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E-grocery retailing: from value proposition to logistics strategy

Abstract. This paper develops two frameworks that identify and organise the elements that make up the value proposition and the logistics strategy of grocery pure players. Those frameworks are also applied to see how the elements of both frameworks are related. To identify the key elements and design characteristics, an extensive literature review was conducted. In addition, an exploratory study with five grocery pure players helped connect both frameworks. The value proposition can be classified into ten elements (range, virtual store, order features, area of delivery, sales mode, velocity, time slots, substitutions, returns, and extra services) and the logistics strategy in twelve (warehousing, inventory, procurement, picking, packing, stock out, transport type, transport ownership, consolidation, dispatch time slots, routing, and returned inventory). The case studies underline important differences among the relationships of these elements for intermediaries and independent pure players.

Keywords: Grocery Logistics, Grocery Retail, E-grocery, E-fulfillment, Value proposition, Logistics strategy

1. Introduction

The COVID-19 crisis has accelerated the growth of the e-grocery market sector as consumers become more comfortable purchasing online (Keyes, 2020). This situation adds to the constant growth of e-grocery, which has been seized upon as an opportunity to shake up the food market once again (Kuijpers *et al.*, 2018; Liu, 2018). Over the last few years, numerous pure players (grocery retailers that only sell online) have come to the fore in many countries. Successful examples are Instacart in the US, Ocado in the UK, Grofers in India and Honestbee in south east Asia. This boost, combined with a lack of clear backing for an omnichannel response from bricks-and-mortar supermarkets (Hübner *et al.*, 2016b), which have not been able to face their customers' evolving interests, has turned the pure players into a dominant force in the market (Kuijpers *et al.*, 2018).

These changing interests have accelerated the rise of two different grocery pure-player business models (Beynon-Davies, 2018): intermediaries between customers and bricks-and-mortar supermarkets, which take on the job of picking an order in store and delivering it to the end customer; and independent pure players, which establish dedicated warehouses where orders can be prepared before being sent directly to customers (Lunce *et al.*, 2006).

The aspects that define a business model can be classified into three categories: financial (revenue streams and cost structures), the notion of value (value streams, customer value and value proposition), and the connections between the firm and its exchange partners, such as delivery channels, network relationships, logistics strategy and infrastructure (Zott *et al.*, 2011; Bilińska-Reformat *et al*., 2019). Among these aspects, the value proposition and the logistics strategy are considered the two most critical when analysing e-grocery business models (Delaney-Klinger *et al.*, 2003; Pateli & Giagles, 2004; Haas, 2019; Barroso *et al.*, 2019).

The value proposition is the strategy element that looks outward at the demand side of the business. It analyses which products, features and services are provided to customers (Magretta, 2011) and, in turn, determines how companies will deploy their logistics strategy to deliver this value in the best possible way (Christopher, 2016). Their importance in e-grocery is due to the peculiarities of a sector in which perishable products need minimised storage time, fresh and frozen products require special conditions for storage and delivery, windows for delivery are extremely tight, and the average order size is much larger than for non-groceries, therefore demanding increased picking times (Wollenburg *et al.*, 2018).

In e-grocery, some studies have already shown how specific features of the value proposition are highly linked to the logistics strategy of online supermarkets (e.g. Heim & Sinha, 2001; Boyer & Hult, 2006; Goethals *et al.*, 2012). Other authors have studied the characterization of the different logistics strategies that such supermarkets can deploy (e.g. e.g. Hübner *et al.*, 2016a; Ishfaq *et al.*, 2016; Marchet *et al.,* 2018). Moreover, studies on bricks-and-mortar retailers have shown that online fulfilment from warehouses (the strategy used by independent e-grocers) and online fulfilment from retail stores (the strategy used by intermediaries when collecting orders from different stores) may have important consequences for customer service due to logistics restrictions (e.g. Hübner *et al.*, 2016a; Hübner *et al.*, 2016b).

In other industries, authors have analysed integration of the value proposition and the logistics strategy: both Prockl *et al.* (2012) and Marchet *et al.* (2017) analysed the third-party logistics (3PL) business model and developed frameworks in which they linked elements of the value proposition with different logistics strategies. In the area of online businesses, Boojihawon & Ngoasong (2018)

focused on integrating value and logistics networks for digital entrepreneurship models in developing economies.

However, none of these works has addressed the particularities faced by the rising industry of the grocery pure players. In e-grocery, changing customer interests have highly impacted the level of service, which is increasingly demanding in terms of speed, range of products and flexibility (Wollenburg *et al.*, 2018). This has originated a variety of value propositions among pure players, which work toward a highly personalized offer that aims to deliver the right product at the right price, right time, and right location (Christopher, 2016; Kuijpers *et al.*, 2018).

Furthermore, considering the differences that might arise depending on the business model used by a pure player, either acting as an intermediary or independently, it becomes crucial to understand which logistics strategies can be more suitable for a certain value proposition and how pure players are deploying them when diagnosing competitive advantage in this industry (Porter, 1985; Christopher, 2016). Therefore, both retail research and practice will benefit from a complete view that structures the design characteristics of each element, i.e. the alternatives that pure players can choose from within each element of the value proposition and the logistics strategy; and also from an integrated view of how these elements are related. To tackle these unresolved issues, we propose the following research questions:

RQ.1 *What are the elements, and design characteristics within each element, that define the value proposition and the logistics strategy of grocery pure players?*

RQ.2 *How are these elements related?*

In order to deal with the knowledge gaps mentioned above, our research aims to identify and integrate the elements that make up the value proposition and the logistics strategy of grocery pure players. For this, a literature review allowed us to create two frameworks that included all the elements, and the design characteristics within each element, of the value proposition and the logistics strategy. Then, an exploratory study was conducted, where both frameworks were applied to five grocery pure players that represent the two main types of pure players: intermediaries and independent pure players. By analysing the choices made by each pure player regarding the elements of both frameworks, i.e. the design characteristics chosen for each element, we were able to establish the connections existing between the elements.

This paper is structured as follows: this introduction is followed by the methodology section. The third section looks at the literature review underpinning the study, which helped identify the elements and design characteristics for the value proposition and logistics strategy frameworks. Then, the two frameworks that arise from the literature review are presented in section 4. In section 5, we analyse each pure player with those frameworks in mind, and then the relationships found between the elements of both frameworks are discussed in section 6. The final section contains the conclusions and establishes the paper's limitations and the fields for future research.

2. Methodology

The purpose of the literature review was to identify the most outstanding elements of the value proposition and the logistics strategy and the main characteristics shaping them. Two rounds of search were undertaken to maximise inclusion of all relevant articles (Lim & Srai, 2018). Google Scholar and Scopus were used as databases, since they cover a sizable portion of e-grocery literature. The first round was based on researching the e-grocery value proposition and the logistics strategy followed by grocery pure players, for which we used combinations of specific search terms such as *e-grocery, online grocery, pure player, value proposition, customer service, logistics, e-fulfillment* or *operations*, as recommended for literature reviews (Crowther & Cook, 2007). Since specific contributions in both fields were lacking, the authors broadened the sample by using a "snowballing" technique, i.e. citations were trawled in order to come across related articles (Nguyen *et al.*, 2018). This approach gave rise to a second search, focused on the value propositions and logistics strategies followed in e-commerce in general, which were extrapolated to the e-grocery industry. Ultimately, the literature review gave rise to two frameworks that included all elements of the value proposition and the logistics strategy of grocery pure players.

The value creation framework is structured around and characterized only with regard to those elements of the value proposition that have an influence on the logistics strategy (e.g. Lim *et al.*, 2018). The reason for this was that, by eliminating specific elements of the value proposition that do not have a real impact on the real players' logistics operations, such as user experience or payment

methods, it was possible to establish the connections between the elements of the value proposition and the logistics strategy later on (e.g. Jocevski *et al.*, 2019)

These initial frameworks were then used to orient the exploratory study carried out later (e.g. Colla & Lapoule, 2012). To relate the elements of both frameworks, given that the subject was still underdeveloped, it was decided to use a multiple-case exploratory study (Harris *et al.*, 2018). The case studies exemplify the two main business models used in the e-grocery sector, as intermediaries between customers and bricks-and-mortar supermarkets or as independent pure players. Our study investigated the five most important Spanish e-grocers which do not have physical stores. Apart from Amazon, which was not included in this study due to its unique features as a multinational marketplace that sells more than groceries, the combined revenue of the companies under study adds up to more than 80% of the grocery pure players' market share in Spain. Spain also fits the requirements from the point of view of the sample, since it represents a homogenous market with a high degree of competition among retailers and fast growth and investment in the online channel (Kantar Group, 2018; Eriksson *et al.*, 2019).

**Table 1**. Overview of participating grocery pure players

Pure player code	Business model type	Presence in the industry (Years)	Role of the interviewee
Company 1	Intermediary	5	CEO
Company 2	Intermediary	5	CCO
Company 3	Intermediary	6	COO
Company 4	Independent Pure Player	10	CEO
Company 5	Independent Pure Player	8	COO

Data gathering comprised two stages: desk research for secondary data and interviews with company managers. During the first stage, a detailed analysis was made of the various data sources (websites, annual reports, press releases, etc.) to establish the context for each company and to obtain data about its value proposition elements such as the product range offered by the pure players, the areas of delivery, the time windows offered, etc. Logistics strategies were analysed only in the next stage, since none of the companies disclosed sensitive information about their internal operations publicly.

The second stage included two semi-structured interviews with each retailer. The interviewees were CEOs, COOs and CCOs with a high level of knowledge about all areas of their companies (e.g. Hübner *et al.*, 2016a). Each interview lasted between two and four hours, which was enough to apply the frameworks and connect the elements within. They were always carried out by two people: one to guide the conversation and the other to take notes for later study and discussion.

During the first interview, questions were asked about the elements selected from the literature review in order to gain more understanding about them, and to compile data about the choices made by each pure player regarding each element, i.e. the selection of design characteristics for each one. In addition, we were able to establish preliminary connections between elements of both frameworks. The coding pattern for the interviews was based on these elements, but subcodes had to be used to analyse the design characteristics for each element. Additionally, we used simultaneous coding in the analysis to find the existing relationships between elements, meaning that there might have been two or more codes (elements) within a single datum from the interviews (Saldaña, 2009). Furthermore, we reviewed the interview texts twice: after each interview of this first set and after the first set of interviews was completed. This way, adding new existing connections to the analysis was an on-going process, which made us go back to the texts multiple times.

During the second interview, the relationships originated by the elements of the frameworks were discussed and reviewed with each pure player. Finally, a draft of the interview was emailed to the interviewees for them to review the information, add extra data to improve reliability of interpretations and further develop the key learning (Martin & Hofmann, 2019). Below, Figure 1 summarizes the research process.
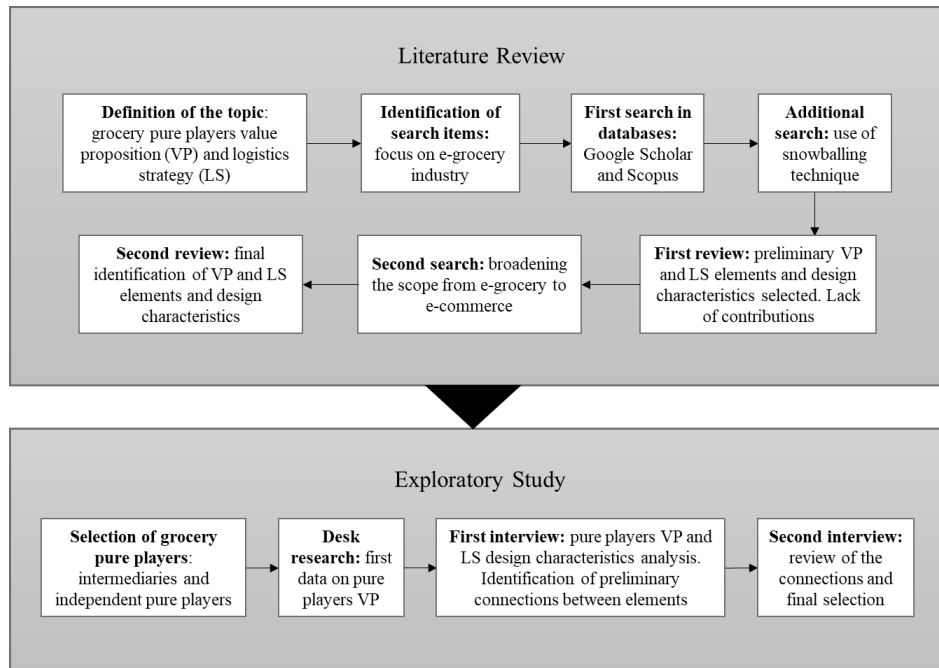
Figure 1. Research Process Stages

3. Literature Review

This section summarizes contributions from the literature related to the value proposition and the logistics strategy and the elements that make them up, from the standpoint of both e-grocery and e-commerce in general. Table 2 shows the distribution of the reviewed articles and a preview of the elements of both frameworks.

3.1. Value Proposition Review

The e-grocery retail industry is characterized by low profit margins (Kuijpers *et al.*, 2018) and broad product ranges (López *et al.*, 2014). The physical differences between products (size, weight and fragility) and the complexity of handling them make selecting that range one of the most important decisions in e-grocery. Decision makers must always be aware that too broad a range could require excessive logistics effort from the company (López *et al.*, 2014; Holzapfel *et al.*, 2016). In this sense, a pure player can offer a range made up of non-food, dry, fresh and/or frozen products (Kuijpers *et al.*, 2018). Additionally, the company can decide whether those products come from one or several traditional supermarkets and thus act as an intermediary for various stores (De Kervenoael *et al.*, 2016), or whether it sells its own products (Lunce *et al.*, 2006). For those acting as intermediaries, it is also relevant whether the pure player sells products through a single virtual store that integrates the offer of one or more supermarkets, or whether the customers can directly choose the supermarkets they want the products to be picked from (De Kervenoael *et al.*, 2016).

Depending on the range on offer and in a bid to ease order management, pure players can set limits and/or surcharges on their services such as a minimum order, weight restrictions or delivery fees. Minimum orders make order preparation and delivery more profitable (Ishfaq *et al.*, 2016); weight restrictions help stop top-heavy orders; and delivery fees aim to cover delivery costs incurred by the company (Ogawara *et al.*, 2003; Goethals *et al.*, 2012).

The temperature requirements of the product range along with customer demands mean the trend is towards ever faster deliveries (Wilson-Jeanselme & Reynolds, 2006; Marchet *et al.*, 2018). This minimizes the time the customer has to wait for a product (Zhang *et al.*, 2019) and turns delivery speed and timetable slots into highly relevant elements in the value proposition (Wollenburg *et al.*, 2018). Delivery speed has a notable impact on the logistics strategy as the offer is broken down into one-hour, same-day or next-day deliveries or a delivery over the following few days (Hübner *et al.*, 2016a; Ishfaq *et al.*, 2016).

Timetable slots are often divided up into one-hour or two-hour bands, in two bands throughout the day or in undefined bands (López *et al.*, 2014). Undefined bands require less planning, but imply lower customer satisfaction too (Hübner *et al.*, 2016a).

Customer preferences also affect how things are sold. E-grocers mostly use home delivery as the delivery mode (Lim & Winkenbach; 2019), although Click and Collect services (C&C) can also be offered (Hübner *et al.*, 2016a; Buldeo Rai *et al.*, 2019). Regarding the area to which an e-grocer offers delivery, it can be defined as local, regional, national or international (Hübner *et al.*, 2016a).

Stock-outs—produced by demand uncertainty and supply rigidity (Jing & Lewis, 2011)—and the policy adopted to deal with them can significantly affect customer buying decisions (Heim & Sinha, 2001; Nguyen *et al.*, 2018). This policy can be based on removing the product from the order or offering a substitute product, which can be chosen by the customer or the company (Kornum & Bierre, 2005). Stock-outs, together with customer mistrust at not being able to see and feel the products and customer reticence at having a stranger touch and select their food, mean that returns are a major problem in e-grocery and returns policy has become a key factor in terms of customer behaviour and loyalty (Nguyen *et al.*, 2018). Pure players can offer to collect the product from the customer's home, from a specific place or store, or just return their money (Hübner *et al.*, 2016a; Hübner *et al.*, 2016b).

The need for e-grocers to add value for customers to fight against traditional supermarkets is reflected in the extra services that pure players offer. The most common options are shopping lists for recipes (Picot-Coupey *et al.*, 2009), the ability to recreate a previous order (Galante *et al.*, 2013), post-purchase modifications and "prime" or "subscription" services.

3.2.Logistics Strategy Review

Due to the stringent demands of temperature, tracking and quality existing in e-grocery, it is critical for a business to choose the right type of warehousing if it is to become successful (Aspray *et al.*, 2013). That choice will depend on the business model selected and the basic choice is whether to possess a warehouse or not. Fernie *et al.* (2010) explain that using dedicated warehouses offers a series of advantages such as multi-order preparation or real-time, web-based viewing of products. However, the investment needed is a heavy load for companies to bear (Vanelslander *et al.*, 2013). Alternatively, a warehouse-free model is more efficient (for small business volumes), requires less initial investment (Aspray *et al.*, 2013) and is ideal for obtaining short-term profits as opposed to long-term efficiency (Doherty *et al.*, 2006) and the improved general efficiency gained from using a warehouse for logistics operations (Abushaikha *et al.*, 2018).

Inventory management is a strategic area within e-commerce and will be dependent on the type of warehousing selected (Marchet *et al.*, 2018). In models with dedicated warehouses, customers can see actual inventory levels as they buy (Fernie *et al.*, 2010). In models without warehouses, Lunce *et al.* (2006) explained that inventory depends on a bricks-and-mortar supermarket and so the pure player's level of control is greatly reduced. If the pure player manages its own inventory, it can adopt different procurement approaches such as consignment inventory (Wu *et al.*, 2016), purchase for stock or Just-in-Time (JIT) purchase, where supply takes place the moment the customer's order is received (Hastings, 2011).

Order preparation, comprising picking, packing and dealing with stock-outs, is another strategic activity within e-commerce and even more critical in e-grocery (Marchet *et al.*, 2018). Boyer & Hult (2006) have determined that the type of picking selected has a major impact on customer perception. Picking at traditional stores is inefficient (Lunce *et al.*, 2006) because a supermarket's layout is not designed for this purpose (Murphy, 2003). This contrasts with the warehouse, which is quicker (Zhang *et al.*, 2020), more efficient (Boyer & Hult, 2006) and offers the possibility of automation (Hübner *et al.*, 2016a), although this would only be profitable for a constantly high customer number (Aspray *et al.*, 2013).

Moreover, intermediaries encounter more unavailable stock when preparing orders at stores (Hübner *et al.*, 2016a), which can considerably hinder order preparation. The problem is often solved by substituting one product for another of a greater value, buying the product in another store or eliminating the product from the order (Kornum & Bierre, 2005). Finally, packing requires exhaustive monitoring such as temperature control due to the specific needs of the various foodstuffs (Saskia *et al.*;2016). To overcome this situation, pure players can opt to use, as well as the traditional plastic bags, cardboard boxes for carrying dry products and thermo boxes for fresh, refrigerated and frozen products (Regattieri *et al.*, 2014).

An essential activity in e-commerce is transport: more specifically, the 'last mile' (Ishfaq *et al.*, 2016). This, linked to home delivery as a critical resource when it comes to being successful in e-grocery (Marchet *et al.*, 2018), makes transport a determinant factor from a logistics control point of view. It can be managed in-house or externally (3PL or several independent contractors) (Lim *et al.*,

2018), with outsourcing offering greater efficiency in relation to costs (Vanelslander *et al.*, 2013). Furthermore, collaboration with other online grocery sellers in last-mile distribution can bring important reductions in terms of the distance covered (Aktas *et al.,* 2020). Moreover, different types of vehicles are used in last-mile delivery, including trucks, vans, motorcycles, or even bicycles (Gevaers *et al.*, 2009; Vanelslander *et al.*, 2013).

Regarding delivery, intermediary pure players can choose between dispatch every time an order is prepared, or with the orders for one-time slot; whereas independent pure players can make several pre-established dispatches throughout the day or dispatches linked to each slot they offer (Aspray *et al.*, 2013; Wang, 2019). As for order consolidation, these can be done in a store, by an intermediary, in a warehouse, by an independent, or in a place specially assigned for it (Zhang *et al.,* 2019). Consolidation at a specific point offers greater efficiency in both costs and time (Durand & Gonzalez-Feliu, 2012), although according to Benrqya (2019) the most economical alternative is a combination of consolidation in a warehouse and cross-docking. At the same time, routing will differ for intermediaries and independent pure players, as deliveries made from warehouses imply longer distances in comparison to delivering from stores (Hays *et al.* 2005; Durand & Gonzalez-Feliu, 2012; Wollenburg *et al.*, 2018).

Finally, if a pure player decides to manage customer returns by collecting them, then they must handle the re-inclusion to stock of that product, which is an activity with a major impact on inventory management. In this regard, pure players can choose between returning the product to the warehouse or delivering it to a supermarket if they are intermediaries (Agatz *et al.*, 2008; Nguyen *et al.*, 2018).

Table 2. Elements of the Value Proposition and Logistics Strategy in the reviewed articles

	Element	Papers
Value Proposition	Range	López *et al.*, 2014; Holzapfel *et al.*, 2016; Kuijpers *et al.*, 2018
	Virtual Store	Lunce *et al.*, 2006; De Kervenoael *et al.*, 2016
	Order features	Ogawara *et al.*, 2003; Goethals *et al.*, 2012; Ishfaq *et al.*, 2016
	Areas of delivery	Hübner *et al.*, 2016a
	Sales mode	Hübner *et al.*, 2016a; Lim & Winkenbach, 2019; Rai *et al.*, 2019
	Velocity	Wilson-Jeanselme & Reynolds, 2006; Hübner *et al.*, 2016a; Ishfaq *et al.*, 2016; Marchet *et al.*, 2018; Wollenburg *et al.*, 2018; Zhang *et al.*, 2019
	Time slots	López *et al.*, 2014; Hübner *et al.*, 2016a; Wollenburg *et al.*, 2018; Zhang *et al.*, 2019
	Substitutions	Heim & Sinha, 2001; Kornum & Bierre, 2005; Jing & Lewis, 2011; Nguyen *et al.*, 2018
	Returns	Hübner *et al.,* 2016a; Hübner *et al.*, 2016b; Nguyen *et al.*, 2018
	Extra services	Picot-Coupey *et al.*, 2009; Galante *et al.*, 2013

Logistics Strategy	Warehousing	Doherty *et al.*, 2006; Fernie *et al.*, 2010; Vanelslander *et al.*, 2013; Aspray *et al.*, 2013; Abushaikha *et al.*, 2018
	Inventory	Lunce *et al.*, 2006; Fernie *et al.*, 2010; Marchet *et al.*, 2018
	Procurement	Hastings, 2011; Wu *et al.*, 2016
	Picking	Murphy, 2003; Boyer & Hult, 2006; Lunce *et al.*, 2006; Aspray *et al.*, 2013; Hübner *et al.*, 2016a; Marchet *et al.*, 2018; Zhang *et al.*, 2020
	Packing	Regattieri *et al.*, 2014; Saskia *et al.*, 2016
	Stock-out	Kornum & Bierre, 2005; Hübner *et al.*, 2016a
	Transport type	Gevaers *et al.*, 2009; Vanelslander *et al.*, 2013
	Transport ownership	Vanelslander *et al.*, 2013; Lim *et al.*, 2018; Aktas *et al.*, 2020
	Consolidation	Durand & Gonzalez-Feliu, 2012; Benrqya, 2019; Zhang *et al.*, 2019
	Dispatch time slots	Aspray *et al.*, 2013; Wang, 2019
	Routing	Hays *et al.*, 2005; Durand & Gonzalez-Feliu, 2012; Wollenburg *et al.*, 2018
	Returned Inventory	Agatz *et al.*, 2008; Nguyen *et al.*, 2018

4. The Frameworks

In this section, we answer the first research question by presenting the two frameworks obtained as a result of the literature review. The first framework (Figure 2) refers to the value proposition, i.e. the elements and service characteristics offered to the customer by the pure player that have an influence on the logistics strategy. The second (Figure 3) focuses on the design options for each element of the logistics strategy.

In both frameworks, the first column represents the group under which each element is encompassed, in line with value creation and logistics strategy theory. Then, the main elements of both the value proposition and the logistics strategy are listed in the second column. The horizontal axis shows all the alternatives that the pure players can choose from within each element, constituting what are known as design characteristics. These design characteristics are all independent of each other, but it is possible for companies to offer or operate more than one alternative for the same element in certain cases. These groups, as well as their composition, are described below.

4.1. Value Proposition Framework

Considering the characteristics of the e-grocery retail industry, we classify the value proposition of grocery pure players into four main groups: Product, Logistics Service, After-sales Service and Others. Based on Porter's work on positioning strategy (Porter, 1996), Magretta (2011) defined the value proposition offered to a group of customers as the products, services and features offered to those customers at a relative price. As pricing strategies are not considered in this study, we focus on the specific features of the products and services offered to e-grocery buyers.

The Product group comprises what the company has chosen to offer (Magretta, 2011), and it includes the following elements in our framework: product range, the virtual store where that range can be purchased, and the limits or restrictions on orders. The first is important since pure players need to decide if they offer fresh and frozen products, both of which require special conditions for storage and delivery. The second refers to the possibility that customers have of buying products from multiple grocery stores, but still being managed by the pure player. Order restrictions may apply such as minimum basket values, maximum weight per basket, etc.

Regarding the services offered to customers, we established three different groups based on the features of the e-grocery industry derived from the literature review. The first one is the Logistics Service, which is traditionally seen as a key link between supply chain activities and customers (Delaney-Klinger et al., 2003), and a source of added value (Christopher, 2016). In our framework, it includes all the elements that define the order delivery service, which comprises the delivery area (from local to international), the sales mode (home delivery vs. buy-online and pick-up-at-store), the delivery speed, and the time slots on offer.

For its part, After-sales Service includes all the services that attempt to facilitate dealing with and resolving any problems arising during and after order preparation, which is also seen as an important source of the value a company can offer (Porter, 1985). This group comprises substitutions management and returns policy, which are two of the greatest difficulties when it comes to satisfying customer needs in e-grocery (e.g., Jing & Lewis, 2011; Nguyen *et al.*, 2018). Finally, as any industry is different from others in terms of what value-added means to its customers (Porter, 1985), the Others group includes extra services such as subscriptions or prime services that can be of importance in e-grocery retailing (Kuijpers *et al.*, 2018).

PRODUCT	RANGE	Non-food		Non-food + dry		Non-food + dry + fresh + frozen
	VIRTUAL STORE	Single			Multiple choice	
	ORDER FEATURES	Minimum order		Number of units		Weight
LOGISTICS SERVICE	AREA OF DELIVERY	Local	Regional	National		International
	SALES MODE	Home delivery		Click and Collect		
	VELOCITY	1 hour or less		Same day / Next day		Two or more days
	TIME SLOTS	1/2 hours		Morning / Afternoon		No time slots
AFTER-SALES SERVICE	SUBSTITUTIONS	Contact customer		Substitution: picker's decision		Remove product from order
	RETURNS	Company collects product		Customer returns product		Refund only
OTHERS	EXTRA SERVICES	Purchase based on recipes	Subscriptions		Prime service	Shopping planning

Figure 2. Value Proposition Framework

4.2. Logistics Strategy Framework

Considering that design and management decisions are taken in each of the logistics processes, players operating in e-grocery must consider four main groups linked to the logistics strategy: Supply and Warehousing, Order Preparation, Distribution and Reverse Logistics (SCC, 1999; Christopher, 2016). The Supply and Warehousing group includes three critical elements. Regarding the warehousing strategy, pure players may or may not own a warehouse from where they supply the online orders, which is closely related to the next element, inventory, which tells us if the company owns any inventory at all. The procurement element refers to the way in which companies are supplied with the products they sell, and only applies to those pure players that carry some inventory. These pure players may keep certain levels of stock, opt for consignment inventory if suppliers allow it, or just buy their products from suppliers as online orders are placed.

Order Preparation comprises orders picking (single order or multiple orders at a time), packing preferences and how stock-outs are managed internally. The most often used options for packing are cardboard boxes, plastic or paper bags or insulated cool boxes. The choice will depend on the product being transported.

The next group is Distribution, and the elements that make it up are the type of transport (ranging from trucks and vans to motorbikes and bicycles), who owns it, where order consolidation is done (if any), the dispatch time slots and if the routing networks will involve long or short distances. Finally, Reverse Logistics is based on internal returns management, which includes the reincorporation of products back into stock.

SUPPLY & WAREHOUSING	WAREHOUSING	With warehouse		Without warehouse	
	INVENTORY	Owned		Outsourced	
	PROCUREMENT	In stock	Consignment inventory	Just in Time	
ORDER PREPARATION	PICKING	Single-order		Multi-order	
	PACKING	Cardboard box	Insulated cool box	Own bag	Third-party bag
	STOCK OUT	Product substitution	Buy at another store	Remove the product	
DISTRIBUTION	TRANSPORT TYPE	Truck	Van	Motorbike	Bicycle
	TRANSPORT OWNERSHIP	Owned		Outsourced	
	CONSOLIDATION	Warehouse	Store	Place specially assigned	
	DISPATCH TIME SLOTS	Order by order	2/3 predetermined slots	By offered slots	
	ROUTING	Long distances		Short distances	
REVERSE LOGISTICS	RETURNED INVENTORY	Return to store		Return to warehouse	

Figure 3. Logistics Strategy Framework

5. Applying the Frameworks: Exploratory Study

In this section, we briefly present the five companies that participated in the exploratory study and describe how they are positioned regarding the elements of the value proposition and logistics strategy.

Company 1

Company 1 offers a complete range of products, multi-store purchase, and home delivery services. The products offered are always linked to a bricks-and-mortar supermarket where the company does the order picking manually. For shops that are further away or specialised in certain products, the company contacts them so that the transport company only has to pick up the order (transportation is outsourced to a 3PL provider). Products are packed in the bags of the supermarkets or shops they come from. Home delivery is offered in 1 hour and with 1-hour time slots in Madrid and Barcelona. The delivery process is as follows: the picker gathers the order in a supermarket and hands it to the transport company or deposits it at a specialised locker; the transporter must pick up all the orders they are assigned and deliver them to the customers' homes. The deliveries are usually done in groups of 2 or 3 orders, corresponding to the next time slot.

Company 2

Company 2 offers customers the possibility to make multi-store orders of all types of supermarket products in the 7 largest cities in Spain. The pickers have to go to the right store to carry out the picking manually as though they were just another customer (single-order picking) and, afterwards, they deliver the order to the customer's home. Packaging is in the supermarkets' own bags and in order to keep items cool the company simply recommends that the drivers use insulated cool bags during transport. From a customer standpoint this delivery service has the following features: home delivery in 1 hour with 1-hour time slots in several cities in Spain. In order to fulfil this, the pickers use the company's vans or motorcycles to deliver the orders, which means that the slots for transport dispatch are done order by order. If an order includes products that need to be collected in more than one store, the picker collects all sub-orders first and then delivers them to the customer.

Company 3

Company 3 offers the possibility of multi-store orders (with different deliveries from each store) of all types of supermarket products. These products are the property of specific bricks-and-mortar supermarkets near to the delivery area, in which Company 3 purchases what has been ordered by the customer. The deliverer has to go to the right store, carry out manual picking, and deliver the order to the customer's home. The orders are delivered in most of the main cities in Spain and the company has already expanded internationally to many other large cities worldwide. Delivery is offered in less than 60 minutes and also in 4 time slots during the day (first thing in the morning, morning, afternoon, and evening). To do this, the transporters, who are self-employed, make the deliveries on motorbikes or bicycles or in vans. The supermarkets' own bags are used for packing and the deliverers use insulated cool boxes to maintain temperatures.

Company 4

Company 4 is an independent pure player which aims at flexibility and customer focus. The range on offer is made up of fresh, frozen and dry foods, and all types of supermarket products which come from its warehouse of over 8,000 items. Supply of fresh produce is done just-in-time, except for those elements that are offered for same-day delivery, of which a small inventory is kept in the warehouse. This company's warehouse is automated and has two goods-to-worker robots: one for dry products and the other for fresh ones. There is also a conventional shelving area for high rotation, large volume, frozen products. To prepare orders, a multi-order, pick-to-light system is used for the products placed on the robots and a pick-to-voice system for products on the shelves. After picking, the products are grouped by category and placed in the corresponding bags so that they can later be stored on the robot for cooled items to await dispatch.

Regarding deliveries, these are made on the same day or the morning after receiving the order, in 2-hour time slots throughout the entire region of Madrid, although longer time slots are available (morning time slot from 9 am to 2 pm and evening time slot from 4 pm to 9 pm) for lower delivery charges. To do so, it uses self-employed workers and small companies that leave the central

warehouse in refrigerated vans to go to the customers' homes in three daily batches (one in the morning and two in the afternoon.).

Company 5

Company 5 is also an independent pure player that delivers from its dedicated warehouse. The company offers 17,000 items, comprising non-food products and dry food for distribution all over the Iberian Peninsula. Additionally, in Barcelona and its metropolitan district, it offers fresh, refrigerated and frozen products. A mixed operational system is used to supply these products: those offered in Barcelona and throughout the Peninsula that have low economic value and high rotation are stored in the warehouse, whereas high-value, low rotation products are bought on-demand from suppliers and send straight to the customers' (dropshipping), where orders are consolidated. Finally, most fresh products, which are produced locally and are supplied in and around Barcelona, use a daily JIT purchase system.

Deliveries in Barcelona are carried out within 24 hours, with 2-hour time slots. Throughout the Peninsula, deliveries are made 2 to 3 days after an order is placed. The Peninsula service is provided by subcontracted transport companies using vans, while the company itself takes care of deliveries in the Barcelona area, where the orders grouped in the warehouse go out in two batches: one in the morning and one in the afternoon. The service is provided by using vans or vans and motorbikes depending on the density of the orders and the delivery area.

Finally, Table 3 shows the current situation of each pure player in schematic form, by illustrating how they position themselves according to the frameworks developed.

Table 3. Value Proposition and Logistics Strategy of the companies under study

		Intermediaries			Independent	
	Elements	Company 1	Company 2	Company 3	Company 4	Company 5
Value Proposition	Range	Complete	Complete	Complete	Complete	Complete / Limited
	Virtual Store	Multiple	Multiple	Multiple	Single	Single
	Order features	Minimum order	Minimum order	Weight	No. of Units	No. of Units
	Areas of delivery	Local	National (Urban)	International (Urban)	Regional	Regional / National
	Sales mode	Home delivery	Home delivery	Home delivery	Home delivery	Home delivery
	Velocity	1 hour	1 hour	1 hour	Same day / Next day	Next day / Two or more days
	Time slots	1-2 hours / Morning - Afternoon	1-2 hours	1-2 hours	2 hours / Morning - Afternoon	2 hours / No time slots
	Substitutions	Contact	Contact	Contact	Substitution	Contact
	Returns	Collected (Limited) / Refund	Collected (Limited) / Refund	Customer returns	Collected	Refund only
	Extra services	None	Recipes	None	Recipes / Shopping planning	Subscriptions

Logistics Strategy	Warehousing	Without warehouse	Without warehouse	Without warehouse	With warehouse	With warehouse
	Inventory	Outsourced	Outsourced	Outsourced	Owned	Owned
	Procurement	N/A	N/A	N/A	In stock / JIT	In stock / Consignment / JIT
	Picking	Single order	Single order	Single order	Multiple order	Single / Multiple order
	Packing	Third-party bag	Third-party bag	Third-party bag / Insulated cool box	Own bag	Own bag / Cardboard box
	Stock-out	Substitution / Elimination	Substitution / Elimination	Substitution / Elimination	Elimination	Elimination
	Transport type	Van	Van / Motorcycle	Van / Motorcycle / Bicycle	Van	Van / Truck / Motorcycle

	Transport ownership	Outsourced	Owned	Outsourced	Outsourced	Outsourced
	Consolidation	Special Locker	Store	None	Warehouse	Warehouse
	Dispatch time slots	Order by order / Predetermined slots	Order by order	Order by order	Predetermined slots	Predetermined slots
	Routing	Short distances	Short distances	Short distances	Long distances	Long distances
	Returned Inventory	Returned to store	Returned to store	None	Return to warehouse	None

6. Connecting the Value Proposition and Logistics Strategy Frameworks

In this section, we discuss the most important relationships between the elements of each group, based on the pure players' value propositions and logistics strategies. The logistics strategy should always be design from the 'customer backwards' so the basic needs of the customer are met, but also to add extra value through the service provided (Christopher, 2016). Thus, our discussion is presented in a way that shows how each element of the value proposition impacts the design and management of key elements of the logistics strategy. This will answer the second research question. The relationships are summarised in Table 4.

Regarding the range on offer, Table 3 shows that all the companies except Company 5 offer a full range of products (non-food, dry, fresh and frozen) throughout Spain. In the words of the Company 5 respondent, this is due purely to transport costs incurred when maintaining the cold chain. Furthermore, when it came to providing fresh products, the two companies that have warehouses (Companies 4 and 5 – independent pure players) opt for a JIT system because of the delicateness and short durability of these products (Holzapfel *et al.*, 2016). By doing so, they greatly reduce losses through deterioration. Moreover, all intermediaries (Companies 1, 2 and 3) highlighted the importance of having small, specific ranges of products from each store, since they do not own any inventory, which makes it difficult for them to assure the availability of certain products with low rotation that might not always be available at stores. Fresh and frozen sales also have a major impact on delivery and packing (Wilson-Jeanselme & Reynolds, 2006; Saskia *et al.*, 2016). Thus, the options varied greatly from refrigerated vans (Company 4), to cool boxes (Companies 3 and 5), and even the use of no system for cooling (Companies 1 and 2). For those pure players using batching (both independent pure players and Company 1), dispatch time slots came out as an important element affected by selling fresh products, since they are conditioned by the time these products can last between being prepared and being delivered to the customer (Aspray et al., 2013).

Regarding the virtual store, companies offering the chance to buy in multiple stores do not own a warehouse, that is, they are intermediary pure players (De Kervenoael *et al.*, 2016). In addition, delivery activities are affected: Table 3 shows that intermediaries have very frequent dispatches (either order-by-order or offered timetable slots), because they are intermediary companies that carry out picking in many places (stores). In the case of independent pure players, the time slots offered are grouped into three or four dispatch time bands because they can prepare the orders at a single point and then keep them preserved in the warehouse. As a consequence, intermediaries generally use smaller vehicles (motorbikes or bicycles), as the shipments are less voluminous (order by order or a few orders). This is also linked to the limitations that certain pure players impose on orders for capillary distribution in cities (see Table 3), such as restrictions on the number of units or weight (Ishfaq et al., 2016). It would be impossible to use such vehicles if the orders were excessively large or heavy. Companies 2, 3 and 5 are clear examples of this tendency. Finally, the packing used by the three intermediaries studied is that from the same physical store where purchases were made (see Table 3), whereas companies that only have a single, integrated virtual store (independent pure players) have their own packaging (possibly because of the ease of storing this packaging in the same warehouse in which the online orders are prepared).

Looking now at the logistics services offered by pure players, the elements of this group are logically the most closely linked to the company's logistics strategy (Rexhausen *et al.*, 2012). Independent pure players tend to operate exclusively in the region where the warehouse is located. The only exception is Company 5, which sells throughout the Iberian Peninsula although it has more restricted delivery speeds and product range. Delivery costs will increase dramatically over long distances if frozen and refrigerated products are sold. Moreover, customer satisfaction might be in jeopardy when delivery times increase for fresh produce (Hübner *et al.*, 2016a). When there is no

warehouse, the delivery area can extend to any place that has shops for order preparation (Companies 1, 2 and 3).

On the downside, acting as an intermediary limits delivery to urban areas where a certain density of stores and customers can be achieved. In terms of expanding to new cities, the respondent of Company 2 stated that, for intermediaries, owning the transport fleet might become a barrier at some points due to the initial investment required when starting in a new location. In fact, using deliverers that have their own vehicles was highlighted as one of the keys for international expansion by Company 3. Conversely, the companies that are not only limited to urban centres tend to use outsourced larger vehicles (vans or trucks) (Vanelslander *et al.*, 2013). When the delivery area is smaller (mainly large cities or even city centres), vans, motorbikes and bicycles are selected.

Regarding the possibility of collecting the order from a store or pick-up point, none of the pure players analysed currently offer C&C (Table 3). The interviewees from companies with a warehouse (Companies 4 and 5) explain it is complicated and costly for them to have a place for the customer to pick up their own order. From the point of view of the intermediaries, the most commented option was the possibility of establishing agreements with supermarkets so that they provide an area in their stores for order collection. However, they also cited the difficulty they had when it came to establishing alliances as they are in competition with the traditional supermarket chains' own online sales.

As for the speed of order delivery, it is worth noting that the companies that can offer one-hour delivery (Companies 1, 2 and 3) are all intermediaries that prepare orders individually in external stores and use small vehicles (Vanelslander *et al.*, 2013). Furthermore, in the words of the Company 1 respondent, the consolidation of an order that requires picking up products at multiple stores becomes a great challenge when offering delivery in one hour. In addition, Company 3 stated that this was the main reason why they do not use consolidation, as they preferred to do multiple deliveries from different stores to fulfil a single multi-store order, with the only purpose of assuring that the customer receives the order in less than one hour. When orders are prepared in a warehouse, such as in independent pure players, the lead time each order follows inside the automated warehouses must be considered. This, together with the use of JIT-style supply, by which the product is received the day after being ordered, obliges these companies to deliver orders one day after they are placed by the customer (see Table 3).

Similarly, the intermediary pure players with individual order preparation and frequent dispatches (order by order) are those that offer the shortest time slots (one hour) (Agatz *et al.*, 2011). The independent pure players stated the difficulty of offering such short time slots when one route contains several deliveries one after another, or when routes are simply too long (extra-urban areas). Thus, none of these companies offers slots of less than two hours; the use of longer time slots allows these independent pure players to optimize transport as they can carry more orders per route (Hübner *et al.*, 2016a), although this requires using large vehicles such vans or trucks for delivery.

For substitutions management, it is difficult for companies with a warehouse to offer an alternative to customers because of the automation employed in their picking processes. Thus, both independent pure players opt for removing the product from the order when a stock-out occurs. However, the respondents from independent pure players emphasized that they had few missing products when it came to making up orders. This is because the view of a product online could be linked to their own stock (Fernie *et al.*, 2010). Substitution management is, however, easily done by companies picking in stores. Moreover, these latter companies can not only offer substitutions, but also think about completing an order in other stores. Contrarily, the companies that carry out picking in multiple stores have to battle against interference from traditional sales, which might cause frequent stock-outs of products (Hübner *et al.*, 2016a).

Regarding returns policy, offering to collect the returned product from the customer's home is a service that is only offered by Company 4, although some intermediaries (Companies 1 and 2) also offer this service for a limited range of high-value, non-fresh products. However, this independent pure player admitted that integrating returned inventory into its warehouse was complicated and expensive, the reason stated by Company 5 (the other independent pure player) for not doing it. When home collection is not offered, the most common option is to reimburse the customer (Companies 1, 2 and 5) (Hübner *et al.*, 2016b). Finally, Company 3 was the only intermediary that takes advantage of the stores where it buys the products and offers customers the possibility of returning those products to stores at no cost.

As far as extra services are concerned, the companies that offer recipe-related sales (Companies 2 and 4) have special packing for this service. Furthermore, Company 4 has much more exhaustive checks on the inventory used in the recipes because a stock-out on just one product can have a knock-

on effect on a much greater sale (Picot-Coupey *et al.,* 2009). Company 2 only uses products with high rotation and high availability for its recipe offers to overcome the fact that it does not have any inventory. In the case of product subscriptions, the survey respondent from Company 5 also emphasized that stock control is key. This is easier to do for independent pure players with their own inventory management. Although none of the analysed pure players is currently offering "prime" services, there was agreement from all of them that a company would need to have its own warehouse and stock in order to offer such a service. Finally, the planned buying offered by Company 4 obliges it to have its own stock as the company must ensure that it has specific articles already reserved when the order is placed.

Table 4. Relationships between Value Proposition and Logistics Strategy Elements

	Intermediary	Independent
Value Proposition	Logistics Strategy	
Range	Packing, Transport type, and Dispatch time slots: temperature requirements	Packing, Transport type, and Dispatch time slots: temperature requirements
	Inventory: low control requires small ranges of specific products to assure high availability	Inventory and Procurement: perishability of fresh produce
Virtual Store	Warehousing: only intermediaries with no warehouse offer multi-store shopping	Packing: need for pure player's own packaging
	Packing: no need for own packaging	
Order features	Transport type: weight and volume restrictions enable the use of smaller vehicles	Transport type: weight and volume restrictions enable the use of smaller vehicles
Areas of delivery	Warehousing: intermediaries can easily extend their sales networks by adding new stores in new cities, although they might be limited to urban areas	Warehousing: independent pure players are limited to certain areas of delivery by the location of their warehouse(s) - considering a full range of products
	Transport type: smaller vehicles can be used in limited, small urban delivery areas where stores are located	Transport type: the use of larger vehicles is required to sell in non-urban areas
	Transport ownership: expansion to new locations becomes easier when outsourcing transport	
Sales mode	Warehousing: intermediaries can partner with the stores where orders are collected to offer click and collect	Warehousing: independent pure players would need to create specific collecting points to offer click and collect
Velocity	Warehousing and Picking: picking at stores means being closer to the final customer and allows for faster picking	Warehousing: the use of warehouses limits high speed service
	Dispatch time slots and vehicle type: high speed services require dispatching order by order, which can be done more efficiently with smaller vehicles Consolidation: high speed makes consolidation more difficult	Procurement: JIT systems are extremely important for products with low rotation that are not kept in stock
Time slots	Dispatch time slots: short time slots require dispatching order by order	Dispatch time slots: longer time slots allow order consolidation at warehouses
	Routing: short distances allow for easier planning and shorter time slots	Routing & Transport type: longer time slots allow the optimization of long-distance routes when using large vehicles

Substitutions	Warehousing, Picking, and Stock-out: preparation order by order at stores makes it easier to offer substitutions when stock-outs happen	Warehousing, Picking, and Stock-out: multi-order preparation at warehouses makes it impossible to offer substitutions. Stock-out management is reduced to removing products from orders
Returns	Warehousing: picking at stores allows pure players to offer customers the chance to return the products by themselves at no cost	Warehousing: operating a warehouse limits the returns policy to either collecting the product or refunding (unless collecting points are used)
	Returned inventory: bringing back products to multiple stores might become too expensive	Returned inventory: re-incorporating it to warehouses inventory is complicated
Extra services	Inventory: low control limits the offer of extra services	Inventory: higher control required for subscriptions, recipes and prime services
	Packing: for separating recipe products	Packing: for separating recipe products

7. Conclusions

When undertaking this study, we have responded to two research questions: *What are the elements, and design characteristics within each element, that define the value proposition and the logistics strategy of grocery pure players?* and: *How are these elements related?* These questions were answered by developing two frameworks that identify and structure the elements that make up the value proposition and the logistics strategy of grocery pure players. Moreover, the frameworks were applied to five grocery pure players, which allowed us to establish the relationships between the elements of both frameworks.

7.1. Theoretical Contributions

Our research contributes to the literature of e-grocery retailing by means of the capacity of the frameworks to structure and integrate the elements that make up the value proposition and the logistics strategy and, furthermore, to define design characteristics within each element. Ten elements of the value proposition have been identified (range, virtual store, order features, area of delivery, sales mode, velocity, time slots, substitutions, returns, extra services), sorted into four groups (product, logistics service, after-sales service and others). In the case of the logistics strategy, twelve elements have been identified (warehousing, inventory, procurement, picking, packing, stock out, transport type, transport ownership, routing, consolidation, dispatch time slots, returned inventory) sorted into four groups (supply and warehousing, order preparation, distribution and reverse logistics).

In addition, the application of the frameworks helped us discover current trends regarding pure-player business models. The value propositions on offer are characterised by their heterogeneous nature, with notable differences existing between the two basic business models. Intermediary pure players tend to offer complete product ranges with very fast deliveries and short time slots in limited delivery areas. Thus, these intermediaries prepare orders in external stores and use small vehicles (motorbikes and bicycles), which are prepared in short dispatch time slots (mostly on an order-by-order basis). Independent pure players also offer complete ranges but with slower deliveries over longer time periods and in larger delivery areas. This happens because they use dedicated warehouses (which add an order-processing time) and larger means of transport that are less agile in urban areas (although this allows them to deliver larger orders, group orders and optimize last-mile delivery).

7.2. Managerial Implications

This research has strong managerial implications as well. First, the frameworks act as a guide so that new pure players entering the e-grocery industry can better develop their business models by defining their value propositions and logistics strategies using both frameworks. Pure players should look at their value propositions and their logistics strategies not as a collection of individual elements, but a group of interdependent features, which, linked correctly, will allow competitive advantage in terms of better process coordination, higher optimization, and extra value added to customers. In turn, the frameworks can be also used for comparing grocery pure players; any

company could determine what the strengths or weaknesses of their value proposition and logistics strategy are compared to the competition, and so manage improvement actions.

Second, the practical examples taken from the exploratory study underline the fact that there is no single solution for the design of a business model that will be valid for every retailer; any chosen option could be valid depending on the company's characteristics. However, the application of the frameworks allowed us to see how the elements of both frameworks are related, which can help e-grocery managers be aware of the implications for the logistics strategy generated by their value proposition, and vice versa.

As can be seen from the decisions made by the companies, intermediaries and independent pure players are set to target different customer segments. Intermediaries are more limited to operating in urban areas where a certain density of stores and customers can be achieved. However, the use of traditional stores allows them to be closer to customers, which might become an important competitive advantage, as customer expectations keep increasing in terms of the logistics service required. In countries such as the UK, Spain or France, 30-minute grocery delivery is already available and offered only by intermediary pure players. It will be difficult for independent pure players to deliver orders from large warehouses to meet such requirements in terms of delivery speed. However, this group can achieve higher degrees of process optimization through their logistics strategies, which can become an important advantage as online sales keep increasing. Suburban areas with lower densities, which are rarely served by intermediaries, may become a good source of online customers for independent pure players aiming to achieve economies of scale.

7.3. Research Limitations and Further Research

The exploratory study is limited to five grocery pure players from Spain. Further research could use larger samples to study the most common value propositions and logistics strategies among pure players depending on multiple factors, many of which might be country-specific, such as e-grocery penetration, order frequencies and basket sizes. Moreover, when evaluating pure-player business models, it would be useful to compare the cost associated to the deployment of different value propositions and logistics strategies.

Finally, evaluating how the value proposition and logistics strategies of grocery pure players evolve throughout the different stages of business growth will also bring relevant insight and understanding into the field of e-grocery, as economies of scale grow in importance and revenue models change through time. We believe that the importance of knowing how pure players work will continue to grow in relevance in the future. As online sales continue to rise, and the market becomes increasingly competitive, pure players will be forced to keep adapting their business models.

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