their own cluster to increase bargaining empowerment.
Midstream of the chain	Primary Activity	<ul style="list-style-type: none"> The coffee rosters search only for the qualified coffee bean. They should improve more marketing promotion through various channels. The coffee rosters should concern toward CRM and SRM implementation.
	Support Activity	<ul style="list-style-type: none"> The owners should consider in apply the ICTs systems to operating their businesses and marketing their products. They need to create the business alliance to empower their market share and develop trusts.
Downstream of the chain	Primary Activity	<ul style="list-style-type: none"> The coffee shops need to develop their own unique or identity to show the differentiation. They should search for the qualified roasted coffee to keep their standard and identity. The coffee shop owners should increase their sales volume and maintain the satisfied customers to manage the CRM strategy.
	Support Activity	<ul style="list-style-type: none"> They need to consider about the human resource management. They are applied more ICTs and Web2.0 as a tool for communicate with all customers and promote their products and services. They also concern in reduce the cost or procurement by developing business partnership.

Competitive Advantages

Figure 3: Value chain analysis for coffee industry to develop a competitive advantage.

From the findings of the 1st phase, it shows that most stakeholders in the coffee supply chain of Chiang Mai agree that the innovative Information and Communication Technology and business partnerships are influenced to develop a strong competitive advantage. At the same time, these two issues can add value to the whole chain because it could improve the operational management and control all budgets and expenses. Furthermore, the benefits of the Internet and Web 2.0 could offer an alternative marketing channel to every player in the supply chain to contact and promote its products and services.

Therefore, in the second stage of this project, the researchers developed the web-based technology in order to illustrate the coffee business cluster in Chiang Mai, Thailand. In this webpage, the users will be informed about the business profile, the location and map, contact information, the best-recommended menu and images of the products and/or services, which presents in Figure 4, and 5. Additionally, this webpage shows the supply chain information of each coffee shop which is might use for the users or customers who interest to track the origin or type of coffee bean. Nonetheless, the web 2.0 technology provides as an online cluster for all stakeholders in coffee business, where allows them to contact and develop their business relationship. They also will be acknowledged about suppliers and demanders from upstream to downstream of this business chain.

The URL of this webpage is <https://chiangmaicoffeehub.com/>. In figure 4, it presents the 1st page of this website where illustrates the location of all coffee chain's stakeholders in Chiang Mai, Thailand. The red points are represented the coffee shop, the yellow points are represented the roasted shop and

the green points are represented the coffee producers. Additionally, Chiang Mai Coffee Hub webpage will present the information and detail of each member, that includes a brief business profile, location, contact address, images, the top 3 popular menus and the chain of its coffee bean, as shown in figure 5. This webpage presents the information of 415 small and medium coffee businesses in Chiang Mai, which include coffee producers, coffee roasters and coffee shops.

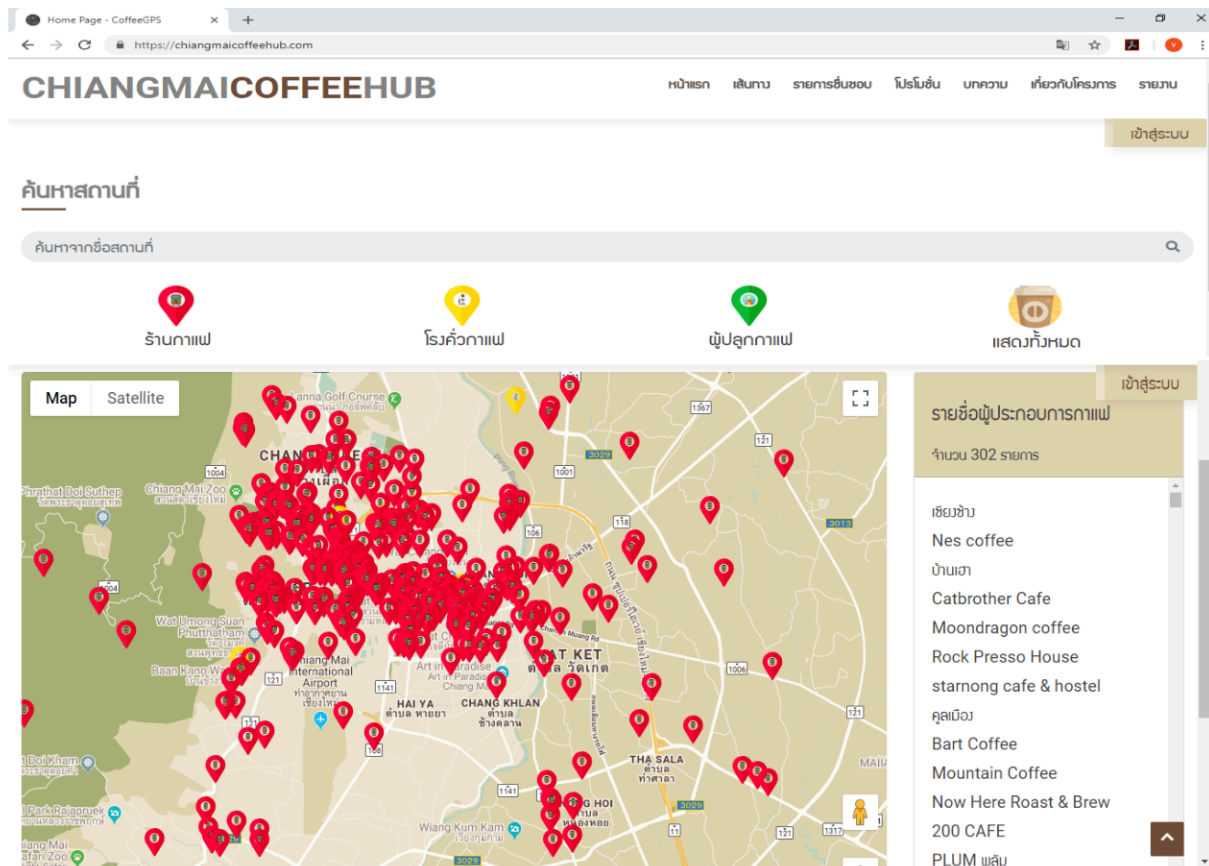


Figure 4: The 1st page of www.chiangmaicoffeehub.com



Figure 5: An example information of each member

After testing with 50 samples, the results show that 40 from 50 testers (80%) are satisfied with this webpage. Also, 42 samples or 84% said this webpage is user-friendly with a clear design and organized, however, they suggested to insert more image of the menu and atmosphere, as well as their

logo. Likewise, a majority of the testers with 86% agree that this webpage provides a useful information about the suppliers and customers in the market and should help them to develop a greater business relationship with their suppliers and customers, which could be lead to stronger competitive advantages in today's highly competitive market environment. Nonetheless, this webpage is available for the public. Even the main target users are the coffee business owners, all customers also can be access to the information.

Conclusion

To conclude, this research project develops a new platform for small and medium coffee enterprises' cluster in order to present their business information. Also, this webpage should provide more information to all coffee businesses in Chiang Mai to develop their relationship with their prospect supplier and customers. All coffee entrepreneurs who are the members in this webpage are covered from the upstream to downstream of the coffee business. The total of 415 coffee business members is included 386 of coffee shops, 18 of roasted shops and 11 of coffee producers. Additionally, the majority of users who tested the system with 85% satisfy with this webpage and agree that it should increase the opportunity for them to increase a greater relationship in their supply chain management by offering as an alternative channel to communication and offering basic information for the suppliers and customers.

This research not only provides a benefit to the business side but also useful for the academies who interested in this study area. However, this study has some limitation due to the time and budgeting. The study conducted with only coffee business in Chiang Mai province. Therefore, to increase the validity of the research outcome the study should be extended to wider geographic as should be aimed for further research.

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