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Products ´categorization and suppliers´ mix analysis

Categorização de produtos e a análise do mix de fornecedores

Evanielle Barbosa Ferreira
Mestranda em Engenharia de Produção - UFPE e Bacharela em Engenharia de Produção - UNIFSA
Instituição: Universidade Federal de Pernambuco - UFPE
Endereço: Av. Professor Moraes Rego, Iputinga, Recife, PE, Cep: 50.670-901
Orcid: https://orcid.org/0000-0003-3776-359X
E-mail: evanielleb99@gmail.com

Rhubens Ewald Moura Ribeiro
Mestre em Administração - UFPR, Cursando MBA em Gestão Estratégica, Inovação e Conhecimento - UNIMAIS, Capacitado em EAD - UFPR e Bacharel em Administração - UFPR.
Instituição: Centro Universitário Santo Agostinho - UNIFSA
Endereço: Av. Valter Alencar, 665, São Pedro, Teresina, PI, Cep: 64.019-625
Orcid: https://orcid.org/0000-0002-8970-6864
E-mail: rhubens.ribeiro@gmail.com

Carlos Alberto de Sousa Ribeiro Filho
Mestrando em Gestão Pública - UFPI, Especialista em Mercado Financeiro - ICF e Bacharel em Administração - UESPI
Instituição: Universidade Federal do Piauí - UFPI
Endereço: Av. Universitária, s/n, Ininga, Teresina-PI, Cep: 64.049-550
Orcid: https://orcid.org/0000-0002-5806-490X
E-mail: carlosribeiro@email.com

Kaíque Barbosa de Moura
Bacharel em Engenharia de Produção - UNIFSA
Instituição: Centro Universitário Santo Agostinho - UNIFSA
Endereço: Av. Valter Alencar, 665, São Pedro, Teresina, PI, Cep: 64.019-625
Orcid: https://orcid.org/0000-0002-5386-4449
E-mail: kaique.96moura@gmail.com

ABSTRACT
Purchase activity is increasingly becoming a strategic function. Therefore, it is necessary to achieve a better understanding of traded products, company´s real needs and the nature of supplier-purchaser relation. Thus, the study had as its goal the improvement of the profits center of the decoration products of a retail company in Teresina/Piauí/Brazil, aiming to subsidize the purchasing management and the suppliers mix analysis. In order to do so, a documental research was conducted with data referring to a one year´s period that was collected from sales report generated by the Integrated Commercial Automation System (SACI, the acronym in portuguese). Results indicate a new profits center structure and a reduction on the mix of suppliers associated with biggest

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accumulated sales value, thus becoming possible to feed the buying sector with information for strategic decision-making. To future researches, deepened analysis on costs related to these changes is suggested and, as practical action, similar analysis on the remaining sectors/families of registered products is encouraged.

Keywords: Products categorization. Suppliers. purchasing management. Supplies. Retail.

RESUMO
A atividade de compras tem se tornado cada vez mais uma função estratégica. Assim sendo, é preciso possuir um maior entendimento dos produtos negociados, sobre as reais necessidades da empresa e sobre a natureza da relação entre comprador e fornecedor. Desta forma, o estudo objetivou a melhoria do centro de lucro dos produtos de decoração em uma empresa varejista na cidade de Teresina/Piauí/Brasil, visando subsidiar a gestão de compras, além da análise do mix de fornecedores. Para tal, foi realizada uma pesquisa documental por meio da coleta de dados dos relatórios de vendas gerados pelo Sistema de Automação Comercial Integrada – SACI, referentes ao período de um ano. Os resultados apontaram uma nova estrutura do centro de lucro e uma redução no mix de fornecedores responsáveis pelo maior valor acumulado de vendas, sendo possível subsidiar o setor de compras com informações para tomada de decisões estratégicas. Para pesquisas futuras, sugere-se o aprofundamento na análise de custos atrelada a tais mudanças e, para ações práticas, sugere-se que a organização realize análises similares nos demais setores/famílias do mix de produtos cadastrados.

Palavras-chave: Categorização de produtos. Fornecedores. Gestão de compras. Suprimentos. Varejo.

1 INTRODUCTION

Organizations are set in a context that demands differential and a growing search for improvement in all processes in which they are embedded. In order to gain client loyalty to goods and services, it is important that processes are lean and controlled in a focused on results fashion. For proper functioning of the company an adequate management of all evolved activities is required.

Company needs to conduct purchasing sector in an effective way to achieve success in the process of acquisition since decision making in this step have direct impact on stocks efficiency and, if done correctly, helps in costs reduction and, therefore, in higher profitability (Pozo, 2010). Furthermore, it has an impact on company´s competitiveness and success. The purchasing activity of a company must be considered as a strategic function. This way a is necessary a wider understanding of traded products, firms real needs and also the nature of the supplier-purchaser relation. Therefore, employment of management tools becomes essential to the strategic success.

In face of these findings, the research proposal departed from theoretical background referred to the contextualization that allowed a more aware regard on the market in relation to the purchasing process, given its´ differentiation at a increasingly higher level of demand in order to keep up with needs of the market.

The importance of the research lies in the offering of a study about the improvement of purchasing process in a retail company in the State of Piauí, collaborating, this way, with the

academic community through the delivery of a study focused on contributing to the elaboration of forthcoming works.

This study was also a way to display the professional field of the Production Engineer in the retail industry through improvements in the companies purchasing process. The research´s theoretical contribution dwells on the reduced number of studies associating improvement on purchasing management to the categorization of the profits center and, later, the suppliers mix analysis, unlike the direct reduction of supplier´s mix, bringing newness to the research.

For such, the main goal of the research was to optimize the purchasing process by means of the use of strategies and tools that drive the categorization of the profits center and, hence, reduce the suppliers, bringing gains to the company's purchasing sector.

In the course of this work, assessments will be made about features of the value chain, supplier's networks and ABC classification of supply. Besides that, an approach about products´ categorization is made.

2 METHODOLOGY

Many typologies of research constitute the classification of research that grounds researchers' studies. In terms of technical procedures, the one presented here classifies as bibliographic research, since its development was based on books, scientific papers, journals and e-books with the purpose of acknowledge and analyze the scientific contributions about the studies' theme. It was also a documentary research due to analysis of data from company´s documents, such as sales value, types of products, and classification of products´ center of profits.

In terms of procedural methods, the study at hand classifies as observational because of its analytical look to the studied process´ activities. Besides that, it qualifies as a monographic research, since it deals with cases such as institutions, groups, community as its object of study, analyzing them in all its features.

With respect to research goals, it was a exploratory study, since system´s data collection served as basis to the suggestion of ideas. Furthermore, the exploratory research allows gaining familiarity with the problem in frame aiming the formulation of hypothesis. Besides that, the facts observed were registered and described in its features without interference, thus characterizing this as a descriptive research.

The research may also be classified by its approach as a mix approach. Both quantitative approach as qualitative presents different strong and weak points, but when merged produce information that support each other (Santos, Erdmann, Meirelles, Lanzoni, Cunha & Ross, 2017). Numerical application was used as reinforcement to the quantitative analyses to decision making.

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The field of research comprised the purchasing management of the decoration department of a retail company located in teresina/Piauí/Brazil, from January to December of 2018, with the documentary research being held in October 2019.

Data collection statements and reports from SACI management system made available by the organization in order to obtain data for the study. The data obtained were analyzed and interpreted in a qualitative and quantitative manner with the intention of applying the results in the situation that the company finds itself. As this step, the books, papers and materials already published were important to the improvement in the evaluation and analysis of these data.

3 THEORETICAL BACKGROUND

3.1. VALUE CHAIN

Management of supplies or supply chain management (SCM) is the integration of business processes from primary suppliers, which enables products/services and information, up to the final consumer that will make use of them. Companies that participate in the chain need to integrate its processes increasing the value delivered to client and guaranteeing competitive advantage to all others chain members (Barney, 2012).

Considering Porter´s concept of value chain, which aims to widen the companies' value generation, it is noticeable that such value chain involves also the company´s supply chain in a competitive environment. In order to guarantee chain of supplies management, it is necessary that there are professionals from involved areas (production, logistics, sales, among others) in addition to support areas (as, for example, information technology). Besides, emphasis has been given to the purchasing sector so that firms works in the improvement of its competitiveness (Weele & Raaij, 2014).

3.2. SUPPLIERS CHAIN

Supply chain´s management also means administration of the relationship with other companies. Trust in a partnership relation entails investments in long term and successful relations. Partnership among companies are collaborative, demand cooperation on both sides and requires an efficient and long-term purchasing-supplier relation (Ferreira & Ribeiro, 2019; Ribeiro, Ribeiro Filho, Alves, Neres & Vale, 2019).

It is possible to track the suppliers´ net through products purchased by the company and, hence, create strategies that improve relationship. Monitoring the relationship is essential to good purchasing management. Enduring relationships are usually followed by cooperative relations in which negotiation aims satisfactory agreements for both sides (Junior, 2011).

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3.2.1. ABC Classification of Supply

The ABC Curve tool was initially conceived by Vilfredo Pareto, who made a study about income distribution in some regions of Europe in 1897 and noticed that such distribution wasn't uniform since there was great concentration of wealth (80%) in the hands of a small segment of population (20%) (Schneiders & Sellitto, 2017).

The tool ABC Curve or Pareto´s Diagram classifies products in three classes: A, B and C. Class A comprises 20% of items that accounts for 80% of the total value. Class B comprises 30% of items accounts for 10% of total. Lastly, Class C includes 50% of items (most of them of low value) and account for 10% of the investment (Ferreira & Ribeiro, 2019).

Pareto´s diagram point out the set of problems that requires more priorization on correction or minimization of failures, aiming strategies of satisfactory result. Pareto´s principle indicates that 80% of effects come from 20% of causes. Therefore, this tool allows the manager to identify the distinct importance of each class of items (Maia, Cruz, Oliveira & Fraga, 2017).

4 CLASSIFICATION, CODIFICATION AND CATEGORIZATION OF PRODUCTS

To classify a material means to group it accordingly to dimension, form, type, that is, its similarities. Such classification of goods is considering its peculiarities offers facilities to the purchasing process by merging codes of identification. The codification refers to the representation of all necessary information and sufficient based on the product´s obtained classification. Through each products historic it is possible to follow products information such as initial price, number of sales, localization, among others. Classification system and codification becomes fundamental for adequate purchasing procedures (Reis, 2007).

The method of encoding and description must be standardized to all companies´ departments, allowing a better communication among all about product´s information. The creation of a strong and clear classification has long term impact (Nara, Morais, Kipper, Furtado, Silva, Iserhard & Hoffmann, 2013). Besides that, poorly elaborated product classification may lead to difficulties on the purchasing process, rendering it more vulnerable to failures.

Categorization may be divided in up to three groups, the first one being nominated as group, followed by subgroup and, lastly, section (Tagplus, 2016). The importance of categorization may be testified by the consideration that product organization in groups reduces time of tribute placing as compared to one by one, relating them to groups with alike tributes.

Subgroup´s function is to divide items even more inside groups. If we think in a group containing "COOKER", for example the subgroups "STANDING COOKER" and "COOKTOP STOVE" could be created and related to the group. With these divisions it is possible to achieve

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better information on item´s demand for more precise decision-making. Lastly, there is categorization by section, in which the type of the product is indicated.

5 RESULTS

Purchases are centralizes and, afterwards, distributed to stores that have decoration departments in its products composition. This increases purchased volume, improves bargain power and stock control. The Decoration department has a purchaser responsible for managing the following categories: mat, lampshade, painting, mirror, luminaire, sofa cover, curtain, landscaping and miscellaneous. The purchaser is supported by a purchasing assistant. The lack of automation in purchasing process makes the reports produced by the current system the main resource for analysis of decisions and implies in the consumption of most part of purchaser´s time, who has to elaborate sheets and additional separately info. Purchasing is done exclusively by the purchaser, in the company as well as in fairs and showrooms.

By ICAS system, purchasers analyses the products turnover and the need to replace each of them. Besides, they generate purchase orders, enroll suppliers and put a price on items. System displays item´s sales for the last 12 months but can´t identify seasonal effects or incidence of extra actions, so such analysis is to be carried out by the purchaser. Purchasing orders are included on the system and delivered by email to suppliers. The company´s technology center insert changes and additions based on purchasers´ requests on a TestBase, accordingly to alterations viability, which become available on the official platform for all users. There is no data sharing between the company and suppliers for information security reasons. Products are delivered directly in the distribution center correspondent to the kind of good.

Lastly, information offered by the system for management are: last twelve months products sales, factory and accounting costs of products based on last entry, cost of freight, Industrialized Products Tax (IPI, in Portuguese abbreviation), Sales Tax (ICSM, in Portuguese abbreviation), stock balance, sales history by store, among others. Current center of profit´s categorization of Decoration Department is simplified and doesn´t cover all types of products dealt. Categorization is illustrated on the Figure 1:

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Figure 1. Categorization of Decoration center of profit.

No.	Description	Abbreviation
420000	DECORACAO	DECORA
420100	DECORACAO/TAPETE	TAPETE
420101	DECORACAO/TAPETE/TAPETE	TAPETE
420200	DECORACAO/ABAJUR	ABAJUR
420201	DECORACAO/ABAJUR/ABAJUR	ABAJUR
420300	DECORACAO/QUADRO	QUADRO
420301	DECORACAO/QUADRO/QUADRO	QUADRO
420400	DECORACAO/ESPELHO	ESPELH
420401	DECORACAO/ESPELHO/ESPELHO	ESPELH
420500	DECORACAO/LUMINARIA	LUMINA
420501	DECORACAO/LUMINARIA/LUMINARIA	LUMINA
420600	DECORACAO/CAPA SOFA	CAPA S
420601	DECORACAO/CAPA SOFA/CAPA SOFA	CAPA S
420700	DECORACAO/CORTINA	CORTIN
420701	DECORACAO/CORTINA/CORTINA	CORTIN
420800	DECORACAO/DIVERSOS	DIVERS
420801	DECORACAO/DIVERSOS/DIVERSOS	DIVERS
420900	DECORACAO/PAISAGISMO	PAISAG
420901	DECORACAO/PAISAGISMO/PLANTA ARTIFICI	PAISAG

There is a 36 characters limit for each profit center, what reduces its detailing level. Furthermore, the current categorization doesn't detail the "section" level. Thus, many peculiar items are thrown on a same level. To exemplify such situation, on figure 1, there is profits center number "420500" described as "DECORATION/LUMINAIRE" where "DECORATION" refers to the group, "LUMINAIRE" to the subgroup and, in section, there is again "LUMINAIRE". Thus, there is no definition of different types of luminaires on this profit Center, for instance.

The same behavior is observed in every profit center of the department. This factor makes item analysis more difficult for the purchaser, who can´t produce report for purchase studies by section, and is obliged to analyze the whole subgroup. Besides, turnover and profitability analysis at section level is compromised, since every section are together, being limited only to the department´s subgroup.

Considering difficulties created by the current structure of profit centers of Decoration´s department, a restructuration of product categorization is suggested, including produt´s sections based on the current mix dealt by the company. The new structure proposed can be seen at Chart 1 as follows:

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Chart 1. New structure by sections suggested.

No. CL	DESCRIPTION
720000	**DECORATION**
720100	**DECORATION/TRAY**
720101	DECORATION/TRAY/CRYSTAL
720102	DECORACAO/TRAY/WOOD
720200	**DECORATION/LIGHTING**
720201	DECORATION/LIGHTING/LAMPSHADE
720202	DECORATION/LIGHTING/FLOOR
720203	DECORATION/LIGHTING/CHANDELIER
720204	DECORATION/LIGHTING/TABLE
720205	DECORATION/LIGHTING/PENDANT

In this new structure, taking as an example once more the subgroup "LIGHTING", this time with section "Lampshade, Floor, Chandelier, Table and Pendant", the detailed categorization allows the description of items in a way that facilitates purchasing analyses – such as the one made by this study - and department management with more clarity and agility.

This categorization of profit centers served as basis for the structuration of other kinds of products dealt by decoration department. The suggested restructuration guaranteed a better level of organization and control of items. Besides, conveniences on the purchasing process may be expected, since purchasers can analyze the turnover of different kinds of products and be aware of the most representative, better focusing the use of purchasing budget available for each department.

For the achievement of the proposed restructuration, an analysis of the supplier's product´s mix with whom the companies deals is needed. The company at study has 129 suppliers in its Decoration department´s mix. Figure 2 indicates the amount and value of sales (R$) containing all the suppliers in the year of 2018. Such suppliers are indicated in decreasing order by total value consumed along the year.

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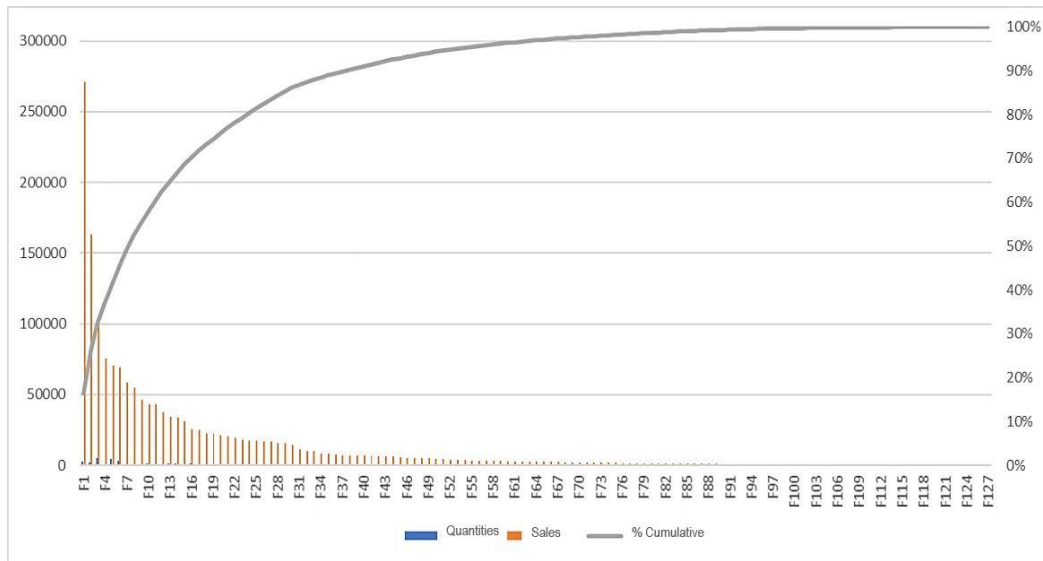
Figure 2. ABC curve Decoration.

Figure 2 illustrates suppliers´ classification by Pareto, composed by bars that represents the sales´ worth of each of them along the year, and the line indicates the cumulative percentage of the aforementioned. The classes´ percentage is based on the sales value of each supplier by the total of suppliers. Chart 2 shows the interval of suppliers belonging to each class and its percentage related to the total amount of sales during the year:

Chart 2. % of Worth of sales by classes.

ABC Class	Number of Suppliers	% total Worth of sales (R$)
A	F1 a F24	80%
B	F25 a F38	10%
C	F39 a F129	10%
Total	F129	100%

Departing from priorization shown by ABC Curve of 20%, 30%, 50%, it was found that Class A suppliers requires focused management and better periodicity. It was also noticed that the number of active suppliers on the purchasing process for the types of products of Decoration department was far beyond necessary, since there are many suppliers offering the same type of product.

Class A, containing just 24 suppliers, represented 80% of the total value of sales of the year, as Classes B and C, together, represented just 20%. This result indicate a unnecessarily employment of efforts, considering the total of suppliers, since the management of only 24 of them would bring the most part of the financial result to the department.

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With these findings, it is possible to consider quantitative data for the suggestion of reduction. However, considered the wide range of types of products needed to compose the Decoration department and that, very often, the suppliers of one product line are specific, that is, because they work exclusively with one kind of product, the representativeness of this supplier in the total sales worth won´t show on the ABC Curve.

In view of the above explaining, suppliers were analyzed by analytical ABC Curve of the kinds of products so that, this way, the most representative products segments were observed and associated with suppliers. In order to do so, the kinds of products were grouped by similarities and displayed in a same type of products so it could be presented in a general and reduced way. Chart 3 displays the types of products and the division by dominant class accordingly to ABC curve:

Chart 3. Suppliers Analytical ABC.

DESCRIPTION	R$ SALES	% CUMULATIVE	CLASS
MAT	232130,7	34%	A
CURTAIN	108721,99	50%	A
BOUQUET	81693,5	63%	A
CHANDELIER	68468,04	73%	A
FLOWERS	60008,46	82%	A
VASE	45682,36	88%	B
SOFA COVER	18330,87	91%	B
KIT FOR CURTAIN	17734,57	94%	B
DISPENSER	10868,41	95%	B
BOARD	8888,6	97%	B
MIRROR	8416,66	98%	B
COFFE TABLE	4165,81	98%	B
LAMPSHADE	4117,58	99%	C
CHRISTMAS TREE	1383,92	99%	C
SCULPUTRE	1116,17	99%	C
CANVAS	851,61	100%	C
CACHEPOT	602,4	100%	C
DOLL	483,56	100%	C
ASHTRAY	431,17	100%	C
POINSETTIA	294,12	100%	C
ORNAMENT	282,92	100%	C

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SWAG	274,71	100%	C
GOLDEN GRASS	178,64	100%	C
RESIN	156,39	100%	C

Analytical ABC classification rendered possible to observe types of representative items of the department and, thus, select the suppliers that work with the same kind of product to ground the decision about the reduction.

As it shows on Chart 3, classification of products types by classes indicates that items "Mat, curtain, bouquet, chandelier and flowers" belong to class A and answer for 82% of total sales value in the studied period. The seven kinds of products that follow represent 15% and are identified as Class B. Lastly, the remaining items belong to Class C, which although encompass most part of items, are responsible for only 3% of total sales worth (R$) in the period.

Class A items demand more attention, its disruption may have a significant impact on department´s profitability. Thus, management of these items must be done with efficiency.

Reduction of suppliers was suggested as a way of improvement of its management, which would facilitate their administration on the purchasing process, and, furthermore, implies in a better relationship and more bargain power on negotiations, since there would be more purchases with suppliers by means of expansion of product´s mix. Besides, it encourages supplier to invest in improvements on quality and on supplying products that are appealing to the consumer (Melo & Herrera, 2014).

Reduction was of approximately 85% on the number of suppliers. The high rate is explained by the fact that many suppliers still have stock balance and, thus, appear on sales rankink of 2018. Besides, suppliers history was analysed and it was found that with many of them there were just a single annual purchase, what doesn´t justify the effort to maintain the supplier on the mix.

In cases whereby supplier represented a small and easily obtained line of products with others suppliers, the choice made was for withdrawing him and widening the mix with a potential supplier with whom there is a long term relationship. Another factor contributing to the high rate of reduction has to do with importers. Many suppliers are only present in annual fairs, guaranteeing the possibility of two purchases a year. As for suppliers suggestion, a reduction of importers was chosen and improving the relationship with national companies with in-house production at an attractive price and with better deadlines and, besides that, with capacity to resolve malfunctions at the time of product receipt, which are qualitative factors measured for such reduction. Figure 3 that follows indicate the percentage represented by each selected supplier on the total sales value of the companies Decoration department.

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Figure 3. ABC curve Decoration.
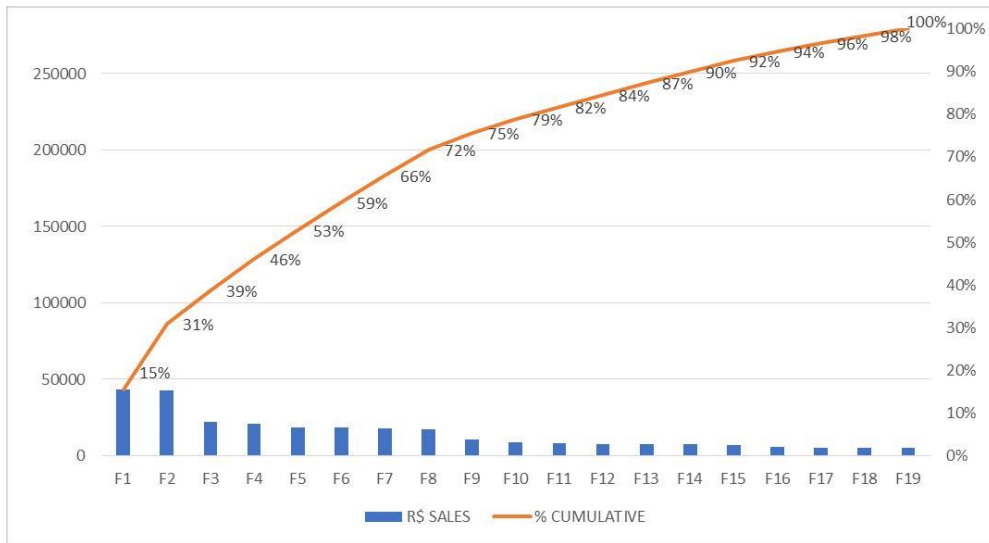
In order to analyse ABC curve, it became necessary to obtain the percentage of each supplier related to the total value of consumed products on the year and, afterwards, classify them by classes. To class determination, suppliers F1 to F10 represent 79% of total sales value, thus, considered Class A items. Suppliers F11 to F14 represent 11% and form class B. Furthermore, remaining suppliers, F15 to F19, answer for 10% of total department´s sales worth and belong to Class C. It is possible to notice that supplier's management of Class A, which are the most representative, was facilitated, which allows a better management even of Class C items. Chart 4 bellow indicates the described ABC Classification.

Chart 4. % of products by class.

ABC Class	Number of Suppliers	% total sales value (R$)
A	F1 a F10	79%
B	F11 a F14	11%
C	F15 a F19	10%
Total	F19	100%

Results of ABC Classification allows the conclusion that, for Class C items, it is more advantageous and productive to maintain partnerships with a small number of suppliers, given the great amount of purchases and the revenue brought by these products.

Use of tools for mix reduction analysis of supplies alongside with the categorization of profits center allowed better management of processes insofar as there was an improvement on purchases

process by means of a lower number of suppliers which. Amidst gains of right-choice of suppliers, could be mentioned the well underway of the processes, deadline guarantees, greater reliability besides client satisfaction (Rossi, 2015).

6 CONCLUSIONS

The research optimized purchasing process by means of strategies and tools that aided categorization of profits center and suggested reduction of suppliers granting gains for the companies´ purchasing sector.

Purchasing process´ analysis have pointed out difficulties related to the great amount of dealt items and to the absence of a structured process by product´s section, rendering evident the difficulty of priorization and purchases´ management.

The research was limited to the company´s Decoration department, which answers for, approximately, 0,65% of total revenue. Besides that, one of its goals was the optimization of purchasing process through time reduction and suppliers engaged in such processes. The impact of the research over other departments would be considerable and with greater costs reduction.

For future studies, suggestions are for the implementation of restructuring and reducing the mix of suppliers on other departments, monitoring such actions and of their performance by means of creation of indicators that measure prior and subsequent scenarios. A focused on costs study is encouraged so that financial gain brought to the organization by changes made can be evaluated.

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