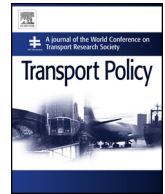




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Chinese third-party shipping internet platforms: Thriving and surviving in a two-sided market (2013–2016)

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ABSTRACT

How can cargo owners be persuaded to switch their traditional offline business practices to a third-party online shipping platform? To address this question, we selected 10 representative third-party shipping Internet platforms in China and analyzed them based on grounded theory. In-depth interviews that lasted an average of 2.5 h were conducted with each company. After applying open coding and axial coding to interview transcripts that included more than 110,000 words (in Chinese), we propose three industrial characteristics that may hinder the development of Chinese third-party shipping Internet platforms. The two most popular initiating strategies adopted to address these issues are "disintermediation" and "service upgrading." Our theoretical framework suggests that each initiating strategy should include three interconnected issues that can ensure a platform's success: value proposition, entry mode and competitive advantage. The final sections of our study describe our contributions to theoretical development and implications for practitioners.

1. Introduction

Many third-party Internet platforms have recently been constructed for the Chinese shipping market based on big data and cloud computing, attracting significant attention from well-known venture-capital firms such as DIG, Matirx, and Source Code Capital. Hundreds of millions of dollars have been invested in this emerging market. It is believed that because of their lack of conflicts of interest with existing market participants, third-party Internet platforms are more likely to incorporate various actors in the market and outperform their traditional counterparts, which are dominated by one or two liner companies. However, so far, few of them have returned positive earnings to their investors. Therefore, it is important for us to examine how to successfully persuade cargo owners to switch their traditional offline business practices to an online shipping platform. More specifically, in our research, we divided the research question into two related sub-questions: 1) What hindrances do online shipping platforms encounter when they start their business? 2) How do the survivors address these hindrances and establish their businesses?

2. Literature review

Compared with platforms launched by shipping companies or cargo owners, such as E-shipping,² which closely resemble an e-business outlet of the focal firms, *third-party shipping Internet platforms (TPSIP hereafter)* have tried to establish their businesses without conflicts of interest with existing market participants. Therefore, TPSIPs are more likely to cooperate with a wide range of liners and shippers and enjoy the direct network externality of the platform: the liners' utility of consuming the platform service increases with the number of shippers consuming the same service and vice versa (Katz and Shapiro, 1985). The two-sided nature of TPSIPs also leads to an indirect externality that is caused by a virtual network rather than a physical network, where the virtual network is formed as a result of technical complementarity or compatibility between primary products and complementary products (Lee, 2013). For example, by accumulating transaction data, TPSIPs can provide value-added services such as credit reports and supply-chain financial services, both of which are difficult to provide in traditional offline markets.

Although TPSIPs have several advantages over their traditional offline counterparts, only a few studies have been conducted on two-sided Internet markets and related topics in the transportation field

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² E-shipping is an online platform owned by China Shipping, China's second-largest ocean carrier.

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(Jafari et al., 2010; Lee et al., 2015), and even fewer have focused on the shipping industry (Peñaloza et al., 2007). More importantly, the core issue in TPSIP initiation still remains unexplored: How to successfully persuade the cargo owners to switch their traditional offline business practices to an online shipping platform. Researchers have conducted related studies addressing issues with new practice adoption in some emerging market segments. For example, She and his colleagues argue that not only economic concerns but also cognitive factors affect consumers' attitude toward battery electric vehicle adoption, leading to the unsatisfactory situation in Tianjin, China (She et al., 2017). Focusing on customers' intention to use self-collection services for last-mile delivery, Yuen and his colleagues concluded that the service design as well as consumers' lifestyle, values and needs affect the diffusion of new practice adoption (Yuen et al., 2017). Most of these studies were conducted in a B2C market and focused on individual customers and their new practice adoption. Therefore, the conclusions have limited explanatory power when they are applied to B2B market practices.

By addressing the research question of how to successfully persuade cargo owners to switch their traditional offline business practices to a third-party online shipping platform, this study increases the understanding in terms of not only TPSIP initiation in practice but also new practice adoption theory in a B2B market. More specifically, we carefully selected and studied 10 Chinese TPSIPs to analyze this emerging market. Using qualitative data such as interview transcripts and third-party reports, we conducted a comprehensive investigation of the operational details of TPSIP practices in an attempt to explain why TPSIPs survive by examining their initiating strategies during the entrepreneurial phase. To date, there are few studies of TPSIPs available,³ so our study adopted an *interpretivism* perspective based on grounded theory and used open coding and axial coding to frame our theory and answer our research questions. Contributions to theoretical development and implications for practitioners are provided in the final sections of this study.

3. Methodology and data collection

Eisenhardt and her colleagues propose that “the purpose of the (case study) research is to *develop theory, not to test it*” (Eisenhardt and Graebner, 2007). Considering the emerging nature of TPSIPs and the few studies that have been conducted on related topics, our study attempts to build a theoretical framework to better understand TPSIPs as well as new practice adoption in a B2B market, thereby laying the groundwork for future empirical studies.

To analyze the data, our interpretive study adopts the grounded theory method, which has been widely applied in social science and was recently introduced in a transportation management study (Paukzstat, 2017). Grounded theory is a research methodology that involves constructing a theory through induction, deduction, and phenomena verification (Strauss and Corbin, 1998). This methodology is neither a quantitative empirical technique nor a methodology used to validate the theory. Instead, grounded theory involves concurrent inductive data analysis and theory construction, both of which influence each other. Generally, researchers first ask a research question and then code, analyze, and model phenomena and data, generating concepts and ultimately, a theory. This methodology is suitable for reflecting on social phenomena using real-life scenarios under specific conditions. Based on a specific research scenario, grounded theory seeks to generate concepts and build a theory through the analysis and induction of data (Glaser and Strauss, 1967). Because TPSIP is an emerging market that few (if any) studies have analyzed, we believe that grounded

theory is the most suitable method to investigate our research question. Our study addresses the issues in the following order: we (1) introduce the methodology and data collection; (2) describe the development of TPSIPs in China; (3) discuss the operational and business details of TPSIPs and explain how they survive by examining their initiating strategy during the entrepreneurship phase; and (4) conclude and discuss future prospects. This paradigm is consistent with classical research that includes case studies (Eisenhardt, 1989; Eisenhardt and Graebner, 2007; Bingham and Eisenhardt, 2011). Our research design can be summarized as follows (see Fig. 1).

3.1. Data collection

TPSIPs are an emerging market that many start-ups enter and leave. Thus far, none of these firms have disclosed their financial and market information. Therefore, we cannot rely on a traditional sampling method and select firms based on criteria such as market share or growth rate. Our *sampling strategy* includes a comprehensive investigation of various types of qualitative data such as mass media and third-party reports. In addition, we interviewed three experts who claimed not to have conflicts of interest, and 15 representative TPSIPs were recommended. These experts are affiliated with the Shanghai International Shipping Institute (2 experts) and Shanghai Maritime University (1 expert) and had experience advising both industry and government agencies. Based on the first round of interviews, we selected 10 of the 15 TPSIPs proposed by our three experts (Table 1). Then, based on a review of prior studies and the expert interviews in the first stage, we constructed a semi-structured questionnaire (see Appendix 1) as an outline for the in-depth interviews conducted during the second stage. Before interviewing a representative from each company, we e-mailed the questionnaire to the interviewee at least one day in advance to ensure that the interviewee had a comprehensive understanding of the purpose of the interview and could make the necessary preparations. We conducted the interviews from April to July 2016. The study participants were employed at companies located in Shanghai (5), Beijing (2), Dalian (1), Suzhou (1) and Ningbo (1). Each participant was interviewed for an average of 2.5 h, and all of the interview transcripts are more than 110,000 words (in Chinese). The interviewees generally held senior management positions or higher, including 5 presidents/CEOs, 1 vice president and 4 managers. To protect the respondents' confidentiality and ensure their ability to speak freely, we guaranteed that their real names would not be used in this study. During the interviews, the principal interviewer interacted with the interviewee while a minimum of two research assistants addressed supplementary tasks such as recording and reviewing the questionnaire to ensure that every question was asked. *During the second-stage interviews, we noted that the interviewees increasingly provided information that was similar to the information gathered in the prior interviews, thus confirming that the 10 representative firms should be sufficient to address our research question.* Furthermore, due to the confidential constraints between TPSIP and their client, these TPSIPs were not able to disclose the names and contact details of representative cargo owners. Rather, they provided their customers' experiences to us in aggregated form. Therefore, in our study, we focused on TPSIP's interviews to address our research question.

3.2. Data analysis

We developed a two-stage coding design to address our sub-research questions (Fig. 1). During the first stage (*Stage 3 in Fig. 1*), we used open coding to analyze the interviewed companies and address sub-research question one: “What hindrances do online shipping platforms encounter when they start their business?” (see Table 2). Using the “hindrances” that were conceptualized during the first stage as clues, we adopted axial coding with selected companies during the second stage to answer sub-research question two: “How do surviving TPSIPs

³ Although we were reluctant to describe the current theoretical research in this manner, after reviewing a substantial number of studies, we failed to find any research on TPSIPs published in mainstream journals.

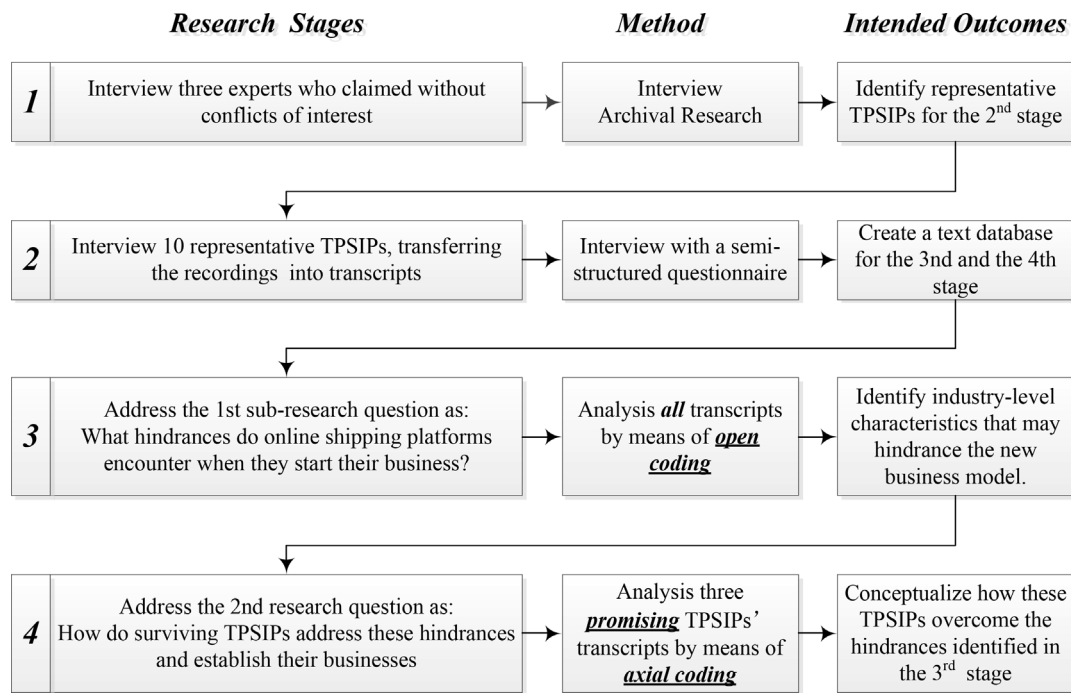


Fig. 1. Research design.

address these hindrances and establish their businesses” (see Table 3; also see Stage 4 in Fig. 1). The coding processes were completed through group discussion by the first three authors; each author independently conducted coding work prior to a group discussion. If the authors could not agree on a specific coding issue, they engaged in a group discussion and evaluation until two of the three authors were satisfied.

Open coding refers to the process of analyzing disaggregated data to define concepts and categories found in the data. During the open coding process, we first read all the textual data. Next, we conceptualized the data and grouped the concepts that were generated during this process into categories based on the concepts' connotations (Corbin and Strauss, 1990).

Axial coding is defined as “a set of procedures whereby data has been put back together in new ways after open coding by making connections between categories” (Strauss and Corbin, 1990; Corbin and Strauss, 1998). We performed axial coding to rebuild the theory using the fragmented concepts produced during open coding, which resulted in an in-depth understanding of the survivors' initiating strategies.

In addition, after each interview, the interview team members discussed and exchanged perspectives within 24 h and created a principal record of each interview to improve the quality of the study.

4. Background: the development of Chinese TPSIPs

In this section, we provide a general picture of the development of Chinese TPSIPs in order to build a common understanding of the emerging market and facilitate the discussion in the following sections.

The international shipping industry includes various trading counterparts, from manufacturers that create shipping demand to various types of carriers that provide transport services such as consolidation, inland truck service, and international shipping. Theoretically, the industry has many opportunities to develop two-sided markets in a niche market. For example, based on the types of goods being shipped, they can be categorized into container TPSIPs, bulk cargo TPSIPs, etc. Interestingly, we identified few TPSIPs specializing in the liquid cargo segment (such as crude oil, LNG, and LPG). One of the most compelling explanations for this phenomenon is that the highly specialized nature

of the liquid cargo shipping market results in vertical integration and the emergence of shipper-owned fleets on a large scale. Conversely, different services can be segmented into transaction-matching TPSIPs, operational management/technical-supporting TPSIPs, and supplementary-service TPSIPs that provide services such as fleet management, ship maintenance, and supply-chain management. Using the above-mentioned categorizations as two dimensions,⁴ we illustrate the development of China's TPSIPs⁵ (Fig. 2) in the matrix below:

Notably, the companies that originally positioned themselves in transaction matching and supplementary services have relatively stable scopes of business. These companies include YunQuNa, Shipping City, Valuefix, Chuanlaoda, Allship and China Shipperserv. Their counterparts are positioned in technical-supporting services and have horizontally expanded their business scopes into neighboring market segments; many of those firms have made significant progress. For example, relying on a large base of SaaS users, CargoGM entered the container transaction-matching market and formed an independent business module. Based on a unique ship-positioning information database, Elane expanded into finance, insurance, and other customized services. Leveraging the strength of its customer community in ship-management software, Matouwang gradually extended its business to the shipping supply market.

5. Discussion

Generally, organizations that focus on technical support and supplementary services achieved more success than those that focused on transaction matching, largely because differentiation can be much more easily achieved in technical support and supplementary services than in transaction matching. For example, Elane can provide unique ship-positioning information, but Matouwang is able to provide more suitable offers for ship storage and accessories for a given condition. Therefore,

⁴ The division depends on the states of companies when they started their businesses.

⁵ The companies listed here include but are not limited to those we interviewed. We wished to describe the macro-state of the market's development based on these companies.

Table 1
Sample description.^a

Company code	Business description	Interviewee's position	Year founded	Number of employees	Headquarters location	Original business
A	Route calculation and information sharing	President/CEO	2015	10–20	Shanghai	Route calculation
B	Bulk cargo matching system	President/CEO	2016	10–20	Shanghai	Bulk cargo broker
C	Container freight market matching system	President/CEO	2002	More than 100	Ningbo	SAAS service
D	Bulk cargo matching system	President/CEO	2013	20–50	Beijing	Bulk cargo broker
E	Container freight market matching system	President/CEO	2014	More than 100	Shanghai	Freight forwarder
F	Container freight market matching system	Vice President	2014	50–100	Shanghai	Container freight market matching system
G	Data mining, Financial solutions provider	Manager	2003	More than 100	Beijing	Ship position information provider
H	Marine supply, Financial solutions provider	Manager	2012	More than 100	Dalian	Ship management software service
I	Domestic bulk cargo transportation matching system	Manager	2014	10–20	Shanghai	Domestic bulk cargo transportation matching system
J	Container-related information integration	Manager	2016	20–50	Suzhou	Container-related information integration

^a To avoid disclosing the names of the interviewed TPSIPs, we replaced the names with capital letters (A to J).

it is more valuable for us to investigate the development of transaction-matching TPSIPs in the following section; this segment's uncertainty and variability in practice is much greater than for technical support and supplementary services TPSIPs.

Second, the ongoing practices in the international shipping market functioned as preconditions for building transaction-matching TPSIPs. These practices not only functioned as restrictions on the entrepreneurs in terms of resource re-allocation and interest groups but also provided opportunities for the entrepreneurs because of the relatively low levels of efficiency, which was rooted in the use of older technologies. Therefore, in the following section, we discuss these characteristics as preconditions and challenges for transaction-matching TPSIP building and examine how the promising TPSIPs managed to overcome the difficulties that resulted from these industry characteristics.

5.1. Industrial characteristics as hindrances

We open coded the text material that was collected (see Appendix 2) and identified three industry-level characteristics that may have substantially affected transaction-matching TPSIP building: (a) customer preferences, (b) homogenized services, and (c) informal relationships (also referred to as “interpersonal relationships”).

a. Customer preferences: Compared with the B2C market in which Taobao and Ebay operated, the international shipping industry is a typical B2B market in which the customers are business organizations such as manufacturers, retailers and traders. These types of customers are quite different from individual consumers in terms of preferences. In general, these types of customers are more concerned with the reliability and visibility of the shipping service or the availability of value-added services such as freight disbursement and other supply-chain financial services.

"Cargo owners (manufacturers) don't care about the freight difference, say, 50 dollars, at all ... If the effort to find a 50-dollar freight difference causes delays, their trade losses may far exceed any money saved."

Organizational customers engage in group decision-making behavior and make decisions based on standardized processes; therefore, these customers are generally expected to be more **sophisticated and professional** than individual buyers (Philip Kotler, 2016). Furthermore, compared to their individual counterparts, group purchasing generally involves larger amounts of money, standard purchasing procedures and multiple buying influences. As a result, in the early stages of entrepreneurship, a TPSIP cannot duplicate its B2C counterparts' initial strategies by merely offering massive subsidies to customers to change customer behavior and ultimately lead them to transform from offline consumption behaviors to online behaviors. This problem is particularly acute in the international bulk cargo shipping market. For example, an interviewee explained the following predicament:

"International traders such as cargo owners, steel mills, and power plants are more concerned about the reliability of shipping services than the price. Moreover, in the cargo-owner-dominated market, there is very limited room for ship owners to lower their prices."

Therefore, it is very important that TPSIPs clearly understand what value they can provide to their customers with limited resources in the initiating stage other than some cost savings. Few TPSIPs managed to resolve this issue, which will be discussed in greater detail in Section 5.2.

b. Homogenized services: Shipping companies provide homogenized shipping services that are widely accepted as transporting cargo from port A to port B. Therefore, the nature of transportation makes it difficult for customers to distinguish the services provided by multiple shipping companies. For example, in most cases, the container-shipping services provided by MSC are similar to the services provided by COCSO Shipping, and the ports are similar at both ends. Most shipping companies encounter the dilemma that they can neither

Table 2
Open coding/industrial characteristics as hindrances.

Third-Level Coding	Second-level Coding	First-level Coding (Typical)	Number of Codings/ Frequency
Customer preference in B2B market	Less sensitive to price fluctuations	Traders do not care for RMB500 per TEU; transportation safety should be the priority.	6
	Reliability and reputation are important	The ship owners place great importance on the background of the broker.	12
	Convenience is also important	Convenience is the most important criterion for a shipper's decision; shippers merely want a door-to-door logistics solution.	13
Homogenized service	Online service homogeneity	Imitation is very common in this industry.	9
	Industrial service homogeneity	Online services can differentiate themselves from their offline competitors only by engaging in price wars.	3
Informal/interpersonal relationships	Informal relationships between shipping companies and freight forwarders	Shipping companies have service contracts with various types of freight forwarders, such as "friends' service contracts" and "relatives' service contracts."	7
	Informal relationships among freight forwarders	I realized that most of the freight forwarders are Shanghai Maritime University alumni.	6
	Informal relationships between cargo owners and freight forwarders	[We have no way to compete with freight forwarders in a cargo owner's locality because] we are unable to pick up or handle gas cylinders for a cargo owner's logistics director like local freight forwarders can.	10

Note for Table 2

First, we conducted the first-level coding of the transcripts.

Analyzing these sentences in our transcripts provided the meaning of "Industrial Characteristics as Hindrances."

Second, we categorized the first-level coding into second-level coding.

For example, we categorized the six first-level codings set forth above as "Less sensitive to price fluctuation."

Third, we categorized the second-level coding into third-level coding.

For example, we categorized "Less sensitive to price fluctuation," "Reliability and reputation are important," and "Convenience is also important" to "Customer preference in B2B Market," which could not be further categorized in this study.

differentiate their services from their competitors nor differentiate their own services offline and online. The homogenized nature of shipping services restricts shipping companies' ability to provide online services at discriminatory prices while avoiding affecting the enthusiasm of their offline sales channels. This discriminatory pricing strategy is widely adopted by those manufacturers who can easily differentiate their products in different channels. As one of our interviewees noted,

"Haier can design specific types of products for online channels with the goal of differentiating those products from products provided for offline channels, but this is impossible in the shipping market in that ship companies worry that online sales channels may affect the enthusiasm of offline sales channels. XX Shipping Company required online prices to not be lower than offline prices."

This phenomenon can also be commonly witnessed in market segments such as freight forwarding, bulk cargo shipping, and particularly in the container-shipping industry. Therefore, the "homogenized services" characteristic makes it difficult for shipping TPSIPs to identify target customers, let alone persuade them to shift their offline business to online without providing additional value and benefits.

c. Informal relationships/interpersonal relationships: Business operations in the offline freight market largely rely on informal relationships among various actors. This tradition is deeply imprinted in the industry and can be traced back to 1744, when the Baltic Exchange was established. Due to the limited communication technologies available, there was a high level of information asymmetry in the market, and individual-level informal ties, generally developing through brokers and freight forwarders, facilitated transactions in the traditional offline freight market. These individuals cherished their reputation and minimized opportunistic behavior in the hope of generating more collaboration in the long run. Therefore, the traditional business model is largely built on an ecosystem of interpersonal mutual trust.

"People (in the container freight forwarding industry) would rather believe a reliable person in an unreliable company than an unreliable person in a reliable company."

However, with regard to advanced communication technologies,

typically represented by the Internet and various forms of Internet-based technologies, reshaping the way that the freight market is organized, those informal/interpersonal ties may hinder this process based on actors' self-interest and political concerns. As a result, transaction-matching TPSIPs find it difficult to shift their offline behaviors to online experiences, particularly during the initial stages when TPSIPs seek to establish their reputation.

"[We cannot replace the local freight forwarders because] we are unable to pick up or handle gas cylinders for a cargo owner's logistics director like local freight forwarders can."

Generally, informal relationships facilitate offline business in two ways: 1) Long-term cooperation builds mutual trust that minimizes unexpected losses caused by opportunistic behaviors; and 2) other economic and non-economic concerns are embedded in an offline business. Therefore, we suggest that the primary issue for building transaction-matching TPSIPs is transforming the personal trust relationships that were established in the original transaction process to a platform-based ecosystem.

We summarize the industrial-level hindrances and their challenges for transaction-matching TPSIPs below (see Table 4).

5.2. Initiating strategies to overcome hindrances

Many TPSIPs have withdrawn from the emerging market, while some of the survivors continue to struggle. In this market, we are curious about how those firms survive the market restrictions described in Table 4. We are also interested in how these firms reshaped their customers' behavior in an online environment. In this section, using open coding and axial coding, we identify two initiating strategies that indicate how the surviving firms overcame market restrictions and developed TPSIPs. These initiating strategies include three interconnected issues: 1) appropriate value propositions, 2) effective entrance modes and 3) unique competitive advantages. These issues can be utilized to address the three challenges listed in Table 5 that result from the market characteristics discussed in Section 5.1.

Appropriate value propositions suggest that TPSIPs must address and satisfy customer demands that have not yet been fully satisfied but

Table 3
Axial Coding/Initiating strategies to Overcome the Hindrances.

Third-level Coding	Second-level Coding	First-level Coding (Overcoming Hindrances, Typical)	Number of Codings	Note
Appropriate value propositions	Offer significant cost savings through disintermediation Service upgrading	USD50 per container cost saving might not change shippers' behavior, but USD 500 will, regardless of the interpersonal relationship. We provide integrated logistics service to our customers.	13	Addressed hindrances: Customer preference in B2B market/informal relationships Addressed hindrances: Customer preference in B2B market/service homogeneity
Entering mode	Software imprinting Customer segmentation and precision marketing	We initially provide our customers with free software to solve their customer relationship management issues. <i>Our company currently has 50 to 60 people developing high-quality customers in big cities. We even know the number of target customers within a 1-km radius around Ningbo Tianyi Square. These salesmen visited the target customers individually. Sometimes they were not allowed to demonstrate our software but had to stand outside the customers' offices. In most cases, our salesmen finally impressed the target customers with their sincerity and persuaded them to try our software.</i> Eventually, we will organize a massive user community or an eco-system to be more precise. We have set a high standard for selecting our logistics service providers and regulating their services.	7	Cultivate user community based on disintermediation Acquire high-quality customers and offer high-quality services
Fostering competitive advantages	Locked-in customers Reliable logistics network		7	Competitive advantage based on a large, software-embedded user community Competitive advantage based on a high-end customer-logistics network system

Note for Table 3

The open coding method in Table 3 is similar to Table 2.

For axial coding, the "Note" column in Table 3 addresses the logic issue between the construct that we identified in Table 3 based on group discussion.

1. Row "Appropriate value propositions" and column "Note": This is the logic between "Disintermediation"/"Service Upgrading" and Hindrances (3) identified in Table 2.
2. Row "Entering Mode" and column "Note": Different entering modes *match* different "Appropriate value propositions."
3. Row "Fostering competitive advantages" and column "Note": Different entering modes benefit/foster different competitive advantages.

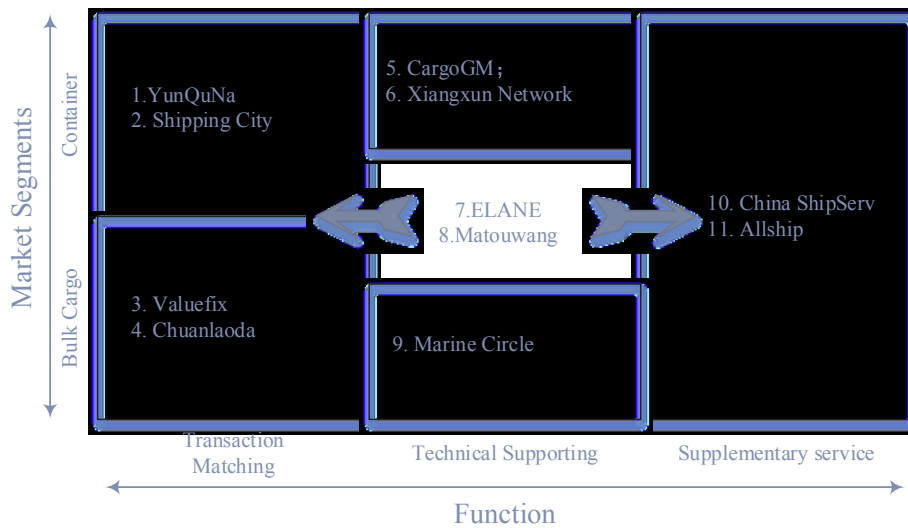


Fig. 2. The Development of China's TPSIPs. Note: All the companies' official websites are listed in Appendix 2.

a. YunQuNa (运去哪) and Shipping City (航运城) are container transaction-matching TPSIPs. These companies attempt to provide the optimal matching of cargos with shipping spaces in the container freight market. YunQuNa provides additional value-added services such as cargo insurance and freight disbursement; Shipping City does not.

b. Valuefix (我来运) and Chuanlaoda (船老大) are bulk cargo transaction-matching TPSIPs. These companies optimize the matching between ships and cargos in the bulk cargo market through information sharing; however, Valuefix differs because it is positioned in the international bulk cargo shipping market, and Chuanlaoda is positioned as its domestic counterpart.

c. CargoGM (大掌柜) and Xiangxun Network (箱讯网) are container-shipping technical-supporting TPSIPs. Olymtech (奥林科技), the predecessor of CargoGM,

has provided management software services for small and medium-sized consumers since 2002. Xiangxun Network focuses on container information integration and tracking services.

d. Marine Circle (海运圈) is a bulk cargo shipping technical-supporting TPSIP. This company primarily provides customers accurate route calculation services.

e. Elane (亿海蓝) and Matouwang (码头网) (ship-management software) are general technical-supporting TPSIPs. Elane provides customers with customized information services by relying on exclusive ship-positioning information. Matouwang offers ship-management improvement services for ship owners. PMS, developed by Matouwang and certified by the China Classification Society (CCS), is the only approved product of its kind.

f. China ShipServ and Allship (中船通) are general supplementary-service TPSIPs. Both companies specialize in supply-chain management for ship storage facilities and accessories.

that can be used to shift customers' behavior from offline to online. After focusing on the appropriate value proposition, the next issue TPSIPs must resolve is “changing the consumer's existing business-related behavior.” This proposition requires a deep investigation into the details of how to offer appealing incentives that will encourage customers to voluntarily transfer their businesses to an online platform. In our study, we conceptualized this issue as the “entering mode” for each value proposition. The third issue for these TPSIPs is how to foster their unique competitive advantage to avoid suffering from competitor imitation. This issue is referred to as unique competitive advantages in our theoretical framework.

5.2.1. Initiating strategy I

One of the most compelling value propositions is “disintermediation,” which refers to a substantial decrease in transaction costs by reducing the involvement of intermediaries. This value proposition is appropriate when the current market is so inefficient that the benefits generated by “disintermediation” are sufficient to ensure that organizational customers that are less sensitive to price are willing to adopt a new practice paradigm, despite uncertainty and regardless of the benefits embedded in their established informal relationships. As one of our interviewee noted,

"In some cases, there is approximately a 500-dollar difference per container between the price offered by direct freight forwarders and that offered by indirect freight forwarders. ... Moreover, the owner will be surprised by the fact that he can use fewer employees to accomplish work online, resulting in lower labor costs."

Interestingly, in mid-August 2016, the price to ship one container from Shanghai to a primary European port was approximately \$1200 US when a local direct freight forwarder was used. These direct freight forwarders usually have direct service contracts with shipping companies. A similar shipping service would cost approximately \$1700 US as quoted by an indirect freight forwarder who obtains shipping space by sub-contracting with direct freight forwarders. Thus, if TPSIPs can match shippers' demand directly with direct freight forwarders, or even shipping companies, shippers will usually not refuse a 30% cost savings to induce them to switch their offline booking practices to an online shipping platform.

“Disintermediation” requires a massive user community to enable a two-sided market and provide the optimal match between demand and supply. Because most of the potential users are accustomed to conducting business offline, the “massive user community” required for an efficient online two-sided market can easily lead to a “free rider problem.” This implies that to avoid the uncertainty associated with a newly established TPSIP, most potential users will adopt a wait-and-see attitude until the number of users reaches the threshold of an efficient platform. This issue is a primary reason why so many freight forwarding companies have failed to adapt to online two-sided market organizations.

"Before 2014, many freight forwarding companies believed that online platform software could integrate market supplies of goods and lead to improved performance. However, they found that their platforms did not work well because of insufficient users while also discovering that some of

Table 4 Industrial characteristics as hindrances and their challenges for TPSIPs.

Market characteristics	Hindrances	Challenges for TPSIPs
Customer preferences	Larger amounts of money, standard purchasing procedures and multiple buying influences	Can we improve our services in addition to providing lower prices? (C1)
Homogenized services	Customers can rarely differentiate between transportation services	Who are our target customers? How can we differentiate our services?(C2)
Informal relationships	Behavioral inertia is rooted in a system of interpersonal mutual trust in the traditional offline business model	How can we reshape transactional relationships on a platform-trust basis? (C3)

Table 5
How promising TPSIPs addressed three challenges.

Challenge ^a	Initiating Strategy I	Initiating Strategy II
C1: Can we improve our services in addition to providing lower prices?	Disintermediation greatly improved the efficiency of the market; even organizational customers cannot refuse the significant cost savings that result from disintermediation. (Value Proposition)	Target consumers are provided with high-quality, integrated services that channel their offline business to online. (Value Proposition)
C2: Who are our target customers? How can we differentiate our services?	Cost savings are sufficient to persuade customers to adapt to an online business model. (Value Proposition)	Identify customers who are not fully satisfied with the existing market. Provide them with high-quality logistics services at a premium charge. (Value Proposition, Entering Mode)
C3: How can we reshape transactional relationships on a platform-trust basis?	Management software is used to penetrate consumers' business processes in advance so that customers can gradually accept the software providers and ultimately transfer their business to those platforms. (Entering Mode)	One-to-one precision marketing is performed to acquire target customers who are persuaded to try platform services and are continuously provided with a high-level user experience. The goal is to retain these customers on these platforms. (Entering Mode)

^a Consistent with the column “Challenges for TPSIPs” in Table 4.

their competitors had adopted similar platform software, resulting in even fiercer competition!”

Without an appropriate entering mode, it is extremely difficult to build a TPSIP that features “disintermediation”. As one interviewee stated, “there is no promising for a TPSIP in the international bulk cargo shipping market.” Currently, TPSIPs are well established in the container freight market in alignment with the EPM (enterprise-platform-market) model. To clarify, to build two-sided markets, these TPSIPs provided software services during their early stages to penetrate consumers' business processes and become an integrated component of their external demand at the right moment. These companies include CargoGM and Matouwang. Most of these organizations used SaaS software and ship-management software to smoothly penetrate consumers' business systems. After attracting a certain number of customers, these firms expanded their services to transaction-matching functions (CargoGM) and supplementary-service functions (Matouwang). This perspective is evidenced in the data described in the fourth part of this study, which indicate that technical support companies essentially provide transaction-matching or supplementary services.

TPSIPs that insist on using “disintermediation” logic will eventually build software embedded in a customer community. More importantly, these markets will also cultivate users' online business practices that are attached to their software, making shifts even more difficult. An information system can collect all types of standardized, real-time customer data, which can facilitate big data analysis and provide a vast number of opportunities to develop various types of logistics-related services such as financial solutions and market predictions.

“We have cooperated with our customers for many years. The software client can collect standardized customer data, which serves as the basis for the development of our platform business ... these resources cannot be imitated by other companies.”

5.2.2. Initiating strategy II

Apart from *disintermediation*, some TPSIPs insist on “service upgrading” as their value proposition for their customers. “Service upgrading” refers to developing a new business model to satisfy shippers' demand for customized logistics services. In the past, these services were generally supervised or ignored in the traditional freight market. These demands include more convenient, reliable, and visible shipping services and customized logistics financial services. For example, the obvious drawbacks in the traditional business model, such as opportunistic behavior and information asymmetry, are blamed for the failure to attempt to provide reliable door-to-door services and total chain management.

“Without effective incentives and supervision, freight forwarders often make offers for the purpose of maximizing their own interests, not those of cargo owners. Therefore, they will always recommend a shipping

service that produces more of an economic benefit for themselves instead of the one that is the most suitable and convenient for the shippers” (opportunistic behaviors).

“When truck drivers return home for the Spring Festival, trailer companies often experience an end-of-year capacity shortage and cannot satisfy cargo owners' spot-hauling demands” (information asymmetry).

Therefore, we believe that the concept of meeting customers' demands by upgrading services is reasonable given the abovementioned state of the freight market. The astonishing recent technological developments such as the Internet of things, big data, and cloud computing will enable the TPSIPs to develop innovative approaches to meet customers' demands that are not fully satisfied in the traditional business model.

Service upgrading is appropriate when a platform can effectively segment the market and access targeted customers who are willing to pay a premium for high-quality transport services. Consistent with this logic, we determined that certain platforms in our case study actively interacted with high-quality consumers, provided services that exceeded expectations and, accordingly, improved their business model. Although it is difficult to penetrate high-quality consumers' logistics processes, certain companies developed solutions to this problem. We argue that the accumulation of high-quality consumers is a fundamental issue for the development of a service-upgrading platform.

“Not every company can become our customer. A target customer should have a monthly shipment of more than seven standard containers.”

“Our company currently has 50 to 60 guys developing high-quality customers in first- and second-tier cities. These salesmen visited the target customers individually. Sometimes they were not allowed to demonstrate our software at first; however, in most cases, our salesmen finally impressed the target customers with their sincerity and persuaded them to try our software.”

Although these consumer development strategies are unsatisfactory, they may be some of the few methods that can be used to directly penetrate a target consumer's original business. As long as resources are available to support the development of a company until its number of customers reaches the threshold value, the company should be fully capable of building its own online two-sided market platform if it can improve the logistics network and accumulate user data.

Concerning the fostering competitive advantages issue, service-upgrading TPSIPs tend to develop an efficient logistics network. By constantly interacting with high-end customers, these TPSIPs must continually upgrade their logistics networks, integrate strategic partners and screen out inefficient service providers. Therefore, as central contactors, these TPSIPs constantly strengthen their status in the virtual logistics service network, which can also be described as their competitive advantage.

Interestingly, these two types of two-sided markets share something

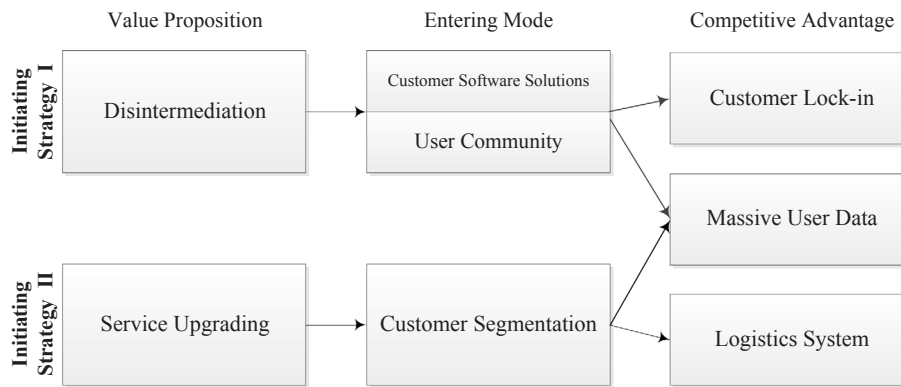


Fig. 3. Initiating strategies of TPSIP Building.

in common: they both continuously accumulate firm-level logistics data in their daily business operations. Furthermore, these data facilitate their expansion to new businesses such as credit-reporting services, insurance, disbursement, and loans. These new services enhance their competitive advantage by improving the consumer's experience and have begun to be developed by Valuefix, Matouwang, Chuanlaoda, CargoGM, Elane, and YunQuNa.

In conclusion, we summarized the initiating strategies for the development of TPSIPs and described how promising TPSIPs addressed the three challenges listed in Table 5 (see Fig. 3 and Table 5).

6. Conclusion and implications

6.1. Conclusion

By analyzing 10 representative Chinese TPSIPs using grounded theory, our study proposed two initiating strategies/approaches to building two-sided markets in the international shipping industry while fully considering the limitations associated with the existing market.

Initiating strategy I: Large-scale integration of market information is utilized to eliminate information asymmetry in the existing market to complete the “disintermediation” and improve market efficiency. Because of current market conditions, TPSIPs must provide customers with technical services as an entry mode, collect standardized user data and gradually expand their business to transaction matching and supplementary services with an accumulation of customers. The core resources of TPSIPs in this initiating strategy include customers who are locked into their platforms in the form of software use and the massive user data generated from daily operations.

Initiating strategy II: These TPSIPs provide target customers with high-level logistics services to build their own customer communities and logistics networks. Because of existing market conditions, these TPSIPs must precisely locate their target customers, penetrate their logistics service systems and offer a customer experience that is superior to existing logistics services to retain target customers. In addition to massive user data, these organizations' core resources include logistics network systems that they can coordinate.

6.2. Implications

Building an efficient TPSIP represents one of the most challenging issues for practitioners and scholars in the Internet era. Economic factors such as efficiency and cost savings are involved in the TPSIP building process, but perhaps more importantly, non-economic issues must also be considered, including informal/interpersonal relationships, power and users' practices. To a certain extent, the depression experienced in the international shipping market since 2008 provided both an opportunity to reflect on existing market operations and a valuable time window for industrial change. As an exploratory case study,

our study provides the following theoretical and practical implications.

1. Theoretical implications. The overcapacity of the global shipping industry and inefficiencies in the market have resulted in attempts to apply new Internet technologies to the international shipping market. Our study is a pilot theoretical work on the theme of TPSIPs; numerous research avenues can be explored in the future. For example, is there a third method to develop efficient TPSIPs? How do shipping companies coordinate online and offline businesses when online operations dominate the industry? What types of pricing policies should TPSIPs adopt? These are emerging issues that are confronting the traditional shipping market and that can provide scholars with many opportunities for future research.
2. Practical implications. Our research has numerous implications for managers as well as policy makers:
 - a) Our study highlights bottlenecks and initiating strategies for building efficient TPSIPs and provides managers with a clear picture of the industry's evolution that can facilitate their positioning strategy and business selection in the Internet era.
 - b) We analyzed the market structure and the status of competition, which can provide managers with a clear understanding of their competitive advantages and highlight differentiation strategies that can enhance their ability to address their existing competitors. For example, our study identified that there are several promising companies and business models in container transaction matching and supplementary services, but not in the bulk cargo-shipping market. Although this finding may be the result of non-standardized bulk cargo shipping practices, it also reminds us that there may be unlimited business opportunities in this niche market.
 - c) For policy makers, we highlight the business model diversity among TPSIPs. Therefore, unitary industry policies and incentive plans might not be as efficient as expected. The market is looking forward to flexible and comprehensive industrial policies that can incorporate the needs of all parties. For example, replacing the business tax with a value-added tax might encourage “service upgrading” TPSIPs who have subcontracted with actual carriers but would have no effect on “disintermediation” TPSIPs that charge their customers an agent fee.

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Ethical approval

This article contains no study that was performed by any of the authors on human participants.

Conflicts of interest

Author Yang Chen declares that he has no conflict of interest.

Author Qiang Zhang declares that he has no conflict of interest. Author Shun Chen declares that he has no conflict of interest. Author Zheng Wan declares that he has no conflict of interest.

Appendix 1. Semi-structured Questionnaire

Dear Sir or Madam:

We appreciate that you have taken time to participate in our interview for our study of the development of two-sided online-shipping markets in China. To improve the efficiency and quality of the interview, we set forth some of the questions that will be asked below. It should be specifically noted that the scope of the interview includes but is not limited to the following questions. Again, we express our gratitude!

Questions by the research team include (but are not limited to) the following:

1. What attempt did you make to participate in a two-sided online-shipping market??
2. What do you think is the core asset (or competitiveness) of a two-sided online-shipping market?
3. What are the relationships between the role positioning of the two-sided online-shipping market and that of traditional business intermediaries (freight forwarders and brokers)?
4. What value does a two-sided online-shipping market create for the industry?
5. Are the current operation models, market segments, and business models of two-sided online-shipping markets well established?
6. What is the biggest obstacle (bottleneck) for introducing a two-sided online-shipping market?
7. What do you think of the development of the two-sided online-shipping market or the industry's future operational model and market structure?

Shanghai Maritime University.

“The Development of Two-Sided Online-Shipping Markets in China” Research Team.

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Appendix 2. Official Websites of TPSIPs Listed in Fig. 1

No.	TPSIP	Official Website
1	YunQuNa	http://www.yunquna.com/
2	Shipping City	http://www.shippingcity.com/
3	Valuefix	http://www.valuefix.com/
4	Chuanlaoda	http://www.chuanlaoda.cn/web/
5	CargoGM	http://www.cargogm.com/shopkeeper-gw-rest/
6	Xiangxun Network	http://www.xiangxuntrack.com/mainweb/
7	Marine Circle	http://www.marinecircle.com/
8	Elane	http://www.elane.com/
9	Matouwang	http://www.matouwang.com/
10	China ShipServ	http://www.i-css.cn/
11	Allship	http://www.allship.cn/

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