

# **Linker: The New Implementation of the Sharing Economy in the Last-Mile Delivery of E-Fulfillment**

by

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## **Abstract**

The purposes of this thesis are to summary the current problems in the Last-Mile Delivery, and explore the possible solutions, a delivery model with sharing economy application called *Linker*, to improve the Last-Mile Delivery circumstances. This is based on the reasonability of the sharing economy. After the model is proposed, a focus group discussion with people representing different groups and two interviews with experts is conducted to give feedback on the proposed model *Linker*. The contribution of this study is expected to be both theoretical and practical. With the proposal and the application of the *Linker* sharing delivery model, the sharing business will penetrate into the logistics field and thus foster more ideas on improving Last-Mile Delivery. And the Linker is supposed to meet online buyer's higher demand on time and lower cost, and provide a more environmental friendly deliver mode. It is hoped to benefit the community and facilitate the economy.

**Keywords:** Sharing Economy, Last-Mile Delivery, E-Fulfillment

## **1. Introduction**

Last-Mile Delivery is a term used in supply chain management and transportation planning to describe the movement of people and goods from a transportation hub to a final destination in the home (Goodman, 2005). The issue in supply chain referred to as a Last-Mile Delivery problem. Final delivery, in the same ways is a Last-Mile Delivery of goods from distribution centers (or retailers) to the final destination, consumer. In this situation, transportation cost is more expensive, while products cost will be expensive accordingly. Likewise, E-Fulfillment were increased at the movement of goods to make sure customer satisfy, demand of individual, retailers, industries that want to receive their products on time and in the desired location. The Last-Mile Delivery become unsustainable as the outcome in terms of economy, societal and environment impact, regulations and infrastructure development can be significant (Dablanc, 2010). The main problems in Last-Mile Delivery we are going to solve are: delivery costs and average delivery time. The purpose of this research is to introduce a new model of sharing delivery to minimize online order cost and reduce

delivery time of last mile logistics in the urban area. Moreover, sharing economy offers flexibility and efficiency to consumers. Using online platform that can match customers and suppliers, sharing economy service such as Uber and Airbnb might achieve greater efficiency than conventional business.

The Last-Mile Delivery has been the bottleneck for the E-Commerce, as a significant cost for maintaining the satisfaction of customers through the timely and safely delivery of the merchandise. When the labor cost tends to be undifferentiated everywhere in the future, the transportation cost will be the stake to gain the competitiveness. The long-haul transportation is limited significantly by the infrastructure condition in each area, while there are more solutions to improve the Last-Mile Delivery that might suit particular urban area. So, the research on the LastMile Delivery will be cost-effective and we expected to come up with solutions to solve the current obstacles in the Last-Mile Delivery for E-fulfilment.

## **2. Literature Review**

### *2.1. History of concept*

“Last Mile” was originally derived from the telecommunications field, which means the final step of the telecommunications chain that delivers the services and physical stuff (such as cable) to the final users. It is the bottleneck in the telecommunication chain, because the network speed is limited by the “Last Mile”. (Cordeiro, 2003) It is similar in the logistic area. Last mile (delivery) has become a problem in the logistics chain, which can create competitive advantage for the companies who effectively and efficiently utilize it. Also, as the bottleneck in the online-business chain, the ineffective Last-Mile Delivery increases the time that needs to deliver the parcel to customers’ home and also increases the cost for sellers (to some extent the price of the product for buyers).

### *2.2. Current problem in the Last-Mile Delivery*

According to Reisman (2011), in our urban life, the increasing vehicle activities are the result of last-mile activities that dispatch the parcels to customers. And at the same time, almost 80 percent of freight delivery is transported by trucks, which take more road surface than a passenger car unit, affecting the overall traffic flow and causing traffic congestions. The large vehicles also discharge a lot of polluted air because of its diesel-powered system. So the Last-Mile delivery has to consider more on its influence on the local traffic services and environment. Another issue faced by the last mile is about the cost. In China, each parcel will cost 10 RMB (around 50 THB) to deliver to home, according to SF express company, the popular courier agent in mainland China. When it comes to small items that value under 10 RMB, the cost of transportation becomes significant. In the cases of expensive products where the delivery cost can be ignored, the total price still includes the transportation cost, which is levied on customers eventually.

### *2.3. Existing solutions in Last-Mile Delivery*

‘Uber Rush’ could be a good example for the new urban last-mile delivery. It takes good use of the sharing service of Uber drivers to delivery good for retailers and online sellers. As simple as keying in the customers’ address and clicking the ‘Delivery’ button, Uber driver will be summoned to pick up the goods and find the best route to eliver the goods to customers. It doesn’t need to wait for a batch of goods to be compiled and delivered together, in which means it saves a lot of time. And this mode of delivery will use the spare time of Uber drivers, so it will also benefit Uber drivers.

(UberRush, 2018) But whether it does save time and cost and benefit community at the same time should be verified. What if the Uber driver's delivery is at the expense of a higher priced Uber customer? What if several orders are addressed to the same area at different time and Uber driver dispatches one by one? That problem will be discussed later in our new model application.

### **3. Research Methodology**

#### *3.1 The process of focus group guide and interview guide design*

##### Focus group guide

As started, the purpose of this thesis is to create a better understanding of the interplay between customer, retailer, and express company in the social context of the E-Fulfillment. The research question that use to find a data contained into four questions was conducts; the first was in the general information about respondent. The second was in the information about online shopping. The third was in the information about Sharing economy (Airbnb, Uber, and sharing bicycle). And the last was in the acceptance of sharing delivery.

##### Interview expert

Interviews are a systematic way of talking and listening to people and are another way to collect data from individuals through conversations (Kajornboon, 2005). According to David & Sutton (2004, p. 160) interviews is "Prompting can be included with the questions and if a question is inappropriate, data on why no response was made can be recorded." The reason for us to choose the interview is that some problems needed to probe (Gray, 2004, p.217). Suggestion and recommendation will be good primary data to improve our new model of Last-Mile Delivery. Meet what customer want and need in real life. Interviews are designed to generate participant perspectives about ideas, opinion, and experience. The interview question contained into four parts; the first was in general information about the expert. The second was in opinion on the current Last-Mile Delivery situation (Time, cost, process, security, community, and environment). The third was in the opinion upon the sharing economy and its application. The last was in the comment on our sharing delivery model – *Linker* (Time, cost, process, security, community, environments).

#### *3.2 Participants Selection*

##### Focus Group

##### 1. Identify the appropriate participants

Subject selection for qualitative research is purposeful with respondents who can best inform the focus group questions (Sargaent, 2012). Our purpose of the focus group is to observe whether our participants can accept the *Linker* delivery model and what problem they might concern about. The selection criteria are laid down as following: The participants must be someone who shop online regularly and has certain amount delivery experience before. Considering about the diversity, we plan to include people from different demography to see whether their degree of acceptance is different towards sharing delivery, and different genders should be both included. With the background of Thai culture, where people generally do not want to share they mind to strangers, we invite some typical respondents with their acquaintance. But we also make sure that not all the

participants know each other, and they will discuss with some strangers as well. All participants had expressed their consent of their real names being included in this research in a written form.

## 2. Sample size consideration

We plan to have the focus group at the size of 6-8 people. Ideally, each focus group will have six to twelve participants (Gibbs, 1997 and Stewart et al., 2007). We might not get enough information and the group discussion might be dull if there are less than 6 people. And the focus group with more than 12 people will be too large to generate a meaningful informative discussion, as not everybody would be given an equal chance to get involved.

### 3.3 Interview

To get more professional reflection on the *Linker* sharing delivery model, we asked 2 experts to evaluate our model and provide some suggestions to develop the model. Their expertise is to be in the logistics field, business solution field, online business field, or psychology field.

## 4. Results Analysis

### 4.1 *Linker* delivery introduction

#### *Context*

The *Linker* delivery is supposed to be applied in a city (or among cities) that is equipped with developed transportation infrastructure, such as Bangkok and Beijing. *Linker* delivery also require the transparency of the location of distribution center in the city, from which people can find the pickup station on the map. The distribution center or pick up station is the start point that trucks of express company delivers the goods to the consumers in the city (Baker, P., 2008). The access to the warehouse stations (or parcel pick up station) has already existed in some city (Google map, 2018). After somebody shops online and the parcel has been sent to the destination city, the *Linker* delivery starts to work.

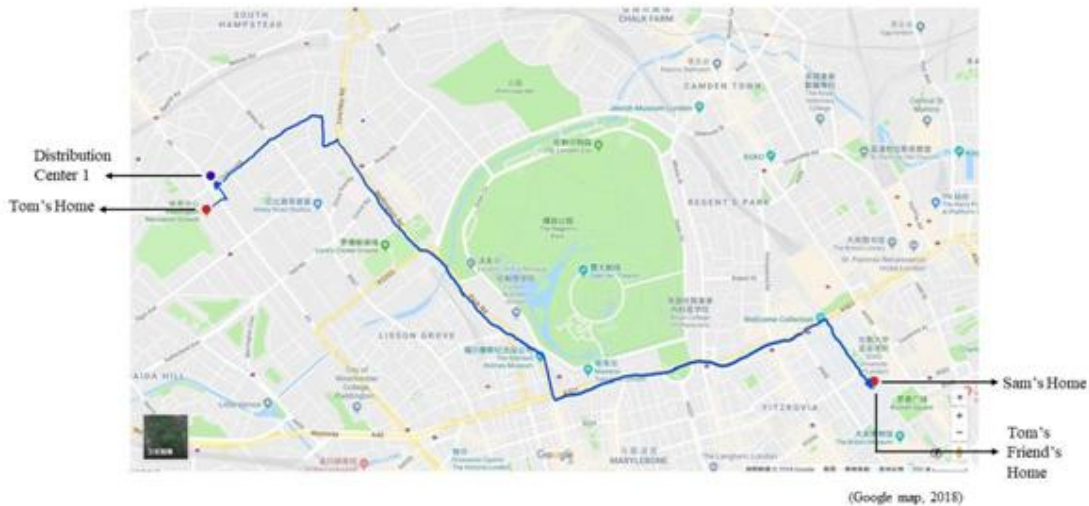
#### *Linker* delivery process

##### Step 1: Use the *Linker* App and know the pick-up stations

We expect to design an application that could provide distribution centers locations and parcel basic information's for people. The users have to register with their real name and phone number. The application will also display users' credit information by collecting feedback from others. People can check the nearby pick up stations around their home through google map or through a smart phone application.

## Step 2: Go somewhere and check the parcel need to be delivered

When somebody is going to somewhere, such as Tom is going to visit friends, he can check if there is any parcel that is needed to be delivered and the destination of the parcel. If Tom find a parcel nearby his house is bought by Sam who just live in the same neighborhood as Tom's friends. In this case, Tom can bring that parcel to Sam with no extra transport. The demonstration can be found in the picture below:



**Figure 1** *Linker* Demonstration: From Point Tom to Sam

Next, Tom goes to the distribution center 1 to take that parcel. Scan it with smart phone to confirm the delivery person is Tom, informing the owner of the parcel, which is Sam, that his parcel has been carried by Tom at distribution center 1. Then the *Linker* application will recommend the route for Tom and calculate approximate time based on the traffic condition. This information will be presented on Sam's phone at the same time, tracking the parcel. Except the private car, all kinds of transportation can be included. BTS, bicycle, motorcycle, and even walk. After Tom arrive Sam's area, he can hand over the parcel to Sam and then scan the QR code on the parcel for the second time to confirm the arrival of the parcel. At the same time, Sam has to confirm he has received the parcel and end the service provided by Tom.

## Step 3: Feedback and get award

After Tom delivers the parcel to Sam, both of them can give feedback on the delivery experience. For instance, the receiver can mark the deliverer about the delivery attitude, if the parcel is damaged or disappeared, or the delivery time. In return, the deliverer can comment about the receiver's hand over time and attitude. The credit system in the application is expected to foster people behavior themselves. At the end of the deliver procedure, the deliverer will get small amount fee for his work as a fee. This fee will come from the seller of the goods, which is contained in the listed price. So, online customers will not pay extra money on delivery.

### Linker Process in Summary



**Figure 2** Linker Process

### Expected Outcome

With the *Linker* delivery, we expect the decentralized delivery mode in the city. From a deliverer view, we think people don't have reason not to try to get some extra money. And from a receiver view, people may concern about the parcel security issue and the time issue. If we can find some solution to these two problem, the *Linker* delivery is expected to be accepted by people.

## 4.2 The result of focus group discussion

### 4.2.1 Individual final opinion

**Joe Yenube Lambongang** is a 26-year-old entrepreneur who just complete his master degree in material engineering. He takes good use of sharing business and is a big fan of Airbnb during his journey all around the world. He thinks the sharing concept saves time and convenient compared to the conventional mode. For instance, to rent a house in Germany often requires tenant to purchase new furniture while Airbnb has well-furniture rooms, according to Joe's experience. He is willing to try the *Linker* delivery model, either receiving his parcel from others or deliver parcels to others. But the problem he concerns about is the time issue. If there is traffic congestion in the city, the delivery process will be slowed down.

**Krittachai Komemeung** is a senior project engineer specialized in elevator maintenance. As an indoors person, he always shops online. He will vote for the *Linker* delivery because he embraces the sharing concept. He believes the sharing idea will close people's distance and contribute to a warmer community in the city.

**Jombund Eamkaew** is a 34 years old senior accountant, and she loved to shop online. She reserved her views towards *Linker* delivery, because she would not really want to take risks to get her parcel from a stranger. She concerns about the safety (will she be attacked?) and security (will her parcel be stealing?) issue. Only when these issue can be carefully controlled, will she try the *Linker* delivery. Otherwise she will use the conventional delivery even at higher expense.

**Mr. Rasmeimony Kaing** is a 28-year-old researcher in Bangkok. He said online shopping is also useful for person who hard traffic jam while go to store or supermarket. For example, when order something online just spend only the price of products and delivery cost, but if he go to store he need to spend for transportation cost, cost of products plus other cost that total more cost than buy online. Moreover. Using sharing economy like urban it can very helpful and convenience compared to conventional taxi for its lower price, and more environment friendly, as well as reduce traffic jam

(less large deliver trucks). According to his experience, He is willing to try the *Linker* delivery, both receiving a parcel from another and deliver to other.

According to **Ms. Ratha Tim**, she is a business developer in a large company in Bangkok. She said sharing economy like Uber is also good. It is a better way than conventional taxi. Normally before using sharing economy she considering about price is mandatory. For acceptance of sharing delivery, she said the problem that she worries is cost and bad service. Illustrated by security of parcel, if parcel damage or lost it's difficult to find somebody to be responsible. From her experience, she will not try the *Linker* delivery model, neither receiving her parcel from other nor delivering to others because she doesn't trust other person that is not the delivery man.

According to **Mr. Meak Chantheng**, He is a PHD student that study in Bangkok. He always uses sharing economy like Uber because it easy to use and save time. Sometime Uber have promotion if we compared to use conventional taxi is cheaper than conventional taxi around 40%. After we introduced the *Linker* delivery, He said is very interesting in the model. For someone who free, they can gain extra money by delivery parcel to other person. It's a good try to decentralize the capitals and money in the society.

**Ms. Chanpanha Chum** often shopping online and received her parcel in 5 days by Thai Post. But she expects to receive the parcel in 2 or 3 days. She often uses Uber, because it is better ways than conventional taxi, more environmental and economic friendly, as well as save time and cost. Consequently, she decides to use sharing economy. After getting the idea of the *Linker* delivery model, she disagrees to receive her parcel that bought online and delivered by other person that is not delivery man, because of trust issue and low responsibility for products damage or lost. Conversely, she willing to deliver the parcel to other person that the save point with her destination and leaver. The price is lower or equal to the price that delivery service charge.

#### 4.2.2 Group's final opinion

All of the group members have online shopping experience and the experience using sharing business such as Uber or Airbnb. The group agreed that the sharing economy brings more benefit to people than the problems and shortcomings. They accepted the sharing economy well and they are willing to see more sharing tries. Their response to the *Linker* delivery are different. 4 people (57.15%) accepted the idea that normal people deliver the parcel for them not a delivery man; while 2 people (28.57%) don't accept the *Linker* delivery; and one of the participants change his mind at last to accept the idea (14.28%).

The voters believe the *Linker* delivery will benefit all the related parties, sellers pay less to express company, buyers pay less to sellers if the price goes down, normal people can earn some extra money through the delivery, less deliver trucks are needed and the environment will be more protected. They believe the sharing concept will foster the relationship between people and decentralize the capital and property in the society.

The main problems they concern about are security issue. Questions like "who will be responsible if the products are damaged or lost?" are needed to be answered. The cheaper price will not encourage the reserved group of people to try our idea. Other issues that are concerned such as "will the delivery time be actually reduced?" and "what if there is nobody drop by my place?" also stop people from trying *Linker* delivery.

### 4.3 The result of expert interview

#### 4.3.1 Mr. Dan McKay, Business Solution Expert

We had the honor to interviewed Mr. Dan McKay, the expert in the business concept evaluation. From business view, he approved the idea of sharing economy but remind us several aspects that need to consider.

First is the flexibility issue. Even we are discussing about the Last-Mile Delivery, there is still a “last hundred meter” issue in the *Linker* delivery model. For instance, a person uses BTS to deliver a parcel for others. Although the delivery fee can cover the person’s BTS cost, it’s difficult for them to assemble at certain BTS station at the same time. Last meter means the hand over process in the *Linker* delivery. How to hand over efficiently and safely is the point we need to think. If the deliverer uses quite a significant proportion of the delivery time to hand over, he may not be willing to deliver for others.

We also discussed the solutions and here are the alternate suggestions from Mr. Dan McKay. To solve the problem of “*last hundred meter*”, one solution could be the application of parcel lockers. The system will make sure the security of the parcel and free the time of deliverer and receiver. They can drop the parcel in the locker or take out the parcel at any reasonable time they want. Since the handover problem is because the significant proportion of the delivery time. The second solution is to put the *Linker* delivery in a wider context. Not within the city but between the cities. If a deliverer sends a box from Bangkok to Chiang Mai or vice versa, he may not concern too much about the hand over time because the hand over time only occupies small part of the whole transport time. The suggestions are practical and we will absorb his advice in our following parts.

#### 4.3.2 Assistant Professor Dr. Chatpong Tangmanee, Chulalongkorn University Business School

Assistant Professor Dr. Chatpong Tangmanee is an expert in Online Purchasing and Trust issue, which will be the main problem in our *Linker* delivery model. Getting a concept about our model, Assistant Professor Dr. Chatpong Tangmanee said it is difficult to trust strangers to delivery one’s parcel. Because he worries about the circumstances that the parcel is lost or insecure. For example, the buyer bought product online from the seller, based on buyer’s trust on the seller. It’s the first layer of trust through internet. Then the seller has to find some agency (long haul Delivery Company) that the seller trusts to transport the item from seller’s city to the buyer’s city (Because normally the products are from different city with the buyer’s city). It’s the second layer of trust. If when the parcel arrives in the buyer’s city, another party (the strangers) takes over the parcel and deliver to the buyers’ home, it will be the third layer of trust. The longer the trust chain and the deliver chain, the more problem it will bring out. So it’s very difficult for the buyer to trust so many layers (so many strangers) to deliver his parcel. Apart from this, a normal people could be anyone either good person or bad person. To trust a person with no idea about his background is much more difficult than to trust a professional agent, such as Line Man or Express companies.

To mitigate the uncertainties of stranger’s delivery, we proposed the idea of parcel locker to Assistant Professor Dr. Chatpong Tangmanee. We assume that with locker the deliverer can leave the parcel in the locker box and the buyer can get the parcel from the locker with the unique password. It has been applied widely in Chinese cities, for example the Tianmao Service Center in the residential area for people to pick up their items purchased online, where you can get your parcel with a confidential parcel code. And Assistant Professor Dr. Chatpong Tangmanee agree with our



solution, saying that the locker will solve the problem of the “last hundred meter” problem (which we discussed with Mr. McKay) and will help make sure the trust issue between the deliverer and the receiver. But there are still some shortcomings of parcel locker. The most difficulty is that the locker facilities are not widely installed in Bangkok, if we assume this model to be in Bangkok. Most locker are at shopping area for foreign travelers to host their baggage. It’s hard to find lockers in residential areas. If the buyer wants the parcel to be sent to their home, it’s difficult to use locker to receive their goods.

Assistant Professor Dr. Chatpong Tangmanee also suggest another method to mitigate the trust problems in the online business and delivery. It is good communication. The sellers and the deliverers are supposed to respond quickly to the questions or comments from the buyers regardless it’s positive or negative. The actual and instant chat will release buyers’ anxiety and promote better trust relationship between all of the parties. Although people might doubt about the strangers to deliver their item, the smooth communication and quick response will reassure their worries.

## **5. Conclusion and Recommendation**

### *5.1 Conclusion*

Returning to the purpose of this thesis, which is to propose a new Last-Mile Delivery model with sharing economy? We identified the current problems in Last-Mile Delivery, evaluated different application of sharing economy in the Last-Mile Delivery, and propose our new sharing delivery model: *Linker* with evaluation and comment from focus group and interview.

With respect to the current problems in the Last-Mile Delivery, we found that the main problem is the delivery cost that cannot be neglected and the long delivery time that much longer than people’s expectation. We found that to improve the customer satisfaction and save cost, sharing economy application in the Last-Mile Delivery, such as UberRush, are created and applied. They foster a more effective delivery process.

Although with the merits of low cost and reusing the spared resource, the company form of the delivery mode limits the resource that can be used to serve more people. So we introduce our new sharing delivery model (*Linker*) that based on the crowd shipping theory to influence a wider scope. The *Linker* model takes good use of every spared person and vehicles to deliver items for others by convenience. We expected the *Linker* model will save cost and reduce delivery time for the Last-Mile Delivery. Through focus group discussion and the in-depth interview with relevant experts, the advantage of *Linker* we found is saving delivery cost, foster people relationships in the community, economically friendly, and decentralizing the capita in the society. But there are some intrinsic disadvantages prevent those models being used widely according to experts and the discussion. The disadvantages are the trust issues, which is the risk of parcel damage, stolen, and dangerous items.

### *5.2 Implications and Suggestions*

Based on the feedback we got from our research, we expect that in the high credit society where people will or have to take responsibility for their own behaviors strictly, the *Linker* model can be applied and accepted well. But in some developing cultures, the *Linker* should be used cautiously and need more regulations to protect both the deliverers and the receivers.

### 5.3 Future Research Recommendations

According to the research of our thesis, conceptual ideas are identified and evaluated through focus group and in-depth interview. But specific relationship between the sharing economy and the delivery performance need further research, such as the relationship between the sharing economy and the actual delivery time, the trust problem and the risks in different cultures and different religions, the “last hundred-meter delivery” issue. Not limited to the delivery and logistics, we also suggest relating the sharing economy to the decentralization of the society capital, finding out how the models like *Linker* will bring benefit for the majority normal people. Another point is environment emission. We appeal that the business world should pay more attention on the environment than the cost and profit. Sharing economy is benefit for the environment and more research on this topic will justify the importance of sharing economy.

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