e-Commerce Websites and the Phenomenon of Dropshipping: Evaluation Criteria and Model

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Abstract. In the contemporary highly competitive digital commerce market, it is easy to miss new online ventures being launched and those that go away. The success of such a venture is highly dependent on the quality of an e-commerce platform. Even more so in the case of dropshipping-based business models, where similarly-profiled businesses are intensively working on acquiring customers to sell goods delivered by the same distributors. Many criteria, frameworks, and models for assessing e-commerce platforms were developed to date, yet applying those directly to dropshipping ventures leave some important areas unexplored. The study scrutinizes the factors that make an e-commerce platform stand out to effectively attract customers in a highly competitive market. Design Science Research approach was used to deliver a dropshipping-oriented evaluation model extension. Business cases for new criteria and proposals for e-commerce platform features designed to address inefficiencies in IT solutions currently operating in the market were provided.

Keywords: e-Commerce · Dropshipping · Website evaluation · Evaluation criteria · Design Science Research

1 Introduction

Dropshipping might be considered a business model for e-commerce logistics in which the company that hosts an e-commerce platform has the sole task of acquiring customers, effectively acting as a middleman [L] is in fact [1]. Their orders are passed along to distributors (e.g. wholesalers or manufacturers) who are tasked with handling all the activities related to delivering the ordered product to a given customer. It is the difference between the wholesale and retail price that is the source of profit for the dropshipping service provider. The relative ease of launching and operating an e-commerce venture in line with the principles of dropshipping constitutes its great advantage. Therefore, such a business model proves to be quite popular in contemporary global markets – market size for dropshipping was reported at over USD 100 billion in 2018, with a Compound Annual Growth Rate predicted at 28.8% by 2025 [GVR] is in fact [2]. The dropshipping service provider does not require its own warehouses [R] is in fact [3] and is not forced to tie up the capital with the goods

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offered via its e-commerce platform. Finally, the assortment that did not find its buyer does not constitute a direct burden on the seller.

The mechanics behind dropshipping-oriented platforms are relatively straightforward from a purely IT perspective. It is required to build and launch a scalable online platform that shall advertise products delivered by one or more suppliers and handle business processes related to ordering. The database of such a platform is required to be subjected to frequent synchronization with the databases of cooperating wholesalers in order to monitor stock levels, update prices, and introduce new product offerings. There are IT vendors on the market who offer Application Programming Interfaces (API) to databases recording products offered by many wholesalers. In such a situation, the primary challenge for an e-commerce business that takes advantage of the dropshipping business model is to offer its customers a platform that streamlines the purchase of a basket of goods and makes it significantly more attractive compared to other ventures that supply goods from the same business partners.

The primary motivation for us was to investigate the dimensions of competitiveness for online stores that sell goods in line with the principles of dropshipping. The goal of the research is to scrutinize the factors that make an e-commerce platform stand out to effectively attract customers in a highly competitive market. To achieve that, it was essential to identify the individual features of a dropshipping-based distribution and translate them into the specific functionality of the software that supports this type of distribution. After the introduction, the literature review is performed. Subsequently, research questions are developed, and the research approach is presented. The findings of the study are introduced and discussed next, followed by conclusions.

2 Literature Review

There is little doubt that website evaluation is a multi-criterion undertaking. One might argue that the most natural criterium for assessing e-commerce platforms relates to Graphical User Interface (GUI) properties – such as functionality, usability, or user-friendliness. In this regard, Yates explores the needs of website users with disabilities, concluding that while there is an obvious rationale behind developing accessible and usable online platforms, the costs behind successfully delivering such platforms made this aspect highly undervalued when the study was conducted [4]. Upon completing three-stage studies of selected websites that included automated accessibility evaluation, expert-led manual heuristic evaluation, and blind user tests, Goncalves et al. came up with a list of recommendations aimed at enhancing accessibility and usability of e-commerce platforms [5]. Diaz et al. discard several usability metrics and propose 39 individual usability metrics grouped into 10 usability aspects, provide quantitative measures, and validate them through interviews with usability experts [6]. Whereas they did not explore a practical application of the proposed method, it might potentially be adapted to assessing dropshipping platforms should the authors increase the portfolio of metrics considering the specific properties of dropshipping websites. On the other hand, Zafiropoulos and Vrana propose a website evaluation framework intended solely for assessing websites that provide hotel services [7]. Their approach uses the Hierarchical Cluster Analysis (HCA). The method establishes 65 evaluation components grouped

under the specificity of hotel services. The proposed solution is an example of a strictly profiled framework.

Nevertheless, most models, frameworks, and evaluation scales go beyond the assessment of the aforementioned features. Technical criteria emerge as one of the leading priorities – in particular those that enable evaluating such aspects as lag-free website loading and operation [8–11] as well as security and privacy-related criteria [8, 10–13]. It is in fact the E-S-QUAL scale for assessing the quality of electronic services [8] that emerged as one of the most widely acknowledged models, which enable identifying strengths and weaknesses of given websites and uncovering room for improvement. It covers all previously discussed criteria with a four-dimensional, 22-item scale and comes with a complementary E-RecS-QUAL set of criteria. The latter is designed to address features that only need to be used when digital sale processes were not completed seamlessly, and inquiries, issues, complaints, or compensations need to be handled. Al-Khalifa proposed a solution called the Mobile University Evaluation Framework (MUEF) taking into account the requirements of W3C Mobile Web Best Practices [9]. The author selected the websites of two universities to validate the proposed method. The websites were rated by two experts who addressed individual criteria using the Likert scale. Chua and Goh performed a study aimed at assessing the quality of world libraries' web portals [10]. They used selected elements of established solutions – such as WebQual and E-SERVQUAL. The assessment method covered three categories: System Quality, Information Quality, and Service Quality. Variables for each of these categories were provided, including Usability, Responsiveness, Ease of Access, and Privacy for evaluating the System Quality. The proposed method was validated via a survey by three experts. A framework for measuring the acceptance of websites profiled for the tourism industry (websites for purchasing the services of low-cost airlines in particular) was delivered by Khalifah et al. [11]. The generic E-QUAL method was expanded to include protection and privacy. Abidi et al. dealt with the problems of applying Web Services Composition Engineering (WSCE) and Web Services Composition (WSC) to the framework called PASCO [12]. Personalization and security issues were the most important dimensions examined. The correctness of the PASCO proposal was verified during the examination of websites of selected banks. Finally, Qi et al. submitted a proposal to evaluate websites across three areas: Website Usefulness, Website Service Quality, and Website Physical Accessibility [13]. The validation of the proposed model was not addressed in the article and no in-depth characteristics of the measures were proposed.

It is marketing that is another essential aspect of assessing e-commerce portals – all the more important in the context of dropshipping. Thus, Sulova proposed a system of indicators for assessing online store websites [14]. The indicators have been grouped into the following sets: visitability of a website, specific e-commerce indicators, functionality of a website, e-commerce platform in terms of a marketing tool. A method for calculating a qualitative metric was proposed that utilizes such variables as no. of visits, no. of unique visitors, returns, time on site, bounce rate, top-exit pages, pages viewed/visitors, top-visited pages, traffic source, an top visitors/country. The proposed method, despite a robust set of indicators, does not cover dropshipping-specific features and constitutes a viable candidate for presenting an extension in that regard.

It should be noted that while some of the proposals are conceptual in nature (e.g. [6, 13]), many schemes are supported by an extensive mathematical apparatus – just to mention [15–17]. Chiu et al. proposed a new hybrid Multiple Attribute Decision Making (MADM) model based on a number of previous solutions [15]. The contribution identified the lack of customer satisfaction with service in the online store as a research gap. The next element of MADM was to formulate a recommendation to modify the website under review to introduce changes that would lead to the required level of acceptability. Yi et al. noted that in assessing customer satisfaction regarding the use of websites, criteria (vectors) such as time and space are not taken into account [16]. High-order subspace analysis based on non-negative Tucker decomposition is performed to enable customer satisfaction evaluation. The proposed model is used to assess several of the most popular Chinese websites by three experts. Kang et al. proposed a framework that represents multiple criteria decision-making methods [17]. They integrate a fuzzy hierarchical TOPSIS method and E-S-QUAL scale for evaluating business-to-customer e-commerce websites. The proposed assessment method features seven stages. The study was concluded with sensitivity analysis and validation of results.

Last but not least, attempts to evaluate web portals in the context of dropshipping emerge. Singh et al. highlight the most important stages of establishing dropshipping activities on the Internet [18]. The authors discuss the importance of (1) proper e-commerce platform operation; (2) correctly configured CSV files; and (3) well-deployed MySQL solutions. They analyze the IT-related implications associated with the Minimum Advertising Price (MAP), i.e. the amount the supplier is not willing to go below. The solutions proposed in the article might be considered guidelines for entrepreneurs who deploy IT services for an online store that operates in line with the principles of dropshipping. Vellve and Burgos dive into the specifics of online dropshipping services in Spain [19]. They reveal that this type of activity is associated with a high level of the so-called annual cart abandonment rates above (63%, measured on an annual basis) as well as high returns (6%) on invoiced goods. The authors of the article propose several solutions that are designed to minimize these two phenomena from an IT point of view.

3 Research Questions Development

The literature review revealed that the scientific community came up with a number of criteria, frameworks, and models for assessing e-commerce platforms. The aforementioned models substantially differ in their abstraction level and focus – from very generic models that cannot be directly implemented in business practice, to heavily profiled ones that lean towards a specific perspective, e.g. the challenge of website performance. That being said, diving into the evaluation criteria for e-commerce platforms and confronting them with the daily practice of businesses operating in line with dropshipping principles led to the conclusion that related research shows a clear trend towards traditional e-commerce solutions. Therefore, the criteria naturally neglect the features that are distinctive for the dropshipping phenomenon. Whereas a number of universal criteria – which constitute the core of many analyzed models – are

undoubtedly useful for evaluating e-commerce platforms taking into account this phenomenon, the multi-faceted look at e-commerce solutions from the perspective of many actors reveals some deficiencies in existing frameworks. Thus, in our humble opinion, we are dealing with a dropshipping-related research gap.

To fill this research gap, the following research questions were posed:

RQ1: What is the difference in the mechanics of goods distribution between traditional e-commerce ventures and those that operate in line with the principles of dropshipping?

RQ2: What additional functionalities and/or features should the software for dropshipping online stores be equipped with compared to IT solutions that support the traditional e-commerce business models?

4 Research Approach

In our study, the literature review accomplished constituted a basis for conducting a series of five semi-structured in-depth interviews with dropshipping practitioners who run their businesses in Poland, EU. The feedback, in turn, fueled the Design Science Research (DSR) approach. Given that both dropshipping – and e-commerce in general – are dynamic phenomena, expert knowledge enabled us to capture the most up-to-date knowledge. The review itself addressed both mainstream models for e-commerce evaluation as well as the phenomenon of dropshipping itself. The Google Scholar service was selected owing to its particularly wide indexing range. The following search strings were used to narrow down the contents of Google Scholar library: (1) website evaluation framework; (2) evaluation e-commerce; (3) evaluation web service economics; and (4) dropshipping.

The DSR method enables contributing to both practice and theory in the course of solving a vast portfolio of practical challenges [20]. It shares core characteristics with Action Research, emphasizing coming up with implementable solutions [21] – yet no joint intervention with the staff of the business engaged in the research is called for. Peffers et al. argue that the design-centric approach may be considered a distinctive feature of Information Systems research among other business academe and brings a set of widely accepted features to the table [22]:

- delivering an artifact that captures domain-specific knowledge with a degree of generalization;
- incorporating a specifically-defined or loosely-defined process for motivating and determining a problem, designing a solution, and evaluating it;
- focus on conceptualizing based on a review of domain-related knowledge created so far rather than ad-hoc solving instantiated problems.

As established by Thakurta et al. in course of charting the DSR discourse through a comprehensive literature review that covered as many as 293 cases, (1) the artifact palette proves to be very broad and includes such types of artifacts as methods (42.7%), models (22.2%), systems (13.7%), constructs (6.8%), frameworks (6.1%) or architectures

(2.0%), whereas (2) 27.6% of artifacts might be classified as fully ready for use after their implementation and validation [23]. Thus, our research falls within mainstream DSR research. To increase the robustness of our study, we took advantage of several guidelines by Hevner et al.: we set up a problem space for the design process, designed a purposeful artifact that delivers a streamlined solution and yields utility to a specific problem domain, we ensured its internal consistency and formalized it, initiated the evaluation process, and finally reported the outcomes of DSR to all potential parties involved [24].

5 Findings

The research conducted resulted in filling some of the gaps that remain upon applying widely acknowledged website evaluation criteria to a dropshipping setting. As a result, an artifact – i.e. the dropshipping-oriented E-S-QUAL/E-RecS-QUAL model extension – was built. Confronting the experiences of the practitioners with the proposals submitted, among others, in [6, 14, 19] allowed for streamlining the list of potential dropshipping-centric criteria.

In order not to unduly complicate the description of the overall model, we put focus on stating business cases for each extending evaluation criteria proposal and related e-commerce platform features while keeping the nature of generic variables and dimensions intact. The artifact takes advantage of the *Core* service quality scale and the *Recovery* service quality scale (Fig. 1) originally proposed by Parasuraman et al. [8]. Within the former, the generic criteria that comprise the *Fulfillment* dimension were supplemented with a couple of dropshipping-oriented criteria, i.e. *Suggesting product replacements to streamline delivery costs* as well as *Delivery time- and location-driven shipping*. As the software behind traditional e-commerce ventures and those that operate in line with the principles of dropshipping differ in a number of ways, the inclusion of a brand-new dimension (*Market Recognition*) proved justified. This extending core dimension features a few specific criteria: (1) *product price juxtaposition mechanics that hints a new competitive price proposal automatically*; (2) *management of multi-instance advertising campaigns*; and finally (3) *wizard for creating customized product descriptions*.

5.1 Suggesting Product Replacements to Streamline Delivery Costs

When purchasing more than one product, the platform should automatically propose potential substitutes for selected goods that are not available from a specific distributor in order to reduce the total logistics costs and produce a more attractive package in terms of total price (customer-oriented functionality).

Business Case. The vast majority of e-commerce websites operating on the principles of dropshipping sell goods offered by various wholesalers and/or manufacturers. The functionality discussed refers to a situation when a customer puts more than one product in a basket, and the assortment to be delivered comes from suppliers located in different geographical locations. In such a situation, it is necessary to process the order by sending more than one shipment to the customer or sending the ordered goods to a

single location – and repackaging those before finally forwarding the goods to the final recipient. Both of these scenarios address the issue of buying goods from more than one supplier, yet result in increased delivery costs.

e-Commerce Platform Features Required. It is recommended that the software that enables a dropshipping e-commerce venture suggested substitutes offered by a single supplier upon a customer selects goods from different suppliers. It is desirable that the substitutes were in a similar price range (or cheaper) and had main features consistent with the original product. Putting such practice into operation would result in decreasing the total amount of the transaction borne by the customer by the cost of at least a single redundant shipment.

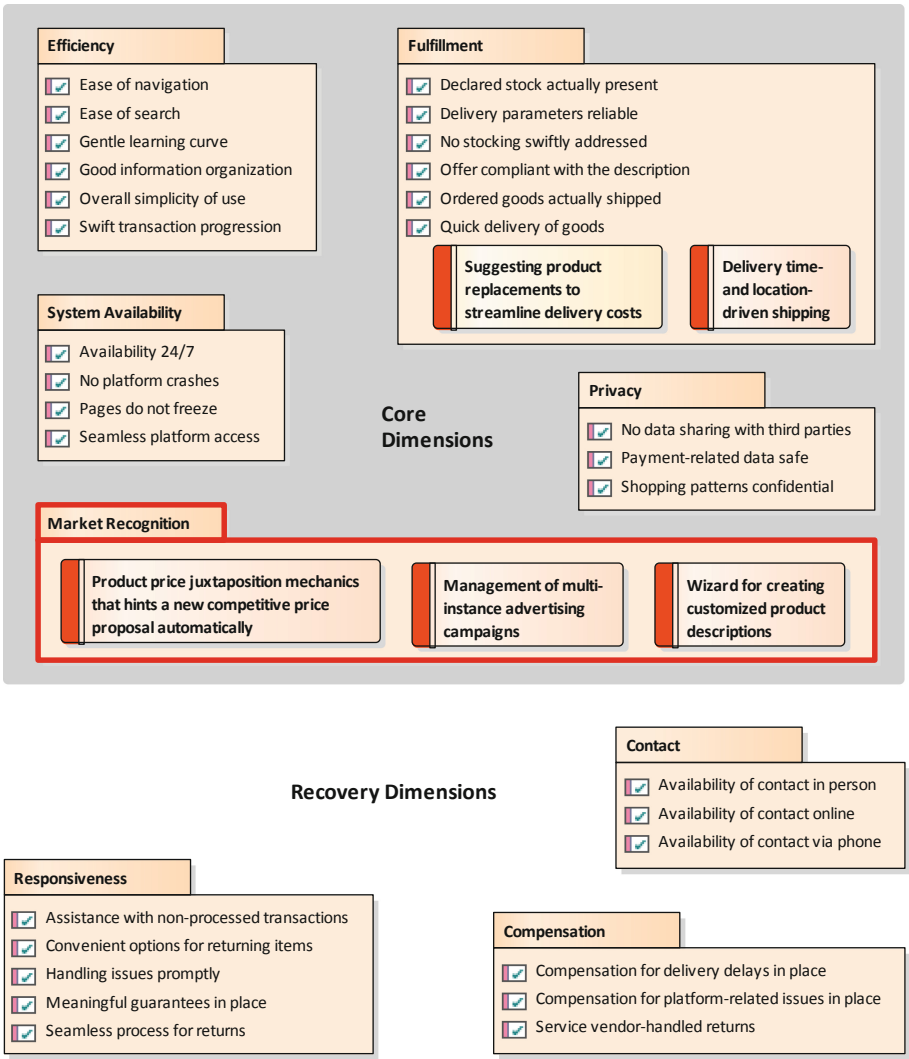

Fig. 1. Dropshipping-oriented E-S-QUAL/E-RecS-QUAL model extension

5.2 Product Price Juxtaposition Mechanics that Hints a New Competitive Price Proposal Automatically

The pricing of goods offered via the platform ought to be automatically confronted with identical products marketed by other online stores. The software is to automatically suggest a competitive price for each of the products sold (administrator-oriented functionality).

Business Case. In practice, many e-commerce stores operating in line with the principles of dropshipping sell goods provided by the same wholesalers or manufacturers. IT services vendors provide APIs that enable access to data from many distributors in an integrated form. A natural consequence of this state of affairs is that target pricing for retail customers across different dropshipping businesses might be alike or even uniform. This occurs quite frequently given the current level of technological maturity and the need to devote significant manual workflows to maintain a rational pricing model – but flat retail prices cannot be considered a general rule. Individual dropshipping e-commerce ventures may have different wholesale prices agreed upon due to the sheer volume of goods from given distributors sold via their platforms and translate this advantage into retail pricing.

e-Commerce Platform Features Required. We propose that the software behind operating a dropshipping online store was able to automatically juxtapose the price of a given item that is planned for sale (as well as the ones already in distribution) with the prices of the same item throughout the competing ventures. This functionality should automatically propose a competitive price for putting goods for sale via the e-commerce platform taking into account the planned margin and supervise the valuation model used. Should a deviation from the model occur due to significant price changes at competitors, alerting should be accounted for.

5.3 Wizard for Creating Customized Product Descriptions

Similarly to the pricing model, dropshipping businesses should be provided with low-effort support in creating/modifying tailored descriptions of products offered via their e-commerce platforms (administrator-oriented functionality).

Business Case. Wholesalers and/or manufacturers who supply products sold through dropshipping online stores supplement their offerings with databases, from which the store's software can automatically download product information. Through such an interface, extensive datasets are exchanged – just to mention product descriptions, accompanying images, specifications, keywords, and customer reviews. Lack of customization leads to a situation in which numerous dropshipping sites offer the sale of the same products with identical photographs and comments – what negatively impacts the credibility and recognition of the venture. Even considering the mechanics behind Internet search engines only, it is vital for a business that product descriptions and keywords used differentiated from those commonly found on the Internet.

e-Commerce Platform Features Required. It is recommended that the software that enables a dropshipping e-commerce venture supported the creation of customized

descriptions of products sold with intensive use of keyword-based phrase generators and description style/layout wizards. This functionality should enable creating one's own descriptions and automatically compare them with the descriptions of the same products offered by other online stores.

5.4 Delivery Time- and Location-Driven Shipping

To make the platform functionality more inclusive for business customers robust and cover specialized goods, enabling placing multi-scale purchase orders for various customer-side locations with fixed dates of delivery might be considered (customer-oriented functionality).

Business Case. According to the domain-related literature, the dropshipping e-commerce logistics business model is predisposed to handle the sale of specialized goods – including perishable ones (such as flowers or food) and those that require dedicated storage conditions. In the process of distributing these kinds of products, a dropshipping e-commerce venture bears neither the cost of acquiring specialized storage spaces nor the risk of losses related to the unsold lot that needed to be recycled. Specialized goods sale might also imply a setting in which the buyer requires delivery of the purchased assortment under one order to different destinations with different delivery times (this applies to e.g. groceries ordered centrally by chains of retail stores). Purchase that falls into this category is usually planned by a recipient well in advance and sometimes features a set of related deliveries. In such a case, traditional, siloed e-commerce solutions and a multitude of shipping methods at one's disposal lead to the practical impossibility of ensuring any kind of delivery synchronization.

e-Commerce Platform Features Required. The software for operating a dropshipping store is to enable the customer to purchase numerous products as a single order or a meta-order, where the composition of items is inherited per facility with an option of adjusting the quantity and pick-up location. For individual (sub-) orders it should be possible to indicate different dates of their actual delivery.

5.5 Management of Multi-instance Advertising Campaigns

Global dropshipping businesses face the need to simultaneously manage multiple advertising campaigns carried out in different online locations (administrator-oriented functionality).

Business Case. As stated before, many dropshipping stores offer the same products at similar prices. One of the ways to increase sales through a given e-commerce platform is a properly prepared and executed advertising campaign that will encourage customers to carry out the purchase transaction through a specific online store. In practice, dropshipping sellers place numerous ads addressing the same product on the Internet, yet lack the technological maturity to monitor and adjust them properly.

e-Commerce Platform Features Required. Dropshipping IT solutions should be able to automate the process of advertising campaign preparation, placing ads in preferred Internet-based channels, and tracking their impact. The management of advertising

campaigns should make it possible to assess the effectiveness of each of the advertisements launched in order to, inter alia, discontinue those that do not generate the revenues required.

6 Conclusions

Electronic commerce is an economic phenomenon accompanied by continuous growth – in 2019 alone, in the USA its volume increased by 14.9% and is reported to grow even more in 2020 [25]. Dropshipping is currently one of the most intensively developed forms of sales via the Internet. That being said, the owners of dropshipping businesses encounter some barriers specific to this form of trade. To gain a competitive advantage, they expect as much support from IT tools at their disposal as possible.

The paper contributes to digital commerce theory by re-assessing a series of website evaluation criteria that date as far back as the E-SERVQUAL method and its further iterations in light of the dropshipping phenomenon – just to mention E-S-QUAL and E-RecS-QUAL scales. It was revealed that whereas the latter scale was found adequate to evaluate e-commerce solution features aimed at handling alternative scenarios of digital sale processes as well as some supporting business processes in the dropshipping context, the core dimensions necessitated additional criteria. Both business cases for new criteria that address leading divergences between e-commerce business models in place (RQ1) and draft system requirements related to e-commerce platform features designed to address inefficiencies in IT solutions currently operating in the market constitute implications for practice as well. Five additional criteria were included, three of which establish a new dimension – Market Recognition. Thus, we addressed RQ2 by recommending a set of dropshipping-specific features that future iterations of the software behind such a business model might be equipped with.

Like virtually any research, this study has a few limitations. First of all, while the design process of the artifact closely followed the guidelines [24], no prototype of the e-commerce solution profiled for dropshipping was built at this stage of research, and the validation of the artifact is pending. A wide audience's feedback ought to be collected to assess the usefulness of individual components proposed in this work at a multi-national scale. Secondly, as long as the study explored and developed the functionality directly related to interfacing an e-commerce platform with numerous IT solutions of suppliers that are covered by the dropshipping business model, the issues of interface reliability, data cleansing, and retransmission upon failure were not discussed.

The next step will be further research on identifying IT-related options for addressing the difficulties encountered in conducting dropshipping activities. Subsequently, the method proposed in this paper is to be developed, enabling the assessment of e-commerce tools available on the market in terms of their suitability in dropshipping. The proposed model will be evaluated by specialists and then applied in practice. The ultimate goal of the solution sought is to increase the number of customers using dropshipping services.

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