

LESSON 3:
**THE COST PLACES:
LIQUIDATION OF THE
COST STATISTICS**



LESSON 3: THE COST PLACES: LIQUIDATION OF THE COST STATISTICS



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COST CENTERS: CONCEPT AND CLASSES

1.1. CONCEPT OF COST CENTER

Recalling the scheme of the process of generating business burdens, once analyzed the details relating to cost elements, we will refer to the following of the concepts: **cost places**.

They respond to an idea of location of the activity for the correct identification of functions and, therefore, of responsibilities. They are defined as those basic cells in which the homogenization of the cost elements for their subsequent transformation into carriers takes place.

Depending on the nature of your intervention in the operating cycle of the company, the places or cost sections can be:

A.- Main: those that participate directly in the cost structure of the bearer. (ex.: Mill in the company to obtain flour from wheat cereal)

B.- Auxiliaries: those that participate in the production do not form an express part of the structure of the bearer and, therefore, do not cede their costs directly to the bearer, but do so through another or other principal or auxiliary places since they do not they maintain a direct relationship with him (electric generator, central heating, repair service, etc.).

It must be clear that the consideration of principal or auxiliary does not affect its importance within the company, but the way in which they relate to the product, so important is the purchasing section of the raw material (main), such as the generator electric that supplies the energy to move the machines (auxiliary).

1.2. MAIN CENTERS

Following Circulatory company structure schematized by Prof. Schneider observed in principle in the company three basic functions: a provisioning or compras, transformación or producción and distribution or sales. In addition to these we also have the function of management, to which we will refer later.

We can match these 3 functions with 3 sections of the company: procurement or purchasing section, transformation section and sales section.

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Procurement or purchasing section: he corresponds the functions that contribute to develop an activity directed to the provisioning of the company. Therefore, these functions can be mainly: management of compra, reception, storage, and conservation of raw materials and the like, and the administrative tasks proper to said problem -their particular administration- (Example: control of supply values).

Transformation section: engloba the functions that contribute to develop an activity directed to the production. Corresponding to it, then, the phenomenology inherent to the company's own objective, and including, also, its own administration (Example: person (s) who are in control of the times, etc.).

Since the own functions depend on the type of company, there is no stereotyped classification depending, therefore, on the product that is manufactured and its technology. (For example, in an F factory terrazzo might be: concrete, pressing, oven, polishing, etc. or processing honey are: harvested, uncapping extraction, filtration, decantation-ripening and packaging and preservation).

Sales section: he will correspond n the functions directed to the management of sales in the company: storage of products, placement and distribution of production, billing and as in the previous ones, his own administration.

But also, the company has, also the function of General Administration that we will match with the **Main administration section** - accounting, management, insurance, etc.-.

The treatment of the administration section, in principle, may have different considerations, however we will only deal with the one that is most commonly applied, that is, consider the particular administration of each section as a place within the section to which it corresponds and the general or common administration to all of them as a main section.

Therefore, we will have 4 main sections: procurement, transformation, sales and general administration.

1.3. AUXILIARY CENTERS

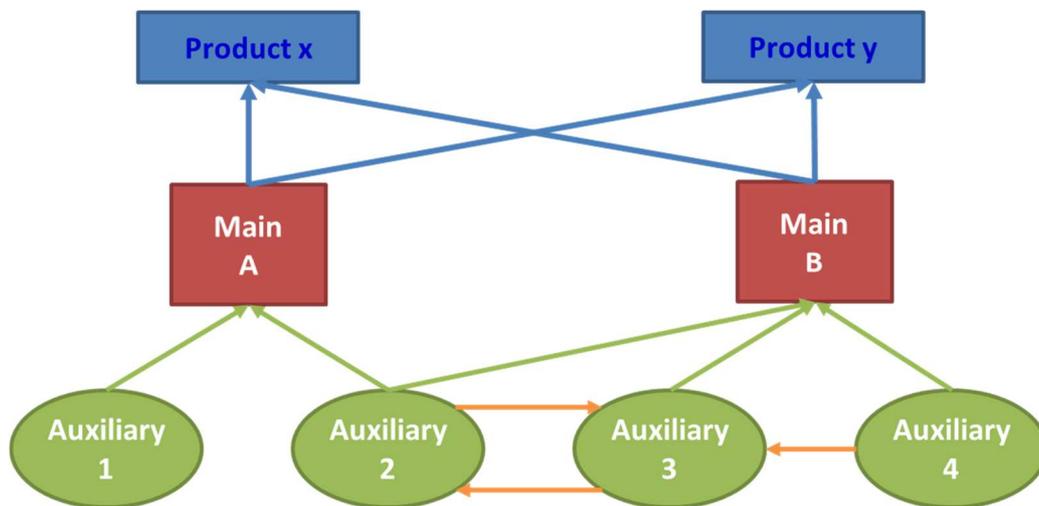
Within the places and **auxiliary** sections, we can, consider, two classes:

- **Auxiliary of the principals**, those who give all their costs to one or more main places.

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- **Common auxiliaries**, those who transfer their costs to auxiliary places and none, one or more main distinguishing, in turn, whether it is **common auxiliaries, themselves**, when they yield costs auxiliary and main (or not), or good of **reciprocal auxiliaries** -which is a special case of the comunes-, when mutually two or more common auxiliary costs are ceded . Therefore, these last ones, in addition to being common, have the characteristic that the mutual cession between two or more places occurs. (Example: repairs or also called maintenance and conservation and steam boiler).

Exercise: depending on the following scheme indicate which type would be each of the sections and places represented in it.



Practical example:

A company is dedicated to the production of terrazzo by treating the raw materials as follows:

1. Upon reception, the aggregates and marbles are deposited in the free zone, while white and gray cement is stored in silos.
2. The transport of the first materials until their reception is carried out by means of a vehicle of the company.
3. For the purpose of its subsequent treatment, the weighing of the various components that make up the product is carried out in order to fix the necessary proportions of them for each of the products.

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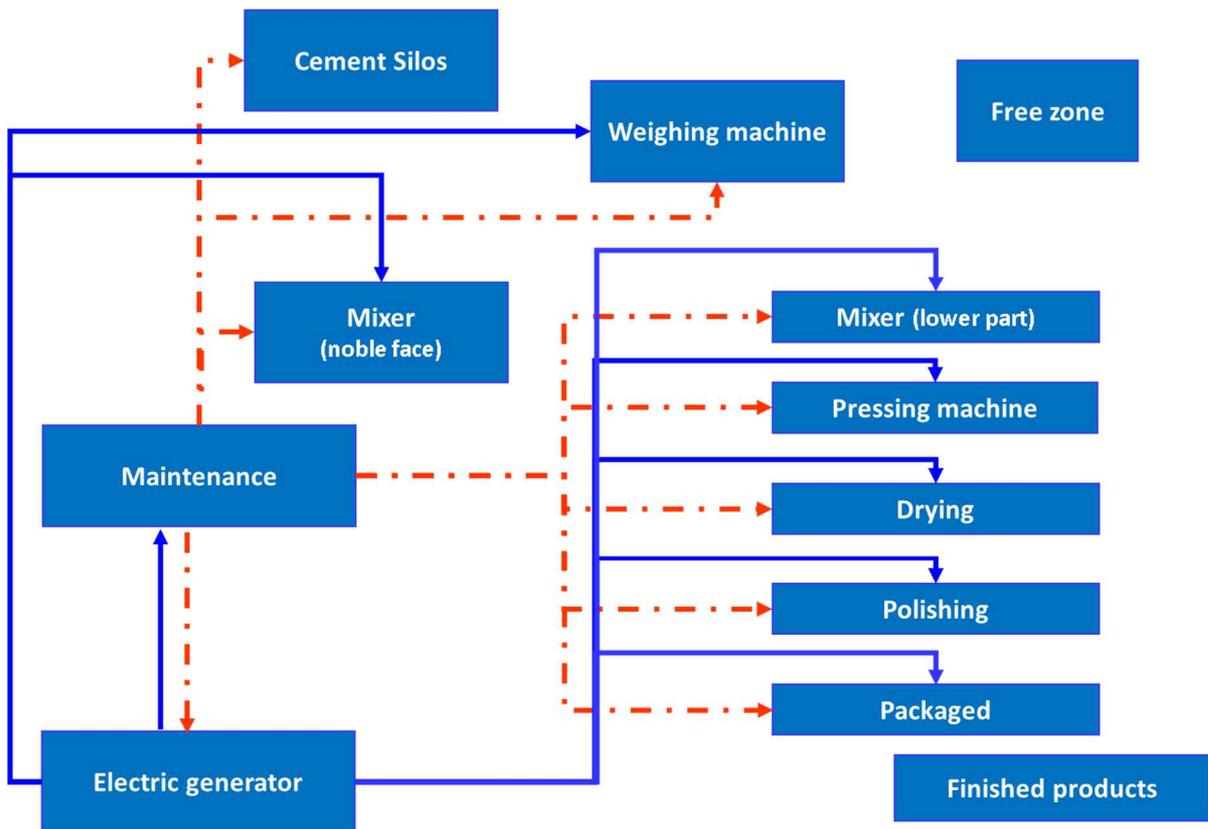
4. Transport from the storage area takes place by pneumatic wheel loaders.
5. Once the proportions are defined, they are transferred, by a system of conveyor belts, to the concrete mixers, in which the different mixtures that make up the upper surface or noble face of the terrazzo are automatically obtained, which are then subjected to pressing in their corresponding section.
6. At the same time, the aggregates and the gray cement are mixed with water in special concrete mixers, obtaining a mixture different from the previous ones that composes the lower part of the terrazzo, which, is later, object of pressing.
7. After that, the current product obtained is transferred to the drying section to extract moisture through electrical panels.
8. The transport from the pressing section to the drying section, and from the latter to the polishing section, takes place by means of forklifts.
9. Said product in progress passes to the polishing section for the purpose of total finishing, after which the finished product is packaged and transferred to the warehouse of finished products in the same forklift trucks.

It is also necessary to know that:

- There is a department in charge of the conservation and maintenance of the machinery.
- The energy necessary for the production process is obtained from its own electric generator.

Taking into account all the above, the relationships between the different places of the company can be represented through the following scheme:

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In the diagram it is observed as conservation and electrical generator are the only two auxiliary places, in the case of reciprocal auxiliaries. The rest are main places.

2 COST STATISTICS

Previously, we have analyzed the cost classes with regard to the computation of their consumption, the next step will be to locate the cost of these factors in the places that correspond to them, to finally allocate the cost, through these, in the carrier final. Such distribution is carried out on the basis of a documentary support called **cost statistics or distribution chart**.

In general, accounting statistics are double-entry tables that have the mission of simplifying and facilitating information and can be both internal and external, depending on whether they are carried out internally or externally.

The **internal statistics** consist of a set of annotations and calculations, generally in the form of double entry tables, aimed at providing information on certain magnitudes and / or checking them for control purposes. They can be developed

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in physical, monetary units or both together, so that different kinds of internal statistics will emerge:

- Technical statistics, if they are expressed in physical units.
- Economic statistics, if they do so in monetary units.
- Economic-technical statistics, in both

In this issue we will refer to economic statistics, m to s particular **statistic costs**, we will allow the distribution of the different types of costs between cost places. It is defined as the set of annotations and calculations aimed at providing information regarding the valuation of the consumption of productive factors attributable to a period, distributed by places and sections, and / or its verification for control purposes. In the cost statistics only indirect costs will be distributed, although they may include direct costs that, due to their characteristics, the company requires that they be distributed among the sections, such as, for example, direct labor.

It can have different forms but usually the following model is used:

Classes		Places		Amount	PURCHASE			TRANSFORMATION			AUXILIARIES			SALES			ADMINISTRATION		
		Code	Name		L1	...	Ln	L1	...	Ln	L1	...	Ln	L1	...	Ln	L1	...	Ln

Regarding the same, we must know that for its liquidation must be carried out, four phases, **physical measurement, economic valuation, distribution and redistribution or internal liquidation.**

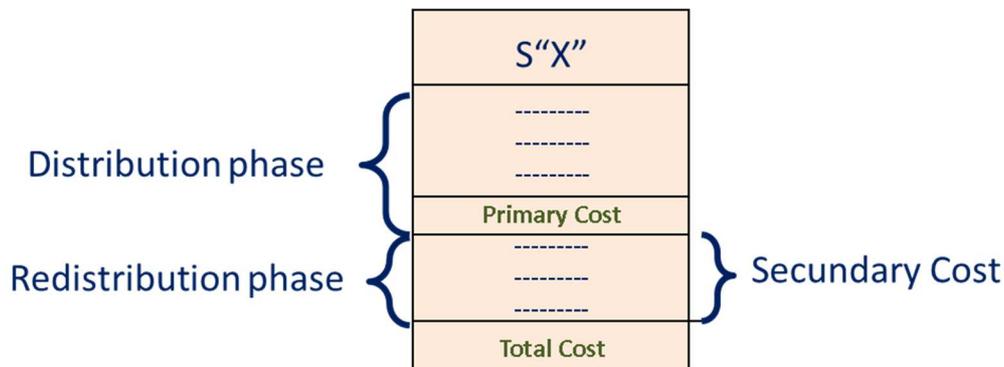
In the first phase, the physical **measurement** of the consumption of the productive factors is carried out during a period in the physical units that proceed (kw / h, liters, kg, telephone steps, etc.).

Then, through the **valuation** It is conducted economic valuation of consumption measured at the previous amount r phase. To do this, the conversion parameter to be determined in each case - the price - **will be set** in order to convert the physical units into monetary units. Thus, by means of the homothetic transformation of the physical units into monetary units, multiplying by the price, we will arrive at the computation of the real consumption of each cost factor applied in a given period.

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Once the amounts of the consumptions are known, the **distribution** phase will consist of dividing all the classes of costs, resulting from the two previous phases, between the different places and sections or cost centers in which the productive process of the company is structured, consisting of influencing what corresponds to each section of each cost element. All the costs that a place or section receives as a consequence of the development of this phase, will give rise to the so-called **primary or autonomous costs** of the different places that make up the company. These costs are those that affect the company from abroad. With this, the distribution phase will end and the 4th phase will begin.

The last phase called **redistribution or internal settlement of the cost statistics**, consists of dividing the costs of the auxiliary sections between those principals and / or assistants to whom they have performed benefits, giving rise to the so-called **secondary costs**, which are those that are generated within the company . It concludes this phase when all the auxiliary sections are canceled and all their costs are included in the main sections, resulting in the total costs of the main sections composed of the primary costs, results of the distribution phase plus secondary costs from the auxiliary sections.



Thus, from the first three phases, the primary or autonomous cost arises and as a consequence of the fourth phase the secondary cost arises, as a consequence of the distribution of the cost of the auxiliary sections.

In order to carry out the settlement of the reciprocal auxiliary sections in the redistribution phase, it is necessary to know the concept of **intermediate cost** that is formed by the primary cost plus the secondary cost originated by the distribution of the common auxiliary sections. This cost is taken as the basis for the settlement of the reciprocal auxiliary sections.

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There is also a common auxiliary section, fictitious or not real, called "Exploitation of buildings" that is used to absorb those low cost classes, small amount or difficult distribution between the different places, gathering them in what could be said a species of "tailor's box". The cost of this common auxiliary section will be distributed among all the places or cost centers, in all the companies equal, depending on the square meters of occupied surface of each place. This distribution will be carried out in the redistribution phase, always being the first common auxiliary section that will be distributed.

3

DISTRIBUTION OF THE COST OF THE FACTORS BETWEEN THE CENTERS

Since the first two phases of the cost statistics, this is measurement and valuation, have already been analyzed in the previous topic, we will proceed to develop the following phases.

The **distribution** phase consists in distributing all the cost classes between the cost places according to the production process of the company, setting the criteria or distribution percentages of the different cost classes (m², etc.).

Therefore, this phase will depend on the type of factor and each company, given that in the absence of homogeneous behavior in all companies, there will be no general or unambiguous criteria for the distribution of costs.

In general, the basic criterion should be the consumption actually applied to the places and sections by direct measurement, whenever possible and in the manner that each case requires. However, this would lead to a process that is too complex and expensive. For all these reasons, a series of more or less pre-established criteria are usually used depending on the factor in question, such as: m² of occupied surface, personnel assigned to the center or place, installed power and hours of operation, etc. taking into account that when choosing a criterion always try to make it as logical as possible.

Let's see some examples of possible distribution criteria:

- For **labor** distribution is carried out according secondment according to staff each location, following the tab that takes for each worker, which consists hours / daily cost and places done benefits.

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- **Amortization** and **other equipment costs** will be distributed according to his secondment.
- The **external services will** be divided according to where they carry out the service (if it is a repair service it will be distributed among the places that may need their services).
- **Electrical energy** can be computed directly and accurately if we install counters in each place to measure consumption (although sometimes not justified by its high cost), or, considering the power of each device and the number of hours of operation. If the cost involved is insignificant, it would lead to the exploitation of buildings that, as we saw in previous questions, would then be distributed homogeneously among all the cost places according to the m² occupied surface.
- The **telephone**, if a direct line exists in each place, will have a number and therefore a certain and known consumption. If, on the contrary, it is a switchboard, it can be distributed according to the number of terminals or equivalent persons.
- The distribution of the **cost of maintenance and conservation** it will be carried out according to ascription or depending on the square meters of surface of the places.
- In the case of cost of **water** would be taken to exploitation of buildings (m²). In the case that it is a raw material for the company, it would be imputed directly by the accountant.
- The cost of **cleaning and cleaning** and **security** is usually distributed according to the m² occupied surface.

4

REDISTRIBUTION OR INTERNAL LIQUIDATION OF THE COST OF THE CENTERS

The redistribution or internal settlement corresponds to the fourth phase of the cost statistics, in which the auxiliary sites distribute their costs among the principals and / or assistants to whom they perform their services, so once this phase is completed, the cost of them will be zero.

The costs originated in this phase will be the so-called secondary costs being those that are generated within the company.

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The redistribution phase can not be carried out capriciously, but must follow a certain order taking into account the kind of auxiliary place in question:

1. The common auxiliaries will be liquidated first. As a consequence, we can calculate the **intermediate cost** by adding the primary or autonomous cost and the secondary cost of the common auxiliaries. When there are several commons, the distribution will begin for those that do not receive from other auxiliaries, being the first one that always deals with the exploitation of buildings.
2. Secondly, reciprocal auxiliaries for which there are different methods of settlement due to the complexity involved in the interrelation of their assignments and, therefore, their costs, which makes it difficult to arrive at the calculation of a total cost for each of these reciprocal sections.
3. Finally, the main auxiliaries will be settled by calculating the cost to be shared as the sum of all assignments he has received from the other assistants do on their autonomous starting cost.

This sorting is applied for very simple cases, for more complex situations, matrix approaches are applied.

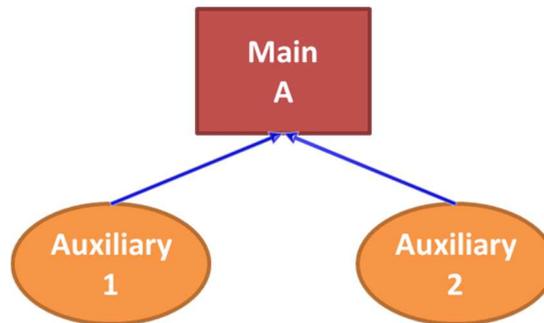
The objective is to get to the CT of the main places for which it will be necessary to add to the primary cost C_p , which comes from distributing the cost classes among the cost places, plus the secondary cost C_s , which comes from the redistribution phase.

$$CT = C_p + C_s$$

Since we have three types of auxiliary sites, below we will see the different distribution cases according to these types of places:

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1. When only exists an auxiliary service to main places, so only auxiliary sections are considered major.



The total cost of the main section A will be the sum of its primary cost plus the cost it receives from the auxiliaries, the so-called secondary cost. So:

$$CT_A = Cp_A + Cs_A = Cp_A + t_{A1} CT_1 + t_{A2} CT_2$$

$$Cs_A = t_{A1} CT_1 + t_{A2} CT_2$$

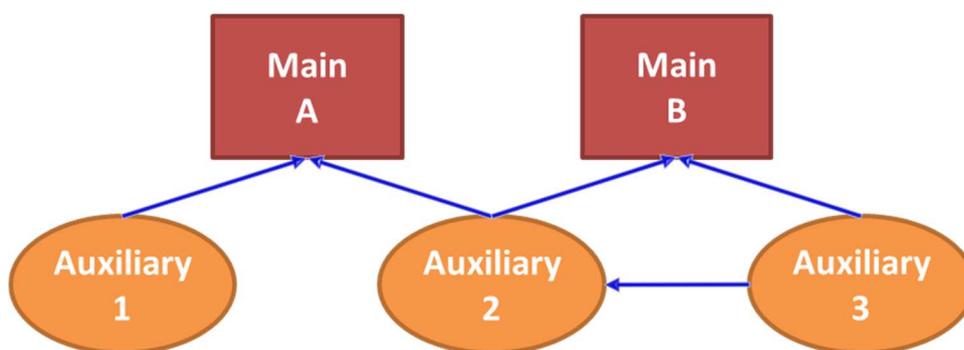
CT = total cost of ...

Cp = primary or autonomous cost of ...

Cs = secondary cost of ...

t_{A1} = both for one share of the main place A in the total cost of the auxiliary place 1

2. There are auxiliary services to auxiliary and main, but without reciprocal benefits.



In this case the cost of the two main sections would be calculated:

$$CT_A = Cp_A + Cs_A = Cp_A + t_{A1} CT_1 + t_{A2} CT_2$$

$$CT_B = Cp_B + Cs_B = Cp_B + t_{B2} CT_2 + t_{B3} CT_3$$

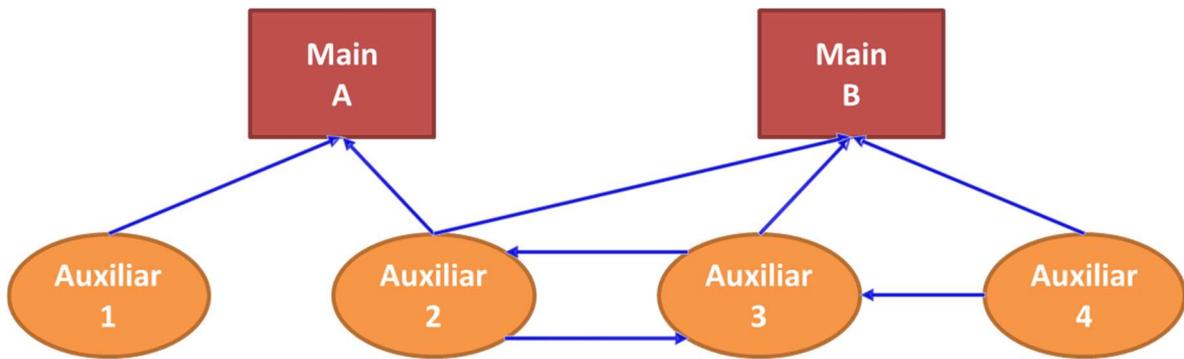
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$$CT_2 = Cp_2 + t_{23} CT_3$$

$$Cs_A = t_{A1} CT_1 + t_{A2} CT_2$$

$$Cs_B = t_{B2} CT_2 + t_{B3} CT_3$$

3. There are three types of auxiliary sections, so there are reciprocal auxiliaries.



The cost of the two main sections would be calculated:

$$CT_A = Cp_A + Cs_A = Cp_A + t_{A1} CT_1 + t_{A2} CT_2$$

$$CT_B = Cp_B + Cs_B = Cp_B + t_{B2} CT_2 + t_{B3} CT_3 + t_{B4} CT_4$$

Where :

$$Cs_A = t_{A1} CT_1 + t_{A2} CT_2$$

$$Cs_B = t_{B2} CT_2 + t_{B3} CT_3 + t_{B4} CT_4$$

Therefore, we will need to know the total cost of the two reciprocal auxiliaries. For settlement of reciprocal auxiliary sites there are different procedures . Of all of them we are going to use the **System of linear equations or simultaneous equations** , which consists of proposing a system of linear equations with as many equations as there are reciprocal auxiliary sections, where the unknowns are the CTs of the same ones, then solving the system by any known method (usually by equalization), you get to obtain the total costs of each reciprocal place and then proceed to its distribution among all those places to which it performs any benefit. To establish the equations, we start from the intermediate cost . The total cost is calculated by applying so many participation nominals on the section that it yields. So therefore, for example for two reciprocal sections, we will have:

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$$CT_1 = C_1 + \% \text{ that recibe from } CT_2$$

$$CT_2 = C_2 + \% \text{ that recibe from } CT_1$$

In this case we would have to propose a system of two equations with two unknowns:

In general, the equations would be:

$$CT_1 = C_1 + t_{12} CT_2 = C_1 + \% \text{ that receives from the total cost of 2}$$

$$CT_2 = C_2 + t_{21} CT_1 = C_2 + \% \text{ that receives from the total cost of 1}$$

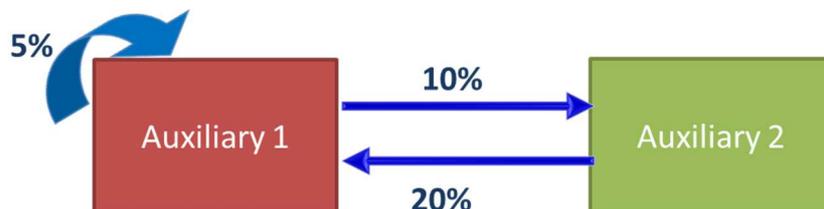
By Therefore, t given the percentages indicated:

$$CT_1 = C_1 + 20\% CT_2$$

$$CT_2 = C_2 + 10\% CT_1$$

Resolving, we will calculate the total costs of 1 and 2, with C_1 being the intermediate cost of place 1 (autonomous plus secondary of the common auxiliaries).

There are occasions in which reciprocal places can be given with self-consumption, such as the auxiliary repair section as this repairs their machines. In the case of two reciprocal auxiliary sections in which self-consumption occurs in one of them, the equations would be as follows:



Under this hypothesis, the equations would be as follows:

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$$CT_1 = C_1 + 0,2 CT_2 + 0,05 CT_1$$

$$CT_1 - 0,05 CT_1 = C_1 + 0,2 CT_2$$

$$CT_1 (1 - 0,05) = C_1 + 0,2 CT_2$$

$$CT_1 = \frac{C_1 + 0,2 CT_2}{1 - 0,05}$$

$$CT_2 = C_2 + 0,1 CT_1$$

Generalizing "n" reciprocal places, where we have incorporated self-consumption:

$$CT_a = C_a + t_{aa} CT_a + t_{ab} CT_b + t_{ac} CT_c + \dots + t_{an} CT_n$$

$$CT_b = C_b + t_{ba} CT_a + t_{bb} CT_b + t_{bc} CT_c + \dots + t_{bn} CT_n$$

$$CT_c = C_c + t_{ca} CT_a + t_{cb} CT_b + t_{cc} CT_c + \dots + t_{cn} CT_n$$

...

...

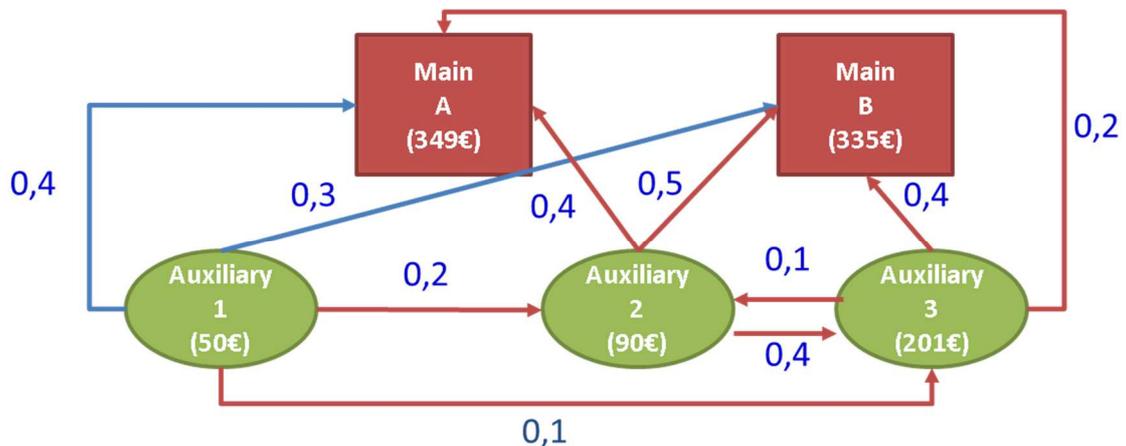
$$CT_n = C_n + t_{na} CT_a + t_{nb} CT_b + t_{nc} CT_c + \dots + t_{nn} CT_n$$

In general, each equation will be:

$$CT_i = C_i + \sum_{j=1}^n t_{ij} CT_j$$

Practical example

The structure of interrelationships between the different places of the company is the one indicated below:



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On the other hand, the primary costs of the different places are:

- a) Main section A: € 349.00
- b) Main section B: € 335.00
- c) Auxiliar 1: € 50.00
- d) Auxiliary 2: € 90.00
- e) Auxiliary 3: € 201.00

Depending on the interrelationship table, auxiliary place 1 is a common auxiliary, while auxiliaries 2 and 3 are common auxiliaries. Therefore, first we will proceed to the distribution of common auxiliary 1 as follows:

	Main A	Main B	Aux. 1	Aux. 2	Aux. 3
PRIMARY COST	349	335	50	90	201
Auxiliary Cost 1	20	15	-50	10	5
INTERM. COST	369	350	-----	100	206
Auxiliary Cost 2					
Auxiliary Cost 3					
TOTAL COST					

Next we will proceed to the distribution of reciprocal auxiliary sites 2 and 3, for this we must first raise a system of equations in order to know the total costs of the aforementioned places.

$$CT_2 = 100.00. + 0.4 CT_3$$

$$CT_3 = 206.00 + 0.1 CT_2$$

Where we get:

$$CT_2 = € 190.00$$

$$CT_3 = € 225.00$$

Once the total costs have been calculated, we can proceed to the settlement of the cost statistics and calculate the total costs of the two main sections:

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	Main A	Main B	Aux. 1	Aux. 2	Aux. 3
PRIMARY COST	349	335	50	90	201
Auxiliary Cost 1	20	15	-50	10	5
INTERM. COST	369	350	-----	100	206
Auxiliary Cost 2	76	95		-190	19
Auxiliary Cost 3	45	90		90	-225
TOTAL COST	490	535	0	0	0

B BIBLIOGRAPHY REFERENCES

- REQUENA RODRÍGUEZ, J. M. Y VERA RÍOS, S. (2008). Contabilidad interna. Contabilidad de costes y de gestión. Barcelona: Ariel S.A.