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The "Perfect" Warehouse: How Third-Party Logistics Providers Evaluate Warehouse Features and Their Performance

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Abstract: The recent trends in logistics outsourcing have led to the need to investigate the 3PL (third-party logistics) industry better. However, the attention has always been focused on operative performance, and the role of the warehouse has been skimmed over. This research aims to define the relationship between warehouse features and the performance indicators of 3PLs, filling the literature gap. This research provides insight into 3PLs' way of thinking, helping 3PLs identify the right warehouse features to improve their performance and providing guidance for real estate companies in designing warehouses meeting 3PLs' needs. The analysis uses a case study approach, carried out by interviewing 3PLs that provided data coded according to the dimensions of the Kano model. This methodology was used to generate an in-depth understanding of how 3PLs evaluate the different warehouse features that are able to drive their performance. The "perfect warehouse" is placed in an accessible location; it has loading bays, a standard layout, and a height suitable to optimize the flow of goods, and it utilises the spaces to make the service flexible and responsive. In addition, the warehouse should have internal areas, such as mezzanines, to deliver value-added services.

Keywords: third-party logistics; warehouse; performance measurement; rating; Kano model; service quality

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1. Introduction

The market for services provided by third-party logistics providers (3PLs) has recently experienced exponential growth. It is due to progress in the e-commerce sector and the increasing use of logistics outsourcing by companies that want to focus on their core activities and improve their customers' satisfaction [1]. The overall market for logistics outsourcing services has increased over the years, generating a revenue of more than USD 960 billion in 2020 [2]. Due to this growth, there is an increase in competition within the logistics industry, which leads 3PLs to look for differentiating factors that enable them to generate value [3]. According to the literature, one of the potential leverages for 3PLs to generate customer value and position themselves in the marketplace consists of physical assets, such as warehouses [4]. Warehouses, understood as the facilities in which firms store or hold goods for varying lengths of time [5], can therefore be considered to be distinctive factors in the market, becoming one of the drivers for building competitive advantage in the logistics industry [6]. Warehouse features affect the performance of 3PLs [7], and better performance of warehouses leads to better service quality and customer satisfaction [8,9].

While the link between warehouse features and the performance of logistics processes has been recognized in the literature and the industry, the literature highlights the absence of scientific contributions exploring this connection and studies of how 3PLs approach the selection of logistics buildings in terms of considerations of warehouse features and their potential impact on performance and the service quality delivered to customers [10]. Scholars have focused their attention on the importance (in terms of efficiency and effectiveness) and the measurement of the performance and service quality of 3PLs (e.g., [1,5,11–13]) without focusing on the single impact of physical assets. In the few cases in which warehouses

appear in the discussion, it is considered as just one of the elements composing the set of assets at the disposal of 3PLs and organizations in general (e.g., [14]). No specific focus or emphasis has been put on warehouses and their features as essential factors affecting the performance of 3PLs, even if, as proven by [4], the warehouse is strategic for 3PLs.

In other words, warehouses' roles in and relationship with performance have been acknowledged. Still, no previous studies have gone the "extra mile" and explored how to turn this relationship into actionable knowledge for 3PL providers so that they can make the most of this relationship and leverage warehouses and their specific features as strategic elements for building competitive advantage. Thus, this research aims to help 3PL providers to identify the warehouse features that impact their performance and the service quality provided, providing an actual insight into 3PLs' way of thinking and informing them in the selection of the warehouses presenting the features that can help in maximizing their performance and competitive advantage. Furthermore, the research investigates the reasons for the importance of the identified warehouse feature. Hence, this research strives to answer the fundamental question: "How and why can warehouse features influence 3PLs' performance and service quality provided?"

In order to achieve this goal, an investigation has been carried out that started from the analysis of state-of-the-art logistics performance and service quality measurement, complemented by a further literature analysis on warehouse features. Then, moving on from the outcomes of this conceptual effort, the warehouse features were linked to performance measurement through an empirical endeavour based on case study research conducted with practitioners operating in the 3PL providers' industry. As a result, the views of 3PLs on the relation between warehouse features and logistics service quality were unveiled, drawing the profile of the warehouse able to improve their performance; as was how warehouse features drive service quality components.

The contribution of this study is two-fold. First, from an academic perspective, we move a step forward in the logistics performance field of research, studying how the warehouse could affect the performance and service offered by the 3PLs. Indeed, we develop the current literature by providing insights into how 3PLs see this relationship between warehouse features and performance indicators and how this relationship can be a driver of their warehouse selection decisions. From a managerial perspective, the research can help 3PLs to identify the right warehouse features to invest in to improve their performance. Moreover, it could be used by real estate companies as a guideline to design and build warehouses compliant with 3PL needs. Finally, it could give shippers elements to evaluate the assets of their logistics providers better.

The remainder of the paper is organized as follows. The next section includes a literature review of the key performance indicators (KPIs) used in the 3PL industry. Next, descriptions of the logistics buildings' features that are deemed important will be provided. The adopted methodologies are described in Section 3, and the findings are shown in Section 4. Finally, Sections 5 and 6 present the discussion and conclusions, with recommendations for further studies in the field.

2. Literature Review

First, the literature section investigates logistics service quality and warehousing performance evaluation in line with the present research's objective. Following that, the analysis moves to the warehouse features.

2.1. Warehouse Performance Indicators

Warehousing is one of the most debated topics in logistics research [7,15]. Warehouses are strategic supply chain nodes where goods are stored until released [16]. In particular, modern warehouses are complex technical structures which allow for high profitability [17]. In addition, they contribute to carbon footprints, and the technologies included in the warehousing activity have recently emerged as game-changing tools [15] since they can have a big impact on warehouse performance [18]. Among the topics discussed in the literature,

an increasing interest has been revealed in the warehouse performance assessment [7], with particular reference to operational performance and its metrics [19], given its positive relationship with 3PLs' financial performance [12].

Due to the increasing growth of the logistics service market [1], measuring warehouse performance has become critical for 3PL providers to increase or maintain their competitive advantage [7]. However, the quality of services has remained the key to winning over the customer [20]. In literature, it is possible to find interesting classifications for warehouse indicators [21]. The researchers distinguished direct indicators (i.e., quantitative measures of warehouse performance provided by a simple, straightforward mathematical equation) from indirect indicators, which are qualitative measures of warehouse performance (e.g., customer perception) and also involve other logistics activities (e.g., transportation) [21]. Among the direct performance indicators, they identify four main categories:

- time: this category groups all the time metrics on the logistics activities performed inside the warehouse (e.g., delivery lead time);
- quality: this category includes all the elements related to the quality of the activity served (e.g., on-time delivery, accuracy);
- cost: these indicators measure the cost associated with the warehousing activities (e.g., order processing cost);
- productivity: it includes all the measures that define the level of asset utilisation; in this case, the asset considered is the warehouse (e.g., surface utilisation).

In the indirect indicators, it is possible to find some of the items dear to the service quality stream of research, such as flexibility, proactivity, customer perception, etc. In the work of [12], indirect and direct indicators are put together. The operational performance (analysed from both provider and customer perspectives) is measured considering five key items: delivery (e.g., order accuracy), quality (e.g., order damage, customer care), flexibility (e.g., delivery of special order), cost (e.g., overall operating cost), and innovation (e.g., level of new value-added content of services). In the work of [14], he presents a list of performance indicators to measure the logistics service. Among them, several refer to warehousing activities, such as productivity indicators (e.g., surface and volume utilisation) and quality indicators (e.g., completeness, correctness, harmfulness, and lead time). As stated by [21], the quality indicators are customer-oriented measures that remain the most used in the literature, especially the literature on service quality measurement (see, for example, the SERVQUAL model by [22], the logistics service quality (LSQ) model by [23], and the logistics service measurement model by [14]). In Table 1, we report the warehouse performance found in the literature, classifying them through the framework proposed by [21].

Table 1. Performance and service quality indicators: a classification adapted from [21].

Category	Warehouse Performance Indicators	References
Time	Delivery lead time, receiving time, order picking time, queuing time, put-away time, dock-to-stock time, equipment downtime	[13,14,21,23–27]
Quality	On-time delivery, accuracy, availability, complete orders, damage, customer satisfaction, order fill rate, flexibility, customer care, responsiveness	[11–14,21,23–27]
Cost	Order processing cost, price, accurate invoice, inventory cost, order processing cost, labour cost, distribution cost, maintenance cost	[13,21,24,27]
Productivity	Labour productivity, warehouse utilisation (surface and volume utilisation), throughput, shipping productivity, transport utilisation, picking productivity, outbound space utilisation, receiving productivity, turnover, stockout	[13,14,21,25]

2.2. Warehouse Features

Warehouses have also evolved from simple facilities to more complex buildings [28]: their primary role as a repository for inventory has turned into a multi-functional logistics hub hosting more complex activities such as product marking, labelling and packaging,

customer services, intermodal services, and reverse logistics services [29]. According to the work of [10], four main areas can be distinguished in a warehouse: (1) location, (2) external spaces, (3) technical/construction specifications, and (4) internal areas and utilities (see Table 2). Location is one of the most important features [30]; it can increase the value of the building and can improve the performance of the entire supply chain [31]. External spaces include truck parking lots, loading bays, dock levellers, and loading bay safety equipment. This aspect can affect warehouse performance as it comes into play when measuring yard productivity and inbound/outbound operations [21]. Technical/construction specifications are all aspects related to the construction of the building (e.g., roof structure) or its layout (e.g., size and clear building height). These are considered the most critical constraints when optimizing warehouse performance [32]. The internal areas are all the space inside the warehouse used to perform value-added activities (e.g., mezzanine) or to support the traditional operations (e.g., office and areas for recharging material handling equipment). Utilities are also included in this analysis area. They cover a range of systems and equipment, such as fire-detecting and fire-fighting systems, lighting systems, electric systems, heating/air-conditioning systems, and photovoltaic systems. Utilities are now under the attention of scholars as seen by the emergent stream of research on sustainability and low-carbon warehousing. The energy consumption derived from the material handling equipment (e.g., conveying, picking and storing systems, and robots), technical building features (e.g., skylights, layout, and insulation construction materials), and utilities (e.g., heating systems, chilling systems, ventilation, and lighting systems) are hot topics [33]. These elements are still under analysis (see, for example, [34,35]).

Table 2. Warehouse features description derived from [10].

Warehouse Features	Definition
Location	The specific site location (in terms of latitude and longitude, as well as its municipality/district/region), the transport services and infrastructure available in the surroundings (motorways, railway stations, ports, airports), and the proximity to logistics centres and freight villages or customers and suppliers.
External spaces	The areas and arrangements for docking the trucks (e.g., truck parking lots, number of loading bays, dock levellers, and loading bay safety equipment).
Technical/construction specifications	Technical and construction specifications refer to factors such as the building plot, size, layout, floor space, clear building height, structural mesh, and roof structure
Internal areas and utilities	All the internal areas (i.e., recharging rooms, offices, and refrigeration rooms) and the utilities (i.e., fire-fighting systems, lighting systems, heating/air-conditioning systems and photovoltaic systems).

3. Methodology

A qualitative case study methodology was used to answer the research question. This methodology has great applicability for exploring the complexity of a phenomenon, and it has been widely applied in research on the 3PL industry (e.g., [36–38]). The use of this methodology is recommended in studies on logistics outsourcing since it ensures in-depth exploration. It enables the researchers to gain insight into the real motivations, the obstacles and problems in the outsourcing process, and their impacts on the organization's performance [36]. Since the relationship between performance and service measurements and warehouse features—the focus of this research—is not formalized in the literature, the use of case studies fits the objective of this research, letting the researchers explore the theme and derive interesting insights.

Multiple cases were selected to achieve an in-depth understanding of which warehouse features are essential for 3PLs to achieve good performance in terms of service quality. Multiple cases help to assess contingent factors and enhance the applicability and robustness of the findings [37]. The within-case analysis allowed in-depth investigation of the mechanisms and the reasons driving 3PLs in their evaluation of warehouses and

their strategic choices related to linking the structural features to the different sets of performance indicators. The cross-case analysis allowed for a synthesized representation of the common patterns and divergencies emerging from concurrently comparing the data collected from the individual organizations and drawing comprehensive insights into the "right warehouse".

We considered the most important warehouse of the 3PL provider as the unit of analysis. It allowed the different nuances of the relationship between warehouse features and performance to be captured.

3.1. Analysed Cases

A sample of eight warehouses of eight different 3PL providers was selected. The sample size was chosen in line with the recommendations of [39–41]. They argued that a sample from four to ten cases should provide evidence to thoroughly explore a specific subject matter. Companies were selected by adopting a set of sampling criteria. First, 3PL providers must operate in the same country to avoid cultural, legal, and environmental bias [42]. Second, the 3PL providers involved must be large companies since these types of companies have structured logistics processes and established supply chain networks that rely on warehouses and complex relationships with external players. This is supposed to allow for a deeper understanding of the link between the structural features of warehouses and a set of logistics service quality indicators. Third, 3PLs could directly provide the transportation service or indirectly provide it through subcontractors. Finally, the 3PL providers selected must operate in different industries characterized by a very high level of logistics outsourcing. This criterion was adopted because the role of the 3PL provider in these sectors is essential for customers, and their knowledge of the mechanisms linking warehouses and service quality is supposed to be considerable. Table 3 summarises information about the companies observed within the study.

Table 3. Description of the case studies of 3PL providers (data refers to the Italian market, and data on turnover refers to 2019).

Case Characteristics	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
3PL company specifications								
Number of employees	800	1000	150	1100	450	900	600	200
Turnover [EUR]	50–100 mln	50–100 mln	10–50 mln	100–300 mln	100–300 mln	100–300 mln	100–300 mln	10–50 mln
Transportation service	Indirectly provided	Directly provided	Indirectly provided	Directly provided	Directly provided	Indirectly provided	Directly provided	Indirectly provided
3PL warehouse features								
City	Liscate	Capriata d'Orba	Livraga	Polpenazze del Garda	Isola Rizza	Landriano	Buccinasco	Cormano
County	Milan	Alessandria	Lodi	Brescia	Verona	Milan	Milan	Milan
Year of construction	2007	2013	2010	2000	2017	2008	1980	2007
Owned or rented	Owned	Owned	Owned	Rented	Rented	Rented	Rented	Owned
Floorspace [m^2]	25,000	40,000	20,000	20,000	20,000	60,000	15,000	10,000
Building clear height [m]	12	12	10	8	12	12	8	11
No. loading bays	20	76	10	15	55	60	30	10

3.2. Data Collection

For the triangulation of information, the case studies were developed based on interviews and documentary analysis [37]. As the first data source, semi-structured interviews were conducted between July and September 2021. Due to the pandemic, it was not possible to conduct only on-site interviews; but using call-conference tools, the researchers were able to interview and visit the warehouses "virtually". The interviewees were logistics managers or logistics operations directors of the 3PL providers, with a minimum working experience of five years in the industry at the middle to senior management level, as this ensures they have experienced the management of logistics services and closely followed the provision of these services over a period that spans across the typical duration of an outsourcing contract. This would provide a better level of understanding of the relevance of the warehouse features and their impact on the service quality performance.

An interview guideline was developed for the semi-structured interviews with open and closed questions based on the literature review results (see Section 2). It facilitated data collection and ensured that interviews were conducted homogeneously [37]. Researchers asked interviewees to describe their viewpoint about the link between warehouse features and performance and rate, using the Kano model, the impact of the different features on the warehouse performance indicators. The researchers included in the interview guideline a questionnaire to record the rating score given by the interviewees. The performance indicators included in the analysis were derived from the literature review (Table 1) and previously validated by a panel of experts and tested with two 3PL providers. Specifically, the panel of experts from the logistics and the real estate industry (i.e., one logistics manager with more than ten years of experience in the industry and one facility manager with more than 15 years of experience in the industry) helped to review the elements presented in Table 1, adding or modifying the wording. The result is shown in Table 4. Concerning Table 2, the panel of experts decide to maintain the warehouse features found in the literature.

Table 4. Warehouse performance indicators description.

Categories	Indicators	Definition	Reference
Time	Delivery lead Time	Lead times from the warehouse to customers or the duration of the delivery activities	[13,14,21,23–27]
Quality	On-time delivery	Number of orders received by customer on or before the agreed delivery date	[11–14,21,23–27]
	Flexibility	The ability of a company to satisfy variations in scheduled orders	[11,12,14]
	Responsiveness	Willingness to help customers and provide prompt service	[11,12]
	Completeness of the logistics service	Capability of providing a wide range of value-added services	[14]
Cost	Order processing cost	Total processing cost of all orders per number of orders	[21,24,27]
Productivity	Labour productivity	Ratio of the total number of items managed to the amount of item-handling working hours	[13,14,21,25]
	Warehouse utilisation	The average warehouse capacity used (used surface/volume divided by the total surface/volume)	[13,14,21,25]

In addition, a pilot test of the interview guideline was carried out with a panel of academics (i.e., two academics with more than ten years of experience and publications in the logistics field of research) and two 3PL providers (the same used for the text of the warehouse performance indicators and features). As a result, amendments were made to the wording of some questions to become more precise and focused. The pilot test assisted in avoiding misinterpretations [40], provided a solid interview guideline, and facilitated comparisons of the cases.

Each interview (a total of eight interviews, one for each case) lasted between one hour and one hour and a half; the discussion was recorded and then transcribed within 24 h. The second source of data consisted of a documentary search. The researchers asked for further documents, such as warehouse layout, pictures and videos of the warehouse, information on the logistics process, and performance reports. The analysis of the interview data and documentary evidence helped to develop the within-case analysis. A copy of the results of within-case and cross-case studies was sent to the interviewees for validation to strengthen the validity of the findings [37,40].

3.3. Data Analysis

The Kano model was used to rate warehouse features and performances. This methodology, introduced by [43], is used to determine the logistics service quality attributes in satisfying customers. It is in line with the objective of the present research, which is to understand what warehouse features could satisfy the 3PL provider in terms of warehouse performance. Furthermore, this method helped to capture the different nuances of the relationship between warehouse features and performance in terms of attractivity for 3PLs.

This methodology was used by [27] to investigate the logistics service also from the 3PLs' perspective. In their research, they explain that Kano's theory of attractive quality groups service quality into five categories (see Figure 1): "attractive" (i.e., exceeding customer expectations), "one-dimensional" (i.e., standard quality proportional to customer satisfaction), "must-be" (i.e., it provokes strong customer dissatisfaction if it fails to fulfil the customer's requirements, but does not increase satisfaction through its presence), "indifferent" (i.e., no impact on either satisfaction or dissatisfaction), and "reverse" (i.e., elements that have a positive impact if not fulfilled or negative if fulfilled) qualities. This methodology was also used by [9] to define what variables affect 3PL providers' selection in the automotive sector. As for [9,27], the responses to the questionnaire were recorded according to the rating scale of the Kano model (R, I, M, O, and A).

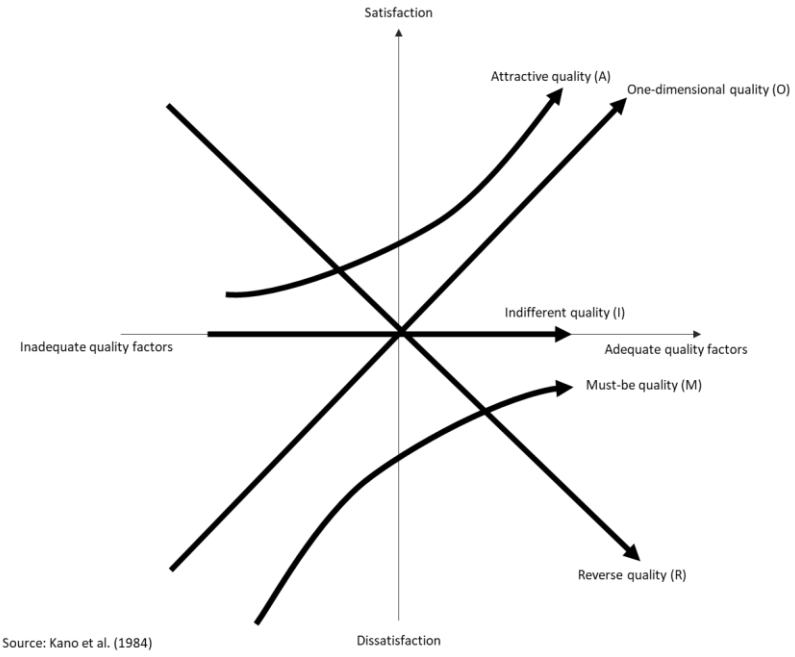

Figure 1. The Kano two-dimensional quality model [27].

3.4. Research Quality Criteria

To ensure the quality and reliability of this research, we adopted a set of well-established criteria. We recognized criteria to ascertain the external validity, internal validity, construct validity, and reliability of the empirical work [40]. Internal and construct validity were addressed by taking from the literature the set of information, categories, and variables (e.g., KPIs, Kano categories) that informed the questionnaire's development and the data analysis. For the same aim, we also triangulated these elements with the data collected from the field [44]. Data triangulation was widely adopted throughout the process, as we consulted industry reports, news articles, and other public documents to increase the study's construct validity [41]. Moreover, the design of a multiple-case approach increased the external validity of the results, along with setting appropriate sampling criteria guided by the research objectives, which permitted the building of a diverse but coherent sample, along with providing information and details on the context and each case. Finally, reliability was validated through the rigour of the research process (the protocol was developed

and validated; structured sampling criteria were also employed for selecting interviewees; the interview protocol was shared with all participants; collection was done in a shared questionnaire and interviews database).

4. Results

4.1. Within-Case Analysis

4.1.1. Case 1

The interview was focused on just one warehouse, specifically the one located in Liscate (MI), which was the most important for flows and size (for further information on the 3PL and warehouse features, see Table 3). As stated by the interviewee, this warehouse is owned by the 3PL and was built specifically for the specific 3PL's needs.

The interviewee was asked to comment on the importance of the warehouse features (see Table 2) and rate the relationship with the performance indicators (see Table 4) to understand the most important warehouse features.

1. Location. This category was not considered crucial by the interviewee. In the interviewee's eyes, this is not a key category due to the externalization of the transport function, so for the typical warehousing function that the 3PL company uses, the location may not impact as much as it does in other 3PLs. Indeed, according to the interviewee, location affects mainly the "delivery" part of the logistics service, specific aspects such as "delivery lead time" and "on-time delivery". Using the Kano model, the interviewee rated this relationship as "attractive" (A). This means that improving the quality of the location will exponentially increase the quality of the delivery service. The relationship between the location features of a warehouse and the flexibility of the logistics service offered is interesting: the interviewee saw a strong influence due to the ability of the location to ensure the possibility of having access to skilled labour to meet customer demand in the place in which the warehouse is located. In this way, it becomes relevant for 3PLs to place their buildings considering strategic locations, especially close to industrial areas and logistics hubs.
2. External Areas. Extending the spaces in front of the loading and unloading areas is significant for a good service level (e.g., flexibility). Likewise, the number of loading bays is important for the 3PL's service accomplishment (i.e., to speed up the receiving and shipping operations). However, these elements are rated "must-be" (M), taken for granted—the interviewee expects all warehouses to be equipped with these features. Moreover, they are not represented as crucial elements for the service level.
3. Building. The shape and size of the building are important for a good level of service in terms of timing ("delivery"), efficiency, and accuracy. The shape determines the exploitability of the building and its performance, but, as for the external areas, these elements are considered "attractive" (A)—their presentation improves the quality of the service provided.
4. Internal Areas. Since this firm mainly carries out warehousing services, the manager emphasised the importance of having suitable rooms, appliances, and utilities to be effective and productive in every task. So, this category is considered "attractive" (A) for productivity, order processing costs, and warehouse utilisation.

4.1.2. Case 2

The interview focused on the warehouse in Capriata d'Orba (AL), where products from the food and cosmetic industries are managed (for further information on the 3PL and warehouse features, see Table 3).

The building is owned and was constructed by the real estate holding company belonging to the 3PL itself, which built this warehouse for the specific needs of the operating division. Having at its disposal a fleet of transport vehicles, in terms of volumes of products managed, the 3PL adopts a direct distribution channel from its central warehouse, which allows it to directly reach the large distribution sales points and a long intermediate channel, for which it has peripheral transit points, for all the other types of goods.

The interviewee was asked to comment on the importance of the four macro-areas (i.e., location, external spaces, technical specifications, and internal areas) and their link with the performance indicators to understand the most important warehouse features.

1. Location. The interviewee highlighted how belonging to a logistics park can determine a remarkable advantage regarding the procurement of skilled labour. As confirmed in many interviews, this kind of procurement is pressing and, most of the time, challenging since, in many operations, the training and the adaptation of labour have a lot of costs in terms of time and money for companies, especially when it comes to products or procedures. Specifically, in the warehouse underassessment, in which the 3PL participates in the management of raw materials for the customer's productive processes, the closeness to the customer's plant is essential for accomplishing the value-added services. Moreover, the expert suggested that this element affected the service quality offered in terms of delivery lead time, on-time delivery, and responsiveness (rated as "one-dimensional"); the motivation is related to the fact that this 3PL also provides transportation services and the proximity to the end customers contributes to significantly reducing the delivery lead time.
2. External Areas. In this area, the most important factors are the number and the density of loading docks, which, as stated by the expert, can strongly influence the quality of the reference warehouse. Therefore, also, in this case, the relationship between this warehouse features and the indicators are seen as a "must be" ("M").
3. Building. Similar to the next interview, this area is not considered as important as location and external areas in the warehouse quality assessment. In this category, the shape and dimension of the building are the most important elements, mainly due to the need for expandability for both seasonal fluctuations in demand and the firm's expansion. In contrast with the opinion of the previous interviewee, here, the flexibility is linked to these warehouse features (rated as "one-dimensional" or "O"). The building shape, size, and potential expandability are requisites for the 3PL to perform the service flexibly.
4. Internal Areas. This area is important since it has specific equipment systems such as photovoltaic and fire-fighting systems. Even though this category was attributed low importance, it involves innovative systems that are usually considered very attractive on the market. Moreover, the presence of mezzanines is fundamental to carrying out added-value operations, so this category could affect the ability of the 3PL to offer a wide range of logistics services (rated as "O").

4.1.3. Case 3

The interview was focused on the most important warehouse in Livraga (for further information on the 3PL and warehouse features, see Table 3). The main takeaways from the interview are discussed below.

1. Location. The interviewee maintained that the context in which the warehouse is set and its accessibility are equally important aspects. This is due to the optimization of the delivery and shipment lead times; orders are considered at the end of the day, and the closer the warehouse is to couriers and hauliers, the closer the warehouse is to highways or important transportation nodes, the higher the service level will be. However, even in this case, the relationship between the delivery service offered and the location is rated as "O". All the other indicators are less important and rated as "M" or "I".
2. External Areas. This feature is considered less important than the others due to the low flow and externalization of the transportation service. The only important feature to bear in mind in this category, according to this interviewee, is the number and density of the loading bays, which facilitate productivity for the receiving and shipping operations (i.e., a good number of loading bays increases the rate of loads and unloads and ensures a good level of service to the customer, rated as "M").

3. Building. This feature has the same significance as External Areas. Notably, the most important object to be taken into account is the expandability of the building that facilitates both the increase of product volumes due to market demand and business expansion. For this reason, the shape and the possibility of expanding the floorspace could strongly affect productivity (rated as "A"), and it is considered a requisite for responsiveness (rated as "M"), according to the interviewee.
4. Internal Areas. This feature is the most critical in the interviewee's view. This choice mainly concerns the need for wide, comfortable internal areas for order preparation, loading, and shipment procedures. These areas are the most important due to the enterprise's need for speed and accuracy (rated as "O"). Indeed, the high degree of automation and technology the building is endowed with is an indispensable parameter for the completion of business operations and productivity (rated as "A"). For instance, the business developer mentioned and highlighted their automated line, used with a system called "pick to light", consisting of an autonomous procedure that weighs, tracks, measures, and sets up each product and order to facilitate and ease the loading and shipment operations. Again, the answers and weights obtained can be explained by the type of product they handle; as the pharmaceutical demand is mainly parcelled, with a high rate of small packages to be delivered, they need technological warehousing systems that allow them to avoid errors in terms of accuracy, timing, and damage to the product (mainly attributable to inaccurate maintenance systems such as controlled temperature sections). For this interviewee, this category is very important. It has also been seen to affect the flexibility of the 3PL (rated as "O"). Indeed, the proper utilities, rooms, and equipment can increase the ability of the 3PL to meet customer emergencies.

4.1.4. Case 4

The interview was focused on the Italian warehouses of Polpenazze del Garda (BS), where the products of the industrial, food, and fast-moving customer goods sectors are mainly managed (for further information on the 3PL and warehouse features, see Table 3).

The main takeaways on the importance of the warehouse features and indicators are discussed below.

1. Location. In the manager's view, this is the most important feature. Better locations lead to better prices and transportation fares. Furthermore, since the transportation is carried out through direct channels (they operate in the B2B market), they can exploit total potential fixed costs, thanks to their vehicles' optimal saturation (Full Truck Load). Therefore, the impact on transportation costs (rated as "A") is mainly determined by the total fares related to the location area. Moreover, the interviewee also rated the location as "A" in relation to the on-time delivery, as the closer the warehouse is to the network, the higher the service provided by the 3PL will be.
2. External Areas. In this case, the interviewee highlighted how important the external area is for new e-commerce and parcelled transportation market trends. Moreover, he emphasized the role of the appearance of a logistics building; even though the external areas, in his opinion, are not directly crucial for the attainment of a good service level (indicators such as "responsiveness", "delivery lead time", and "on-time delivery" are rated as indifferent or "I", meaning that quality of external areas does not have any influence on them), the physical appearances and the status of the building are significant for the customer's opinion.
3. Building. This feature is crucial since the manager thinks that good internal efficiency can compensate for external conformation issues, such as the number and density of loading docks. This is why the interviewee considers that the 3PL's productivity, flexibility, and responsiveness are mainly affected by the building's features (i.e., layout and size). In order to have good internal efficiency, building factors are crucial (rated as "O"). Instead, the features are rated "M" for the operative cost. Moreover, the manager expressed again the idea that the firm operates in a B2B context, so their

warehouses are directly observed and rated by other customer companies. Therefore, the care the building is treated with will reflect customers' perception of service quality. To quote the manager, "Our warehouses must be as attractive as they should have to be to get many likes on social platforms".

4. Internal Areas. According to the interviewee, this is the least important feature; it is generally rated as "I" for all the indicators. The interviewee generally saw the features related to equipment systems such as photovoltaic and fire-fighting systems as most relevant.

4.1.5. Case 5

The warehouse considered by this interview is the most important hub in northern Italy (i.e., Isola Rizza (VR)). In this warehouse, products belonging to the food sector are managed (for further information on 3PL and the warehouse features, see Table 3).

The importance of the four warehouse features and indicators is discussed as follows:

1. Location. This feature is critical due to the type of logistics service offered by the firm and the type of products managed; since some of them need controlled-temperature stock and maintenance, they need to provide quick responses in terms of transport. According to the interviewee, location is a requisite for on-time delivery and delivery lead time ("M"). Moreover, in some cases, it can represent a requisite for flexibility ("M") since, given the size of the 3PL's logistics network, the location can help to serve a specific geographical area.
2. External Areas. The interviewee considered yards and parking to be very important. At the same time, the number and density of loading bays are less crucial for their business activity (rated as "I" for productivity and operative costs).
3. Building. Its importance is attributable to the significant investment and efforts that the firm put into the controlled-temperature products that need a lot of commitment in terms of structural specifications, especially as far as the building layout, height, and expandability are concerned. These elements can affect the flexibility, responsiveness (rated as "O") of the 3PL, and its performance (rated as "A").
4. Internal Areas. The only important factor is the photovoltaic and sustainable aspects that enable the building to gain value for a possible future warehouse sale. Moreover, as for other interviewees, these features could be considered fundamental to offering a wide option of services, rating this feature as "M" (e.g., exploiting mezzanines for value-added services).

4.1.6. Case 6

The warehouse considered was the one located in Landriano (PV) in the north of Italy (for further information on the 3PL and warehouse features, see Table 3). Going forward into the interview, the warehouse features are discussed as follows:

1. Location. This is considered the most crucial area in the interviewee's mind since it highly affects the operative cost (rated "A") but not the quality aspects of the logistics service provider nor the performance (rated, on the contrary, "I").
2. External Areas. This feature is not considered very attractive, as it is considered a "must be" element. The interviewee affirmed that wide parking areas could have a significant impact, but it is not comparable with the other features' relevance. Additionally, the external spaces, mainly consisting of loading/unloading bays, can play a fundamental role in increasing the productivity of the 3PL asset (the only indicators that reach the rate "O").
3. Building. This category is considered important as the warehouse layout and size can profoundly affect 3PLs' productivity, lead times, and costs (all rated as "O"). For example, a regular layout can facilitate the timing of processing and fulfilment of the order itself. Moreover, the importance of the building in shaping the 3PL performance is also highlighted by its impact on flexibility ("O"). Indeed, according to the interviewee, the possibility of expanding or quickly adapting the warehouse

layout could help to meet the changing customer needs, significantly improving warehouse utilisation ("A").

4. Internal Areas. The interviewee considered utilities very important; he pointed out how the costs concerning the electricity, water, and heating/freezing systems have enormous relevance regarding cost efficiency ("M"). Therefore, an excellent logistics building must have good equipment, contributing heavily to the business's financial sustainability.

4.1.7. Case 7

The discussion focused on the warehouse located in Buccinasco (MI) in the north of Italy (for further information on the warehouse features, see Table 3). The main takeaways of the interview are discussed as follows:

1. Location. The manager considered the location to be the most important warehouse feature. In detail, accessibility was rated as the key aspect when assessing the quality of a warehouse. The interviewee considered this category attractive (rated "A") when it came to delivery lead time and on-time delivery. Especially regarding direct deliveries to the final customers, called last-mile deliveries, the warehouse location significantly affects the lead time provided; a strategic location can speed up the deliveries. According to the interviewee, these characteristics of the location also impact responsiveness ("O"); a strategic location can increase the 3PL's ability to respond quickly and proactively to the customer's needs.
2. External Areas. Importance is given to the fundamental role of the loading bays; this feature is considered a "must-be" in relation to all the indicators ("M"). This equipment is a requisite to ensure flexibility in the logistics process. In addition, the correct density of loading bays helps to meet customers' emergencies.
3. Building. Layout and size are the most critical elements since the layout can have an impact on productivity ("O") if it is not adequate for the logistics functions carried out. For costs, the building is rated as a "must-be" feature.
4. Internal Areas. A particular mention was given to the fire-fighting systems, which are crucial and essential. As for the other interviewees, internal areas can help to provide a wide range of logistics services; the layout of the internal structure, as well as the technical features that characterise the warehouse, may or may not allow some specific activities to be carried out (rated "O"). In this regard, it was stated that, for instance, the possibility of inserting mezzanines could make it possible to have more space and thus integrate part of the customers' production process (e.g., packaging or labelling activities) or even have cold rooms to manage products that must be kept at controlled temperatures.

4.1.8. Case 8

The discussion focused on the warehouse located in Cormano (MI) in the north of Italy (for further information on the 3PL and warehouse features, see Table 3).

The main takeaways of the interview are discussed as follows:

1. Location. As pointed out by other interviewees, this feature is important primarily for providing skilled personnel for logistics operations. However, as for the 3PL providers that purchase transportation services, the interviewee saw the location as less important than other warehouse features. However, the interviewee considered this feature responsible for speeding up or decreasing delivery lead times. Being closer to the delivery points and the possibility of accessing resources, for instance, in a logistics park, reduces the delivery lead time ("O"). Being inside a logistics park could also affect flexibility ("O") and responsiveness ("A"); it would allow easy access to other buildings to manage potential demand increases and hire skilled personnel.
2. External Areas. A suitable number of loading bays is required to respond to peak demand and unexpected variability, two conditions that often occur in today's market context. Therefore, the interviewee considered this warehouse feature a "must-be" for

quality indicators and "one-dimensional" for productivity, warehouse utilisation, and cost indicators.

3. Building. The layout and size of the building are attractive ("A") warehouse features to improve all the indicators defined strongly. For example, the interviewee stated that a poor layout led to expensive inefficiencies. Very often, the problem of a building's shape is due to the unavoidable trade-off between the interests of the real estate owner and those of the tenant. Moreover, the building's technical aspects, such as roof and wall insulation or the building height and fire resistance, are fundamental because they may allow completely different products to be managed, offering a full service to the reference customer.
4. Internal Areas. The interviewee rated this feature as a "must-have". These are fundamental to offering value-added logistics services, but this feature's high quality will not further improve the indicators. He mainly refers to the gap between the building's office dimension and the real 3PL's need for offices. Although, in contrast, most buildings have big offices, the manager affirms that these offices are often half unused, stealing crucial space from other warehouse activities.

4.2. Cross-Case Analysis

As mentioned, the data collected from the interviews regarding the relationship between warehouse features quality and performance indicators were coded according to the terminology of the Kano model (R, I, M, O, A). Results are displayed in Table 5.

While Table 5 shows all of the sample data, it is possible to offer a set of specific views related to the different features of the 3PLs included in the sample.

Considering differentiating features of the sample companies, such as size, no difference seems to emerge in the given ratings in most cases. Here, even if 3PLs hosted different clients of different industries that are different in terms of flow and peculiarities (e.g., regulation, security needs, fragile products, etc.), it is possible to see that the interviews report similar ratings of the features and indicators.

Table 5. Result of the rating of the relationship between warehouse features' quality and performance indicators, using Kano model (R = reverse; I = Indifferent; M = Must-be; O = One-dimensional; A = Attractive).

Warehouse Feature: Location								
Warehouse Performance Indicators	**Case 1**	**Case 2**	**Case 3**	**Case 4**	**Case 5**	**Case 6**	**Case 7**	**Case 8**
Delivery lead time	A	O	R	O	O	R	A	O
On-time delivery	A	M	O	A	M	R	O	O
Flexibility	A	I	I	I	M	R	M	O
Responsiveness	A	O	M	I	I	R	O	A
Completeness of the logistics service	A	I	I	R	R	R	I	I
Labour productivity	O	O	M	A	O	A	O	I
Order processing cost	M	O	R	R	I	R	R	I
Warehouse utilisation	I	R	M	R	R	A	R	M
Logistics building adaptability	R	O	R	O	M	O	I	O
Warehouse Feature: External Spaces								
Warehouse Performance Indicators	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
Delivery lead time	I	I	I	R	I	R	M	M
On-time delivery	I	M	R	A	R	R	M	M
Flexibility	M	M	I	M	R	R	M	O
Responsiveness	I	I	R	R	R	R	M	M
Completeness of the logistics service	M	I	R	I	R	R	M	M
Labour productivity	M	R	R	R	I	R	O	O
Order processing cost	M	R	M	R	I	O	I	O
Warehouse utilisation	I	R	M	R	O	A	I	O
Logistics building adaptability	O	O	I	I	M	O	M	A

Table 5. *Cont.*

Warehouse Feature: Technical/Construction Specifications								
Warehouse Performance Indicators	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
Delivery lead time	O	I	M	I	I	O	R	A
On-time delivery	O	I	M	R	R	R	I	A
Flexibility	I	O	M	O	M	O	M	A
Responsiveness	I	M	M	O	I	R	M	A
Completeness of the logistics service	O	I	M	M	M	O	O	A
Labour productivity	A	R	M	M	O	O	M	A
Order processing cost	A	R	A	O	A	O	A	A
Warehouse utilisation	A	R	M	O	A	A	O	A
Logistics building adaptability	M	I	M	I	O	A	O	A
Warehouse Feature: Internal Areas and Utilities								
Warehouse Performance Indicators	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
Delivery lead time	O	I	O	R	R	R	M	I
On-time delivery	O	I	O	M	R	R	M	I
Flexibility	I	M	O	R	R	R	O	M
Responsiveness	I	I	M	R	R	R	M	M
Completeness of the logistics service	O	O	M	R	M	M	O	O
Labour productivity	A	R	O	R	I	M	M	M
Order processing cost	A	R	A	R	I	O	O	M
Warehouse utilisation	A	O	M	R	R	A	O	O
Logistics building adaptability	O	I	M	I	I	A	O	O

On the other hand, interesting differences appear when the perspectives of 3PLs that offer warehousing and transportation services directly versus 3PLs offering only direct warehousing services and 3PLs renting or owning the warehouse under analysis are considered. The differences are discussed in the following paragraphs.

5. Discussion

According to the interviewees, from the interviews conducted and the information collected, we have scrutinized a set of features that a warehouse seems to need to maximize 3PLs' performance.

By looking at the cross-case results, the only warehouse feature considered as mainly "attractive" ("A") by the respondents is the building, and this applies to most of the indicators. Specifically, in line with [32], the size and layout of warehouses are attractive for 3PLs to optimize the building's productivity and utilisation. On the other hand, if a 3PL wants to be flexible and be able to organize the internal spaces according to the specific customer needs, the warehouse should not have structural constraints (e.g., size of the building mesh), which limit the possibility of being adaptable [28]. The building should also be characterised by a regular layout and a height suitable for the activities carried out inside to potentially dedicate spaces for added value activities or increase the productivity of the warehouse itself. It emerges that when 3PLs select or build a warehouse, they tend to look first at the features of the building, even before considering the location. This represents interesting evidence, which confirms the importance of maximizing efficiency and flexibility to improve the opportunity to make the best possible use of resources and maximize cost-efficiency. This goes along with the evidence emerging about the internal areas. Respondents see their role as enablers for providing added value services to the customers, considered a differentiating factor.

Consequently, elements such as temperature-controlled environments and fire-fighting and safety systems are rated as "O" (i.e., good internal areas can proportionally improve the warehouse indicators). While this evidence seems to support the existing literature [28,45], it is interesting to notice that internal areas are not rated "attractive". It would seem that the building's features come first, and how the internal areas are organized and equipped to differentiate the service provision later. Resource efficiency and flexibility requirements make a warehouse more attractive in the eyes of a 3PL.

Location is considered an important aspect, frequently rated as "O" (i.e., a good quality location can improve the warehouse indicators proportionally) but not as "attractive". This is interesting evidence, which still suggests the importance of making strategic choices about the network configuration in terms of facility location decisions. However, that seems in partial contrast to the findings of the work by [9], which indicate location as "attractive". In this work, the shippers' logistics managers were interviewed and they focused on reducing transportation costs, placing the warehouse in the centre of gravity of their flows. However, for the 3PLs, this is important, but not as much as for the shipper. As a point of "interface" between the inbound and outbound flows, to let the 3PL reduce the delivery lead time and the order processing cost (in terms of transportation costs), the warehouse should be in proximity to the shippers' customers, specifically in a barycentric location for all their flows. However, location is not strategic since customers and their logistics network could change.

On the other hand, for the 3PL, it is essential to provide flexibility through location; the warehouse must be located near industrial or logistics areas or in proximity to the main logistics infrastructure (e.g., highways) in order to access skilled personnel or expand the building in case of potential demand peaks. However, in terms of the selection or construction of a warehouse, 3PLs find the facility features more attractive, probably because they see a stronger connection with the execution of the warehouse activities rather than with the facilitation of the inbound transport and outbound distribution processes. 3PLs see more critically the issues related to land use (probably out of the remit of their potential decisions and linked to exogenous factors, such as availability of land and infrastructures). The land development patterns for logistics use are influenced by access to select locations in the urban area, such as major highways and the airport [31]. Placing logistics buildings in logistics clusters (such as logistics parks) can help 3PLs to benefit from geographical aggregation, as shown by [46].

External spaces are instead considered a "must-be" ("M") to achieve flexibility, on-time delivery, and productivity. A wide yard and a high density of loading/unloading bays are requisites for a good level of service (punctuality and flexibility) and productivity. These elements are considered essential enabling factors, and they act as "filters" in the selection of warehouses. Warehouses unable to satisfy the requirements of good external areas are not even shortlisted in the selection process for 3PLs. This confirms the evidence reported by [21].

Another interesting finding could be drawn from the warehouse indicators against the features. The location appears to be the most critical warehouse feature to improve the delivery lead time, while the others are judged to be indifferent. This result is in line with the literature discussed. The relationship between location and delivery performance has been widely analysed; [31] investigated the importance of accessibility (in terms of the relationship between the location and the travel time) to discuss the logistics land use in a city. Likewise, locations drive on-time delivery, enabled by the external spaces considered must-be features. Researchers noted that the number of loading/unloading bays comes into play when measuring delivery performance [21]. Flexibility is driven by the building features (size and layout) and enabled by the other must-be warehouse features. Responsiveness is again driven by location, but internal areas and building features are must-be factors. As noted by [47], responsiveness is linked to the transportation service; normally, customers' demand is related to changes in shipping. Therefore, location (in terms of accessibility) is the most critical element. The completeness of the logistics service is associated with the size of the building, and the same can be said for labour productivity, for which the building's features (precisely the layout and size) can even be a differentiating element (attractive). The order processing cost seems to be driven by the location and the external spaces, probably because it is seen as a matter of order shipping. Similar to labour productivity, warehouse utilisation is also driven by the internal areas, and the building features can make a difference. The presence of mezzanines can help increase

warehouse utilisation and find new areas to dedicate to value-added services (e.g., co-packing activities), as shown by [28].

Finally, it can be said that to empower the logistics service quality, the warehouse has to be situated in a good location (e.g., accessible by different transportation modes, in a logistics park, near couriers or hauliers) to improve the service level and reduce the costs. The warehouse is also required to have a good number of loading bays, a regular building layout, and a height that is able to make the service flexible and responsive to the change in demand and improve labour productivity and warehouse utilisation. Moreover, the warehouse should have internal areas and structures, such as mezzanines, to deliver value-added services, thus enhancing the range of services provided by the 3PL. Then, the 3PL is attracted by warehouses with sizes and layouts that can help the 3PL to optimize the flow of goods and the utilisation of the spaces. It is interesting to note that according to this view, the building features really make a warehouse "attractive" in the eyes of 3PLs. Showing how much the efficiency of the warehouse operations can drive costs down can be an element of great attractiveness for 3PLs in selecting the "right" warehouse for them. In other words, offering the possibility to maximize the dimension of efficiency makes a warehouse interesting, on top of the above considerations of location, external spaces, and internal areas as enablers of service quality and logistics performance.

Different perspectives emerged from 3PLs that offer warehousing and transportation services and those that provide only warehousing as a direct service, buying the transportation service externally. It occurred that the 3PLs that buy the transportation service consider the location and external warehouse features as less attractive (generally, these features obtain a rate equal to "I" or "M"). In contrast, the other 3PLs consider the location as an attractive feature, specifically for service quality issues. Cases 3 and 6 show that location is generally rated as "M" or "I" in relation to the other indicators while Cases 4 and 7, which directly provide the transportation service, rate location as "O" or "A" for service indicators (e.g., delivery lead time). This is due to the fact that the 3PLs that buy the transportation services can rely on the logistics network of the supplier, which can cope with and speed up the shipments.

Finally, during the interviews, it emerged that owning or renting a warehouse could affect the approach to selecting a warehouse and how the various warehouse features are examined against their effect on performance indicators. This means that having chosen in detail every single structural feature significantly affects the alignment with the specific 3PL company requirements. Therefore, 3PLs that are owners more frequently see warehouse features as "attractive", considering them a requisite since they were part of the elements required in the design project. For example, Cases 1 and 8 see the building as an "attractive" feature for productivity and operative cost. In contrast, for 3PLs that rent warehouses, the "attractiveness" could represent must-be features since they are not always present in all the buildings available on the market and not with the same level of quality. Therefore, Cases 4 and 7 see the building as a "must-be" for productivity and operative cost.

6. Conclusions

In the present research, the relationship between the features of warehouses and the performance indicators of service quality of 3PLs was analysed. The analysis, carried out by interviewing a sample of 3PL providers, who provided data coded according to the dimensions of the Kano model, allowed us to understand how 3PLs evaluate the different warehouse features that drive their performance. In this way, it was possible to shed some light on how 3PLs look at warehouse features when they evaluate or select warehouses and how they think performance indicators are affected by the warehouse features.

6.1. Implications of the Study

This work has theoretical and practical implications.

Regarding theoretical implications, we address significant shortcomings of the existing literature on warehouse management and the third-party logistics sector. The literature

has traditionally focused on managing warehouse operations and optimizing warehouse processes and activities, dealing with the service level and cost performance as objectives of the optimizations, along with facility location problems. On the other hand, the literature on the third-party logistics sector has focused more on the 3PL buying process from the perspective of shippers or cargo owners when they buy logistics services in an outsourcing context. As a result, the selection decisions of shippers are linked to service outcomes that typically neglect the role of warehouses. In the best of cases, warehouses are considered as just one of the elements composing the set of assets at the disposal of 3PLs and organizations. However, the literature has also indicated that warehouses are important physical assets that can affect the performance level of 3PLs and of the organizations that buy logistics services from 3PLs. Consequently, in this endeavour, we adopted a more holistic perspective, putting the warehouse at the centre of a decision-making process seen from the point of view of 3PLs and not of shippers. In this sense, we advance the current knowledge by taking a step back in the 3PL buying process, starting from one of the very first—typically neglected—strategic decisions that 3PLs need to make to set up their logistics services. In doing this, we also add to the current knowledge investigating how 3PLs see the features of warehouses affecting their performance level. The link between warehouse features and performance is something that the literature has not contemplated. While we do not make claims of direct causality, we develop the current literature by providing insights on how 3PLs see this relationship between warehouse features and performance indicators and how this relationship can be a driver of their warehouse selection decisions. Traditionally, according to the existing theory, cost and land/building availability considerations were the object of this decision.

Regarding managerial implications, scrutinizing and selecting warehouses is essential for 3PLs to present themselves in the best possible way in a crowded and competitive marketplace. This research contributes to practice by giving 3PL providers an indication of how selection decisions are typically made in terms of "what to look at" when selecting a warehouse and how the scrutinized elements can have an expected effect on performance. This could facilitate 3PLs in going beyond simplistic selections of strategic facilities such as warehouses, based traditionally on cost factors and land availability, and to embrace a more holistic view in appraising the various features of warehouses and the effect these can have in fulfilling their requirements. Furthermore, by offering a dual perspective on performance indicators and warehouse features, the study provides 3PLs with the opportunity to scrutinize different operational aspects and features of warehouses and the relationships among them so that considerations on specific drivers and potential investments can be made in their strategic planning activities.

6.2. Limitations

However, the study comes with limitations too. This research aimed to explain how 3PLs evaluate the various warehouse features and the relationship between warehouse features and performance indicators. However, a limited sample of companies was built since a qualitative research approach was chosen to delve deeper into the analysis and explore the motivations and the reasons for ratings given by 3PLs. Furthermore, the qualitative approach selected, even if it provides a rich picture of the investigated phenomenon, does not entirely allow for generalizing our findings. Likewise, establishing direct causality links between features and performance indicators was impossible. Another limitation regards the adoption of videoconferencing for carrying out the interviews. It is widely acknowledged that this type of interviewing has some advantages for qualitative research compared to face-to-face interviews (e.g., reducing the need for travel and the costs of transcription, resulting in time saving for a researcher, and putting the researcher in touch with distant locations, see [48–50]).

Conversely, videoconferencing can be problematic when sensitive topics are addressed or when the emotional distress of interviewees can emerge. Nevertheless, both these factors were absent in our case. While face-to-face interviews can also be advantageous in ensuring

visualization of body language and eye contact, videoconferencing instead can prevent these factors. In our case, though, we made sure the interviewees had their webcam activated, and we prepared them for the interview to avoid distractions from other sources of information such as other open websites, email accounts or mobile phones. A limitation can be the quality of the audio–video connection related to the internet bandwidth, which can jeopardize the effectiveness and quality of the interview. The same can be said about the level of information technology familiarity of the interviewees. In our case, we pre-tested the videoconferencing media to ensure that the technical and digital competence matter was not a problem.

Nevertheless, building on the results of this work, it is possible to overcome the above-mentioned current limitations through further exploratory research based on the adoption of quantitative methodologies, such as survey studies and structural equation models, to test the statements inferred. Furthermore, different geographical contexts, where the availability of warehouses in the real estate market may be additionally compared to the one analysed in this study, can offer significant insights into the investigated relationship between warehouse features and performance indicators.

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