Cost Management in Fabric Printing Services through Absorption Costing: a Case Study

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A R T I C L E   I N F O

A B S T R A C T

The goal of this article is to demonstrate the calculation of the costs of fabric printing services using the method of absorption costing. The research is classified as descriptive, conducted through a case study, with a predominantly qualitative approach. Primary data was collected through interviews with the organization's managers and secondary data were obtained through desk research on the records kept by the managers. The data analysis was performed through document analysis and content. The numbers obtained refer to the period from September to November 2014, from which was applied the allocation of the direct costs to products, of the indirect costs to the service and production departments and, then, to the services provided. For the allocation of the total costs to the services provided it was used the criterion of area (cm²) of the drawings created, engraved and printed, taking in consideration the diversity of these services. The total of direct and indirect costs of each product unit resulted in the total unit cost, previously unknown by the organization. By applying the methodology proposed in this study, the company enabled the construction of a cost management history that will allow it to increase its competitiveness in the segment of providing fabric printing services in the city of Brusque – Santa Catarina.

INTRODUCTION

The activity of providing fabric printing services is part of the group of yarn finishing, fabrics and textile artifacts in the National Classification of Economic Activities (CNAE) and is recognized as one of the traditional sectors of the economy of Brusque, a city in the State of Santa Catarina (SEBRAE, 2013). According to the aggregate database of Central Register of Enterprises of the Brazilian Institute of Geography and Statistics of Santa Catarina (IBGE / SC), the number of active companies in Brusque in 2012 and belonging to Section C (Manufacturing industry), Division 13 (Manufacture of textiles products) of CNAE 2.0 is 402 units.

Santos (2007) points out the textile sector in Santa Catarina as the second largest in the country in terms of employability, accounting for 15.76% of the total jobs created in the textile and clothing industry,

concentrated in 131.113 companies, representing 13% of Brazilian companies in the sector. The city of Brusque, located in Eastern Itajaí Valley, where the company object of this study is located, holds 1,397 companies in the textile-clothing sector, which represents over 26% of the total textile-clothing companies in the region in which it is located, 98% of them being classified as micro and small companies.

According to data from the Ministry of Finance of Santa Catarina, the Value Added Tax (VAT) of Santa Catarina, in 2010, reached the figure of R$ 102.4 billion of which Brusque accounted for 2.27% of this amount, being in the 8th State position in relation to other municipalities of Santa Catarina. Of this total, the group which includes the fabric printing activity represented 8.6% of municipal contributions to the Brazilian state excise tax and the Brazilian federal excise tax, having growth of 124% in the period from 2008 to 2010. The companies

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classified as manufacturing industries, which is the case of the fabric printing companies, correspond to 25.6% of the total companies located in Brusque and, from this total, 89.94% are micro-enterprises, responsible for 21.27% of the manpower employed in this sector (SEBRAE , 2013).

Nascimento (2002) justifies the performance of the micro and small enterprises in the textile sector as a result of the transfer of more intensive activities of labor of medium and large organizations for the micro and small ones, through subcontracting and outsourcing. The author also points out that these changes, occurring in levels of technology and arrangement of supply chains in the textile and clothing Brazilian sectors, have followed the world trend and allow significant gains in productivity. These gains are the result of efforts made by the national companies from the opening of the Brazilian market in the nineties, aimed at increasing the competitiveness, both nationally and internationally.

It is due to the characteristics of the micro and small companies that Barbosa and Teixeira (2003) call the attention to the cost management. Given the characteristics of simplicity, identified by limited resources and the underdeveloped structure, it is necessary to establish conditions conducive to the strategic thinking in order to the company to become competitive in an environment of rapid changes. Sonaglio et al. (2004) point to the strategic cost management as a valuable support tool for defining strategies for micro and small companies, although, often, it has been neglected by the managers who find themselves involved in an endless race against time. As these managers worry too much about short-term practical results, they consider the studies on the costs as an unnecessary waste of time and resources.

Souza (2012) points out that micro and small textile companies develop different strategies to ensure their survival and increase their competitiveness facing the intensification of global competition and the exponential growth of Asian products in the international commerce. In a study to identify these strategies, the author outlined a number of strategies to reduce costs, such as: the development of intensive training programs to enhance the efficiency and effectiveness of the employees; the investments in technology in order to reduce costs associated with the manufacturing processes and the adoption of a few management levels aiming at reducing fixed costs.

Considering the economic representativeness of the sector of yarn finishing, fabrics and articles textile for Brusque and the large number of micro and small companies in the sector mentioned above, the following research question was formulated: How to assess the costs of the fabric printing services using the system of absorption costing?

From that question, the objective of this study was to demonstrate the calculation of the costs of the fabric printing services using the method of absorption costing. Therefore, this study begins with a brief literature review in order to frame the empirical object, followed by the presentation of research methods and procedures that will provide the data for the description and analysis of the results, finishing with the relevant considerations on the research carried out.

Theoretical Foundations:
The importance of cost management for small service companies:

Raupp and Sousa (2013) emphasize that the process of determining and reducing costs of products and services, as well as the strategic decision making based on these data in the companies, is a constant challenge for managers and academics, considering the technological evolution of the production processes that require constant improvement of cost management systems.

The strategic cost management was presented by Shank and Govindarajan (1995) as a cost analysis in a broader context in which cost data are used to develop strategies to achieve sustainable competitive advantage. In this context of competitiveness are the comments of Bornia (2002) on the economic and market situation faced by the modern companies. The author states that the current situation is that of a competitive market with low-priced products, good quality, short life and diversity of models available to the customer and that this scenario makes the effective control of productive activities and its costs indispensable.

However, Scramin et al. (2002) point out the restriction of access to funding tools of various sectors of the national industry, especially for small companies. In addition, the description of their study on midsize dairy companies highlights the deficiency in recording and controlling the data, which are used for managing the costs or forecasting the productivity. Similarly, the study of Zamberlan et al. (2005) highlights the lack of advance planning on the viability of the business and the precipitation in the decision-making as the causes of the short life of many micro and small companies. Highlights the flexibility of small organizations in the face of larger organizations due to the use of simpler technologies and concludes in favor of the great importance of the cost systems for small businesses, mainly in order to provide advance information for budgeting, simulation of future results, business viability and decision making.

The absence of strategic management in small services provider companies is pointed Lerias (2011) as a result of the individual management that these organizations are subjected. Often, it is the owner himself who has the control of the entire management of the company in order to minimize fixed costs of more complex hierarchical levels, besides simplifying the decision making. The goal in seeking techniques for the analysis process and

detailing of functions in the services provider companies is to increase productivity, reduce costs and eliminate, reduce or improve the activities that do not add value to the business.

Horngren et al (2004) report that the services provider companies are seeking improvements in their cost management systems and present three stages of improvement of costing systems and the identification of direct costs - improving the accuracy in the allocation of costs to the services -, the increase of indirect cost centers and cost drivers - expanding the number of indirect cost centers to reach the homogeneity - and through the costs allocation criteria - identifying the appropriate allocation criterion for each indirect cost center.

Absorption costing:

The costs management process of micro and small service provider companies involves a sequence of decision making that may significantly affect its competitive advantage and survival. The basic information to calculate the cost of the services follow the general line for costing of products, replacing only some terms as product structure (here service structure) and manufacturing process (here execution process) (Padoveze, 2006).

In this sense, the choice of the costing method to be used should consider the type of data to be presented and desired by the manager. Therefore, it is appropriate to present a short description of the absorption costing method, chosen to support the proposal for the company object of this study.

The name, absorption costing, comes from the feature that, through this method, the cost of the goods and services should absorb fixed and variable costs (Martins and Rocha, 2010; Bornia, 2002; Stark, 2007). This costing method can also be found in the literature as full costing, conventional costing, whole costing or global costing (Stark, 2007).

The criterion of absorption costing, according to Leone (2009), includes the indirect costs of manufacturing within a certain period in the costs of the different industrial activities, which can be products, processes or services. As one of the main methods used in Brazil, and in several countries, to evaluate stocks for balance sheet purposes and for preparing and income statements, the absorption costing considers as components of products cost all the elements directly or indirectly related to the production (Stark, 2007).

This is the method derived from the application of the Generally Accepted Accounting Principles, not a principle itself, but a methodology resulting from them, born with the cost accounting (Martins, 2003).

In absorption costing, the allocation of costs to products is usually performed by segregating the groups called cost centers. They can be the cost center of production – in charge of the activities directly involving materials and equipment, converting them into products - or support centers - whose activities provide services to other cost centers (Martins and Rocha, 2010).

Figure 1 shows the basic structure of the absorption costing criterion. It is observed that the general costs production are totally absorbed by the products through the apportionment criteria, while the direct costs, such as materials and manpower, are directly allocated to the products according to the effective consumption per unit produced.
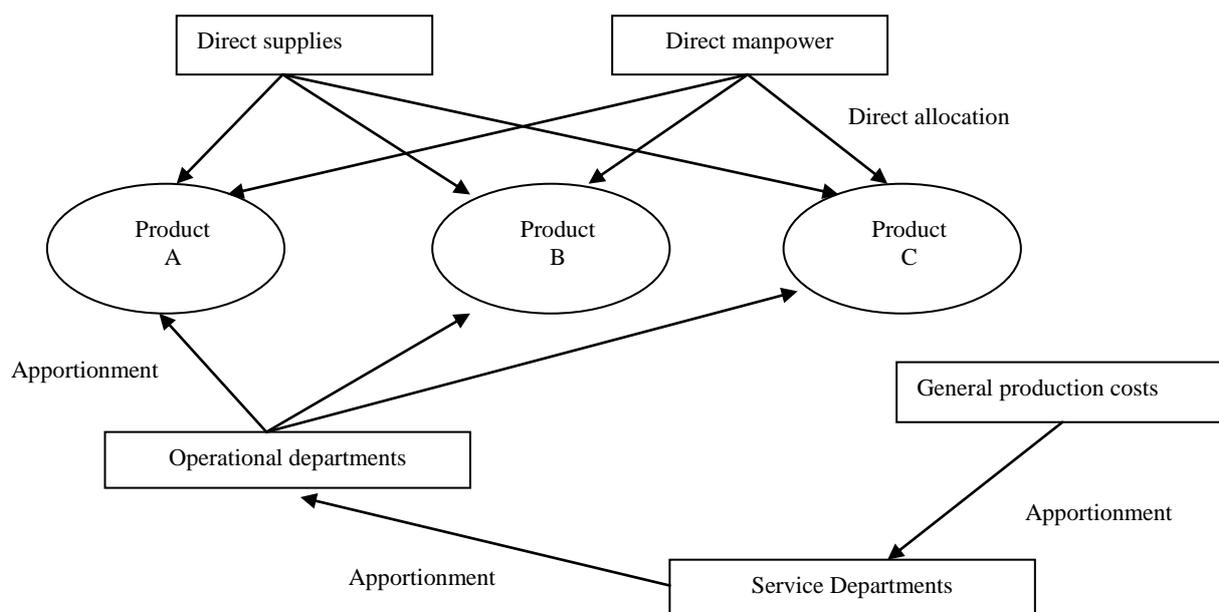
Source: Adapted from Leone (2009).
Fig. 1: Basic structure of the absorption costing criterion.

The allocation of the products costs can be done in two ways, using the departmentalization or not. Martins (2003, p. 44) defines department as the "minimum administrative unit represented by people and machines that develop homogeneous activities". They can be divided into departments of production or services according to their direct intervention or not on the products, respectively. The departments can be subdivided into cost centers. The cost centers are the minimum units of indirect costs accumulation, being possible for a department to have one or more cost centers (Martins, 2003).

Stark (2007) describes the steps for calculating costs by absorption costing as: separation of costs and expenses, allocation of the direct and indirect costs to the production in the period, determining the cost of the finished production, determining the cost of goods sold and determining the income.

When using the departmentalization, Martins (2003) presents as basic scheme: separation of costs and expenses; allocation of direct costs directly to the products; allocation of indirect costs that belong to the departments ,grouping the common ones; apportionment of common indirect costs to the various departments (production or services); choice of the sequence of the apportionment of costs of the service departments to the production departments; and allocation of the indirect costs, already included in the production departments, to the products, according to pre-set criteria.

As advantages and disadvantages of using absorption costing, Stark (2007) states that a major advantage is that the information generated by this method are valid both for balance sheet purposes as for income tax, besides presenting better information to the management to establish the selling prices, aiming at recovering the total cost in the period. As a disadvantage, and corroborating the statements of Maher (2001), the author points out the arbitrariness of the apportionment criteria of the indirect costs, which do not express proportionality or cause / effect relationship.

Methodological Procedures:

Regarding the objectives, this research is classified as descriptive, a case study with qualitative approach. Gil (1999, p. 44) states that the descriptive and exploratory research are the most used in the field of social research related with practice. He presents the main objective of descriptive research as "the description of the characteristics of a given population or phenomenon or the establishment of relationships among variables". Therefore, this type of research uses standard techniques of data collection.

Although the means of research based on case study provides little basis for scientific generalizations, it deals with information related to the phenomenon studied, facing a situation technically unique, based on several sources of evidence that can serve as an anchor for future research within the context researched (Yin, 2004).

Flick (2004) considers that the relevance of qualitative research to the study of the social relations lies on the fact that the pluralization of the spheres of life requires a new sensitivity to the empirical study of the issues. Creswell (2007) adds that the criterion of historicity to this type of research, pointing out that for the success of qualitative research, the researcher must think personal and theoretically, including its data in a specific context.

The set of primary data was obtained through guided interview that, as described by Gil (1999), has a certain degree of structure and is guided by a list of points of explored by the interviewer along its course. Secondary data were obtained by desk research that has, among its objectives, the analysis of change in organizations and, as an advantage, saves time and resources (Quivy and Campenhoudt, 2008).

The data obtained through the guided interview were analyzed using the technique of content analysis. This technique is attentive to words, allowing inferences from the content of the communication, drawn from the messages that are the interviewee's answers. The document analysis, to which the data from the document research were submitted, consists in handling the data provided by the documents examined so that its use allows to achieve the proposed objectives.

Analysis of the Research Results:
Presentation of the company object of study:

The company object of the present study, located in the city of Brusque / SC, participates in the service sector and is classified as micro company according to the companies classification criteria of SEBRAE and according to the Complementary Law 123/2006 of December 14, 2006. Being just over a year old, this service company is the result of the current scenario in which are inserted the textile companies in the region. In efforts to reduce fixed costs, many medium and large companies outsource their services, offering the opportunity for the creation of new businesses by young entrepreneurs.

Situated in an area of approximately 700m², the company's service is fabric printing. However, other services related to fabric printing are also part of the company's portfolio, such as engraving screens and creating drawings. Currently, the company has 9 employees and two managers who supervise the production activities, in addition to performing customer service, delivery of goods and business management. Therefore, the scenario this company is similar to those researched by Lerias (2011).

Aiming at improving its position in the market, the company studied earned the ABVTEx Supplier Certification, classified as one of the most important

certifications for local textile chain, with grade 8.5. This certification requires, among other audit points, that the companies have adequate costs management in order to ensure the survival of the organization (ABVTEx, 2013).

Proposal of cost management:
Identification and classification of expenses:

Through the guided interview with the company's managers, it was found out that the calculus of the costs of the services provided are based only on empirical data coming from the managers' experience in the printing industry and they do not have a system of storage and control of data.

The control of the services provided is performed manually in notebooks intended for these records and, eventually, spreadsheets are created in Microsoft Excel.

Thus, the company does not keep an organized record of administrative data, and the managers rely on reports provided by the outsourced accounting office whenever necessary.

From the data collected, the company was divided into four departments which represent the cost centers which have the same name: printing, engraving, creation and administration.

All the items of expense and their amount, considering the average of the months from September to November 2014, are identified in Table 1.

Table 1: Identification of the expenses.

Item	Monthly average (R$)
Electricity bill	2.900,00
Gas	55,00
Water	280,00
Phone	185,00
Accounting assistance	560,00
Office supplies	140,00
Taxes	265,70
Property tax	39,20
Rent	1.300,00
Associations of the class	1.200,00
Qualification of employees	1.890,00
Waste collection	600,00
Electrical maintenance	176,50
Hydraulic service	130,00
Computer maintenance	55,00
Machinery and equipment maintenance	265,60
Masonry maintenance	76,90
Manpower	15.930,70
Partners withdrawals	2.257,90
Social security	3.637,72
Dismissal fund	1.455,10
Fuel	250,00
Vehicle costs (maintenance, insurance)	132,40
Printing supplies	3.570,00
Screen engraving supplies	2.893,80
Drawings supplies	160,00

Source: Research data (2014).

The methodology chosen for the allocation of costs in the company object of study was the absorption costing with departmentalization. This choice was based on two main points that were, first, the absence of cost management methods in the company; and second, by believing that this method could satisfactorily meet the primary need of the company that is the calculation the cost of the services provided.

Allocation of direct costs:

Based on the description of the data provided by the managers, it was identified as direct costs those related to the services of printing, engraving screens and creating drawings.

These expenses are related to the supplies for the printing service, supplies for the engraving service

and manpower employed in the creation of the drawings, and its allocation is shown in Table 2.

All the numbers shown in Table 2 are related to the purchase of supplies to provide the services of this company. Besides those costs, there are no other direct costs to be allocated, considering that in none of the other cost items is possible to objectively identify the amount consumed by each service offered by the company object of this study.

Allocation of indirect costs:

Raupp and Sousa (2013) identify some peculiarities of costs in providing services in relation to the costs of production. According to the authors, the main features of the services are: non-storage, personhood and being consumed as it is provided.

In the company object of this study, the services analyzed were printing, engraving screens and

creating drawings, requiring the description of the services and departments considered for the apportionment map of the indirect costs.

The expenses were allocated into four departments: administrative, creation, engraving and printing. The administration department is the department of service in the apportionment map and includes the reception of the company and the area of control and management of the business. The production departments in the apportionment map were considered the creation, engraving and printing.

Table 3 shows the process of allocation of the costs to the service and production departments:

Table 2: Direct costs.

Product	Monthly amount	Printing	Screens	Drawings
Printing	3.570,00	3.570,00		
Screens	2.893,80		2.893,80	
Drawings	160,00			160,00
Units		57.750	840	735
Unit direct cost		0,06	3,45	0,22

Source: Research data (2014).

Table 3: Allocation of the costs to departments.

Item	Monthly Amount	Service departments	Production departments		
		Administration	Creation	Engraving	Printing
Electricity bill	2.900,00	145,00	145,00	290,00	2.320,00
Gas	55,00				55,00
Water	280,00	14,00		98,00	168,00
Phone	185,00	185,00			
Accounting assistance	560,00	560,00			
Office supplies	140,00	140,00			
Taxes	265,70	265,70			
Property tax	39,20	39,20			
Rent	1.300,00	1.300,00			
Associations of class	1.200,00	1.200,00			
Qualification of employees	1.890,00	1.890,00			
Waste collection	600,00				600,00
Electrical maintenance	176,50	176,50			
Hydraulic maintenance	130,00	130,00			
Computer maintenance	55,00	55,00			
Machinery and equipment maintenance	265,60	13,28	13,28	26,56	212,48
Masonry maintenance	76,90	76,90			
Manpower	15.930,70		1.768,31	1.768,31	12.394,08
Partners withdrawals	2.257,90	2.257,90			
Social security	3.637,72	662,07	331,03	331,03	2.313,59
Dismissal fund	1.455,10	264,83	132,41	132,41	925,44
Fuel	250,00	250,00			
Vehicle costs (maintenance, insurance)	132,40	132,40			

Source: Research data (2014).

The items of cost were allocated to the departments according to the estimated consumption of the respective item by each department, as explained below.

The criteria used for the apportionment of the electricity and water bills were the amount of equipment and points of consumption in the departments. From the mapping of these quantities, the percentage ratio of the amount spent on electricity and water to be allocated in both services and production departments was calculated.

The costs with withdrawals were allocated to the department of services due to the fact the administrators are responsible for the administrative management of the company and for the supervision of the services provided. The cost with manpower was allocated to the departments of services according to the number of employees in each work area and the respective amount were calculated based on the total amount (manpower, Dismissal Fund and Social Security) based on percentage. The creation and engraving departments have only one employee each and the printing department holds all the manpower left.

All the other items shown in Table 3 not discussed previously were firstly fully allocated to the department of services, and then allocated to the departments of production, as presented in Table 4.

The allocation of the costs of the department of service to the departments of production done was based on the total indirect costs of these departments, considered as a satisfactory criterion for the company once the managers do not have control of the time devoted to the individual management of the departments.

With all the indirect costs allocated to the departments of production, it was necessary to allocate them to the final products so that it is possible to determine the unit cost of providing each one of the services of the company.

Determination of total unit costs:

In order to determine the total unit costs of the services provided by the company object of this study, a survey on the production of each department

of production (creation, engraving and and printing) was conducted in the months from September to November 2014, as presented in Table 5.

Table 4: Allocation of service department costs to production departments.

Item	Creation	Engraving	Printing
Allocation of the department of service to the departments of production	975,78	1.073,36	7.708,64
Costs of the Departments of production	2.390,03	2.646,31	18.988,60
Total	3.365,81	3.719,67	26.697,24

Source: Research data (2014).

Table 5: Monthly average of services provided.

Service	Monthly average
Creation	735
Engraving	840
Printing	57.750

Source: Research data (2014).

Given the diversity of the services provided by each of the departments and understanding the direct relationship of the cost of the company's services with the area of the drawings created, engraved and printed, it was decided to allocate the costs according to this criterion. In this way, the data found on costs by cm² may later serve as basis for the funding the other services provided by the organization.

In a conversation with company managers, it was identified that the main drawing size of the creation area is 50x60cm corresponding to an area of 3000cm². In the sector of engraving and printing, the

main sizes are 50x60cm and 20x30cm corresponding to an area of 3000cm² and 600 cm² respectively, and divide equivalently the demand in the sectors.

Using the monthly average of services provided by each department, presented in Table 5, and relating these data to the areas of the services provided, the following data was found out, as presented in Table 6.

Then, the costs of each department were attributed to the total area of services provided in order to find out the unit costs, by cm², shown in Table 7.

Table 6: Total area of services provided.

Service	Total area (cm²)
Creation	2.205.000
Engraving	1.512.000
Printing	103.950.000

Source: Research data (2014).

Table 7: Unit cost by cm²

Service	Unit cost (R$/cm²)
Creation	0,00153
Engraving	0,00246
Printing	0,00026

Source: Research data (2014).

According to the information obtained in the interviews with the managers, the empirical method used for the costing of the services provided seemed to be satisfactory for the company's needs. However, after applying the absorption costing method, it was noticed that the empirical method presented outdated costing values in relation to the proposed method.

As an example, it can be mentioned that the cost of providing the printing services for screens of 50 x 60cm. In the empirical method, previously applied, the final price for the customer was R$ 0.75 for prints with only one color. In the method of absorption costing, the cost of printing service was estimated in R$ 0.78, and for the calculation of the final price for the customer it would be necessary for the company to add the desired profit margin to this cost.

Conclusions:

This study was proposed taking into account the importance of effective cost management for the survival of the companies in highly competitive environments, such as in the textile environment. For the company object of this study, it was proposed a methodology that aims to assist in the management of their costs due to the diversity of services provided.

To reach the goal of the research, guided interviews were initially conducted with the managers of the organization, and documentary research, in order to identify the departments of the company, the total expenditure incurred and the amount of services provided during the period from September to November 2014.

The methodology proposed for this service provider company was the absorption costing with

departmentalization, based on the organizational structure and the information desired by the management. It was also taken into consideration the fact that the company doesn't have any method for cost management, being the data obtained with this methodology suitable for its primary needs.

The company structure was sorted in departments according to the services provided. The direct costs were allocated to the services of the productive sectors of creating drawings, engraving screens and printing. For the appropriation of the indirect costs to the services, it was decided to classify the minimum unit cost in cm² considering the importance of this measure for the organization and for later calculations of costs.

Comparing the empirical data with the data obtained from this research, it is emphasized the importance of cost management in small companies providing printing services and the need of the administrators for the management these information.

Despite the simplicity of the proposed method, it can be used permanently by the organization and should be continuously checked by the manager. Being a dynamic and flexible method, it can be adapted as the organizational structure goes through changes.

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