



DESIGN OF A MANAGEMENT SYSTEM COSTS FOR INDUSTRIAL COMPANY OF CASTELLON

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INTRODUCTION

Over the recent decades world trade has had a huge increase and industry driven by this growth has evolved considerably at all levels (global, national and regional). The globalization of markets means that increasingly consumers are better informed so its level of demand towards the products in terms of technology and quality is increasing, this has meant that businesses adapt in order to compete in a market increasingly internationalized. In the vast majority of cases this adjustment is reflected in the way that institutions adjust their production processes, where the indirect costs that are associated with the various products have taken on a special significance.

Besides this, the economic crisis that has taken place in recent years has brought new challenges for companies as they all have been forced to reduce their costs because they have experienced the fall in sales. One of the ways they have used these organizations to minimize these costs is to reduce the staff and production, others have opted for the optimization of their production processes. This optimization can be performed with information systems that enable companies to streamline costs by maximizing the productive capacity that is available at the time.

In this context, given that many studies explain that the calculation models and traditional management costs (as direct costs or whole) have become obsolete with regard to providing information on costs of production and cost management, and especially acquiring great importance for organizations to quantify the indirect costs, is presented as an objective of this work, the study and implementation of a cost management model based on activities (ABC) in an industrial company that manufactures forklifts, this model will allow us to group and quantify the indirect costs incurred by the company throughout the entire production process.

To perform this implantation first we will focus on the theoretical framework which will explain in detail the ABC model and the advantages and disadvantages arising from the adoption of this model compared to traditional cost model, and then relying on this framework apply the model the selected company. The importance of the realization of this work is that the cost model under study enables the company also to have greater control over the activities and costs involved therein providing valuable information to which managers may have a solid foundation that proves helpful for decision-making. Also, while it is true that it is difficult to implement a business system costs designed for

another entity, since they coincide in business sector each has its own operational, this paper may serve as a starting point for those companies with similar characteristics to the study, who want a deeper understanding about the costs that are incurred and therefore wish to implement this model of cost management study.

GOALS

The objective of this work is the design and subsequent implementation of a system of activity-based costs for a company in the industrial sector which is located in the city of Castellon de la Plana and whose main business function is making trucks. Thereby achieving the aim enables managers to provide a tool that allows them to get a more detailed study of the costs necessary to carry out productive work within the organization. In addition to implementing the model objectives to be achieved the following details are below:

- Obtain information to determine more accurately the cost of the final product.
- Determine the weight more reliably involving resources on the cost of the final product.
- Be able to identify and quantify in a more accurate indirect costs incurred by the organization to produce the product.
- Control and reduce costs by reorganizing the activities taking place throughout the entire production process. This will allow the company to improve its structure to eliminate activities that do not add value to the product and instead are a burden for the organization.

In order to achieve these objectives, this work is divided in such a way that in the first part the theoretical framework in which the ABC model where the main steps are as follow for the proper performance of the model structure is shown and then we will support the design and implementation of the same in the studied company resulting from all this a more practical vision model. In short, the framework will consist of a brief summary of what the basic concepts of the model, such as activities, cost elements or cost drivers.

In the second part we will focus on a proposal for practical implementation of the ABC model in a real industrial company in the province of Castellon, so to make this proposal we have compiled information of the entity studied. All information gathered comes from interviews with staff of the company, the website of the same and the own life experience,

because I was part of the production team a few years ago. In addition to business information, to design the model we have relied on all the concepts seen in the theoretical framework and knowledge acquired during the study of the cost model based on activities or ABC.

Finally pose different conclusions are drawn as a result of the preparation of this work and the different contributions that have provided it.

MODEL DESCRIPTION OF ACTIVITY BASED COST OR MODEL ABC

The companies usually tend to have the need to calculate with a high degree of precision how the different products or services undertaken by the entity consumes the resources of it, this has led to the managers of the various organizations to review their systems consider costs and improvements in order to have information with a more detailed level of consumption of resources of the entity breakdown, and with this information to improve management systems and production. One of the measures that more often opt these managers is to implement a system that allows them to identify the different activities of the company throughout the entire production process in order to allocate the costs to each cost center which the activity is performed. But often to do this is not easy since there is always a role model or it is not known for sure at what point is the entity to have this as a starting point. On this basis, one of the systems cost management that has gained importance over the last decades is the cost model based on activities or ABC model, as this model has a way of expressing exactly the cause-effect relationship between resources consumed and activities throughout the production process. This model of cost management will be the subject of our study and to play a fundamental part in it, to implement this first we must know its structure and this is what we will do next.

The method is to design and implement is the cost management model based on activities or ABC. Due to the characteristics of the entity studied and how this has structured the department where productive work and which is the focus of our study is developed we have opted for the study of this model will be the most suitable for developing in the company. This entity has been in almost constant growth since its inception, and given the characteristics presented its changing and globalized environment it is necessary to organize a more accurate value of the costs involved in conducting its business activities study. Furthermore, given the size of the company and taking clear that our study will focus on one of its delegations, the information obtained

can be of great importance for the study of the costs of other delegations that entity are composed.

The ABC model is premised that the products do not consume resources without consuming activities or services, these in turn are consumed by the products, so we can say that the generated costs are not products they are the activities developed to carry out the production process. Therefore it is important to know the type of activities that the entity and classify them correctly. It is these activities which consume resources and costs are the expression that quantifies in monetary terms the consumption of these goods or productive factors. These costs are passed on to the products in accordance with the cost drivers. Therefore proper management or control of the activities will lead to continuous improvement of its implementation and activities more efficient and/or effective that will reduce costs and allocate them more successfully in a less arbitrary way (Möller, 2011).

Currently to group activities carried out in the company, we keep in mind that according to the model-based cost management activities, they must meet two requirements: one is that there must be some consistency between activities you want to group and forming direct or indirect part of the production process. The second condition that must be met is that the activities are likely to be quantified using it for the same unit of measure or unit costs. Ultimately the aim is that the activities are at the center of absorption of resources used in the production process, so then these are assigned to the products according to cost generators (this term is explained later). In addition to the above, the ABC model activities should be designed so that only the direct cost will be collected, because in this management model the possibility of indirect costs between activities is eliminated and, thus the charging of secondary distributions between activities which may be the less messy and costly in terms comet, and time (Garcia, 2012) is avoided.

CLASSIFICATION OF THE ACTIVITIES OF THE COMPANY

In this section classifying the activities of the entity that is the subject of our study, this group is determined according to the criteria used in the ABC model. Therefore, we will perform this classification on the following criteria (Garcia Gonzalez J. Möller, and Gonzalez Soria). Depending on the level of activity of the same for the product:

- Activities at the unit level: those which necessarily run each time a product is manufactured. In this case the resource consumption is determined by the number of units produced. As an example we can put a piece cut to produce the product.
- Batch-level activities product: are those incurred to produce a new order, different from what was manufactured before. In this case the cost of the resources consumed by these activities is determined by the number of lots of products that are made, but will be independent of the number of units that you make. As an example we can put cleaning a machine to prepare another batch of different products, or preparation thereof.
- Level activities product line is made to maintain the function of any line production process. These activities are necessary for continuous improvement of manufacturing processes. The costs incurred for carrying out these activities are independent of the number of units produced and the number of batches produced, but are related to the introduction of changes in manufacturing processes or products. Thus, an example of this type of activity is that of facilities dedicated to packaging products (understood by the place and personnel in charge of this work).
- Activities at the enterprise level: those whose implement aims to support the entire organization. Within this category are the activities that are in the areas of administration, accounting, legal and labor advice, etc. These activities are common to all production processes, so that the allocation of the costs of these activities are charged with a high degree of subjectivity.

Depending on the frequency of performing the activities, we can classify as repetitive and non-repetitive. Repetitive are those performed systematically and continuously in the company. Also these activities preset standard resource consumption to occur whenever a particular purpose and also determined for each one. On the other hand, non-repetitive activities are those performed sporadically, i.e. they are made occasionally.

The ability to add value to products, here we see the problem from two different perspectives. On the one hand, from an insider's view it is considered that an activity is able to generate value added to the product when it is necessary to obtain the product, i.e. if the removal of such activity does not create any problem for the manufacture of the product before an activity that does not add value to it.

Moreover we have the external view is regarding the customer. Activities that generate added value are those that applied to make this product more attractive to the customer and will make you more interested in that product. An example concerning our particular

case can be the good finish of a product that is well painted, flawless, clean and well-greased (Gonzalez, J.).

COST GENERATORS

It provides that the management system based activities aim to respond to the subjectivity many times in the process of allocating indirect costs. The process of allocating these costs to products by activities appear to solve the subjectivity of that complaint, however, to do this you need a set of appropriate units of measurement and control to set correctly the relationship between activities and products.

These units of measurement are what is known as generators costs or cost drivers, i.e. those factors within each activity generated a cost for the company. The type of imputation model used in the ABC systems perform very similar to the work units used to allocate costs in the full cost models function, however, these measures are not equivalent. In the ABC model the degree of precision achieved in the process of allocating costs is much higher than the taking as a basis for allocating the work units. This is because the cost drivers are able to establish (less subjective) more accurate and realistic causal relationships between products and consumption activities. (García and others).

Within each activity you can establish the existence of generators of different costs to each other, so the difficulty is determined by the need to decide which is best suited for use in our allocation process. Therefore, anything that can help us in choosing the most appropriate cost generators is to examine what best fits the following features:

Which best suits an agency relationship between activities and outputs consumed obtained (cause-effect relationship between the two) and another key feature is that the unit cost is easy to observe and measure (Gonzalez, J. and others).

COST ALLOCATION PROCESS

For the cost allocation process, in the ABC model they can distinguish two distinct phases, which are composed in turn by various stages.

The first phase consists in assigning costs to different activities while in the second step, proceed to the determination of cost of products through the allocation of direct costs and the activities thereof. Then we explain more in depth each phase (Gonzalez, J.).

First Stage. Assigning costs to activities for the determination of this phase we perform the following steps.

1. Allocation of indirect costs to cost centers: in this first stage we locate the indirect costs for the product in each of the sections or departments where the company is divided.

2. Identification of activities of centers: for this we have to identify and classify the various activities carried out in each section. This stage is one of the most important and sensitive model as this approach will depend and be performed more objectively for the sharing of costs. To this end one of the most common procedures is often the use of interviews or questionnaires integrated in each area and the people responsible for them. The information is intended to pick up with this method that is relating to operations, processes and tasks performed in the organization with which to develop a map of activities. The choice of these activities should result in the allocation of direct costs to them, thus eliminating the indirect costs with respect to them.

3. Determination of measurement units: This stage is crucial in the allocation for each activity you must choose the inductor cost that best represents the cause-effect relationship between the consumption of resources for the activities and the products obtained which must also be easily identified and measured as discussed above. For example a basis for allocating the costs may be the time spent on each activity carried out for the final product. Therefore it is very important this stage, as it will allow us to allocate costs to different activities, later attributed these activities and their corresponding products that consume costs.

4. Reclassification or regrouping of activities at this stage and to simplify the process regroup activities that are repeated, because within the different centers can be identical or very similar activities and actually obey the same generator costs.

5. Calculate unitary cost of the units of measurement: at this stage simply divide the cost of each activity performed throughout the production process between the numbers of inductors of cost. The unit cost of each inductor comes to represent the measure of resource consumption per unit of measure is needed to carry out its task.

Second Phase. Allocation of direct costs and activities to products: this phase is divided into the following steps (Gonzalez, J.).

A. Allocation of activity costs to products: as mentioned above, this model is based on the premise that resources are consumed by the activities and these in turn are consumed by the products, and inductors costs that relate directly to one another way. So at this point, once the final costs generated by each activity measurement units required for processing of the products are defined and the costs of activities such products through these units of measurement are recognized.

B. Allocation of direct costs to products: the direct costs (such as raw materials) have not participated in previous stages. This stage is hereby terminated with the allocation of direct costs to each of the products. We have to clarify that the allocation of these direct costs refers to raw materials consumed directly on products.

ADVANTAGES AND DISADVANTAGES OF THE IMPLEMENTATION OF MODELS OF COSTS BASED ACTIVITIES OR ABC.

Throughout the study of the various publications that have been consulting during the development of this work we have observed that many authors have arguments for and against the model that is being studied in the present work, the vast majority of them comparing the ABC model with the model of traditional costs. Since I have not done an exhaustive study of the model of traditional costs which do not make a comparative relative to each other, only the points where the vast majority of authors agree and which may be decisive when they will comment implement a system or another. To do this we define the points where the ABC model highlights from the traditional and then enumerate the advantages that the implementation of the cost model based on activities and the limitations or disadvantages associated with this control system costs (García, 2012).

As for the differential points ABC model against the model of traditional costs we can note that in the cost model based on activities you may identify more cost, in this model's groups costs are created, also a feature more important it is that in this model there must be a causal relationship between the various costs incurred and activities in each grouping of costs.

Among the various advantages of the implementation of the cost model based on activities we include the following: (García and others).

- a) This model provides a basis for allocating logical and understandable for the calculation and subsequent cost management costs.
- b) It is applicable to all types of businesses.
- c) Provides information that identifies the products, services, customers or any other object not profitable for the organization costs.
- d) Allows the various costs related to their causes due to the more detailed construction which provides the model, representing a fundamental help when it comes to allocate them.
- e) In the ABC model will exist both cost drivers and activities are conducted in each center, while in the traditional system costs only one unit of work for each cost center is used.
- f) Allows a tighter budgeting, allowing better planning and provides support when making strategic decisions.

On the contrary, this model has a number of limitations which we highlight in the following: (García and others)

- a. Allocating some of the costs remains arbitrary, at least as far as infrastructure costs is concerned.
- b. It presents a number of difficulties in choosing cost drivers.
- c. The ABC system is essentially based on historical costs, in the event that within the organization future costs relative importance that charge for this are generated, system utility implementation of this system is at least doubtful.
- d. Some indirect costs related to ancillary activities such as administration or management are considered a difficult assignment, so attributing them to the different main activities continue to have a high degree of subjectivity.
- e. A significant amount of resources consumed in the design and implementation phases of the model.

Given the above, the decision to implement such a system in the organization is determined by the cost structure of the company (in terms of direct and indirect costs are

concerned), the diversity of the products or the size of the organization and above all, the study conducting managers regarding the level of added value that can make the implementation of this system in the company.

BUSINESS OVERVIEW

To begin commenting that all the information relating to the company object of our study which serves as support for the development of this work has been obtained from several sources, the most important being the company's own website, interviews with staff working on it and my own experience within the organization, as part of the production staff of the same a few years ago and this allowed me to see first-hand the organizational structure and functioning of the department. On top of that I have been collecting information through website databases.

Having said that we proceed to a brief introduction to the history of the company. It was created in 1969 as a distributor and manufacturer of machinery for storage. He was well received by the market and its growth was such that in just ten years spent to expand their activities not only in national but also international trade engaging in the export and import of machinery and consumer goods. At this moment it is a company that is in the industrial sector of the manufacture, sale and rental of forklifts and moving machinery goods (trucks, mini loaders, lifting platforms, etc.).

It is one of the first companies specializing in Spanish territory in this area, as well as provide customized financing and after-sales service quality. Its growth has been such that now has more than 8 offices spread throughout the Spanish territory, of which the one located in the city of Castellon de la Plana will be the subject of our study. This has a staff of around 36 people and large facilities fully adapted to the performance of duties by the staff, also has a large fleet of vehicles that serve different customers.

Despite entering the international market, it has not neglected the national level, being particularly active in this and this has been reflected in the strong increase totals have experienced their commercial transactions.

But all this has not come alone, however, have made great efforts to study and meet the needs arising in the industry over the years, so we have designed a series of products and services (which They described below) which have allowed them to grow and become one of the most solid companies in the sector.

One of the reasons that have enabled the company to establish itself as one of the most important in the sector is how to carry out the tasks of rent as well as the aftermarket, and that is to make it a study is done each client is treated in a personalized way

according to your needs. To meet customer requirements the company has a number of services which are summarized below:

Technical assistance:

Here what is meant is to show a series of proposals designed and analyzed as processes related to the transfer and loading goods from the store each individual customer solutions. This is possible because of the experience they have in different industrial sectors. This makes it more aware of the needs that each client may have and offer companies detailed proposals and solutions tailored to their specific requirements, optimize and ultimately maximize the transport and storage processes.

Rental / Leasing.

According to this paragraph, the company provides leases tailored to the needs of its customers, thus, can make contracts of a month, a year, five years, etc. This rental includes maintaining the machinery required, the costs presented are fixed, that is, the rent is fixed throughout the contract (not subject to potential inflation or incidentals). In addition to say that the customer who rents one of these machines have the tax benefits of these expenses, as they are tax deductible expenses.

Repair

The company has a technical assistance service for lift trucks and lifting equipment that allows customers to directly contact qualified personnel who can advise telephonically about unforeseen circumstances, doubts or incidents that may have occurred. In addition to this call it has a large team of technical specialists who have in turn with mobile workshops to travel to their workplace and thus make repairs arising as quickly as possible. This what the aim is to maximize the time and the customer's investment in order to meet the objective is simply to reach the satisfaction of the same, offering a personalized, fast and efficient service, and an ongoing commitment to the contribution of value and continuous improvement.

Maintenance

The maintenance performed on machinery is planned according to the demands by the same customers, so it is a custom maintenance which allows users to simply the periodic review programs necessary for optimal operation of the machine. Also, it is available equipped with mobile workshops to move to the locations where they are different clients in order to perform the necessary maintenance operations to dispose of the equipment at its best highly qualified staff, which It supposed to cause the least possible

inconvenience to users of the machines and that these in turn are held in the best possible conditions.

Parts

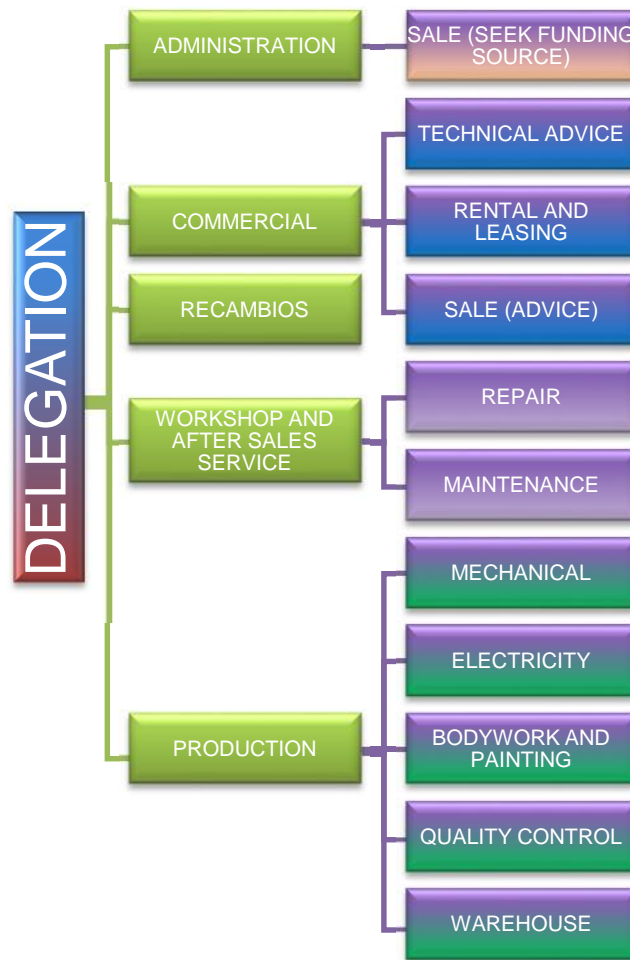
In this section we say it has large facilities to store parts, accessories, spare parts and in general all kinds of parts for the repair of both own machinery rental situation, as it is owned by the customers. Due to the enormous demands of those subject machines, all these parts of which are accessed are original and are available for distribution and use. The customer commitment is such that ensures the delivery of spare parts in nationwide within a period ranging from one to two days.

Sale

The company has a division that takes care of customer advice. This is determined depending on the needs that have to satisfy machinery. Once the machine is chosen the company is responsible for finding sources of financing for the client through the most renowned financial institutions. All this involves access by customers all financing facilities for both the acquisition of new equipment such as refurbished or even renting or leasing.

Some of the services provided by the company have their department responsible for this; however, there are some of these departments that perform several of these services, so we do a schematic overview of the departments that are in the organization and services that each provide the same:

Fig. 1. Departments and activities



(Source: own elaboration)

DESCRIPTION OF ACTIVITIES AND PRODUCTION PROCESS

Forklifts are used for a wide range of activities and / or sectors are machines intended primarily for carrying, pushing, pulling or lifting loads of different weights and sizes, also serve to stack it at high altitudes. Depending on the use to which they go for can be electric (for poorly ventilated areas where you can enclose the smoke from a combustion engine), with diesel or gas, and whether it is to be used in areas with little grip or without to pave the road. Depending on the load that they will support for specific space for which they are to circulate there are larger or smaller (more or less power). These characteristics have led to such machines becoming a cornerstone for the industry and essential for most companies regardless of their size or sector in which they operate.

As discussed above for the completion of this work I focus on the study of the delegation which is located in the city of Castellon de la Plana, and within this, we will focus on the

division that handles production, due to this the most complete and complex part of the company can be decisive to identify and allocate the more accurately the costs they incurred. As explained previously the company rents and sells machinery. The machinery that is sold can be of two types: firstly there is the completely new machinery, where the latest models coming to market with technological improvements that lead in that instant which is included in the market. This machinery is imported, it has an agreement with several brands, which are leaders in the sector. The equipment is designed and manufactured entirely outside Spain, particularly in Japan. Then there is the machinery that is reprocessed or rebuilt, reconstructed each truck meets all technical specifications and standards that lead each particular model or brand. The latter are processed entirely in Spain and the new parts necessary to rebuild are from the mark to which the machine belongs, are completely original pieces.

Now we will focus on the manufacturing side that is the subject of our study is that in addition to selling machinery import, also sells machinery to be "produced" in the company. Referring to the term "produced" this means that machines that have been used for long periods of time, who have had a long life and now have many faults or that are of great importance become reconditioned.

To do this, this type of machinery which is removed in its entirety is taken, a thorough cleaning of the parts, both engine and steering, electrical, mechanical, sheet metal, etc. Once this is done, a rigorous and detailed parts of the state diagnosis is made to see what can be reused and which should be replaced. So the parts that can be reused are overhauled, this leads to the parts that need it and the rest replaced entirely rectified.

All this is done in the workshop, which is divided into a number of sectors or sections to do their specific job. Thus, the production process consists of the following phases:

First: the machine is dismantled and the work of cleaning and inspection before mentioned, for which each section is responsible for its share is made. Thus, the mechanics will be responsible for part of the engine and hydraulic parts, electricians wiring and batteries in case the machine is electric, the painters of the sheets, balances, etc.

Second: electricians are responsible for verifying that all parties are entitled to, for it will have the chassis or frame of the machine in which work inspecting and replacing the wiring you need, as well as the controls or indicators that require machine it. This for the information on the machines running part fossil fuels. For machinery which is entirely driven by the cumulative current in a battery, we have to add that apart from the wiring is much more complex, we have a huge battery to be inspected and repaired. In addition

to this, this type of machinery has engines that have to be inspected by electricians, due to its high content of electrical parts.

Third, the mechanics are responsible for the share of the engine, transmission and steering shafts, hydraulic and lifting machines and mast system. For this disassemble the entire engine, sending some of the pieces to a specialist for the rectified company, others are made in the store, and if they are not available in the same, they are charged to companies specialized in spare parts. Once the necessary parts have been recovered, we proceed to the motor assembly as a whole. The next step is performed once electricians have finished with the chassis. Mechanical engine mounted on the chassis and proceed to check the connections and the motor function properly.

After that we proceed to check and repair steering and wheel axles. Checking clearances, bearings, etc., and repair or replacement parts if necessary. It is found that the hydraulic systems (lifting, handling, etc.) and the mast of the machine working properly, if not, corrections and / or necessary repairs are made. Once it is found that the engine, transmission, axles, steering, hydraulics and lifting system works perfectly, the machine to the fourth phase is passed. (If, after checking the work of the mechanics is all right, but the machine does not work very well because there is an electrical part that is not going correctly, it goes back to the section of electricians and from there once resolved the issue, it will pass to the section in charge of the fourth stage).

Fourth: Once you have the mechanical and electrical checks and found that everything goes correctly, the machine moves to the paint and body section. It will be responsible for grinding, polishing and put putty to pieces. Once this is done, all parts, both which are mounted already in the machine (engine and its components, chassis, axles) and those still missing on mount (balances, mast, side shift and fork) are painted. Remember that all of these pieces have been reviewed and setups.

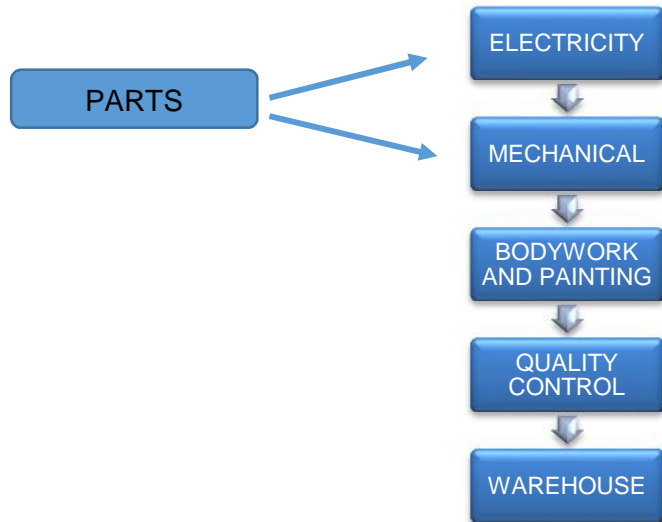
Once painted and dry, all the missing pieces to incorporate mounted forklift, leaving it perfect to move to the final stage of this process.

Fifth, once painted the machine enters the final section in which you make a visual inspection, then they are polished and fixed little flaws that it may have, you put all the stickers that correspond to the type of machine (remember that they are rebuilt so they can be of different brands and models), all the moving parts that are exposed to friction and exposed to dust and atmospheric effects like rain oiled machines. Finally a general

operational check is performed and if everything is correct the truck happens to be in stock again to be sold or rented.

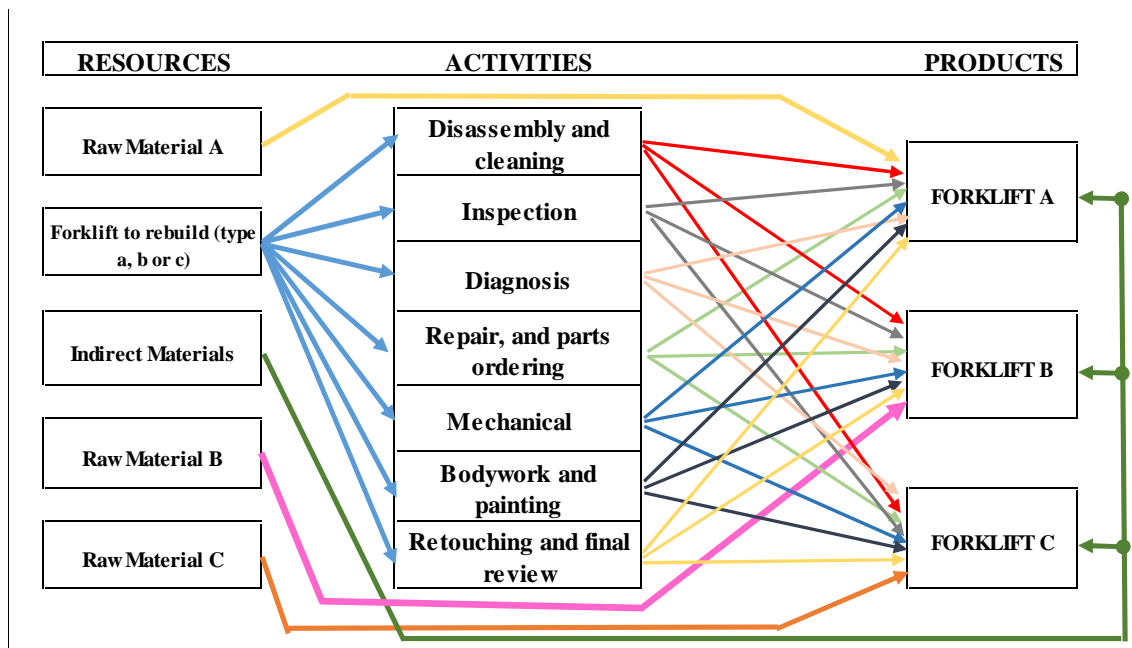
A general representation of the sections that make up the part corresponding to production and another where an outline of how the different resources to different products are distributed becomes:

Fig. 2. Sections of the production department.



(Source: own elaboration)

Fig. 3. Allocation of resources to products.



(Source: own elaboration)

STRUCTURE OF THE COSTS OF THE COMPANY

It is vital for the job you want to make the configuration of the costs affecting the products and therefore the production activity of the company, as this represents the basis of the analysis, especially the fundamental repercussion this concept for the company.

In short, when we refer to cost structure that is the share of each factor or productive service on the total cost or the cost of each unit. Thus, the point from which we start to analyze the structure of costs in the company under study is its profit and loss account to December 31, 2013.

Table 1. Income Statement for the year 2013

INCOME STATEMENT	2013
A) Continued operations	
1. Net amount of the turnover	6455832,07
a) Sales	6455832,07
4. Procurements	-4418745,92
b) Consumption of raw materials and other consumables	-4168635,33
c) Work performed by other companies	-250110,59
5. Other operating income	3646,00
6. Staff costs	-964040,87
a) Wages, salaries and similar	-747514,28
b) Welfare expenses	-216526,59
7. Other operating expenses	-463261,22
a) External services	-429035,80
b) Taxes	-13211,95
c) Losses, depreciation and variation in trade provisions	-21013,47
8. Depreciation of property, plant and equipment	-356345,71
A1) Net operating income (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13)	257084,35
14. Financial income	55,68
15. Financial expenses	-229780,15
A2) Net Financing Income (14 + 15 + 16 + 17 + 18)	-229724,47
A3) Earnings Before Taxes (A1 + A2)	27359,88
19. Income Taxes Expenses	-8207,97
A5) Earnings	19151,91

(Source: SABI)

For the part that concerns us, we will focus on determining costs along the production process which is an important part when calculating the profit or loss that is studied; this is reflected in the following table.

Table 2. Cost structure of the company

		%	ACCUMULATED
Procurements	4418745,92	68%	68%
Staff costs	964040,87	15%	83%
Other operating expenses	463261,22	7%	91%
Amortization	586125,86	6%	96%

(Source: own elaboration)

In this structure we can draw the conclusion that the quantitative importance have two items of expenditure in particular; on the one hand the supplies (mostly direct nature), and on the other hand the share of staff costs heading. As shown in the table between the two games generates 83% of total costs incurred to the company for the development of the activity.

Because of the importance of these two items, you need to determine as accurately as possible the criteria for the allocation thereof. One of the most important features of the strategy of allocating costs is to establish appropriate criteria for allocating them (direct and indirect) to minimize the unit of production; a description of the various items that we discussed.

RAW MATERIALS

In the case of raw materials we can find two types, direct and indirect regarding the product. In the case of raw materials of nature direct the cost thereof can be classified directly into each of the stages of production, it is sufficient simply to know the composition of the products that are to be processed. Under direct raw materials are among other components engine parts, wheels, batteries, hoses of hydraulic system, etc. For the allocation of materials indirect and given that some of these materials come in lots or in amounts that can't be quantified individually as would important to the company costs, sampling them in order to establish an average be held the different consumption of these materials. A clear example of this sampling are screws or washers consumed each time a machine is rebuilt, the quantified would increase the production

time and the resulting increase in costs for the company. Indirect commodities are in addition to those mentioned in the example of oil drums, nuts, welding wire, electric cable, etc.

STAFF COSTS

Moreover, the costs associated with personnel have been identified for each of the phases that are part of the production process and within these, each of the employees who perform the same possible task. This item will include, in addition to staff salaries, social charges.

OTHER COSTS

Regarding other costs, we can see from the above table that is costs of an indirect nature, since they are primarily costs related to amortization and to a lesser extent other operating expenses which includes among other items are the costs for external services.

In practice, given the enormous complexity when establishing relationships between costs and activities of the production process in order to allocate these costs to products (via activity), the vast majority of companies continue to choose to adopt a model of traditional costs, i.e. in terms of units of work, leaving aside the cost model ABC.

PROPOSAL FOR IMPLEMENTATION OF COST MANAGEMENT SYSTEM BASED ON COST MODEL ABC (ACTIVITY BASED COST)

As mentioned above, the main activity carried out by this company is selling forklifts, some are completely new import and others are rebuilt for resale. However, concerning the part of the reconstruction, although most of the work is done in the company, there is a part that is critical to the operation of this type of machinery and which is performed by outside companies, such as among others things rectification of engine components or hydraulic system hoses. Moreover, besides having to sell rebuilt forklifts, the company has machines of these features that are new (not rebuilt), which helped to cover a greater number of customers, as the quality of the machines new is superior, but the reconstructed have the plus of which are cheaper. Following the above we can say that if the customer wants a machine with the latest technology, high quality and durability

will opt for new (if your budget allows), but instead work to play is not too demanding and the more limited budget, you can opt for a rebuilt which will also give the best results.

Once we clear both the type of company, as the sector in which it is located and the work performed by the same within this, we proceed to explain the method of management that aims to control costs in this case is the ABC model.

IDENTIFYING ACTIVITIES

A must when implementing an ABC system is the right step description and recognition of activities carried out throughout the production process the company that wants to implement such a system.

To identify such activities was required information available on the company studied; this is from the accounting, listing machinery and functions thereof, etc. Furthermore there have been tours of the facilities and observing the production process has also asked the people who are involved in this process as are workers in those sections.

Once we have this information available to us we begin to outline the various activities involved in the production process. For the complete identification of the activities necessary in addition to the above, specify as much as possible for each activity, so routes with different managers of each of the sections that make up the production department are performed. These give us more detail about the work being done in every activity that has been previously identified information. Thus, the various activities that have been identified are grouped as follows:

1. Dismantling and thorough cleaning of the machine.
2. Visual and Technical Inspection (through test systems) of different parts.
3. Detailed diagnosis of the state of each piece.
4. Disposal of unusable parts, ordering new parts and grinding parts for repair.
5. Electricity (wiring, controls, indicators, etc.)
6. Mechanical (hydraulic, axes, forks, mast, etc.)
7. Bodywork and painting (putty, sanding, remove dents and paint).

8. Inspection and Finishing: polishing a visual defect that may have, put stickers, cleaning and lubrication

CLASSIFICATION OF ACTIVITIES IN MAIN AND AUXILIARY

Many of the activities of the company are directly related with the subject of costs, this is determined by the function performed by the company, in our case the costs are subject forklifts produced by the entity. These trucks are based on the existence of the entity studied as they represent a vital part of the work performed by it, for it is so important to determine with a high degree of detail the costs of producing such machines as the lack of care in this section could jeopardize the future of the entity. These activities directly related to the subject of costs are what we call main or primary activities, however, there are other activities that have a less direct, but very important for the development of the work by the company these are activities or auxiliary of the main, however, by the fact that services in support to primary, the cost of these should also be on the subject of costs.

Given the analyses of only the production side of the business we can say that this presents an activity unit level. Although in many cases the products they manufacture this company have a common base, they have slight differences in their production process, so to not be a standardized product that is not produced in mass in an assembly each manufactured product requires the realization of the activity will go depending on the product model to rebuild.

This portion corresponding to the primary activities focus on the production side which comment that this organization would not have reached the level where it is now without the contribution offered by ancillary activities, so that the cost of these activities must be charged to trucks that They occur, for it that cost is allocated to the various primary activities that consume these ancillary activities.

As for the frequency of implementation of activities, we consider the case which concerns us that while two consecutive machines with identical characteristics are rarely produced, these do show a high degree of similarity, so we can state that the activities performed in each of the sections of production of the company are repetitive.

Regarding the ability of these to add value to the products, in this respect the activities are quite optimized and therefore all in varying degrees add value to the products that are manufactured.

In short, in the case that concerns us we can consider the following main activities:

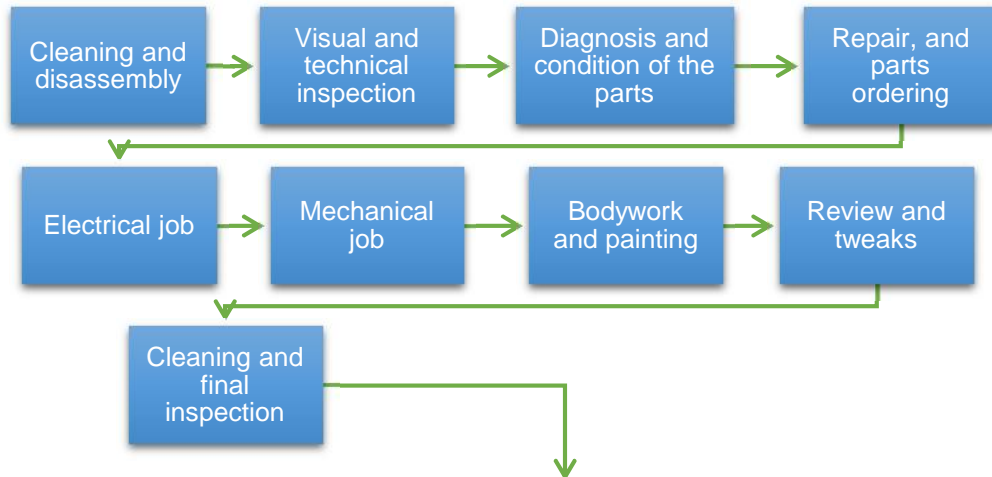
1. Visual and technical inspection.
2. Diagnosis.
3. Disposal of parts, ordering new parts and repair parts.
4. Electricity.
5. Mechanics.
6. Plate and painting.

On the other hand, the ancillary activities are important as more and less of each of these are consumed during the production process by the various core activities and even other ancillary activities. That said, we identified ancillary activities in the production process are:

- Cleaning
- Inspection and tweaks

Then a small scheme that will allow us to see graphically the production process takes place for the reconstruction of forklifts is performed:

Fig.4. Phases of the production process.

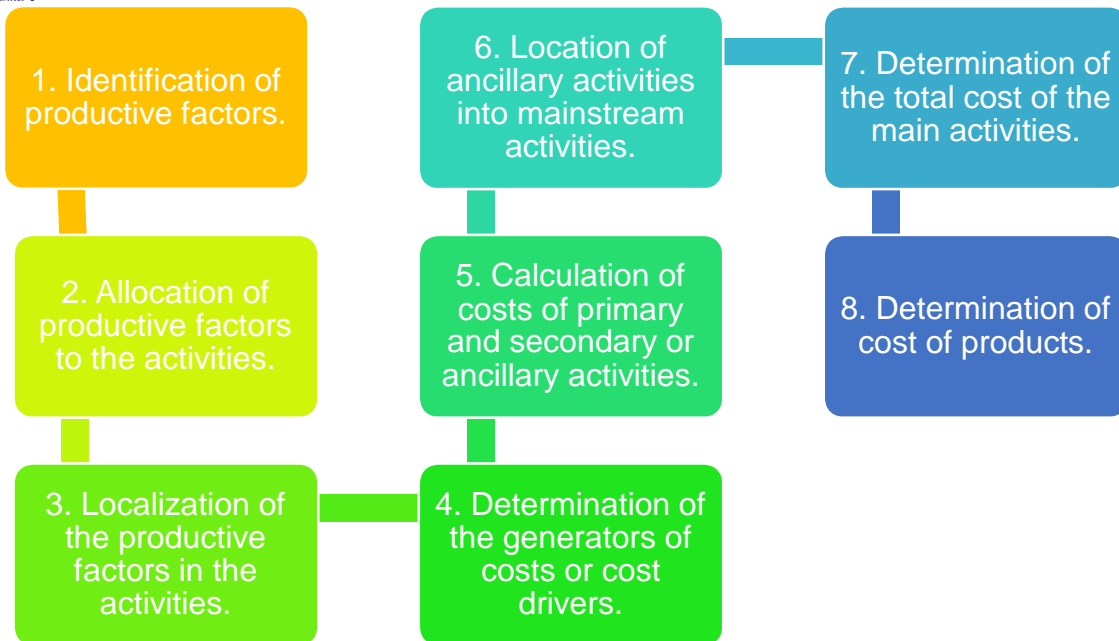


(Source: own elaboration)

ESTIMATED COST OF MAKING A FORKLIFT IMPLEMENTING THE MODEL ABC

Then we proceed to the calculation of the cost of the company rebuilding the various trucks it produces. To accomplish this, the scheme is the steps as detailed below:

Fig.5. Phases of calculating manufacturing costs.



(Source: own elaboration)

The first thing to do to calculate manufacturing costs is to identify production factors that are necessary to carry out the development of these machines, this is a study of the cost components that must be taken into account perform the calculation.

Then it proceeds to determine a way with which to assign the cost of these factors to the various activities of the production department. Once we have made the above we proceed to identify each of the production factors within each activity.

Now the next thing to do is to find a measurement unit or cost generators that allow us to quantify as closely as possible the consumption of activities throughout the production process.

Then we proceed to calculate the cost of all activities carried out throughout the production process. Subsequently we identify ancillary activities which are consumed within each major to allocate the cost of the first on the main. To make that complaint we proceed to use the units of measure that we have identified in the steps above.

Finally we proceed to calculate the unit cost of each truck, and for this also the corresponding cost of consumption of each of the activities, must be added to the corresponding direct cost raw materials.

To see all proceedings more clearly then we proceed to explain everything step by step process in more detail.

1. IDENTIFICATION OF PRODUCTIVE FACTORS

It was in all enterprises incurring a series consumption of resources to carry out these activities and to achieve the objectives that the organization has proposed. In this sense it is essential to conduct a study of the cost components that are to be considered in the analysis, in accordance with certain criteria set out below:

Temporal delimitation in which it will develop the ABC cost model. Here responsible for implementing and supervising the operation of the system can choose a time range in which you see fit, and study the development model, so that this data can be monthly, bimonthly, quarterly, half-yearly, etc.

Delimitation of the type of model to be implemented that is to be clear whether this is a special model of a variant of the full model or model of variable costs. In this section we mean that for example if the company uses modern technology variable costs will have little significance with respect to fixed costs, so the model of direct costs could be discarded. In another sense it could be the case that has perfected the model of variable costs, making the classification of fixed and variable costs also is perfected and thus blurring fixed costs and direct costs model is presented extended all costs affecting the production.

Delimitation of whether it is a model of historical cost, standard or budgeted costs, the ABC model may consider using these different types of costs and historical costs for example can be used to value stocks or standard cost it can be used as a tool for planning and control.

Under these concepts the most important cost elements that have been identified in the entity that is the subject of our study are:

- Work performed by other companies.
- Personnel costs.
- External services.
- Depreciation and amortization.
- Equipment.
- Remaining resources (screws, washers, cables, sandpaper, putty, etc).

2. ALLOCATION OF RESOURCES OR PRODUCTION ACTIVITIES FACTORS.

For allocating resources to the various activities that make up the production process has taken into account the ease with which the same to be quantified in each of the activities that consume them, so some will be charged directly (for example staff costs will be based on the number of employees in each section of the production process), while others and since it is not possible a direct allocation of these because they can't quantify the exact consumption in each Activity will be charged indirectly (e.g. electricity is encompassed in external services and because there is no counter indicating consumption for each section, shall be allocated to activities based on a consumed kilowatt estimate).

Thus, some of the resources consumed aimed at obtaining the object of costs which in our case are rebuilt trucks, will be charged according to the following table:

Table.3. Allocation of factors of production activities

RESOURCE CONSUMED	IMPUTATION TO THE ACTIVITIES
Thread Tools and qualified staff	Indirect (number of inspected parts)
Specialized machinery	Direct (machine hours)
Metallic plates	Direct (m ² used)
Electric cable	Indirect (meters consumed cable)
Electric chargers	Direct (machine hours)
Screws and washers	Indirect (estimate used units)
Welding	Indirect (meters thread consumed)
Sandpaper	Indirect (number of consumed leaves)
Putty	Indirect (amount of putty used)
Degreaser	Indirect (estimate used centiliters)
Water	Indirect (estimate used liters)
Rinse aid	Indirect (estimate used centiliters)
Grease	Indirect (estimate amount used)
Work performed by other companies	Direct (repaired parts)
Personnel expenses	Direct (Number of employees)
External services	Indirect (estimated consumption of services)

Depreciation and amortization	Direct (number of machines or square meters of installations)
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(Source: own elaboration)

The references in the table above are estimates from data provided by the staff of production. However, due to limited information, lack of figures that determine what amount is allocated each production factor to each of the activities to be able to offer would be more accurate data necessary a period of time in which to perform the implantation a model that allows more accurate allocation of costs to each activity corresponding manner.

3. LOCATION OF PRODUCTION FACTORS IN THE ACTIVITIES

Once you have identified the factors of production proceed to its location in the different activities that take place throughout the production process. To do this we consider that productive factors that we identified which are the vast majority of the costs that are incurred during the activity, these have been grouped into these items in order to obtain highly relevant information on activity costs. The way of allocating the cost of the different productive activities factors has been through estimates from section managers and foremen, plus some information from the administration department. Thus we get assigned (with the least possible subjectivity) costs corresponding to each activity to the extent that each consumes each of these factors.

Thus, the factors of production located in different activities of the company studied are classified according to the following table:

Table.4. Location of production factors in the activities of the company

		ACTIVITIES							
		Visual and technical	Diagnostic	Order parts and repair	Electricity	Mechanical	Bodywork and painting	Cleanliness	Review and tweaks
RESOURCES CONSUMED	Work performed by other companies			X	X	X			
	Personnel expenses	X	X	X	X	X	X	X	X
	External services	X	X	X	X	X	X	X	X
	Depreciation and amortization	X	X	X	X	X	X	X	X
	Machinery	X	X	X	X	X	X	X	
	Other resources	X	X	X	X	X	X	X	X

(Source: own elaboration)

4. DETERMINATION OF GENERATORS COSTS OR COST DRIVERS

It is not easy to determine the most appropriate indicators of costs for activities carried out by the company throughout the production process, since these must be a direct relationship between the unit of measurement of the activities and the production factors so that if the scale of production varies, so should the factors of production to the same extent. In addition to this, the measurement of activities through cost drivers should avoid or reduce to the minimum extent possible subjectivity in allocating indirect costs that are incurred in order to carry out productive activity, what is right from the initial approach in which the units of measurement are the cause of cost and the activity is the effect originates.

Moreover we must consider the cost inductor which is determined by the degree of accuracy with which you want to get information and also by the degree of complexity that have products that are being manufactured. But you can't take as many inductors as you want regardless of the search of all information for a proper allocation of costs in the activities generates a significant economic cost, so opt for the best of the inductors not always It is the most appropriate measure if it does not take into account the high cost such finding may involve generating costs. For this reason many times, especially when it comes to the first implementation of the cost model ABC, it is a better choice to use databases or alternative data that is not as accurate as the ideal, but acceptable in terms of the information we can provide and are much more affordable in economic terms. The disadvantage involved opt for the second option is that, by not using suitable inducers the information you get with them will not be as accurate as the first choice.

Once we consider this and after analyzing the different activities carried out throughout the production process we concluded that the best way to allocate activity costs to products is through models cost drivers which are summarized in table:

Table.5. Generators costs

ACTIVITY	CLASSIFICATION OF ACTIVITY	COST DRIVERS
Visual and technical inspection	To unit level	NUMBER OF INSPECTIONS
Diagnosis	To unit level	NÚMBER OF DIAGNÓSTICS
Order parts and repair	To unit level	NUMBER OF REPAIRS
Electricity	To unit level	MAN-HOURS
Mechanics	To unit level	MAN-HOURS
Bodywork and painting	To unit level	MAN-HOURS
Cleanliness	To unit level	RESOURCES CONSUMED; WATER, DETERGENT, DEGREASER.
	To unit level	NUMBER OF REVISIONS

Review and tweaks		
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(Source: own elaboration)

So, for visual inspection we have chosen to choose the number of inspections as generator costs as this section bases its activity on the number of checked each of the machines that will be rebuilt parts. For diagnostic activity based allocation is very similar to that discussed above, since the parts are inspected become diagnosed, so the cost drivers for this activity is the number of diagnoses.

As for order and repair parts, the higher costs are caused by the rectification of such important parts as are the cylinder head or the engine block, transmission, axles, etc. hence the generator costs in this activity the number of repairs. Furthermore the costs of the activities of mechanical, electrical and paint and body will be determined by the number of hours of labor that are necessary to optimally stop the share of each section, which is why we have chosen to choose generator costs as man-hours.

To the cleaning costs most relevant are set by the consumption of resources, so that the generator will be the cost of resources consumed such as water, detergent or degreaser. To conclude this section we have chosen to establish as a generator of costs for the review activity and touches the number of revisions since it has to be checked minutely finishing and functioning of each of the pieces that each truck is made.

5. CALCULATION OF THE COSTS OF THE MAIN AND SECONDARY OR ANCILLARY ACTIVITIES.

The next step in the design of a system based on costs and activities, once they have been defined and quantified aspects related to the distribution of costs between the various activities of the company, is to collect and add all the information necessary for to determine the cost of each and every one of the activities being carried out throughout the production process.

Since the information at our disposal is limited and confidential, we can't leave any information about the costs incurred by the company for each of the activities, but if we know some of the resources that are consumed in the activities production factors to them. Such use of these elements will be allocated to activities according to Tables 3 and 4 explained above, which will give us an approximation of consumption of these elements in each activity the production process and the corresponding cost thereof to proceed to attributed to each of these activities that consume them.

For data collection we proceed to leave a model table that can be synthesized all the necessary data to determine the cost of each of the activities (both primary and auxiliary or secondary) performed in the department production.

Table 6. Activity costs

	ACTIVITY	COST FOR ACTIVITY
PRIMARY ACTIVITIES	Visual and technical inspection	
	Diagnosis	
	Order parts and repair	
	Electricity	
	Mechanics	
	Bodywork and painting	
AUXILIARY ACTIVITIES	Cleanliness	
	Review and tweaks	

(Source: own elaboration)

6. LOCALIZACIÓN DE ANCILLARY ACTIVITIES INTO THE MAINSTREAM

Normally each company incurs a series of activities that allows it to meet the objectives for which it was created; these are the ones we know as primary or main activities. Most of these activities are easily recognized because these have a very close relationship with the production process, however, these entities could not get to achieve their goals if they do not some activities that support will be made to the primary activities, these activities are what we know as ancillary activities. For the part that affects us ancillary activities are not executed during the manufacturing process forklifts, so the cost of the

same cannot be distributed directly among the products manufactured, but should be charging on the main activities that have a relationship with them, spreading the cost of secondary activities in those consuming the first primary. Besides all this, we must also bear in mind that there are ancillary activities that consume other ancillary activities, so this is an important time to spread the costs over each other aspect, because otherwise they would be imputing of wrong expenses that come with them. The sharing of the costs of ancillary activities on primary method that will go down in the table attached below is proposed.

Table 7. Allocation of ancillary activities in primary

		AUXILIARY ACTIVITIES	
		CLEANLINESS	REVIEW AND TWEAKS
PRIMARY ACTIVITIES	Visual and technical inspection	X	
	Diagnosis		
	Order parts and repair		
	Electricity		X
	Mechanics		X
	Bodywork and painting	X	X
AUXILIARY ACTIVITIES	Cleanliness		
	Review and tweaks	X	

(Source: own elaboration)

To determine the costs generated by the various ancillary activities and charging on the main activities is necessary to choose a unit of measure the activities that have the most appropriate potential, for its costs these generators should reflect as clearly as possible a relationship cause and effect between the various activities involved and the cost generators. As already discussed in previous sections, chosen generators costs are summarized below.

Table 8. Generators costs of ancillary activities.

AUXILIARY ACTIVITIES	COST DRIVERS
Cleanliness	RESOURCES CONSUMED; WATER, DETERGENT, DEGREASER.
Review and tweaks	NUMBER OF REVISIONS

(Source: own elaboration)

7. DETERMINATION OF TOTAL COST DELAS MAIN ACTIVITIES

Once you have made the allocation of the costs of ancillary activities on major activities that consume them, and given that we should already have the information that indicates the cost of performing each main activity are obtained as a result the total cost of each activity that takes place throughout the production process. In this case and considering that only one type of product you are forklifts is done, it is not necessary to define units of measure for the costs for the various activities to the products, in this aspect greatly simplifies the method you want to implement in this organization.

8. DETERMINATION OF COST OF PRODUCTS

At this point only the cost is attributed to each of the products manufactured, so we must be clear about the amount of inductors that has consumed each product in each of the activities that make up the production process (this will be looking at the reports and working parties) and charge the cost of each of the activities on the product through cost drivers. In addition to these costs must be added the cost of direct materials that are required to develop each specific truck. We should note that although they are trucks with similar characteristics, they are not exactly the same and in production processes that differ in some of their procedures, so it does not make any sense to add the full cost of the activities and divide by the number of trucks produced because if we did we would be skewing the cost of developing a truck over another (could overestimate the cost of underestimating the cost of each other). In short, adding the cost of raw materials consumed and the activities consumed to produce a truck, we get the cost of developing such a machine for the company. This should be done to calculate the cost to the entity to produce each of the machines produced.

To conclude this section discussion of the design and implementation of cost system based on activities or ABC has been carried out with the aim that this is a tool that helps

company managers in making decisions on logistics and planning. To do this model provides information with which to identify those activities that do not add value to the product and therefore must be eliminated so that a double effect is achieved, first reduce the costs of production activity and second should enhance the productivity activities if they add additional value to the product. Beyond this, adequacy in production costs provides a tool with which the company can compete within the context of economic crisis facing the country, and that is because this setting can allow the company to adapt their prices and thus obtain an improvement in their competitiveness.

CONCLUSIONS

In the present work we have tried to give practical exposure to the implementation of a cost management system in a real company, in our case the axis of the explanation is the cost system based on activities or ABC model. It was decided to opt for this system due to the high flow of information given to the study of the costs that are incurred as a result of productive activity, but especially to the characteristics of the entity object of our study, as an implementation right of it can provide great advantages in terms of cost optimization, plus the ability to implement the same in other delegations.

In short, what was intended to work is to give the entity studied a tool that serves to aid decision-making and allows an improvement of the activities of the production system, and therefore an improvement in the management of costs. For this, the implementation of the system should give detailed information on the resources consumed by each activity performed and causes because the products in turn, require these activities. This will give us greater precision when allocating costs for each product manufactured.

Has been chosen to implement the ABC system to the corresponding production department as it is the lifeblood of the organization, is where the product that the company develops its commercial work is done, which is to be the section where he performs more and more noticeable the consumption of resources of the organization studied and therefore the part where it's important to know in great detail all the activities carried out and the costs that are incurred as a result of conducting such activities. For these reasons and because it is also the most complex part of the company, we have seen fit not claim from the outset cover and implement the model across the organization due to the high level of detail would such implementation and due to limited the information that we have encountered, the system could become too complex and estimates based tool, which would make it imprecise.

Furthermore to ensure the involvement of managers is key to implementing such models in an organization, but for the correct operation of the commitment of the heads of the sections and production personnel is also required.

To conclude this section discuss how important it is to consider the various constraints that we have crossed over the implementation of the ABC model in the company studied

and have been discussing during the preparation of this work. These limitations can be decisive when it comes to implementing the model, so it is vitally important to consider them for future actions by the company.

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