

Rotterdam School of Management Erasmus University





SUMY: Urban Freight Delivery

MULTI-SIDED PLATFORMS IN EUROPE'S LOGISTICS SECTOR (Case 2)



RSM - a force for positive change

Introduction

In 2016, the European Commission launched the EU Horizon2020 Project SELIS (Towards a Shared European Logistics Intelligent Information Space) to accelerate digitalization of the logistics sector in Europe. Eight SELIS Living Labs (LLs) took place in different geographical settings all over Europe, including the Netherlands, Belgium, Greece, etc. During the project, supply chain visibility was one of the key strategies targeted by the LLs, also strongly related to other strategies like data reliability and quality. The overall aim of all the SELIS LLs was to contribute to the adoption of innovative business models by logistics communities and enabling the participation in a green, agile and collaborative European logistics and transportation system. In summer 2019, the project came to an end and it was time for the actors participating in the LLs to scale the multi-sided platforms launched within the project in a pilot base and implement them in their actual day-to-day business activities. How would the use of a multi-sided platform transform their business? What challenges would they encounter when implementing it? And how to improve the platform in order to make it most effective and maximize its long-term value?

Multi-sided Platforms

Multi-sided platforms (MSP) are "technologies, products or services, that create value primarily by enabling direct interactions between two or more distinct customer or participant groups"¹. Platforms as such have existed for years; a shopping mall for example, works a platform, connecting consumers and traders. The difference of this era, which is dominated by the growth of information technology (IT), is that the need to own physical infrastructure and assets has been substantially reduced. Because of the use of IT, developing and scaling up platforms has become way simpler and less expensive, as the smooth and almost seamless participation is made possible, and thus network effects are enhanced. This way, an enormous amount of data can be captured, analyzed and exchanged, and the platform's value grows for all interested parties. Platform businesses like Uber and Airbnb, have grown tremendously, disrupting and revolutionizing their industries².

This case is based on field research. It is written to provide material for class discussion rather than to illustrate either effective or ineffective handling of a management situation.

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A digital platform matches supply and demand of physical goods, services and/or information provision. The position of the platform is in between the two markets as an independent player; the platform host is the "matchmaker". What the platform sells to its users is access. The role of the platform host can differ in intensity (**Exhibit 1**); they could just offer a platform for exchange or retain more control over the interactions and have an integrated payment system and customer service.

Platforms can vary a lot, but they all have an ecosystem with common structure and four main categories of players involved: owners, providers, producers and consumers (**Exhibit 2**). The platform owners have control over their intellectual property and they are responsible for the governance of the platform. The providers act as the platforms' interface with the users. The producers make offerings to be used by the consumers.

Many digital platforms create economies of scale, as costs of enabling a transaction decline when the number of transactions increases. This scalability is a reason why digital platforms can cause a disruption to existing market; they can potentially grow fast. Multi-sided platforms are characterized by network effects (**Exhibit 3**) which should be considered when shaping the applicable market.³ Network effects can be either positive (value-enhancing) or negative (value-diminishing)⁴.



Exhibit 1. Types and examples of platform businesses⁵





Exhibit 3. Potential network effects of multi-sided platforms⁷



SUMY

It was a busy autumn afternoon of 2019 in the centre of Brussels. The already congested roads of the city centre during peak hours were becoming even more crowded due to the light rain that was going on for hours. While this weather was typical for this time of the year, it still forced urban dwellers to choose the comfort of their private vehicle rather than public transport or biking to, and from, work. In addition to cars, many freight vans and tracks that made frequent stops for urban distribution, made the traffic situation even more difficult to handle.

Hinde Boulbayem looked out of the window of her office. She wondered if her vision of the company she had set up to relieve urban congestion by providing alternatives to the current system of urban deliveries was going to be successful. Boulbayem is the founder and managing director of SUMY (Sustainable Urban MobilitY & Logistics), a Logistics Service Provider (LSP) in the area of Brussels, which focuses on the delivery of fresh food and pharmaceutical products, aiming at the optimization of this transport with enhanced information sharing and increased level of collaboration with other local LSPs and shippers. SUMY's ultimate goal is to maximize load factors¹, improve quality of service and consequently reduce the environmental footprint of urban freight in Brussels.

A few years ago, SUMY introduced a multi-sided digital platform, where all individual Brussels-based stakeholders (e.g. shippers, service providers) would be enabled to communicate their demand (i.e. freight transport orders) and offer (i.e. available capacity) in order to execute collaborative planning, collect transport events and real-time traffic data, to monitor the transport progress and react to disturbances (e.g. rerouting, notifications). But in reality, the implementation of the platform proved to be more challenging than in theory.

Truck drivers were used to flexibility and they sometimes opposed the introduction of a track and trace system that aimed at optimizing routes and reducing emissions. The situation was even worse in cases where unions were involved: there the resistance to change was way more organized and powerful. Boulbayem remembered a recent extreme incident: a company bigger than SUMY tried to introduce a track and trace mechanism, but due to the existence of employee unions, the opposition was so strong that it even included life threats of the company owner. As a consequence, the company chose to stop the process.

Boulbayem was aware that it was really difficult to persuade the actors involved to change the way they are used to do business. She wondered how they could achieve this mind-

¹ Load Factor: "The load factor is the ratio of the average load to total vehicle freight capacity (vans, lorries, train wagons, ships), expressed in terms of vehicle kilometres. Empty running is excluded from the calculation. Empty running is calculated as the percentage of total vehicle-kilometres which are run empty. Load factors and empty running are both expressed as percentages." Source: <u>https://www.eea.europa.eu/data-and-maps/indicators/load-factors-for-freight-transport</u>

shift and how the multi-sided platform could be optimally used to eventually maximize the benefits of all actors involved and help the transition of cities to a more sustainable and resilient future.

Urban Freight Transport Industry

It is undisputable that urban freight distribution is an essential part of modern cities, with continuously increasing importance. The majority of goods that are consumed in cities are produced in areas outside them and then are being transferred to them. The transport process that takes place within the city boundaries until the products reach their final destination is often called the "last mile" in the supply chain. In most cities, trucks are the main transport mode for this last mile, as they are often considered the most suitable option within the complex urban network. Nevertheless, the use of trucks is responsible for considerable impact on the environment, such as the emission of CO_2 , NO_X , particulates (PM₁₀, PM_{2.5}, PM₁), as well as noise and visual pollution. Parking requirements for delivery vehicles and ensuring traffic safety for all road users is also an issue that requires particular attention. Urban freight delivery has effects that can be felt on a global level, such as greenhouse gas (GHG) emissions, and others that are mostly perceived on a local level. The last mile, in addition to causing environmental harm, can also be troublesome both for citizens and for logistic service providers. The promotion and implementation of sustainable, environmental-friendly solutions that include alternative approaches should hence be a crucial component of urban transport planning⁵.

Approximately 10-15% of the kilometres travelled within cities is made by urban freight itineraries and 6% of all transport related GHG emissions is estimated to be caused by urban freight. The amount of urban land that is used for logistics activities is usually between 3% and 5% and about the same amount of the total labor force of cities is occupied in the sector. Most of the vehicle kilometres travelled are due to imported goods (40 – 50%) and about a quarter is caused by transport of exported goods, while the rest is related to transport that has both "legs" in the city⁸. In Brussels area in particular, these percentages are even higher; 10% of the traffic is associated with freight transport, but over 30% of the pollution is caused by it.

The negative impacts of urban freight transport can be divided into three broad categories: economic impacts, social impacts and environmental impacts. ⁹

The economic impacts can involve offering an unreliable delivery service to consignees, because of additional time spent on the road due to traffic congestion. Moreover, impacts belonging to this category can also include the costs associated with resources exploitation or/and with complying to existing regulations of urban freight transport. The social impacts can entail impacts on health of the citizens, due to air pollution, traffic accidents, visual and noise pollution. Furthermore, the use of heavy goods' vehicles on urban roads can cause damage to infrastructure. Last but not least, environmental

impacts refer among others to CO_2 and local pollutants emissions (such as CO, NOx and PM) and the utilization of non-renewable resources such as fossil fuels.

The market sector share of urban freight transport is presented in Exhibit 4.

Urban freight is an important part of the recent Sustainable Urban Mobility Plan (SUMP) of the Brussels region. The success of the innovative approach that was followed in Brussels regarding urban distribution planning was recognized at the European level, with the reward of the 5th EU Sustainable Urban Mobility Award on the theme of urban freight. Moreover, in addition to Brussels, other Belgian cities such as Antwerp have implemented low emission zones (LEZ) that ban certain older types of vehicle engines. The LEZ in Brussels becomes progressively stricter with the goal to completely ban diesel vehicles by 2030 and gasoline vehicles short after that.¹⁰



Exhibit 4. Market sector of urban freight transport^{1,11}

Actors in the City Logistics Industry

A large number of flows and activities intersect in urban cores, and thus many diverse actors are involved in the system of urban freight transport. The classification of actors that follows is based on the CIVITAS Policy note "Smart choices for cities: Making urban freight logistics more sustainable" (2015).⁵

Supply Chain

The supply chain actors can be analysed further to the following three sub-categories:

<u>Shippers</u>: manufacturers, wholesalers, retailers, etc. Shippers are often not located in the city; they are responsible for sending the goods to other companies or individuals and they often do not think they have major responsibility regarding issues created by urban freight delivery. Their objective is to maximise their quality of service and reliability while keeping the costs low. In many cases, they hire transport operators to carry out the urban freight delivery.

<u>Transport operators</u>: freight carriers, couriers, etc. Their objective is to achieve the maximum possible efficiency and quality of service while keeping their costs at a minimum level. Sometimes they have to face certain restrictions that are set by other actors, such as having to perform the deliveries within specific pre-decided time windows. The geographical coverage of transport operators usually exceeds that of the city.

<u>Receivers</u>: shopkeepers, offices, residents, etc. Receivers are often the last link of the supply chain and they can have a key role in it, as they are the ones who decide on the time windows for the delivery of goods. Being usually located within the city limits, they can have better understanding of the local circumstances and problems.

Resource supply

There resource supply stakeholders can be divided into infrastructure providers, infrastructure operators (managers), and landowners. Their decisions on where to invest can have a major impact on the possibilities for urban freight transport.

Public Authorities

Public authorities determine policies which also have an impact on urban freight transport possibilities. This category can include the government on the local or/and national level, and also on the EU level for some issues such as defining the EURO - standards for vehicles.

<u>Local authorities</u>: Ensuring that the city has an efficient transport system and enhancing accessibility is a critical part of the agenda of local authorities. They also aim at reducing congestion and the negative impact of traffic on the environment and increasing road safety; overall, they are interested in creating and maintaining an attractive city as a whole. For that reason, they attempt to resolve potential conflicts between supply chain actors and citizens.

National authorities: Urban freight transport is usually considered a local matter, and therefore the involvement of national government can be quite limited. Nevertheless,

national strategies such as reducing CO₂ emission or air pollution and congestion at a national, can influence local authority policies.

Impactees

This group of actors include people who although they experience the impact of urban freight transport, they are not often able to have a direct say on the related policies (only indirectly through voting for their preferable representatives at the elections). The impactees can include:

<u>Other traffic participants</u>: This category comprises vulnerable road users (cyclists and pedestrians), as well as drivers and passengers of private vehicles that interact with the urban freight vehicles within the city environment.

<u>City residents and city users</u>: This category includes the individuals who live, work, or/and spend leisure time in the city. They experience the negative consequences of urban freight transport such as noise and/or visual pollution, decreased air quality etc.

<u>Visitors/tourists</u>: This category is affected by urban freight transport to a more limited degree as they spend less time in it comparing to the residents, although the existence of a large number of trucks in the centre can deteriorate the city's image in terms of urban space quality. An attractive city, which people from other areas express interest to visit can also be beneficial for the commercial life of the city, and hence, minimising the nuisance caused by urban freight transport is important.

Other stakeholders can be the providers of vehicles, information technologies (IT) support systems, and other means that can help the rest of the actors accomplish their roles. It is worth mentioning that those who often experience the negative effects of urban freight transport can sometimes be the main beneficiaries of the products and services delivered, e.g. the owners of shops, restaurants, bars etc.

The SUMY Digital Platform – Opportunities Created

The digital platform introduced by SUMY, aimed at steadily increase the usage of available capacity of the different vehicles out on delivery within the context of a complex, short distance urban distribution environment. The ultimate objective was that improving Urban logistics service providers' (LSP's) load factor would consequently lead in decreasing the environmental impact (such as CO_2 emissions), but was also expected to decrease operational costs and increase the overall productivity of the collaborators. Furthermore, the platform aimed to enhance supply chain visibility through collaborative information sharing and seamless integration of multiple sources.

The digital platform was tested with two main customers; Färm and Pharma Belgium - Belmedis (PhB-B)¹².

- Färm is one of the leading co-operative organic health food markets operating in and around the area of Brussels. It represented, in 2019, 7 shops and aimed to grow bigger and reach, through its collaborations, 20% of the market in the forthcoming years. With more than 4.000 products in each of their shops, delivered through 260 suppliers, more than 100 deliveries per week are required. All these deliveries are organised independently; nevertheless, Färm aims at reducing the number of deliveries to the minimum possible level, through the promotion of collaboration among their suppliers, in order to optimize the transportation of products to shops that are located in the same region. Färm strongly believes that by merging a number of deliveries, the total duration of delivery can improve, leading to a cost-efficient solution which will be at the same time positive for the environment.
- Pharma Belgium Belmedis (PhB-B) is a wholesaler of pharmaceutical products. With a market share of more than 30%, it is one of the most important players on the Belgian market of pharmaceutical products' distribution. Having 8 branches in Belgium, PhB-B organises the distribution of pharmaceutical and cosmetic products to about 4000 customers through up to 3 deliveries per day. Deliveries are made both by PhB-B contracted drivers as well as by subcontractors. They wish to track their vehicles and be able to reroute them if necessary. In addition, PhB-B explored the possibility of organising shared deliveries to increase the visibility of own data and improve the information flow between stakeholders both internally and externally.

In one of the latest meetings she had with the SUMY team, Boulbayem talked to them about the important opportunities that, according to her opinion, were created by the introduction of the digital platform. She said "we have now sufficient proof that the digital platform does allow a much more efficient collaboration with our partners and it has helped us improve our public image – urban LSPs are now considered more environment friendly, therefore they tend to be preferred transport service providers, from environmentally sensitive shippers and customers. This is expected to result in an increase of transport demand, especially after the full implementation of the solution. Several of our current clients have told us clearly that they made the choice of working with us because we have this sustainable and ecological public image".

She continued, supporting the view that if they use and develop further the multi-sided digital platform, they will be able to effectively and seamlessly facilitate the collaboration among the involved stakeholders, and it is expected that this will have positive and direct impact on their visibility, which they currently struggle to follow, and therefore increase both the user as well as the end customer satisfaction. As a result, she claimed that this could accelerate the adoption of the digital platform solution to a wider audience and greater extent.

The Way Forward – Remaining Challenges for SUMY

Although the introduction of the multi-sided digital platform is associated with the aforementioned many opportunities, there is still a number of remaining challenges to be addressed, and Boulbayem knew that well. How can the platform be used to reveal many new synergies in the delivery map and help exploit them to make the services more efficient and productive, in line also with the suggestions of the SUMP of the city of Brussels (see Introduction)?

- The mental shift was still an essential factor for the platform to succeed. To persuade users to actually use the platform implies raising awareness about the potential benefits that will be created for them (such as e.g. for drivers: time savings, less frustration while driving due to reduced congestion, creating a healthier city for themselves and their families etc.) A way to do that could be to improve user experience on the platform, by accommodating management of massive data and allowing efficient filtering of irrelevant information. The platform could include and integrate more collaborative and open data; this way, with an easy to use and stable platform, the user base would be more engaged and clearly see the added value the platform could bring to their day to day. Furthermore, being able to efficient planning. These data can also be shared with clients to increase awareness on their own parcels' status. Close and real-time monitoring of the delivery progress can also have positive impact on strategic planning of more efficient routes, and help activating re-routing in case of unexpected events.
- In urban logistics, the financial cost is often only related to the direct cost to LSPs. Nevertheless, there are several negative externalities, in addition to CO₂ that should be considered, such as noise pollution or traffic congestion, which have an additional cost for the cities. Ideally, the platform will be able in the future to calculate this external cost with the aim of reducing it in parallel to the financial cost. Based on this cost allocator, a service for less profitable delivery points could also be designed that could provide a basis for decision making for adjusting the transport price or outsourcing those delivery points. The platform could also be enriched with statistical traffic information, and track not only CO₂, but also NOx emissions. Also, the platform could be used to reduce empty runs of trucks in the urban environment.

SUMY would like to be in the forefront of tackling these challenges and finding efficient solutions, in order to establish its position in the market and develop even further, delivering the vision of a zero-emissions urban freight environment for Brussels. One of the most promising alternative fuels is hydrogen, at the moment however (2019) the technology was not there yet.

Conclusion

Thinking about these challenges, Boulbayem realized that in order for the SUMY platform to follow a successful path ahead, action needed to be taken. Therefore, she decided to call the rest of the SUMY team on a meeting under the objective of deciding the most efficient strategy to move forward.

Furthermore, she decided to explore an idea that might be considered "crazy" by many of her colleagues: merging the over 9000 carriers and transport providers that existed in Belgium¹³ by using the multi-sided platform.

Boulbayem was convinced that it would be hugely beneficial for the future of urban logistics to promote the merging of the carriers and transport providers because having a reduced number of organizations involved could lead to reduced complexity. She believed that the multi-sided platform could be a great means to achieve this as it demanded the integration of different systems and extensive collaboration. She was going to ask from the SUMY team to help her search creative ways to achieve this ambitious vision for Brussels, so the way can be opened for the rest of the country as well.

Endnotes

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