PACHÉ (Gilles), MOREL (Christian), ROVEILLO (Gérard), « Stratégies de digitalisation dans les services de gros. Une perspective logistique de l'intermédiation », *Revue Européenne d'Économie et Management des Services*, n° 12, 2021 – 2, p. 157-169

DOI : 10.48611/isbn.978-2-406-12261-6.p.0157

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Résumé – Les services de gros sont désormais l'objet de pratiques logistiques vertueuses, tout particulièrement en termes de gestion des tournées de livraison dans l'espace urbain, de création d'emplois qualifiés et de recours à des techniques de transport éco-efficientes. Le pilotage des flux physiques par les flux d'information étant au cœur des pratiques logistiques vertueuses, l'attention est portée dans le point de vue à l'adoption d'outils numériques par les grossistes afin de les améliorer.

Mots-clés – digitalisation, système d'information, pratiques logistiques, transport, services de gros

Paché (Gilles), Morel (Christian), Roveillo (Gérard), « Digitalization strategies in wholesaling services. A logistical perspective of intermediation »

Abstract – Wholesaling services are now subject to virtuous logistics practices, particularly in terms of managing delivery rounds in urban areas, creating skilled jobs and using eco-efficient transport techniques. As the monitoring of physical flows by information flows is at the heart of virtuous logistics practices, attention is paid in the viewpoint to the adoption of digital tools by wholesalers in order to improve them.

Keywords – digitalization, information system, logistical practices, transport, wholesaling services

DIGITALIZATION STRATEGIES IN WHOLESALING SERVICES

A logistical perspective of intermediation

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INTRODUCTION

Since the Antiquity, wholesale trade has been distinguished from retail trade (Holleran, 2012). Although both wholesale and retail trade cover the purchase of products for resale, retail trade involves the purchase of small quantities of products mainly for consumers who are not acting as "professionals". Wholesale trade, on the other hand, is based on the purchase, storage and sale of products to a predominantly professional clientele (small retailers, restaurants, hospitals, colleges and universities, etc.). Wholesale trade also includes the billing of various services such as sorting, delivery, assembly or installation of products. Although these services are sometimes similar to product processing, they are only related functions, distinct from the main activity of wholesalers: *BtoB intermediation*. At present, the wholesale function is carried out not only by wholesalers, i.e. companies that purchase and resell products from professionals on a principal basis, but also

by large retailers and franchise networks, whose influence has grown steadily since the 1980s.

This explains why for many years, the role played by wholesalers in the deployment of efficient intermediation strategies has been largely underestimated. In Europe and North America, the large retailers have strongly integrated the wholesale function in two ways, at the transactional level and at the logistics level, by setting up central purchasing units, on the one hand, and warehouses and platforms, on the other. They effectively excluded wholesalers, one of whose *raisons d'être* corresponded to the supply organization of independent retailing (Filser, 1989). However, the economic vitality of wholesalers and their capacity to propose technologically innovative solutions, particularly in the context of city logistics, has never been denied; the implementation of shared systems, that are particularly efficient in terms of transport, storage and delivery rounds, has thus been recognized by many observers and highlighted in recent works (Jones *et al.*, 2017; Sirjean *et al.*, 2017; Pryor, 2018). After decades of oblivion, even contempt, wholesalers are now the focus of attention.

The guide to city logistics practices for wholesalers, written by Sirjean and Boudouin (2017), reveals that own-account transport and insourcing of warehousing operations are nowadays characteristic features of the logistical organization of many wholesalers, focused on physical flows. On the other hand, the main issue of digitalization is still poorly taken into account, whereas digital supply chains are a major disruption for several years (Büyüközkan and Göçer, 2018). Although there is an abundant academic literature highlighting the excellence – or even managerial superiority – of logistics service providers and carriers, and the Authorities tend to underestimate their economic importance, the role of wholesalers in intermediation is not negligible and concerns a significant number of companies (and jobs). The logistical practices of wholesalers are therefore worthy of interest, especially since initial analysis shows that they are rather virtuous (environmentally friendly transport, customer value creation) (Dachs, 2016). This viewpoint wishes to emphasize the interest of the topic, the state of logistical practices and the challenges ahead[1].

1 The authors sincerely thank two anonymous reviewers of the *European Review of Service Economics & Management* for their valuable comments on a first draft of the viewpoint.

1. GENERAL OVERVIEW

Admittedly, own-account transport remains little explored and analyzed, particularly in the context of urban deliveries (Marcucci and Gatta, 2013). It is still strongly associated with a negative perception: companies that are "cold", with no real expansion strategy, and with no distinctive logistical competences. At the same time, however, own-account transport is often presented as an essential lever to directly control the execution of logistical operations, without relying on the capabilities of external partners, who may behave unfairly or opportunistically in the sense of Williamson (1985). Indeed, the transaction cost theory clearly indicates that relying on an external partner can lead to manipulation of the selling prices of the logistical service, in the absence of sufficient controllability of its actions. The external partner may also conceal information on the productivity gains made during the execution of the contract, which allows it to significantly increase its margin to the detriment of its customer, in a situation of information asymmetry.

Own-account transport and, more generally, transport organization, is one of the major components in the management of physical flows within the framework of companies' supply chain policies. Wholesalers are no exception to this reality, which has been known since Kolb's (1972) and Lambillotte's (1976) seminal works in France in the 1970s, regardless of the type of wholesaler, usually grouped into four categories (see Table 1). On the other hand, the transport issue cannot be disconnected from information flows, control of which is an essential condition for improving the flow management, which are most often put under pressure to reduce stock levels along the supply chain (Christopher, 2016). From this point of view, it is relevant to approach wholesalers' own-account transport logistical practices with reference to the digital tools mobilized and their contribution to improving practices for better performance of intermediation activities.

Tab. 1 – Four categories of wholesalers.

Type of wholesaler	Range of products	Clientele
Full lime	Complete range of products	Food service clientele
Traditional	Specialization by type of products (grocery, frozen food, kitchen equipment, etc.)	Diversified clientele (food service, retail market)
Specialized	Range of technical products	Specialized clientele (bakers, confectioners)
Cash & carry	Self-service depots offering the whole range of products (food, non-food, beverage)	The diversified clientele comes to the depot

Traditionally, digital tools are mobilized by the different functionalities of an information system (Fabbe-Costes, 2000). They refer to the processes of acquisition, storage, processing and communication of the data necessary to monitor physical *flows*. Without concern for exhaustiveness, it is possible to cite tools, systems and technologies concerning data (smart data, big data, open data), global tracing/tracking, customer relations (*via* an effective CRM), flow and stock management, simulation and optimization (TMS and WMS, among others) (Seyedan and Mafakheri, 2020). The tools, systems and technologies can be used statically, within wholesalers' warehouses, but also dynamically, to connect different members of the supply chain with each other and with customers. In Europe, it is interesting to note that wholesalers receive the most orders *via* computer networks, as shown in Figure 1. The question of how tools, systems and technologies interact with the wholesaler's internal and external organizational processes is of primary importance.

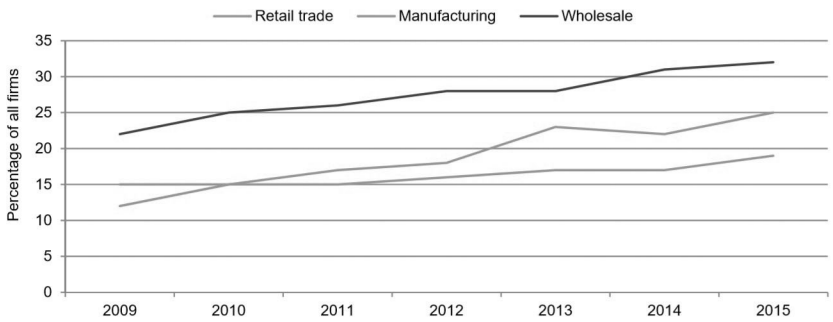

FIG. 1 – Share of European enterprises which have received orders *via* computer networks in different sectors (Dachs, 2016).

One of the main challenges faced by wholesalers is to simultaneously manage both traditional and digital distribution channels. More precisely, they have to provide digital solutions adapted to the expectations of different categories of customers with heterogeneous levels of digital maturity. At the same time, wholesalers need to maintain and strengthen the quality of the existing product and service package. From this point of view, digitalization allows to implement an efficient omni-channel strategy that better meets the needs of traditional customers and offers the opportunity to reach new customers with specific requirements. Digital tools also help to reinforce the added value of complementary services, to obtain productivity gains in the logistical processing of orders and to improve the tracing/tracking of flows. In short, as Weber (2021) points out, digitalization is a major driver for the optimization of wholesalers' commercial and logistical processes. However, we should not fear a brutal disruption: the human relationship built over time, the personalization of the advice and the technical expertise are still elements that differentiate wholesalers from start-ups in the digital world.

2. PRACTICES

The overall performance of a supply chain refers to notions of fluidity and continuity of flows, which can only be truly achieved if there is a perfect connection between the nodes allowing the product delivery and a continuous collaboration between all supply chain members, including wholesalers. Within this value creation system, intermediation has the task of facilitating the matching of supply and demand by bringing together several companies with complementary interests (Fulconis and Roveillo, 2017). Intermediation has both a transactional dimension (organization of exchanges) and a logistical dimension (management of physical and information flows) (Pardo and Paché, 2015). The logistical dimension covers a triple dimension of transport, handling, and storage, as indicated by the American Marketing Association as early as 1948, based on the work developed in OR before the WW II. Through the carrying out of the transport activity directly by the owner of the goods, as is the case for the wholesaler, own-account transport requires physical resources in terms of vehicles and personnel, which is applied through an outsourcing policy (see Figure 2). The outsourcing/insourcing opposition is, moreover, one of the best-known trade-offs in the field of logistics, the relevance of which Williamson (2008) has vigorously noted with reference to transaction cost theory.

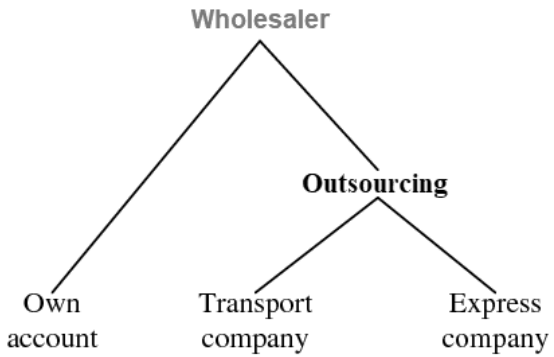

FIG. 2 – Transport service type for a wholesaler.

As underlined by Sirjean and Boudouin (2017), own-account transport is still the preferred method of organization for French wholesalers (nearly half of them use it as the main means of transporting products). On the other hand, it is interesting to note that for many of them, several modes of organization can be used simultaneously. Flow management must therefore involve different information tools, enabling communication both internally and externally with the same level of performance, responsiveness and reliability. Efficient implementation of the tools requires the wholesaler to equip itself with a sophisticated information system that enables it to anticipate (planning), organize (management systems), control and monitor (scorecards) all physical flows. In fact, it is easier to understand that digital tools are identified at all stages of mobilizing and managing logistical resources: (1) at the vehicle level (with reduced consumption, geolocation, and maximization of the fill rate); (2) at the level of information systems (with traceability of flows, and optimization of routes); and (3) at the level of connection with customers (with EDI, and real-time management of contingencies and risks).

One of the most interesting cases is that of the American company Ingram Micro, one of the world leaders in wholesaling services dedicated to electronic equipment. The company, which owns 150 warehouses worldwide, is deploying an ambitious development strategy in France since 2017. A 43,000 m^2 warehouse has been built in Lomme, near Lille, where 22,000 references are processed. Receiving 500 to 600 pallets per day with peaks at 800 pallets, Ingram Micro has 200 regular suppliers. With a maximum stock duration of 60 days controlled by a WMS and an ERP, orders are received until 7 pm for deliveries made mostly on D+1 before 1 pm all over France. Three types of order preparation are carried out: (1) preparation for parcels weighing less than 70 kg, supported by a mechanized system of conveyors, packaging and labeling; (2) preparation for shipments weighing more than 70 kg; and (3) specific preparation for e-tailers. Ingram Micro covers all the logistical links in the wholesaling services dedicated to electronic equipment industry, from receipt to final delivery and dedicated order picking, shipping more than 11 million items from the Lomme warehouse.

However, one should not jump to conclusions from a few success stories. Joyeux (2020) thus underlines the persistence of "traditional

wholesalers" who have great difficulty in generating value from strategies based on digitalization. Faced with a dynamic that affects many sectors, and which is profoundly modifying inter-organizational processes, many traditional wholesalers are indeed struggling to implement a digital strategy that facilitates their insertion into efficient supply chains. Joyeux (2020) has led in France an important field research in the context of materials trading, based on a triadic methodology integrating suppliers and customers of wholesalers. It concludes that there has been a significant delay in the digitalization of wholesalers, which allows their suppliers to take the lead in information flows, while leaving the simple management of physical flows to the traditional wholesaler. The data provided by Dachs (2016) thus conceals important differences between categories of wholesalers that should not be ignored.

3. CHALLENGES AND PERSPECTIVES

The analysis of data (information) related to the functioning of supply chains offers important perspectives of optimization, provided that we know how to collect and aggregate them. Supply chain members must therefore implement partnerships in which they agree to share the use of their data in a decentralized way, based on the blockchain model, with a high degree of transparency and shared objectives. In turn, technical advances in data analysis facilitate the creation of predictive models to adapt the functioning of supply chain to potential contingencies (Nguyen *et al.*, 2018). The implementation of data-sharing networks allows wholesalers to meet their customers' expectations by communicating on the product flow. Data sharing, in addition to transforming the relationships between supply chain members, also refers to the consideration of societal issues related to the parsimonious use of increasingly scarce resources, as well as the respect of environmental constraints that now weigh on human activities.

The contribution of digital tools to the improvement of processes and the organization of logistics for wholesaling services is part of a global approach to optimizing the circulation of products, particularly

in urban areas, as shown in Table 2 adapted from Morganti (2011). We find here important issues of quality of life and reduction of the negative externalities suffered by city residents (Taniguchi, 2014; Nathanail *et al.*, 2017). These elements are very often interconnected; for example, urban deliveries that take place without difficulty generate less environmental pollution and better economic performance for retailers and other stakeholders. They thus contribute significantly to the public acceptability of logistical activities (De Oliveira *et al.*, 2020). Considering that the energy balance is a relevant indicator to measure the effects of transport in general, it should be noted that goods contribute about 30% to the overall urban transport account. A more precise approach by pollutant emissions indicates 40% for nitrogen compounds or 45% for fine particles related to diesel vehicles, in particular (Sirjean and Boudouin, 2017).

Tab. 2 – Urban logistics variables set for wholesaling services.

Categories	Variables	Details
Logistical variables	Frequency	Delivery frequency of the products
	Load unit	Number of items arranged as a single unit (pallet, roll, box, etc.)
	Delivery features	Number of deliveries by trip, and weight of each delivery
Organizational variables	Typology of vehicles	Dimensions and technical features of the vehicles
	Delivery window	Period of the day in which the delivery of the products is usually carried out
	Delivery optimization	Capacity utilization of the vehicle (in weight and/or volume)

Source: Adapted from Morganti (2011).

This reality, which has a direct impact on the health of citizens, is now well-known and can no longer be ignored by the Authorities. Moreover,

the political dimension associated with logistics, particularly city logistics, is giving rise to research that calls for increased interventionism to reduce the environmental impacts of urban freight deliveries (Sirjean *et al.*, 2018). The use of digital tools to better manage vehicle stops in the city and their duration – to inform in real time of the availability of a delivery space, or to better regulate traffic, clearly contributes to improving the useful presence times of vehicles in urban area. Thus, the light commercial vehicle stopped in front of a small shop, the heavy truck delivering materials to a construction site, the van supplying a craftsman, the garbage truck picking up waste, etc., can be better synchronized with the need for reception or collection, exactly at the time when this logistical need is expressed.

These are important prospects for wholesalers, whose logistical practices have always been intimately linked to the city's supply activities, and which ultimately correspond to the vision developed by Le Corbusier (1943/1973), in the famous *Athens charter*. The current evolutions are in fact part of the model of functional urban planning in reference to the geometrical order desired by Le Corbusier (1943/1973) based on the four major functions of the modern city: living, cultivating, working, circulating. A kind of rational thinking must lead to the optimization of the mobility of the inhabitants, but also of the delivery of products to enable them to live, and the recovery of the waste they inexorably generate. In other words, nothing must be left to chance in the mechanistic vision of urban space, managed as best as possible on the basis of precise calculations of the flows linked to a population that has to be moved and fed. This rationalist approach to the city has been widely criticized, notably by Marxist urban planners, but it undeniably corresponds to a reality in which today's wholesalers and the use of digital tools are part of the picture.

CONCLUSION

This viewpoint wished to address issues related to the organization of supply chains, whose intermediation directly participates in the efficient delivery – in terms of cost, service and responsiveness – of products to end consumers. Academic literature sometimes forgets the wholesalers,

understood as intermediaries that do not create value, and symbols of a past gone of retailing industry. However, many innovative wholesalers have developed virtuous logistical practices, particularly in terms of managing delivery rounds in saturated urban areas, creating skilled jobs and using eco-efficient transport techniques. This last point is important insofar as own-account transport is often presented as an essential lever to directly control the execution of logistical operations, without relying on external partners who may develop opportunistic behavior.

Drop shipping is one of the most significant examples of economic developments that place wholesalers at the center of the new economic game. In drop shipping, an e-tailer signs a contract with a partner in charge of storing the products in its warehouse. Once the products are purchased or ordered, this partner delivers them directly to consumers on behalf of the e-tailer. The e-tailer focuses on the promotion of its products while avoiding the logistical inconvenience of stock management and product delivery. With each order made by a consumer, the e-tailer transmits the delivery details to the partner with the part of the payment corresponding to the purchase price of the products fixed in the contract. The partner then takes care of shipping the products. Many wholesalers are starting to position themselves on the drop shipping market as they have understood that e-tailers do not have the logistical skills associated with the management of final deliveries (small shipments), while global sourcing from China is fully mastered.

However, it is commonly accepted that the multiplication of small shipments from a large number of shippers is both costly for the wholesaler and has a negative impact on the environment by increasing the number of vehicles on the road. For example, customer pick-ups at wholesale platforms (such as cash & carry or wholesale market for fruit, vegetables and agricultural produce [*marchés d'intérêt national*, MIN]) generate a large number of small vehicles on the road that saturate urban space. In some cases, the relationship to the product (the recipient's need to see and touch the product) will predominate over logistics optimization. Wholesalers have a good understanding of what is at stake. They are increasingly offering delivery services for this purpose by relying on the pooled model of delivery round organization, while working on the relationship of trust with customers. Wholesaling services are unquestionably at a key moment in their evolution and, as such, they undoubtedly deserve in-depth reflection in future work.

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