Entering China via Cross Border E-Commerce: logistics solutions and related challenges

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Abstract: Back in 2013, China has started a development plan, known as the "Belt and Road Initiative", with the aim to build a transnational network of trade and investments and increase its connections with global economies (HKTDC, 2017). Within this more open policy, the government has also boosted the development of e-commerce both within and across China's borders so that China has become the first e-commerce market in the world already in 2015. Nowadays, with an online market value of 752 billion euros (16% of the total retail sales), the country keeps this leadership untouched, attracting numerous foreign companies to set up their online business in China, mainly facilitated by large Chinese platforms such as Alibaba's Tmall or JD.com. Therefore, Cross Border E-Commerce (CBEC) has become one of the main entry strategies to China. Despite being attractive, CBEC has several complexities, including linguistic and cultural differences, regulatory matters, compatibility between online payment systems. One of the greatest challenges in this field, however, is logistics, due to longer distances, higher service level expectations, and stronger dependence on local service providers. Based on a survey targeting 259 non-Chinese companies selling consumer goods online in China, and 14 interviews, this paper investigates the solutions currently adopted to manage logistics underlying CBEC, and the main challenges related to each solution. This paper finds that the most frequent solution is the distribution from warehouses located in Chinese CBEC pilot zones or, alternatively, outside but close to Mainland China, e.g. in Hong Kong. Also, international delivery by plane is the preferred solution with almost 75% of the companies choosing it over the sea freight. This study is a first attempt to gather empirical evidence about logistics practices related to CBEC to China. It contributes to literature by providing industry-specific insights based on real data, whereas most of the papers in this field are rather descriptive and general.

Keywords: Cross Border E-Commerce, China, logistics solutions, internationalization, logistics challenges

1.Introduction

Cross Border E-Commerce (CBEC), i.e. the process of selling abroad via e-commerce, is one of the newest and fastest growing phenomena of the past few years and today represents an important business opportunity for producers, wholesalers and retailers to expand their customer base. China is one of the countries most commonly acknowledged as very promising for the adoption of e-commerce and might be considered as one of the top destination countries for CBEC sales. In the past few years, it has experienced a significant growth of both its economy and the use of technologies. Nowadays, with over 750 billion euro of market value, it is the largest B2C e-commerce market in the world, accounting for 35% share of global e-commerce value (Forrester, 2018). Despite being attractive, CBEC entails several complexities and challenges. For instance, according to Gomez-Herrera et al. (2014), many barriers exist for CBEC development, including linguistic and cultural differences, regulatory matters, compatibility and interoperability between online payment systems, parcel delivery and logistics. Among these elements, the effective management of logistic activities is one of the most complex issues (e.g. Cho et al., 2008; Delfmann et al., 2002; Ramanathan et al., 2014; Mangiaracina et al., 2015). This is also true in a global context for several reasons, including the longer distances and delivery times, the need for additional packaging and care during transport, the possibly higher dependence on 3PLs and the impact of customs clearance procedures (Yang and Shen, 2015). This is why an effective configuration of the logistics underlying a cross border online operation is key for the ultimate success of the initiative. The aim of the present paper is to add knowledge to the CBEC logistics field by conducting a study that (i) identifies possible logistics solutions supporting online export to China, (ii) investigates the level of adoption of each alternative among companies exporting online to China, and (iii) analyses the main challenges connected to the identified solutions. This paper addresses the need to bridge some gaps identified in present literature. CBEC is indeed an issue of growing importance, but has received limited attention in literature so far, as confirmed by Giuffrida et al. (2017a) and Hsiao et al. (2017). This paper is organised as follows: Section 2 presents the literature and RQs. Section 3 describes the methods applied in the study, Section 4 discusses results and Section 5 concludes.

2. Theoretical background and research questions

2.1 Theoretical background

In the past decades, China has undergone drastic changes in its economy and society, becoming one of the greatest and fastest growing countries in the world. Back in 2013, it has started a development plan, known as the "Belt and

Road Initiative", with the aim to build a transnational network of trade and investments and increase its connections with global economies (HKTDC Research, 2017). Within this more open policy, the government has also boosted the development of e-commerce both within and across China's borders so that China has become the first e-commerce market in the world already in 2015. Nowadays, the country keeps this leadership untouched, attracting numerous foreign companies to set up their online business in China, mainly facilitated by large Chinese platforms such as Alibaba's Tmall or JD.com. Therefore, Cross Border E-Commerce (CBEC) has become one of the main entry strategies to China. Despite being attractive, CBEC has several complexities, including linguistic and cultural differences, regulatory matters, compatibility between online payment systems. One of the greatest challenges in this field, however, is logistics.

Logistics capability is indeed found to positively impact the performance of e-commerce firms (Cho et al, 2008). Complex returns management, together with expectations of fast and precise deliveries, pose further stringent requirements on global distribution strategies. In current literature, supply chain and logistics management is a highly debated field and plenty of contributions exist on the identification of the main challenges of both national and global supply chains. A non-exhaustive list of contributions include, for instance, Sanchez-Rodrigues et al., (2010); Sawhney and Sumukadas, (2005); Vilko et al., (2014). However, all these contributions mainly focus on offline transactions. As for the researches specifically addressing the connection between logistics and e-commerce, they happen to be predominantly focused on national transactions, rather than cross border ones. It is therefore apparent that, when it comes to CBEC, literature is generally scarce and fragmented. This might be due to the novelty of the phenomenon, which implies research is still in a development phase. The most treated topics in CBEC refer to legal and fiscal issues, including the determination of internet jurisdiction (e.g. Ward et al., 2016), dispute resolution (e.g. Cortés, 2011), and taxation (e.g. Agrawal and Fox, 2016). Also marketing and cultural issues in online internationalisation environments are often discussed (e.g. Guercini and Runfola, 2015; Lendle et al., 2012). Conversely, when dealing with logistics and supply chain issues the set of available contributions reduces. A recent literature review on CBEC logistics in China highlights there are still many open research areas in this field (Giuffrida et al., 2017a). One of these is the distribution network design in the context of CBEC in order to determine how products should be delivered (number and types of echelons, as well as transport modes).

2.2 Research questions

Given the identified gaps, the present study aims to contribute to the extant literature on CBEC logistics by investigating available logistics alternatives to support CBEC sales in China and analysing their features and level of adoption among current exporters in China.

In order to reach the mentioned goals the following research questions are addressed:

RQ1 – What are the main logistics solutions enabling CBEC to China?

RQ2 – What is the level of diffusion of these solutions among foreign companies selling online to China? Are there any relationships between adopted solution and type of product sold?

RQ3 – What are the main challenges affecting the identified logistics alternatives?

3. Methods

3.1 Methodological phases

The paper has an empirical approach in trying to provide some practical evidence of the studied phenomenon. The study is developed by following a three-step methodology:

•Phase I – Identification of the logistics solutions.

In this phase, possible solutions are identified based on current literature and secondary sources

• Phase II – Analysis of the adoption of identified solutions and possible relationships with product category.

The method used to address this phase is a survey targeted at 259 exporting companies that adopt CBEC and operate in several consumer goods industries

•Phase III – Analysis of the main challenges of each solution.

Beside survey results, some qualitative information on the main complexities of managing CBEC logistics under different configurations is collected through 14 interviews addressed to a subset of the survey respondents

3.2 A note on the survey design and administration

The data used in this research is collected through an online survey targeted at both foreign companies selling online in China and 3PLs, because companies often do not manage logistics directly, but rather outsource these processes to service providers. Defining the population for this study was not an easy task. Indeed, no official statistics listing all the companies implementing B2C CBEC to China is available. To identify suitable subjects for our survey, we conducted our investigation by contacting professionals that have LinkedIn profiles.

LinkedIn is a business-oriented social network, available worldwide since 2003, which counts 500 million members as of April 2017. Using this platform, has provided some advantages, including direct access to the respondent professional profile and contacts, building of a more informal relationship with the recipients thus facilitating information sharing and response rate, possibility to target the most adequate profiles and filter by specific industries, company sizes and countries through the embedded search engine. An initial list of over 4000 profiles was found matching our keywords, for example "logistics", "CBEC",

"B2C", "China", which corresponded to over 1500 companies. This represents our population. According to Forza (2002), sample size is linked to the statistical power of the test and to the strength of the researched relationship. He also suggests that at least 179 answers should be collected to detect also small association with a significance of 0.05 and a statistical power of 0.6. Therefore, we consider this as the minimum sample size to reach. Out of the population, we contacted and then sent the survey, upon acceptance to participate in this research, to 563 companies, i.e. our theoretical sample. The recipients were selected by stratified random sampling, in order to guarantee homogeneity within each stratum (i.e. industry), thus allowing comparison among subgroups. We received a total of 259 answers with a 46% response rate. This sample size is adequate for the purposes of our study. Details about the characteristics of the final sample are presented in **Appendix I**.

The survey was administered online, preceeded by a pilot version addressed to both practitioners and academics, external to the research group, to test its clarity. The survey consists of three main sections. Section 1 collects information about context variables, such as company size or industry; Section 2 investigates the adopted solution by asking about (i) the transport mean mainly adopted, (ii) the presence of hubs or warehouses in China, (iii) the level of outsourcing of logistics activities; Section 3, finally, aims to identify challenges related to the logistics solutions. In this case, we identified a set of possible critical areas according to available literature and secondary sources (e.g. customs cleareance, compliance issues, cost management, demand forecasting, service level) and asked to give a score to the items according to their criticality. We used a five-point Likert-like scale to help measure the criticality (lowest scores are assigned to less critical items). We combined results from this section of the survey with the interviews to understand the main complexities of each logistics model.

4. Results

4.1 RQ1: Identification of logistics solutions

Based on extant literature on the topic (e.g. Giuffrida et al., 2017b), there are three main logistics solutions to support CBEC logistics, namely (i) distribution from a warehouse in the country of origin through express couriers, (ii) distribution through sorting hub(s) located in China and (iii) distribution from warehouse(s) in China. All these alternatives are characterised by different costs and service levels. International express couriers are typically the most expensive, while the distribution through a warehouse in China with the use of a ship-based transport is the cheapest, despite it causes a duplication of inventory. Other contributions simplify the classification (e.g. Ballering, 2017) by stating that companies selling via CBEC can either opt for a "B2C" or a "B2B2C" delivery model. The "B2C" model implies a direct shipment of each order by relying on the services provided by logistics companies such as express couriers. The "B2B2C" model allows bulk shipment of multiple products to a bonded warehouse within one of the 13 CBEC pilot zones located in mainland China or a "traditional" (not bonded) warehouse located outside Mainland China, but most probably nearby (e.g. in Hong Kong).

Given that the retrieved classifications look very similar, we opt for the first one, which is more comprehensive, as it makes a distinction about the role of the logistics infrastructure located in China (i.e. whether it is a warehouse with storage functions or a transit point with sorting functions). As a consequence, we include the following options to describe the adoptable logistics solutions in our survey: (i) **Option A**: products are delivered from warehouse(s) located in China; (ii) **Option B**: products are delivered from logistics hub(s) located in China, and (iii) **Option C**: products are delivered directly from the country of origin with no use of logistics nodes in China.

Coming to the possible transport modes, literature reveals that local distribution is typically performed via chinese couriers, while the international transport can be performed via plane, ship or train (mainly from Poland or Germany). The three transport modes are therefore included as transport options in the survey tool. These findings provide an answer to our RQ1 about available logistics configurations.

4.2 RQ2: Adoption of logistics solutions

A first descriptive analysis of received responses was performed to investigate the choices currently made by companies exporting online to China. Results are displayed in **Figure 1.**

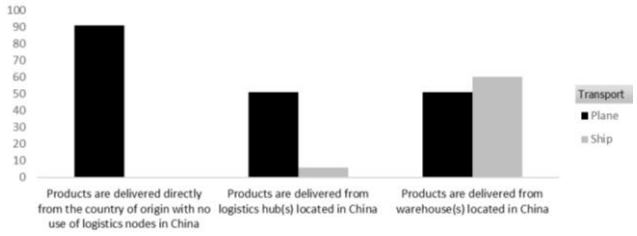

Figure 1 - Frequency of adopted logistics solutions

As shown in the histogram, the most frequent solution is the use of a local warehouse (43% of respondents). The main reason why companies select this option, based on interviews conducted on a subset of survey respondents, is the positive impact on the service level to the customer. In China, consumers are used to very fast deliveries, especially those living in first-tier cities. Consequently, many foreign companies prefer to use a local warehouse. Having the goods already physically located in China indeed shortens delivery lead times. When using a local warehouse, companies almost equally split between those who transport the goods to the warehouse by plane (20%) or ship (23%). This is a rather surprising result, since literature suggests the use of a local warehouse is mainly associated to a ship-based transport, especially when the items' value does not justify an expensive delivery by plane. There are some reasons why the combination "plane and warehouse" seems counterintuitive. First, by following a cost-driven approach, in case products were delivered by plane, the higher transport cost would be typically compensated using a local hub rather than a warehouse to save on inventory

costs. Second, if the company is more concerned about service level than costs, the use of plane is justified because it is faster and helps reduce the cycle time. However, there would normally be no need to keep the products waiting in the warehouse in advance with respect to order issuing, as it might be the case with slower transport modes like the ship. Apparently, there must be other reasons why using a warehouse is acceptable even when coupled with a shipment by plane. We believe this is the case when companies need to reduce transport time uncertainties, in a context of unpredictable, but typically high, demand volumes. In fact, companies that rely on this solution are mainly those who need to reduce replenishment times (ships take more than one month to reach China from overseas) because of product characteristics (e.g. obsolescence of fast fashion items) or because demand is not easy to forecast, therefore shipments cannot be adequately planned in advance. Especially for new products, it can be hard to predict the success and consequent demand by consumers. Relying on ship transport in case products are sold fast and need rapid replenishment could cause missed sales opportunities, that are possibly more "costly" than the use of a plane for the shipment. This is true especially for exclusive products (e.g. in high-fashion or luxury industries) being sold at a discounted price (that quickly drives volumes up). This happens, for instance, during important Chinese e-commerce festivals such as the Singles Day (11th November) introduced by Alibaba or similar events originated by other platforms (e.g. JD's 6th June, Vipshop's 8th December).

The second most adopted solution is direct shipment from the country of origin (35%). In this case the main motive behind this decision is typically the reduction of the organisational effort needed to manage complex logistics processes. Indeed, all logistics activities are outsourced to external service providers, such as international couriers. Lastly, the use of logistics hubs in China is the least frequent solution (22%). In this case, inventory holding costs decrease with respect to the use of a warehouse. There is convenience in adopting this model when sales volumes are not high enough to justify investment in a local warehouse.

Coming to the transport modes, shipment by plane is the preferred solution with 75% of companies choosing it over the plane (25%). Quite surprisingly the train seems to be ignored as a possible solution. This might be due to the novelty of this alternative and the fact that a limited number of routes is currently available. Nonetheless, we do expect this solution to spread more in the future as the reinforcement of the railway infrastructure is one of the top investment priorities of the Belt and Road initiative. By combining the information about the adopted logistics solution and the industry membership we can gather some insights as to whether there is a relationship between the type of product (i.e. the industry) and the chosen alternative. Results are displayed in **Figure 2**

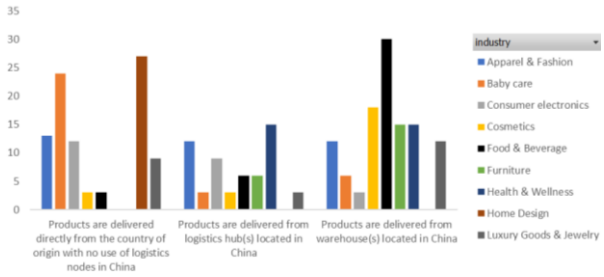

Figure 2 – Distribution of adopted logistics solutions by industry

The graph suggests that there is an association between industry membership and adopted solution as the distribution of solutions by industry does not look randomised. If it was, we would expect industries to be equally distributed among solutions. In order to verify this perception, we conduct a Chi-squared test of association. We find that the value of the Chi-squared statistics is < 0.001, therefore we must reject the assumption of independence among the two variables. More specifically, Food and Beverage and Cosmetics, which are most heavily regulated, are more frequently associated with the use of a local warehouse, Home Design and Baby care products are mostly shipped directly from the country of origin, while Luxury, Fashion and Consumer Electronics companies, typically dealing with high-value products, take a more diversified approach, as we find observations from these sectors for all the available solutions.

Based on this analysis, we can state some of the available solutions are more widely adopted than others (e.g. the use of a local warehouse, the shipment by plane) and that their selection is not statistically independent from the type of product, although no detailed explanation about the nature of the relationship between industry and logistics solution can be performed at this phase of the research. With this evidence we can provide an answer to our RQ2.

4.3 RQ3: Main logistics challenges

By relying on the interviews conducted with some of the respondents to the survey (please refer to the summary table in **Appendix II)**, the following considerations can be made with respect to the challenges affecting logistics alternative examined so far:

One of the most complex issues for companies conducting CBEC initiatives to China is being compliant with regulations. This challenge seems to affect most companies, regardless of the adopted logistics solutions. More specifically, compliance issues, which are related to quality requirements and customs procedures, seem to matter especially to companies in Cosmetics, Food, and Baby care. These are all sectors to which China has long proved sensitive and that have been most heavily affected by recent regulatory updates. Unclear and ever-changing customs or legal procedures are some of the most common barriers to global online trade facilitation. Trying to correctly shape interventions that could support, rather than hinder the development of the sector has become of crucial importance. This problem has also recently come to the forefront of interest, not only of Chinese customs authorities, but also of the World Customs Organisation (WCO), which has set up a working group in 2016 to better

understand and manage the CBEC phenomenon and its impact on efficiency of clearance and delivery of parcels (WCO, 2016).

As for the logistics solution based on the use of a warehouse in China, the main challenges faced by the companies are related to:

1)Deciding upon the location and number of warehouses: this is not an easy choice as several variables need to be considered, e.g. the geographical distribution of the demand, the customs policy adopted in each pilot zone, the expected volumes. Given the vastity of the country, from a logistics perspective, it is important to know where the main customers are located and how they can be reached. On one side, it is useful that an increasing proportion of the overall population lives in urban areas. Nonetheless, these major population centres represent less than 10% of the overall population and there is an increasing number of consumers in smaller cities

2)Estimating warehousing costs: the main challenge is that the costs of owning or renting a warehouse depend on the location and can vary over time. Moreover, other types of costs related to warehousing activities need to be taken into account. These include handling costs, administrative costs, custom clearance costs, picking costs. All these can fluctuate and hit a peak under some circumstances (e.g. increased volumes, customs clearance delays)

3)Forecasting and managing demand: this is a major issue as it influences decisions about warehousing activities, but it is very hard to perform in such an uncertain market as the online Chinese one is

Companies using local transit points, i.e. warehouses without a storage function, list among the main challenges the following:

1)Forecasting and managing demand: similarly to the previous case, demand is hard to predict or influence. However, demand does have an impact on the hub's performances in terms of handling and packaging effort required

2)Limiting transport costs: this solution is very often associated to the use of a plane as an international transport mode, therefore it is typically very costly

3)Meeting service level expectations: Transport by plane to a logistics hub in China might take from 5 to 8 days since some time is typically needed to reach saturation of the transport units before delivery starts. Depending on the type of product and the willingness of customers to wait for it, this one-week time might negatively affect customer satisfaction because Chinese normally expect very fast deliveries

Last, the companies adopting a direct shipping model with no use of logistics infrastructure in China, mainly claim the following difficulties:

1)Controlling overall costs: Since this solution implies outsourcing the whole logistics process, it is the most expensive of the three. The main cost items are transport costs and in-transit stock costs. Carriers typically charge not only by item or weight but, very commonly, by volumetric dimension. Therefore, companies have a limited number of levers to reduce costs. One of the most important, in case of charge by volume, is packaging optimisation. Due to high costs, this solution might not be accessible to all types of companies but only to those that provide high-margin products or sell limited quantities.

2)Meeting service level expectations: although most of international express couriers are fast and able to complete deliveries from country of origin to the door of the Chinese customers in 3 or 4 days, a given amount of uncertainty is involved in the process. Typically, Chinese consumers are willing to wait longer for products directly shipped from overseas, as they recognise a value of quality and originality. Nonetheless, there is always a risk that shipment is delayed beyond the accepted waiting time due, for instance, to customs clearance procedures.

Regarding the companies that use the "plane and warehouse" solution, they typically face all the challenges related to warehousing activities (i.e. network design, cost and demand forecast and management), while having to face very high costs not only for inventory holding, but also for transport.

To conclude, it must be said that another difficulty for all companies, regardless of the chosen solution is the identification of reliable local service providers to collaborate with. The logistics industry in China is still in a development phase. In the past, logistics infrastructure was insufficient, and the growth of e-commerce has pushed for its advancement. Lately, the Government has heavily invested to improve the logistics industry so that, in 2016, over 31 billion parcels were delivered (+50% on the previous year) (eCommerce Worldwide, 2017). Still, foreign producers and retailers may find it very hard to manage logistics and meet the competitive delivery requirements without a trustworthy local partner. China Post is the main public player in Chinese logistics industry; however, more than 3000 private companies dominate the domestic scenario and can act as local supporters for cross border operations. The main issue is finding the right partner, able to understand the Chinese market well enough, manage taxation, customs clearance and support possible scaling needs.

5. Conclusions

Given the main purpose of this paper – i.e. to analyse CBEC logistics solutions to enter China, their level of adoption and related challenges – an empirical study that combines evidence from literature, interviews and a survey to practitioners has been developed.

Four highlights can originate from this study:

1)First, distributing from local warehouses, typically managed with the support of local providers, is the most frequent solution. This is often due to the necessity to meet very stringent customer requirements. For domestic online transactions, Chinese people are used to deliveries within 24 or 48 hours in most parts of the country. This increases expectations about delivery options also for international transactions.

2)Second, transporting by plane, despite being more expensive, is the preferred solution to reduce delivery times and their uncertainty

3)Third, this study suggests the existence of a relationship between industry and adopted logistics solutions, as the Chi-squared test of independence shows. More specifically, Food & Beverage and Cosmetics are more frequently associated with the use of a local warehouse, Home Design and Baby care products are mostly shipped directly from the country of origin, while high-value industries such as Luxury, Fashion and Consumer Electronics tend to take a more diversified approach, as we find observations from these sectors for all the available solutions.

4)Fourth, managing customs and duties procedures, facing regulations uncertainty and finding local logistics partners are the biggest challenges of CBEC logistics in China. Indeed, these elements are mentioned by companies adopting different logistics solutions. Some other challenges are, instead, more specific of each logistics alternatives, e.g. cost management issues in case of direct overseas distribution or network design issues in case companies rely on local logistics infrastructures.

The present paper has both academic and practical implications. From a theoretical point of view it aims to originally contribute to the extant literature by reinforcing studied related to a nascent topic in the e-commerce logistics field, i.e. CBEC. Moreover, focussing on China provides the opportunity to investigate a very peculiar context, whose global importance is growing and being widely recognised. At the same time, this study presents results gathered on field, by interacting with professionals that are daily involved in CBEC operations. Therefore producers and retailers in consumer industries willing to start a similar business can gain practical information that can support their decisions or analyses.

Appendix I – Features of the survey sample

Item	%	Item	%
Company HQ		*Respondent*	
Asian country	32.9	Exporting company	59.1
European country	34.7	Logistics service provider	40.9
North American country	32.4	Total	100
Total	100.0	*Respondent profile*	
		Account director	20.1
Company size		CBEC manager	17
Small (≤ 50 employees)	21.2	Director of Logistics/SC	11.6
Medium(50 -250 employees)	26.4	Founder /CEO	11.6
Big (> 250 employees)	54.8	International logistic manager	19.7
Total	100.0	Overseas business manager	20.1
		Total	100
	Industry		
Apparel and fashion	14.3	Furniture	8.1
Baby care	12.7	Health and wellness	11.5
Consumer electronics	9.3	Home design	10.4
Cosmetics	9.3	Luxury goods and jewelry	9.3
Food and beverage	15.1	Total	100.0

Appendix II – Profile of interviewed companies

Interviewee	Industry	Employees	Logistics solution
1	Fashion	>250	Warehouse
2	Food&Beverage	>250	Warehouse
3	Baby Care	11-50	Warehouse
4	Consumer Electronics	51-250	Direct shipment
5	Food&Beverage	51-250	Direct shipment
6	Fashion	11-50	Transit point
7	Luxury	51-250	Transit point
8	Luxury	>250	Direct shipment
9	Cosmetics	51-250	Warehouse
10	Furniture	11-50	Direct shipment
11	Baby Care	51-250	Direct shipment
12	Consumer Electronics	11-50	Warehouse
13	Fashion	11-50	Warehouse
14	Fashion	51-250	Transit point

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