

COST AND REVENUE ANALYSIS

How to produce partial profitability information





1. OPERATIONAL PRODUCTIVITY

O_{PHYSICAL}

LPHYSICAL

- a) Partial
- b) Total

EFFICIENCY

2. FINANCIAL PRODUCTIVITY

O_{REVENUES}

LEXPENSES

- a) Partial
- b) Total



JUST THE OPPOSITE

1. OPERATIONAL PRODUCTIVITY

- a) Partial 🗸
- b) Total X

2. FINANCIAL PRODUCTIVITY

- a) Partial X
- b) Total 🗸

EFFICIENCY

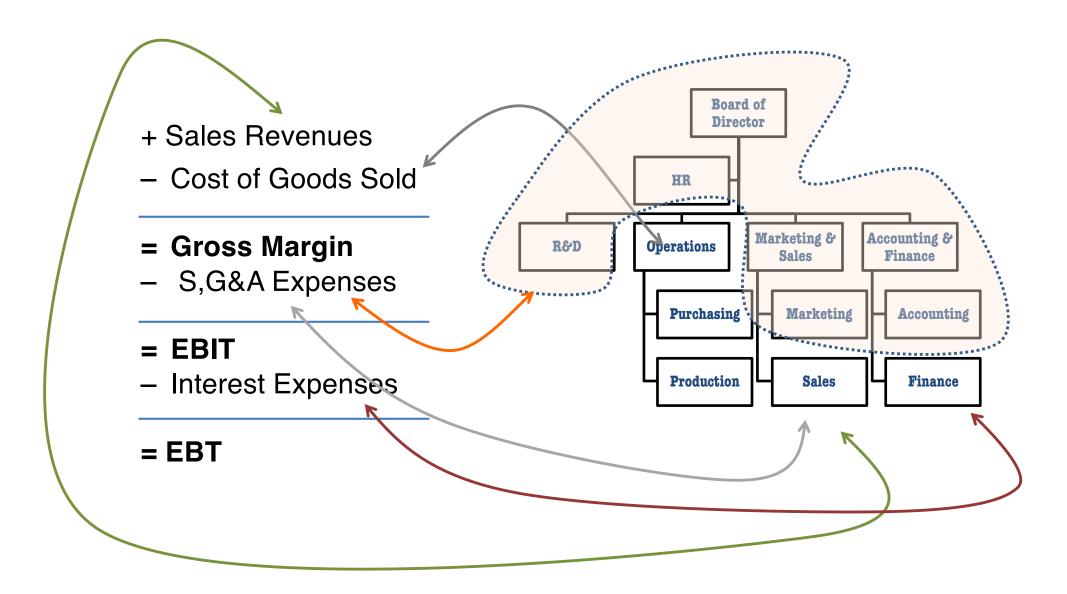


DIFFERENT POSSIBLE PROFIT MARGINS

+ Sales revenues	€	265.780	100,00%
- Cost of goods sold (@manufacturing variable cost)	-€	85.330	-32,11%
= Manufacturing variable margin	€	180.450	67,89%
- Sales variable costs	-€	24.550	-9,24%
= Contribution margin	€	155.900	58,66%
- Fixed costs (excluding depreciation and amortization costs)	-€	83.009	-31,23%
= EBITDA	€	72.891	27,43%
- Depreciation and amortization costs	-€	38.126	-14,34%
= EBIT	€	34.765	13,08%
- Interst expenses	-€	12.500	-4,70%
= EBT	€	22.265	8,38%
- Income taxes	-€	6.680	-2,51%
= EAT	€	15.586	5,86%

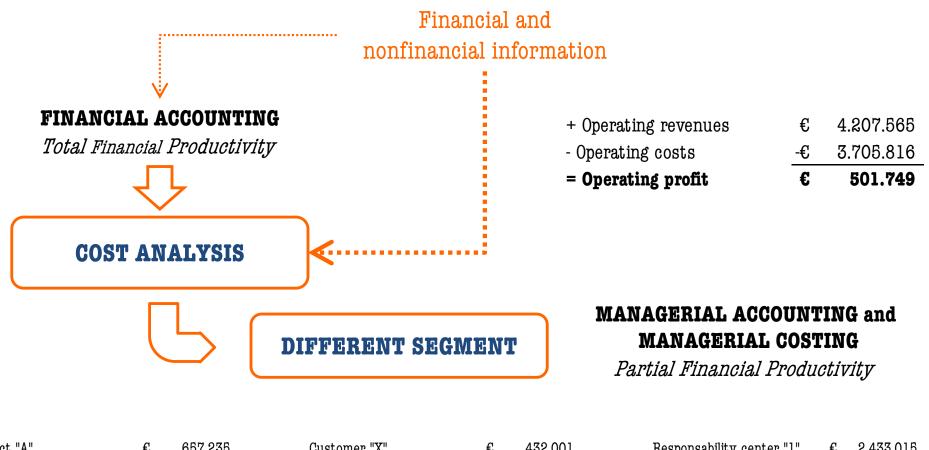


SOME IMPORTANT RELATIONSHIPS





FROM TOTAL TO PARTIAL FINANCIAL PRODUCTIVITY

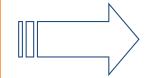


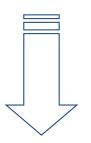
Operating profit	€	501.749	Operating profit	€	501.749	Operating profit	€	501.749
Product "N"	-€	138.758	Customer "K"	-€	25.789	Responsability center "12"	-€	835.519
	•••••		••••••	•••••		•••••		
Product "C"	€	432.267	Customer "W"	€	312.826	Responsability center "3"	-€	64.520
Product "B"	€	546.763	Customer "Y"	€	367.455	Responsability center "2"	€	1.774.550
Product "A"	€	657.235	Customer "X"	€	432.001	Responsability center "1"	€	2.433.015



DIFFERENT COST OBJECTS

COST OBJECTS





"Internal"

Resources (Means of Production)
Responsibility Centers (Departments)
Activities or Processes
Projects
WIPs
Products or Product Lines

"External"

Customers or clusters of Customers
Distribution Channels
Geographical Areas
Suppliers

These cost objects are the most innovative: they denote the adoption of a more modern management control. The focus is on the outside world.

Those who adopt this perspective seek to obtain the information necessary to manage market competition more effectively



A SEGMENT INCOME STATEMENT

JOB 1

+ Sales Revenues
- Sales Commissions
- Not Donomos
= Net Revenues
- Direct Materials
= First Margin
- Outsourced Work
= Second Margin
- Other Direct Costs
- Direct Labor
= Job Orders Direct Margin

XXX	XXX	XXX	XXX	xxx
XXX	xxx	XXX	xxx	XXX
= xxx				
- xxx				
= xxx				
- xxx				
= xxx				
- xxx				
- xxx				
= xxx				

JOB 3

JOB ...

JOB 2

JOB N

- Manufacturing Overhead
- Selling Overhead Expenses
- Administrative Expenses
- General Expenses
- = Ebit

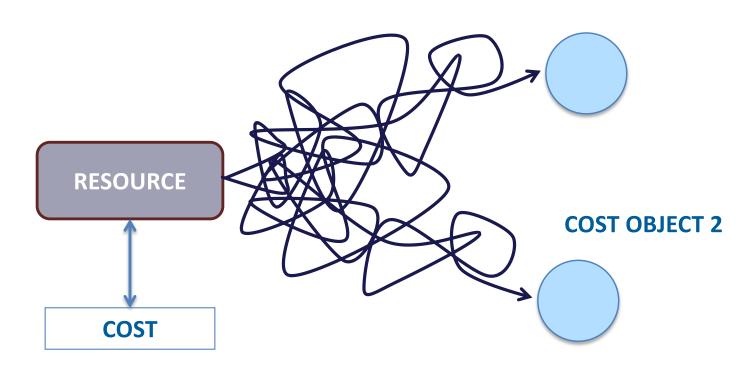


Total

WHY IT IS DIFFICULT TO COMPUTE....

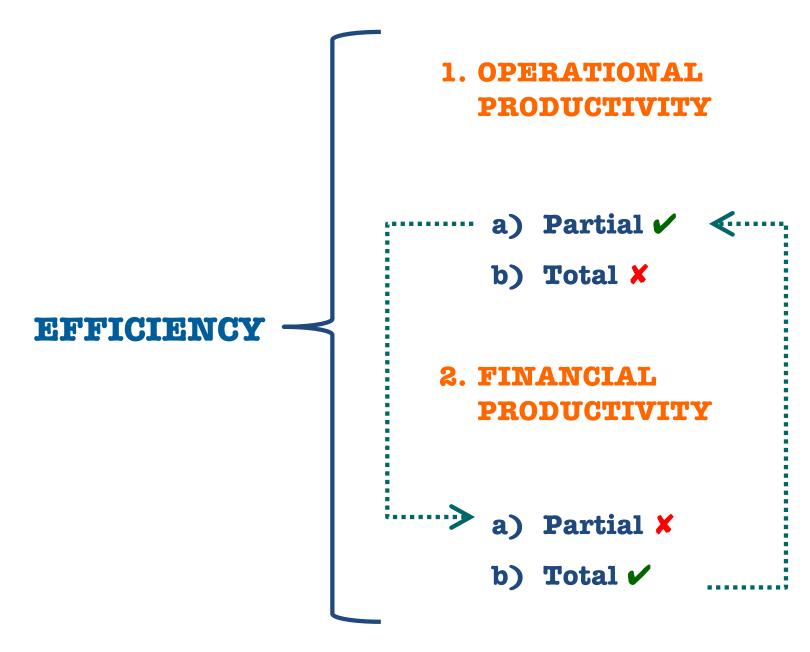
Partial financial productivity measure:

COST OBJECT 1



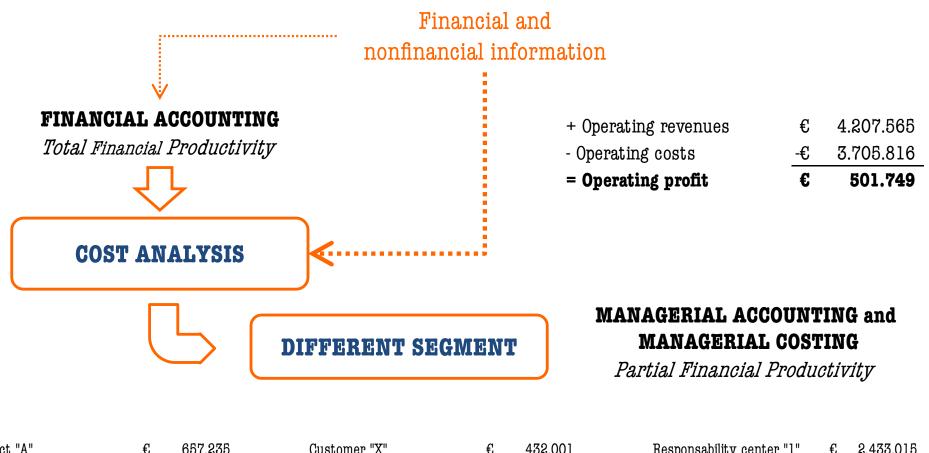


WHY IT IS DIFFICULT TO COMPUTE....





FROM TOTAL TO PARTIAL FINANCIAL PRODUCTIVITY



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COST COLLECTION SYSTEMS

Cost accumulation is the collection of cost data in some organized way by means of an accounting system.

Cost collection systems typically accounts for costs in two broad stages:

- 1. they initially accumulates costs classifying them "by nature": that is to say into categories that remind us the type of resources purchased or consumed (e.g., raw materials, depreciation, transports costs, rent expenses, wages and salaries, etc.). Later this criterion is combined with other two that focus their attention on cost behavior (fixed and variable costs) or on the robustness of the relation that link a cost to a specific cost objects (direct and indirect costs).
- 2. They then assign these costs to cost objects.

COST ACCUMULATIONS



COST ASSIGNMENT



COST ANALYSIS

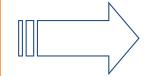
The concrete implementation of a proper cost analysis requires to make some basic decisions about the following issues:

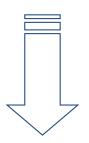
- Cost Object
- Periodicity of the analysis (one time "had hoc" versus systematic)
- Portion of the cost base that is to be assigned to the cost object: selection
 of the "cost rule" that is to say of the evaluation criterion in terms of cost
 for the cost object)
- Structure of the cost flow: selection of the proper accumulation's method
- Input measurement base



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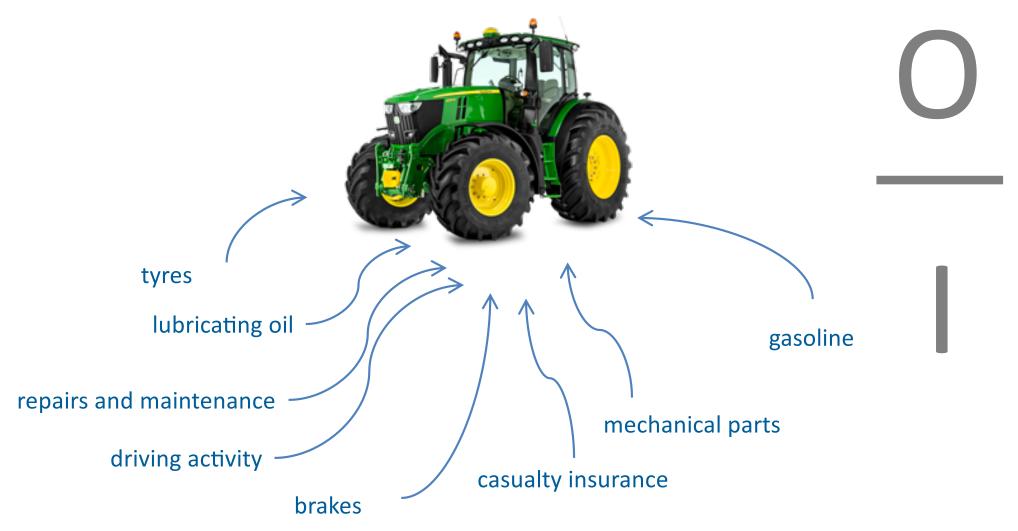
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A RESOURCE AS A COST OBJECT

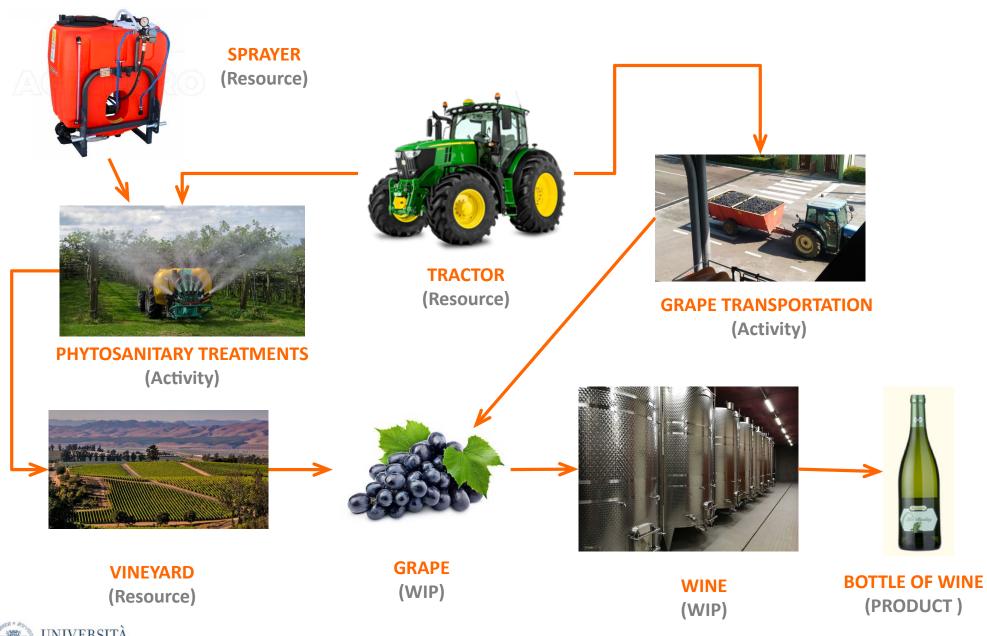
hours of work performed



Please note: the cost of operating a tractor is a **compound cost consisting of the sum of many elementary costs**. some of these costs are incurred exclusively for the operation of the tractor (tyres depreciation) others, however, are also incurred for other reasons (the cost of personnel who, in addition to doing other things, drive the tractor).



RELATION BETWEEN DIFFERENT COST OBJECTS



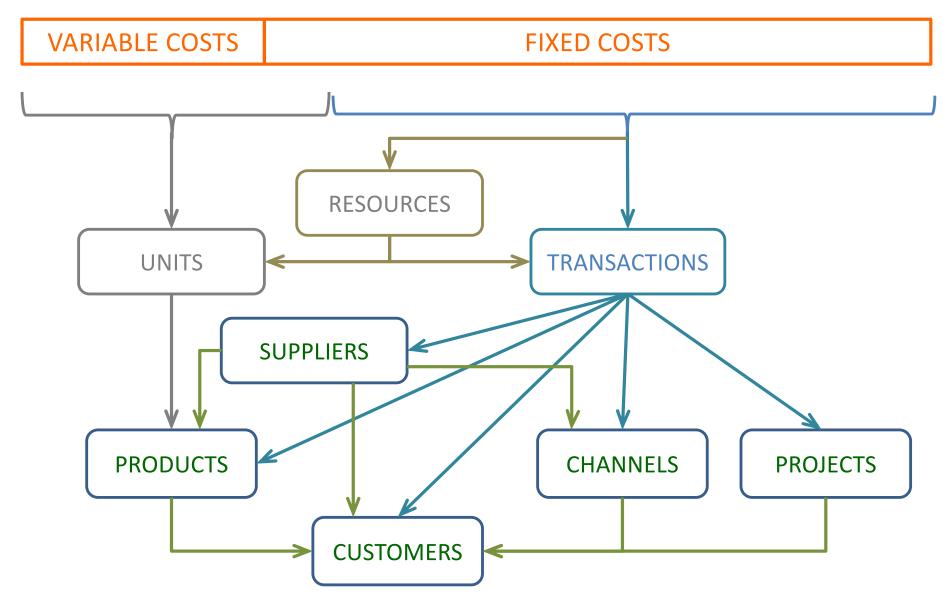
A VAN AS A RESPONSIBILITY CENTER bofrost* carriage paid cost of goods custom duty paid transit insurance www.bofrost.it bofrost* loading and unloading charges tyres basic wage lubricating oil bonuses repairs and maintenance mechanical parts gasoline casualty insurance fringe benefits dearness allowance



employer's contribution to employees' state insurance

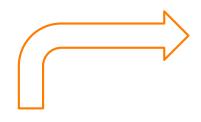
brakes

RELATION BETWEEN DIFFERENT COST OBJECTS





PERIODICITY OF THE ANALYSIS



SYSTEMATIC AND CONSTANT INFORMATION FLOWS

COST & REVENUES ANALYSIS

A set of logic, criteria, methods and techniques for the

- \diamond collection,
- \diamond classification,
- ♦ attribution

of costs and revenues



COST SYSTEMS

Focused on cost-objects that are considered particularly relevant for day-by-day decisions and, therefore, that need constant monitoring

PRODUCTION OF "AD HOC" INFORMATION IN RELATION TO SPECIFIC DECISION MAKING

ONE-OFF COST ANALYSIS

Relating to specific cost-objects, from time to time different depending on the type of decision to be taken



DIFFERENT DECISIONS, DIFFERENT SETS OF INFORMATIONS

Decision to be made:

- A. Things to do in Rome while visiting the city as a tourist for a five days period
 - Different possible hotel/B&B accommodations
 - Best restaurants in town
 - Underground tickets and weekly pass
 - Best Museum
 - Exercise drills

- B. Things to do in Rome while spending a six months period in the city for work
- Apartments monthly rates
- Convenient grocery stores nearby
- Used cars prices, buses and train monthly pass
- Places to visit in the surrounding area
- Gym and swimming pool memberships



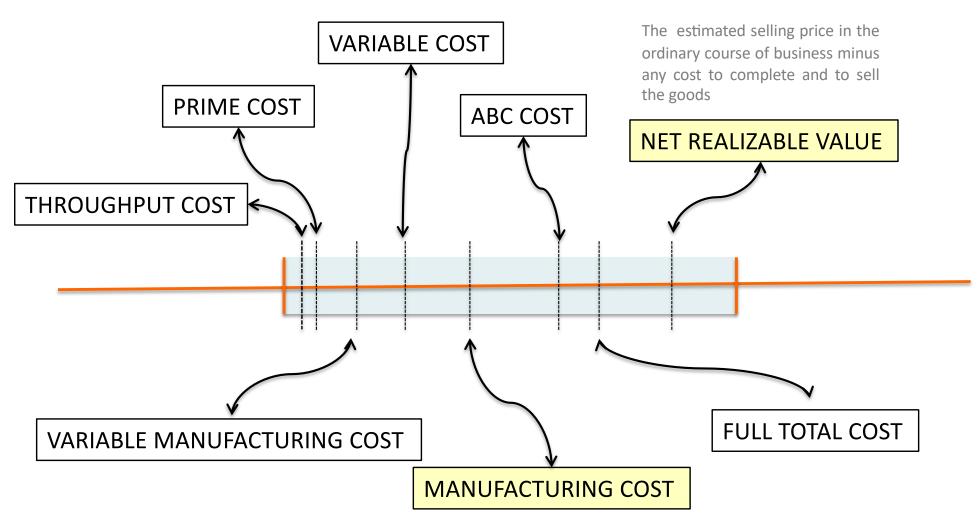
DIFFERENT FUNCTIONS, DIFFERENT DEMANDS

Functions	Frequency	Allocation	Scope of System	Nature of Variability	Degree of Objectivity
Inventory valuation	Monthly or quarterly	Aggregate	Factory costs	Irrelevant	High
Operational control	Daily, by unit of work accomplished	None	Responsibility center	Short-term variable and fixed	High
Product cost measurement	Annually and at major change points	Extensive, down to individual products or product lines	Entire organization including marketing and distribution, engineering, service, and administration	All variable	Low

SOURCE: Kaplan, "One Cost System Isn't Enough", Harvard Business Review, January - February 1988



DIFFERENT VALUATION CRETERIA FOR A PRODUCT



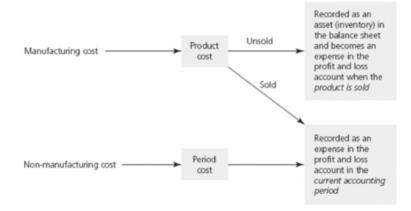
The costs necessary to convert raw materials into products. All manufacturing costs must be attached to the units produced for **external financial reporting under US GAAP**. The resulting unit costs are used for **inventory valuation** on the balance sheet and for the calculation of the **cost of goods sold** on the income statement.



COST OBJECTS AND COST RULES

COST ACCOUNTING

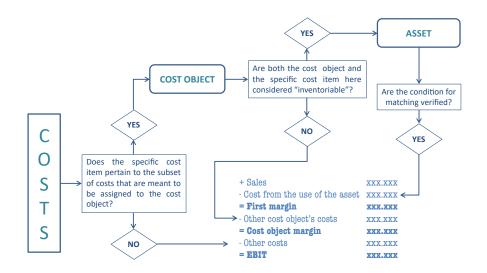




Within financial accounting we essentially have a single cost object (the "product", typical or atypical, produced by the enterprise) and a single cost rule (called "absorption costing")

MANAGERIAL COSTING

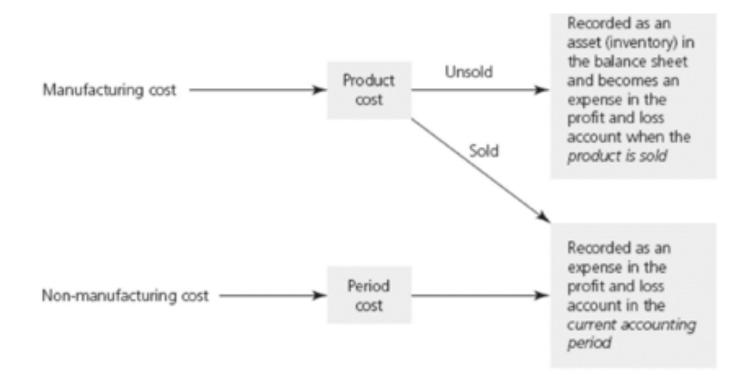




For managerial costing requirements we have, on the other hand, the need to calculate the cost of several different objects (several very different entities) and apply several cost rules in order to obtain the relevant information with respect to the decisions to be taken

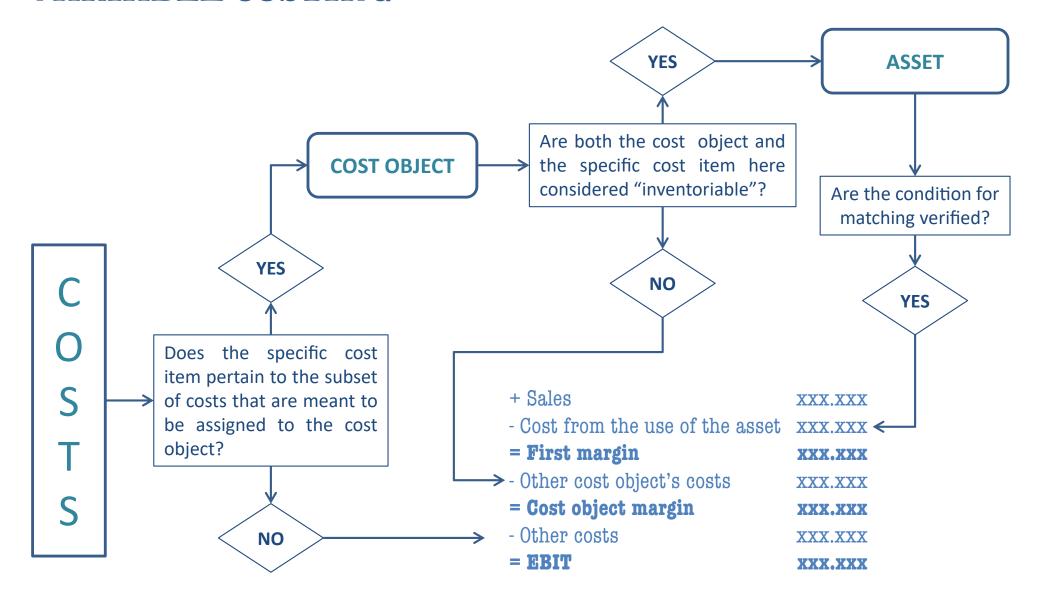


ABSORPTION COSTING





VARIABLE COSTING





VARIABLE COSTING

Raw Material are used and converted in Finished Products using Direct Labour and other Manufacturing Resourcs



Products obtained are put into storage



Products obtained are sold to costumer



Variable Manufacturing Costs are incurred

Variable Selling Costs are incurred



MORE PRECISELY **WORK IN PROCESS Variable Manufacturing Costs FINISHED PRODUCT YES ASSET WORK IN PROCESS FINISHED PRODUCT** Are both the cost object and **COST OBJECT** the specific cost item here considered "inventoriable"? **Variable Costs** Are the condition for matching verified? **YES Variable Selling Costs** NO **YES** Does the specific cost item pertain to the subset + Sales of costs that are meant to XXX.XXX be assigned to the cost - COGS (@ manufacturing variable) XXX.XXX ← object? = Manufacturing Variable Margin XXX.XXX → - Selling variable costs XXX.XXX = Contribution Margin XXX.XXX → - Fixed Costs XXX.XXX NO = EBIT XXX.XXX

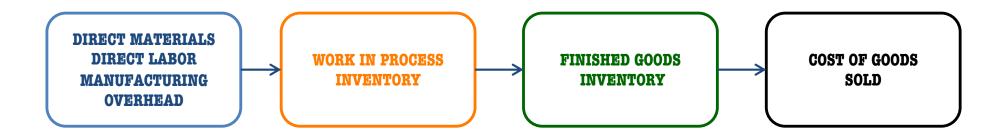




PROCESS COST AND JOB ORDER COST

Process Cost System Company Product		Job Order Cost System Company Product			
Jones Soda, PepsiCo	Soft drinks		Young & Rubicam, J. Walter Thompson	Advertising	AD!
ExxonMobil, Royal Dutch Shell	Oil		Disney, Warner Brothers	Movies	2
Intel, Advanced Micro Devices	Computer chips		Center Ice Consultants, Ice Pro	Ice rinks	
Dow Chemical, DuPont	Chemicals		Kaiser, Mayo Clinic	Patient health care	٩





Job costing is a costing system that <u>accumulates costs and assigns them to specific jobs, customers, projects, or contracts</u>. The basic supporting document (usually in electronic form) in a job costing system is the **job cost sheet**. It records and summarizes the costs of direct materials, direct labor, and factory overhead for a particular job.

A **job costing system** is used by companies that produce **unique products or jobs**. Examples of companies that use job costing systems include Boeing (airplanes), Lockheed Martin (advanced technology systems), and Deloitte & Touche (accounting).















Automotive Job Costing Solutions

Automotive job costing can often be a complicated endevour. Getting an accurate sum of labour and materials can be the difference between profitability and loss, data inaccuracies or lack of tracking can ensure issues in the future. Keeping track of client and vehicle records is important for customer service. We have the solutions to get your business running at peak performance as well as giving you a complete view of your business activities.

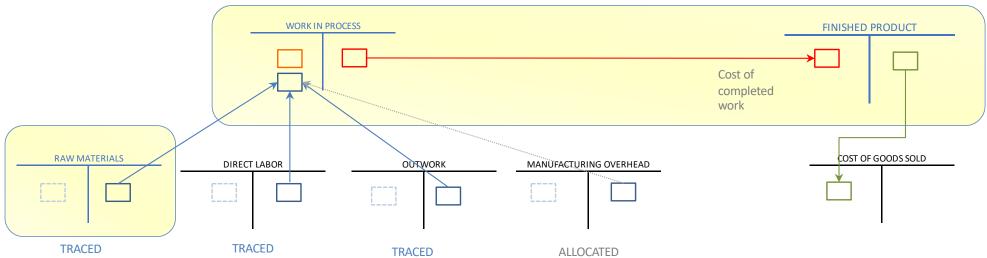


FLOW OF COSTS IN JOB COST SYSTEM





ASSETS



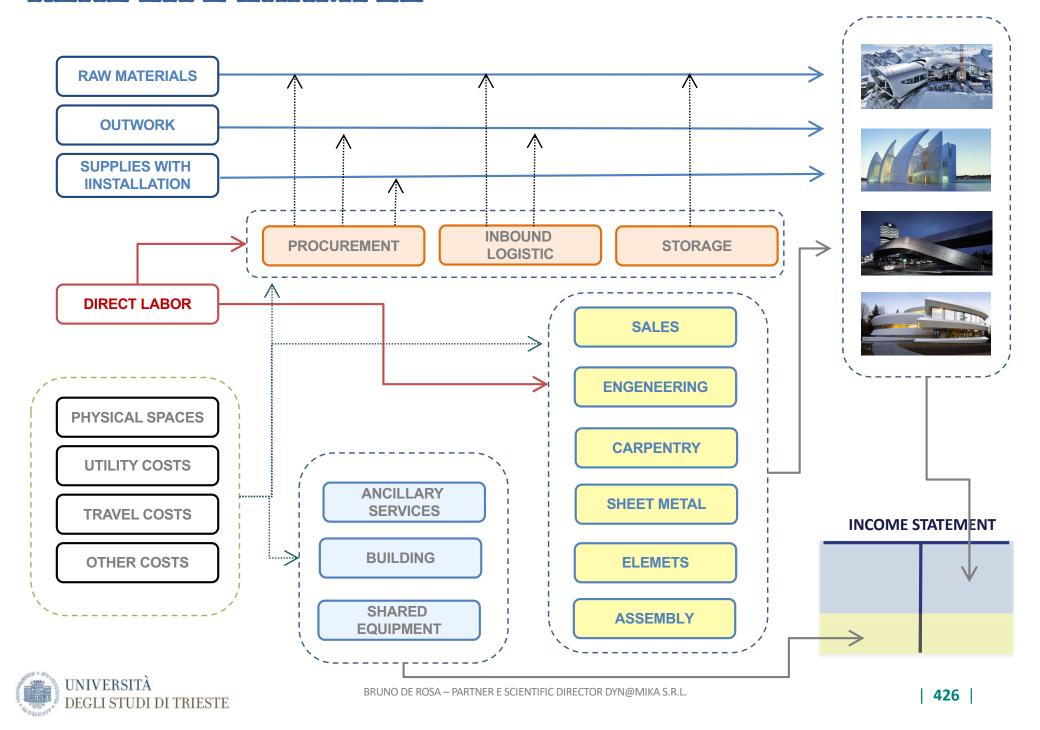


mac ning. H.I.	METER	90
		707 0
STARTED Sept. 23, 1929	FL AREA 2	791,000
COMP	LETED Mag	y 1,1931
The state of the s	Cost	Cu. Ft.
General Con.	2,723,56	2 .0758
Foundations		
Piling or Cals.	1,192,469	-0352
- Struct. Steel	4,706,925	1184.
StoneoGodlydo . W. P.	1 2 2 2 2 2	
Arches	54,722	.0015
Masonry	1,415,07	.0394
-	1,501,012	.0418
Exterior Stone	1,124,874	-0378
Term Come Granite	82,202	.0023
Roosing & Sheet Met.	/ 110 EWA	CO COLOR
Sheed Metal Windows	1.075 500	0000
THE WASHINGTON		
Carpenaly	265,324	
· Lath. & Plast.	185,861	*0038
FL Fill & Finish	913,693	-0254
Millwork	555,908	-0094
Mer. Drs. & Trim	92,273 345,805	-0026
Elevator Encl.		9600*
Glass and Glan . O .	245,053	.0069
Hardware	98,838	
· Iron & Be.	58,084	-0016
Miss-iron Bronze	195,835	-0055
Mail Chuie	254,195	-0071
Interior Marble	51,655	-0015
THE Hydrosone	996,361	.0278
Terrano & *ile	222,652	-0002 -0062
State & Comp. FStruct. Cla	70 000	
Paint & Decor.	189 000	.0019
The 6 Declar	189,002	.0053
A. Whiteham .	,882,775	+0803
of Mary St. Mary	,121,401	.0312
The state of the s	,648,213	-0459
Hect. Pix.	108,583	-0050
Sprinkler System		-0000
Refrigeration		-0004
West Class Syalm sula tion		-0001
Passa Service - Tower Scaffo	1d56,105	.0036
Stl. Shut & Doors	1,885	.0000
Mont Chores Flag Poles	5,920	\$000
Vanda & Doces		-0000
		.0004
Prisonatic Late Wire Work		0003
Furn & First	0227001	
Damproofing	55,525 .	0009
Window Carlling	44,812	0007
Westernint Met. Tower	50,407	0014
boda Foundain	5,029	0002
The second second second	-	A STATE OF THE PARTY OF THE PAR
Control Control	8,699 -	00002
Educations Sind Direction		0002
Samuel Street	ALCOHOL: UNKNOWN	
	.679,772 -	71.50

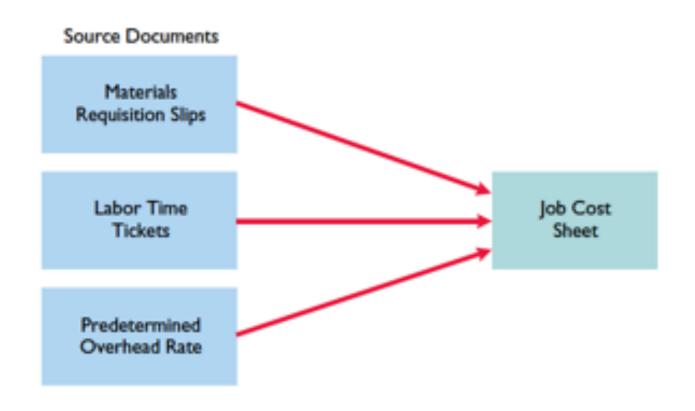
	EMPIRE STATE BUILDING	
	Cost of Common Brick Laid in Place Back of Linestone and Interior Walls	
Account	Labor Amount	
м2,м5,м4	Labor, Bricklayers Apprentices Bricklayers, Laborers, Hoisting Eng. etc. \$353,620, Insurance - average rate 8.516% 30,114.	
GC14 Hod Ho	ist - Labor, proportion Hod Hoist, Plant & Equip. 10,333. Insurance, 6% 620.	88
GC14 Indus.	Rwy Labor proportion Industrial Rwy. 2,753. Insurance, 6% 165.	44 20
GC14 Mixing	Plants-Labor, proportion Mortar Mix.Plants 615. Insurance, 6% 36.	
902	Labor - proportion Gen. Organiz.Payroll 23,970.0 Insurance 1.75% 419.4	7
MT	Labor - proportion Maintenance or Equip. 1,367.5 Insurance, 8,516% 116.4	
	Labor Cost laying 10,258,628 Com.Bricks 424,133.1 Gross Labor Cost per 1000 bricks,\$41.34	7
	Material	
M2,M5,M4 GC14 GG14 GG14 MT	Common Brick, Lime, Sand, Cement, Plant, etc. 254,905.43 Material, proportion Hod Hoist plant & Equip. 13,322.07 Material, proportion Industrial Railway 1,806.30 Material, proportion Mixing Plants 1,040.81 Proportion Mainten.power,oil,gas,water,etc. 1,375.33	
	Material Cost Laying 10,258,628 Com.Bricks 272,449.94 Gross Material Cost laying 1000 Br. \$26.56	/
	Gross Labor and Material Cost laying 1000 common bricks, \$67.90	
	Net Labor Units Straight Excess	
	No.Laid Time Time Tot	al
Interior	1ck,Backing Limestone 8,877,700 M2 32.22 1.97 34.1 Common Brick 1,227,467 M5 36.51 .82 37.3 1ck at Lot Line Wall 153,461 M4 27.44 .21 27.6	3
	Ratio Proportion per Bricklayers Laborers S-hr.Bricklayers	
Interior	tick,Backing Limest. 1 1.1 864 Common Brick 1 1.4 858 tick at Lot Line Wall 1 1.2 1052	



REAL LIFE EXAMPLE



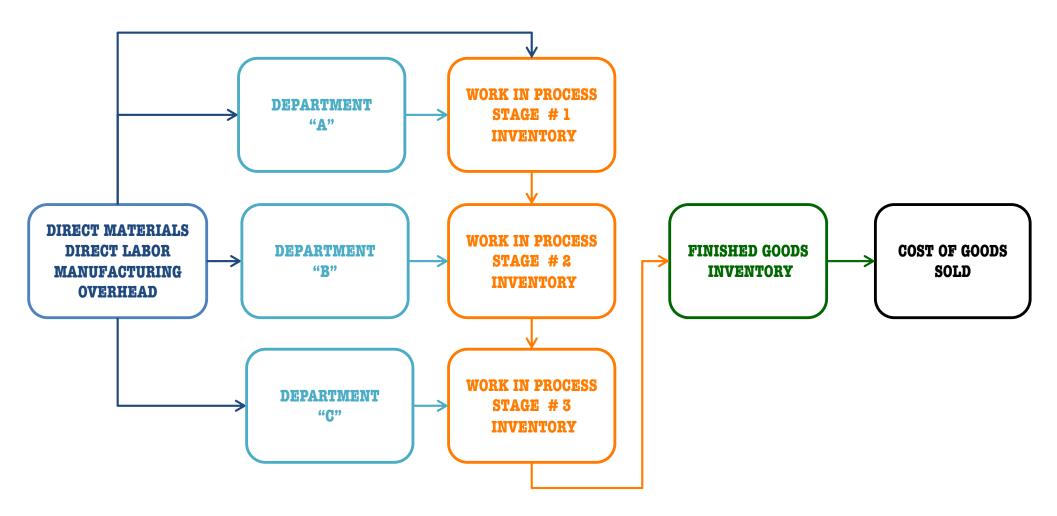
FLOW OF DOCUMENTS



The job cost sheet summarizes the cost of jobs completed and not completed at the end of the accounting period. Jobs completed are transferred to finished goods to await sale.



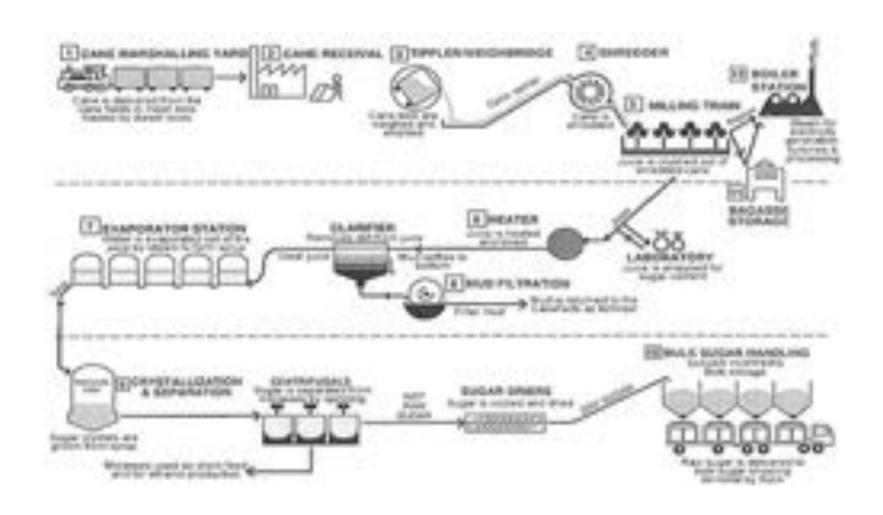
PROCESS COSTING SYSTEM



Process costing is a product costing system that accumulates costs according to processes or departments and assigns them to a large number of nearly identical products. A **process costing system** is used by companies that **employs a standardized production process to manufacture homogeneous products**. Examples of companies that use process costing include Chevron Corporation (petroleum products), the Wrigley Company (chewing gum), and Pittsburgh Paints (paint).

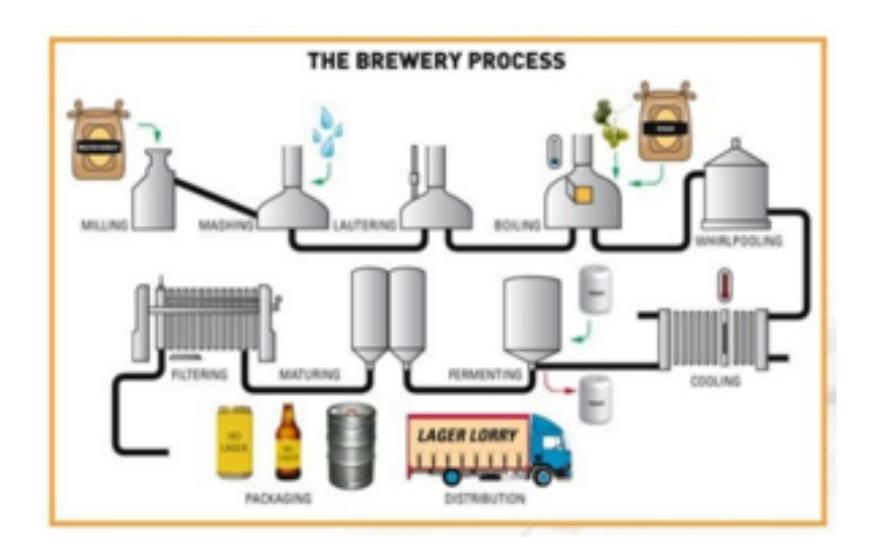


PROCESS COSTING SYSTEM



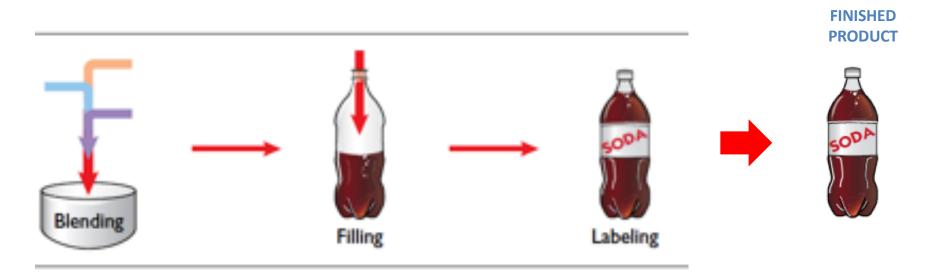


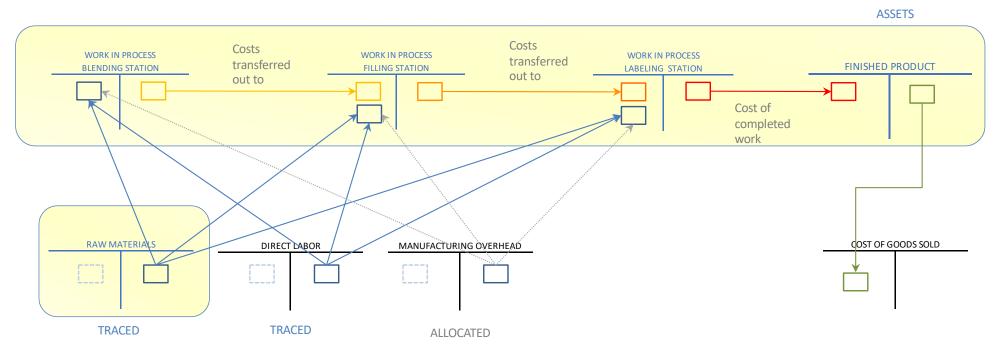
PROCESS COSTING SYSTEM





FLOW OF COSTS IN PROCESS COST SYSTEM







JOB ORDER VERSUS PROCESS COST SYSTEMS

Feature

Work in process accounts

Documents used

Determination of total manufacturing costs

Unit-cost computations

Job Order Cost System

One work in process account

Job cost sheets

Each job

Cost of each job + Units produced for the job **Process Cost System**

Multiple work in process accounts

Production cost reports

Each period

Total manufacturing costs + Equivalent units produced during the period



FINANCIAL ACCOUNTING VS. MANAGERIAL ACCOUNTING

FINANCIAL ACCOUNTING

Reports to those outside the organization:

Owners

Creditors

Tax Authorities

Regulators

- Emphasizes financial consequence of past activities
- Emphasizes precision
- Emphasizes companywide reports (focus on the whole)
- Must follow GAAP/IFRS
- Mandatory for external reports.

MANAGERIAL ACCOUNTING

- Reports to manager inside the organization for Planning
 Controlling
- Emphasizes decisions affecting the future
- Emphasizes timeliness
- Emphasizes segment reports (focus on parts)
- Need not follow GAAP/IFRS
- Not mandatory

"supporting documents" are normally needed (receipts, invoices, proofs of payment, etc.)



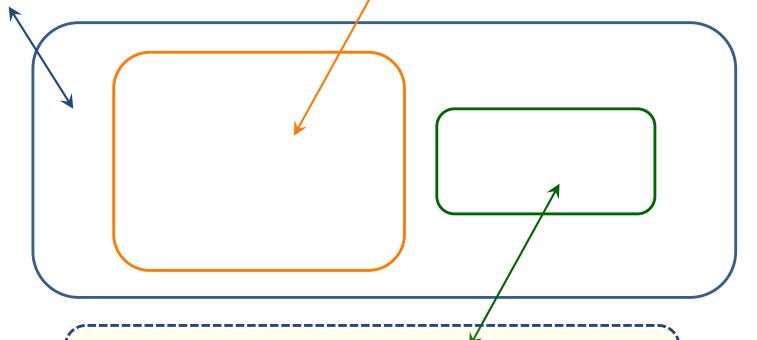
SOME BASIC DEFINITIONS

COSTS

All resources that are sacrificed or forgone in order to achieve a specific objective.

EXPENSES

Costs of assets consumed, or services used in the process of earning revenue.



OPPORTUNITY COSTS

Forgone benefits that could have been realized for the best forgone alternative use of an actual resource



INPUT MEASUREMENT BASE

DIRECT COST INDIRECT COST **ACTUAL COSTING SYSTEM** Actual Actual Actual **NORMAL COSTING SYSTEM Standard** Standard **Standard** STANDARD COSTING SYSTEM



PREDETERMINED MANUFACTURING OVERHEAD RATE

Predetermined manufacturing = Total estimated manufacturing overhead costs

Total estimated quantity of the manufacturing overhead allocation base

The most accurate allocation can be made only when total overhead cost is known—and that is not until the end of the period. But managers cannot wait that long for product cost information. So the predetermined manufacturing overhead rate is calculated before the period begins. Companies use this predetermined rate to allocate estimated overhead cost to individual jobs. The predetermined manufacturing overhead rate is based on two factors:

- Total estimated manufacturing overhead costs for the period (in Smart Touch's case, one year)
- Total estimated quantity of the manufacturing overhead allocation base

The key to allocating (assigning) indirect manufacturing costs to jobs is to identify a workable manufacturing overhead allocation base. The allocation base is a common denominator that links overhead costs to the products. Ideally, the allocation base is the primary cost driver of manufacturing overhead—that is, the more "allocation base," the more overhead costs and vice-versa. As the phrase implies, a cost driver is the primary factor that causes (drives) a cost. Traditionally, manufacturing companies have used the following as cost drivers (allocation bases):

- Direct labor hours (for labor-intensive production environments)
- Direct labor cost (for labor-intensive production environments)
- Machine hours (for machine-intensive production environments)



- In financial accounting, the typical cost objects are finished and semi-finished products. These "entities" are tangible resources with an economic value that are controllable by the company that produces them and, therefore, can be found in the financial statements as assets. This means that the costs that are attributable to the products (both finished and semi-finished) can also be "inventoried" (that is to say their "amount" can be added to a stock inventory and therefore subtracted from the formation of the economic result) if the units to which they are allocated are still present in the inventory.
- Cost objects used in managerial costing do not always have these characteristics. There are, for example, cost objects such as activities performed, or customers served, or sales channels used, or others that cannot be reported as assets on the balance sheet. For this reason, for the purposes of the reasoning that we are about to do, we must begin by distinguishing the set of costs that can be attributed to a specific cost object from its possible subset that contains "inventoriable costs" (that is to say costs that can be actually "offset" by a corresponding increase in the value of inventories).



The "cost collection and allocation process" can be viewed as a set of cost accumulation and allocation steps. We can think of the accumulation phases as the arrival and departure points of the process (but also the intermediate stopping points) while the allocation phases represent the moments of movement from a specific point to the next one.
The wording "cost accumulation" identifies the activities of collecting a set of costs that refer to the same cost object. This means that normally the "cost" of a cost object is a compound cost, consisting of the sum of several elementary costs.
The wording "cost allocation" identifies, instead, the transfer of a cost value previously recorded in relation to a cost object, to a subsequent cost object.
As you certainly know, flow chart is a picture of the separate steps of a process in sequential order. Well, the "cost collection and allocation process" can be effectively represented thanks to the employment of a flow chart in which the stages are the moments of cost accumulation, and the vectors are the phases of cost allocation.



- In order to be truly effective, a process of accumulation and allocation of costs must portray as realistically as possible the flow of activities that make up the production process. In fact, it is these activities, and the ways in which they are carried out, that determine the transfer of the value contained in the resources first to the WIP and then to the finished products and from these eventually to the customers.
- Clearly, the activities that define production processes take a different form depending on the technology employed and the production process undertaken. The process of cost allocation must, therefore, respect these specificities and cannot take place in a standardized way, i.e., using using the same structure regardless of the specific process developed.
- They exist but of the general archetypes that can be used like bases of reference in order to distinguish two various modalities to configure the productive activities and therefore the flow of accumulation and attribution of the costs. These are: the "job costing system", used by companies that produce unique products or jobs, and "process costing system" used instead by companies that employs a standardized production process to manufacture homogeneous products.



- ☐ There are three methods managers and accountants can use to calculate product unit cost:
 - Actual costing method,
 - Normal costing method, or
 - Standard costing method.
- The actual costing method uses the actual costs of direct materials, direct labor, and overhead when they become known to calculate the product unit cost. This means, many times, waiting until the end of the period when all the cost data are available. For most companies, this is not practical.
- ☐ The normal costing method combines the easy-to-track actual direct costs of materials and labour with estimated overhead costs to determine a product unit cost. The use of this costing method is widespread, since many overhead bills, such as utility bills, are not received until after products or services are produced and sold. For this reason, normal costing system that uses actual costs for direct materials, direct labour and other direct costs and applies indirect costs using a predetermined overhead cost rate.



- ☐ To compute the predetermined overhead rate, four steps are needed:
 - 1. Estimate total overhead costs for the operating period, usually a year.
 - 2. Select the most appropriate allocation base (i.e. the basis that best reflects the cause-effect relationship that links indirect costs to the chosen cost object)
 - 3. Estimate the total amount of the chosen allocation base for the operating period.
 - 4. Divide the estimated total overhead costs by the estimated amount of the chosen allocation base to obtain the predetermined overhead rate.
- The standard costing method uses estimated or standard costs of direct materials, direct labour, and overhead to calculate the product unit cost. This method is used because managers sometimes need product cost information before the accounting period begins so that they can control the cost of operating activities or price a proposed product for a customer. In such situations, product unit costs must be estimated, and the standard costing method can be helpful. Moreover, standard costing is very useful in performance management and evaluation because a manager can compare actual and standard costs to compute the variances. In such a way it becomes a tool for exercise a form of steering control and can be used for learning.

