P.PORTO

PORTO
ACCOUNTING
AND BUSINESS
Shcool

M

Master in
Accounting and Finance

The Management of Logistics Activities in The Furniture Sector - Cost Control with Application of Time Driven Activity Based Costing Model

Bruno Filipe Teixeira Pacheco

10/2022

Bruno Filipe Teixeira Pacheco. The Management of Logistics Activities in the furniture sector- Cost control with Application of Time Driven Activity Based Costing Model
10/2022

PORTO
ACCOUNTING
AND BUSINESS
Shcool

M

Master in
Accounting and Finance

The Management of Logistics Activities in The Furniture Sector - Cost Control with Application of Time Driven Activity Based Costing Model

Bruno Filipe Teixeira Pacheco

Master's dissertation presented at Porto Accounting and Business School for obtaining the degree of master's in Accounting and Finance under the supervision of Prof. Dra. Amélia Cristina Ferreira da Silva and co-supervision of Prof. Dr. Ricardo Jorge Oliveira da Silva

Bruno Filipe Teixeira Pacheco. The Management of Logistics Activities in the furniture sector- Cost control with Application of Time Driven Activity Based Costing Model
10/**2022**

Acknowledgements:

First, I want to thank my family for all the help, education, patience, and advice throughout all my life phases. You allowed me to maintain in the right direction and gave me the ambition never to stop learning and growing as a person.

I want to thank also to my supervisor Dra. Amélia Silva and Ricardo Silva for the guidance in every step of the paper. Overtake the difficulties that appeared on the track was not easy. Still, with your advice, support, and belief in my capacities, I am here full of pride writing the acknowledgements, finishing one of my most incredible journeys.

I'm thankful to all my friends for the comprehension of my disappearance for periods to be able to conclude this paper.

But two exceptional people gave me a lot. They supported me, gave feedback, and helped in everything I asked, including Filipe Ribeiro and Carlos Ferreira. Without them, my life would have been far more complicated.

Last but not least, I need to thank my life partner, Ana. You are the last because I already have no more words for you and need time to think about saying THANK YOU!

You never stopped believing in me, even when I thought I could not do it. You advised me, suffered, and lost nights of sleep just to help and comfort me when I needed the most. More than everybody, you know what this achievement means to me and how much important it was to finish it.

Abstract:

The furniture sector in Portugal is predominantly composed of Micro, Small, and Medium Enterprises (SME'S). Its internationalisation process has been continuous and growing. However, to be viable, SMEs need to compete with international and large companies which benefit from economies of scale. Thus, SME's must create a competitive advantage in quality, differentiated furniture design, and customised services. In this context, the management of value chain activities gains extreme importance.

This research work focuses on the logistics activities in the furniture sector. It aims to analyse the management practices of Portuguese SMEs regarding customer service in logistics and propose a framework for to cost calculation of customer service activities in logistics.

Using an approach based on the Delphi methodology, we consulted a panel of experts in the furniture sector to develop a questionnaire to identify logistics activities in the furniture business. Then the questionnaire was applied to SMEs operating in the furniture sector. Despite the small number of participants, the results indicate that firms are aware of the importance of cost management of logistics for their competitiveness, they have the necessary data to calculate their costs, and Time Drive Activity Based Costing can be a suitable solution for costs calculation, once it can perform an accurate cost division per each stage of the transport workflow and determine the total cost of the operation with high precision, based on the type of transportation and selected incoterm negotiated with clients.

Keywords: Internationalisation, Transport Workflow, TDABC, Furniture Industry, Logistic

Index

Table Index:

Figure Index

List of Acronyms:

SME: Small and Medium Enterprises

CAE: *Classificação das Atividades Económicas Portuguesas*

INE: *Instituto Nacional de Estatística*

DGAE: *Direção geral das Atividades Económicas*

GVA: Gross Value Added

GDP: Gross Domestic Product

APIMA: *Associação Portuguesa das Indústrias de Madeiras e Afins*

EU: European Union

AEPF: Associação Empresarial de Paços de Ferreira

PME´s: Pequenas e Médias Empresas

ICC: Internation Chamber of Commerce

SABI: Sistema de Análise de Balanços Ibéricos

TDABC: Time Driven Activity Based Costing

ABC: Activity Based Costing

Introduction

A significant part of the Portuguese furniture sector comprises Micro-enterprises or SMEs -Small and Medium Enterprises. The globalisation of the economy presses these companies for Internationalisation and to search for new market opportunities. In times of crisis, SMEs tended to try to grow over frontiers to maintain profitability and competitive results.

This internationalisation process results in increasing company costs that must be overtaken by an increase in productivity or, in other words, by the rise in business volume. (J. B. Fernandes et al., 2021).

As it is necessary to prepare and send the furniture for different destinations, logistics relevance becomes more preponderant to mitigate costs and work effectively. Despite being a complex process, with many operations, one nuclear part of logistics is transporting the goods from the seller to the buyer. Deep down, logistics has its fundamental mission to bring together geographically separated markets, minimise operations and lead-time, and ensure maximum customer satisfaction at the lowest possible cost. To become more competitive, companies need to respond with increasingly sophisticated strategies, including international logistics tactics, to guarantee strategic advantages in supply chain management with their partners in the distribution channel (Henriques & Moreira, 2010).

To increase their competitive position in international markets, companies should be able to anticipate barriers in the foreign markets where they intend to operate and analyse the potential risks that make the perfect flow of materials in unfeasible distribution channels. Once companies are aware of these barriers and risks, they can take the necessary measures to reduce or avoid them will, all are extremely necessary to guarantee an efficient logistics system (J. B. Fernandes et al., 2021; Henriques & Moreira, 2010)

This study aims to help furniture companies better understand their logistics process and related costs, exploring a necessary starting point to developing a suitable tool that supports and helps the decision-making in the process of shipping goods to international markets.

I Chapter - Literature Review

1.1 Logistics, Scope, and Importance in the Value Chain

When someone thinks about logistics, the first question that may arise is "What is the definition of Logistics?" The truth is that, as it seems a simple and logical question, the answer is not easy. According to Kukovič (2014), much has been written about the meaning, significance, and content of logistics, and even what should constitute it. Still, the discussion on the topic has not yet been completed.

Searching for the most appropriate definition is always challenging due to the multitude of meanings discovered online, in articles or textbooks. These are some founded definitions:

"Logistics is... the management of all activities which facilitate movement and the coordination of supply and demand in the creation of time and place utility"(James L Heskett; Nicholas A Glaskowsky; Robert M Ivie, 1973)

"Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies." Council of Supply Chain Management Professionals, 2012)

*"Logistics is... the positioning of resource at the right time, in the right place, at the right cost, at the right quality." (*Riopel et al. 2005, cited in Farahani et al., 2009)

It is so difficult to find a suitable definition for logistics coverage and purpose because it is a task composed of many sub-functions and many subsystems, treated as an independent management operation. Every industry is a "*world" with* particularities and characteristics. For each company, different strategies regarding market approach and procedures to satisfy their clients might be chosen and be very different.

Logistics is so diverse and dynamic in its scope that it needs to be flexible and modulate itself, to respect and fulfil all the needs of the inserted environment.

Transport, inventory, and warehousing, which are considered the three critical components of logistics (Rushton, et al, 2014), have been key elements of industry and economic life for numerous years. However, due to all subfunctions, subsystems, and operations, only in the last 20 years has logistics been recognised as one primary function.

In any case, as referred by Rushton et al, (2014), to have a better comprehension, understanding, and planification of all logistics activities, both the academic and the business world now accept that there is a need to adopt a more holistic view of these different operations to consider how they interrelate and interact with each other.

Scope of Logistics

Although complex and distinct, for most companies, it is possible to draw up a familiar list of critical areas representing the significant components of distribution and logistics. These will include transport, warehousing, inventory, packaging, and information (Rushton, A., Croucher, P., and Baker, 2014).

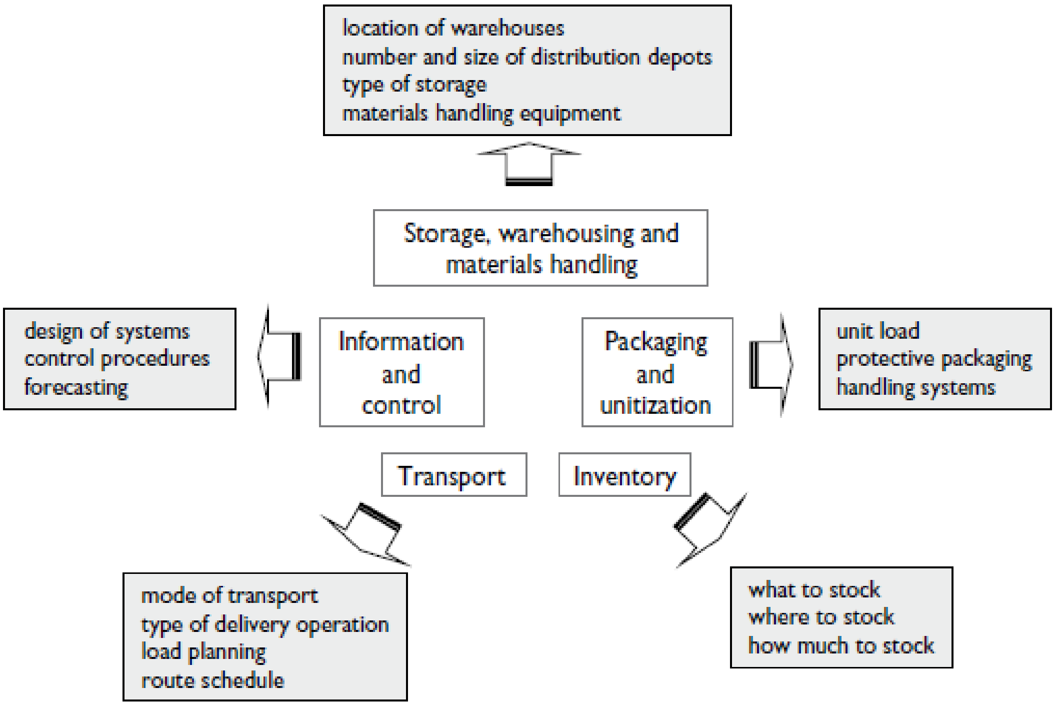


Figure 1 *The key components of distribution and logistic*

Source: *The Handbook of Logistics and Distribution Management (Rushton, A., Croucher, P. and Baker, 2014)*

Every single one of these functions and sub-functions is interdependent, must be adjusted and planned, and decisions must be made in terms of the company´s local environment and, in a larger range, in terms of the distribution system, as a whole. For this, the company's logistics department is composed of a highly professional and stress-resistant team that can manage and support all these decisions. The department’s management has an overly complex and challenge in planning and controlling the logistics system (Farahani et al., 2018)

According to Ghiani et al. (2003) , logistics decisions are traditionally defined as strategical, tactical, and operational in terms of the planning horizon and temporal effect.

- **Strategic Decisions:** long-term effect decisions, made by executive administrators, top managers, and stockholders. Capacity to reduce capital (measured by the level of necessary investment), cost reduction (with transport and storage), and service-level improvement are the main goals to be optimised by this type of decision.
- **Tactical Decisions:** medium-term basis (quarterly or monthly basis revised) includes production and distribution planning and all resource allocations. Decisions such as selecting the mode of transport, where to allocate the storage, and order-picking strategies and procedures are considered tactical decisions.
- **Operational Decisions:** daily basis decisions, normally directly related to the operational service, as is the case of warehouse order picking and shipment or vehicle dispatch.

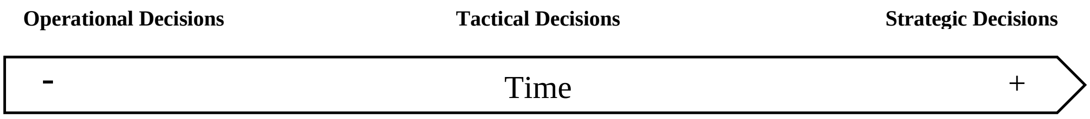


***Figure 2** Logistics decisions related with time spectrum*

***Source:** Adapted from Ghiani et al., (2003)* According to Rushton, A., Croucher, P. and Baker (2014), distribution and logistics are not simply transporting goods from one storage point to another. Many other components go together to produce an effective distribution and logistics operation. These elements interrelate and need to be planned over suitable time horizons, meaning with this that is mandatory to have a systematic approach where continual review is required.

This concept is very important in logistics because, as referred by Lagorio et al., (2022) the needs have been pushing companies to implement the operational flexibility required to manage demand volatility, product variety, products' short life cycles and to shrink delivery times effectively, which means that most operations and procedures must change and adapt to fulfil all the requirements of the market and environment where companies are inserted.

The logistic importance in the value chain

Logistics has assumed great relevance in the modern business world (Hernández & Garcia, 2008), becoming a central pillar in the value chain for industries and companies (Wang, 2016) In this sense, numerous models have emerged to explain it which stands out the 7R's logistics model (Hernández & Garcia, 2008; Wang, 2016). The principles of the 7R's in logistics are considered in the literature as fundamental in developing desirable skills in employees working in the context of storage (Trichai et al., 2021) and making companies more competitive in the market (Wang, 2016).

According to the laws of the 7R's model, the main objective is to make logistics respond correctly to seven crucial aspects: supply the right product, in the correct quantity and condition, in the right place, at the right time, to the right customer and at the right price (Hernández & Garcia, 2008; Michlowicz et al., 2015; Wang, 2016).

Exploring each of these aspects in more detail, through a literature review (Gleissner & Femerling, 2013; Raj & Sudalaimuthu, 2009;Trichai et al., 2021), 1-right product corresponds to the knowledge and capabilities for the correct storage of the product, with a view to maintaining good quality and appropriate characteristics according to the agreed specifications or established taking into account the customer's requirements; 2-right quantity consists of the development of capacities to verify the correct quantities of product and amount of storage required, requiring continuous coordination with the customers; 3 - right conditions concerns the development of capacities and knowledge about the delivery of the products in the correct conditions according to the customer's requests, demanding for this purpose that the stored products be complete and unbreakable; 4- right place contemplates the capabilities for storage and delivery in correct and/or specific areas so as to be able to locate and find the products quickly in the warehouse; 5- right time, highlighted with one of the most essential factors in warehousing, encompasses the capabilities to store the product only for the necessary time, as well as deliver the products to customers at the right time; 6- right customer embraces the capabilities of storage and delivery to respond to customer requirements and needs so as to exceed expectations and generate satisfaction; lastly, 7-right price, which encompasses the knowledge of good management of warehouse and storage operating costs as the main cost that can influence the company.

For Wang (2016), considering today's consumer behaviour and the dynamically changing and uncertain logistics environment that characterises the current context, meeting the above requirements is becoming increasingly difficult. These facts create challenges and opportunities for logistics, which require new methods, products, and services, as well as greater flexibility, adaptability, proactivity, and self-organisation on the part of companies (Wang, 2016)

1.2 Portuguese Furniture Sector

Activities and Products Classification

All the economic activities in Portugal, are organised by a classification called CAE – *Classificação das Atividades Económicas Portuguesas*. According to Instituto Nacional de Estatística (2007), the first version of the Portuguese Classification of Activities (CAE) published dates from 1953 and resulted from a translation, under the responsibility of INE, of the International Standard Industrial Classification of all Branches of Economic Activity published in 1949 by the United Nations Statistical Services.

Based on CAE Classification, the furniture industry is presented in the C *Section – Transformation Industries* – associated with it the CAE 31 with the label of Manufacture of furniture and mattresses. Although this sector is related to the manufacture of furniture and mattress, this subsector also includes the manufacture of office furniture, kitchen furniture, mattresses, wood furniture for other purposes, and metal furniture for other purposes, among others.

Searching for CAE 31 in the data analysis provided by DGAE (*Direção Geral das Atividades Económicas*) in the year 2020 (year of last information available) there was a total of 4.429 active companies in Portugal, from a total of 67821 (only in the manufacturing industries), which is the correspondent of about 6.5% of total manufacturing industries companies and, about 0.33%, in terms of all companies labouring in Portugal.

Geographic distribution

The geographic distribution of the companies tends to be quite different in all Portuguese territories. If we look through the information on the sector, the tree major clusters are the North, Centre, and Metropolitan Area of Lisbon (DGAE, 2020). Those clusters have very distinctive percentages, as shown in figure 3.

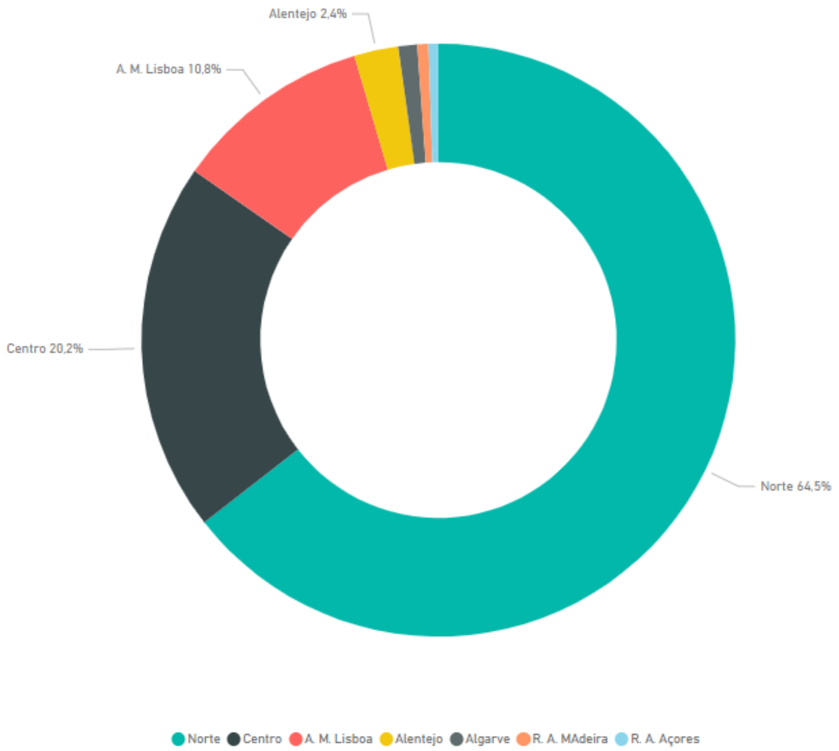


Figure 3 *Geographical Furniture Companies Localization*
Source: *DGAE*

The North of Portugal has 64,5% of companies, followed by the Centre region, with 20,2%. These two regions stand for 84,7% of total companies from the total of the entire Portuguese furniture business. The manufacturing industries follow the same tendency (although more accentuated in the furniture industry), with 49,1% in the North, 24,3% in the Centre, and 15,01% in Lisbon Metropolitan Area, as the three major clusters.

According to DGAE (2020), in the year 202034.184 employees were working in the furniture industry (0.81% of all manufacturing industry). During the crisis period of 2010-2014, the number of workers decreased from 35.452 to 28.873 (correspondent to -18,6%). The percentage of companies who disappeared for the same analysis period is the same (-18,6%) as it went from 5512 companies in 2010 to 4489 in 2020. In later years until 2020 (2015-2020), there was a growth of 14,5% of personnel labouring in this manufacturing industry.

Despite this growth, the sector continues searching for new and specialised personnel. As it refers, (Caetano, 2021) and (Larguesa & Castro, 2022), furniture companies are refusing orders due to the lack of workers to the sector's needs.

Workers tend to have in-depth knowledge, helping bring greater efficiency and quality to the company. In this regard, it is important to note that their productivity levels have been high over the last decade, with apparent labour productivity (in thousands of euros) rising from 14,10K€ in 2010 to around 18,61K€ in 2020, which corresponds to an increase of more than 4K€, a very positive figure with a variation of approximately 32%. (DGAE, 2020)

Business Composition of Furniture Companies according to size

According to Barbosa, (2020), the major companies in this sector are family-owned, with few employees and technical staff, which emphasises the existence of many errors in various areas. Another major problem is the lack of qualifications of employees in SMEs and micro-enterprises. Being small companies allows them to adapt more quickly to the needs and changes in the market, which can lead to some competitive advantage when acting in very volatile markets.

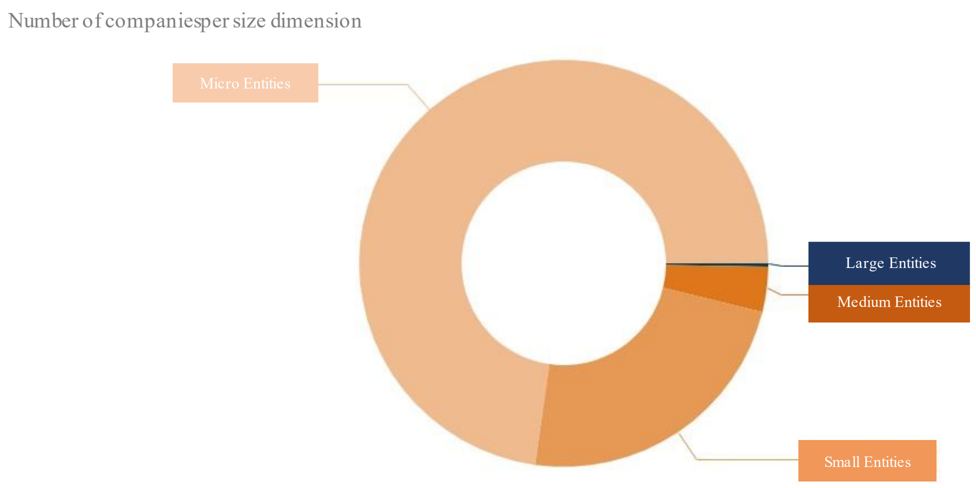


Figure 4 *Number of Companies per size dimension*
Source: *"Banco de Portugal"*

As shown in figure 7, the information obtained from sector boards of "*Banco de Portugal"*, for the year 2020, the furniture industry is composed, in terms of dimension, mainly of micro and small-size companies. Equally, micro and small-sized companies are a percentage of 96.15% of total entities.

In terms of sales and provided services of the sector, the small companies contribute more to the increased value of the ratio, with an amount of 616 M€. On the opposite side, the micro-enterprises, despite being the most quantity entities in the sector per dimension, are the ones who contribute less, with an amount of 236 M€. This represents -62% of the contribution for the sales volume compared with small-size enterprises. (the year 2021)

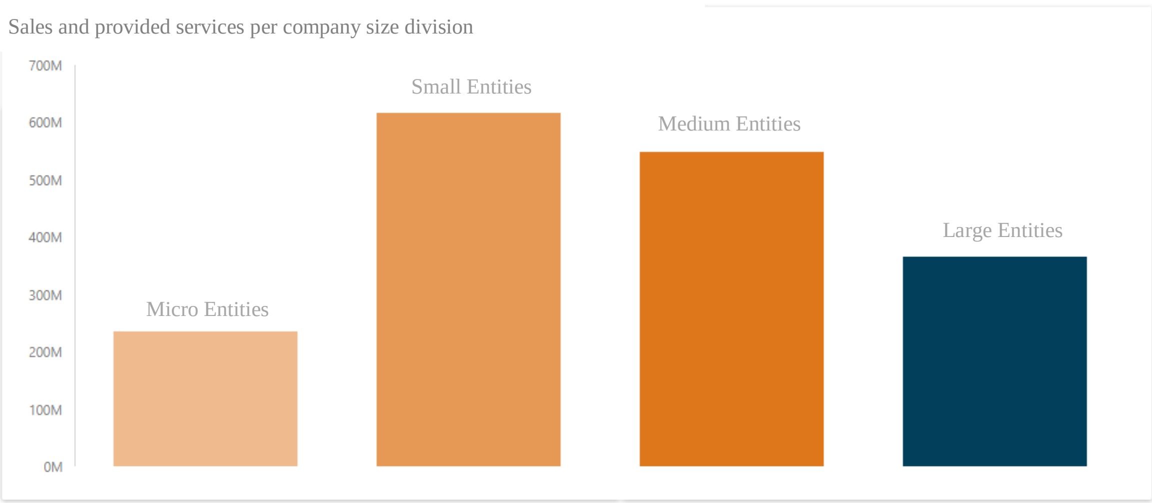


Figure 5 *Sales and Services per dimension (€)*
Source: *"Banco de Portugal"*

The high technological advancement and the great flexibility in manufacturing have allowed, in recent years, for the sector to get a remarkable ability to present new products and styles. Portuguese furniture companies have been innovating both in equipment and products (especially after generational succession processes). Distinctive materials and an innovative approach growing based on contracting specific of designers, some of them internationally renowned, had a positive impact on furniture development. The design arises as a decisive factor for innovation and, as an element associated with the brand or the company's image (Morgado, 2012).

Corresponding Morgado (2012) the business fabric is very diversified, and companies can be found with the following characteristics:

- Traditional companies: include a lot of manual work, hand carving, little computerised management equipment, and little finishing work.

- Classical companies: have some degree of mechanisation and finishing sections, but with poor prospects for the sustainability of the business, deficiencies in compliance with the provisions, and deficiencies in compliance with health, safety, and environmental regulations.

- Intermediate Companies: some with wood drying equipment, automated and CNC equipment, fulfilling the requirements related to hygiene, safety, and environment, but with problems still to be solved regarding the company's strategic management, such as product design and development, equipment, and its profitability in the market approach.

- Modern companies: with ultra-modern technological facilities and equipment, and management and production control systems.

Sectorial Aggregated Data and International Trade Business

In terms of economic figures, the GVA- Gross Value Added, which measures the value of goods produced in a country, minus the cost of all inputs and raw materials directly attributed to that production (Kenton et al., 2022) is 636M€, which corresponds at 0.32% of GDP – Gross Domestic Product.

In addition, it is possible to realise that the ratio of GVA, after the Portuguese crisis in 2010-2014, increased from 386 M€ (2014) to 680 M€ (2019), which corresponds to a growth of 76% in five years period. Since 2019, there´s been a slight reversal in the tendency, and the GVA reduced to approx. 636M (39% reduction).

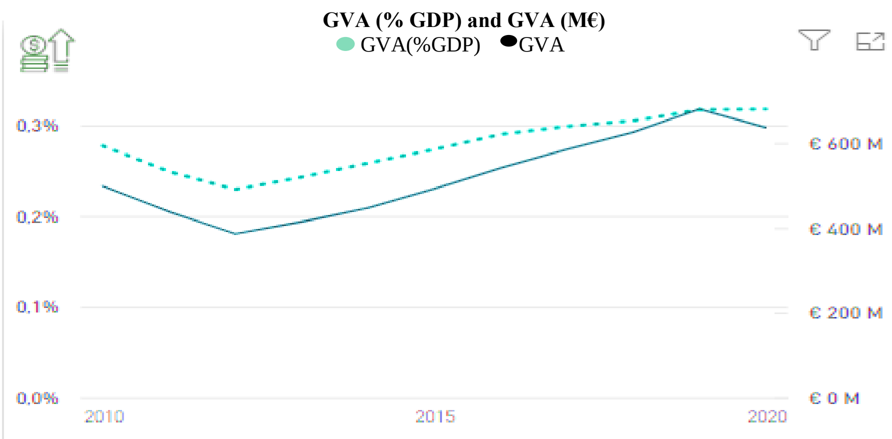


Figure 6 *GVA Evolution*
Source: *DGAE*

Export vs Import Market

In the competitive environment where companies run nowadays, there is a need to adopt internationalisation strategies to enable consolidation in diversified markets. The internationalisation process is part of a relevant strategy for companies, has several implications, and is influenced by many specific issues, namely companies' behaviour, culture, and structure, as well as company leadership (J. Fernandes & Machado, 2016)

After the Portuguese crisis of 2010, furniture companies began to have an international approach, searching for global markets and opportunities.

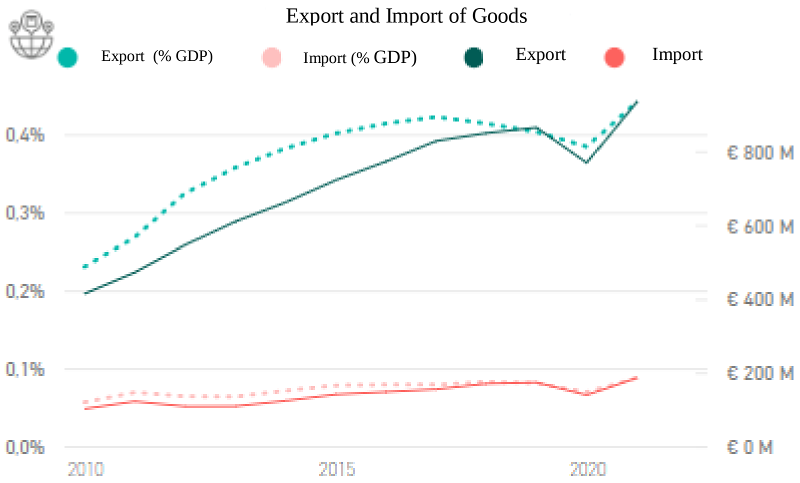


***Figure 7** Export and Import of Goods*
***Source:** DGAE*

As it is possible to realise from figure 7, the export trend for the sector increased to 935 M€ for the year 2022. It reflects a considerable increase of about 126%. There was a small percentage from 2019 to 2020, and it is returning now to the growth path (raise of 22%)

The recognition of the furniture industry as a relevant driver of economic development led to the creation of APIMA – *Associação Portuguesa das Industrias de Madeiras e Afins*. It is a business association created in 1984, a non-profit, private law and national scope, based in Porto. It aims to promote the competitiveness of the furniture and related cluster through a set of actions that look to stimulate the growth and development of the different sectors that integrate it, as well as its national and international dissemination.

During the last decades, APIMA has deepened its preponderance as a spokesperson and representative of this sector. The Association continues to play a particularly relevant role in the global promotion strategy, leading successive joint internationalisation projects. Recent years have emphasised the importance of complementarity and an integrated offer at the international level.

In this sense, APIMA has been broadening its scope of action, standing for several sectors and activities complementary to furniture, allowing a joint promotion of the Portuguese Home Sector. APIMA integrates two critical worldwide sector networks, the

European Furniture Manufacturers Federation, and the World Furniture Confederation (*Portuguese Association of Furniture and Related Industries,* 2019).

According to APIMA annual financial report, the top three main international markets are:

- **France:** 500 million euros in sales volume and a market quote of 31.61%
- **Spain:** 437 million euros in sales volume and a market quote of 27.68%
- **Germany:** 85 million euros in sales volume and a market quote of 5.48%

Top 10 Destination Country (Year 2020)		
Market	**Sales Amount**	**Quote**
France	500 025 281 €	31,61%
Spain	437 950 181 €	27,68%
Germany	86 715 346 €	5,48%
United Kingdom	86 628 975 €	5,48%
U.S.A	74 339 592 €	4,70%
Netherlands	32 686 868 €	2,07%
Angola	23 350 462 €	1,48%
Czech Republic	22 989 797 €	1,00%
Switzerland	20 753 126 €	1,36%
Italy	20 725 244 €	1,00%

Table 1 *Top 10 Destination Country Per Sales Volume*
Source: *APIMA*

Although having an exporter culture, the furniture companies are highly dependent on the French and Spanish markets that have together, a quote of 59% of total sales revenues for the industry.

Crossing data from the furniture industry, obtained from the APIMA annual financial report, with the Pordata database (*Portugal: Exports of Goods: Total and by Main Trading Partner Countries | Pordata*, 2022), it is possible to realise and confirm that the furniture sector follows the exact behaviour of all industries in Portugal on export destination countries. As shown in the below graphic, Spain, Germany, and France are the most poreminent receivers of exported goods from Portugal.

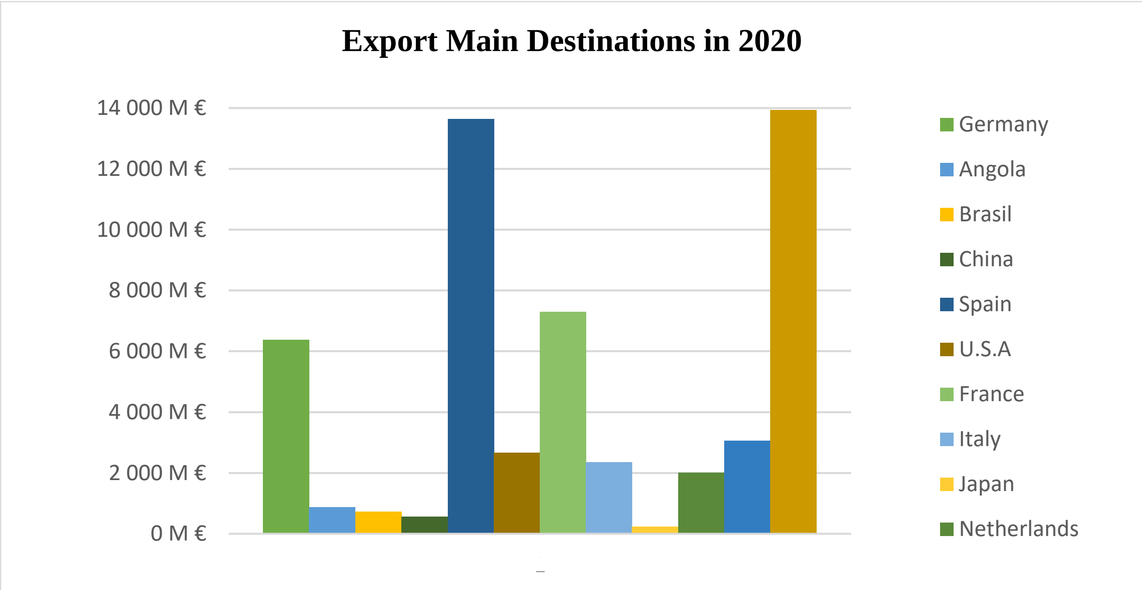


Figure 8 *Main Export Destination Countries from Portugal*
Source*: Adapted from Pordata*

The need for Internationalisation

As shown in the above chapter, the main entities in the furniture industry are micro-entities and SMEs. Following this, according to Almeida & Saraiva Da Cunha, (2019), currently, in the economic and high-tech periods we live in, SMEs (Small and medium size enterprises) face a lot of competition, not only between each other but also against larger companies. Furthermore, this competition is increased because technologies are developing at a much faster rate than ever before and due to the phenomenon of globalisation, which reflects s more competitors from outside economies.

The domestic market is often a weak source to conduct the desired result for the companies, once it is either overloaded or does not have enough customers, forcing the SMEs to cross borders, so that they can reach newer markets and different opportunities to grow and expand.

However, it is important to realise that, as cited by J. B. Fernandes et al., (2021) export business and Internationalisation involve various new costs to companies, that can only be covered with an increase in productivity or, in other words, in an increased business volume.

Typically, SMEs are organisations with an extremely limited number of resources available, both human and financial, and, have very limited knowledge regarding this subject of Internationalisation, which creates a lot of difficulties when they are going through their respective internationalisation process, leading to failure in most of the times (Almeida & Saraiva Da Cunha, 2019).

1.3 Furniture Companies: TDABC importance for calculating and monitoring costs

Nowadays, in every industry, there is a huge need for accurate costs. In the relationship between customers and suppliers, deep cost knowledge is the basis for decision-making. It is not a simple task to control and manage the costs, and it is very complex to find the costing method that can fulfil the needs and complete the complex equation of *cost vs benefits* (Teece, 2010).

A firm's global profitability depends not only on whether the sales prices can regain product costs but also on whether this gross margin is enough to cover the cost-of-serving the customer (Everaert et al., 2008; Shapiro et al., 1987). The cost of customer service includes order-related costs and specific logistics, selling, and administrative expenses.

By understanding the cost-to-serve, companies can safeguard profitability, even in a competitive environment (Foster et al., 1996). However, this requires that the cost model used is accurate and detailed enough to capture the many factors that influence the cost of serving the customer (Everaert et al., 2008)

Therefore, managers must know the unit cost of products and the cost of customer service levels to use them during negotiations with other supply chain members. Only by having detailed and accurate cost information can suppliers succeed in realising fair exchanges and profitable partnerships (Lin et al., 2017; Norek & Pohlen, 2001; Themido et al., 2000).

According to Hoozée et al. (2009), calculating and monitoring cost behaviour must be a constant task to maintain competitiveness, guarantee profitability, long-term advantage and, above all, ensure that product and service costs do not exceed market prices. Mazzuco et al. (2017) observe that, in recent decades, accounting practices management have been defined by the development of several artifacts, with greater precision in terms of allocation of costs in products – it stands out in this aspect the Activity-Based Costing (ABC), Activity-Based Management (ABM) and Balanced Scorecard (BSC). The authors highlight the ABC method presented by professors Robert Kaplan and Rob Cooper as an alternative to costing methods that would allow more information accurate costs and activities.

Understand that the costs of implementing the ABC method were extraordinarily high and difficult to implement. In 2004, researchers Kaplan and Anderson suggested a new methodology for ABC, called Activity-Based Costing or Time-Driven Activity-Based Costing (TDABC). The TDABC method simplifies the procedures of ABC because it discards the second stage of Activity-Based Costing and requires estimating only two parameters for its operationalisation: the cost of supplying resources to a specific activity and the time required to perform it.

II Chapter –Research Design and Methodology

2.1 Research Design and Methodology

Attending to the needs of the study and, to being able to reach a better solution for cost division in logistics operations, the Delphi methodology was adopted to obtain the final questionnaire, to send to the furniture companies.

The Delphi model method was created in the 1950s by mathematicians Norman Dalkey and Olaf Hermes and emerged just at the time of the Cold War, to predict the impact that technology would have on the world.

This technique allows for obtaining qualitative data, relatively accurate information, and opinions about a complex topic's future, such as logistic operations (Fernandes, 2014).

Its functionality is to reduce the possibilities of forecasts or assumptions as much as possible. This way simplifies the outcome of complex work due to the opinion of the group's experts (*Método Delphi: O Que é e Como Utilizá-Lo Na Prática*, n.d.).

The four steps of this method are:

- Define objectives.
- Selection of experts.
- Preparation and launch of questionnaires.
- Identification of results.

To design and better perform the methodological research and it´s results, the bellow table was developed:

Objective	Methodology	Expected Results	Calendar
Contextualisation of the problematic	Unstructured interviews with representatives of the sector. Documentary analysis (Strategic Plan). Sabi Data.	Evaluation of the relevance/opportunity of the research. Definition of the problem's boundaries	Sep. to Dec 2020

Positioning of logistics in the value chain. Description of the logistics process	Expert Panel Inquiry	Definition of competitive strategy typologies and their implications in the management of the logistics process. Validation of the questionnaire to be applied to the entrepreneur to describe the activities and respective times and resources.	Jan to Mar 2021
Identify and analytically describe the dominant logistics management models in the industry	Questionnaire applied to furniture manufacturing companies	Definition of the dominant structures/models of management of the logistics process of the sector, identifying the activities and defining units of measurement of consumption of human resources, equipment, and materials	Apr to May 2022

Obtain conclusions about how to better measure the transport costs in logistics transportation	Analysis of results from de applied questionnaires	Definition of the better tool to perform cost of logistics operation	May to Sep 2022

Table 2 *Timeline to perform the methodology*
Source: *Self elaboration*

2.2 Participants

The six participants in the expert panel were selected based on their experience and expertise. They all have in-depth knowledge of the sector and its operational reality, both in the strategic and operational logistics process.

One of the main goals in selecting these experts was to join the knowledge from the furniture sector and its main particularities and the deep understanding of two of the primary modes of transportation, which are sea freight and land (by truck).

Simultaneously, we intend to ensure that experts have a reasonable understanding of customs clearance procedures and related costs once they may impact the final cost of transportation. Indeed, it is a component of the final cost of sending cargo for EU- European Union and Extra EU destinations.

Following these above goals, the selected panel of experts was composed by 1- the director of AEPF – *Associação Empresarial de Paços de Ferreira*, 2 - the managing director of one specialised company in sea freight, 3 - the managing director of a truck company that is specialised in sending furniture for international destinations, 4 - the managing director of a dispatching company, 5 - one managing director of a leading furniture company and, 6 – a logistics consultant, responsible for training and development workers in logistic procedures, mainly in the furniture sector.

As shown above, this heterogeneous sample of experts allows consolidation and analysis of several visions for the same questions. For a topic with so many complexities, as is the logistics and its operations, it is indispensable to have the most different visions possible. Although having a lot of processes, all logistics procedures are connected and have the same importance for the companies' efficient workflow and regular performance.

2.3 Development of logistics model and Experts questionnaire

Using the Delphi methodology with the objectives of better understanding the sector, its main challenges, the importance of logistics, and the process of preparing and sending furniture to clients in the national and international market, it is necessary to formulate the first set of questions. Our questions were defined as shown below:

- Question 1: *"What are the big challenges for the furniture sector in the next 5 years?"*
- Question 2: "*What is the logistics process's role and importance in the furniture sector's competitiveness?"*
- Question 3: *"What type of initiatives/projects in the logistics area can the collective agents of the Municipality of Paços de Ferreira (Town Hall; Business Associations, among others) develop to support companies in the sector?"*.
- Question 4: *"How would you describe the work process associated with the logistics area of the furniture sector? (Please describe in as much detail as possible)"*.
- Question 5*: "In the following pages or, in the link below, for a preview of the web version, there is a questionnaire that will be applied to industrial companies in the logistics sector. The purpose of the questionnaire is to collect information that will serve as a basis for the description of the entire work process associated with the logistics area, to identify the activities and tasks, times, human resources, equipment, and materials consumed."*

The first question aims to understand the long plan range of the sector. This question supports the identification of present and future challenges in the furniture industry. Here, it is imperative to consider the effects of Covid'19. The questionnaire was developed in 2020. In that period of fear and uncertainty, having an extended plan range expectation was crucial for planning and developing a valid questionnaire to deliver to the firms.

Focusing on the second question, it links the importance of logistics with the sector's competitiveness. As seen in the literature revision, the sector's competitiveness is increasing, leading furniture companies to develop business behind barriers. Based on an expert's opinion, this question connects the dots to understand the connection between the logistics process and competitiveness.

Bearing in mind the covid 19 effects, the third question arises to understand the support of collective agents in the furniture sector to search if there are projects that can support the logistics activities of companies with internationalisation costs.

Question four is one of the most critical questions for developing the final questionnaire to deliver to the furniture companies. Based on this point, we were able to understand if our first theoretical draft regarding the workflow of sending furniture to the final client is or is not correct and adjusted to the company's reality.

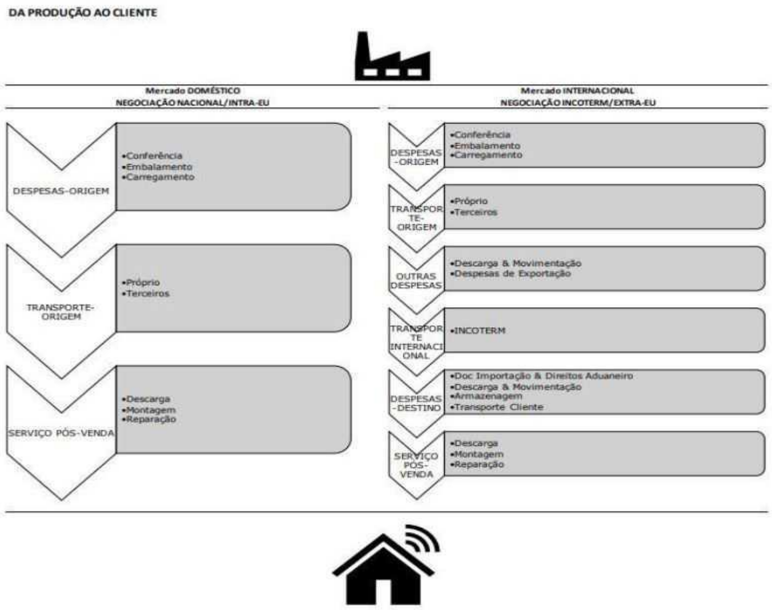


Figure 9 *Delivery workflow for national and international markets*
Source: *Self Elaboration*

Regarding the final question, the preliminary version of the questionnaire, submitted to the experts' appreciation, was based on literature and sector evaluation.

First draft of questionnaire to deliver to the furniture companies

One of the objectives of the questionnaires was to identify the present situation regarding the management and cost control systems, i.e., which management tools are actually applied by the companies and what operational and cost information could be obtained from them. Considering these objectives, a questionnaire with three main sections was designed.

SMART framework was used to design the questions and measure the results.

The fundaments of SMART framework are:

- **S** - specific: It is necessary to narrow questions
- **M**- Measurable: The question is better to be quantified and countable; it makes analysis and data collection more straightforward and more efficient
- **A-** Action Oriented: Does the question influence creation of a different or new feature approach?
- **R -** Relevant: Does the question is the most suitable to the critical aspects of the case under study?
- **T -** Time-bond: It can let the person in cause to respond for a specific period.

The first section (General Data about Respondent) contains sociodemographic questions, such as age, academic habilitation, working position and years working in the company. This section aims to characterise the respondents generally.

Following, the section 2 aims to search for economic data of the company. It intends to measure companies' size based on sales revenue, number of workers and the volume of export business.

The third section seeks to identify the management accounting/cost control tools such as balanced scored card, tableau de board. Moreover, it aims to understand if these tools produce inputs for the annual budget or comparative analysis and reports.

Another section seeks to understand if companies have access to specific data, such as working hours per worker, direct costs of material per type of process, etc. The main objective of this third section is to have an overview of used management account tools and to have some guidance on the viability of implementing a better cost division system.

Expert´s evaluation and final questionnaire

After sending the questionnaire for approval from the panel of experts, it became necessary to adjust some of the sections of the first questionnaire.

The first general change was to insert a small introduction of the financial/ economic concept where necessary because, according to experts, most furniture companies have top management or responsible logistics department personnel without further knowledge of economic ideas.

Another meaningful change was to divide sales volume per ordinary scale to do the same with all the numerical values necessary to respond to the questionnaire.

Considering that coronavirus was in its higher evolution in Portugal, the expert´s suggested that it would be better to add values for the years 2019 and 2020, aiming to search for further studies and compare some values differences in case of need.

Section 3 was divided in two; thus, it was created 4th section. Based on these changes, section 3 has now got questions that search to understand the type of management tools furniture companies are already applying to support strategic decisions, such as the usage of tableau de board, forecasting, and others.

The new section 4, named "Management Accounting and Logistics", aims to understand the workflow of preparing and sending furniture from the factory to the client destination, bearing in mind all steps and costs related to the process. Here it is questioned if the company has access to specific information such as the costs per process presented in the workflow, and the labour hours spent in each part of the process, among other expenses related to the workflow steps.

2.4 Creation of the transport workflow

In the development of the questionnaire, it became necessary to understand the cost allocation in each division of transport procedure. To do this division correctly is necessary to know in which kind of agreement will be delivered the goods. In this way, the idea of who will pay for the service of the exchanged goods became relevant.

The growth of the global economy has given most businesses greater access than ever before to markets all over the world but is quite important to *"live by the same rules"* when the subject is the economic trade of goods.

The ICC – International Chamber of Commerce is responsible for ensuring fair international trade for the growth and prosperity of companies.

ICC is responsible for the creation of the so-called "incoterms". These incoterms are rules that describe the bellow information helping to manage the matter of national and international transactions of goods:

- Obligations: Who does what as between seller and buyer, e.g., who organises carriage or insurance of the goods or who obtains shipping documents and export or import licenses.
- Risk: Where and when the seller "delivers" the goods, in other words where risk transfers from seller to the buyer.
- Costs: Which party is responsible for which costs, for example, transport, packaging, loading, or unloading costs, and checking or security-related costs.

(*Incoterms 2020 Rules for the Use of Domestic and International Trade Terms*, 2019)

Based on the incoterm's definition of obligation, risk and cost, the bellow workflow was developed:

SEQUENCE IN THE ALLOCATION COSTS BETWEEN SELLER AND BUYER

Local	Concept
Country of Origin	1 Packing and checking
	2 Charges for loading at the seller's premises
	3 Transport in the country of origin (pre-transport)
	4 Customs expenses (export)
	5 Charges at the boarding terminal)
Internacional	6 Main Transport
	7 Transport Insurance
Country of Destination	8 Charges at the Destination Terminal
	9 Customs expenses (importation)
	10 Logistics and Transport in the destination country (transport)
	11 Unloading charges at the buyer's premises

Table 3 *Sequence in The Allocation Costs Between Seller and Buyer*
Source*: Adapted from International Chamber of Commerce, (2019)*

This first draft provides insight into the allocation of the specific costs in sending the goods to the destination. The main problem is to understand the part costs can be passed from the seller to the buyer, according to the incoterm agreed at the time of contracting the transport of goods. Another limitation of this sequence is that it does not contain the hypothesis of sending the goods, only to the national market.

To better have a clear vision about how split the costs of the process, a new diagram was created based on the selected incoterm. As an example, if a customer buys a chair and needs to be delivered in Switzerland, choosing the incoterm FCA (Free Carrier), it is the carrier's responsibility only until the cost of customs clearance in origin:

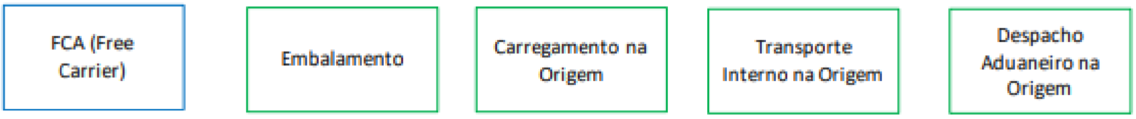


Figure 10 *FCA Incoterm Obligations*
Source*: Adapted from International Chamber of Commerce, (2019)*

The costs that the shipper needs to add to the process of transport of this transaction are composed by packaging, loading in the firm, transport until the customs in Switzerland and then, all the next related costs are going to be the buyer´s responsibility.

2.5 Data Collecting Procedure

The results of this study will be obtained through the qualitative analysis collected from the final questionnaire approved by the sector experts, using the online platform Zoho Forms.

As already mentioned, the questionnaire suffered slight modifications to fulfil the suggestions of the experts panel, which tried to adapt and adjust as much as possible to the reality of the furniture sector and the needed information to perform this study. Only the opinion questions were able to be inserted with an empty value once, all the multiple and quantification questions were created with the obligation of being answered to submit the questionnaire.

The selection of entities to send the form was performed with SABI - *Sistema de Análise de Balanços Ibéricos* database software, filtering all the entities by CAE Rev 31, obtaining a total of 8506 search results. The top 100 entities to participate in the study were selected from this total amount.

After the first round of sending the questionnaire via email to all companies, only two submitted the answers. It was reinforced again by email and by a mobile call to the selected companies, explaining the study, his importance, and the importance of having data to perform it better. Even making this second approach, only nine participations were obtained.

III Chapter – Results Analysis

3.1 Analysis of the expert´s answers

The content analysis of expert´s answers was done for each question separately. This procedure allows us to get a deeper view of each question.

For each question, a table is presented expert´s answers and, at the end of each table, there is a synthesis of all results and main ideas Question 1 - "What are the big challenges for the furniture sector in the next 5 years?"	
Expert 1	The pandemic will undoubtedly condition the issue of the furniture sector in the next 5 years, because this situation has resulted in a new economic and social order. It is our understanding that this process of economic and social transformation is still ongoing, which will certainly be a unique opportunity for the Portuguese furniture industry to position and reassert itself in the domestic market, but above all abroad, namely by the differentiation and quality of the product, production capacity, positioning the country in a favorable geography position to Europe and the world. Today we buy and sell "Global" as such, having a strategy and creating partnerships in a global dimension, will certainly allow the Portuguese furniture industry to assert itself before any competing market, whatever size it may be.
Expert 2	The great challenges are through competitiveness, innovation, design and quality, application of good materials, I think that only in this way we will be able to compete with Asian markets and some European countries specialised in this sector.
Expert 3	The great challenges of the furniture sector for the coming years will be the increasingly less specialised workforce and the loss of acquired know-how, the valorisation of the imputation of added value and product differentiation, the affirmation of Portuguese furniture in the international context, the adaptation to new consumption habits and the environmental sustainability of the furniture industry.

Expert 4	Considering the situation, we are currently experiencing caused by the pandemic, we can immediately highlight problems related to breaks in the supply chain and supply and the abrupt reduction in orders. It will be necessary to restructure the working method to rebuild and reinvent the sector.
Expert 5	Given the pandemic situation we are in, I would say that everything is very unpredictable, and we cannot control as much as we thought. At this moment, we are still trying to understand how the market is going to behave, and governmental decisions may influence, to a large extent, the actions of consumers and, consequently, the reactions of companies. Anyway, there is a problem in the companies, which is generalised, and we are trying to find solutions, to stop this problem. It has to do with the lack of skilled labour, predominantly due to uncompetitive salaries and, not least, the increase in demand for higher education, which to some extent, takes away the interest in operational work. To fill this gap, we try to offer ourselves to companies, as a training entity, to specialise their employees, from the various areas, aiming to specialise as much as possible. However, it is important to train young people, just as in any other area, since many of these contracted employees are of a much older age group. As an example, although it is not in our municipality, the “Centro de Formacão Profissional das Indústrias da Madeira e Mobiliário” receives high school students, through professional courses, in the field of furniture and similar skills. It is, without a doubt, the best training source for young people who will work in our companies in the future. But we don't want to stop here. The area of furniture is as important and exciting as any other. Therefore, we try to create partnerships with higher education, and not underestimate this sector, through young people in areas such as design. It is fundamental for these companies to have innovation in their products, making them different in the market and creating trends.

Expert 6	In the business world, the main challenge is always the market. It is to anticipate the market's needs and respond to them. It is to be as innovative as possible and to do it assertively. If I can anticipate a market need and respond with a product in an adjusted way that no competitor has, I can set the price at a higher value. That is permanently our challenge. Whatever the moment, as far as the business world is concerned, what matters is that we respond to a market need, whatever it may be. It may even be a need that I create, but it is always necessary. I must respond to that need, preferably alone. The more alone I am, and the more difficult others are to copy, the better my product is, and the better I am positioned in the market.

Table 4: *Answers to the first question*
Source*: Self Elaboration*

As expected, the covid 19 theme is one of the concerns in the long plan range. Experts one, four and five, both refers that covid 19 effects will undoubtedly change the furniture sector in the next 5 years, because there is a new economic and social order resulting from this situation. It is the responsibility of managers to understand that this process of economic and social transformation is still underway, which will undoubtedly be a unique opportunity for the Portuguese furniture industry to position and reassert itself in the domestic market, but above all abroad, namely, by the differentiation and quality of the product, production capacity, favourable geographic positioning of the country to Europe and the World. Another effect related to the pandemic, referred by the experts, is the shortage of raw materials in the supply change.

Important thematic as innovation, positive difference, design, and informatisation of procedures will present significant challenges in the next five years. It is essential to refer the sustainability in emergent markets. To be competitive, searching for new consumption habits with more eco-friendly approaches is necessary.

Another critical topic is the lack of skilled labour. This theme has already been referred to in the sector framework and, arises again as one of the major concerns in the next five years. Some possible explanations for this may be the uncompetitive salaries and, not least, because of the increased demand for higher education, which to some extent, takes away the interest in operational work.

Question 2 -" What is the role and importance of the logistics process in the competitiveness of the furniture sector?”	
Expert 1	In this field, we must take advantage of the various logistics models and processes already developed because large furniture producers worldwide and adapt them to our reality. The entire supply chain must be aligned with organised and optimised logistics processes. The management and communication between purchasing, planning, orders/orders, production, is fundamental in optimising resources with immediate implication either in costs or in the speed of execution of the order as well as the quality of the final product. Creating dedicated logistics centres (Hubs) can optimise the efficiency and, consequently, the logistics costs involved in this area.
Expert 2	For meeting the delivery deadlines, safety and quality of the logistics chain is very important. It is important for furniture manufacturers to have good logistics operators. A good logistics service will make the End Clients bet more on this sector.
Expert 3	Creating a global network of specialised transport has been discussed and proposed several times in the municipality and the Sousa Valley area. To provide scale so that transport companies could invest in their specialisation in the furniture business combined with a competitive cost can shorten the distances to European markets and thus position us with a competitive price, freeing up room to invest.
Expert 4	Currently, and considering the situation in which we find ourselves, it would be important to obtain support for developing and updating infrastructures and even operating/computer systems to boost the company's performance and ensure better results.

Expert 5	Most of our furniture companies have no idea of the importance of logistics and how a bad logistics organisation can affect all their sales, profits, and customers. We have companies with great structures but poor resource management and vice versa. On the other hand, we have many small companies, which do not even have ten employees. The latter don't even know what a manufacturing order is, and they don't know what a customs clearance is. They need intermediaries for export because they don't have the specialised resources to communicate. A lot of issues lead only to sales, production, and shipping without knowing what procedures they are exactly using, if they are right and if they can improve them. Another issue, no less important, is the difficulty in cooperation between rival companies. We are talking about a very competitive market, where only in the municipality of Paços de Ferreira and Paredes, which are neighbor's, we find the largest cluster of furniture production entities in the country. This makes the competition tremendous and the competition between them increases without any white smoke when we talk about partnership. The same companies collaborating with each other, to provide a more efficient process for both seems to me to be an agreement with no smoke in sight. They still see each other as "every man for himself" and tend to find distinct solutions where each one benefits individually.

Expert 6	Logistics is an ambiguous challenge because what is going to arise is the need, on the one hand, for companies to improve the way they transport their products - and, here, the packaging is fundamental - and, on the other hand, for transport companies to articulate their processes, to reduce operation costs significantly. It is a job that interferes with the companies' logistics sector and process organisation. In this case, the Business Association of Paços de Ferreira may play a fundamental role and be an added value. It is because most of the existing companies in this sector, in the municipality of Paços de Ferreira, are micro-companies with few resources and without large storage capacities. Thus, with a privileged agreement with a carrier, which, in turn, offers privileged agreements to its customers (of the association), AEPF could make the infrastructure and resources available to receive goods from all producers. It would allow, on a regular basis, to reach certain frequencies, such as the fulfilment of schedules, optimisation of administrative resources, delivery guarantees, load utilisation and, consequently, better transport prices. All this would necessarily also lead to another level of organisation on our part, mainly in infrastructures, in the standardisation of processes and procedures, to make them as effective and efficient as possible. There are characteristics that are extremely important. The first is regularity. All customers know that there are certain lines, where trucks leave on those exact days of the week and are expected to arrive within the stipulated transit time. The second is not to fail. Delays happen to any haulier. But we cannot afford to have delays on a regular basis. The same applies to the supplier; when he commits to delivering goods, don't miss production deadlines. Here, the key is to have good professionals working with us. The third is security. It is extremely important that the goods arrive at the customer as they were sent from the supplier. If there is damage, the costs will be quite high because we are not talking about cheap materials, nor about short distances, where the replacement of the item cannot be supported by the profits from the sale. Not to mention the bureaucracy,

	between the responsibility and compensation that will be "kicked" afterwards, from one side to the other. It is fundamental to understand that the administrative responsibility, through AEPF could be shared by all clients, instead of working in each company. It is a way of empowering micro-companies and making the larger ones profitable. Always in win-win conditions - not at the expense of anyone's loss, but mainly at the expense of the organisations' gains, by optimising processes.

***Table 5**: Answers to the second question*
***Source**: Self Elaboration*

As mentioned before in this paper, this question tries to connect the dots to understand the connection between logistics process and competitiveness, based on expert´s opinion.

According to expert´s opinion, logistics plays a major importance role to fulfill the delivery deadlines. It is important for furniture manufacturers to have good logistics operators because, a good logistics service will make the final costumers bet more in this sector. Many experts arise with the need to creation of a global network of specialised transport companies for carrying the furniture at better costs and including a better logistics service to the sipper and consignee of goods.

The entire supply chain must be aligned with an organised and optimised logistics. The management and communication between purchasing, planning, orders/orders, production, is fundamental in the optimisation of resources with immediate implication either in costs, or in the speed of execution of the order as well as the quality of the final product.

The fact of companies being geographically distributed in particular locations of the Portuguese territory and that, only in the municipality of Paços de Ferreira and Paredes (which are neighbor locations), it is possible to find the largest cluster of furniture production in the country, according to some experts, it creates a more aggressive competition between them, which leads to very difficult chances to create partnerships to improve furniture transportation.

Question 3 - “What type of initiatives/projects in the area of logistics can the collective agents of the Municipality of Paços de Ferreira (Town Hall; Business Associations; among others) “	
Expert 1	The collective agents of the Municipality of Paços Ferreira, should promote communication and the exchange of experiences, organising colloquiums to debate the problems and develop effective solutions for this industry through the testimony of those involved in the most diverse sectors in this area.
Expert 2	Probably to encourage the Logistic/Transportation Operators, to bet in this geographical area, to install themselves there. The support of the Municipalities, in this case the one of Paços de Ferreira is important.
Expert 3	The creation of a global network of specialised transports has been discussed and proposed several times, not only in the municipality, but also in the *“Vale do Sousa”* area. To provide scale so that transport companies could invest in their specialisation in the furniture business combined with a competitive cost able to shorten the distances to European markets and thus position us with a competitive price, freeing up room to invest.
Expert 4	Currently, and considering the situation in which we find ourselves, it would be important to obtain support for the development and updating of infrastructures and even operating/computer systems to enhance the company's performance and ensure better results.
Expert 5	AEPF has initiatives to promote its associates, although few of them are related to logistics, strictly speaking. One of them is the Furniture Capital Fair, where we gather all the companies that want to participate in it, to expose their articles to private customers and possible resellers. It is the biggest furniture fair held annually in Portugal.

Expert 6	Firstly, recognise the problem or the possibility of its existence. That is the first initiative. Then, it's trying to find solutions to the problems that affect companies. If we try, we will succeed in some way, in a certain period. But if we do nothing, we will not succeed. Now, these problems are solved with a collective effort and the companies we speak of tend to have a perspective of every man for himself, especially when we speak of competitors. They are not very concerned with collective efficiency, but rather with the efficiency of their own activity. However, it is easy to see that we would all gain if we could achieve a significant improvement in logistics, from an increase in sales, due to better price competition; satisfaction of transporters, due to standardised packaging of goods; satisfaction of clients, due to better cargo packaging. I strongly believe in the role of associations, given the type of companies we have in the municipality. The history we have tells us that our furniture companies are "lazy" when it comes to solving problems. By this I mean that they tend to do what makes them money and not what is necessary. In other words, they are more geared towards the management of funds, rather than the need to solve problems or conflicts between associates. Companies prefer to look for activities where they can easily obtain income, as is the case with funded training, rather than necessarily channelling investment into an issue within the organisation. From a political perspective, I think it's a bit different. The political power interferes with companies as a warning or a reminder of problems that may exist. It's seen more as a starter to recognise a problem. Then, it is up to the companies to find the answers and take measures that respond to those challenges.

Table 6: *Answers to the third question*
Source*: Self Elaboration*

Related to the vital role that business associations can perform to support the associated results, promoting communication and the exchange of experiences, organising symposiums to discuss the problems and develop effective solutions for this industry through the testimony of participants from the most diverse sectors in this area.

Another important role is the importance that business associations can have is connecting all the firms in the sector. As one of the topics discussed in the past questions, it can be stated that most experts believe that cooperation between furniture companies is the key to decreasing the high costs of transporting furniture goods. This margin, obtained from the optimisation of the logistics process through cooperation, could be invested in an internationalisation strategy or new innovative furniture models, to create a positive difference in the global furniture market.

Question 4: "How would you describe the work process associated with the logistics area of the furniture sector? (Please describe in as much detail as possible)"	
Expert 1	The working process in the logistics area of the furniture sector, in our opinion, must take into account the optimisation of resources that must include a series of factors such as the correct choice of the incoterm, the use of (3D) space management systems for the optimisation of loads, specialised load centres (HUBs) with know-how in this specific area, the design of the parts with a space efficient packaging, but safeguarding the quality and safety of the product, the transport negotiation done in an efficient way, through the use of space (in containers or trucks) with several loads sharing the costs (LCL/ LTL) capitalising and making the most of the cost of the cargo space. This optimisation requires something that is not easy to implement, which is a kind of "mobile industry cooperative". Not resisting the changes and the demands of the new times and using all the resources available in Logistics will dictate the success of the Furniture Industry in Portugal.
Expert 2	I do not have the experience to be able to answer this question. I would like to inform you that my area is totally customs. I am aware that we export a lot of furniture for the Hospitality sector because we have a client who exports furniture for this sector. At the Import level, my experience includes some wooden furniture and chairs/seats.

Expert 3	The normal logistics process is to use specialised transport with costs that can represent 10 to 20% of the furniture value or to opt for generalist transport and run the risk of defective handling and possible damage. This requires an extra packaging cost and total quality control of deliveries. Testing and constant monitoring of transport companies is a good practice until you find the one(s) that offer the best guarantees. Many industries do not find this balance and opt to buy their own fleet, as it is cheaper than specialised companies.
Expert 4	The logistics process associated with the furniture sector is quite laborious. When it comes to furniture, it is necessary to be in constant contact with customers, which in most cases are the suppliers themselves, to monitor the production and finalisation of the product. As soon as the goods are finished, they are collected or delivered to our facilities. When the goods enter the warehouse, the load is classified and packed. The goods are then grouped by destination and the van/truck is loaded. The best routes are analysed to reduce costs (diesel, tires...) and reduce delivery times. Set Go monitors the goods from the exit of our warehouse to the final customer. An appointment is made with the end customer and the exporter is informed as soon as the goods are delivered. It should be noted, especially in the case of the furniture sector, that the possibility of delays by suppliers in the finalisation of products is relatively high. This way, we must adapt to the conditions presented to us and consequently adapt the logistics process already started to guarantee the deadlines and maintain the quality of the service.
Expert 5	I do not have enough knowledge to give a concrete and accurate answer.
Expert 6	Regarding shipping, some companies have their own transport; some look for freight forwarders, and others do it in a mixed way. As for the transport of goods with assembly, the same thing happens. Some companies have

	their transport and assembly teams and sometimes transport the teams and the goods in the vehicle itself. Others have their own assembly teams in the country of destination and, in addition to these, companies here seek partners abroad. Of the 5,000 companies we have in this association, you will certainly find completely different structures.

Table 7 *Answers to the fourth question*
***Source**: Self Elaboration*

The most suitable answer to question 4 was the one from Expert 4. According to his description, the logistics process associated with the furniture sector is quite laborious. When it comes to furniture, it is necessary to be in constant contact with customers, which in most cases are the suppliers themselves, to monitor the production and finalisation of the product. As soon as the goods are finished, they are collected or delivered to service provider facilities. When the goods enter the warehouse, the load is classified and packed. The goods are then grouped by destination and the van/truck is loaded. The best routes are analysed to reduce costs (diesel fuel, tires...) and reduce delivery times.

It is referred by some expert´s too, that some companies have their own transport, some look for freight forwarders and others do it in a mixed way. As for the transport of goods with assembly, the same thing happens. Some companies have their own transport and assembly teams and sometimes transport the teams and the goods in the vehicle itself. Others have their own assembly teams in the destination country.

As it is generally a complicated cargo to handle, there is a constant need to search for a better solution regarding ratio price *vs* quality service. Finding optimal values of this ratio is very complicated, so many furniture companies choose to buy their own fleet because it is cheaper than specialised companies.

Question 5: “In the following pages or, in the link below, for a preview of the web version, there is a questionnaire that will be applied to industrial companies in the logistics sector. The purpose of the questionnaire is to collect information that will serve as a basis for the description of the entire work process associated with the logistics area, to identify the activities and tasks, times, human resources, equipment, and materials consumed”	
Expert 1	I think the questionnaire is fit for the purpose.
Expert 2	The questionnaire is very complete, well framed in the context of the sector
Expert 3	I would include service valuation questions to understand what values per m3/delivery we are talking about for each market, both the ones you currently pay and the ones you want/should pay. I would include more sensitive questions such as: would you have any problem loading at a nearby competitor's premises if this would mean significant savings? Ask directly if they see any problems or disadvantages in joining a local logistics network where they would have to provide their customers' details, such as addresses, so that as a group they could look for partners (competitors) who have goods for the same customer/destination. The sharing of information is crucial to the success of this project. Still, it is also one of the biggest psychological barriers in our sector and municipality, mortgaging the project from the start. It is necessary to convince them that saying that they sell to a certain client, in what volume and with what regularity will not harm them or cause them to lose business. On the contrary, it will boost their competitiveness and that of their partners (local competitors) in the international market. It must be us competing with the "world" and not us competing with our "next door" neighbor. This is what we have been doing and we are slowly "killing" each other's margins, becoming more and more fragile before the client.
Expert 4	No Reply

Expert 5	The survey seems fine to me, in general. However, it is important to remember that the mentality of the companies in this sector, given all the problems that exist, do not have "time to waste". In addition, managers of these companies are mostly operational and are present in the factories, close to the production and not in the offices, nor do they participate, to a large extent, in administrative tasks. It is, therefore, essential to review the questions in perhaps not-so-technical vocabulary so that the questions are straightforward and easy to understand.
Expert 6	In this context, I would say that it is complicated for us to get companies to fill out a questionnaire. I am, in fact, always very reluctant when I must do it, since they are seen as a waste of time. So, I would suggest some changes in shortening the answer options, as is the case of one of the initial questions, where it asks the level of education. I believe that the goal here is the importance of the level of schooling and, thus, it would be more pertinent to understand if they have the former 4th grade, secondary education (vocational or general) or, if beyond this, they went on to secondary education. In this case, I think that what is important to keep in mind is the issue of school interest and the education obtained, rather than in which year they stopped. As far as accounting figures are concerned, it is important to stress that those answering the questionnaire, if they are from the logistics sector, may understand little or nothing about accounting issues. It is therefore advisable to adapt the vocabulary to general and less technical terms. Finally, it would be easier to create scales of values to make it easier to answer the questionnaire. Otherwise, the respondent may pass the questions to accounting or give up.

***Table 8** Answers to the fifth question*
***Source**: Self Elaboration*

Regarding the analysis of the expert´s answers to this bellow question, it is crucial that many managers in furniture companies are mostly operational and are present in the factories, close to production and not in the offices, nor do they participate to a large extent in administrative tasks. It is, therefore, essential to review the questions in perhaps not-so-technical vocabulary so that the questions are straightforward and easy to understand.

To mitigate this effect, all the economic terms were revised and, as bellow already said, added to the questionnaire some light introduction about the economic figure we were asking about.

Another interesting suggestion was that it would be easier to create scales of values, to make it easier to answer the questionnaire. Otherwise, the respondent may pass the questions to accounting or give up.

3.2 Analysis of the furniture companies Questionnaire

According to data retrieved from the application of questionnaires, it is possible to obtain several information about the analysed companies. The responsible person for answering and submitting data was between 35 to 59 years old.

Related to this information, it is possible to understand that the person at a more advanced age is the one with the lowest level of studies and, 77% have a superior degree and, most people have more than 10 years of experience in the sector.

One of the most common problems referred to by the experts is the lack of synergy between direct competitive companies in the furniture sector. In that sense, the questions 2.9 and 2.10 were strictly directed to understand the openness of the companies to initiatives in this field.

Encontraria algum inconveniente em carregar nas instalações de um concorrente próximo, caso significasse uma poupança significativa?
Não
Não
Não
Sim
Sim
Não
Não
Não
Sim

Table 9 *Question 2.9 of Companies Questionnaire*
Source*: Self Elaboration*

In question 2.9, the companies were asked if they saw any inconvenient in charging goods in a competitor´s place, if this would mean significant savings. Surprisingly, 67% of participants answered "No".

The intention of the question 2.10 was to understand if, as suggested by the experts, some external entity would be capable of specialising and giving a quality service for the right price, so that companies can save some margin to invest in the development of other sectors. In this case, the percentage of "No" answers rises to 89%

Encontra algum problema ou desvantagem em aderir a uma rede logística local gerida por uma entidade externa?
Não
Não
Não
Não
Não
Não
Não
Não
Sim

Table 10 *Question 2.10 of Companies Questionnaire*
Source*: Self Elaboration*

Regarding the application of some management account tools to support the strategic decisions of the companies, it can be observed the bellow compacted information:

Type	Percentage of positive answer
Management account	33%
Standard cost model	33%
Annual Budget	67%
Annual budget per department	33%
Tableau de Board	44%
Balanced Scored Card	11%

Table 11 *Application of Management Tools*
Source*: Self Elaboration*

The most used management tool companies are applying is the *annual budgeting* for the company as a whole. Tableau de board is the second most used management model, followed by the application of management account, standard cost model and annual budget per department. These last three, with a usage of 33% compared to the total number of companies.

Questions 4.8 and 4.10 aim to pursue the best solution tool that can support the decision-making process and an accurate cost division according to transportation activity and performance. As seen before, the transport workflow follows specific steps and, for these questions, it was asked about the possibility of obtaining information retrieved from the accounting information system.

Available working time allocated to the activity (measured in annual labour-hours), the yearly cost of labour work, and fixed or semi-fixed costs directly related to transportation activities, are information possible to obtain from some furniture companies.

Although being possible to obtain this information from the companies, there are some variables, such as the standard rate of use of available time in the loading cargo phase, where only 22% of total answers.

Conclusion

This paper aims to identify the management and cost accounting model that better answers the specificities of a critical scope of logistics in the furniture sector, which is transportation to the customer.

As a primary approach, it was created a panel of experts, which were selected by their experience and, to have in-depth knowledge of the sector and its operational reality, both in strategic terms and in terms of managing the logistics process.

The heterogeneous sample of experts allows to consolidate and analyse several visions for the same questions. For a topic with so many complexities as it is the logistics and its operations, is fully necessary to have the most different visions as possible. Although having a lot of procedures, all procedures of logistics are connected and have the same importance for the efficient workflow and regular performance of the companies.

The questions presented to the experts were created to perform a better understanding of furniture market, the big changes in a long-range plan and to evaluate a previous questionnaire and workflow of transportation model, to send to the furniture companies in the market.

Relevant information, regained from expert´s, shown that there are some active problems in the sector, such a lack of skilled labour work to fulfil the sector needs and an important matter as innovation, positive difference, design, and informatisation of procedures. The covid 19 effects and new consumer habits, are among the main concerns in the sector. The reality is that to maintain competitiveness in comparison to the greater market references, the companies need to bet on quality and differentiated furniture design.

The objective to create the bridge between logistics process and competitiveness, based in expert´s opinion was explored, and it was possible to realise that logistics management and organisation, plays a major importance role to fulfil the delivery deadlines.

It is important for furniture manufacturers to have good logistics operators because, a good logistics service will make the final costumers bet more in this sector. Many experts arise with the need of creation of a global network of specialised transport companies for carrying the furniture at better costs and including a better logistics service to the shipper and consignee of goods.

Another important role is the importance that business associations can have, connecting all the firms in the sector. As being one of topics discussed in the past questions, it can be stated that major part of experts believes that cooperation between furniture companies is the key to decrease the high costs of transporting furniture goods. This margin, obtained from the optimisation of the logistics process through cooperation, could be invested in internationalisation strategy or new innovative furniture models, to create the positive difference in the furniture global market.

Although some expert´s relate that it can exist a lack of capacity to create synergies between the furniture companies, the analysis of the companies shows that it can be possible to create this cooperative effect. The questions 2.9 and 2.10 where strictly connected to try to understand the opening to the subject cooperation between companies and, in both, it is possible to realise that a percentage of 67% companies doesn´t have problems regarding load cargo in a direct competitor if this could would bring an advantage in the cost reduction of transportation goods and 89% says that would not have problems to deliver cargo to a specialised sector entity that can handle all the transportation process.

The companies that gave respond to questionnaire, already uses some cost management tools as the adoption of management account, Standard cost model, annual budget per company and per department, tableau de board and balanced scored card.

Crossing que gathered information obtained from the experts, with the answers to the questionnaires and literature review it is shown that, 1St companies have accounting data in their records and, if it does not have them, it is not very expensive to obtain them, which makes it no difficult to find access to information, in order to adopt a correct management tool, 2nd although being very complex, it is possible to standardise the customer service logistics and transport workflow in the furniture companies and 3rd the percentage of indirect costs of all different orders are a very important part of total cost of shipping . Generally, in the same cargo, there is a groupage of several orders to different clients, which complicates the correct and accurate cost division per order. As most companies are SMEs, with an important need to export to external markets to grow and, bearing in mind that logistics is very important in the process of Internationalisation, the adoption of TDABC can be used as a cost model to support and give accurate cost management.

Logistics operations are very complex, with many factors that can influence the cost accuracy, and there is a constant need for action - reaction attitude. As the markets got highly competitive and volatile in the last decades, logistics tends to adjust to the company needs, to better serve its clients.

Based on the incoterm's rules, the workflow created in this study tries to simplify the process and divide the costs responsibilities according to what is defined by buyer and seller. TDABC, can perform an accurate cost division per each phase of the transport workflow, and determine the total cost of the operation with high precision.

To be applied it would be necessary to have data from working hours for each phase, the amount of human capital, and all direct and indirect costs, related to the phase in question. It is important to understand that TDABC method simplifies methodology of ABC, when it discards the second stage of Activity-Based Costing and requires estimating only two parameters for its operationalisation: the cost of supply resources to a specific activity and the time required to perform it.

The major limitation of this study is the lack of answers to the questionnaire. Despite several attempts to obtain answers, it was extremely difficult to obtain data. One possible explanation for this, is that during the pandemics period, a lot of companies started to receive a considerable amount of online survey´s, so that could be performed studies for the impact of pandemic on the society consumer habits and companies' operations. It was a period of deep changes and uncertain that marked and affected all aspects of society.

Having a larger range of answers to the study, would allow to better perform the results analysis and it would contribute to enrich the study that was made.

For further research and development, the action- research methodology could be applied to create and implement the TDABC in a real case. Technologies as Outsystems, allows to create web-based applications, with the possibility to be integrated with the accounting software of the furniture companies and so, calculate a real and live estimation cost of sending a specific sending order, from seller to buyer, having in the cost equation which incoterm was selected and all the costs that TDABC can attribute directly to all phases of transport workflow.

Bibliography

Almeida, M. B., & Saraiva Da Cunha, G. (2019). *Internationalisation of SMEs in Portugal: Focus on the shoe manufacturing industry of Portugal*.

Barbosa, R. (2020). *Os impactos da Indústria 4.0 na Indústria do Mobiliário-Caso de Estudo: Vilar dos Prazeres*.

Caetano, E. (2021). *Indústria do mobiliário rejeita encomendas "todos os dias" porque não há trabalhadores – Observador*. https://observador.pt/2021/11/02/mobiliario-rejeita-encomendas-todos-os-dias-porque-nao-ha-trabalhadores/

Council of Supply Chain Management Professionals. (2012). *CSCMP's Definition of Logistics Management*. https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx

DGAE. (2020). *Dashboard de monitorização das empresas nacionais (não financeiras)*.

Everaert, P., Bruggeman, W., Sarens, G., Anderson, S. R., & Levant, Y. (2008). International Journal of Physical Distribution & Logistics Management Cost modeling in logistics using time-driven ABC: Experiences from a wholesaler Customer profitability analysis with time-driven activity- based costing: a case study in a hotel. In *International Journal of Physical Distribution & Logistics Management* (Vol. 38, Issue 5).

Farahani, R. Z., Asgari, N., & Davarzani, H. (2009). Contributions to Management Science: Supply Chain and Logistics in National, International and Governmental Environment: Concepts and Models. In *Supply Chain and Logistics in National, International and Governmental Environment: Concepts and Models*.

Farahani, R. Z., Rezapour, S., Temponi, C., Eds, N. V., Klausnitzer, A., Lasch, R., Impact, T. H. E., Trade, O. N., & Jaekel, F. (2018). Logistics Management: Contributions of the Section Logistics of the Germen Academic Association for Business Research. In *Cloud Logistics* (Vol. 262).

Fernandes, G. J. P. (2014). A metodologia Delphi como ferramenta de apoio na gestão de destino turísticos. *Revista Turismo e Desenvolvimento*, 129–131.

Fernandes, J. B., Barbas De Albuquerque, E., & da Silva, A. F. C. (2021). *The internationalisation dilemma of Portuguese furniture sector SMEs*. *23*, 53–62.

Fernandes, J., & Machado, F. C. (2016). *The influence of company size in its capacity for Internationalisation: an application to the Portuguese furniture manufacturing industry*.

Foster, G., Gupta, M., & Sjoblom, L. (1996). Customer profitability analysis: Challenges and new directions. *Journal of Cost Management*.

Ghiani, G., Laporte, G., & Musmanno, R. (2003). Introduction to Logistics Systems Planning and Control. In *Syria Studies* (Vol. 7, Issue 1). John Wiley & Sons, Ltd.

Gleissner, H., & Femerling, J. C. (2013). *Logistics: Basics - Exercises - Case Studies*. Springer International Publishing.

Henriques, G., & Moreira, M. R. (2010). *Barreiras Logísticas à internacionalização-Uma revisão da literatura por Gonçalo Henriques Dissertação de Mestrado em Economia e Gestão Internacional*.

Hernández, R. J. G., & Garcia, M. J. (2008). *The Projects manager and the logistics*.

Hoozée, S., Vermeire, L., & Bruggeman, W. (2009). *A risk analysis approach for time equation-based costing*.

Incoterms 2020 ICC rules for the use of domestic and international trade terms. (2019).

Instituto Nacional de Estatística (Portugal). (2007). *Classificação portuguesa das actividades económicas.* Instituto Nacional de Estatística.

International Chamber of Commerce. (2019). *Incoterms® 2020 English*. ICC Services Publications Department.

James L Heskett; Nicholas A Glaskowsky; Robert M Ivie. (1973). Business logistics: physical distribution and materials management. *New York: Ronald Press*, 14–21.

Kenton, W., J. Boyle Michael, & Eichler, R. (2022). *Gross Value Added (GVA): Explanation, Formula, Example*. https://www.investopedia.com/terms/g/gross-value-added.asp

Kukovič, D. (2014). A Comparative Literature Analysis Of Definitions For Logistics: Between General Definition And Definitions Of Subcategories. *Business Logistics in Modern Management*, *0*(0), 111–122.

Lagorio, A., Zenezini, G., Mangano, G., & Pinto, R. (2022). A systematic literature review of innovative technologies adopted in logistics management. *International Journal of Logistics Research and Applications*, *25*(7), 1043–1066.

Larguesa, A., & Castro, F. (2022, January 26). *Mobiliário corta investimento e recusa encomendas por falta de trabalhadores – ECO*. https://eco.sapo.pt/especiais/mobiliario-corta-investimento-e-recusa-encomendas-por-falta-de-trabalhadores/

Lin, N., Fu, Y. C., & Hsung, R. M. (2017). The position generator: Measurement techniques for investigations of social capital. In *Social Capital: Theory and Research*.

Mazzuco, M. A. S., Wronski, P. G., & Zonatto, V. C. da S. (2017). Custeio Baseado em Atividades e Tempo (TDABC): um estudo em uma instituição de ensino superior do sul do estado de Santa Catarina. *XXIV Congresso Brasileiro de Custos, Florianópolis, SC, Brasil*.

Método Delphi: o que é e como utilizá-lo na prática. (n.d.). Retrieved October 30, 2022, from https://www.questionpro.com/blog/pt-br/metodo-delphi/

Michlowicz, E., Smolińska, K., & Zwolińska, B. (2015). *LOGISTICS ENGINEERING IN A PRODUCTION COMPANY*.

Morgado, F. (2012). *A Exportação/Internacionalização Das Empresas Do Setor Do Mobiliário Do Vale Do Sousa (Paredes E Paços De Ferreira) É Uma Estratégia Empresarial Ou Uma Consequência Da Recessão Do País (The Export/Internationalization of Companies in the Furniture Sector of Vale Do Sousa*

(Paredes and Paços De Ferreira) is an Entrepreneur Strategy or a Result of the Country Recession?).

Norek, C. D., & Pohlen, T. L. (2001). Cost Knowledge: A Foundation for Improving Supply Chain Relationships. *The International Journal of Logistics Management*, *12*(1), 37–51.

Portugal: Exports of goods: total and by main trading partner countries | Pordata. (2022). https://www.pordata.pt/Portugal/Exporta%C3%A7%C3%B5es+de+bens+total+e+por +principais+pa%C3%ADses+parceiros+comerciais-2346

Portuguese Association of Furniture and Related Industries. (2019) Retrieved October 30, 2022, from https. https://www.apima.pt/sobre/

Raj, A., & Sudalaimuthu. (2009). *Logistics Management for International Business.* Prentice Hall of India.

Rushton, A., Croucher, P. and Baker, P. (2014). *Handbook of logistics and distribution management*.

Shapiro, B. P., Rangan, V. K., Moriarty, R. T., & Ross, E. B. (1987). Manage customers for profits (not just sales). *Harvard Business Review*.

Teece, D. J. (2010). Business Models, Business Strategy, and Innovation. *Long Range Planning*, *43*(2–3), 172–194.

Themido, I., Arantes, A., Fernandes, C., & Guedes, A. P. (2000). Logistic costs case study - an ABC approach. *Journal of the Operational Research Society*, *51*(10), 1148–1157.

Trichai, Patcharawadee, Tamkaew, Nattapong, Lasun, Sarayut, Kumvilai, & Aumpol. (2021). Developing Warehouse Employee Performance by Applying the Principles of 7R in Logistics. *Turkish Journal of Computer and Mathematics Education*, *12*, 4121–4126.

Wang, K. (2016). Logistics 4.0 Solution-New Challenges and Opportunities. *Proceedings of the 6th International Workshop of Advanced Manufacturing and Automation*.

Attachments

Exmo. Sr. Administrador da empresa …

Na qualidade de aluno de Mestrado, estou a desenvolver um trabalho sobre a gestão das atividades de logística no setor do mobiliário. Este trabalho tem duas fases:

- a primeira fase visa situar o processo de logística no âmbito da cadeia de valor da indústria de mobiliário;
- a segunda fase visa desenvolver um modelo de custeio que proporciona às empresas uma ferramenta útil para a tomada de decisão na gestão da atividade de logística.

Neste contexto, gostaríamos de ouvir um painel de Peritos que, pela sua experiência e saber, são profundos conhecedores do setor e da sua realidade operacional, quer em termos estratégicos, quer ao nível da gestão do processo de logística.

Com base nas respostas ao inquérito que se anexa, procuraremos cruzar as diferentes visões e contributos dos Peritos sobre duas grandes questões:

Qual o papel da logística na cadeia de valor?

Que parâmetros definem a logística do mobiliário?

Tendo V/ Exa. sido identificado como perito, vimos solicitar a colaboração neste estudo, através da resposta ao inquérito que se anexa.

Gratos pela colaboração.

PERGUNTAS:

Quais os grandes desafios do setor do mobiliário nos próximos 5 anos?

Qual o papel e importância do processo de logística para a competitividade do setor de mobiliário?

Que tipo de iniciativas/projeto na área da logística podem os agentes coletivos do Municípios de Paços de Ferreira (Câmara Municipal; Associações Empresariais; Escolas; entre outros) desenvolver para apoiar as empresas do setor?

____

____

____

____

Como descreve o processo de trabalho associado à área da logística do setor do mobiliário? (descrição técnica com o maior detalhe possível)

____

____

____

____

Nas páginas seguintes está um questionário que será aplicado às empresas industriais do setor do mobiliário com sede em Paços de Ferreira. O objetivo do questionário é recolher informação que sirva de base para a descrição de todo o processo de trabalho associado à área da logística, de modo a identificar as atividade e tarefas, os tempos, os recursos humanos, os equipamentos e os materiais consumidos.

Por favor, deixe aqui um comentário sobre o questionário, nomeadamente sugestões de perguntas a incluir e opções de resposta a considerar.

____

____

____

____

Appendix 1- Expert´s letter

QUESTIONÁRIO DESTINADO ÀS EMPRESAS DE MOBILIÁRIO

1. Dados gerais do inquirido

1.1 Idade *

Formação académica *

- ○ 2º ciclo do Ensino Básico
- ○ 3.º ciclo do Ensino Básico obtido no ensino geral ou por percursos de dupla certificação
- ○ Ensino Secundário vocacionado para prosseguimento de estudos de nível superior
- ○ Ensino secundário profissional vocacional para prosseguimento de estudos de nível superior acrescido de estágio profissional - mínimo de 6 meses
- ○ Qualificação de nível pós-secundária não superior com créditos para prosseguimento de estudos de nível superior
- ○ Licenciatura
- ○ Mestrado
- ○ Doutoramento
- ○ Outro

1.3 Função *

1.4 Anos de experiência no setor *

2. Dados gerais da empresa

2.1 Ano de constituição

2.2 Volume de Negócios *

2.3 Número de trabalhadores *

2.4 Volume de exportações *

3. Dados gerais do sistema de informação

3.1 Tem contabilidade analítica? *

- ○ Sim
- ○ Não

3.2 Utiliza o modelo de custos-padrão? *

- ○ Sim
- ○ Não

3.3 Elabora um orçamento anual para a empresa? *

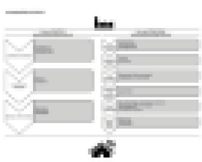
- ○ Sim
- ○ Não

3.4 Tem tableau de bord ou balanced scorecard? *

- ○ Sim
- ○ Não

3.5 Identifica-se com o esquema abaixo, relativamente ao processo de envio de mercadorias?

Sim



Não

3.6 O que modificava no esquema acima descrito?

3.7 Qual o número médio de envios semanais que a empresa efetua? *

3.8 Em relação aos clientes no destino da mercadoria, defina a quantidade médias de envios semanais, nos modos abaixo: *

	Número médio de envios semanais
Enviada para um único cliente	
Agrupada para vários clientes (grupagem)	

3.9 Relativamente aos envios semanais efetuados, defina a quantidade, de acordo com a tipologia de cliente : *

	Número médio de envios semanais
Cliente final	
Revenda	
Distribuidor	
Outro	

3.10 Quais os principais destinos de envio de mercadoria? *

	Número médio de envios semanais
Portugal	
Espanha	
França	
Reino Unido	
Outro	

3.11 Considerando o atual sistema de informação da sua empresa, em especial a Contabilidade, defina com "Sim" e "Não" a informação que consegue obter com fiabilidade, **tendo em mente cada umas das atividades/processos e seus gastos anuais: ***

	Tempo de trabalho disponível afeto à atividade (medido em horas - homem anuais)	Taxa de aproveitamento normal do tempo disponível	Custo Anual do trabalho disponível afeto à atividade (medido em horas - homem)	Fornecimentos e serviços externos anuais relacionados diretamente com a atividade. Custos fixos ou semi-fixos	Amortizações de equipamentos afetos diretamente à atividade. Custos fixos ou semi-fixos	Taxas, impostos, e outros gastos relacionados diretamente com a atividade
1.Embalamento	-Selecionar-	-Seleci...	-Selecion...	-Selecionar-	-Selecionar-	-Selecio...

	Tempo de trabalho disponível afeto à atividade (medido em horas - homem anuais)	Taxa de aproveitamento normal do tempo disponível	Custo Anual do trabalho disponível afeto à atividade (medido em horas - homem)	Fornecimentos e serviços externos anuais relacionados diretamente com a atividade. Custos fixos ou semi-fixos	Amortizações de equipamentos afetos diretamente à atividade. Custos fixos ou semi-fixos	Taxas, impostos, e outros gastos relacionados diretamente com a atividade
2.Carregamento da Mercadoria	-Selecionar-	-Seleci...	-Selecion...	-Selecionar-	-Selecionar-	-Selecio...
3.Transporte na Origem	-Selecionar-	-Seleci...	-Selecion...	-Selecionar-	-Selecionar-	-Selecio...
4.Descarga na Origem + Movimentações	-Selecionar-	-Seleci...	-Selecion...	-Selecionar-	-Selecionar-	-Selecio...
5.Processo Administrativo / Despacho Exportação	-Selecionar-	-Seleci...	-Selecion...	-Selecionar-	-Selecionar-	-Selecio...
6.Outro	-Selecionar-	-Seleci...	-Selecion...	-Selecionar-	-Selecionar-	-Selecio...

3.12 Considerando o atual sistema de informação da sua empresa, em especial a Contabilidade, defina com "Sim" e "Não" a informação que consegue obter com fiabilidade, **tendo em mente cada um dos serviços de logística/entrega de encomenda:** *

	Tempo, em horas-homem, despendido especificamente com a entrega/encomenda	Materiais diretos aplicados devido à entrega/encomenda	Seguros, honorários, subcontratação, comissões e outros serviços afetos diretamente à entrega/encomenda	Comunicações, combustíveis, portagens, energia, e outros FSE relacionados diretamente com entrega/encomenda	Taxas, impostos, e outros gastos relacionados diretamente com a atividade
1.Embalamento	-Selecionar-	-Seleci...	-Selecionar-	-Selecionar-	-Selecionar-
2.Carregamento da Mercadoria	-Selecionar-	-Seleci...	-Selecionar-	-Selecionar-	-Selecionar-
3.Transporte na Origem	-Selecionar-	-Seleci...	-Selecionar-	-Selecionar-	-Selecionar-

	Tempo, em horas-homem, despendido especificamente com a entrega/encomenda	Materiais diretos aplicados devido à entrega/encomenda	Seguros, honorários, subcontratação, comissões e outros serviços afetos diretamente à entrega/encomenda	Comunicações, combustíveis, portagens, energia, e outros FSE relacionados diretamente com entrega/encomenda	Taxas, impostos, e outros gastos relacionados diretamente com a atividade
4.Descarga na Origem + Movimentações	-Selecionar-	-Seleci...	-Selecionar-	-Selecionar-	-Selecionar-
5.Processo Administrativo / Despacho Exportação	-Selecionar-	-Seleci...	-Selecionar-	-Selecionar-	-Selecionar-
6.Outro	-Selecionar-	-Seleci...	-Selecionar-	-Selecionar-	-Selecionar-

3.13 Na sua opinião, os dados que constam nas matrizes dos pontos anteriores são suficientes para calcular, com fiabilidade, o custo dos processos de logística associado à entrega no setor do mobiliário? *

- ○ Sim
- ○ Não

3.14 Deixe aqui a sua sugestão/recomendação para a conceção e desenvolvimento de um modelo de cálculo dos custos dos processos de logística associado à entrega, no setor do mobiliário: *

Rever Enviar

Appendix 2 – Questionnaire for the furniture companies - 1st Draft

QUESTIONÁRIO DESTINADO ÀS EMPRESAS DE MOBILIÁRIO NA ÀREA DA LOGÍSTICA

Todas as questões assinaladas com * são de resposta obrigatória.

1. Dados gerais do inquirido

1.1 Data de Nascimento *

dd-MMM-yyyy

1.2 Formação académica *

○ Primeiro Ciclo ou Ensino Básico

○ Ensino Secundário

○ Licenciatura

○ Mestrado ou Doutoramento

○ Outro

1.3 Função *

1.4 Anos de experiência no setor *

2. Dados gerais da empresa

2.1 Ano de constituição *

2.2 Tipologia da Atividade Principal *

○ Fabricação de mobiliário para escritório e comércio

○ Fabricação de mobiliário de cozinha

○ Fabricação de mobiliário para outros fins

○ Outro

2.3 Volume de Negócios em Euros (Relativamente ao ano de 2020) *

○ Até 9.999 EUR

○ De 10.000 a 100.000 EUR

○ De 100.001 a 500.000 EUR

○ De 500.001 a 1.000.000 EUR

○ Superior a 1.000.000 EUR

O volume de negócios é o valor dos bens e serviços vendidos por uma empresa no âmbito da sua atividade habitual, durante um determinado período de tempo.

2.4 Volume de Negócios em Euros (Relativamente ao ano de 2019) *

○ Até 9.999 EUR

○ De 10.000 a 100.000 EUR

○ De 100.001 a 500.000 EUR

○ De 500.001 a 1.000.000 EUR

○ Superior a 1.000.000 EUR

O volume de negócios é o valor dos bens e serviços vendidos por uma empresa no âmbito da sua atividade habitual, durante um determinado período de tempo.

2.5 Número de trabalhadores (a 31 de dezembro de 2020) *

2.6 Número de trabalhadores (a 31 de dezembro de 2019) *

2.7 Volume de exportações em Euros (Relativamente ao ano de 2020) *

○ Até 9.999 EUR

○ De 10.000 a 100.000 EUR

○ De 100.001 a 500.000 EUR

○ De 500.001 a 1.000.000 EUR

○ Superior a 1.000.000 EUR

2.8 Volume de exportações em Euros (Relativamente ao ano de 2019) *

○ Até 9.999 EUR

○ De 10.000 a 100.000 EUR

○ De 500.001 a 1.000.000 EUR

○ Superior a 1.000.000 EUR

2.9 Encontraria algum inconveniente em carregar nas instalações de um concorrente próximo, caso significasse poupança significativa? *

○ Sim

○ Não

2.10 Encontra algum problema ou desvantagem em aderir a uma rede logística local gerida por uma entidade externa? *

○ Sim

○ Não

No conceito de rede logística local, existiria a necessidade de facultar os dados dos seus clientes, nomeadamente as moradas para que, em grupo, pudessem procurar parceiros (concorrentes) que tenham mercadoria para o mesmo cliente/destino.

3. Dados gerais do sistema de informação Interno

3.1 Tem contabilidade analítica? *

○ Sim

○ Não

A contabilidade analítica é uma parte/ramo da contabilidade que analisa os quadros e mapas empresariais com o objetivo de apurar os resultados de cada atividade, avaliando as suas estruturas de custos e de proveitos.

3.2 Utiliza o modelo de custos-padrão? *

○ Sim

○ Não

O modelo de custos-padrão analisa os desvios da empresa, comparativamente aos custos padrão. Estes definem-se como sendo um custo pré-determinado, que representa o valor ideal, ou ponto de referência de determinados custos para um empresa.

3.3 Elabora um orçamento anual para a empresa? (vendas, produção, compras, fornecimentos e serviços externos, amortizações, encargos financeiros, recursos humanos, entre outras rubricas) *

○ Sim

○ Não

3.4 Elabora um orçamento anual para cada departamento da empresa? (vendas, produção, compras, fornecimentos e serviços externos, amortizações, encargos financeiros, recursos humanos, entre outras rubricas) *

○ Sim

○ Não

3.5 Tem "tableau de bord" ? *

○ Sim

○ Não

Tabelu de Bord é um instrumento de monitorização e controlo de gestão onde é geralmente efetuada a comparação entre um determinado valor pretendido e o valor efetivamente realizado, que permite a avaliação de desvios dos objetivos fixados

3.6 Tem "Balanced Scorecard" ? *

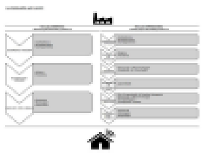
○ Sim

○ Não

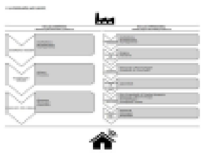
Balanced Scoredcard é uma metodologia de medição e avaliação das alternativas estratégicas da empresa

4. Contabilidade de Gestão e Logística

4.1 Identifica-se com o esquema abaixo, relativamente ao processo de envio de mercadorias? *



Sim



Não

4.2 O que modificava no esquema acima descrito?

4.3 Qual o número médio de peças/volumes enviados por semana? *

4.4 Em relação aos clientes no destino da mercadoria, identifique o número médio de peças/volumes enviados semanalmente, de acordo com as opções abaixo indicadas: *

	Número médio de envios semanais
Enviada para um único cliente *	
Agrupada para vários clientes *	

4.5 Relativamente aos envios semanais efetuados, defina o número médio de peças/volumes, de acordo com a tipologia de cliente: *

	Número médio de envios semanais
Cliente final *	
Revenda *	
Distribuidor *	
Outro *	

4.6 Quais os principais destinos de envio de mercadoria? *

	Número médio de envios semanais
Portugal *	
Espanha *	
França *	
Reino Unido *	
Restantes Países Comunitários *	
Países Terceiros (Fora da União Europeia) *	

4.7 Se Selecionou a opção "Restantes Países comunitários ou Países Terceiros", defina qual/quais os países:

4.8 Considerando o atual sistema de informação da sua empresa, em especial a Contabilidade, defina com "Sim" e "Não" a informação que consegue obter com fiabilidade, **tendo em mente cada umas das atividades/processos e seus gastos anuais:** *

	Tempo de trabalho disponível afeto à atividade (medido em horas - homem anuais)	Taxa de aproveitamento normal do tempo disponível	Custo Anual do trabalho disponível afeto à atividade (medido em horas - homem)	Fornecir serviços anuais rel diretame atividade. (ou sen
1.Embalamento *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-
2.Carregamento da Mercadoria *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-
3.Transporte na Origem *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-
4.Descarga na Origem + Movimentações *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-

	Tempo de trabalho disponível afeto à atividade (medido em	Taxa de aproveitamento normal do tempo disponível	Custo Anual do trabalho disponível afeto à atividade (medido em horas -	Fornecir serviços anuais rel diretame
5.Processo Administrativo / Despacho Exportação *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-
6.Outro *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-

4.9 Se Selecionou a opção "Outro", defina o nome da atividade/processo:

4.10 Considerando o atual sistema de informação da sua empresa, em especial a Contabilidade, defina com "Sim" e "Não" a informação que consegue obter com fiabilidade, **tendo em mente cada um dos serviços de logística/entrega de encomenda:** *

	Tempo, em horas-homem, despendido especificamente com a entrega/encomenda	Materiais diretos aplicados devido à entrega/encomenda	Seguros, honorários, subcontratação, comissões e outros serviços afetos diretamente à entrega/encomenda	Comun combu portagens outros FSE r diretam entrega/e
1.Embalamento *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-

	Tempo, em horas-homem, despendido especificamente com a	Materiais diretos aplicados devido à	Seguros, honorários, subcontratação, comissões e outros serviços afetos	Comun combu portagens outros FSE r
2.Carregamento da Mercadoria *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-
3.Transporte na Origem *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-
4.Descarga na Origem + Movimentações *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-
5.Processo Administrativo / Despacho Exportação *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-
6.Outro *	-Selecionar-	-Selecionar-	-Selecionar-	-Selecionar-

4.11 Se Selecionou a opção "Outro", defina o nome do serviço de logística/entrega de encomenda:

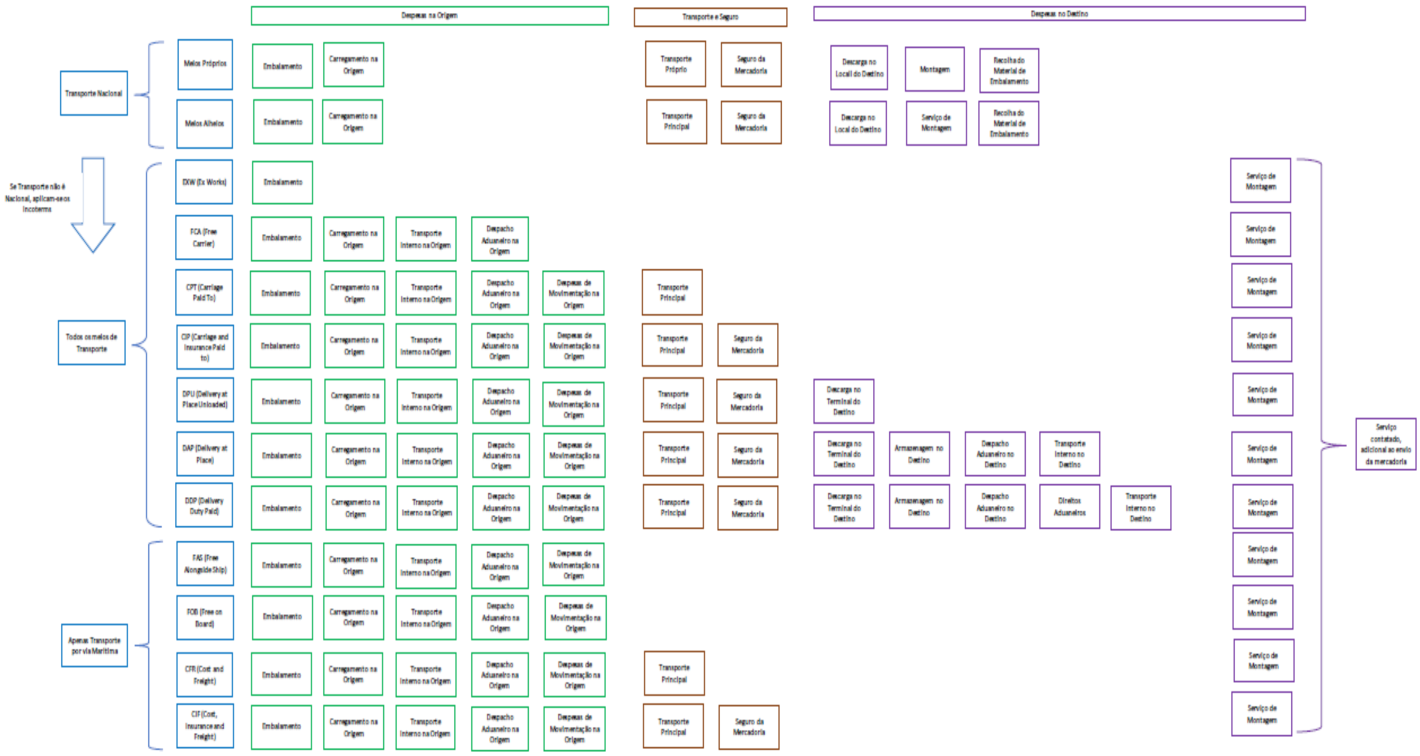
4.12 Na sua opinião, os dados que constam nas matrizes dos pontos anteriores são suficientes para calcular, com fiabilidade, o custo dos processos de logística associado à entrega no setor do mobiliário? *

- ○ Sim
- ○ Não

4.13 Deixe aqui a sua sugestão/recomendação para a conceção e desenvolvimento de um modelo de cálculo dos custos dos processos de logística associado à entrega, no setor do mobiliário:

Rever Enviar

Appendix 3 – Questionnaire for the furniture companies - Final Draft



Appendix 4 – Decision diagram based on Incoterms