

Improving Reverse Logistics Operations

The case study of IKEA

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Abstract

In the competitive environment in which we live today, many companies are trying to differentiate themselves from the rest in the most diverse aspects. IKEA distinguishes itself not only by providing a wide range of products at a very low price, but also in its 365-day return policy that is unmatched by the policies of other companies in the same industry. As a Swedish multinational company in constant expansion, reinvesting part of the profits in the opening of new stores, intends to reduce some of its expenses, focusing on improving the procedures of some of their areas.

In Portugal, IKEA has five stores: Alfragide, Loures, Matosinhos, Braga and Loulé. The company identified reverse logistics as one of the areas to be improved, it is in this context that the present study appears, defining as objective the control and eventual reduction in the number of customer returns to the store. To this end, a research methodology was established, which began with the collection and analysis of data related to returns from the IKEA store in Alfragide, optimization, systematization and standardization of reports and creation of an aggregated data analysis tool to evaluate the behavior of returns throughout the year.

With the use of the tools created and complemented by a more analytical approach, conclusions were drawn regarding the behavior of returns during the last fiscal year and improvements were suggested.

Keywords: supply chain, supply chain management, logistics, reverse logistics, returns, retail, distribution, lean management

1. Introduction

In the retail world, and due to the technological evolution, that has allowed the expansion of the distribution channels to other types of commerce, there is an area that has gained special attention in recent years: Reverse Logistics, more specifically regarding returns. If in the usual "bricks and mortar", where the customer goes to a physical store to buy a product, there are already returns, those increase when there is an expansion for e-commerce, especially in products such as the ones from IKEA where the perception of the customer when

viewing the product on the internet may not match the reality of when receive it at home.

In the Portuguese IKEA store of Alfragide the returns represent values between 4 and 5% of the value of sales, which may seem reduced, but given the volume of weekly sales correspond to very high values. It is in this context that the present study appears in which the main objective is to develop tools to collect and analyse the weekly and yearly returns of the IKEA store from Alfragide more quickly, systematically and efficiently to control and monitor the weight of returns as well as the entire process and

flows of the product in store. This will consist in optimizing, improving and standardizing reports that are already made and create a tool that allows to aggregate the updated data automatically of the various weekly reports to give a more generic notion of the behaviour of the returns during the fiscal year, assessing trends and patterns that in the current reports become complicated to analyse.

In addition, it is also intended to complement this creation of new tools with its use to study the returns flow, to take some conclusions and suggest future improvements not only to the tools but also to the operations within the store.

In order to achieve this goal, the present paper is divided as follows: section 1 is the introduction with some contextualization of the problem and clarification of the main objective; section 2 is where some concepts and research frameworks relevant to this study are reviewed; section 3 is where are presented some data about the company as well as the methodology to resolve the case; section 4 is where some analysis and results are presented and, finally, section 5 correspond to the conclusions of this paper and future suggestions.

2. Literature Review

2.1 Supply chain

According to Ganeshan and Harrison (1995) the supply chain is a network of facilities and distribution facilities that perform the functions of procurement of materials, the processing of these materials into manufactures and finished products and the distribution of these ones to customers. All this due to an integration of processes and collaboration between the various entities that participate: suppliers, manufacturers, distributors, retailers and customers (Beamon 1998). It encompasses activities such as planning, product design, production, assembly, distribution, storage and customer sales (New and Payne 2010). According to Chopra and Meindl (2007), supply chain consists of all parties that are, directly or indirectly, involved in satisfying a request from a customer. For this a supply chain must be dynamic and involve a constant flow of information, products and funds between the various entities.

The concept of Supply Chain Management is broader and presents numerous definitions as well. According to the Council of Supply Chain Management Professionals (CSCMP, 2017), "Supply chain management encompasses the planning and management of all activities involved in supply and acquisition, transformation and all logistic management activities. It also includes coordination and collaboration with channel partners who may be suppliers, intermediaries, third-party service providers and customers. It essentially integrates supply and demand management". Christopher (2011) defines supply chain management as the management of upstream and downstream relationships with suppliers and customers in order to offer customer value, both in the form of products and services, with the lowest possible costs for the entire supply chain. As such it is necessary to manage the relationships between the various parties involved to achieve the highest possible profit for all, which sometimes poses some challenges as the interest of an individual entity will always be less important than the interests of the chain as one all.

2.2 Logistics and returns

The Council of Supply Chain Management Professionals (CSCMP, 2017) defines logistics as being "part of the supply chain that is responsible for planning, implementing and controlling the efficient and effective direct and inverse flow and warehousing operations of goods, services and related information between the point of origin and the point of consumption in order to meet the needs of customers". For Islam *et al.* (2013) there are five key elements of logistics: Transport Management, Inventory Management, Storage Management, Packaging and Information Processing.

It is important to differentiate direct logistics (LD) from reverse logistics (LI). Direct logistics corresponds to all logistics, previously defined, from the point of origin to the point of consumption in order to satisfy the requirements of the customer whereas reverse logistics is defined as the movement of products or materials in the opposite direction for the purpose of recapturing value and appropriate disposal of products (Rogers and Tibben-Lembke 1998). In

relation to reverse logistics, there is in the literature the division of its activities into five (Brito and Dekker 2003), (Kocabasoglu *et al.* 2007) (Prahinski and Kocabasoglu 2006): Acquisition, Collection, Inspection and Sorting, Recovery and Distribution.

In order to reduce the risk of customers, increasing their satisfaction and thus increasing sales, retail companies have been developing ever more flexible returns policies.

Rogers *et al.* (2002) state that there are five categories of returns that must be managed individually and each represents different challenges: customer returns, marketing returns, returns of assets, product recalls and returns for environmental reasons.

2.3 Evaluation frameworks

Lean management is essentially based on maximizing customer value and minimizing waste. It is a philosophy that can be applied in the most diverse sectors of activity optimizing processes and operations (Bardhan and Thouin, 2013), with one of the bases being the standardization of processes which it is in the mindset of the tools that will be created during this study.

This philosophy assumes the use of several methodologies and frameworks that range from the analysis of the current situation to the creation and implementation of improvements that reduce waste throughout the process (Melton, 2005). There are some frameworks that can be used in the current study to analyse the data, such as, cause and effect diagrams and pareto diagrams.

3. Case study and methodology

When products are unloaded in the IKEA store, they are directed to the respective areas according to their type (Show Room, Self Service, Market Hall or Full Service). The Show Room, which is the principal area of the store, is divided into twenty sections, or HFB's (Home Furnishing Businesses, known by numbers), according to the products: sofas (01), storage and organization furniture (02), work spaces (03), furniture for bedroom (04), mattresses (05), bathrooms (06), kitchens (07), meal spaces (08), children's spaces (09), lighting (10), bedding (11), textile (12), carpets (13),

kitchen utensils (14), food (15), decoration (16), outdoor (17), home organization (18), secondary storage (19) and other business opportunities (92). Regarding the returns, as said before, IKEA distinguishes itself from all the other companies with the 365 days policy return. This policy is so liberal that the customer can return the product for one year only because he has changed his mind. IKEA divided internally the reasons for customer returns (with respective subreason code) into the following:

- ❖ Change of mind:
 - Style or size does not fit (01)
 - Bought more than needed (02)
 - Found better products or prices elsewhere (03)
- ❖ Services:
 - Packaging and/ or products are damaged (01)
 - Delivery service delay (02)
 - Differences in the delivery document (03)
 - Not satisfied with service (04)
- ❖ Product quality:
 - Parts are missing or wrong (01)
 - The product has defects (02)
 - Product malfunction (03)
 - Unsafe or withdrawn product (04)
- ❖ Sales process:
 - Sold wrong product (01)
 - Incorrect information from IKEA (02)
 - Picking error (03)
 - Handling damages (04)
 - Error in payments (05)
 - Sold product that is out of stock (06)
- ❖ Client support:
 - Ordering of articles or parts (01)
 - VAT refund (02)
 - Forgotten article on IKEA (03)
 - Customer incident (04)
 - Promotion of services (05)

When a product is returned one of two transtype (inventory adjustment) is constituted according to its destination:

TT320: item in good condition and able to be back to stock to be sold at its normal price;

TT325: is there an issue with the product or the packaging and it can't go direct to stock. After going to the recovery area, the product will undergo through a repackaging process if the issue was only in the packaging, to the other business opportunities area if it has

any flaw but can be sold with a lower price or to the recycle if it cannot be sold on opportunities.

In order to achieve the objective proposed, the following methodology was established:

1. Data collection
2. Characterization and creation of an aggregated tool
3. Diagnosis of returns
4. Suggestions for improvements

3.1 Data collection

In this step weekly data regarding returns from the beginning of the fiscal year 2017 are collected from internal software and reports are made. These weekly reports are based in an Excel template that was created in this step with the objective of standardizing all the reports. This template shows the returns data regarding many aspects, such as, discriminated by reason and subreason, transtype, the sections of the Show Room, the name and identification of the product, the name and identification of the client, the quantity return as well as the value, among other information. After copying all the data about the weekly returns given in the intern software to a sheet in the template called "Data" and after some needed operations to those data, a pivot-table in the template helps to build some Tops of returns, half of them by value and the other half by quantity, that allow us to see the product, respective reference and section in the store with the highest returns. Those tops are made also by transtype and by reason.

Once these Tops are all built, in the main page of the document, "ACC Returns", it is possible to have a more macro view of the returns of that week because there are two tables, again one by value and another by quantity, where it can be seen the total returns for HFB and for return reason, and it is also possible to expand the table in order to also see the subreason. In addition, in the table by values, we also have a column, "Sales Share", which allows us to have the percentage of returns of each HFB as a function of the sales of that same HFB allowing to compare with the percentage of returns of the store in relation to sales of the store, analyzing which HFB's are above and below this average. There are also some

graphs that allow to visualize that data. In addition, there are other graphs to compare the returns that originate TT320 and TT325, the percentage of each reason in the total returns, the percentage of each HFB in the total returns as well as the returns in store or by the service transportation provider of IKEA, which is TNB.

3.2 Characterization and creation of an aggregated tool

These weekly reports are important not only for the Customer Relations department to control and to have an overview of the reverse flow of store products but also for the heads of each HFB - shopkeepers - to be able to analyze the performance of their section in general, as well as compare with the remaining HFB's. However, this analysis, being weekly, does not allow to evaluate trends nor standards throughout the year, which could be an added value for the store. As such, the idea arises of creating a file, also in Excel, that allows accumulating all this data throughout the fiscal year, thus, not only to see patterns but to make possible predictions about the reverse flow. This file will follow the line of the individual reports discussed above, although, of course, it does not contain as much information as is not very exhaustive. As an aggregated file of returns during the fiscal year, it will seek information on 52 weekly reports that will be filled during the year, and may therefore be consulted throughout the year with partial information.

In this Excel file appears, on the initial sheet, a table with the sales share (percentage of returns based on sales) for each HFB (listed by lines) from week 35, which is when the fiscal year begins, until week 34 (listed by columns), which is the last week of August. In order to allow an easy reading of this table, the 52 columns are divided by quarters, being able to reduce the total table to only three columns. Considering that there are several promotions throughout the year, the commercial calendar is also included in this table because promotions and discounts are expected to influence the return of the products from the customer to the store. It should also be noted that this file has links in the first row of the table, where the week number appears, with the weekly reports, since it allows anyone who is analyzing it to

be automatically directed to a specific report if he want to go into detail in the analysis of that week's returns. Also on this sheet of the aggregated file we can also have a graphic view not only of the percentage evolution of returns in relation to sales during the year, but also of the evolution of these two entities separately. In the second sheet of the file, much like the weekly reports, there are also two tables as well as the respective graphs of the returns accumulated since the beginning of the year by value and quantity. In addition, there are also other charts similar to the weekly reports, but instead of being only data of one week, are the sum of all data until the last week analyzed. It is important to emphasize that after every week, once the template is built, this aggregated file is updated automatically.

3.3 Diagnosis of returns

With the weekly reports all standardized and the aggregated file with links to them for automatic updates we can now analyze some data of the returns using some known tools. Since we are dealing with an enormous amount of data, it would be interesting to focus on those that have a greater impact on the problem in question and as such the idea of a Pareto diagram arises. In this case study, this analysis will not make sense at the stock keeping unit level, since there is an average of 10000 in which many of them are discontinued and new products are constantly appearing, causing this study to be outdated easily and bringing little added value for the company. Thus, the idea of doing so at the level of HFB's arises because there we can verify that there is a group whose impact on returns stands out in relation to the others.

After selecting which HFB's have the greatest impact on discards, one can focus the study on these HFB's and evaluate the

evolution over the year of returns in relation to sales. Looking at the weeks that constitute the peaks for each section, the weekly report is used in the respective HFB and it is tried to perceive the causes that within that HFB can lead to the returns. Once the causes are known, we can draw solid conclusions about the reverse flow and try to apply improvements that lead to a better control of this flow. This methodology is outlined in Figure 1.

4. Analysis and Results

In this section we intend to make an analysis of the returns data using both weekly and aggregated reports. Ideally, this analysis should serve as an example to IKEA and that the company should do so not only at the end of the fiscal year but also throughout the year to respond more quickly and efficiently to variations in returns. We start this by collecting all the values of Returns Share of all HFB's from the aggregated file and put them in a table in descending order and then create a column with the percentage accumulated as well as the values of Sales Share in those sections.

HFB	RETURNS SHARE	% Accumulated	SALES SHARE
04	15,7%	15,7%	5,1%
07	15,2%	30,9%	7,3%
01	10,7%	41,6%	6,2%
05	9,3%	50,9%	5,9%
02	7,2%	58,1%	4,6%
12	5,8%	63,9%	6,9%
10	5,6%	69,5%	4,7%
11	5,1%	74,5%	3,0%
08	4,6%	79,1%	4,5%
13	3,9%	83,0%	6,7%
03	2,8%	85,8%	3,4%
06	2,6%	88,4%	4,7%
16	2,6%	91,0%	2,5%
09	2,5%	93,5%	2,5%
18	2,1%	95,6%	2,0%
17	1,4%	97,0%	4,6%
15	1,0%	98,0%	1,3%
14	1,0%	99,0%	1,2%
19	0,7%	99,7%	3,2%
92	0,3%	100,0%	2,8%

Figure 2 - Returns Share of all HFB's

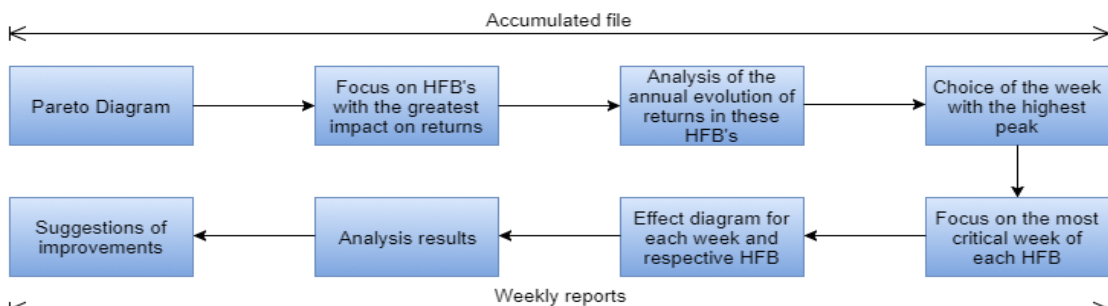


Figure 1 – Methodology for the diagnosis of returns

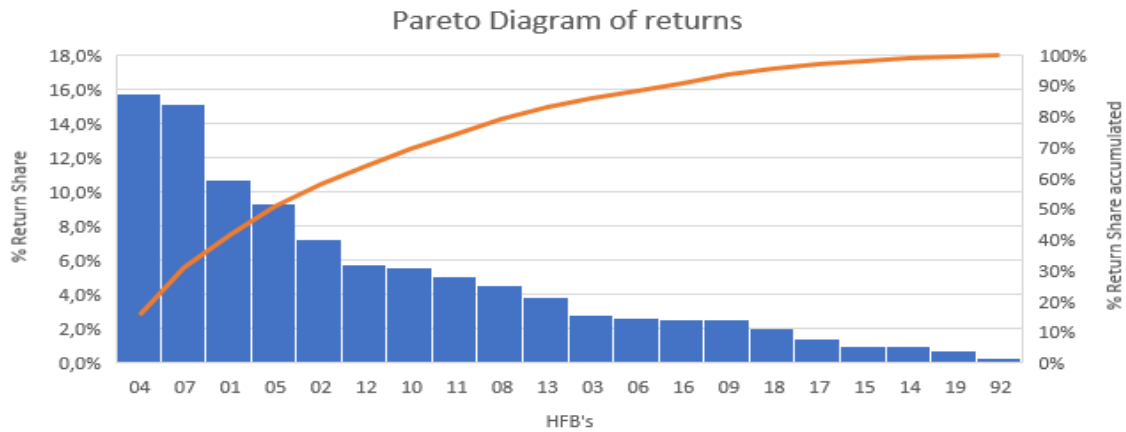


Figure 3 - Pareto Diagram of returns

This table, which is illustrated on figure 2, lead to the Pareto diagram of figure 3.

As can be seen, approximately 50.9% of the total returns of the store correspond to only four HFB's: furniture for bedroom, kitchens, sofas and mattresses.

About the furniture for bedroom, after analyzing the annual evolution of returns to sales on that HFB (Figure 4), we conclude that the peak week was the 46th (13th to 19th of November) with the sales share of 12,9 % while the annual average on that HFB was only 5,1 %. One reason for this is basically due to promotions on this section between week 38 and 43 and the fact that promotions lead to a boom of returns afterwards. Regarding the reasons for returns during this week, the results of the cause and effect diagram are the following:

- ❖ Change of mind: 61,2 %
- ❖ Services: 25,5 %
- ❖ Sales process: 10,3 %
- ❖ Product quality: 3 %

Regarding the destination of the product, 73 % were TT320 while 27 % were TT325.

About the kitchens, after analyzing the annual evolution of returns to sales on that HFB (Figure 5), we conclude that the peak week was the 04th (22th to 28th of January) with the sales share of 19 % while the annual average of that HFB was 7,3 %. Again, one reason for this to happened is the promotion that we can see in the commercial calendar between week 44 and 51 in this section where a lot of kitchens were sold and, afterwards, some of them were returned. The reasons for returns that week were:

- ❖ Change of mind: 83 %
- ❖ Services: 4,3 %
- ❖ Sales process: 9,1 %
- ❖ Product quality: 3,6 %

Regarding the destination of products, 71 % were TT320 and 29 % were TT325.

About the sofas (Figure 6), the peak week was the 51st (18th to 24th of December) with a value of sales share of 12,6 % while the annual value of this section was 6,2 %.

Regarding the reasons for returns, the results were:

- ❖ Change of mind: 53,6 %
- ❖ Services: 13,6 %

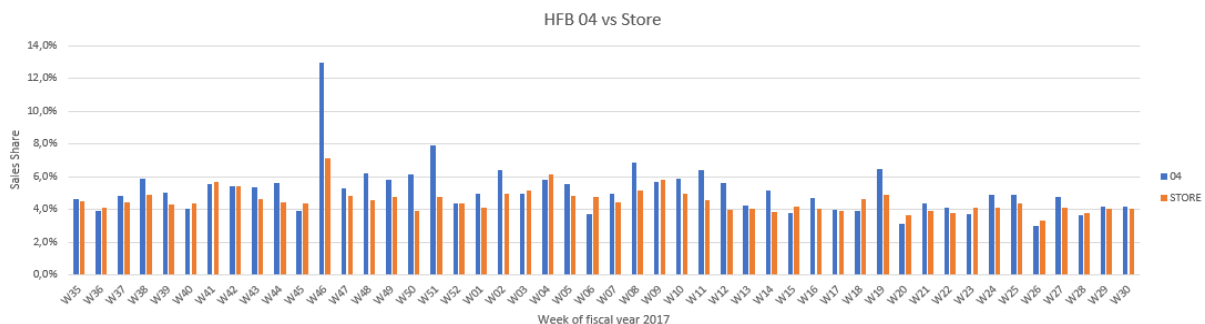


Figure 4 - Sales share HFB 04 vs Store

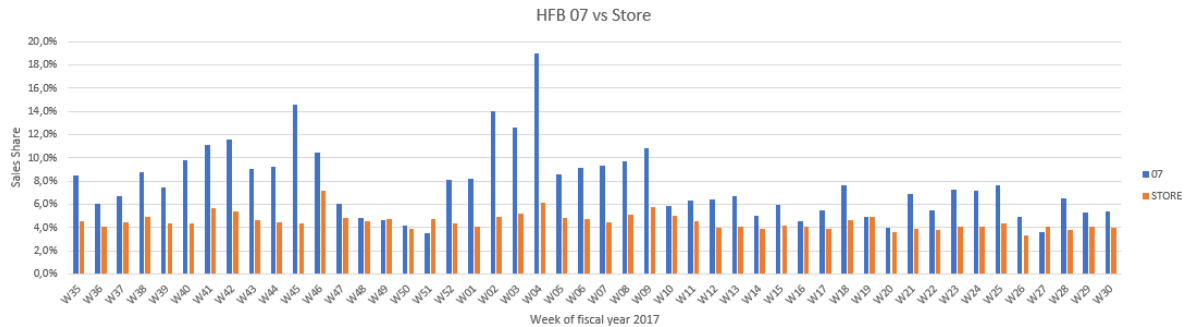


Figure 5 - Sales Share HFB 07 vs Store

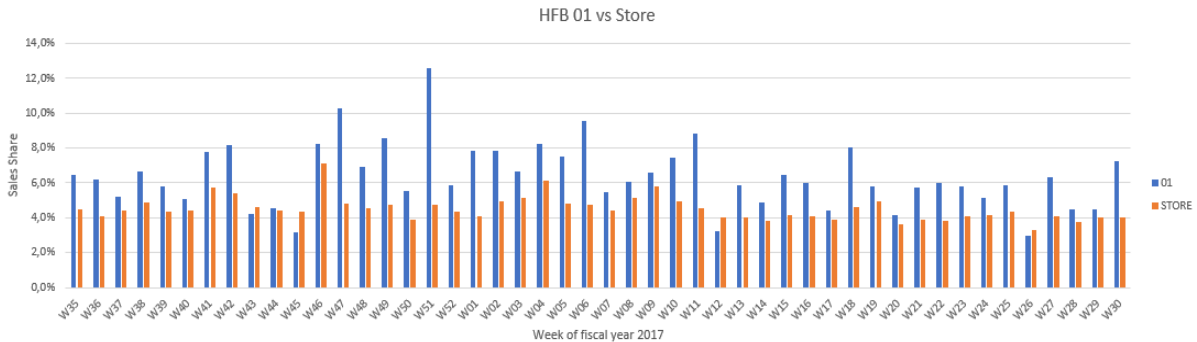


Figure 6 – Sales Share HFB 01 vs Store

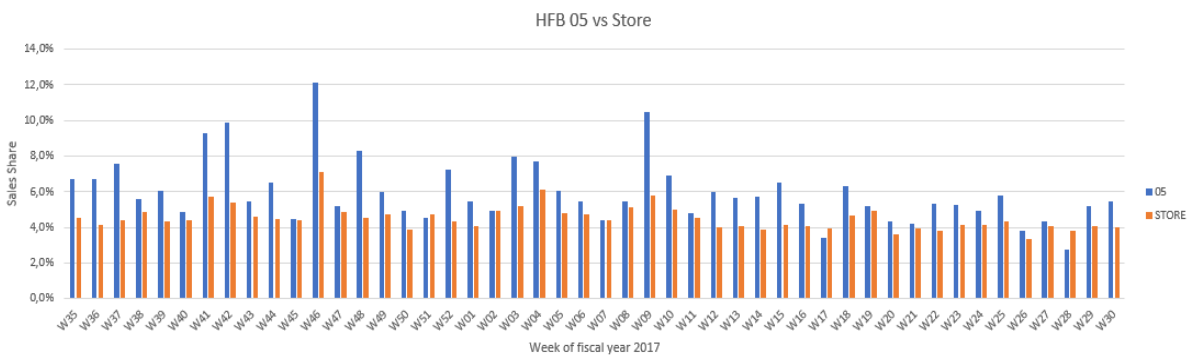


Figure 7 – Sales Share HFB 05 vs Store

- ❖ Sales process: 28 %
- ❖ Product quality: 4,8 %

This section had 60,8 % of the products constituting TT325 and 39,2 % constituting TT320, being the only one analyzed that had more TT325 than TT320, which represents more costs to the company and this happened essentially due to high handling damages in the sales process.

Regarding the mattresses (Figure 7), the peak week was the same as the furniture for bedroom, week 46 (13th to 19th of November) with sales share of this section of 12,1 % while the annual sales share is around 5,9 %. The results of the percentage of each reason are the following:

- ❖ Change of mind: 78,8 %
- ❖ Services: 14,1 %

- ❖ Sales process: 3,3 %
- ❖ Product quality: 3,3 %
- ❖ Client support: 0,5 %

This was the only analysis which present an article returned by client support namely an article forgotten in the store. Regarding the destination of products, 63,8 % were TT320 while 36,2 % were TT325.

Table 1 shows the total returned quantities of the store since the beginning of fiscal year and in each of the HFB's mentioned for each reason for return, as well as their percentages in relation to the total.

As we can see, the significant percentage of store returns is caused by a change of customer's opinion. Although it is the great reason for the returns, it is something that the company does not intend to change

Table 1 - Quantities returned for each reason

HFB	05-CHANGE OF MIND	15-SERVICES	25-PRODUCT QUALITY	85-SALES PROCESS	95-CUSTOMER ASSISTANCE	GRAND TOTAL
Total	274028	13686	10448	21470	919	320552
04	17433	3481	1294	3096	20	25324
%04	6,4%	25,4%	12,4%	14,4%	2,2%	7,9%
07	36959	4703	2193	9525	70,36	53450
%07	13,5%	34,4%	21,0%	44,4%	7,7%	16,7%
01	4205	375	491	640	11	5722
%01	1,5%	2,7%	4,7%	3,0%	1,2%	1,8%
05	5117	395	218	510	12	6252
%05	1,9%	2,9%	2,1%	2,4%	1,3%	2,0%
% Total	85,5%	4,3%	3,3%	6,7%	0,3%	100,0%

since this policy of return as liberal is the basis for customer satisfaction, one of the great pillars of IKEA. However, it is interesting to note that although the services and sales processes represent very low returns, more than half of the products returned under each of these reasons belong only to HFBs 04 (furniture for bedroom) and 07 (kitchens).

It was also made an analysis, based on the aggregated tool, of the total returns since the beginning of the year per reason and subreason code (the codes are showed in section 3) and table 2 summarizes it all.

Table 2 - Percentage of subreason code of returns during the fiscal year

Reason	Subreason code	Percentage of total returns
Change of mind	➤ 01	78 %
	➤ 02	7,1 %
	➤ 03	0,4 %
Services	➤ 01	1,2 %
	➤ 02	0,9 %
	➤ 03	1,3 %
	➤ 04	0,9 %
Product quality	➤ 01	0,5 %
	➤ 02	2,2 %
	➤ 03	0,4 %
	➤ 04	0,1 %
Sales process	➤ 01	1,9 %
	➤ 02	0,8 %
	➤ 03	0,1 %
	➤ 04	2,9 %
	➤ 05	0,3 %
	➤ 06	0,7 %
Client support	➤ 01	0,1 %
	➤ 02	0,0%
	➤ 03	0,2 %
	➤ 04	0,0%
	➤ 05	0,0%

5. Conclusions and future suggestions

This paper gives an overview of the master thesis developed in IKEA with the objective of control and monitor the returns from customers. To do so, a template in Excel for weekly reports were created and a small explanation of it was done in section 3.1. Afterwards an accumulated tool able to aggregate all the weekly data automatically was developed. A small explanation of this tool was made in section 3.2. Images of this tools created within this study weren't showed here because of their dimensions.

To complement the files created with a more analytical approach, some frameworks were used to perform more detailed analysis examples. These analysis were based on what was already known from empirical knowledge that most of the returns are due in fact to the policy of return, namely to changes in the customer's opinion with the subreason of the style or size of the product inappropriate. The second great cause also depends on the will of the client and has to do with having bought more than needed.

After these causes, resulting from the customer's change of mind, the ones that follow as having the greatest impact on the returns are those derived from the sales processes, as shown in table 1, with the handling damages and the sale of wrong product to stand out from the rest, as shown in table 2.

Regarding services, which are the third major reason for the returns as shown in table 1, it is noted that there are major

differences in the delivery document as well as damages in the product or packaging during the delivery and assembly service, as shown by the codes in table 2.

As for the quality of the product and client support, it was verified in both the weeks and cumulative analysis (and shown in table 1 and 2) that are not reasons that have a significant impact on the total returns of the store.

After the creation of the files themselves and their use to analyze some data, some issues have arisen that can be improved in the future. These improvements are divided into two major groups: improvements to what has been done (template of weekly reports and aggregated tool) and improvements at the store operational level.

As for the first group there are some suggestions for improvements:

- Creation of a macro in Excel that allows to reduce even more the realization of the weekly reports
- Separate the returns of products that were bought in Alfragide from those that were bought in other stores
- It is also suggested a review of the KPIs of returns as well as the creation of new ones for the aggregated file and for measures that may be implemented
- Finally, it is suggested a separation, in the aggregated file, of the returns for each HFB where the analyses that served as examples during the diagnosis can be made in sheets of the Excel file and that allow each shopkeeper to open this tool and, in a simple and quick way, to evaluate the performance of its section alone

As for the improvements at a more operational level, there are small suggestions:

- At the behavioral level, and linking with the last suggested improvement to the aggregated file, reinforce the idea with the heads of the different sections of the store to better analyze the reports with respect to their HFBs so that they

can establish action plans for their sections

- Strengthen the idea with sales employees to seek to provide more information about the products to customers, in terms of quantity, functionality and style of the products
- Evaluate the possibility of giving information days before about future promotions to customers who buy certain products, as it is the case of the kitchens where it was found that in the first weeks of promotions there is always a peak of returns
- Make some effort together with the customer service collaborators to get to the heart of the issue in the management of returns, since in peaks of affluence is always placed "the style or size of the product do not fit" in the internal system of IKEA. In addition, in order to prevent the increase in waiting queues, increase trainings regarding the attendance and management of returns to the different employees of other areas for those peaks of greater affluence to forward them to the service desk at customer to manage each return in a more detailed way without running the risk of increasing customer waiting time
- Review the contractual conditions between IKEA and TNB in order to see if there is any way to reduce the damage caused by the latter in the transport and assembly of the products as well as to improve communication and coordination between the two to avoid differences in delivery documents and delays in the delivery that often occurs due to the indication of a time window on the part of IKEA to the customer other than the one that TNB can fulfill. After that, depending on the results and given the fact that there have already been situations where IKEA has punctually hired an external courier service, investigate the possibility of incorporating a second carrier in order to reduce returns caused by services.

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