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Q-commerce logistical networks: A shift in digital retail towards “going dark”?

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Abstract. In recent years, the retail sector has entered a new phase in its digitalization process with the emergence of quick commerce (or Q-commerce). The model is based on a promise to deliver consumer products within a very short time, around 10 to 15 minutes after an online order via an application. To achieve this, an original logistical network has been set up in the heart of cities. It is based on dark stores where deliverymen on bicycles or scooters come to supply the last mile, after the orders have been prepared. This research note highlights how Q-commerce puts the “battle of the deadline” at the center of the analysis, which responds to a cult of urgency that continues to grow in Western countries. To win this battle, logistics is more essential than ever, but the form it is taking with dark stores is generating tensions, especially in Europe, which could lead to regulations that slow down this new phase of digitalization of the retailing industry.

Key words. Battle of the deadline, Digitalization, Logistical network, Quick commerce, Retailing industry.

INTRODUCTION

The extremely rapid growth of quick commerce (or Q-commerce), in urban areas of the United States as well as in Europe and Asia, is of interest to many researchers specialized in retail and marketing channel management, while also arousing the curiosity of researchers in other fields such as entrepreneurship and corporate finance (Huang and Yen, 2021). Indeed, new entrants to this dynamic market, most often start-up companies, are attracting massive investments from venture capitalists, even though their profitability is far from certain, as evidenced by the disappearance of many start-up companies after a rocket-like development. In any case, Q-commerce is increasingly systematically catching the eye, and while some see it as a major form of future commerce, particularly in South Asia (Ahmed and Shafighi, 2022), others note

the negative external effects on the functioning of the city, with local residents weary of the nuisance caused by the ballet of deliverymen on bicycles or scooters who ensure the daily operation of Q-commerce.

In fact, Q-commerce consists of fast delivery –in less than an hour, most often in 15 minutes or less– of consumer products that the consumer has purchased online via a smartphone application. This is where the real revolution lies because while traditional e-commerce has revolutionized in-store retail, the average delivery time there is still three to five days for many websites (Paché, 2022). Q-commerce has the advantage of delivering small orders almost immediately, when and where consumers want to receive a unique product (or a small range of products). The reactivity required by this immediacy requires the implementation of local logistical networks, based on dark stores, which destabilize the urban space by creating numerous nuisances. In brief, it is possible to evoke a headlong rush towards “everything, right away”, the consequences of which could be socially dramatic by instilling the idea that waiting is no longer tolerable to satisfy a need, whatever the price to be paid by residents.

The latest trend in the unlimited digitalization of distribution, whose collateral effects in terms of physical store closures are now known, Q-commerce fascinates as much as it frightens. It fascinates insofar as the logistical prowess on which it relies is exceptional; who could have imagined, barely twenty years ago, when online orders were taking off, that the availability of products would one day take a few minutes? But it is also frightening, given its predatory power *vis-à-vis* traditional city center small stores, not to mention the working conditions it imposes on logistical operators (deliverymen and pickers), who are under continuous time pressure (Altenried, 2019). Shapiro (2023) does not hesitate to write that Q-commerce is one step closer to the “going dark”, a world where the darkest recesses of retailing industry appear in full light. This research note explores the new model by highlighting its managerial underpinnings, namely winning the “battle of the deadline”, and the means implemented to achieve this, namely efficient logistical networks.

THE BATTLE OF THE DEADLINE

While the emergence of Q-commerce predates the Covid-19 pandemic, as Amazon’s Prime subscription system (2005) and then the pedestrian drive system (2018) are often cited as the successive birth acts of the business model, the pandemic is seen as a significant “gas pedal” of the phenomenon. Q-commerce had begun to expand in the restaurant industry, particularly for takeout delivery, but it quickly gained other market segments, most notably in the grocery sector. By the spring of 2020, consumers in many countries had to rely on online shopping amid weeks of lockdown. Large retail players such as Walmart and Tesco saw this as a real opportunity to expand their home delivery services, countering consumer disaffection with physical stores due to fear of contamination with no known vaccine (remember that the Pfizer and Moderna vaccines will not be available until late 2020, with mass vaccination beginning in early 2021).

Observing this evolution with attention, old and recognized stakeholders in the fast delivery industry such as Deliveroo, Getir, GoPuff and Postmates, have positioned themselves on the market. Their common characteristic is that they are start-up companies that have quickly understood that the key to success in Q-commerce lies in the perfect control of logistics operations to allow same-day delivery to the consumer, a few minutes after his/her online order (Dablanc, 2022). Indeed, with the intensification of competition in the Q-commerce segment, it seems indisputable that companies will fiercely compete for the same customers to increase their market share, especially when the hedonistic values of customers lead them to pay close attention to the quality of their digital experience, which is sometimes difficult to guarantee (Weber and Chatzopoulos, 2019). To achieve their goal of increasing market share, Q-commerce companies will seek to offer faster and more reliable delivery than competitors. The key idea of the business model is that this choice must improve the customer experience and the loyalty of time-sensitive consumers, given a cult of urgency and speed that has been imposed over time, which Laïdi (1999) describes as a true tyranny.

The result is impressive. For the year 2020, which is the year of takeoff, Q-commerce has delivered more than 9 million orders in 22 countries, with 22,700 associated outlets and dark stores. In Europe, Getir (Turkey) is leading the way with 10-minute deliveries to their urban customers, beating their American counterparts by five minutes (the average is 15 minutes across the Atlantic). These five minutes may seem anecdotal in absolute terms, but they represent a 50% increase in delivery time. The success of the most successful start-up companies relies on four key elements: developing an efficient and fun application; purchasing the best products from their suppliers; covering the territory with a powerful logistical network; having delivery people ready to go to the consumers at any time. Because this is the secret of Q-commerce success: knowing how to accelerate deliveries, thus minimizing the time that elapses between the purchase of a product online and its availability, in other words knowing how to win the battle of the deadline. For Mobility Foresights, 2021 remains the key year for “big moves” in Q-commerce, as Table 1 indicates, and certainly the post-Covid-19 moment of its explosion as the new standard for e-commerce (Bouvier and Mohrt, 2022).

The rise of Q-commerce is obviously forcing established multi-channel retailers, such as Carrefour in France, to improve their own delivery systems in urban areas, or to join forces with new entrants to capture their competences and resources, at the risk of rapidly losing competitiveness. To do this, these multi-channel retailers will tend to give priority to increasing their online ordering capacity, which is their “*productivist*” foundation, and which shows how difficult it is to turn one’s back on the processes of pooling and massification of flows that are rooted in the history of the company (Filser *et al.*, 2020). This is undoubtedly one of the key issues. Pure Q-commerce, to use the terminology of pure players in the traditional e-commerce sector (Ghezzi *et al.*, 2012), are not prisoners of logistical networks inherited from the past, notably mega-warehouses in peri-urban areas, and they have the possibility of mobilizing the capital necessary to improve in the key areas of retailing that are flow management and data

processing. These are two advantages not necessarily available to multi-channel retailers that have been in the market for years.

Table 1. 2021: a key year for Q-commerce

Period	Company	Developments
December 2021	Zepto	The ten-minute grocery delivery Zepto is a quick commerce start-up company and raised \$100 million in a Series C round.
December 2021	Careem	Careem has entered quick commerce with the launch of Careem Quik in the UAE which is a quick-commerce e-grocery service.
December 2021	Delivery Hero	Delivery Hero is a world's leading local delivery platform that has driven into quick commerce thereby expanding its Logistics-as-a-Service (LaaS) over 25 markets.
December 2021	Grofers	Grofers is an online grocery delivery platform that has rebranded itself as Blinkit in order to concentrate on a quick commerce platform.
November 2021	Buyk	Buyk, a 15-minute grocery delivery service, has set its sights on differentiating itself in the next years through its industry experience, which will allow the company to develop more swiftly and successfully.
November 2021	Getir	Turkish ultrafast delivery firm Getir has made its U.S. debut in Chicago, with expands to the New York and Boston metropolitan regions by the end of 2021.
October 2021	Delivery Hero	Delivery Hero invested in the Berlin-based on-demand grocery delivery company Gorillas in order to strengthen the quick commerce industry.
August 2021	Yemeksepeti	Yemeksepeti is a subsidiary of Delivery Hero in Turkey launched Mahalle which is a quick commerce platform and has completed acquiring Marketyo which is an online shop platform.
June 2021	Gopuff	Gopuff signed an agreement in order to acquire rideOS which is a San Francisco based start-up and to accelerate the innovation in advanced delivery, routing and logistics.
May 2021	Gopuff	Gopuff partnered with Uber in order to bring essential products to Uber Eats.

Source: Adapted from a Mobility Foresights document (2022).

AN EFFICIENT LOGISTICAL NETWORK

In traditional e-commerce, mega-warehouses based on the outskirts of cities are responsible for fulfilling online orders (Zuchowski, 2016), the aim being to bring into play the phenomena of economies of scale and pooling. In contrast, Q-commerce

relies on the multiplication of small logistical centers located in the urban space (their surface area usually varies between 100 and 300 m²), a *sine qua non* condition to ensure deliveries in the shortest possible time. Table 2 highlights the major differences between e-commerce and Q-commerce. The most common name for Q-commerce logistical centers is the dark store, which is usually a former physical store that has been closed and transformed into a simple order picking area. The dark store is the logistical relay for online purchases, in the direct proximity of the destination points, and obviously has no vocation to revitalize a city center, for example from an experiential perspective as defined by Holbrook and Hirschman (1982). As indicated in Box 1, the Covid-19 pandemic has largely favored the expansion of the business model given the constraints of physical distance and travel limitations imposed on populations.

Box 1. Covid-19 pandemic: a windfall for the dark store

Dark stores first took hold in the United Kingdom, as retailers repurposed their stores to fulfill online orders, and they are variously known as dark shops, dark supermarkets, or dotcom centers. These outlets are usually located in suburbs or on the outskirts of cities, where real estate is less expensive. They generally consist of large warehouse-like facilities, but in some cases, they also include places where customers can inspect and collect items they ordered online. Dark stores started coming into vogue as retailers struggled to accommodate the restrictions placed on consumers during the Covid-19 pandemic. As people were told to stay home and avoid crowded places and store fronts were closed for months, the popularity of online shopping surged at the expense of brick-and-mortar locations. Traditional retailers needed a way to compete with web-based retailers and attract new business, while some online retailers needed to establish a physical presence. This gave impetus to the dark store concept, which allows consumers to shop and receive their items without having to engage in much social contact. Dark stores also allow retailers to offer their customers greater convenience, more immediate gratification, and a better shopping experience.

Source: Adapted from an Oracle document (2022).

Table 2. Comparison between e-commerce and Q-commerce

Main features	E-commerce	Q-commerce
<i>Logistical network</i>	Mega-warehouses located several tens of kilometers away from densely populated areas	Dark stores (closed to the public) located in the heart of cities for instant deliveries
<i>Delivery time</i>	3-5 days	10-15 minutes
<i>Delivery vehicle</i>	Large delivery vehicles like trucks	Two-wheelers like bicycles and scooters
<i>Product assortment</i>	Wide variety of goods	Small variety goods
<i>Type of purchase</i>	Planned purchase	Impulse purchase

The concept itself is not new, as retailers such as Whole Foods, Walmart, Target and Bed Bath & Beyond have used variations of it in the past. However, in the context

of Q-commerce, the difference is notable: it is not a question of a windfall effect which consists in using a physical store left vacant for lack of customers. On the contrary, a real planning of the logistical network accompanies the extension of the business model, with the implementation of partnerships with companies specialized in the management of the last mile and the investment in advanced technological systems for the preparation of the orders. In the Q-commerce format, companies typically keep limited, high-demand inventories of products (typically less than 3,000 items) in their dark stores, which can be quickly prepared and shipped to nearby areas as soon as online orders are placed. Unlike deliverymen, whose workspace is both anywhere and nowhere (Richardson, 2022), pickers' workspace is grounded in a confined space where social relationships are almost non-existent outside of interactions with other pickers. Picture 1 shows a dark store of the start-up company Flink, with the daily activity of a picker.

Picture 1. Standard order picking in a dark store



Source: Flink document (2021).

The success of Q-commerce is largely due to profound changes in consumer preferences. Urbanization, the explosion of single households, and aging populations have transformed buying patterns and, more broadly, consumer orientation (Foxall, 2022). Instead of acquiring large volumes of convenience goods, consumers now prefer to acquire products as they go, in real time, as they need them. Such a development is obviously favorable to Q-commerce insofar as one or two products can be delivered to the consumer within minutes of the order via an application. A logistical network calibrated to deliver to a consumer in three to five days is therefore immediately disqualified in an economy where the cult of urgency reigns, as

mentioned above, even if Husemann and Eckhardt (2019) identify weak signals of a consumer deceleration. This leads to two sources of competitive advantage for Q-commerce:

- *Optimize product assortment according to logistical constraints.* Q-commerce companies need to analyze which convenience goods sell best in different catchment areas and source them from suppliers to avoid out-of-stocks. Out-of-stock items can discourage consumers from making repeat purchases and increase their frustration. The larger the product assortment, the more difficult it will be to deliver. Rigorous analysis of product assortment structure can help track top-selling convenience goods based on big data and maintain optimal stock levels at all times in dark stores.
- *Optimize the location of dark stores.* Delivering orders during peak hours (e.g., evenings) in the face of recurring traffic congestion requires logistical centers located in multiple places, with easy access to the different neighborhoods of the cities in which they operate. Establishing local logistical centers and finding the right delivery partners is critical to the long-term growth and profitability of Q-commerce, which is the only way to meet the promise of 10-15-minute delivery. It is essential to think about the optimal location of dark stores, using a multi-criteria analysis.

For the moment, Q-commerce companies are still looking for consolidation in a hyper-competitive context where failures are not uncommon, such as Kol, a French start-up company created in 2015 and in judicial recovery in December 2021, not to mention the resounding bankruptcy of Fridge No More in the United States in March 2022, or the takeover of Gorillas by Getir in December 2022. To achieve this, discussions are underway on the “sinews of war”: the optimization of logistical networks through increased automation, the sole objective of which is to win the battle of the deadline mentioned above. Numerous ergonomic studies have been carried out to develop optimal routes in terms of time within dark stores, using artificial intelligence and computer vision. Business information modelling is used to reduce the number of order pickers’ movements within the shelves, while delivery by drone and/or autonomous vehicle is being tested by several companies as a substitute for delivery personnel on bicycles or scooters. Following the example of dark kitchens, whose food preparation platforms have greatly reduced the dependence on transport accessibility (Talamini *et al.*, 2022), Q-commerce companies clearly aim to remove the travel constraint usually borne by customers, and primarily optimize the delivery system. But is the Q-commerce business model robust?

DIGITALIZATION UNDER THREAT

It must be recognized that Q-commerce is characterized by low profit margins, the main reason being the cost of managing the last mile and the cost of warehousing, both of which still rely on a large workforce. An aggravating factor is that the average

amount of an order, most often impulsive, remains low (it rarely exceeds 40 euros). As a result, the delivery business is structurally unprofitable, given the fact that bicycle deliverymen make a maximum of three deliveries per hour. To achieve profitability, Q-commerce companies must therefore aim for higher average order values, and higher-margin “baskets” must become the standard, not the exception. A lot of marketing communication work needs to be done to reach a critical size that can absorb logistical costs, notably through commercial arguments such as the guarantee of ultra-fast delivery times, an improved customer experience through a drastic reduction in missing products, and even the presence of local and/or sustainable brands to which millennials in particular are increasingly attached, especially for the most highly educated among them (Bollani *et al.*, 2017).

To optimize the management of flows in the Q-commerce model, it remains to equip oneself with information systems adapted to a singular context: the companies do not have a large product assortment but only a limited and fast-moving product assortment. In these conditions, it is essential to forecast demand with the greatest precision and to stock products accordingly, especially when their shelf life is limited (this is the case for certain food products). Using an advanced forecasting and massive data analysis tool that predicts demand based on the rotation and buying patterns of consumers in different geographic areas is critical to making the right purchasing decisions with suppliers. Adding to this, technology-based variable pricing strategies should leverage factors such as purchase history, the time of day the order is placed, and even changing weather conditions, as the work of Brusset and Bertrand (2018) indicates. Does a rainy day, for example, cause more orders via an app? Blockchain technology could, however, offer answers to these issues, but uncertainty remains high for many experts (Gupta *et al.*, 2022).

The digitalization of distribution based on the Q-commerce model is thus likely to come up against significant logistical and technological obstacles. But it is the regulatory brakes that could prove even more problematic in the coming years, which is a reality in many countries like France (Filser *et al.*, 2020). For several months now, a wind of revolt has been blowing in many French cities, and residents’ groups have been multiplying to denounce the evils of dark stores. The main reproach is based on the movements of the deliverymen on bikes and scooters, which crisscross the already crowded streets, disturbing the peace and mobility of the inhabitants, but who are ultimately only slaves to algorithms (Armano *et al.*, 2022). As an example, Picture 2 shows deliverymen from the start-up Gorillas cluttering up the streets of Paris waiting for deliveries. In the summer of 2022, elected officials from different political parties, from the right and the left, joined forces with residents’ groups to denounce a real “retail dumping” on the part of Q-commerce, which, in addition to not respecting urban planning regulations, generates unfair competition with small traditional stores that have survived decades of commercial concentration.

Picture 2. An example of a nuisance associated with dark store

Source: *Challenges*, September 6, 2022.

In parallel to the battle of the deadline, Q-commerce must prepare for the regulatory battle, the outcome of which is difficult to know in Europe (see the Amsterdam case in Box 2). By leaving it up to cities to decide the fate of dark stores, won't they be tempted to focus on economic rather than societal dimensions? After all, is leaving a commercial space vacant for months or even years in a deserted city center, with the ominous "For Sale" sign, better than turning it into a dynamic logistical center for Q-commerce? It is true that cities have been pushing logistical activities out of their walls for decades, by pushing a policy called "sprawl" that has benefited the periphery (Aljohani and Thompson, 2016), including in terms of financial benefits. With Q-commerce, a reverse movement could be set in motion to enhance the value of a local logistical network that is undoubtedly less invasive than the mega-warehouses of several tens of thousands of square meters located on the outskirts. But the major risk is to forget that the negativity associated with logistics, as mentioned by Mutter (2023), could reinvest the city, and generate strong affects based on a repulsion towards Q-commerce.

Box 2. An example of regulation on the implementation of dark stores

In Amsterdam, the dark stores are no longer welcome in residential areas or mixed residential-working areas with shopping, bars, and restaurants. A specific combination of concerns makes the establishment of dark stores in residential areas and mixed zones impossible, says the municipality unless the specific local circumstances allow it. The establishment of dark stores

in shopping streets is thereby excluded, as a dark store does not add enough to a shopping street. Industrial parks are the most suitable environments for dark stores, according to the city of Amsterdam. But, to which industrial park should the dark stores move? Amsterdam is closing one industrial park after another within the Amsterdam Ring Road. Industrial companies have to leave there to make room for new, trendy neighborhoods where the people of Amsterdam live and work. The people of Amsterdam, young and old, will soon be unreachable for the Q-commerce services. That simply won't work from industrial parks outside the ring. The vitality of (new) urban districts lies precisely in offering a good mix of functions, including fast home deliveries. Make room for this and make agreements on it. Above all, it is an arbitrary "legal" measure. What will the Q-commerce deliverers of retailers Albert Heijn, Gall, and Jumbo do? Will the new Amsterdam rules soon also apply to pizza and sushi delivery companies?

Source: Adapted from <http://www.citylogistics.info/> (Accessed May 14, 2023).

From this point of view, the Q-commerce business model and the dark kitchens business model have similarities that need to be analyzed in depth in terms of impact on city logistics. As Rubinstein (2020, p. 97) points out in studying the case of Deliveroo, one of the leaders of the dark kitchens market, *"by adjusting the material substrates of the city to more seamlessly interconnect its services to its users, Deliveroo logistically operationalizes the city. It turns the city into a staging ground to optimize the delivery of its goods and services. As a primarily logistical construct, the dark kitchen serves as a principal node within Deliveroo's sprawling delivery network"*. This development underlines a profound break with the Athens Charter, of which the French architect Le Corbusier is one of the main instigators, and which considers that the ideal city is based on a perfect equilibrium between four functions: social life, work, leisure, and transport infrastructures (Le Corbusier, 1933/1973). It is to be feared that the expansion of Q-commerce (and dark kitchens) introduces a potential disequilibrium by considering that the implementation of logistical networks is *central* and directly conditions the positioning of other functions in relation to them.

CONCLUSION

Today's consumers are increasingly impatient and prefer to use quick purchase methods for consumer goods; this phenomenon was identified by Swoboda and Morschett (2001) in the early 2000s. While e-commerce has gone from a week to one to two days delivery time, Q-commerce introduces a radically different commercial world with the delivery of small orders in minutes. As consumers become more accustomed to this method of purchasing convenience goods, other categories such as pet products, fashion products, consumer electronics and household accessories are likely to follow. Since millennials are known to be quick to adopt new shopping methods, Q-commerce could become the next big evolutionary trend in retail. However, Q-commerce companies must overcome significant obstacles to thrive in this hyper-competitive world. For example, delivery constraints could make it difficult to achieve sufficient profitability in the medium term, especially since regulatory

obstacles could severely block the implementation of a local logistical network through the rejection of dark stores.

However, the implementation of dark stores is not a revolutionary and totally disruptive model since it involves increasing the responsiveness of a system by pre-positioning resources as close as possible to demand. In humanitarian supply chain operations, for example, it is understood that such pre-positioning of food and emergency equipment is necessary to save lives (Abazari *et al.*, 2021), at the risk of seeing supply delays annihilate the action of rescuers. While Q-commerce is by no means “humanitarian”, it does rely on the same organizational dimensions. The question is obviously whether the cult of urgency should be encouraged, with the emergence of standards for making products available within minutes of a purchase via an application. It is not for logistics professionals to take sides, criticizing the impact of “going dark” on employees and urban geography (Shapiro, 2023). Perhaps they can simply point out the economic, environmental, and social costs that the Q-commerce model will have if it develops on a large scale, leaving it to other stakeholders to calmly judge the relevance of the cult of urgency.

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