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Status and Proposed Models of Backhauling System in Thailand

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***Abstract*—**Transportation cost is the highest cost in logistics cost of Thailand, and truck transportation is counted as about 90% of the overall transportation cost. The main problem of truck transportation is backhauling. Backhauling has become an attractive cost-saving approach in logistics. To explore such opportunities, this paper investigated the current backhauling systems in Thailand. It was found that the backhauling problem is attracted to both governmental agencies and private sector. They gave attempts to build backhauling systems. This paper investigated two systems built by governmental agencies and one by private sector. Moreover, based on the interviews with the system representatives and users, pros and cons of the systems were found. The obstacles and challenges were obtained. This paper finally proposed a conceptual model of to-be backhauling system in Thailand.

***Keywords*—**Backhauling system, Backhauls, interview, Thailand.

I. Introduction

BACKHAUL is a hauling cargo back from point B to the originating point A. It costs almost as much time to drive empty as fully loaded. This makes economic sense since it helps to pay for the operating expenses for the trip back to the originating point A for the trucking company and/or trucker. Moreover, using backhaul would save the environment. Reference [1] stated that backhauling is an efficient way to reduce the transportation costs by filling empty trucks on their way back to the home base after delivering goods to customers. Due to such large cost saving opportunities, backhauling has become a growing trend in the transportation industry and transportation firms wanted to consider backhauling options [2], [3]. Moreover, using backhauling would make increase resource utilization and cost savings.

Previous contributions in the area of backhauling have mostly emphasized in backhauling optimization especially vehicle routing problem with backhauls, which is a class of pick-up/delivery problem [4]-[6]. Reference [7] studied single-depot unit-capacity vehicle scheduling with pickup and backhaul. Reference [8] gave a comparative review of analytical studies on freight consolidation and backhauling and stated that 83% wanted to consider backhauling options. All of the studies reviewed here the developed models and/or solution procedures for backhaul problem. None of the previous studies have addressed about backhauling management, which is found as the main problem of backhauling in Thailand. Further, since Thailand's logistics cost was 1.64 trillion baht or 15.2% of GDP in 2010. The logistics cost was composed of transportation cost (776.4 billion baht, 47.2 %), inventory cost (722.5 billion baht, 44%), and logistics management cost (145.1 billion baht, 8.8%) [9]. It can be seen that transportation cost is the highest cost in logistics cost of Thailand. Moreover, truck transportation was counted as 90% of the overall transportation cost. Cost of truck transportation then gains a lot of attentions of practitioners, researchers, and governmental agencies in Thailand. One of the means to reduce truck transportation cost is by using the backhauls. The main problem of using backhauls is the backhauling management system. Therefore, governmental agencies and private sectors have given attempts to make the backhauling management system. This paper then introduces the present status of backhauling in Thailand. Obstacles of using backhauling in Thailand are investigated. Finally, this paper proposes a conceptual model of backhauling management in Thailand.

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II. Present Status

Based on the present study, it is found that two governmental agencies and one private sector give importance to the backhauling. Two governmental agencies are in two ministries, namely ministry of industry and ministries of energy. The sector that gives responsibility of backhauling in ministry of industry is in bureau of logistics, department primary industries and mines. That in ministry of energy is in energy policy and planning office. The two governmental agencies have currently developed and implemented the backhauling management systems and they have done separately. Bureau of logistics, department primary industries and mines, ministry of industry, has done the backhauling project for six years, whereas the office of energy policy and planning, ministry of energy has done the project for a few years. The general model of backhauling systems is shown in Fig. 1. They are two players and one system. The players are logistics service providers (LSPs) and senders. Senders may or may not be LSPs. Based on the survey, only one private sector seems to have success in backhauling. It is called Mae-Klong logistics.

This study then interviews the project masters of both governmental agencies and private sector consisting of four persons, and logistics service providers (LSPs) who would use the backhauling systems including 20 persons.

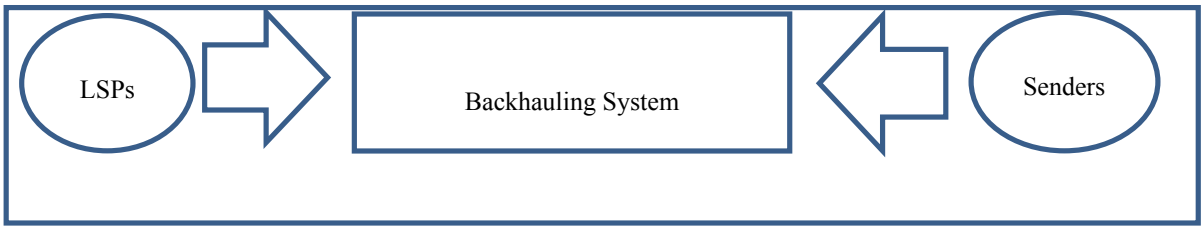

Fig. 1 General model of backhauling system

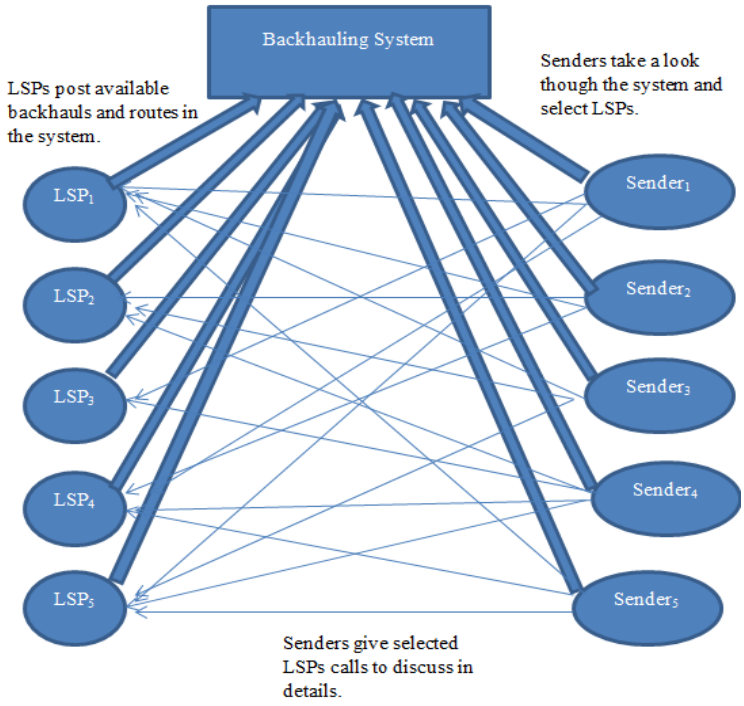

Fig. 2 Interrelationships between LSPs and senders of the governmental systems

The systems constructed by both governmental agencies seem to be similar. It starts with the posting backhaul routes by LSPs. If senders find the matching route, they would give the LSPs calls for delivery details, price, and negotiations. There is no space for senders to post because the senders are afraid of a lot of calls from LSPs. By interviewing LSPs, LSPs are afraid of price cut, so they would not put the delivery cost in the system. Therefore, the interrelationship between LSPs and senders can be shown in Fig. 2. Based on the interviewing government agencies, presently no one uses the constructed system. Further, the system was not fully developed because it lacked monitoring the delivery and it has no screening system of users. Therefore, it resulted in distrust among users including both LSPs and senders and also system itself.

The benefits of governmental systems are free and simple. Since they are free, there is no system administrator to monitor and look after the systems. Moreover, there is no user-screening system. Everybody can register and use the system. It results in distrust of the systems. Due to the absence of rigid system administrator, the systems lack of continuous improvement.

The only one private sector that is successful in backhauling system management is Mae Klong Logistics. A backhauling system was constructed by Mae Klong Logistics and Mae Klong Logistics has managed the system after that. Both LSP and sender users are required to register to ensure users' identities. Most of the users also know one another. Thus they have trusted in users and systems. Based on the interviewing, the backhauling system of Mae Klong Logistics seems to suit and fully qualify. The system has a complete and detailed database matching to Thai laws and regulations. Moreover, GPS monitoring system is installed and the system can monitor all deliveries online. The system has continuously updated the information. The overview of the system can be shown in Fig. 3. It starts with both LSPs and senders post what they want. Mae Klong Logistics would do the matching manually and let both LSP and sender know the result.

Even though the backhauling system of Mae Klong Logistics seems to be fine, the numbers of users are limited.

They are in groups and knowing one another. This paper then extends the concept of the backhauling system of Mae Klong Logistics to be acceptable in all LSPs and senders. Further, some features are recommended to insert to the system in order to make the system more valuable and to

fulfill the customers' needs.

III. Proposed Model

Based on the interviews with LSPs, it found that the main obstacles of the success are trusts in both players in the system and the system itself. Most LSPs stated that they have not known the one who offered and hired the routes in the system. They would not know whether they would experience fraud or not. They also would not trust the system since the system seems to be open and shared. They would be afraid of price cut that may be applied by someone else. Moreover, they stated that the government agencies lacked the serious and continuous public advertisement. Moreover, no serious action has paid to monitor the system. In the view of senders, low information about backhauling system is given by governmental agencies. Trust is also the main problem of the system in the view of sender also. Therefore, generating trust is the most important fact of the system. First, the users should be registered to the system. To register, the required documents include the commercial registration, financial statements of the last three years, and the details of all vehicles. Senders can check if LSPs are reliable or not and select an appropriate LSP.

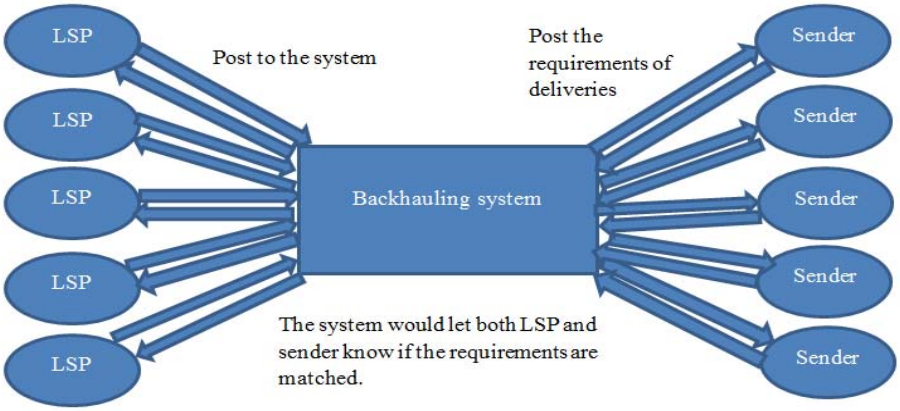

Fig. 3 Interrelationships between LSPs and senders of the Mae Klong Logistics system

The proposed system should include both LSPs and senders. The matching between them should be done by the system. The matching between them should be done by the system. When an LSP post available backhauls from point A to point B, the system would show related senders who want to delivery thing from point A to point B or between those points. The LSP can select one of them. The standard price of the LSP would be sent to the sender. The sender can decide if he/she wants to do business with the LSP or not. When LSP and sender are matched, the information is eliminated. On the contrary, if a sender posts what he/she wants to deliver from point A to point B, the system would show the related LSPs that provide the backhauls in the same route. The sender can select a LSP to send goods from point A to point B. The standard price of the LSP would send to the sender. Similar to above, the sender can decide if he/she wants to do business with the LSP or not. When LSP and sender are matched, the information is eliminated.

For reviewing system, the system would provide the scores for LSPs to give more ensure for the senders. The scores may be based on how long LSPs have been registered in the system, how many matching times incur, and how much score LSPs obtained from senders. Further, insurance should involve in the delivery as an option. Fig. 4 shows the proposed conceptual model.

The system would ease to maintenance since it is not required to do the matching. However, the system is still required a system administrator to perform the monitoring and the control in order to give confidence to both LSPs and senders. Moreover, the information about the system would be dispersed. More users in the system would make the system successful.

IV. Conclusions

This paper intended to study the current situation of backhauling system in Thailand. It was found that a few systems have been constructed. Two systems were done by governmental agencies and one was done by private sector. The two governmental systems seem to be too simple to use. Only backhauls are allowed to post to the systems. Senders would just take a look to the system for backhauls and select possible LSPs from the systems. Telephone calls are normally used for communication. No system administrator is provided by the governmental agencies. Therefore, a lot of problems were found in the governmental systems. By now, no one uses the system. Mae-Klong logistics is the one developing a backhauling system and using the system among their group. The system is monitored and managed by Mae-Klong logistics. In this system, both LSPs and senders can post their requirements. Mae-Klong logistics would do the manual matching between LSP and sender. This paper proposed a conceptual model of a backhauling system in Thailand.

The proposed system is automatically shown the relevant matches and LSP or sender should select the one who wants to match by himself/herself. Insurance policy and reviewing system are added in the backhauling system. Even though,

backhauls would make users save, and laws and regulations may be required to enhance the use of backhauls.

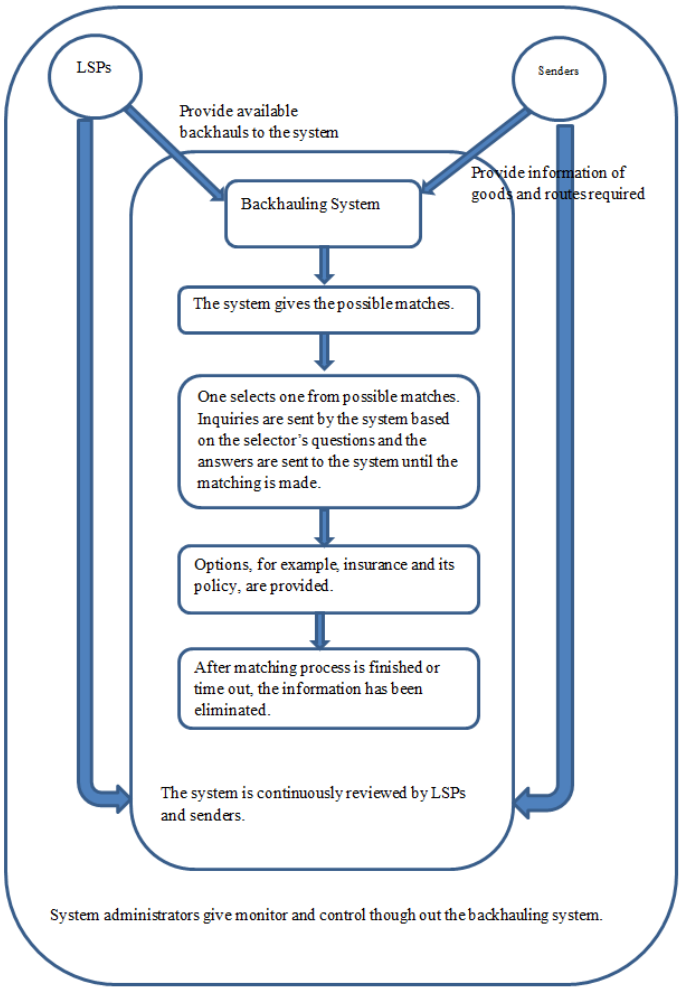

Fig. 4 Proposed conceptual model

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