

LESSON 5:  
**THE MAIN ANGLOSAXON  
SYSTEMS TO COST  
CALCULATE**



## LESSON 5: THE MAIN ANGLOSAXON SYSTEMS TO COST CALCULATE



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### 1

## ANGLOSAXON MODELS TO COST CALCULATE

Analyzed the different models of cost allocation (full-costing, direct-costing, etc.) and the different development alternatives of these, that is, the so-called cost systems (organic, inorganic, etc.), in this topic we will focus on the latter.

There are two main lines of thought around cost systems:

- **Anglo-Saxon cost models (North American and British).** Centered the interest in adjusting the model to the different types of organization of the production of the companies.
- **German or Central European cost models** . They have their raison d'être in the different alternatives for capturing and calculating the cost structure .

The criterion usually used by the Anglo-Saxon authors to classify the cost models focuses on the particularities of the process of cost accumulation, which in turn will depend of the specific characteristics of the production process contemplated. Thus, the analysis of the Anglo-Saxon models leads us to the consideration of the distinguishing features of production processes, and the key being continuous or discontinuous nature of production.

In the first case, the conversion of the raw material into a finished product is carried out as an uninterrupted flow over time, with no difference at the unit level, since it is a homogeneous mass production (series production). In the case of discontinuous production, we work from orders to produce a good or a lot of goods.

Precisely on this basis the traditional classification of Anglo-Saxon models is based:

- Cost model for work orders.
- Cost model by processes .

In a **cost model for work orders**, each order starts its own cost calculation process, which ends when the order is finished.

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In a **cost-per-process model** , costs are accumulated by time intervals (period) and are related to the production obtained in said period.

These two models would be the extremes of an interval, between which there are other production systems, which are often called hybrid or mixed models, since they have characteristics of the previous two although they do not coincide fully with any of them. These models would be:

- **Cost model by operations.**
- **ABC model.**
- **Cost model for regression.**

### 2

## COST MODEL FOR WORK ORDERS

This model is assimilable to a system of inorganic costs and is based on the concept of **work order or individual order**, as embodied in a set of instructions and specifications of a technical nature relating to the means to be used and operations to be to obtain a specific product or service.

It applies, therefore, to companies that are engaged in the manufacture of a particular product or provision of a particular service but according to the specifications and particulars of each external customer( for example, shipyards, construction companies, custom furniture manufacturing, printers, repair of automobiles, consultancies, audits, ...) or according to the specifications of the company itself (for example, television producer).

In short , these are companies that operate in a discontinuous production regime, where repetitive actions are not carried out, but rather a "work order" for each order, which will be the carrier of costs, which will have to be tracked detailed for the allocation of costs, since the **production cost corresponding to each order** has to be calculated .

From this calculation of costs, the margin corresponding to each order is obtained by the difference between the net realized sales revenue of each of them and the corresponding cost of sales. T he result of the period is obtained by adding the

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margin relating to orders placed (sold) in the period and deducting from said aggregation the general indirect costs of the period.

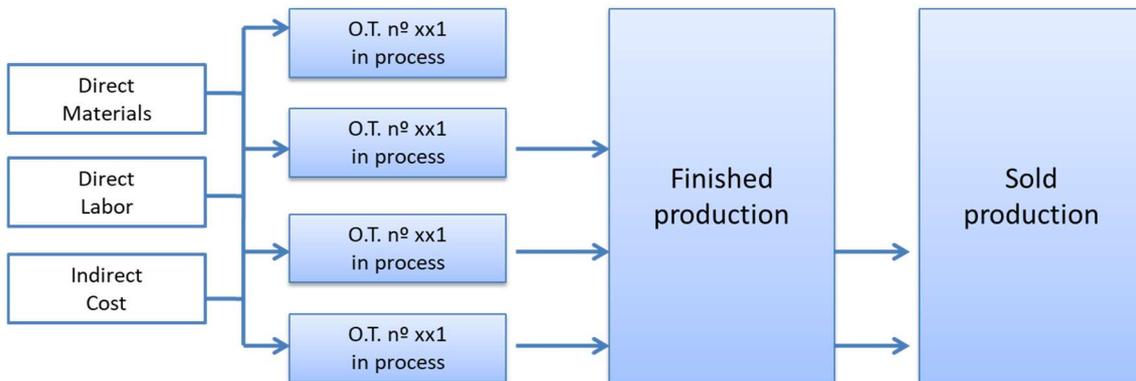


Figure 1. Source: Requena y Vera (2007: 379)

To determine the cost of production (intrinsic cost) of the work order (cost carrier), from the inorganic approach, we will take into account as direct production factors (MD), direct labor (MOD) production cost factors. and the indirect manufacturing costs (CIF), in such a way that:

1. The **direct costs of materials** (only raw materials and incorporable materials) **and Labor** (only the corresponding to the personnel really linked to obtaining the work order), are directly incorporated into each order.
2. The **Indirect Cost of Production (ICP)** (the rest of the MD, the rest of the OM, the supplies, external services, amortization ...), since it is not possible to allocate them directly to the order, they are distributed through the **supplement method**, ( through a global rate or several different rates ), either on real data, waiting at the end of the period, or by means of an estimate that would lead to **applied ICP** .
3. The **Unit production cost** is calculated by dividing the production cost of each order by the number of units that integrate it.

In the case for performing calculations a predetermined rate ICP is used, at the end of the exercise will be a comparison between actual ICP and applied ICP that can reveal differences, which may be cataloged as:

- **No significant.** In the event that the amount is not significant, these differences will be absorbed directly by the result of the period.

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- **Significant:** If the amount of the difference is outside the tolerance range established by the company admissible -usually roasted on experience, should trigger an analysis, so that:

- If the cause is due to a circumstantial, non-scheduled event of a non-repetitive nature and the order has already been sold, the margins must be re-calculated; and if it has not been sold, the cost of production must be rectified. In any case, it will not cause a change in the rate to be applied in the next period.
- If the cause is permanent, besides having to re calculate margins or cost of production, as sold or not the production, we will proceed to rectify the applicable rate in the following periods.

### EXAMPLE

The company " ALFA, SA" has implemented a cost system for manufacturing orders. During the month of November 20XX, three manufacturing orders have been manufactured and placed , of which the following information is known:

MANUFACTURING ORDER	INCOME	DIRECT MATERIALS COST	DIRECT LABOR COST
ORDER 1	20.000,00 €	10.000,00 €	5.000,00 €
ORDER 2	25.000,00 €	8.000,00 €	10.000,00 €
ORDER 3	18.000,00 €	12.000,00 €	6.000,00 €
<b>TOTAL</b>	<b>63.000,00 €</b>	<b>30.000,00 €</b>	<b>21.000,00 €</b>

Knowing, in addition, that:

- a) Indirect manufacturing costs are charged on the basis of direct labor supplement, with the default rate of 0,30€/labor cost.
- b) There were no stocks of products in curs or in any of the orders.
- c) After the period it is known that the indirect costs of actual production amounted to 7.350,00€ and general indirect costs 5.000,00€.

**IS ASKED:** The calculation the margin on each production orders and result calculation period, whether the difference between the actual and ICP level is considered significant or not.

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**SOLUTION**

MANUFACTURING ORDER	DIRECT MATERIALS COST	DIRECT LABOR COST	CIF APPLIED	PRODUCTION COST
ORDER 1	10.000,00€	5.000,00€	1.500,00€	16.500,00€
ORDER 2	8.000,00€	10.000,00€	3.000,00€	21.000,00€
ORDER 3	12.000,00€	6.000,00€	1.800,00€	19.800,00€
<b>TOTAL</b>	<b>30.000,00€</b>	<b>21.000,00€</b>	<b>6.300,00€</b>	<b>57.300,00€</b>

A) If we consider that the **difference** is **not significant**.

MANUFACTURING ORDER	INCOME	PRODUCTION COST	MARGIN
ORDER 1	20.000,00€	16.500,00€	<b>3.500,00€</b>
ORDER 2	25.000,00€	21.000,00€	<b>4.000,00€</b>
ORDER 3	18.000,00€	19.800,00€	<b>-1.800,00€</b>
<b>TOTAL</b>	<b>63.000,00€</b>	<b>57.300,00€</b>	<b>5.700,00€</b>

$$\text{Deviation ICP} = \text{ICP}_{\text{actual}} - \text{IPC}_{\text{applied}} = 7.350,00 - 6.300,00 = 1.050,00 \text{ €}$$

$$\begin{aligned} \text{+/-Result} &= \text{Margin} - \text{General indirect Costs} - \text{Deviation ICP} = \\ &= 5.700,00 - 5.000,00 - 1.050,00 = \text{-350,00 €} \end{aligned}$$

B) If we consider that the **difference** is **significant**.

\* Default rate = 0,30 €/labor cost

\* Real rate = Actual ICP / Actual Labor Cost =  
= 7.350,00€ / 21.000,00€ = 0,35 €/labor cost

Deviation ICP = Real rate - Default rate = 0,35 - 0,30 = 0,05 €/labor cost

MANUFACTURING ORDER	INCOME	PRODUCTION COST	INITIAL MARGIN	TOTAL MARGIN
ORDER 1	20.000,00€	16.500,00€	<b>3.500,00€</b>	<b>3.250,00€</b>
ORDER 2	25.000,00€	21.000,00€	<b>4.000,00€</b>	<b>3.500,00€</b>
ORDER 3	18.000,00€	19.800,00€	<b>-1.800,00€</b>	<b>-2.100,00€</b>
<b>TOTAL</b>	<b>63.000,00€</b>	<b>57.300,00€</b>	<b>5.700,00€</b>	<b>4.650,00€</b>

$$\begin{aligned} \text{Initial Margin} &= \text{Income for sales} - \text{Cost of production sales} = \\ &= 63.000,00€ - 57.300,00€ = 5.700,00€ \end{aligned}$$

$$\text{Total Margin} = \text{Initial Margin} - \text{Deviation ICP} = 5.700,00€ - 1.050,00€ = 4.650,00€$$

$$\begin{aligned} \text{+/-Result} &= \text{Total Margin} - \text{General indirect costs} = \\ &= 4.650,00€ - 5.000,00€ = \text{-350,00 €} \end{aligned}$$

### 3 MODEL OF COSTS BY PROCESSES

This model is comparable to a system organic costs and applies to companies operating regime **in series**, ie leading out a continuous production in which the physical units produced have identical characteristics, although they belong to different items, not differing from each other throughout the different stages of its transformation process. We speak, for example, of cement manufacturing companies, sugar mills, mills, textile industry (fabrics), paper mills, oil companies, etc.

The productive process is divided for analysis into a series of phases that are entrusted to operational units called **departments**, where the direct materials will flow until they become the final product, with the production treated in each of said departments being the carrier of the intrinsic cost .

In this case, to calculate the value of the production it will suffice to add the unit costs of each department for which the same has occurred. It coincides, therefore, with the methodology of the differential calculation in the division method.

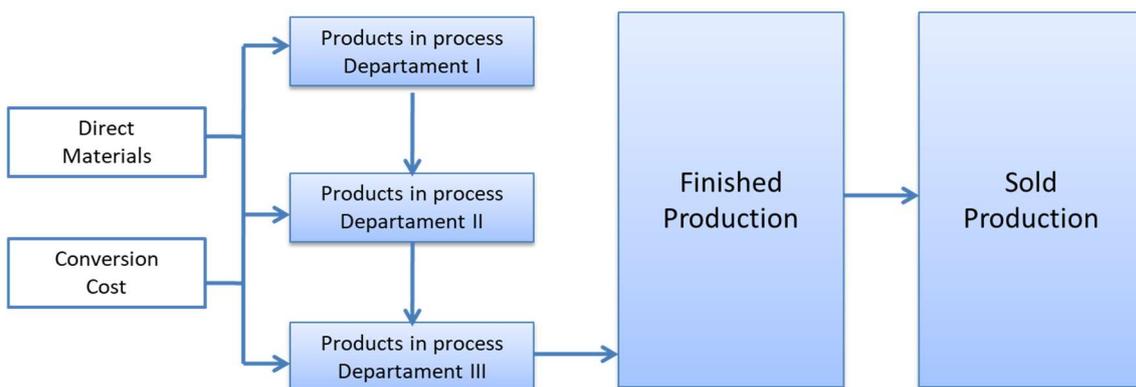


Figure 2. Source: Requena y Vera (2007: 404)

The accumulation of costs occurs at the level of each department, for this, it starts from the costs of direct materials, that are charged to the different departments and will go through them, perfecting themselves to become finished products. The other factors that are part of the cost of production (Labor and ICP), which is called

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**conversion costs** will be incorporated into the various departments, as their use is made through a picture -sharing similar to the cost statistics seen in previous topics. In addition, it will be necessary to take into account the value of the production in progress in the intermediate departments.

So to assess the units treated in each department, the division method (pure or by equivalences) is used, so that the production cost of each product will be the sum of the unit costs of all the departments in which it has been treated said product.

### EXAMPLE

The company "BETA , SA" is dedicated to the manufacture and commercialization of the "X" product. This company has implemented a cost-per-process model that is developed through 3 processes.

In the attached table, the costs incurred for manufacturing the month of November, in which 850 uq "X" have been obtained, are shown.

PROCESS	DIRECT MATERIALS	COSTS OF CONVERSION	COST OF THE PROCESS
Process 1	5.600,00	12.400,00	18.000,00
Process 2	26.400,00	7.800,00	34.200,00
Process 3	30.000,00	9.600,00	39.600,00
<b>TOTAL</b>	<b>62.000,00</b>	<b>29.800,00</b>	<b>91.800,00</b>

Knowing in addition that:

- There is no production in progress at the beginning of the period.
- The cost of the processes is shared among the units of products according to the pure division method, since all the units treated in the same center apply the same class and amount of work (except for process 3 where there are 50 units of product left). in progress at the end of the period with an advance grade of 60%).

**Is Asked, for November**, calculate the unit cost of production of the products that has been in course at the end of the period and the unit cost of production of the finished product.

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### SOLUTION

PROCESS	COST OF THE PROCESS	UNIT COST FINISHED PRODUCTION	UNIT COST IN COURSE PRODUCTION
Process 1	18.000,00	20,00	20,00
Process 2	34.200,00	38,00	38,00
Process 3	39.600,00	45,00	27,00
<b>TOTAL</b>	<b>91.800,00</b>	<b>103,00</b>	<b>85,00</b>

Distribution of the cost of process 3 (method of division by equivalences)

PRODUCT	Quantity	Equivalence coeffic.	Equivalence amount	Cost per unit homogeneous	Unit Cost prod.
Finished product	850	1	850	45,00	45,00
Product in course	50	0,6	30	45,00	27,00
			880		

$$\text{Cost per unit homogeneous} = \frac{39.600,00}{880} = 45,00 \text{ euros/u.c.p. hom.}$$

By way of summary, the main characteristics that differentiate the two extreme models that we have just analyzed are reflected in the following table:

Differential elements	ANGLOSAXON MODELS	
	WORK ORDERS	BY PROCESSES
<i>Production regime</i>	Discontinuous and heterogeneous.	Continuous and homogeneous.
<i>Core of accumulation of costs</i>	The singular product or the units that make up a lot.	The production of the period of each department.
<i>Calculation of the unit cost</i>	At the level of each work order.	At the level of departmental production.
<i>Method of calculation</i>	Supplement methods.	Methods of division.
<i>Period of calculation</i>	It can cover several successive periods, until the conclusion of the work order.	Specific periods. A new calculation process begins with each period.

Source: Requena and Vera (2007: 370)

### 4

### MODELS OF MIXED COSTS

In practice not all companies conform to these two schemes that we have just seen since there are companies with production processes that have characteristics of both models, which has contributed to the adaptation of these models and the appearance of others with characteristics near organic systems, such as **cost model for operations or ABC (Activity Based Costing)**.

#### 4.1. THE COST MODEL BY OPERATIONS

This model is applied to production processes that are placed between the individualized production order and mass production, where the manufactured products are similar, but not identical, obeying these differences to the different operations to which they have been subjected. In these cases, direct costs are affected to each lot, while direct labor and indirect manufacturing costs are accumulated and charged to operations, calculating the unit cost corresponding to the different operations.

In particular, the production processes to which we refer are carried out in companies that manufacture different products using, **totally or partially**, the same sequence of actions. That is, companies that manufacture several products in large quantities or batches (large series of different models or standardized varieties).

Thus, faced with the total heterogeneity of the work order (individualized cost tracking) and the total homogeneity of the series (joint calculation), we find ourselves in this model with an intermediate approach where each unit of the lot receives the same treatment and behaves, therefore, the same productive effort (footwear, textile-clothing industry, etc.).

Thus, the production process is divided into different operations ordered sequentially, repetitive actions where  $s$  is carried out  $n$  regardless of the specific characteristics of the product are performed.

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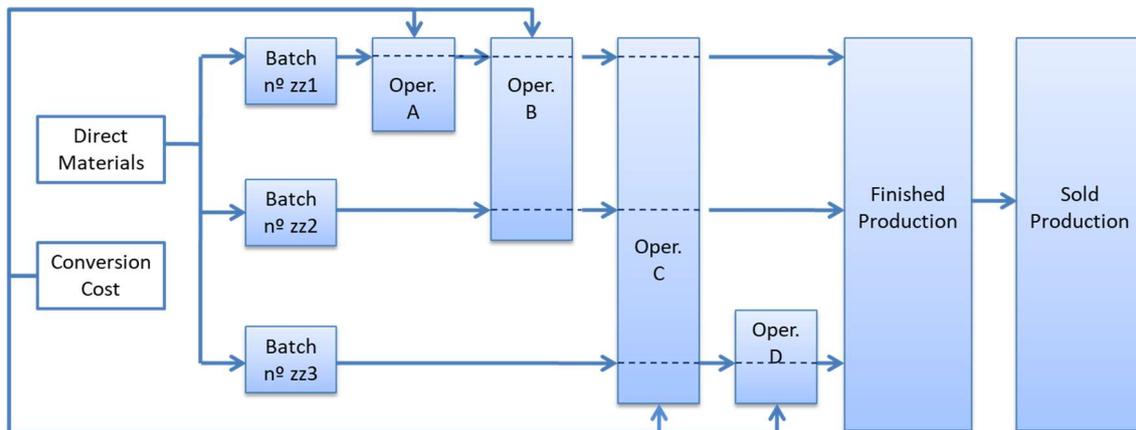


Figure 4: Source: Requena y Vera (2007: 406)

The MD (direct materials) are allocated by division to each lot and the conversion costs (Labor and ICP) are allocated to the different operations through a distribution table, so that all the units submitted to the same operation support the same cost of that operation.

The cost of the different operations will affect each lot to the extent that each operation has contributed to the obtaining of said lot or not.

**C. Unit zz1 batch = C. Unit MD**  
+ C. Unit Conver. Op. A  
+ C. Unit Conver. Op. B  
+ C. Unit Conver. Op. C

**C. Unit zz2 batch = C. Unit MD**  
+ C. Unit Conver. Op. B  
+ C. Unit Conver. Op. C

**C. Unit zz3 batch = C. Unit MD**  
+ C. Unit Conver. Op. C  
+ C. Unit Conver. Op. D

### 4.1. THE ABC (SYSTEM OF COSTS BASED ON ACTIVITIES)

The ABC model (Activity Based Costing) arose in North America in the eighties in front of the traditional approach based on causation factor-product, which assumes that products consume inputs in proportion to their volume of production, the ABC model calls for, first, they are activities that consume inputs

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and In the final analysis, it is the products that consume the activities necessary for their manufacture.

The causal relationship is, on the one hand, between FACTOR-ACTIVITY and, on the other, between ACTIVITY-PRODUCT:



Therefore, the KEY IDEAS of the ABC are:

- On the one hand, that the **products do not consume factors**, but consume the necessary activities for its manufacture .
- On the other, **activities are those that consume resources** .

The costs constitute the quantified expression in monetary terms of those resources or productive factors consumed by the activities, so it can be deduced that they are the activities and not the products or cost objectives<sup>1</sup> those that cause or generate costs.

As a result of the above, it can be deduced that :

1. Proper cost management must act on the activities that are the real cause of them.
2. It is possible to establish a cause-effect relationship between activities and products, so that the higher the consumption of activities by a product, the more costs will have to be allocated and, conversely, the lower the consumption of activities minus costs.
3. According to the previous consideration, the ABC systems can be used to assign costs in a more precise and objective way, since when calculating the cost of a specific activity, their costs will be assigned to the products or services according to the use and consumption that each One has made these.

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<sup>1</sup> The notion of a *cost objective* goes beyond products, since it covers services, contracts, projects, customers, markets and, in general, any object whose cost is computed because it is of interest to the company.

**B**

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