

Literature Review in the Field of Crowdsourcing Logistics

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Abstract

This paper summarizes and reviews the literature on the related research issues in the field of crowdsourcing logistics, and points out that the current research on crowdsourcing logistics is mainly focused on four aspects. These four aspects are: discussion on the concept of crowdsourcing logistics, application research on the mode of crowdsourcing logistics, discussion and research on the current situation analysis and development countermeasures of crowdsourcing logistics, and evaluation research on the service quality of crowdsourcing logistics. Through the introduction and sorting of the literature of the above research, it is helpful to have a comprehensive and specific understanding of the field of crowdsourcing logistics. After sorting out, it is found that there is still lack of researches on the transport capacity scheduling; incentive mechanism and pricing strategy of crowdsourcing logistics, and these research directions may become the new development directions in the field of crowdsourcing logistics.

Keywords

Crowdsourcing Logistics; Literature Review; Research Direction.

1. Introduction

Crowdsourcing logistics is an open distribution mode, which builds a participation platform based on the Internet and outsources logistics distribution tasks to the public in a voluntary and paid way by virtue of big data and mobile network technology [1]. Crowdsourcing logistics was inspired by the operation mode of online ride-hailing such as Uber and Lyft at the beginning of its birth. In the process of continuous development, crowd-sourcing logistics provides the possibility and effectiveness to solve the problems of end-logistics distribution, and is called an important solution to the "last mile" distribution dilemma. Crowdsourcing logistics has experienced less than ten years from its appearance to its development. Although the relevant researches on it are not perfect, they have formed a certain pattern. These researches mainly focus on the following four aspects.

2. Relevant Researches in the Field of Crowdsourcing Logistics

2.1. Discussion on the Concept of Crowdsourcing Logistics

Overseas for an earlier study of the concept of crowdsourcing logistics is appeared in 2015, Mladenow A et al. (2015) through the traditional concept of logistics and information integration of the concept of logistics, points out that the package of logistics is the enterprise through the Internet have outsourced logistics task of the individual package party to complete, and complete way includes two kinds: one is based on the competition mode, namely the individual with their own solutions to competition and to get to complete the task; The other is based on collaboration, where multiple recipients work together to come up with a solution and get the job done [2]. Carbone V et al. (2017) in the study of 32 cases, and the analysis of global 57 crowdsourcing logistics website, believe that all the logistics is a type of collaborative

logistics, and define it as a platform based on Web and mobile applications, the ability to use personal idle resources to provide a new way of logistics distribution service [3]. Rai H B et al. (2017) define crowdsourcing logistics as a market that supports matching the supply and demand of logistics tasks with undefined external personnel through information connection, and these personnel are willing to invest their time and space in order to obtain corresponding compensation [4].

Chinese scholars began to study the concept of crowdsourcing logistics in 2015 at the earliest. Li (2015) believes that crowdsourcing logistics shares idle time and labor, and is one of the important logistics development modes in the sharing economy [5]. And according to Lei (2017) point of view, and crowdsourcing logistics is in cloud computing and big data services platform to establish a logistics operation system, it is based on the Internet, and cloud computing ability, the intelligent decision support, information sharing, operation process standard and control precision to complete logistics service, and reduce the cost and improve efficiency [6].

In general, there is no unified statement on the concept of crowdsourcing logistics so far, but several factors are missing: platform, technology and idle capacity of public personnel. However, different scholars have slightly different interpretations and definitions of these factors.

2.2. Research on the Application of Crowdsourcing Logistics Model

The application research of crowdsourcing logistics mode is mainly carried out by establishing the corresponding model to solve a certain problem and verifying the model through case analysis. Mladenow A et al. (2015) constructed A location-based crowd-sourcing logistics model (LBCS) and used actual cases to support the effectiveness of this model for traditional logistics and information logistics using crowd-sourcing [2]. Wang Y et al. (2016) have established a crowdsourcing logistics model of city-end distribution, and made an empirical analysis and test of the model by collecting relevant data from Singapore and Beijing [7]. Frehe V et al. (2017) analyzed the nature and characteristics of the crowdsourcing logistics business model, and based on this, established a business model that could provide theoretical guidance for companies that want to carry out the crowdsourcing logistics business [8].

Different from foreign researches, domestic scholars' researches on the application of crowdsourcing logistics mode are mostly focused on the cold chain fresh industry. Ji et al. (2016) pointed out that the crowdsourcing logistics mode is the best way to help traditional fresh e-commerce enterprises out of the distribution dilemma [9]. Chen et al. (2017), after analyzing the current distribution situation of "the last kilometer" of fresh food in China, explored a crowdsourcing logistics distribution mode centered on customer demand and based on fresh food platform [10]. In order to ensure the timeliness and flexibility of cold chain distribution, Liu et al. (2019) built a cold chain distribution model based on crowdsourcing logistics model, aiming at minimizing the total cost of cold chain logistics distribution and maximizing customer satisfaction, and verified the effectiveness of the model through simulation [11].

It can be seen that domestic and foreign researches on the application of crowdsourcing logistics mode have different concerns. Foreign scholars do not carry out targeted studies on a certain subdivision of the distribution industry under the logistics industry, but explore the possibility and mode of enterprises' implementation of crowdsourcing logistics from the perspective of universality. However, due to the end distribution bottleneck encountered by China's cold chain fresh food industry, domestic scholars, starting from the actual problems, studied the way to solve the dilemma by using crowdsourcing logistics.

2.3. Research on the Situation Analysis and Development Countermeasures of Crowdsourcing Logistics

The analysis of the current situation of crowdsourcing logistics is mainly to study its existing problems and give corresponding development countermeasures. Mladenow A et al. (2015) pointed out that at the present stage, crowd-sourcing logistics may have problems in distribution responsibility, privacy leakage, delivery timeout, and safety of deliverers and customers, etc., and simply put forward some ideas to solve these problems [2]. According to Huang et al. (2015), crowd-sourcing logistics, as an emerging distribution mode, will inevitably have various problems. Among them, the qualification of public distributors, safety of all parties, cost standard and service standard are the main problems, which are focused on by Huang and put forward corresponding development countermeasures [12]. Lei et al (2017) think crowdsourcing logistics in our country in four big dilemma: lower distribution, low professional user information security, low degree of user scale and the disorder, the development of the industry to help crowdsourcing logistics enterprises out of these difficulties, Liu put forward five upgrade path, the upgrade path is from the perspective of technology, mechanism and system [6]. Wang et al. (2018) specifically took Dada-JD at home as the research object, analyzed the problems encountered in its development process and put forward targeted countermeasures and suggestions. For example, Dada-JD Home often has the situation that the delivered goods are lost and damaged, but it is difficult to find out the responsibility and compensation. For this reason, Wang Ying proposed the methods of crowdsourcing riders to conduct real-name authentication and identity information binding when downloading the registration APP [13]. Luo et al. (2019) mainly focused on the disordered development of the crowdsourcing logistics industry, so they put forward three suggestions to promote its healthy and orderly development: first, to issue laws and regulations related to the crowdsourcing logistics model; Second, to enhance the personal quality and professional ability of mass distribution personnel through training; Third, make full use of big data, Internet of Things, artificial intelligence and other technologies to explore new mechanisms to improve service quality and profitability [14].

No matter at home or abroad, after analyzing the status quo of crowdsourcing logistics, researchers have concluded that it has many problems, and the problems mainly focus on the security of goods, the security of distributors, the security of customers, the security of data, the security of privacy and other aspects, as well as the quality of service. In addition, compared with foreign studies, domestic scholars pay more attention to macroscopic issues such as whether the system, mechanism and law are sound, and whether the industry environment is orderly and healthy, and tend to give decision-making suggestions from an overall perspective. In addition, domestic research shows a trend of focusing on a specific perspective or enterprise from an all-round analysis. It is precisely because of this focus that the status quo of crowdsourcing logistics is presented in a more detailed way.

2.4. Research on the Evaluation of Crowdsourcing Logistics Service Quality

The evaluation of the service quality of crowdsourcing logistics distribution is mostly from the perspective of customers, and the level of service quality is depicted from the perspective of customers. Lin (2016) points out that the crowdsourcing logistics service process is divided into information service, the customer service center and logistics service three modules, and according to the customer oriented principle, feasibility principle, the principle of sufficiency, five principles of universal principle and systematic principle, build the crowdsourcing logistics service quality evaluation index system and the system dynamics model, at last, by taking a company as a case for empirical research, verified the index system and model is practical and effective [15]. Klumpp M (2017) combined theory with practice and proposed a corresponding evaluation scheme for the quality of crowdsourcing logistics service, aiming to provide a

reference method for its development [16]. Chen et al. (2017) measured the quality of fresh logistics distribution by sending questionnaires to customers, and put forward some suggestions to improve the service quality according to the results of the questionnaire analysis [10]. Zhang (2018), from the perspective of customer perception and based on the service contact theory, established a crowdsourcing logistics service quality indicator system with four dimensions, including goods contact, personnel basis, platform contact and technology contact. In addition, some scholars have studied the impact of crowdsourcing logistics enterprises' management behavior on service quality on customers' perceived service quality [17]. Meng et al. (2020) constructed a differential game model of superior package logistics service quality by taking seven indicators such as personnel communication quality, order quality and express package integrity as the decision variables of the model, and solved the optimal trajectory of crowdsourcing logistics service quality change over time under different game situations [18]. It is not hard to see through the above literature, on the package of logistics service quality evaluation of research from the perspective of customer, after all, only the truly experience the distribution services customers have qualification and ability of its level for effective and meaningful assessment, according to the evaluation results also can truly for crowdsourcing logistics enterprise service quality management and service behavior of crowdsourcing mass distribution member give valuable advice.

2.5. Others Research

In addition to the above four main aspects, there are a few other directions of research. Such as studies of crowdsourcing logistics capacity scheduling, Mu et al. (2018) by introducing the fuzzy time window, establishes crowdsourcing logistics personnel profit maximization as the goal, based on a revenue incentive model of crowdsourcing logistics capacity scheduling and instant delivery, at the same time the model through the case analysis verifies the in improving crowdsourcing logistics personnel enthusiasm and ensure customer satisfaction both feasible and effective [19]. About crowdsourcing to research the incentive mechanism of logistics, Liu (2019), design effective incentive mechanism for the whole of crowdsourcing logistics industry has significant practical significance, so he based on the principal-agent theory, discuss the fixed mode, the reward and performance reward mode, crowdsourcing logistics distribution member efforts and crowdsourcing incentive coefficient of the relationship between logistics platform [20]. Some scholars have also studied the pricing of crowdsourcing logistics platforms. Wang et al. (2018) studied the dynamic pricing model of crowdsourcing logistics in the case of considering the social distribution capacity. The results show that dynamic pricing strategy can stimulate the social distribution capacity and maximize the expected revenue of crowdsourcing logistics platforms [21].

The above researches are either limited in number or started late, which may become the development direction of future researches on crowdsourcing logistics.

3. Summary

By sorting out and commenting on the research problems in the field of crowdsourcing logistics, this paper concludes that the current research on crowdsourcing logistics mainly focuses on four aspects. They are: discussion on the concept of crowdsourcing logistics, application research on the mode of crowdsourcing logistics, discussion and research on the current situation analysis and development countermeasures of crowdsourcing logistics, and evaluation research on the service quality of crowdsourcing logistics. However, there is not much research on the transport capacity scheduling, incentive mechanism and pricing strategy of crowdsourcing logistics, so these may become the development direction of future research.

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