

Bartucz, Csilla

Article

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Can the Trust in Uber-like Platform Use Be Translated into Parcel Logistics?

Csilla Bartucz

Széchenyi István University, Hungary

Abstract

Rising expectations for urban logistics are the biggest challenge for parcel service providers. The increased costs posed by obstacles reduce profitability, and providers are forced to develop a novel operating model based on cooperation. The new model can combine what is known so far, which can be integrated into a platform-based system to implement collaborative resource sharing. The implementation of the platform will result in the introduction of a new player and the creation of a partly common ICT background. The platform-based approach is known in the context of the sharing economy initiative, which has also brought a novel trust-based model to life. On the one hand, this article presents a possible business model for parcel logistics providers and, on the other hand, the operation of a third-party IT platform and the method of resource allocation designed to reduce costs. In addition, it presents the possible reasons for the intention to join the platform and the conditions necessary to maintain the platform.

Keywords: platform-based, sharing economy, parcel logistics, last-mile delivery

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Introduction

The exponential growth rate of e-commerce, the need for online shoppers to deliver within 24 hours or the same day, and the pollution reduction regulations of city governments often pose insurmountable challenges for parcel logistics providers. The biggest challenge in parcel delivery logistics is making the last few meters of delivery, called the last mile. The growth of e-commerce, urbanization, and growing customer demands leads to increasing transportation activity (Paddeu et al., 2016). As Oliveira et al. (2017) state, this type of development leads to a higher social and environmental load, which results in increased environmental pollution, road traffic, and a decrease in the liveability of cities and downtowns. The response of city authorities to increased pollution and traffic is the introduction of restrictive measures that result in the closure of neighborhoods, road sections, or restrictions on access. The limits imposed place an even more significant burden on transport providers, as they cannot meet increased customer demand in a timely and cost-effective manner. In addition to that, Olsson et al. (2019) argue that last-mile transportation is the highest cost of logistics service, which will increase even more due to growing load and constraint. Nowadays, the factors influencing parcel delivery are passed on to service providers from several sides and by different actors. Increasing air pollution is tightening environmental regulations. In response, the city administration is introducing restrictions that mean closed roads and even fewer parking spaces for service providers. In addition, customer expectations are growing, same-day delivery needs are becoming more common, and planning is also problematic in this line of business. The situation created by many aggravating factors forces service providers to work together. However, cooperation is minimal.

Scientific researchers believe that service providers are forced to work together to meet these expectations due to the stronger competition. In the logistics industry, the parcel delivery segment is characterized by a horizontal of the two known forms of cooperation (vertical and horizontal). As Basso et al. (2020) determine, a horizontal relationship between firms means when firms operate in the same supply chain, compete, and often serve the same customer in the same field. In the non-parcel sector of the logistics industry, horizontal cooperation is becoming more common, e.g., more grocery stores are working together to make deliveries more efficient and cheaper. Collaborations in the vertical (below the superiority relationship) based supply chain management area are commonplace. In the field of parcel delivery industry, cooperation initiatives between competing players have already appeared. A large parcel service provider has allied with a bicycle courier company or the emergence of urban logistics centers that have forced service providers to work together because of the city's environmental objectives. However, previously known collaboration models may not be able to address new types of challenges and expectations. The pandemic situation in 2020 has resulted in a new foundation for the digitalization of citizens and the industrial sector. In the field of parcel delivery, a new digital strategy needs to be created that will help meet the expectations of the city management and the needs and intentions of the service providers (Lindawati et al., 2014).

In 2008, three young men set up a website to get cheap accommodation. In 2009, a technology platform for a company was established that radically changed the passenger shipping industry. Airbnb and Uber are now the epitomai of the sharing economy phenomenon. The sharing economy operates mainly in the customer-to-customer sector (C2C), and its potential is being explored with interest by the business sector and the scientific world. The introduction of the platform economy, derived from the sharing economy, and the development of a different

business cooperation model based on it may be the future of the parcel delivery service sector.

Because of the above, the main objective of this article is to introduce and assess what development path is needed to establish a platform-based business model. The creation of any business model requires motivating factors and the elimination of obstacles and limitations. This article examines the motivating and hindering factors needed to establish cooperation. The fundamental research question that this article seeks to answer is as follows:

- *RQ1. What are the biggest challenges in developing a platform-based parcel delivery service model (motivators and inhibitors)?*

The answer to the research question is given in the framework of a comprehensive literature review and an overview of the development stages of the collaboration. Finally, a visionary business model is provided. Based on all these, the paper is structured in the following: in Section Methodology & Literature review, a literature review is provided covering different last-mile delivery collaborations. The Section Discussion provides a detailed assessment of the various collaboration types and describes the factors necessary for their development in each stage. In addition, this section presents the final set of collaboration opportunities and a development path: a visionary, platform-based business model. Furthermore, the chapter examines the significance of the factors leading to the development of platform-based operation and attempts to provide answers to the challenges associated with the platform-based service model. In the final section, the findings are concluded, and future research directions are provided.

Literature review

The customer-related phase following the distribution of goods is called last-mile delivery, which has undergone significant change in recent years. The present study is limited to the previous mile phase of parcel delivery, an activity performed by service providers in the courier express and parcel (CEP) market. CEP market players are characterized by having their resources and often serving the same customer. In addition to their national service, CEP market participants are also active in so-called urban logistics, i.e., they serve customers in downtown areas. According to McLeod et al. (2020), the biggest challenge for urban logistics is closed road sections, streets, access restrictions, high parking fees, massive congestion, and increased emissions, which are also caused by parcel delivery. Bhati et al. (2020) argue that the Covid epidemic beginning in 2020 increased e-commerce and changed it.

Citizens' online shopping habits have changed, their demand for parcel delivery has increased; However, they do not prefer home delivery, according to the authors' opinion, customers use it again after the epidemic. Home delivery is the most convenient delivery method, so it is conceivable that previous habits will return after the end of a life-altering forced situation. After COVID, people re-maximize their benefits and choose home delivery (again) if it proves more convenient for them. Homo economicus / homo sociological is re-emerging, however, changed behavior patterns and societal expectations may affect their trade habits (Ailon, 2020). The trend in e-commerce will intensify in the coming years.

The scientific literature has been dealing with the scope of the last-mile parcel delivery problem for years to find the optimal solution to the growing issues. Some of the proposed solutions focus on the use of innovative technologies and sustainable vehicles (Allen et al., 2017, Oliveira et al., 2017, Dai et al., 2011, McLeod et al., 2020), while others offer optimization solutions to address the problems (Dahl et al., 2011, Park et al., 2016, Allen et al., 2017, Limoubpratum et al., 2015). The third group of

solutions deals with logistics structures (Park et al., 2016, Serrano-Hernandez et al., 2018), and the fourth part with regulation (Park et al., 2016). Suggestions provide solutions to some of the problems and often answer the questions raised through case studies (Paddeu et al., 2016). Collaborative solutions are discussed under the third group of literature. Cooperation in the logistics industry and the formation of various strategic alliances to provide better service are not unknown (Gonzalez-Feliu et al., 2018). However, the parcel logistics are not characterized by cooperation, although there are already live examples of completed projects. The complexity of the parcel logistics and the solid competitive orientation implement the cooperation complex. In any industry, the examination of cooperation also requires the factors influencing the development of cooperation. In parcel logistics, some shared resource use develops during the collaboration, i.e., the parties lose some control over their resources. Fear of loss has a deterrent effect on establishing cooperation.

According to Crujssen et al. (2007), companies operating at the same level of the supply chain that cooperate or compete with each other have a horizontal relationship. CEP market players are typically at a horizontal level, so the characteristics of the horizontal relationship need to be analyzed when developing their potential cooperation. McLeod et al. (2020) find that involving another party in a horizontal relationship to cover an area in transportation is a model that could be successfully operated. Establishing an urban city center (UCC) could play a significant role in the urban logistics area parcel delivery examined in this article. Through the implemented and operational UCC, Park et al. (2016) and Paddeu et al. (2016) demonstrated the efficient operation and usability of the centers in optimizing parcel delivery activities.

Nevertheless, Bengsston et al. (2000) argue that although collaboration is a possible direction to overcome existing problems, due to its complexity, service providers are unsure of how they could establish a reliable and fruitful collaboration. Though establishing collaboration can benefit service providers, some barriers can hinder collaboration, such as lack of trust, loss of control, liability issues, risk, brand identity, IT-related issues. In addition to the characteristics of horizontal relations, the factors that facilitate and hinder cooperation must also be examined.

The advent of Uber and Airbnb and the success of their digital resource sharing has also piqued the interest of scientists researching the development of the logistics industry, who believe that the model of the sharing economy can serve as an innovative solution for collaboration (Qin et al., 2020). Although ordinary people have developed a partnership based on trust that has never been seen before, factors other than trust are needed for the successful cooperation in a relationship system between companies.

The solutions examined in the literature analyze one aspect of the cooperation. In the case of carrier's carrier cooperation, the implemented business model is presented. In the case of the established UCCs, the city management idea necessary for establishing the UCC is analyzed. To the best of our knowledge, no article has been written that presents the direction of development of collaborations, the factors necessary or hindering their growth, and the business model born of the changes that will necessarily result from the sharing economy and the creation of more liveable cities.

Methodology

This study presents the developmental stages of possible collaborations of last-mile parcel delivery and the motivating and inhibiting factors necessary for the establishment of each station. In addition, a vision of cooperation based on the sharing economy and the elements essential for its creation are presented. The future cooperation model is a new opportunity, the establishment of which still raises questions that need to be answered. The study provides a non-systematic literature review on that topic.

Results

The most crucial characteristic of logistics service providers operating in the CEP market is using their resources at all stages of parcel processing. The use of own resources requires serious investment for service providers, as each step of processing has to be equipped with different tools. A service provider that is not capital-intensive enough will outperform its competitors in the constant and ever-increasing competition. CEP market competition is for market share, which is characterized by the daily number of parcels. Competitiveness is measured by the speed of processing, the quality of deliveries, and the service price. In addition to maintaining the demanding competitiveness of the investment, service providers must constantly monitor the development of costs. The most problematic delivery method is the home delivery solution, especially in the downtown area. In the absence of cooperation, each parcel delivery service provider delivers goods to the city center, often to the same customer. Due to increased congestion and environmental pollution, the city administration is introducing more severe restrictions, complicating their operation. All service providers suffer from the problems and the rising costs indicated in downtowns, so the question arises as to why they do not cooperate.

Development stages of collaboration

Bengtsson et al. (1999) identified four types of horizontal cooperation: competition, cooperation, coexistence, and competition. In examining the development of collaboration, this article deals with the kind of cooperation from the four classes in parcel delivery logistics.

The first step in developing collaboration happens when the service provider does not further increase its resources, instead of engaging a subcontractor to do the extra work that requires help. This model can be called subcontractor involvement rather than collaboration, yet it is worth mentioning, as the service provider is forced to share some of its data with a third party. The service provider is driven by an economic interest in employing the subcontractor. It is more worthwhile to use a subcontractor from a financial point of view than to expand its resources. Even in this initial step, trust appears as one of the factors to be examined. The service provider must make sure that the subcontractor to be involved is reliable to entrust his data to him. In case of unreliability, the coating does not take place.

The next possible stage in collaborative development is when a company contracts for an assignment that has neither the resources nor the competencies internally and does not intend to build on it. Collaboration based on such motivation is called the complementary type. One company collaborates with another to take advantage of its unique capabilities. This type of relationship is primarily economic, driven by a specific financial interest on both sides. A notable example is the cooperation between GLS in Hungary and the market-leading Hungarian bicycle courier service to solve the downtown parcel delivery. Even though the two

companies provide services in the same field, often to the same customer base, they are essentially not competitors. The cooperation between the two companies is complimentary, as GLS wanted to take advantage of the bicycle capabilities of the courier service. Another motivating factor at GLS is reducing pollution impacts, which is why it delivers packages to customers by bike in the most problematic area. The motivating factor of the bicycle courier company is purely economic. Increase capacity and revenue.

Cheong et al. (2016) clearly state in their article that "in the modern world, the concept that "business is war" is becoming outdated". Continued competition and the desire to increase market share, in other words, to achieve significant growth or access to additional resources in the life of a company, require either considerable capital investment or joint operation with another company. In addition to economic interests, access to other resources is a motivating factor for cooperation. A strategic dilemma emerges, according to which a decision must be made as to what price, how much risk-taking skills, and with which partner the company is willing to cooperate. The next level after subcontracting and complementary relationships is the creation of a strategic alliance. In the case of a strategic partnership, two or more companies begin to work together. Part of their resources is shared for a common goal, which is typical to reduce costs or better divide or cover an area. A strategic alliance presupposes excellent risk-taking skills and trust between the parties. To share resources, the parties must share certain information, which is possible with a well-concluded contract and trust. In a strategic alliance, the primary motivating factor is economic interest, including the need for more favorable access to resources, and an influencing factor, trust, appears. The parties will relinquish ownership of resources and information for the benefit of the community once the alliance is formed. In any coalition, the parties compete and cooperate simultaneously, so a formation of the horizontal relation called coopetition is created.

Increasing pollution, unbearable traffic jams are making cities uninhabitable for the population. The city administration is trying to bring the city back to the people by introducing regulations. A significant part of the regulations is manifested in road closures and restrictions, which makes the city and part of the city more liveable and makes the situation of parcel delivery service providers operating in the city more complicated. The rules established by the city administration are so strict that, in some cases, it makes the day-to-day work of service providers impossible. Some city administrations set up nearby urban consolidation centers (UCC) from which parcels can be delivered to the closed part of the city. With the establishment of the center and the introduction of regulations, the city administration forces the service providers to connect to the center; otherwise, they would not deliver the parcels. There are several successful examples of the operation of UCCs, the most critical feature of which is that a third party appears in the collaboration, which is often the city management. The service providers are connected to the UCC operated by the city administration, i.e., they join the cooperation. In addition to offering the area, UCCs often also provide service providers who do not have to provide the service or resource they purchase in-house. The emergence of UCC is a coercive force that forces service providers to implement a not necessarily desirable collaboration. City leaders offer incentives to service providers for successful examples, so coercive power also brings benefits. Because city management can make joining UCC attractive, the motivating factor for service companies to join is, on the one hand, compliance with the rules and, on the other hand, cost reduction with reduced resource requirements. Trust as an influencing factor also appears before a decision

is made. The contractor must decide whether they trust the service offered by UCC, are willing to sacrifice resources, and share information for operation. The topic of founding UCC has long been of concern to experts and the scientific community. A well-functioning UCC can only exist if it is in the interest of all parties and if there is adequate start-up capital for its establishment.

This chapter has provided an overview of the development paths of horizontal type collaborations and the factors that motivate, promote, or hinder their establishment. The phenomenon of the sharing economy has shown the viability of an IT platform-based service. The success of Uber and Airbnb and the new service model they represent raises the question of how all this could be transferred to the parcel delivery services market. The next chapter presents an opportunity for the development stage of the cooperation, examines the conditions and motivating factors for its establishment, and highlights the questions to be answered.

The vision of the platform-based business model

A related and sharing platform-based service in operational terms is combined with the economic concept of the 'sharing economy,' which aims to bring suppliers and consumers together by using spare capacity.

More and more services have emerged in the United States, England, and the Netherlands that offer resource sharing based on an IT platform typically developed by start-up companies. Accommodation, personal transport service, boat rental, food or cooking location sharing services are based on an unprecedented trust among the population. Whether the new service model developed in the C2C market can be transformed into the B2B and B2C world. The basis of the cooperation examined so far is provided by the will created by the parties, which motivates the actors to achieve some economic interest. The new model created by the sharing economy almost forces market players to start a new operation. Actors in the last mile service sector operate in any business model, have mechanized processes, and partially own resources. Each of the collaboration models examined so far assumes the sharing of some activities and resources, which also carries some level of risk-taking capacity. As Dervojeda et al. (2013) state in a European Union case study, people's primary motivation is to buy products and acquire ownership. Offering the developed product for use leads to a partial release of possession of the product. However, the ownership relationship remains during the transaction but is temporarily transferred to another person. The transformation of the model into the business sector means that companies wholly or partially relinquish the resources they own. Loss of resource ownership also means a loss of control over resources, which is a significant impediment to developing a business model based on the use of shared resources.

The resource-sharing basis of ordinary people is also based on economic interest. The owner shares the cost of owning and using a resource with another party, so maintaining the help becomes more cost-effective. In the last mile service, the acquisition and maintenance of a resource represent a significant proportion of operating costs, so the possibility of sharing resources arises in any cost-cutting measures. All players in the parcel delivery market have the necessary infrastructure and resources for transportation, and their customers are often the same; they face the same problems when delivering parcels (traffic jams, pollution, limited parking spaces, high parking fees). A pool of resources for the benefit of all actors would benefit both environmental standards and the company's economic interests. The creation of UCCs set in motion this trend, which led to the development of a hitherto unknown business model involving a third party. Following this development path, a

coordinated and regulated platform operated by a third party would be established, targeting the B2C sector primarily. The platform would act as a kind of umbrella over the package providers; in connection with the buyer's delivery request, the platform offers the most favorable offer. The package delivery provider receives the proposal through the platform, which he delivers to the recipient if accepted. A platform alone in the package delivery industry is not attractive enough for any service provider to join. The platform-based resource allocation model, which is widespread among the population, could only work in package delivery if it provides additional benefits to the service provider and the platform-based service. Moving along this line of argument, further complementing the collaboration model developed in UCCs and platform-based could together create an opportunity that is appropriately attractive to individual providers. Therefore, the platform provider must also provide additional services for the package delivery company to have an interest in joining.

Rising environmental expectations and regulations, the responses of the city management point in the direction that there will be no other way in the future to meet parcel delivery expectations in a limited way. UCC-type business models will forcibly emerge because regulations force this; providers will have no choice but to join this model if they want to continue to operate in a particular area. The associated platform is an IT tool that supports and coordinates the entire activity, in which a decision-making mechanism supported by algorithms supports the operation. The emerging business model will be based on cooperation between service providers in a horizontal and vertical relationship. Nevertheless, the business model will be a hitherto unknown model that will bring together horizontal and vertical service providers and appear to integrate a third party, the whole. The task of the integrator third party is to offer attractive services and operate the model according to aspects that are beneficial to each party.

Discussion

The development of a visionary hybrid platform-based business model raises many questions that need to be addressed and answered to be implemented. The critical question is what service is so attractive that service providers join the model in the event of a forced situation. The solution experienced for UCCs may be the resource sharing offered, which may be embodied in the sharing of processing and delivery capacity. If the service provider can save costs in either processing or sharing transmission capacity, it will be in the service provider's interest to join the collaboration.

- The cost-effectiveness of any resource allocation is based on developing a pricing system that determines the value of the service and provides the service provider with the data to perform its calculations so that a decision can be made to connect. The connected service provider loses control of its resources, reducing resource costs, and the loss must be recouped.
- It is essential to examine precisely what role the integrator should play in the collaboration. Different models need to be examined whether it is sufficient or worthwhile to "only" manage the platform and cooperate. What would it mean from a financial point of view that if the integrator takes over part of the process from the service providers, e.g., delivery planning, processing, provision of warehouse capacity? Analyzing these issues is essential to determine the integrator's responsibilities and authority.
- Another essential aspect to consider is predictability: service providers currently expect to receive and handle a certain number of parcels. Loss of

volume can appear as an inhibitory factor. The platform-based operation allows one provider to deliver unmanageable parcels to another, but this action is considered unpredictable for the provider. However, according to experts, service providers are usually unable to deliver with a fully loaded truck, so they always have additional spare capacity. The institution of the freight exchange is known in international freight forwarding, which allows freight "bought" at auction to be transported to avoid empty truck freight. The parcel exchange can be introduced during platform-based operation but can only perform a particular service (e.g., a concise time window).

- Connection to the platform, i.e., which the integrator accepts service provider. In addition to existing service providers, new ones who want to join the platform at an early stage in their development life cycle can be created. As the service provider will be entrusted with delivering customers' packages, it is essential to examine the service provider in advance to avoid any future adverse incidents.
- In connection with environmental regulations, the rule-forming response of city governments can also act as coercion for cooperation with service providers. In this case, the establishment of successful collaboration, the development of a successful integrator model, requires prior cooperation with the city administration and legislators. In addition to the regulations, a thorough examination of the possibilities provided by the Antitrust Act is also required.

The factors required for accession have been examined above. The connection can also have negative aspects for service providers, which require in-depth analysis in developing an integrator model.

- The biggest fear for service providers is losing their current market position. Joining the platform can only benefit them if they do not lose their market position or minimize any losses.
- Another fear of service providers related to the market position is the decline in volume and thus revenue. They join a new business model if it provides them with economic benefits.
- Any cooperation requires the sharing of information and data. Service providers' customer database is currently their most significant value, and sharing it will be associated with the fear of losing customers.
- Fear of losing identity and brand. Service providers have been working for years and decades to build and strengthen their current position, identity, and brand. They will only enter into cooperation if they are not harmed.
- Trust is a necessary factor for all kinds of cooperation. Although ordinary people have given unconditional confidence in the operation of platform-based services, the question is whether this can be transformed into the B2C world, and if so, under what conditions. In addition, there is a need for service providers to have confidence in the integrator, which is likely to be obtained by providing the service and defining the benefits.

Horizontal relationship-based collaboration models have existed in the logistics industry for decades, at least in theory. The formation of relationships can be characterized based on motivational factors. Table 1 summarises the development of the collaborations presented above and demonstrates the possibility of building each station on top of each other. In Table 1, the most essential characteristics of each model were collected, such as motivating and compelling factors, the need for trust, and risk-taking skills. The table also suggests the type of business model for each collaboration model.

Table 1

Development stages of collaborative business models and their characteristics

Collaboration model	Motivating factor	Coercive factor	Trust	Risk-taking	Business model type
Using subcontractor	Economic interest	Lack of capital for additional resources	Needed	Limited	Vertical/Horizontal
Collaboration – complementary service	Economic interest	Missing competence	Needed	Moderate	Horizontal
Alliance /Coalition	Economic interest, access to additional resources	No	Highly required	High	Horizontal
UCC	Economic interest if the service of UCC is attractive	Regulations	Needed	High	Hybrid
Integrator-platform	Economic interest access to additional resources and services	Regulations	Needed	High	Hybrid

Source: Self-prepared table

The visionary business model of the future still has several questions to answer before it can be designed. Each of the issues and findings outlined in the present study requires a thorough analysis of future research topics for this vision to become a reality or be rejected.

Conclusion

Parcel delivery logistics faces serious challenges these days. Environmental requirements, the regulations of city management to make cities more liveable place an additional burden on service providers, for whom the last stage of package delivery is the most problematic and at the same time the costliest. In the current situation, parcel delivery service providers are almost forced to work together to achieve more efficient operations. However, collaborations occur in very few cases. Based on the above, the main objective of this article has been to assess what development path would be needed to establish a platform-based business model, where the research question has been: What are the biggest challenges in developing a platform-based parcel delivery service model (motivators and inhibitors)?

As a first step in answering the research question, a comprehensive literature review was carried out, based on which the development system of the formation of collaborations was outlined. Stations for the development of partnerships can exist independently, but they can build on each other and develop further. The highest and most visionary solution to the development cycle is the platform-based business model. Platform-based models have become increasingly popular in the lives of ordinary people as a result of the sharing economy initiative. The transformation of

the operating model developed here, and the necessary trust factor into the business world would allow its operation.

The central element of the vision is the integrator and, at the same time, the platform operator. The other key player in the model is the world of service providers themselves, who perform their tasks by connecting to the platform. This document has examined and summarised the factors and aspects required to connect to the platform and reviewed the negative aspects that may arise from service providers before joining.

To develop a viable, integrator-driven platform-based business model, each of the aspects defined in this document alone requires in-depth analysis, which, once performed, can determine whether the vision is a viable or rejected business model.

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About the author

Csilla Bartucz, Ph.D. works at the Széchenyi István University, Hungary. Author can be contacted at bartucz17.csilla@gmail.com