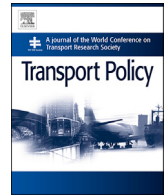


Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Transport Policy

journal homepage: www.elsevier.com/locate/tranpol

An investigation of customers' intention to use self-collection services for last-mile delivery

Kum Fai Yuen^a, Xueqin Wang^{b,*}, Li Ting Wendy Ng^b, Yiik Diew Wong^b^a Department of International Logistics, Chung-Ang University, Seoul, Republic of Korea^b School of Civil and Environmental Engineering, Nanyang Technological University, Singapore

ARTICLE INFO

Keywords:

Last-mile delivery
Self-collection
E-commerce
Adoption behaviour
Innovation diffusion theory

ABSTRACT

Anchored on Innovation Diffusion Theory (IDT), this paper analyses customers' intention to use self-collection as a last-mile delivery method. Characteristics of innovation were hypothesised to be key factors influencing customers' intention to use self-collection services. Demographic characteristics were also tested. Survey data were collected from 164 consumers located in Singapore and analysed using hierarchical regression analysis. The results show that among the five key characteristics of innovation, relative advantage, compatibility and trialability positively influence customers' intention to use self-collection services. It is also found that the pre-eminent step to improve customers' intention is to integrate self-collection into consumers' lifestyle, values and needs. In addition, self-collection services should be marketed in a manner that confers a clear advantage over other last-mile delivery methods. This paper enriches the literature on IDT as well as the management and design of self-collection services for last-mile delivery.

1. Introduction

Last-mile delivery is defined as the last segment of a delivery process which “involves a series of activities and processes that are necessary for the delivery process from the last transit point to the final drop point of the delivery chain” (Lindner, 2011). Parcel deliveries made directly to the doorsteps of customers have been the most popular mode for last mile delivery. However, in recent years, there has been an emergence of self-collection delivery as an alternative to home delivery. Self-collection delivery involves the provision of a network of service points where operators pool and deliver their consignees' parcels, and consignees pay, collect or return their parcels (Piplani and Saraswat, 2012). Such service points could be stationary (e.g. collection at locker points or convenience stores), mobile (e.g. collection at locker-fitted vehicles), attended (e.g. collection aided by a service attendant), or unattended (e.g. collection aided by fully-automated systems) (McKinnon and Tallam, 2003).

There are numerous benefits associated with adopting self-collection delivery services over home deliveries. Firstly, from the operators' perspectives, self-collection delivery services improve order fulfilment by minimising failed deliveries that are commonly associated with home deliveries. This could translate to substantial cost-savings for the operators. It is estimated that £850 million could be saved if all home deliveries

in London were successful at first attempts (Francke and Visser, 2015). Secondly, from the societal and environmental perspective, self-collection delivery services allow consolidated shipments which reduce the number of road trips that are generated to serve customers. This reduces road congestions, demand for curb-side parking, emissions of greenhouse gases, and improves urban liveability (Chen et al., 2017; Van Duin et al., 2016). According to Edwards et al. (2010), up to 83% reduction of carbon emission could be achieved if consumers collect their parcels from self-collection facilities. Finally, from the consumers' perspective, self-collection delivery services eliminate inefficiencies associated with consumers waiting at home for their deliveries (Agatz et al., 2011). Home deliveries are often made within a 2-h timeslot and consumers need to wait at home for the deliveries. For self-collection deliveries, notifications are often sent to consumers when their parcels are delivered to the service points. Consumers can then choose to pick up their parcels at their own convenience within a certain time window. This reduces consumers' opportunity costs that are associated with waiting.

However, despite the various advantages that self-collection services possess over home deliveries, it is noted that home delivery remains as the more popular mode of last-mile delivery amongst consumers in some countries. According to a recent survey conducted by Tan (2016), 80% of

* Corresponding author.

E-mail address: wang1072@e.ntu.edu.sg (X. Wang).

<https://doi.org/10.1016/j.tranpol.2018.03.001>

Received 4 September 2017; Received in revised form 28 January 2018; Accepted 2 March 2018

the surveyed consumers in Singapore prefer home deliveries over self-collection services. In addition, [Choo \(2016\)](#) reported that only 5.5% of all last-mile deliveries in Singapore are made to self-collection points. Similarly, according to [Morganti et al. \(2014\)](#), only 10% of online shoppers in France chose self-collection services over home deliveries. Their findings clearly reveal a strong inertia in consumers' acceptance of new modes of last-mile delivery.

The existing literature has primarily focused on optimising the self-collection network as well as discussing the trade-offs involving the various modes of last-mile deliveries ([Deutsch and Golany, 2017](#); [Park et al., 2016](#)). There are currently very few theoretical studies that explore factors influencing consumers' behaviour i.e. their selection or adoption of last-mile deliveries. To bridge the gap in the literature, this study examines these factors through the theoretical lens of innovation diffusion theory (IDT). It describes how an innovation, idea, practice or objective become accepted and spread through societies large or small ([Rogers, 2003](#)). IDT is an appropriate theoretical lens for this study because it involves examining a relatively new, last-mile logistics practice i.e. self-collection services, which can be considered as an innovation. According to the theory, there are five factors that influence the consumers' acceptance of an innovation ([Baskerville et al., 2014](#)). They are relative advantage, compatibility, complexity, trialability, and observability.

The remaining parts of the paper are organised as follows. First, a review of the contemporary literature on self-service deliveries and IDT was conducted. Thereafter, hypotheses were formulated. Subsequently, surveys were designed and conducted for the purpose of data collection. Next, the data were analysed and hypotheses were tested using hierarchical regression analysis. The results were then presented and discussed. Finally, conclusions are drawn based on the results.

2. Literature review

2.1. Self-collection services

As early as 2001, [Lee and Whang \(2001\)](#) recognised the importance of e-fulfilment strategies in helping organisations to emerge victorious in the last-mile of e-commerce. Using two core concepts on information utilisation and resource leverage to complete last-mile delivery, they pinpointed five e-fulfilment strategies that organisations can adopt, namely “Logistics postponement”, “Dematerialisation”, “Resource exchange”, “Leveraged shipments” and “Clicks-and-mortar”. Two of the strategies are most relevant to this study. “Leveraged shipments” is a strategy that can maximise e-tailers' delivery-value density. It is a measure that can determine if it is economical to deliver goods to a neighbourhood in a single trip by aggregating orders. It can also be done by engaging localised home delivery service providers known as “dealers”, with each dealer making deliveries to customers of their assigned zones. For the “Clicks-and-Mortar” model, it involves engaging customers' cooperation in the last-mile delivery. This can be done by tapping onto the bricks-and-mortar stores of e-tailers or a local store for customers to pick up their parcels. These strategies have materialised and are being applied in today's context in the form of self-collection points, a concept where aggregated customers' orders are delivered and customers self-collect their parcels.

Before the birth of the self-collection concept, e-grocery was used as basis for last-mile delivery research. Reception box and delivery box concepts were discussed by [Punakivi et al. \(2001\)](#) and these concepts are deemed to be feasible approaches of unattended delivery. Reception box is a “refrigerated, customer-specific reception box installed at the customer's garage or home yard” whereas delivery box is an “insulated secured box equipped with a docking mechanism”. These approaches however, mainly revolve around only one customer at a time. [Punakivi and Tanskanen \(2002\)](#) further discussed how shared reception boxes concept can increase the cost-efficiency of last-mile delivery. Although this delivery method requires customers to pick up their parcel within the specified pick-up time window, the operation efficiency ratio of such

deliveries per hour is the highest. Moreover, 55%–66% of cost savings can be achieved subjecting to an operational efficiency that is 2.8 times higher than home deliveries. Time is saved using this method as customers are not required to specially travel to a store, and parcel collection can be planned and included as part of their daily travelling activities. Although the demand for such services is unpredictable at the time of study, the researchers saw its potential and suggested future research to be directed towards its feasibility and the acceptance of self-collection services.

Moving forward to today's environment, researchers begin to steer their course towards the study of self-collection points resulting in an influx of studies on alternative parcel delivery services.

[Morganti et al. \(2014\)](#) focused on self-collection networks in Europe and analysed how the operators arranged the self-collection networks, giving insights on the spatial patterns. Their findings showed that the self-collection networks reduce the operational cost of last-mile logistics delivery. It also improves parcel consolidation while reducing the possibility of failed deliveries. However, the conceptual framework proposed in the article only identifies the main considerations and limitations that may affect the design of a self-collection network and was based on an operator's perspective. In addition, the framework also presents a new perspective to designing self-collection network. For example, centres and nodes in cities, which originally represent parameters related to end-customers' mobility and accessibility to socio-economic activities can be converted into a self-collection network to encourage customers to use self-collection services.

From a behavioural perspective, [Collins \(2015\)](#) investigated the environmental footprint of last-mile parcel delivery. It was found that adjusting factors such as price, quality, location of self-collection points and delivery offering can influence customers to switch to more environmental friendly modes of picking up from the self-collection points or to integrate their pickup into an existing trip. This not only illustrates how changing certain characteristics of self-collection points and home delivery can influence customers' choice of transportation mode, it also shows how customers' choice and subsequent behaviour can be influenced by certain factors that they perceived to be important. This opens up the possibility of studying such behavioural influence on different areas, such as comparison between home delivery and alternative delivery methods.

[McLeod et al. \(2006\)](#) investigated the transport impact of local self-collection points. By comparing the existing home delivery and self-collection point method, [McLeod et al. \(2006\)](#) found that self-collection points are more favourable when (1) the carrier's depot is inconveniently located and is distant from the collection area, making it hard for trips to be combined, (2) a substantial number of people walk to their local self-collection points, or (3) when there is a high number of first-time home delivery failures. Additionally, having more self-collection point locations is also constructive to customers as they can travel shorter distances. However, this might potentially be detrimental to carriers as they have to deliver parcels to more locations.

[Xu and Hong \(2013\)](#) examined the factors influencing customers' intention to use self-collection services. Among the four main facets of personal characteristics, parcel characteristics, environmental characteristics and service evaluation of traditional home delivery, “convenience perception of home delivery”, “online shopping age”, “frequency of online shopping in a specified period” and “parcel values” are discovered to be significant variables affecting customers' willingness to choose self-collection services. Following which, the authors proposed that customer segmentation can be implemented to better suit the needs of customers. An intriguing finding is that customers' satisfaction of home delivery service is not a significant factor influencing customers' willingness to use self-collection services. This implies that service quality will not motivate customers to choose new delivery alternatives.

According to [Joeris et al. \(2016\)](#), self-collection services are not well-received by most consumers despite the benefit of picking up their parcels at their convenient time. This corroborates recent studies

Download English Version:

<https://daneshyari.com/en/article/7497031>

Download Persian Version:

<https://daneshyari.com/article/7497031>

[Daneshyari.com](https://daneshyari.com)