



MANAGERIAL COSTING

What is “managerial costing” and why it is needed



WHAT IS ACCOUNTING AND WHY IT IS IMPORTANT?

Accounting is the process of:

- COLLECTING
- RECORDING
- ESTIMATING
- ORGANIZING
- SUMMARIZING

FINANCIAL AND OPERATIONAL DATA

in order to provide **VALUABLE INFORMATION** to **DECISION MAKERS**



USER OF ACCOUNTING INFORMATION

All accounting systems are designed to provide information to

“DECISION MAKERS”

SOURCE: Lanen-Anderson-Maher, “Fundamentals of Cost Accounting”, Third Edition



USER OF ACCOUNTING INFORMATION

All accounting systems are designed to provide information to

“DECISION MAKERS”

Some of them are not directly involved in the daily management of the firm.

These users of the information are often “**external**” to the firm.

We defined “**internal**” to the firm, those users that are responsible for its performance.

SOURCE: Lanen–Anderson–Maher, “Fundamentals of Cost Accounting”, Third Edition



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- ✦ **ACTUAL OR POTENTIAL INVESTORS**
- ✦ **CREDITORS**
- ✦ **GOVERNMENT AGENCIES**
- ✦ **TAX AUTHORITIES**

We defined “**internal**” to the firm, those users that are responsible for its performance.



MANAGERS

- Executive Level
- Middle Management Level
- Production Level

FINANCIAL ACCOUNTING AND MANAGERIAL ACCOUNTING

“EXTERNAL” DECISION MAKERS



FINANCIAL ACCOUNTING

Field of accounting that reports financial position and income according to accounting rules.

“INTERNAL” DECISION MAKERS



MANAGERIAL ACCOUNTING

Field of accounting concerned with providing information to managers for use within the organization. It has, therefore, the aim of identifying, measuring, analyzing, interpreting and communicating information for the pursuit of an organization's goals.



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	FINANCIAL ACCOUNTING	MANAGERIAL ACCOUNTING
▪ Users of the system	▪ External	▪ Internal
▪ Most important criteria	▪ Comparability, Objectivity, Verifiability	▪ Decision relevance, Timeliness
▪ Who establishes or defines the system?	▪ Standard-setters	▪ Managers
▪ How to determine accounting treatment ?	▪ Standards	▪ Relevance for decision making

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**

SOURCE: Adapted from Garrison, Noreen, Brewer, "Managerial Accounting", 16th Edition



COST ACCOUNTING AND MANAGERIAL COSTING

“EXTERNAL” DECISION MAKERS



FINANCIAL ACCOUNTING

Field of accounting that reports financial position and income according to accounting rules.



COST ACCOUNTING

“Cost accounting is measuring and reporting costs intended for external financial reporting or regulatory purposes where guidelines and principles must be followed and complied with to meet regulatory, legal, or other defined standards and requirements.”

Source: IFAC (International Federation of Accountants), “Evaluating and Improving Costing in Organizations,” International Good Practice Guidance, July 2009.

“INTERNAL” DECISION MAKERS



MANAGERIAL ACCOUNTING

Field of accounting concerned with providing information to managers for use within the organization.



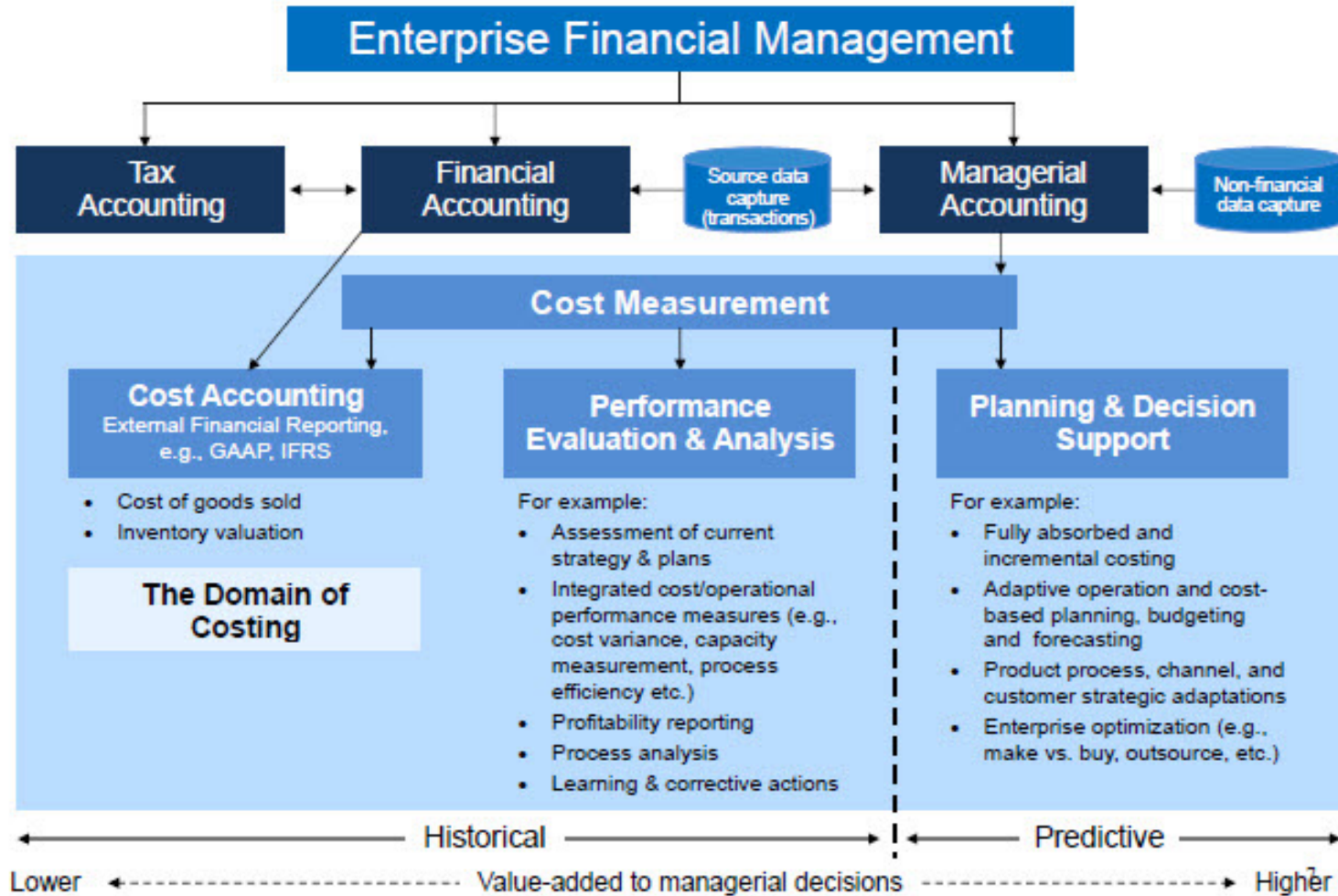
MANAGERIAL COSTING

“Managerial costing is costing done purely for the organization to use internally to ensure that information for decisions reflects the characteristics of the organization’s resources and operations.”

Source: IMA (Institute of Management Accountants), “The Conceptual Framework for Managerial Costing,” Statement on Management Accounting, September 2014.



COST MEASUREMENT, COST ACCOUNTING & MANAGERIAL COSTING



COST MANAGEMENT

We frequently hear business people use the term *cost management*. Unfortunately, that term has no uniform definition.

We use **cost management** to describe the **approaches and activities of managers to use resources to increase value to customers and to achieve organizational goals.**

Cost management decisions include decisions such as whether to enter new markets, implement new organizational processes, and change product designs. Information from accounting systems helps managers to manage costs, but the information and the accounting systems themselves are not cost management.

Cost management has a broad focus and is not only about reduction in costs. Cost management includes decisions to incur additional costs, for example to improve customer satisfaction and quality and to develop new products, with the goal of enhancing revenues and profits.

SOURCE: Horngren, Datar, Foster, "Cost Accounting. A managerial Emphasis", 11th Edition

STRATEGIC COST MANAGEMENT

Strategy specifies how an organization matches its own capabilities with the opportunities in the marketplace to accomplish its objectives. In other words, strategy describes how an organization will compete and the opportunities its managers should seek and pursue.

Deciding between [different] strategies is a critical part of what managers do.

Management accountants work closely with managers in formulating strategy by providing information about the sources of competitive advantage—for example, the cost, productivity, or efficiency advantage of their company relative to competitors or the premium prices a company can charge relative to the costs of adding features that make its products or services distinctive.

Strategic cost management describes cost management that specifically focuses on strategic issues.

SOURCE: Horngren, Datar, Foster, “Cost Accounting. A managerial Emphasis”, 11th Edition

STRATEGIC COST MANAGEMENT

Management accounting information helps managers formulate strategy by answering questions such as the following:

- **Who are our most important customers, and how can we be competitive and deliver value to them?** After Amazon's success in selling books online, management accountants at Barnes and Noble presented senior executives with the costs and benefits of several alternative approaches for building its information technology infrastructure and developing the capabilities to also sell books online. A similar cost-benefit analysis led Toyota to build flexible computer-integrated manufacturing (CIM) plants that enable it to use the same equipment efficiently to produce a variety of cars in response to changing customer tastes.
- **What substitute products exist in the marketplace, and how do they differ from our product in terms of price and quality?** Hewlett-Packard, for example, designs and prices new printers after comparing the functionality and quality of its printers to other printers available in the marketplace.
- **What is our most critical capability?** Is it technology, production, or marketing? How can we leverage it for new strategic initiatives? Kellogg Company, for example, uses the reputation of its brand to introduce new types of cereal.
- **Will adequate cash be available to fund the strategy, or will additional funds need to be raised?** Proctor & Gamble, for example, issued new debt and equity to fund its strategic acquisition of Gillette, a maker of shaving product

SOURCE: Horngren, Datar, Foster, "Cost Accounting. A managerial Emphasis", 11th Edition



OPERATIONAL COST MANAGEMENT

Operational cost management involves the whole set of planning and monitoring activities that are necessary to increase the level of efficiency and effectiveness with which business processes are carried out.

Planning comprises:

- a. selecting organizations goals, projecting the results under alternative ways of achieving these goals, deciding on the plan of action that is deemed most effective in achieving the desired results and
- b. communicating the goals and how to attain them to the entire organization.

Monitoring comprises:

- a. taking actions that implement the planning decisions (execution of the strategy) and
- b. deciding how to evaluate the performance and to provide what feedback that will increase the level of efficiency and effectiveness with which business processes are carried out and help future decision making.

SOURCE: Horngren, Datar, Foster, "Cost Accounting. A managerial Emphasis", 11th Edition



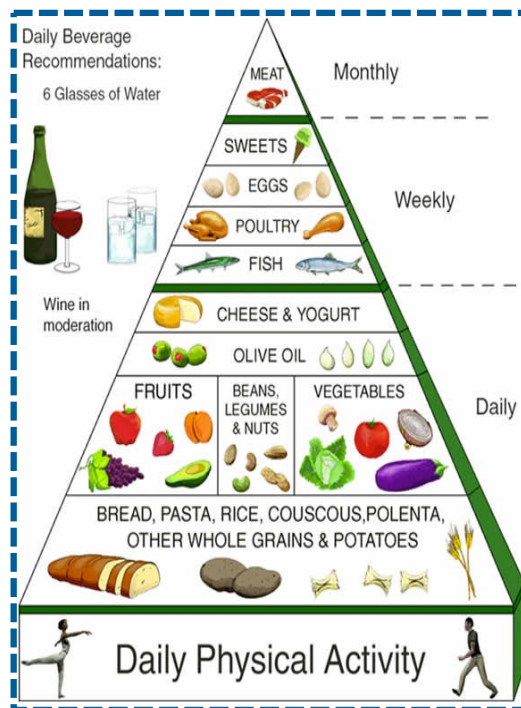
WHAT DOES A MANAGER DO?

1. He/She acquires information



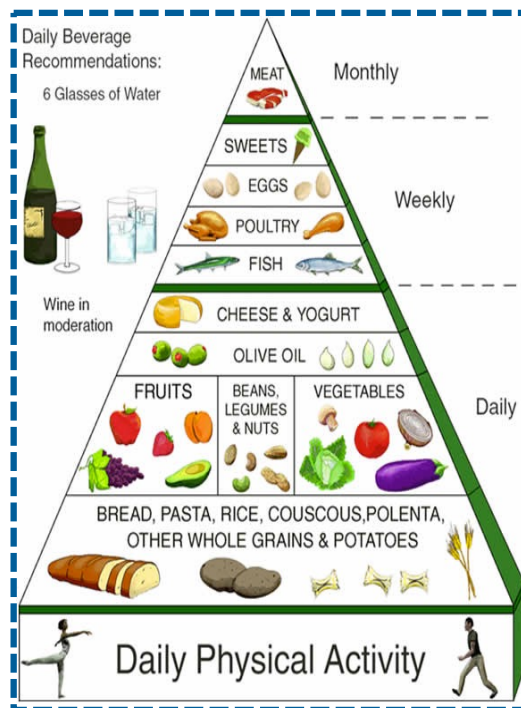
WHAT DOES A MANAGER DO?

2. He/She makes decisions



WHAT DOES A MANAGER DO?

3. He/She tries to put the decision taken in practice



COHERENCE BETWEEN INFORMATION AND DECISIONS



DECISION
MODELS

The information must be **RELEVANT** for the decisions that managers, operating in a particular business environment with a particular strategy, make.

MENTAL MODELS

In 1971 Jay Wright Forrester defined mental models as follows:

“The image of the world around us, which we carry in our head, is just a model. Nobody in his head imagines all the world, government or country. He has only **selected concepts, and relationships between them**, and uses those to represent the real system”

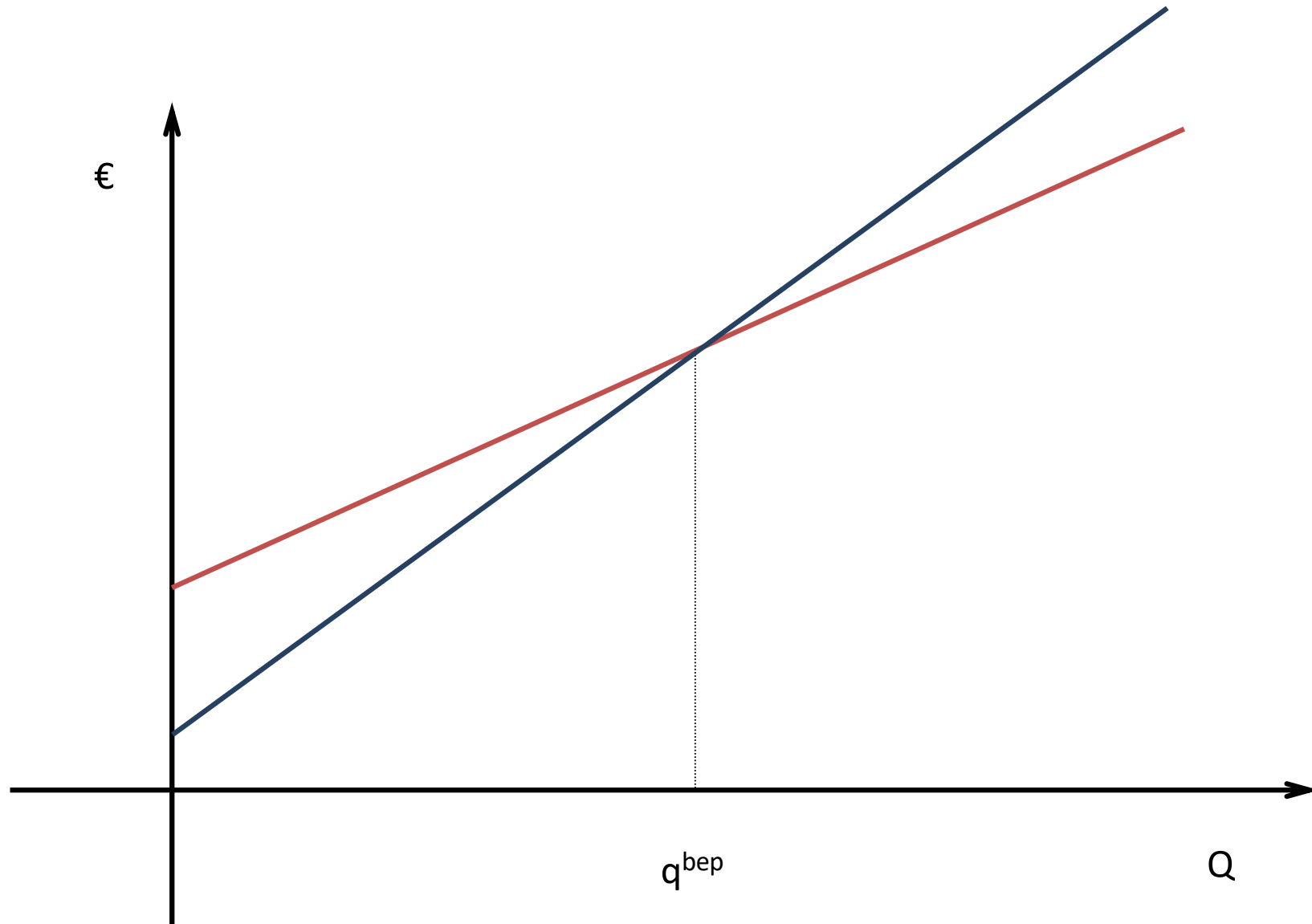
Mental model is an explanation of someone's thought process about how something works in the real world. It is a representation of the surrounding world, the relationships between its various parts and a person's intuitive perception about his or her own acts and their consequences. Mental models can help shape behavior and set an approach to solving problems (similar to a personal algorithm) and doing tasks.

A mental model is a kind of internal symbol or representation of external reality, hypothesized to play a major role in cognition, reasoning and decision-making. Kenneth Craik suggested in 1943 that the mind constructs "small-scale models" of reality that it uses to anticipate events.

SOURCE: https://en.wikipedia.org/wiki/Mental_model

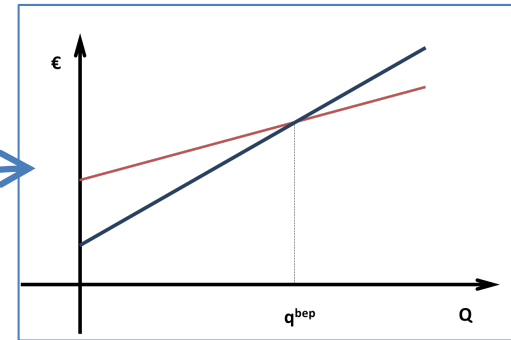


COST-VOLUME-PROFIT ANALYSIS



DECISION MODELS

SELECTED CONCEPTS AND
SELECTED RELATIONSHIPS
BETWEEN THEM



DECISION MODEL
(ABSTRACTION)



BUSINESS PROCESSES
(REALITY)

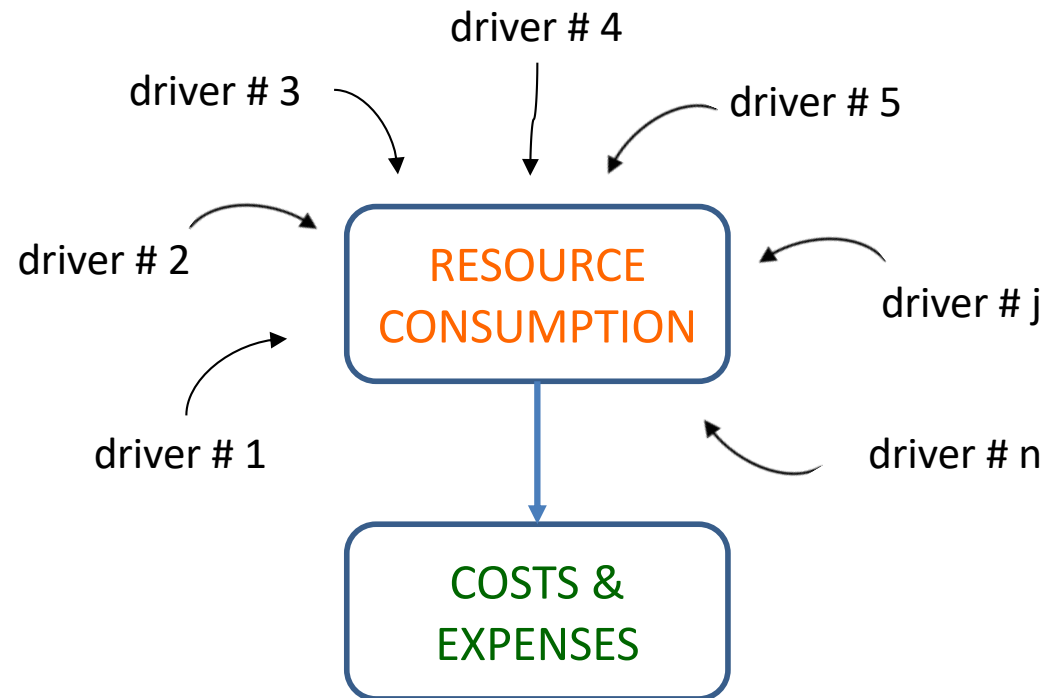


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COSTS, RESOURCES AND DRIVERS

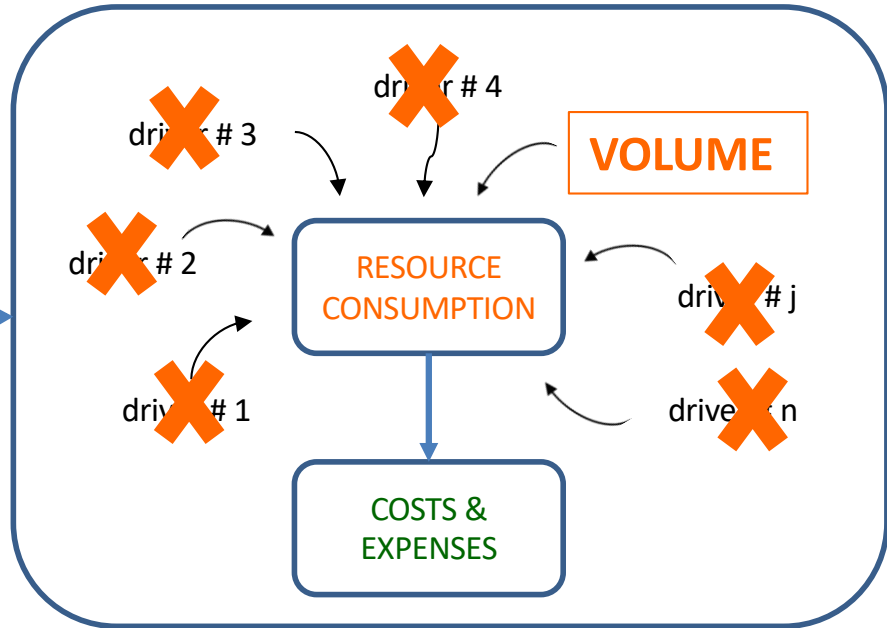


A **cost** is a sacrifice of resources. More precisely the cost (and therefore an expense) is **the monetary reflection** of the sacrifice of one or more resources that are used in order to perform business processes. The **usage** of a resource is determined by different kinds of causes (generally indicated in accounting as drivers)

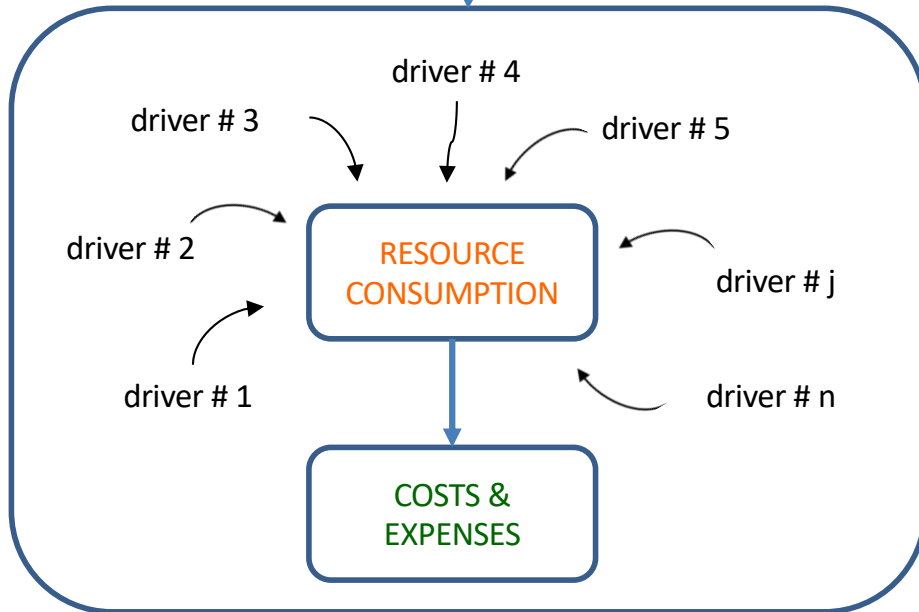
«The objective of managerial **costing** is to provide a **monetary reflection** of the **utilization** of business **resources** and related cause and effect insights».

COST-VOLUME-PROFIT MODEL

SELECTED CONCEPTS AND
SELECTED RELATIONSHIPS
BETWEEN THEM



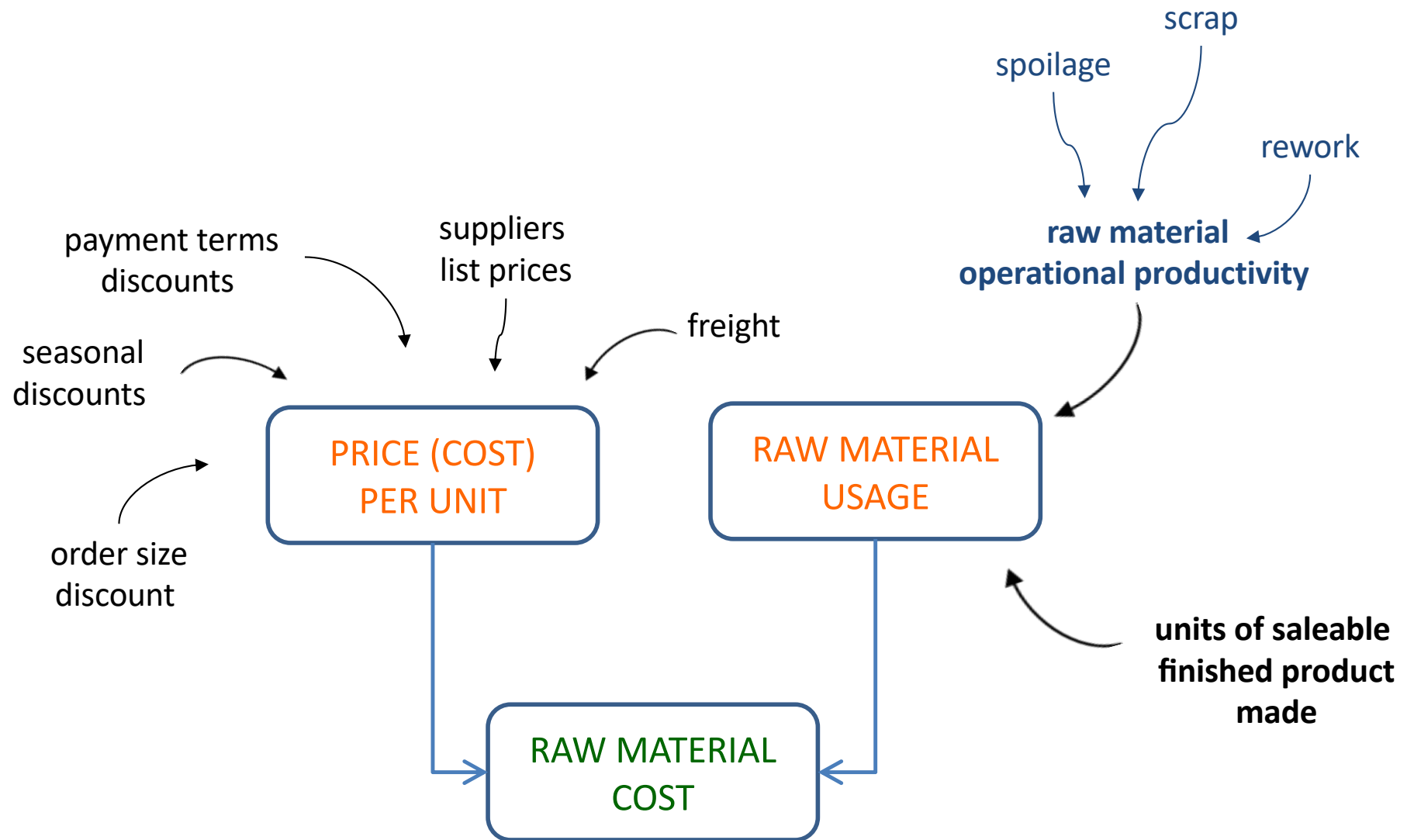
DECISION MODEL



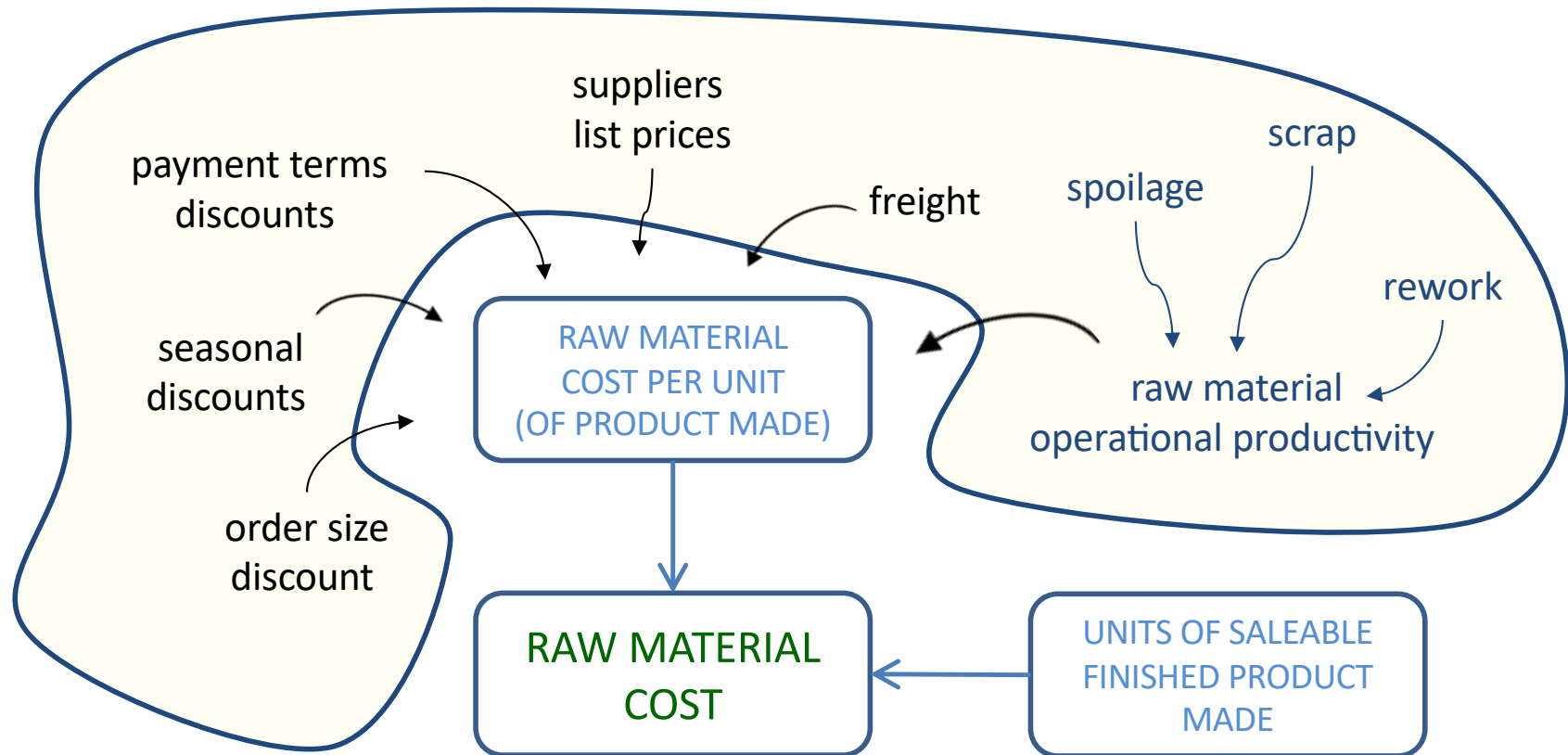
REALITY



COST OF RAW MATERIAL UTILISATION



COST OF RAW MATERIAL UTILISATION



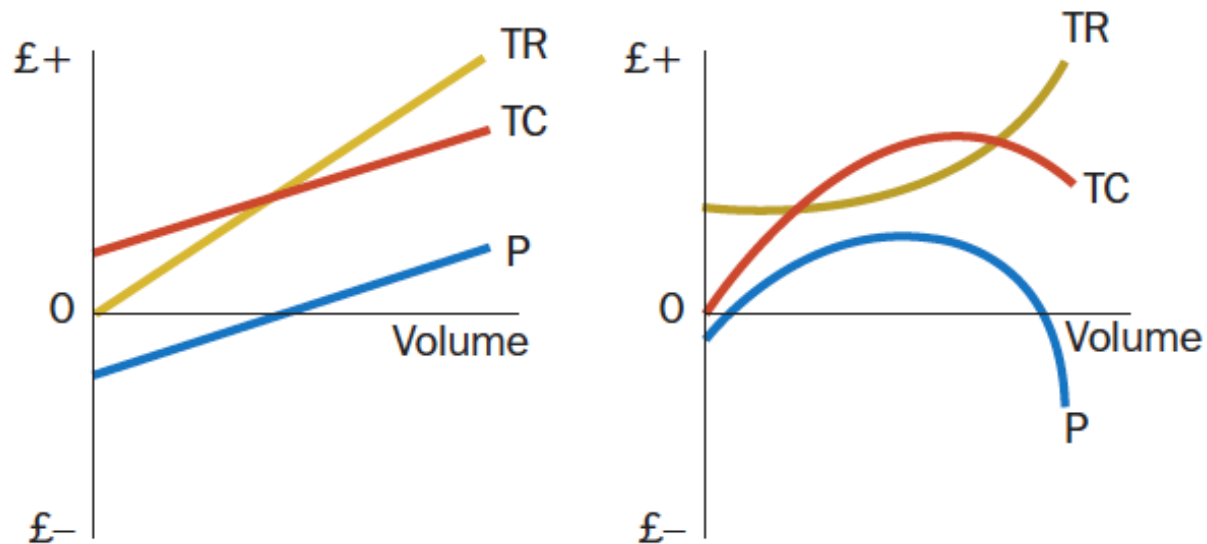
COMPARE

The graphs shown below show cost–volume– profit relationships as they are typically represented in

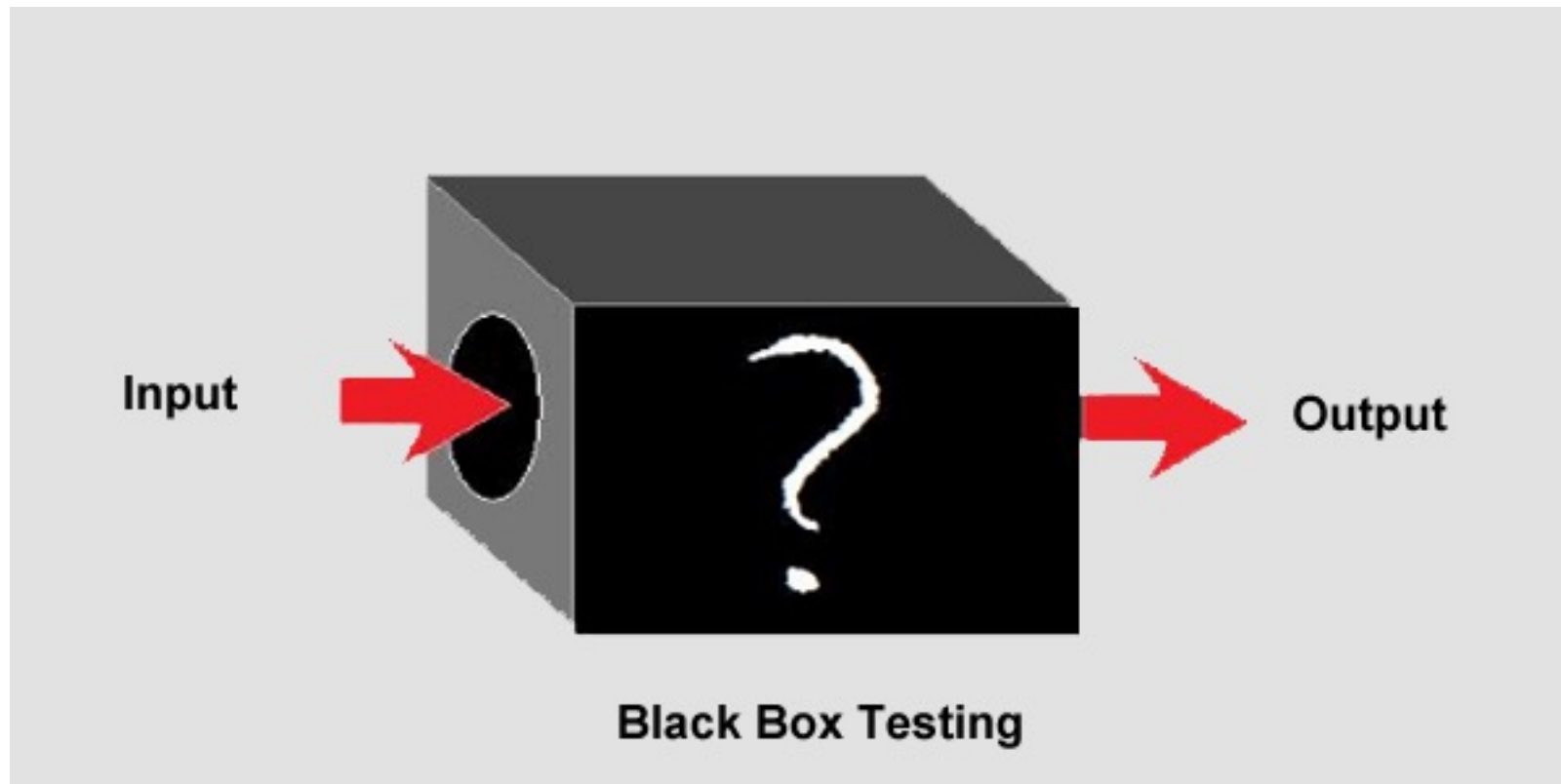
1. management accounting and
2. economic theory.

In each graph T = total revenue, TC = total cost, and P = profit.

You are required to compare these different representations of cost–volume– profit relationships, identifying, explaining and commenting on points of similarity and also differences.



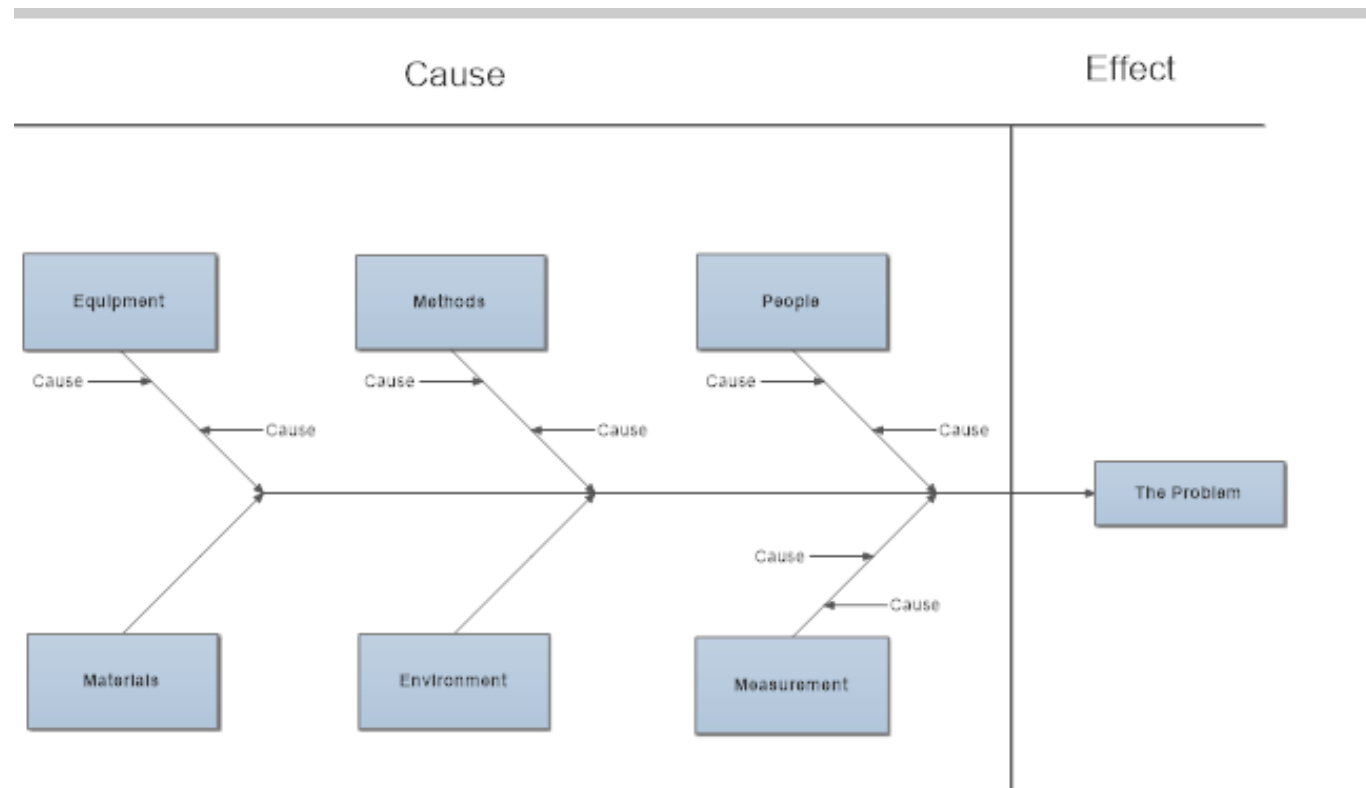
THE FIRM AS A “BLACK BOX”



<<In most of the microeconomic theory, the firm is depicted as a “black box” consisting of a set of production activities or even a presumed production function with a finite set of inputs to be adjusted so-as-to generate a set of outputs corresponding to a maximal level of profits or some other measure of owner utility. The inputs controlled by the firm are then assumed to be put to their most efficient use without having a look “inside” the firm or “outside” in the relations with other economic agents, excepting for competition with other firms>>.

SOURCE: Andersson & Johansson, “Inside and outside the black box: organization of interdependencies”

CAUSES AND EFFECTS RELATIONSHIPS



If one really wants to manage a business, one must know the various cause-effect relationships that link inputs and outputs. One must make the black box transparent by reconstructing (on the basis of the measurement of analytical reasoning) which are the main relationships on which attention must be focused if the desired effects are to be produced. Managing requires a focus on causes so that effects can be produced.

CASUALITY AS THE GUIDING PRINCIPLE IN COST MODELING

Cost modeling provides a monetary representation of the organization's resources, processes, and products and services. [...].

The guiding principle for operations modeling (and, hence, cost modeling) is **causality**, the ability to reflect **cause-and-effect relationships**.

A useful cost model must efficiently guide a manager

(1) from a monetary effect to the operational cause and

(2) to clear and direct insight into the probable monetary effect of a particular operational action (or cause) being considered

Causality: The relation between a managerial objective's quantitative output and the input quantities consumed if the output is to be achieved

By applying the principle of causality and its associated concepts, **we can create a model that represents an organization's operations and explains the resulting financial results.** This establishes the baseline from which managers will seek to achieve strategy in an optimal manner.

Source: IMA (Institute of Management Accountants), "The Conceptual Framework for Managerial Costing," Statement on Management Accounting

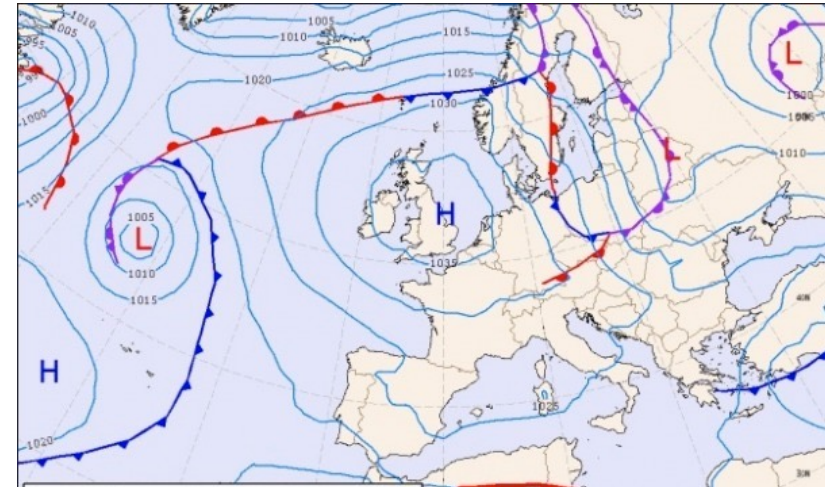
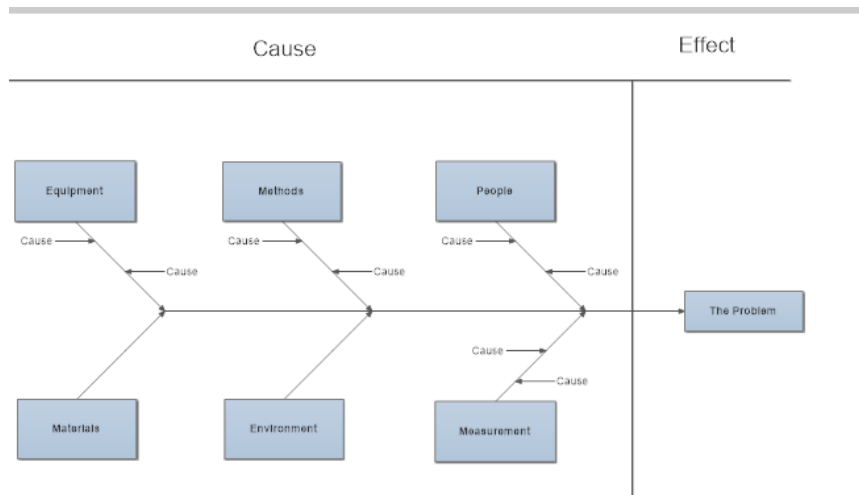


AN INPUT-PROCESS-OUTPUT MODEL OF THE FIRM



A well-designed cost model highlights the relationships that exist between the different **resources that are used**, the specific **activities that are carried out** as a result of the use of the different resources available, and the multiple **outputs (tangible or intangible) that are obtained** as a result of carrying out the activities that constitute the business process

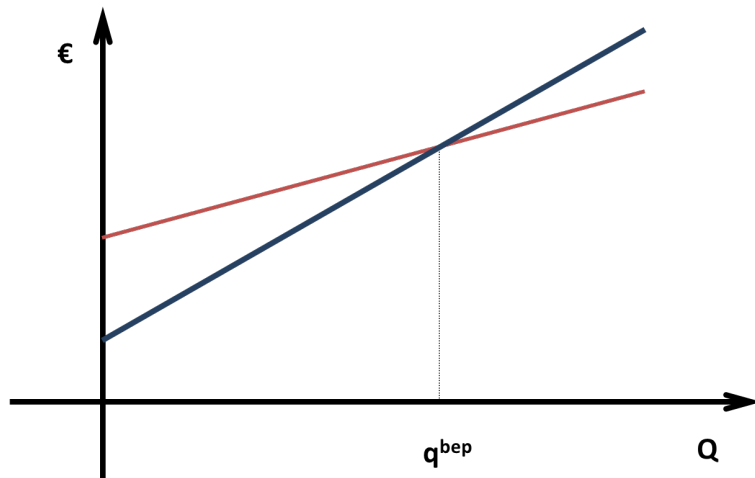
ANALOGY AS THE GUIDING PRINCIPLE FOR DECISION MAKING



The guiding principle for decision making is **analogy**—the **use of causal insights to infer past or future causes or effects**. Managers use cost information by **applying the principle of analogy to infer past or future causes or effects**. This results in learning from the past, making plans for the future, and supporting resource application decisions to achieve strategic objectives.

Source: IMA (Institute of Management Accountants), "The Conceptual Framework for Managerial Costing," Statement on Management Accounting

INFERRING THE FUTURE USING THE CURRENT INFORMATION

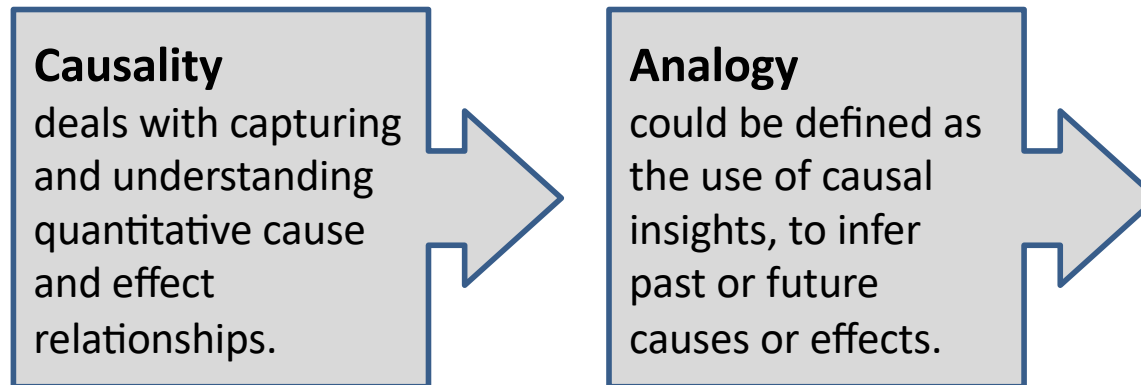


if the quantity sold were to increase by 20% and fixed costs were to rise by 10%, then the new break-even point would be 7,700 units and EBIT would rise by 36.47%.

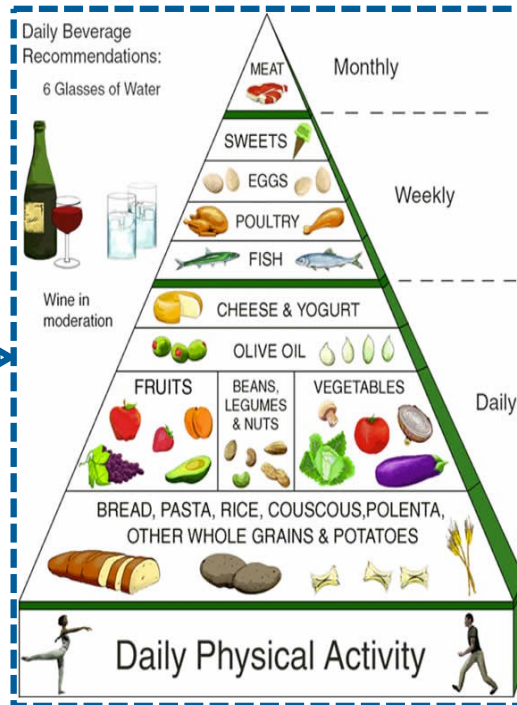
Contribution Margin per unit: \$ 375.00
Total Fixed Costs: \$ 2,625,000
Actual level of Sales: 11,250 units

PURPOSES OF MEASUREMENT

- To understand the **real causes** of the value creation process.



ABILITY TO INDUCE ORGANIZATIONAL BEHAVIOR



DECISION
MODELS

MANAGEMENT
CONTROL



BOTH ARE NEEDED!



There are basically two ways to get people to do what you want. You can **threaten them with punishment** or you can also **entice them with rewards**. Normally we do both. One way of saying this is what we call “the **carrot-and-stick approach**.”

MANAGEMENT INVOLVES DIRECTING THE ACTIVITIES OF OTHERS

A dual sets of
control mechanisms
Is needed

The first is designed to **guard against undesirable behavior**. It aims, therefore, to **avoid that wrong or dangerous actions are carried out**. It performs the same functions of **“brakes”** in a car: it blocks actions, avoids collisions.



The second set of control mechanisms is used in order to **encourage desirable behavior**, to **motivate people** to perform better than average, to induce them, if possible, to **go above and beyond their duties and abilities**. The aim of this different group of control mechanisms, therefore, is to “provide energy to the system”. The analogy, here, is clearly with the **“accelerator”** (throttle) of the car.



MANAGEMENT INVOLVES DIRECTING THE ACTIVITIES OF OTHERS

A dual sets of
control mechanisms
Is needed

LIMITS AGAINST UNDESIRABLE BEHAVIOR

The "Administration" responsibility centre may not, in the coming year, exceed the following values for any single cost item

- consultancy costs \$250,000
- training expenses \$120,000
- travel and transfers \$80,000

INCENTIVE TO CARRY OUT DESIRED ACTIONS

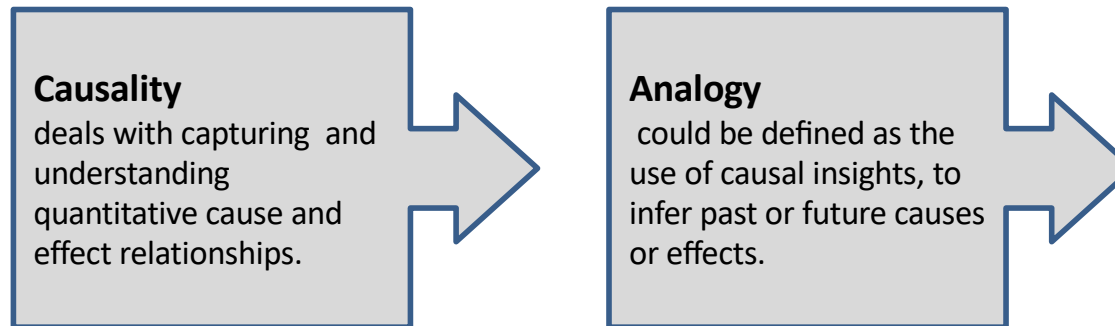
The manager of the "Painting" centre will receive a bonus if the average cost per square centimetre painted is less than \$ 2.15



PURPOSES OF MEASUREMENT

What are the purposes of measurement applied to management?

- To understand the **real causes** of the value creation process.



- To influence (to drive) **behavior**.

Human beings adjust behavior based on the metrics they're held against. Anything you measure will impel a person to optimize his score on that metric. What you measure is what you'll get. Period.

Dan Ariel

CONTROLLING AS DRIVING: A GREAT ANALOGY



Like a formula 1 driver, a manager must have the ability to direct the resources assigned to him or her along winning directions!



IF HE OR SHE WANTS TO WIN, A GOOD DRIVER MUST...

- know at all times where he is and have an idea of where he wants to go and, therefore, which trajectories he wants to follow
- know how the opposing drivers are behaving
- know perfectly well how the 'resource' (the car) at his disposal really works
- have the ability to perceive the onset of any problems before they are manifested
- have at the same time the ability to understand what is working properly
- have sufficient information flow (from the pits) and be able to interpret it correctly and quickly
- be able to extract the maximum result from his vehicle, without depleting it, but on the contrary making it grow in quality over time.



WHY ARE CONTROLS NEEDED?

If all personnel always did what was best for the organization, control - and even management - would not be needed. But, obviously **individuals are sometimes unable or unwilling to act in the organization's best interest**, and a set of controls must be implemented to guard against undesirable behavior and to encourage desirable actions.

Personal limitations. People do not always understand what is expected of them nor how they can best perform their jobs, as they may lack some requisite ability, training, or information. In addition, human beings have a number of innate perceptual and cognitive biases, such as an inability to process new information optimally or to make consistent decisions and these biases can reduce organizational effectiveness. Some of these personal limitations are correctable or avoidable but for others, controls are required to guard against their deleterious effects.

Lack of goal congruence. Even if employees are properly equipped to perform a job well, some choose not to do so, because individual goals and organizational goals may not coincide perfectly. In other words, there is a lack of goal congruence. Steps must often be taken either to increase goal congruence or to prevent employees from acting in their own interest where goal incongruence exists.

SOURCE: Kenneth A. Marchant, The control Function of Management, Sloan Management Review, Summer 82, (43-55)



ABSORPTION COSTING – COGS FORMAT

Income Statement (COGS)	Whole Company	Per unit
+ Sales Revenue	€ 5.928.000	€ 6,89
- COGS (@manufacturing cost)	€ 3.388.578	€ 3,94
= Manufacturing Margin	€ 2.539.422	€ 2,95
- S.G.&A. Expenses	€ 1.816.209	€ 2,11
= EBIT	€ 723.213	€ 0,84
- Financial cost	€ 85.000	€ 0,10
= EBT	€ 638.213	€ 0,74



ABSORPTION COSTING – TOTAL OUTPUT FORMAT

Income Statement (Total Output)	Whole Company	Per unit
+ Sales Revenue	€ 5.928.000	€ 6,89
+ Change in Inventory	€ 685.596	€ 3,94
= Total Output	€ 5.242.404	€ 7,64
- Manufacturing costs	€ 2.702.982	€ 3,94
= Manufacturing Margin	€ 2.539.422	€ 3,70
- Period costs	€ 1.816.209	€ 2,65
= EBIT	€ 723.213	€ 1,05
- Financial cost	€ 85.000	€ 0,12
= EBT	€ 638.213	€ 0,93



VARIABLE COSTING – COGS FORMAT

Income Statement (COGS)	Whole Company	Per unit
+ Sales Revenue	€ 5.928.000	€ 6,89
- COGS (@ variable manufacturing cost)	€ 2.199.055	€ 2,56
= Manufacturing Variable Margin	€ 3.728.945	€ 4,34
- Selling variable costs	€ 1.035.384	€ 1,20
= Contribution Margin	€ 2.693.561	€ 3,13
+ Fixed Revenues	€ -	€ -
- Fixed Costs	€ 1.729.677	€ 2,01
= EBIT	€ 963.884	€ 1,12
- Financial cost	€ 85.000	€ 0,10
= EBT	€ 878.884	€ 1,02



VARIABLE COSTING – TOTAL OUTPUT FORMAT

Income Statement (COGS)	Whole Company	Per unit
+ Sales Revenue	€ 5.928.000	€ 6,89
+ Change in Inventory	€ 444.925	€ 2,56
= Total Output	€ 5.483.075	€ 7,99
- Manufacturing variable costs	€ 1.754.130	€ 2,56
= Manufacturing Variable Margin	€ 3.728.945	€ 5,44
- Selling variable costs	€ 1.035.384	€ 1,51
= Contribution Margin	€ 2.693.561	€ 3,93
+ Fixed Revenues	€ -	€ -
- Fixed Costs	€ 1.729.677	€ 2,52
= EBIT	€ 963.884	€ 1,41
- Financial cost	€ 85.000	€ 0,12
= EBT	€ 878.884	€ 1,28





EXPLANATION OF THE DIFFERENTIAL

+ Manufacturing full cost per unit	€	3,94
- Manufacturing variable cost per unit	€	2,56
= Differential in cost per unit	€	1,38
Change in inventory (IN #)	-	174.000
Differential in cost per unit	€	1,38
Differential in value of the net change	-€	240.671
EBT @ variable costing	€	878.884
+ differential in value of the net change	-€	240.671
EBT @ absorption costing	€	638.213



EXERCISE 2 _ ABSORPTION COSTING

+ Sales Revenue	£ 47.500		£ 47.500
- Cost of good sold	-£ 22.800		-£ 19.000
= Gross margin	£ 24.700		£ 28.500
- S.G.& A. Expenses	-£ 21.900		-£ 21.900
+ Fixed revenues	£ 300		£ 300
= EBIT	£ 3.100		£ 6.900
- Interest epenses	-£ 4.100		-£ 4.100
= EBT	-£ 1.000		£ 2.800

EXERCISE 2 _ VARIABLE COSTING

+ Sales Revenue	€ 47.500	€ 47.500
- Cost of good sold	-€ 7.600	-€ 7.600
= Manufacturing variable margin	€ 39.900	€ 39.900
- Selling variable costs	-€ 1.900	-€ 1.900
= Contribution margin	€ 38.000	€ 38.000
+ Fixed revenues	€ 300	€ 300
- Fixed costs	-€ 36.000	-€ 36.000
= EBIT	€ 2.300	€ 2.300
- Interest epenses	-€ 4.100	-€ 4.100
= EBT	-€ 1.800	-€ 1.800



EXERCISE 4 _ INITIAL POSITION

	Company A	Company B
Quantity made	900	900
Quantity sold	1000	750
Average price per unit	\$ 10	\$ 20
Manufacturing variable cost per unit	\$ 3	\$ 14
Selling variable cost per unit	\$ 1	\$ 4
Fixed revenues	\$ 700	\$ 300
Fixed costs	\$ 6.200	\$ 1.300
+ Sales Revenue	\$ 10.000	\$ 15.000
- Cost of good sold	\$ -3.000	\$ -10.500
= Manufacturing variable margin	\$ 7.000	\$ 4.500
- Selling variable costs	\$ -1.000	\$ -3.000
= Contribution margin	\$ 6.000	\$ 1.500
+ Fixed revenues	\$ 700	\$ 300
- Fixed costs	\$ -6.200	\$ -1.300
EBIT	\$ 500	\$ 500
Degree of Operating Leverage	12	3



EXERCISE 4 _ INITIAL POSITION

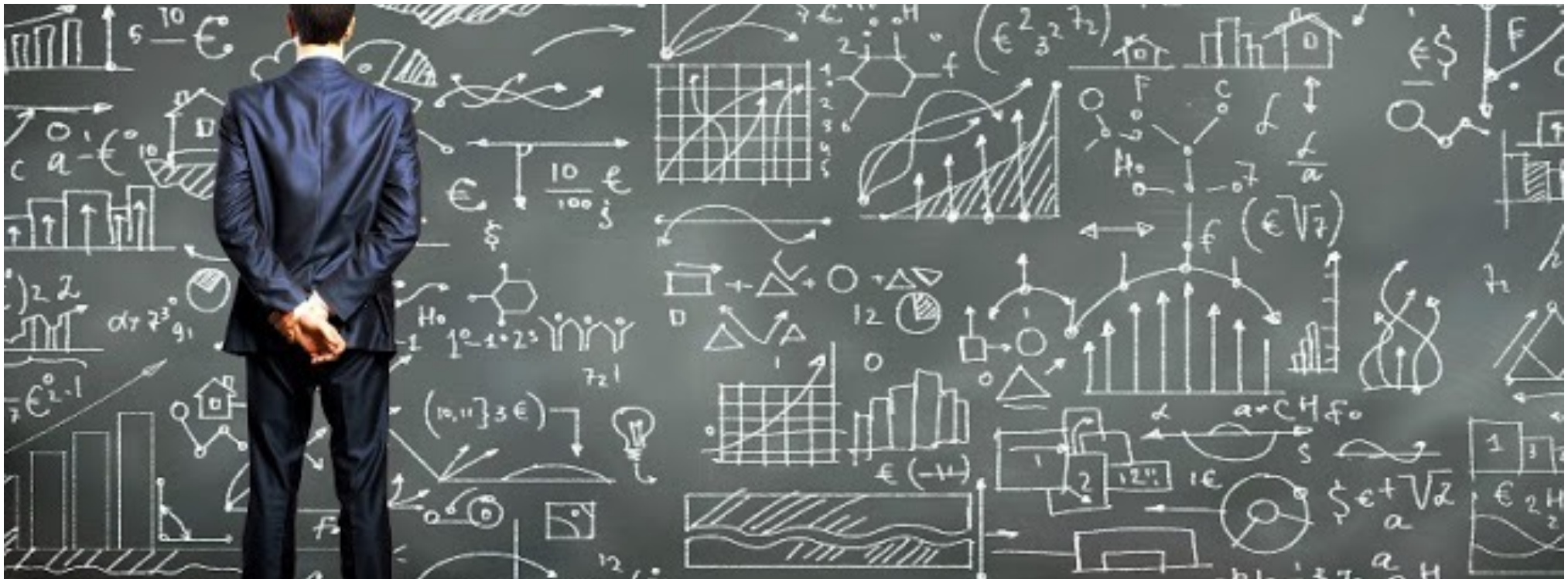
	Company A	Company B
Quantity made	1050	900
Quantity sold	1050	675
Average price per unit	\$ 10	\$ 20
Manufacturing variable cost per unit	\$ 3	\$ 14
Selling variable cost per unit	\$ 1	\$ 4
+ Sales Revenue	\$ 10.500	\$ 13.500
- Cost of good sold	\$ -3.150	\$ -9.450
= Manufacturing variable margin	\$ 7.350	\$ 4.050
- Selling variable costs	\$ -1.050	\$ -2.700
= Contribution margin	\$ 6.300	\$ 1.350
+ Fixed revenues	\$ 700	\$ 300
- Fixed costs	\$ -6.200	\$ -1.300
EBIT	\$ 800	\$ 350
Percentage change in EBIT	60%	-30%
Degree of Operating Leverage	7,88	3,86





COST AND REVENUE ANALYSIS

How to produce partial profitability information



EFFICIENCY

1. OPERATIONAL PRODUCTIVITY

$$\frac{O_{\text{PHYSICAL}}}{I_{\text{PHYSICAL}}}$$

- a) Partial ✓
- b) Total ✗

2. FINANCIAL PRODUCTIVITY

$$\frac{O_{\text{REVENUES}}}{I_{\text{EXPENSES}}}$$

- a) Partial ✗
- b) Total ✓

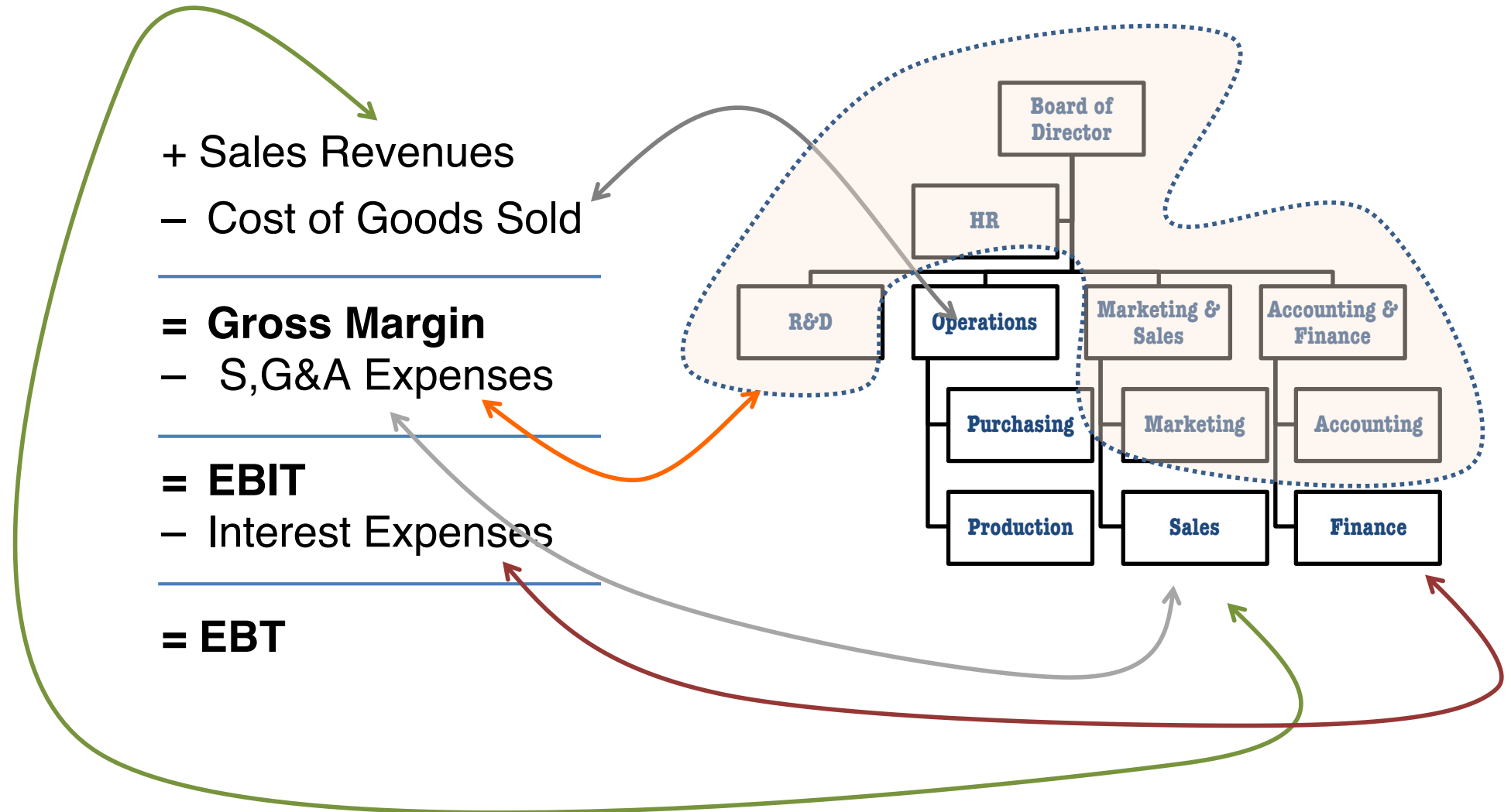


DIFFERENT POSSIBLE PROFIT MARGINS

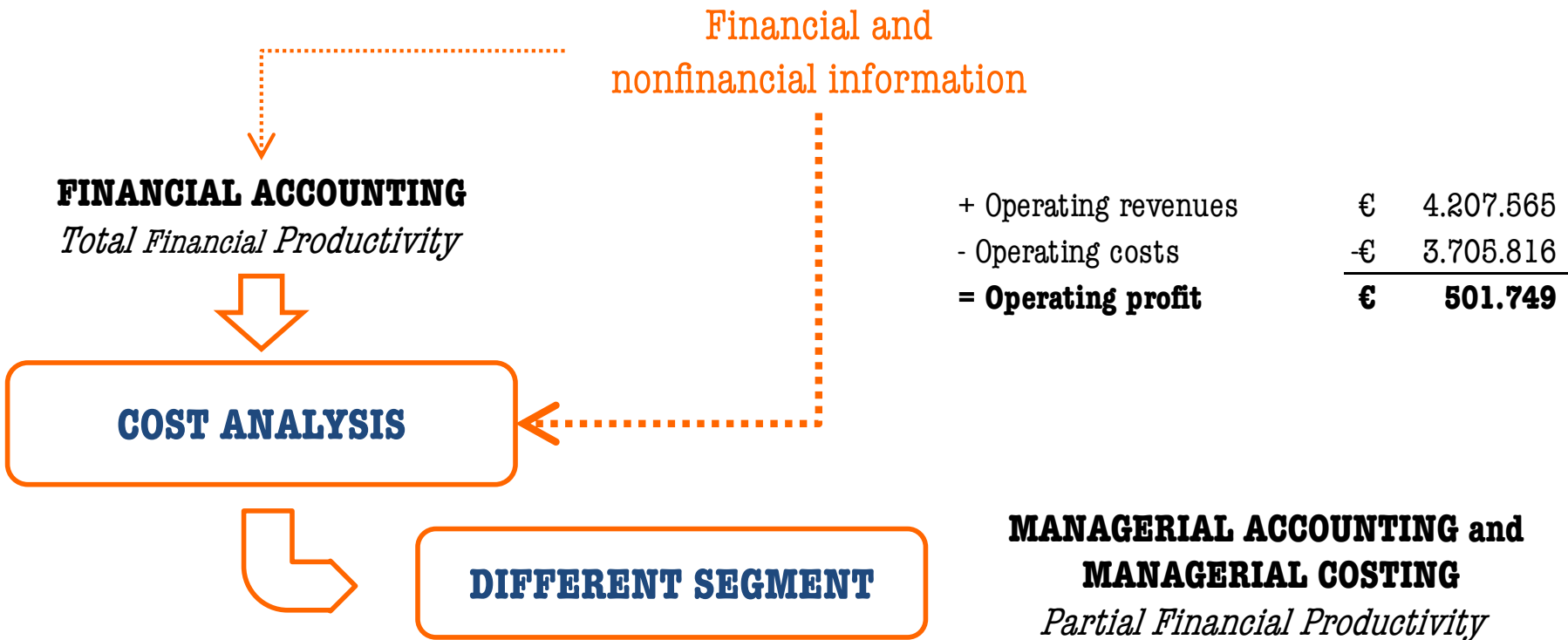
+ Sales revenues	€	265.780	100,00%
- Cost of goods sold (@manufacturing variable cost)	-€	85.330	-32,11%
= Manufacturing variable margin	€	180.450	67,89%
- Sales variable costs	-€	24.550	-9,24%
= Contribution margin	€	155.900	58,66%
- Fixed costs (excluding depreciation and amortization costs)	-€	83.009	-31,23%
= EBITDA	€	72.891	27,43%
- Depreciation and amortization costs	-€	38.126	-14,34%
= EBIT	€	34.765	13,08%
- Interest 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



Product "A"	€	657.235
Product "B"	€	546.763
Product "C"	€	432.267
.....
Product "N"	-€	138.758
Operating profit	€	501.749

Customer "X"	€	432.001
Customer "Y"	€	367.455
Customer "W"	€	312.826
.....
Customer "K"	-€	25.789
Operating profit	€	501.749

Responsability center "1"	€	2.433.015
Responsability center "2"	€	1.774.550
Responsability center "3"	-€	64.520
.....
Responsability center "12"	-€	835.519
Operating profit	€	501.749

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

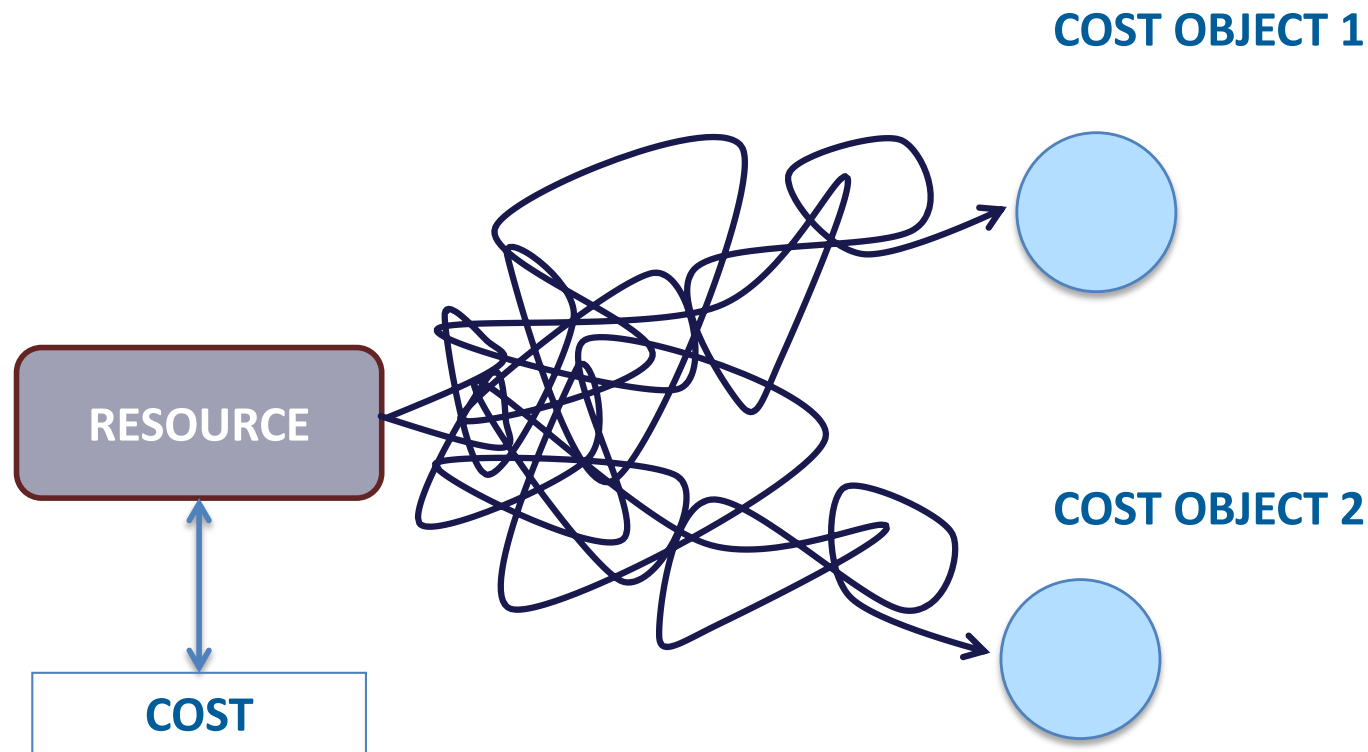
A SEGMENT INCOME STATEMENT

	JOB 1	JOB 2	JOB 3	JOB ...	JOB N	Total
+ Sales Revenues	xxx	xxx	xxx	xxx	xxx	Σ
- Sales Commissions	xxx	xxx	xxx	xxx	xxx	Σ
<hr/>						
= Net Revenues	= xxx	= xxx	= xxx	= xxx	= xxx	= Σ
- Direct Materials	- xxx	- xxx	- xxx	- xxx	- xxx	Σ
<hr/>						
= First Margin	= xxx	= xxx	= xxx	= xxx	= xxx	= Σ
- Outsourced Work	- xxx	- xxx	- xxx	- xxx	- xxx	Σ
<hr/>						
= Second Margin	= xxx	= xxx	= xxx	= xxx	= xxx	= Σ
- Other Direct Costs	- xxx	- xxx	- xxx	- xxx	- xxx	Σ
- Direct Labor	- xxx	- xxx	- xxx	- xxx	- xxx	Σ
<hr/>						
= Job Orders Direct Margin	= xxx	= xxx	= xxx	= xxx	= xxx	= Σ
<hr/>						
- Manufacturing Overhead						- xxx
- Selling Overhead Expenses						- xxx
- Administrative Expenses						- xxx
- General Expenses						- xxx
<hr/>						
= Ebit						= xxx

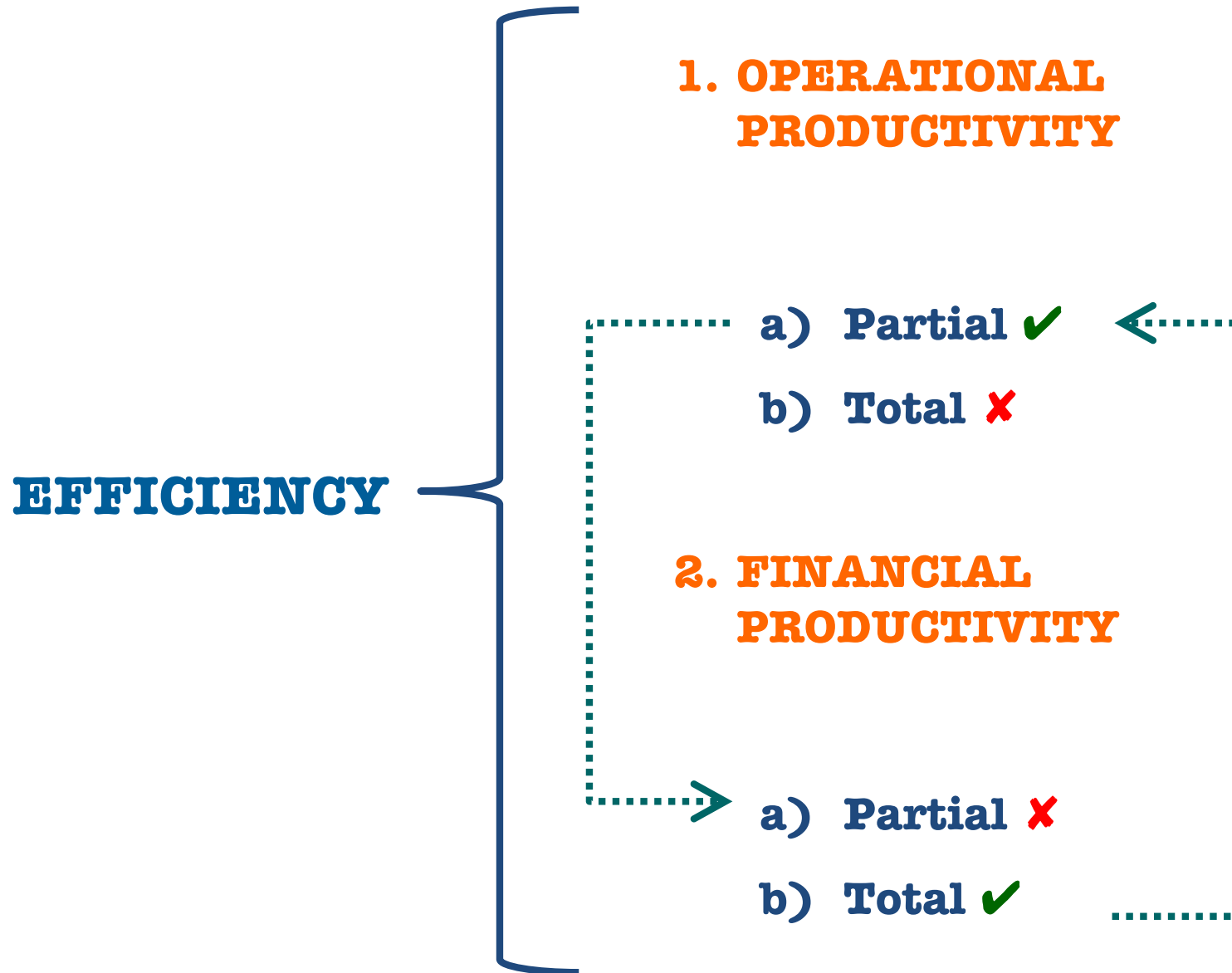


WHY IT IS DIFFICULT TO COMPUTE....

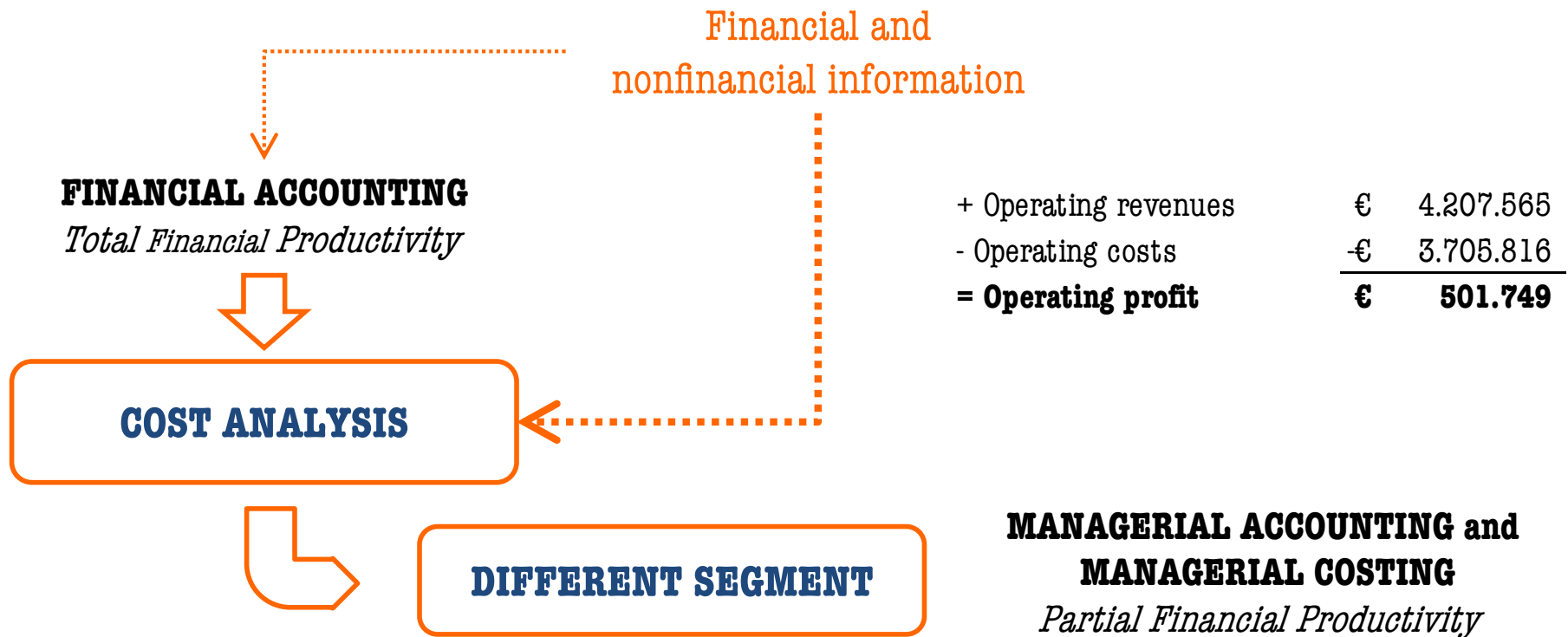
Partial financial productivity measure:



WHY IT IS DIFFICULT TO COMPUTE....



FROM TOTAL TO PARTIAL FINANCIAL PRODUCTIVITY



Product "A"	€	657.235
Product "B"	€	546.763
Product "C"	€	432.267
.....
Product "N"	-€	138.758
Operating profit	€	501.749

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COST COLLECTION SYSTEMS

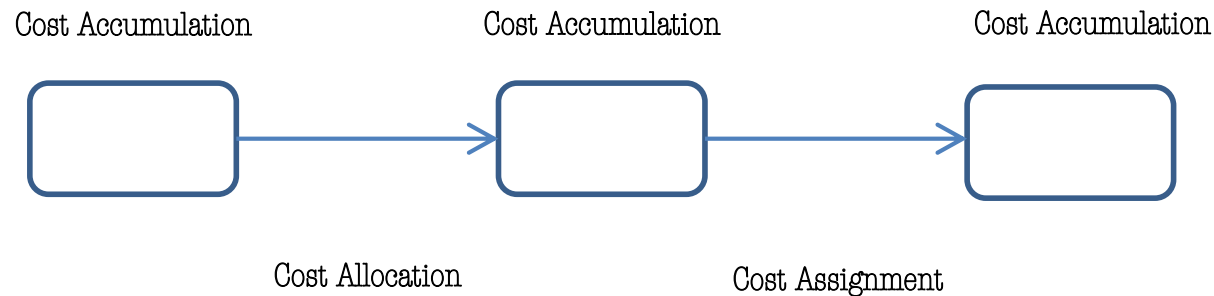
Cost accumulation is the collection of cost data in some organized way by means of an accounting system.

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.



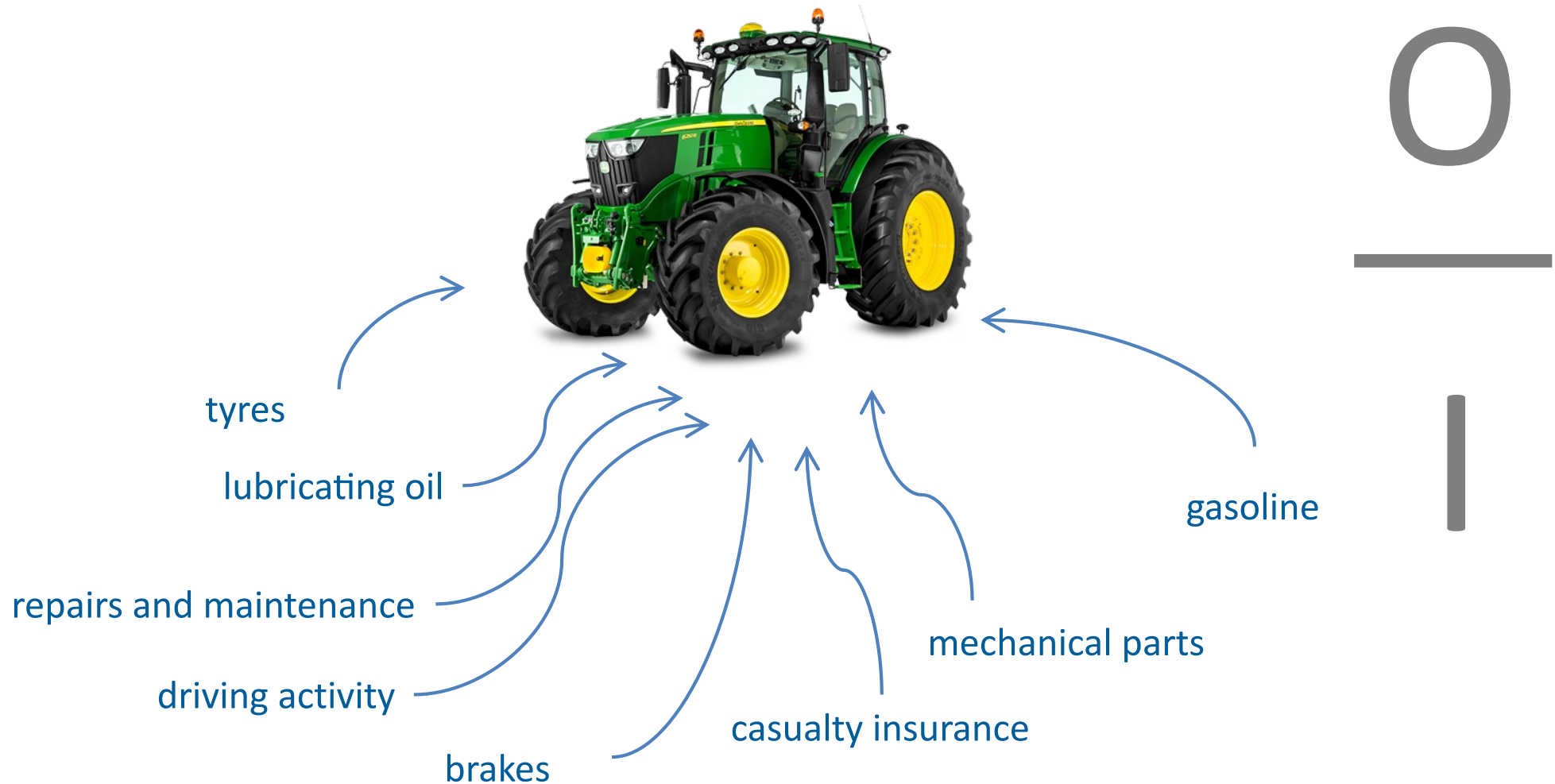
COST COLLECTION AND ASSIGNMENT PROCESS



The “cost collection and assignment process” can be viewed as a set of cost accumulation and assignment 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 assignment phases represent the moments of movement from a specific point to the next one.

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).



ROBUSTNESS OF THE RELATION



denim fabric



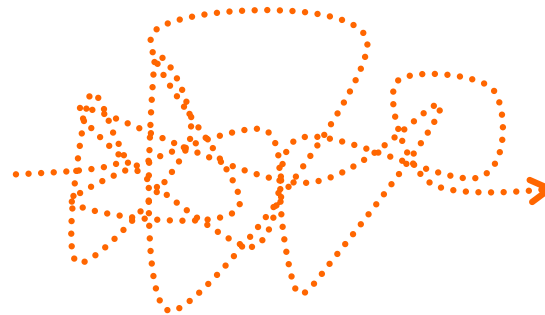
clear, obvious consumption relationship



pair of jeans



gardening services



consumption relationship uncertain,
not obvious, imprecise

ROBUSTNESS OF THE RELATION

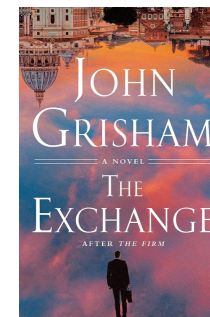


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ROBUSTNESS OF THE RELATION



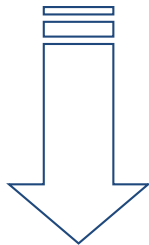
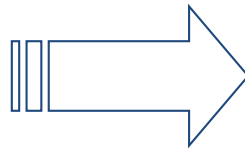
COST ANALYSIS

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

DIFFERENT COST OBJECTS

COST OBJECTS



“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.

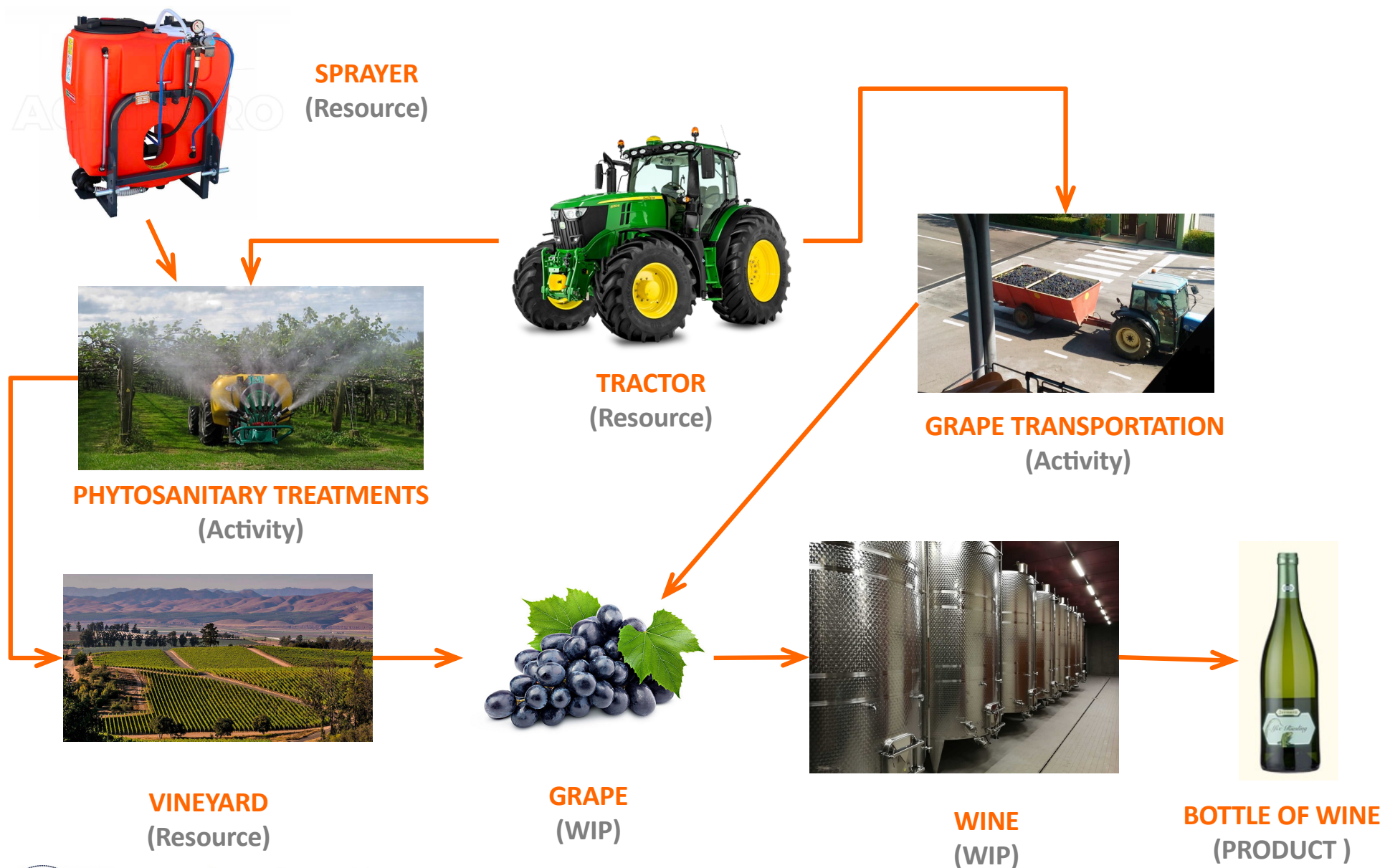
Those who adopt this perspective seek to obtain the information necessary to manage market competition more effectively

“Internal”

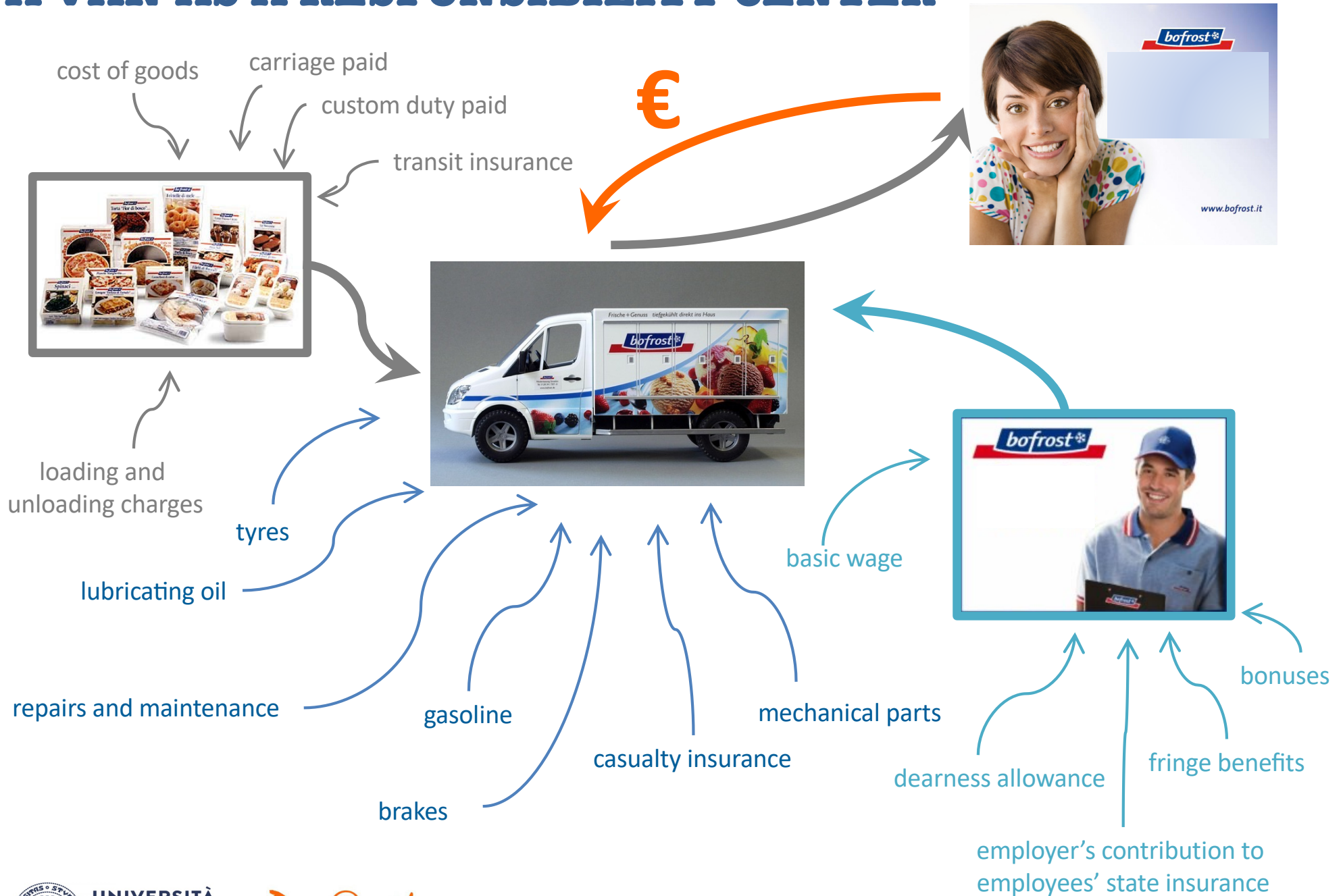
Resources (Means of Production)
Responsibility Centers (Departments)
Activities or Processes
Projects
WIPs
Products or Product Lines



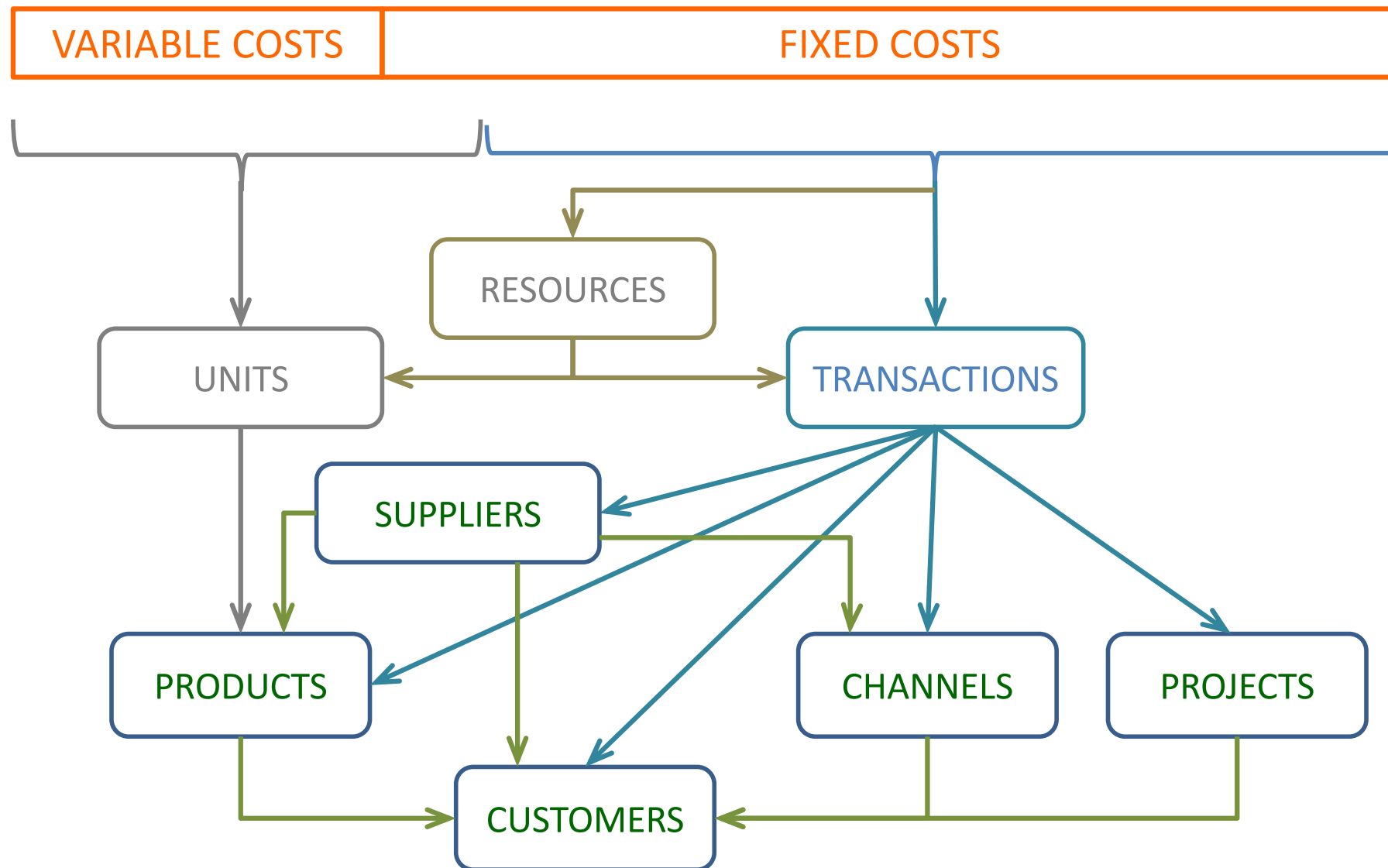
RELATION BETWEEN DIFFERENT COST OBJECTS



A VAN AS A RESPONSIBILITY CENTER



RELATION BETWEEN DIFFERENT COST OBJECTS



DIFFERENT DECISIONS , DIFFERENT SETS OF INFORMATION

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



WHY DOES ONE NEED TO COMPUTE THE COST OF A PRODUCT?

- ✧ To evaluate inventory and other assets for financial and tax statements, allocating periodic production costs between goods sold, period costs and goods in stock.
- ✧ To justify costs or compute reimbursement amounts
- ✧ To provide information for economic decisions
 - Short Term
 - Medium Long Term
- ✧ To motivate managers and other employees



COST OBJECTS AND COST RULES

When you think of cost, you invariably think of it in the context of finding the cost of a particular thing. We call this thing a **cost object**, which is anything for which a measurement of costs is desired.

SOURCE: Charles T. Horngren, Srikant M. Datar, Madhav V. Rajan, "Cost Accounting. A Managerial Emphasis" 14th Edition

A **cost object** is anything for which cost data are desired—including products, customers, jobs, and organizational subunits.

SOURCE: Ray H. Garrison, Eric W. Noreen, Peter C. Brewer, "Managerial Accounting", 15th Edition

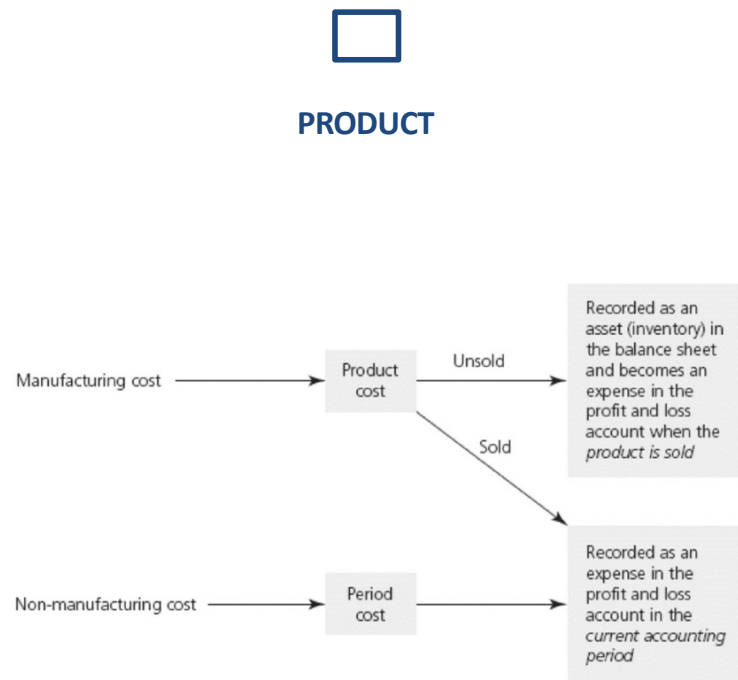
A **cost rule** is a conventional "norm" (not necessarily a legal one) that establishes which components (in terms of individual cost items) must be considered in order to achieve a specific valuation (in cost terms) of a given cost object.

The cost rule, therefore, establishes which classes of cost items are to be assigned to the cost object and which are to be excluded from the calculation process.

As mentioned above, since the relevant information changes in relation to the type of decision to be made, we clearly need different cost rules that allow us to calculate different cost values for the same cost object.

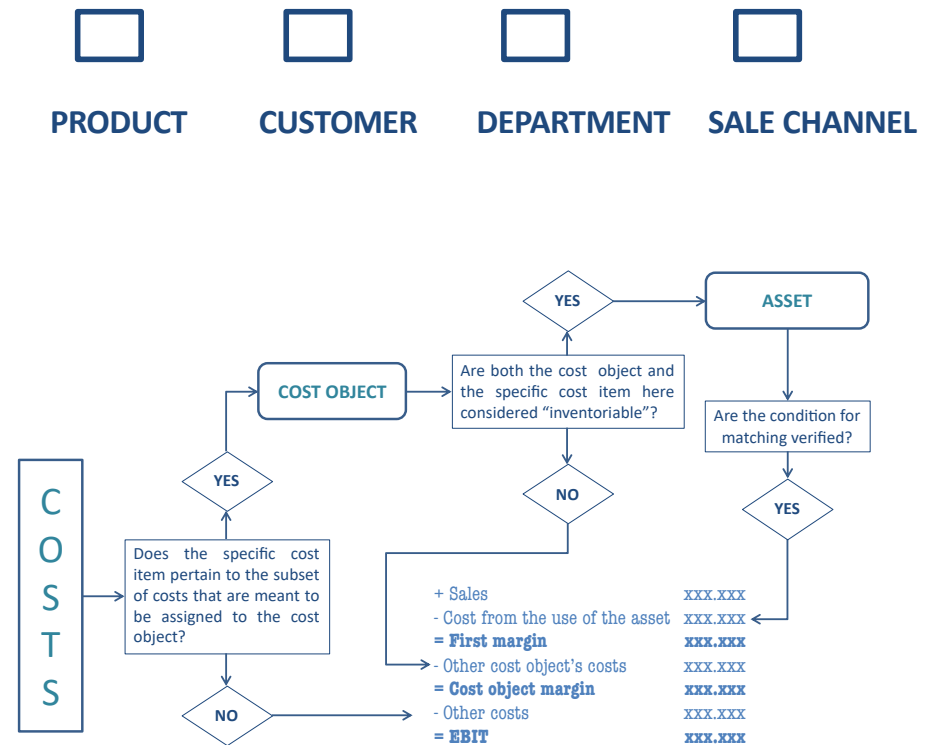
COST OBJECTS AND COST RULES

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

PERIODICITY OF THE ANALYSIS



COST & REVENUES ANALYSIS

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

- ✧ collection,
- ✧ classification,
- ✧ aggregation and
- ✧ attribution

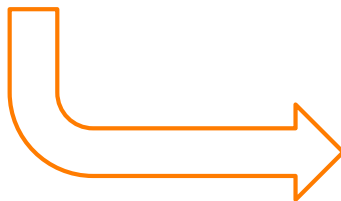
of **costs** and **revenues**

SYSTEMATIC AND CONSTANT INFORMATION FLOWS

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
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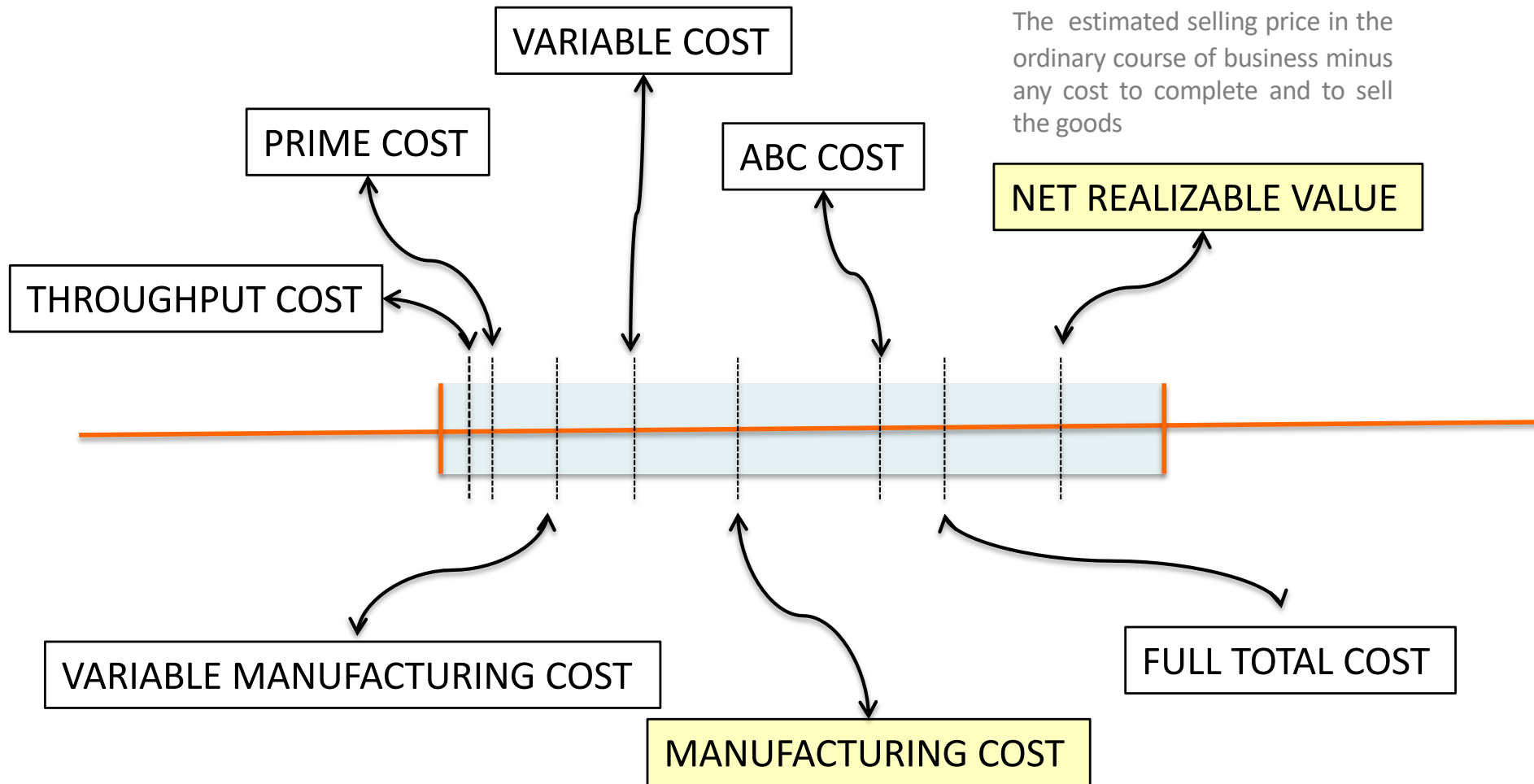


DIFFERENT FUNCTIONS, DIFFERENT DEMANDS

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 CRITERIA FOR A PRODUCT

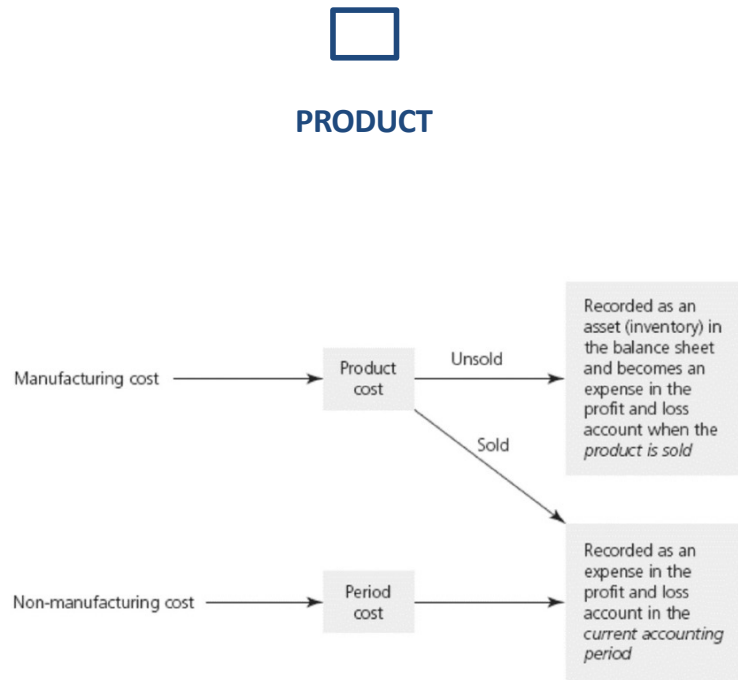


The estimated selling price in the ordinary course of business minus any cost to complete and to sell the goods

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.

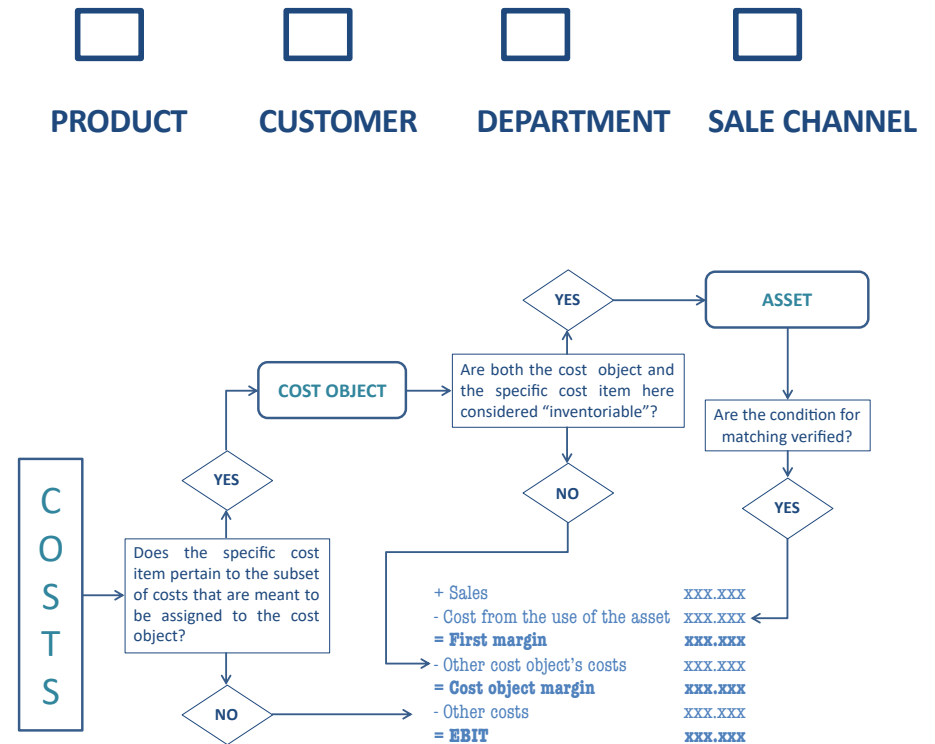
COST OBJECTS AND COST RULES

COST ACCOUNTING



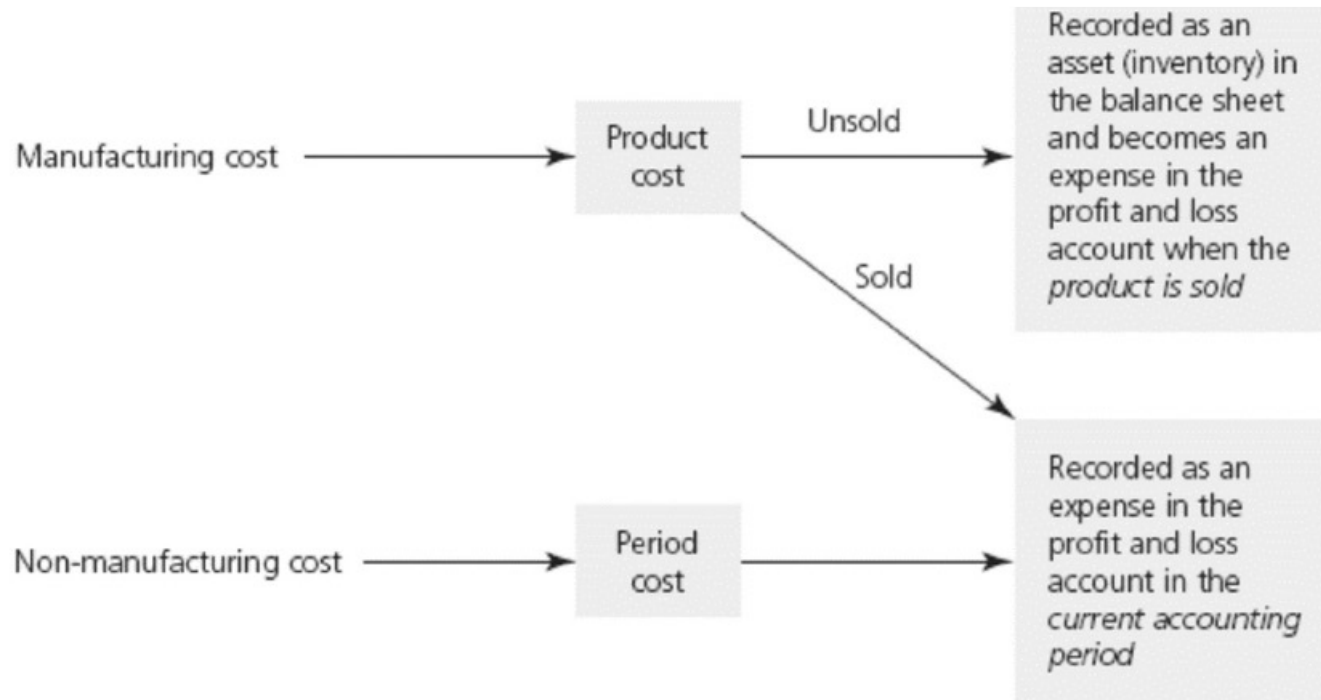
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MANAGERIAL COSTING

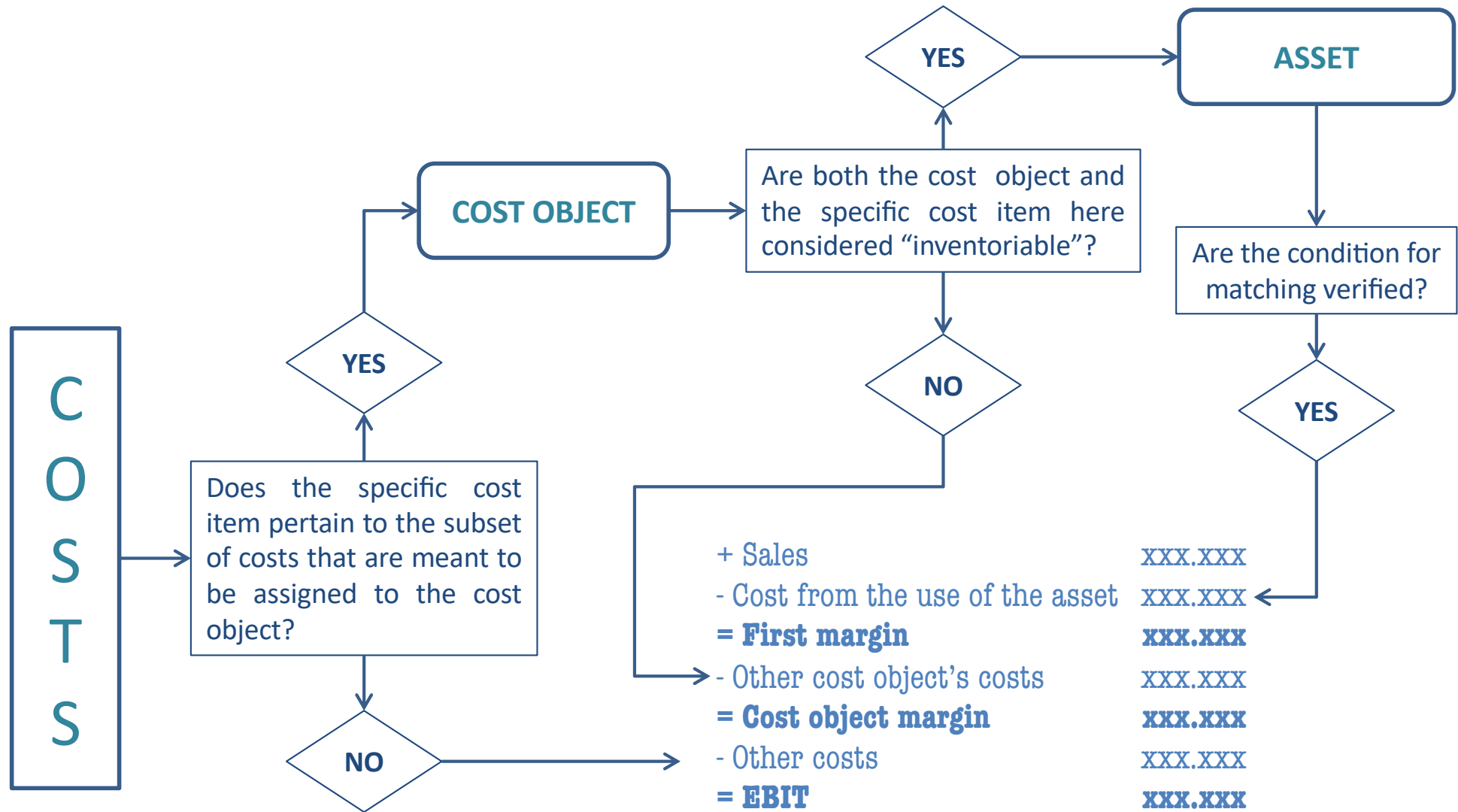


For managerial costing requirements we have, on the other hand, the need to calculate the cost of **several different objects** (several very different entities) and apply **several cost rules** in order to obtain the relevant information with respect to the decisions to be taken

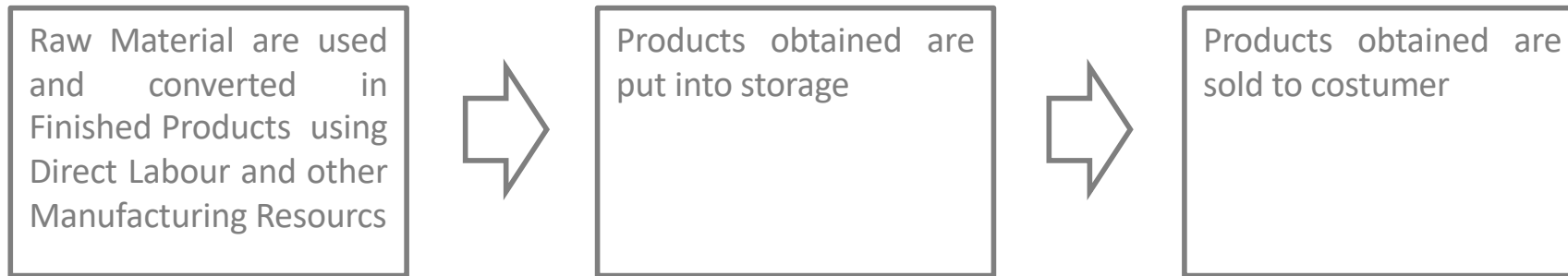
ABSORPTION COSTING



VARIABLE COSTING



VARIABLE COSTING



RAW MATERIALS → WORK IN PROCESS → FINISHED PRODUCT → COST OF GOODS SOLD

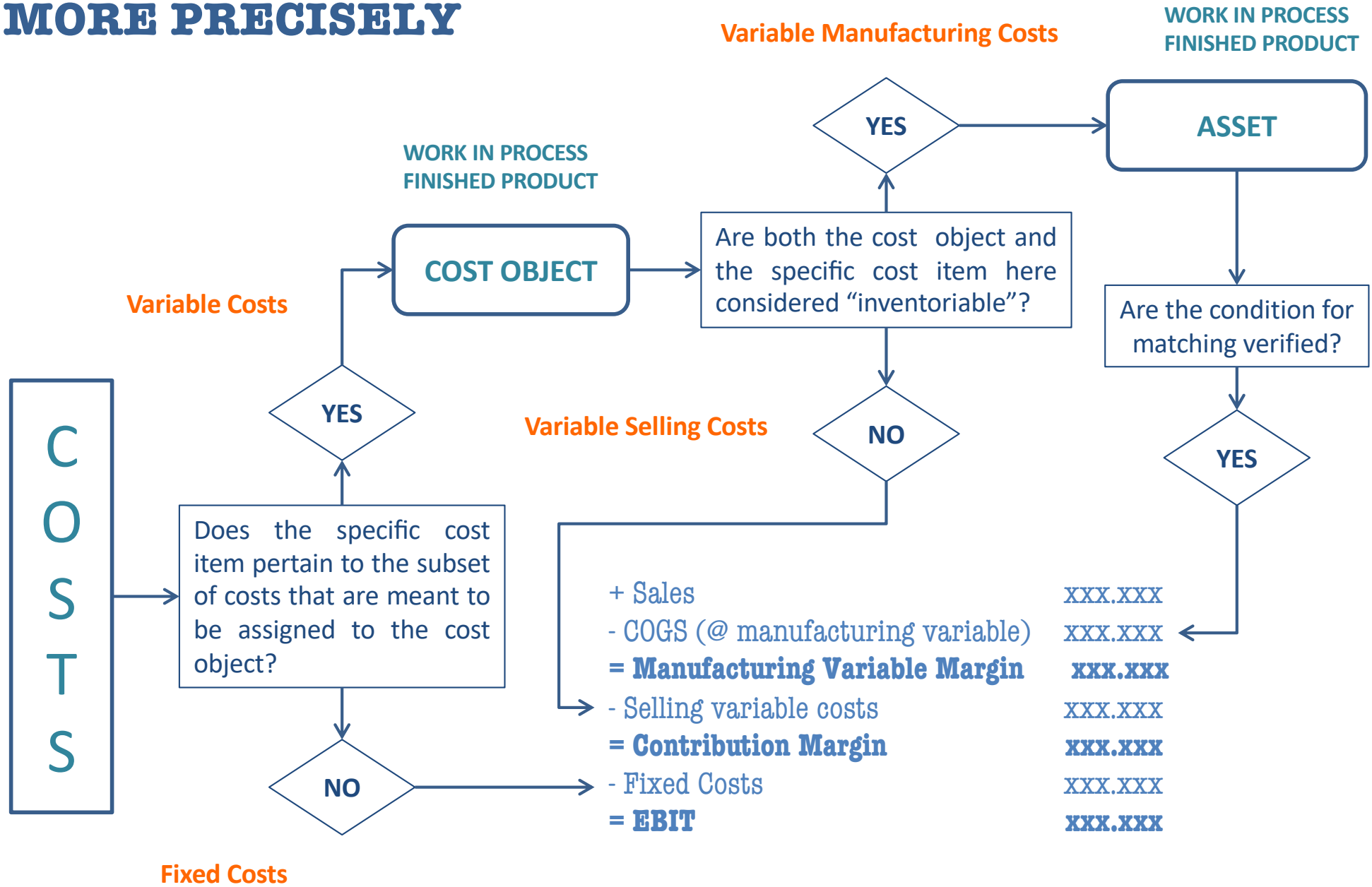


Variable **Manufacturing** Costs are incurred

Variable **Selling** Costs are incurred











MORE PRECISELY

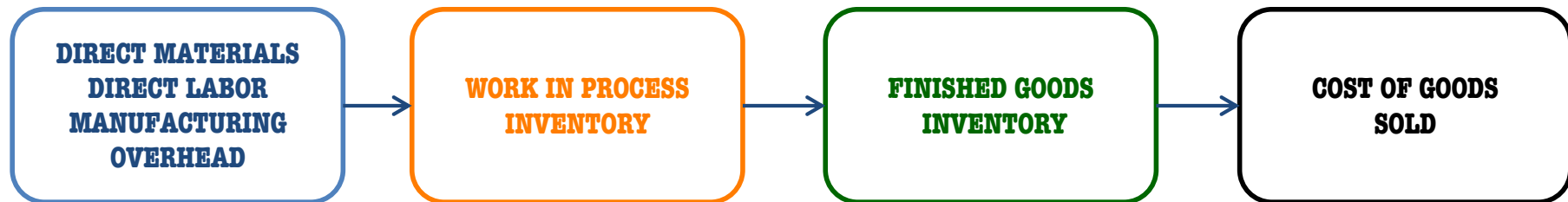


+ Sales	XXX.XXX
- COGS (@ manufacturing variable)	XXX.XXX
= Manufacturing Variable Margin	XXX.XXX
- Selling variable costs	XXX.XXX
= Contribution Margin	XXX.XXX
- Fixed Costs	XXX.XXX
= EBIT	XXX.XXX

PROCESS COST AND JOB ORDER COST

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

JOB COSTING SYSTEM



Job costing is a costing system that accumulates costs and assigns them to specific jobs, customers, projects, or contracts. 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).

JOB COSTING SYSTEM



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JOB COSTING SYSTEM



Automotive Job Costing Solutions

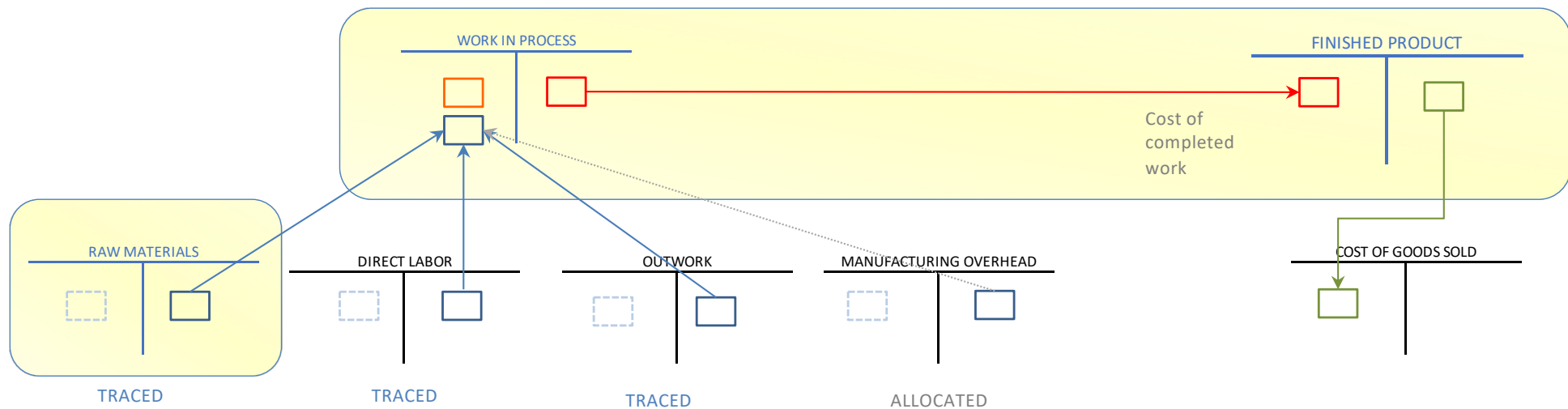
Automotive job costing can often be a complicated endeavour. Getting an accurate sum of labour and materials can be the difference between profitability and loss, data inaccuracies or lack of tracking can ensure issues in the future. Keeping track of client and vehicle records is important for customer 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



JOB COSTING SYSTEM

	Cost	Co. Fl.
CURE 35,905,617		
STARTED Sept. 25, 1929		
FL. AREA 2,721,000.		
COMPLETED May 1, 1931		
General Con.	2,721,562	.0758
Foundations	1,122,468	.0332
Filing or Cais.		
Struct. Steel	4,706,925	.1511
Hydro. W.P.	54,722	.0015
Architect	1,415,072	.0424
Masonry	1,521,012	.0448
Exterior Stone	1,124,874	.0331
Granite	82,202	.0022
Roofing & Sheet Met.	112,560	.0031
Exterior Metal	1,071,672	.0299
Metal Windows	253,124	.0073
Carpentry	155,461	.0043
Lath & Plaster	913,293	.0254
Fl. Fin. & Finish	325,908	.0094
Millwork	22,273	.0006
Met. Dov. & Trim	345,805	.0096
Elevator Encl.	245,053	.0069
Glass and Glaz.	26,338	.0008
Hardware	56,084	.0016
Iron & Br.	196,935	.0055
Monument Bronze	284,198	.0077
Mail Chute	51,655	.0015
Interior Marble	996,761	.0278
Hydrozone	6,885	.0002
Terrazo & Tile	222,622	.0062
Struct. Glass	70,389	.0019
Paint & Decor.	189,002	.0053
Elev. & Dumbars	3,882,775	.0803
Plumbing	1,121,401	.0312
Htg. & Vent.	1,648,213	.0459
Elect. Work	1,178,623	.0317
Elect. Fix.	108,583	.0030
Sprinkler System	29,720	.0008
Refrigeration	13,808	.0004
Acoustic Insulation	3,320	.0001
Formwork-Tower Scaffolding	4,101	.0001
St. Stair & Door	1,375	.0000
Marble-Flag Poles	2,929	.0002
Vault & Dvgs	222	.0000
Carriage for tenants	13,478	.0004
Fire Alarm Wire Work	9,254	.0003
Soundproofing	7,087	.0002
Fans & Flaps	23,223	.0006
Damp-proofing	24,582	.0007
Window Casings	44,812	.0012
Water-t. Net. tower	50,407	.0014
Water Fountain	5,029	.0002
Specialty	4,299	.0002
Insulation	4,205	.0002
Steel	28,679,772	.7128

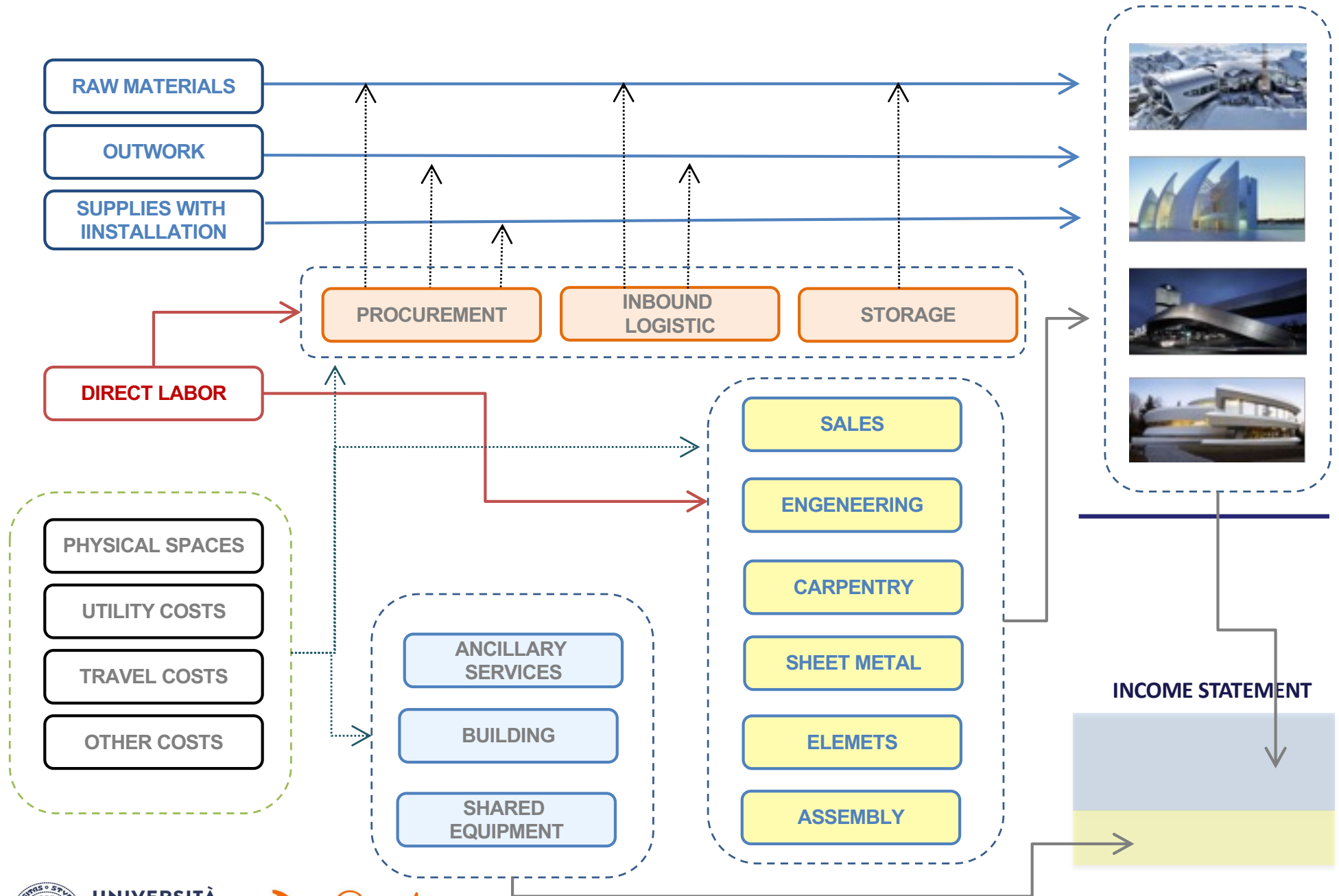
EMPIRE STATE BUILDING

Cost of Common Brick Laid in Place
Back of Limestone and Interior Walls

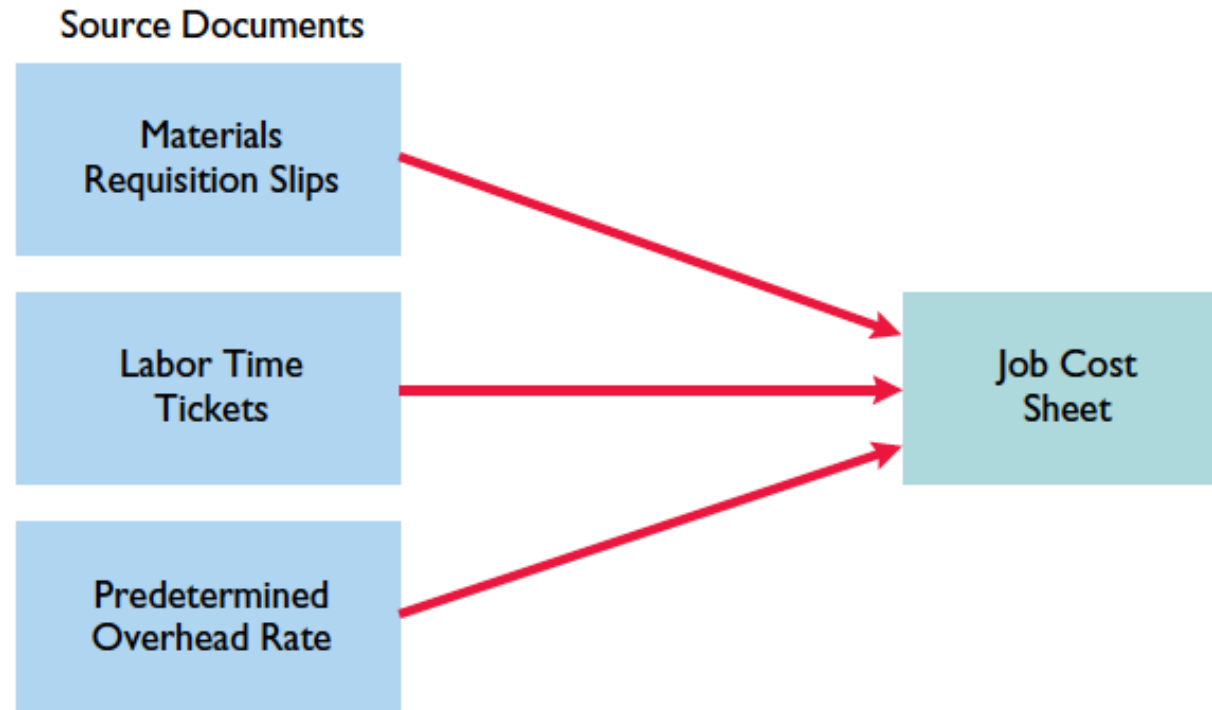
Account	Labor	Amount
M2, M5, M4	Labor, Bricklayers Apprentices Bricklayers, Laborers, Hoisting Eng. etc. Insurance - average rate 8.516%	\$353,620.52 30,114.32
GC14	Mod Hoist - Labor, proportion Mod Hoist, Plant & Equip. Insurance, 6%	10,333.88 620.03
GC14	Indus. Rwy. - Labor proportion Industrial Rwy. Insurance, 6%	2,753.44 165.20
GC14	Mixing Plants-Labor, proportion Mortar Mix. Plants Insurance, 6%	615.34 36.91
GC2	Labor - proportion Gen. Organiz. Payroll Insurance 1.75%	23,970.00 419.47
MT	Labor - proportion Maintenance or Equip. Insurance, 8.516%	1,367.59 116.46
	Labor Cost laying 10,258,628 Com.Bricks Gross Labor Cost per 1000 bricks, \$41.34	424,133.17
<u>Material</u>		
M2, M5, M4	Common Brick, Lime, Sand, Cement, Plant, etc.	254,905.43
GC14	Material, proportion Mod Hoist plant & Equip.	13,322.07
GC14	Material, proportion Industrial Railway	1,806.30
GC14	Material, proportion Mixing Plants	1,040.81
MT	Proportion Mainten. power, oil, gas, water, etc.	1,375.33
	Material Cost Laying 10,258,628 Com.Bricks Gross Material Cost laying 1000 Br. \$26.56	272,449.94
	Gross Labor and Material Cost laying 1000 common bricks, \$67.90	
<u>Net Labor Units</u>		
	<u>No. Laid</u>	<u>Straight Excess</u>
		<u>Time</u> <u>Time</u> <u>Total</u>
Common Brick, Backing Limestone	8,877,700	M2 32.22 1.97 34.19
Interior Common Brick	1,227,467	M5 36.51 .82 37.33
Common Brick at Lot Line Wall	153,461	M4 27.44 .21 27.65
	<u>Ratio</u>	<u>Proportion per</u>
	<u>Bricklayers</u> <u>Laborers</u>	<u>8-br. Bricklayers</u>
Common Brick, Backing Limest.	1 1.1	864
Interior Common Brick	1 1.4	858
Common Brick at Lot Line Wall	1 1.2	1052



REAL LIFE EXAMPLE



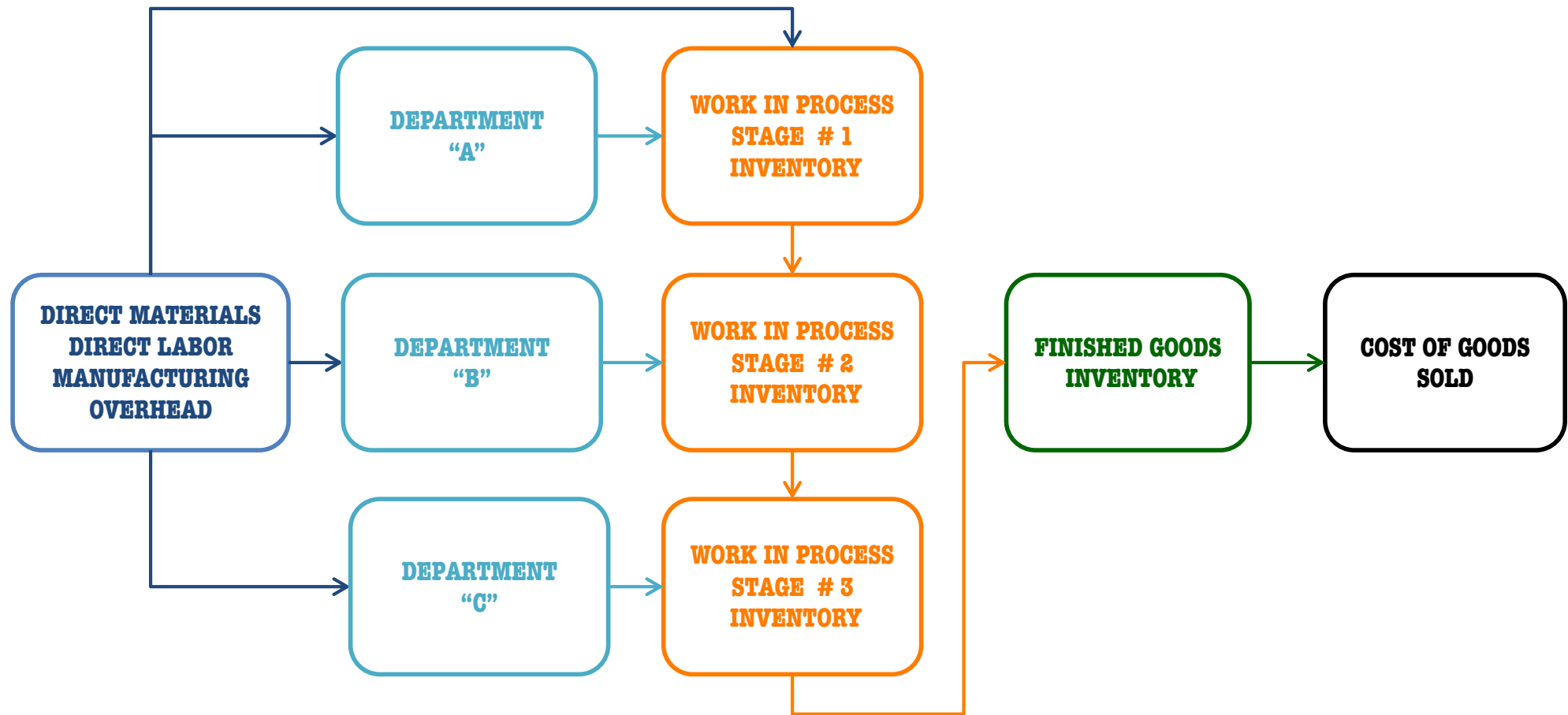
FLOW OF DOCUMENTS



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.

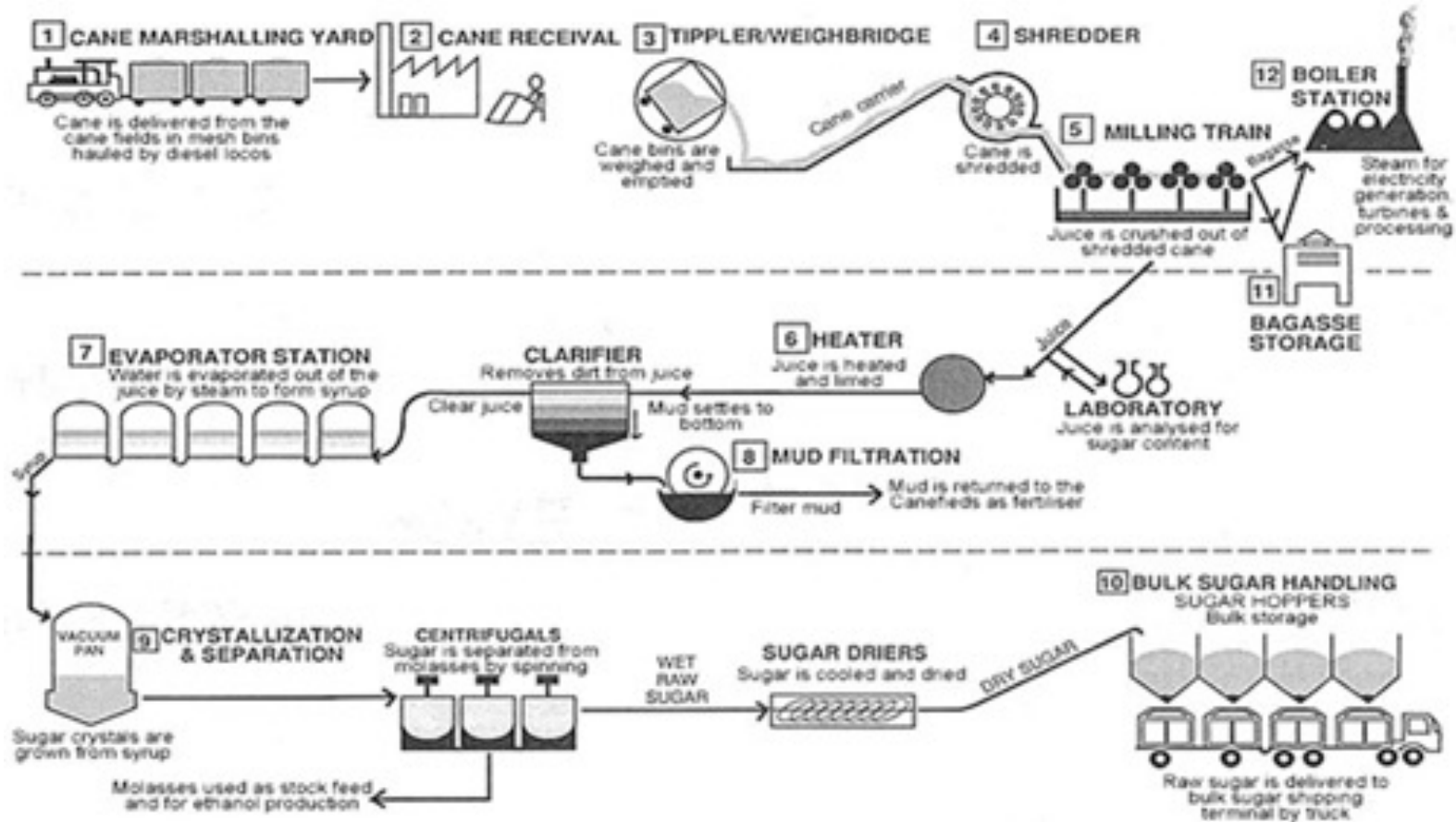


PROCESS COSTING SYSTEM

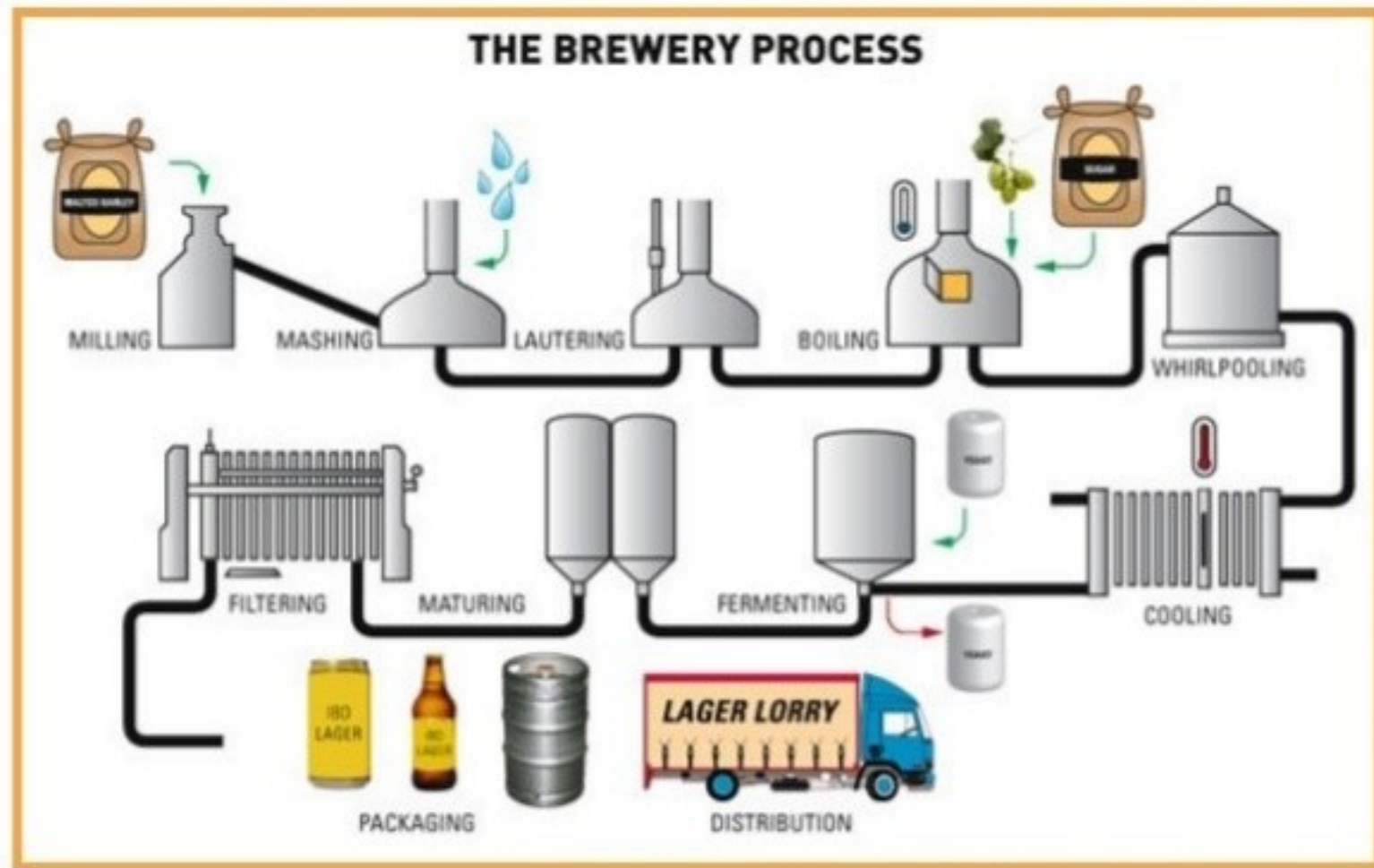


Process costing is a product costing system that accumulates costs according to processes or departments and assigns them to a large number of nearly identical products. A **process costing system** is used by companies that **employs a standardized production process to manufacture homogeneous products**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

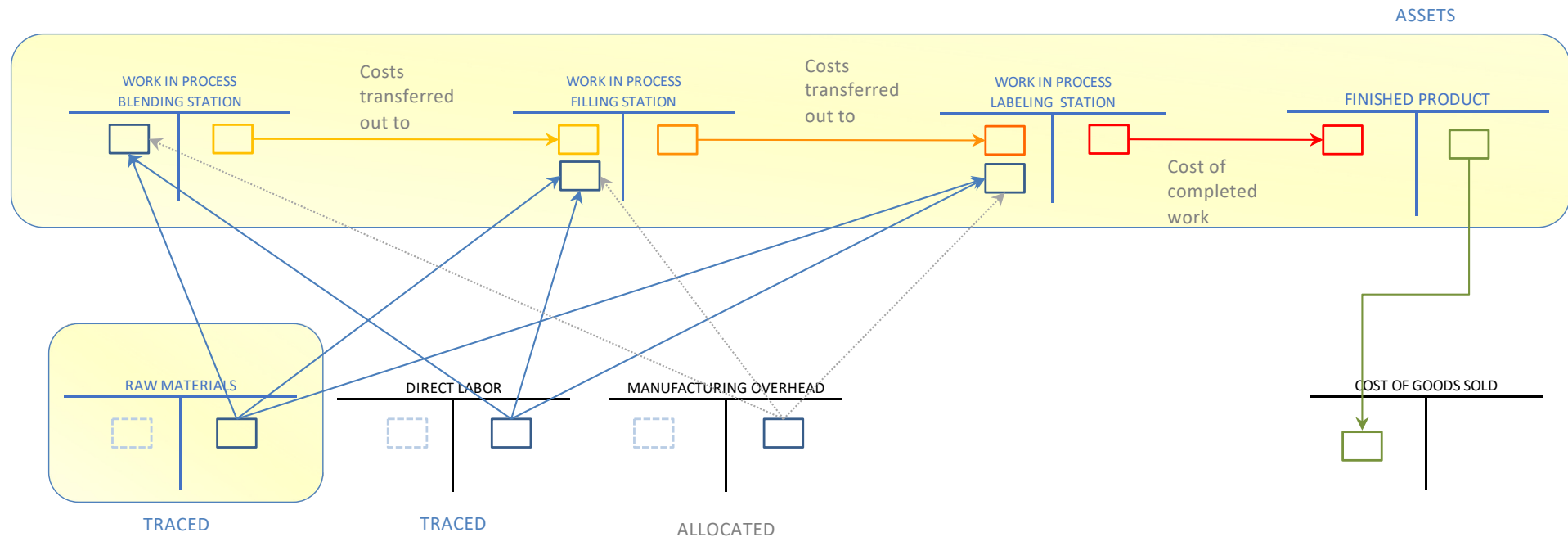
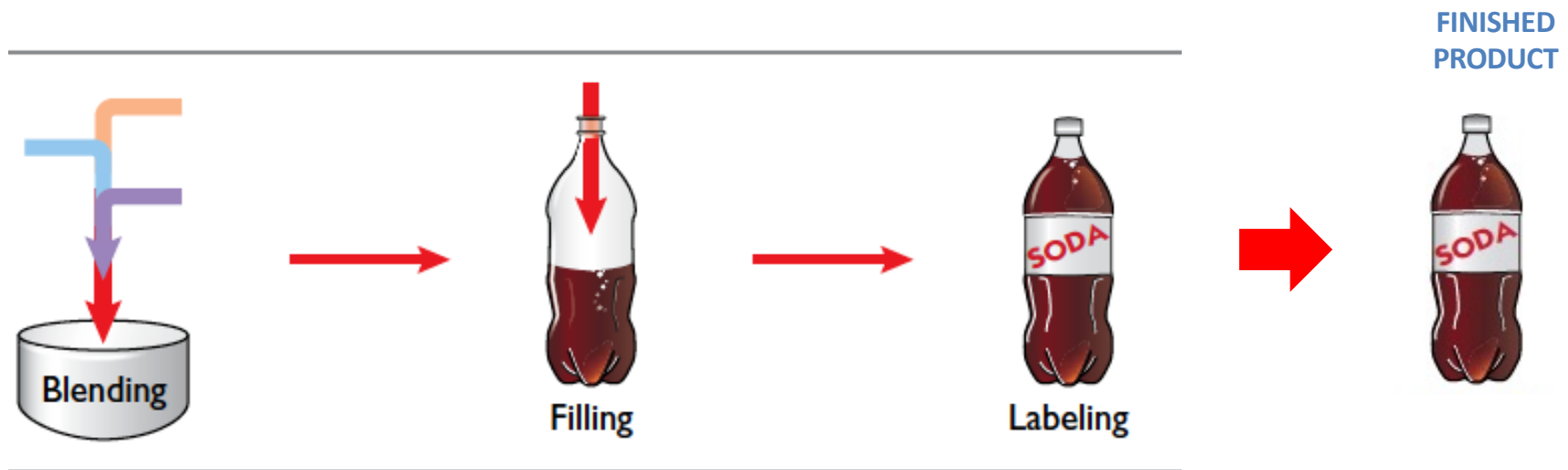
PROCESS COSTING SYSTEM



PROCESS COSTING SYSTEM



FLOW OF COSTS IN PROCESS COST SYSTEM



JOB ORDER VERSUS PROCESS COST SYSTEMS

Feature	Job Order Cost System	Process Cost System
Work in process accounts	One work in process account	Multiple work in process accounts
Documents used	Job cost sheets	Production cost reports
Determination of total manufacturing costs	Each job	Each period
Unit-cost computations	Cost of each job ÷ Units produced for the job	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.)



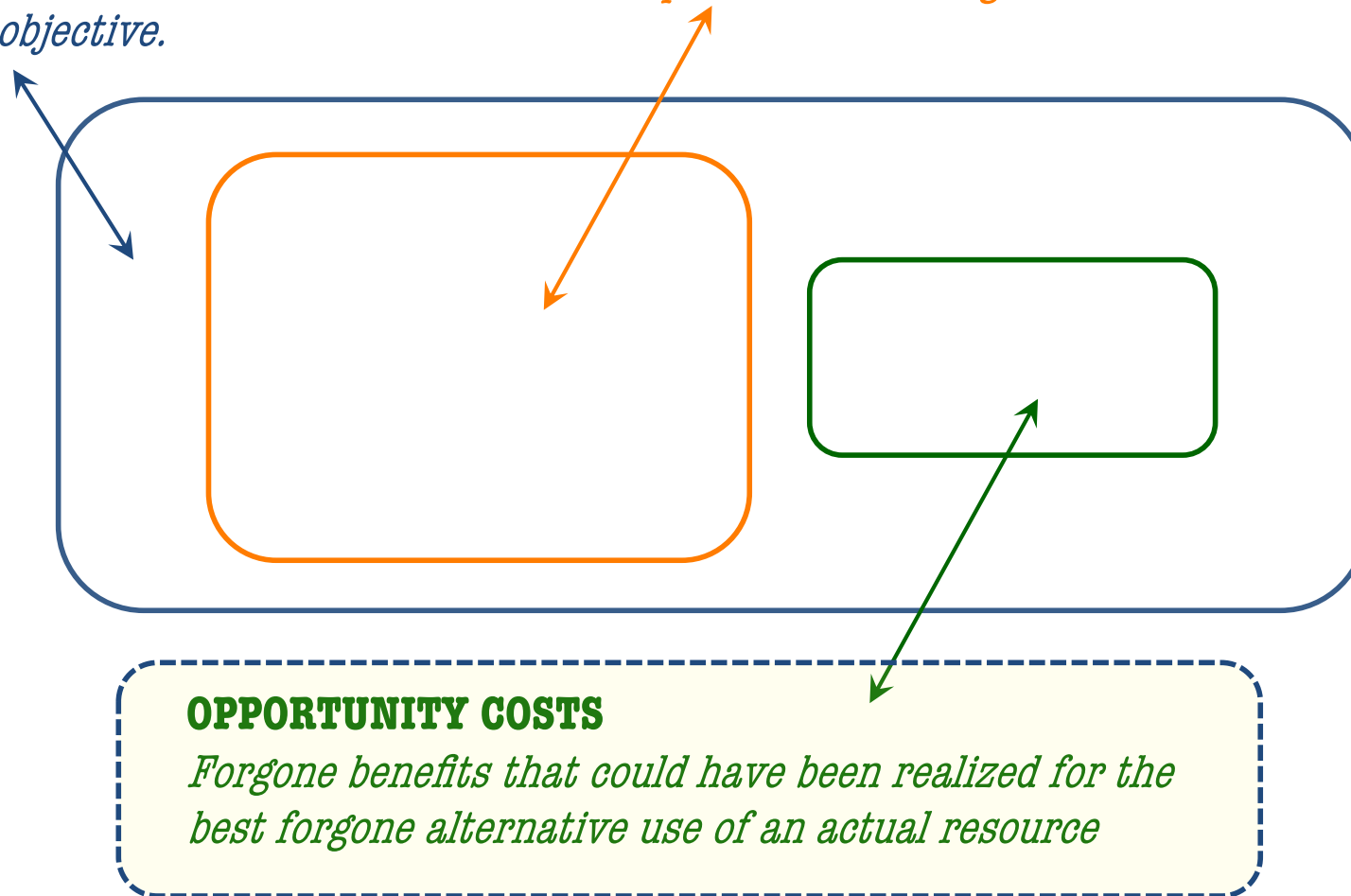
SOME BASIC DEFINITIONS

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

NORMAL COSTING SYSTEM

Actual

Standard

STANDARD COSTING SYSTEM

Standard

Standard



COST COLLECTION SYSTEMS

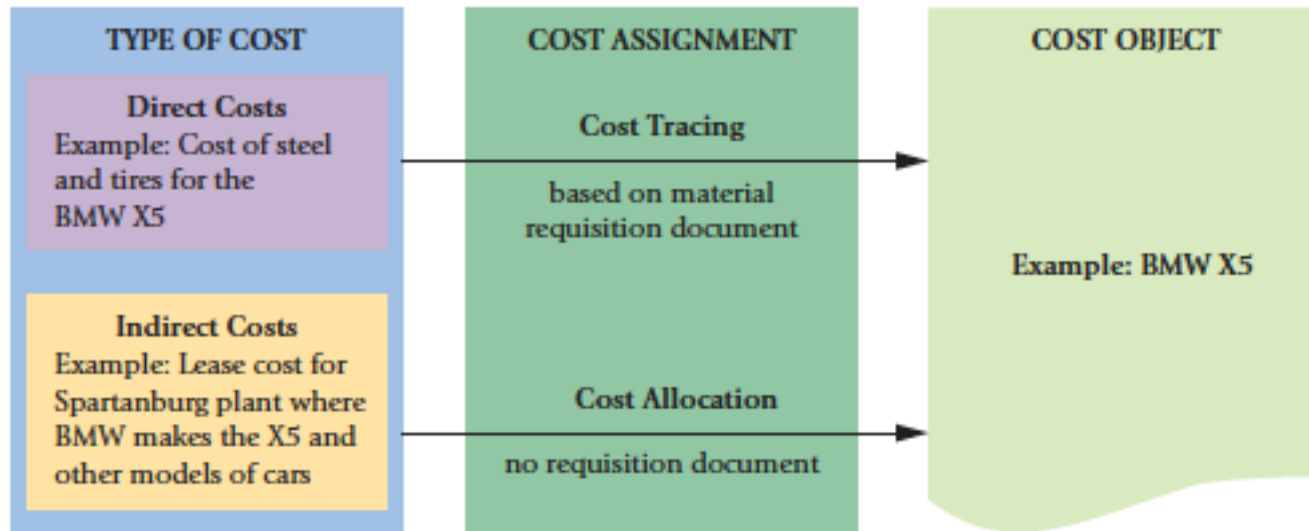
Cost accumulation is the collection of cost data in some organized way by means of an accounting system.

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 ASSIGNMENT TO A COST OBJECT



Cost Object	Illustration
Product	A BMW X5 sports activity vehicle
Service	Telephone hotline providing information and assistance to BMW dealers
Project	R&D project on enhancing the DVD system in BMW cars
Customer	Herb Chambers Motors, the BMW dealer that purchases a broad range of BMW vehicles
Activity	Setting up machines for production or maintaining production equipment
Department	Environmental, health, and safety department

SOURCE: Horngren-Datar-Rajan, "Cost Accounting. A Managerial Emphasis", Fourteenth Edition

SOME (VERY) BAD DEFINITIONS

A direct cost is a price that can be completely attributed to the production of specific goods or services

<https://www.investopedia.com/terms/d/directcost.asp#ixzz4xwrVbOUE>

Most cost estimates are broken down into direct costs and indirect costs.

Direct costs are directly attributable to the object. In construction, the costs of materials, labor, equipment, etc., and all directly involved efforts or expenses for the cost object are direct costs. In manufacturing or other non-construction industries the portion of operating costs that is directly assignable to a specific product or process is a direct cost.

https://en.wikipedia.org/wiki/Indirect_costs

An expense that can be traced directly to (or identified with) a specific cost center or cost object such as a department, process, or product.

www.businessdictionary.com/definition/direct-cost.htm



TAUTOLOGY

Dictionary

tau•tol•o•gy | tō'tälājē |

noun (pl. **tautologies**)

the saying of the same thing twice in different words, generally considered to be a fault of style (e.g., *they arrived one after the other in succession*).

- a phrase or expression in which the same thing is said twice in different words.
- Logic a statement that is true by necessity or by virtue of its logical form.

DERIVATIVES

tau-to-log-i-cal | ,tōtl'äjikəl |adjective,

tau-to-log-i-cal-ly | ,tōtl'äjik(ə)lē |adverb,

tau-tol-o-gist | -jist |noun,

tau-tol-o-gize | -jīz |verb,

tau-tol-o-gous | -gəs |adjective

ORIGIN mid 16th cent.: via late Latin from Greek, from *tautologos* 'repeating what has been said,' from *tauto-* 'same' + *-logos* (see **-LOGY**).

Thesaurus

tautology

noun

avoid such tautology as "let's all work together, everyone, as a team" by saying simply "let's work together": PLEONASM, repetition, reiteration, redundancy, superfluity, duplication.

Wikipedia



Look up **tautology** in Wiktionary, the free dictionary.

Tautology may refer to:

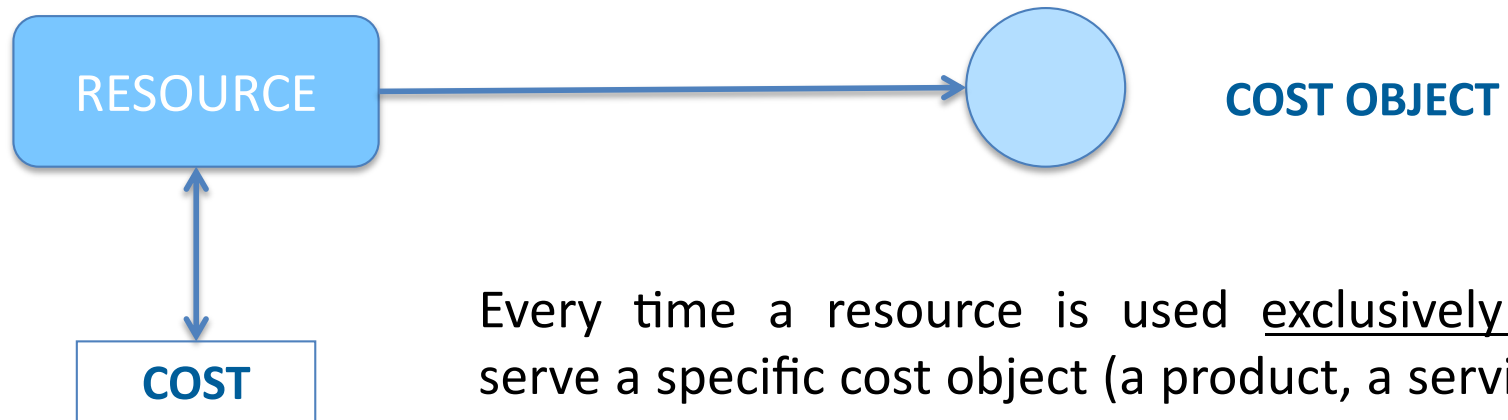
- [Tautology \(rhetoric\)](#), a self-reinforcing pretense of significant truth
- [Tautology \(grammar\)](#), the use of redundant words
- [Tautology \(logic\)](#), a universal truth in formal logic
- [Tautology \(rule of inference\)](#), a rule of replacement for logical expressions
- [Tautonym](#), a species name composed of a repeated word, or one identical to the genus name



DIRECT COSTS – EXCLUSIVE USAGE

A direct cost is a cost that is uniquely and unequivocally attributable to a cost object.

Any cost that can be related unambiguously (without ambiguity) to a cost object is, therefore, a direct cost of that cost object.



Every time a resource is used exclusively to serve a specific cost object (a product, a service, a customer, a distribution channel, an activity, a department) the cost that arises from its usage pertains unequivocally to that cost object. It is therefore a direct cost of that cost object.

DIRECT COSTS – EXCLUSIVE USAGE



**ORGANIC POWDERED
GINGER ROOT**

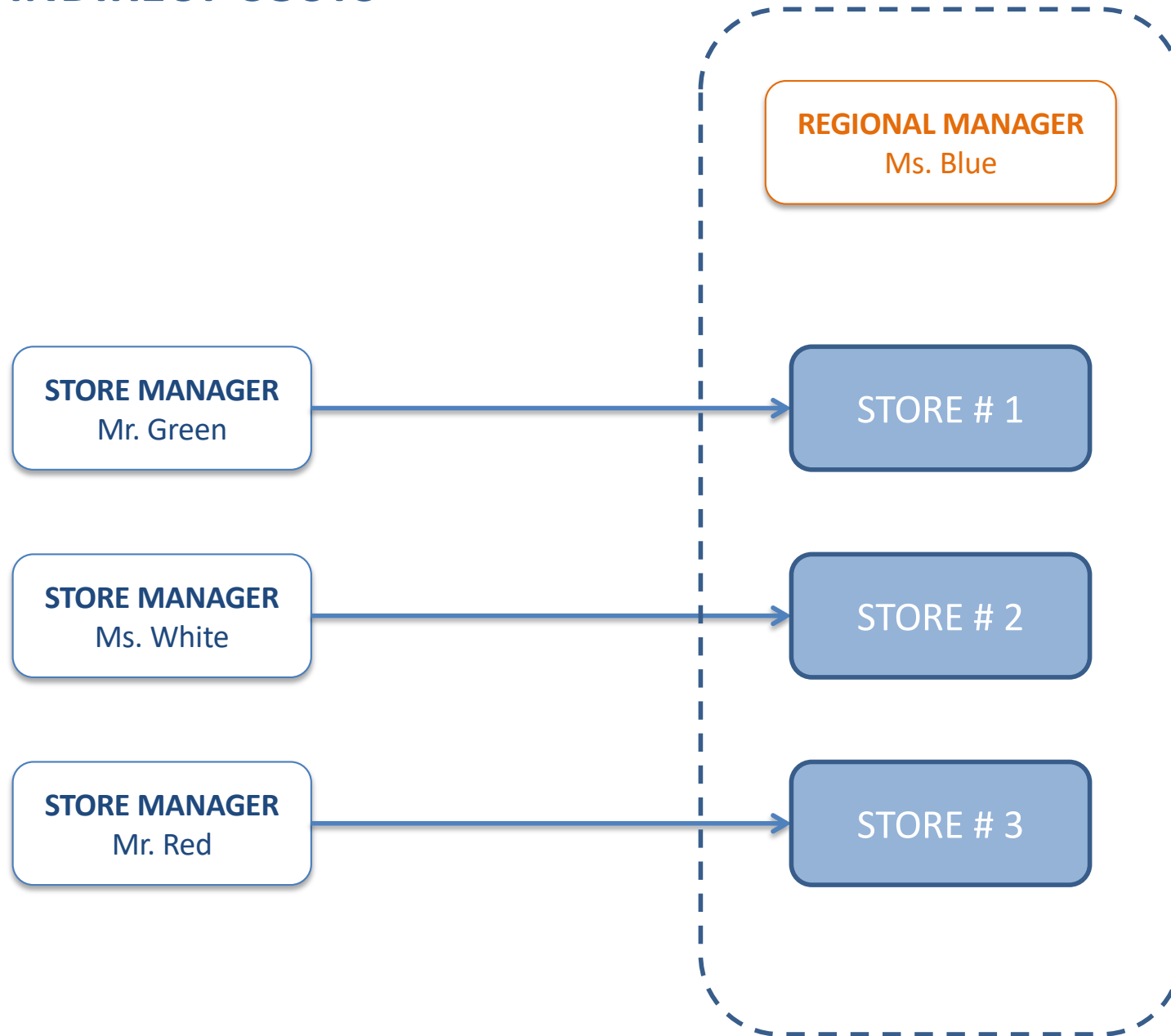
**GINGER SNAP
BISCUITS**



RAW MATERIALS



DIRECT & INDIRECT COSTS



DIRECT COSTS OR INDIRECT?



FLOUR



RAW MATERIALS



GINGER SNAP
BISCUITS



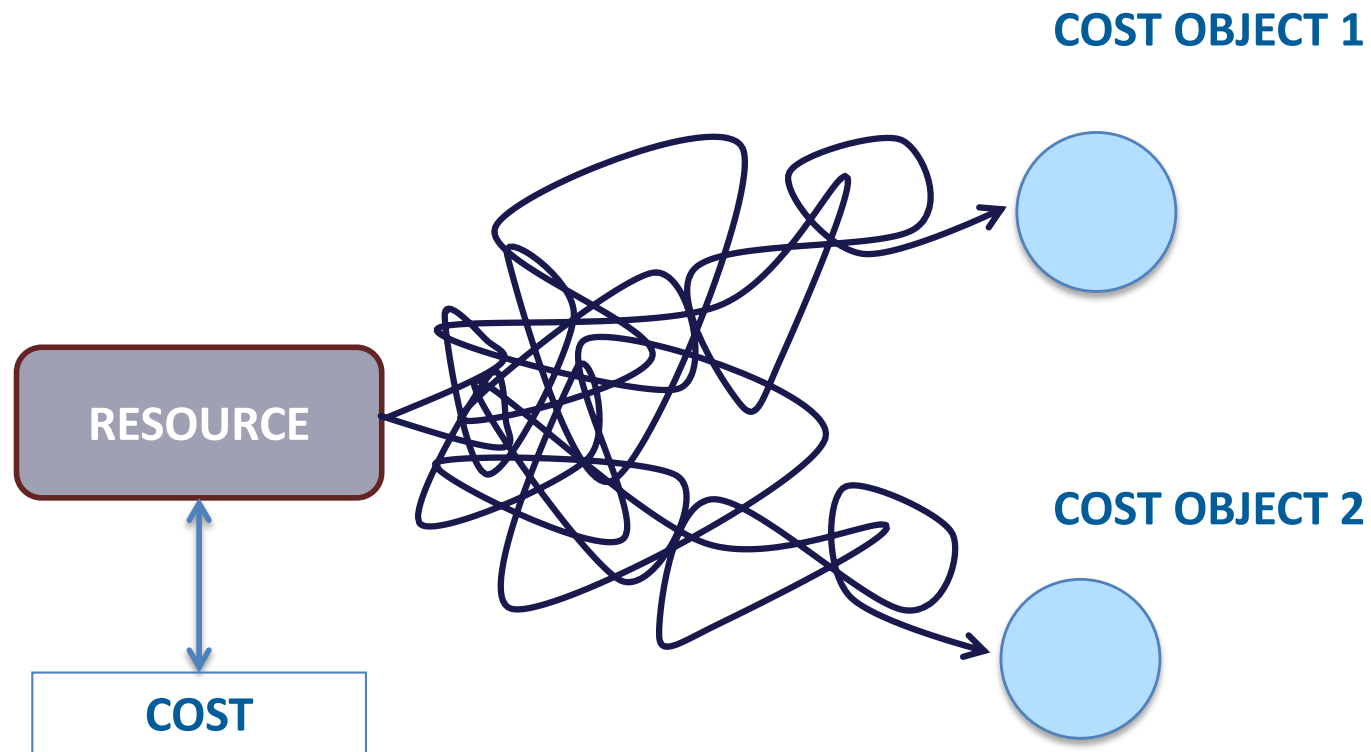
STRAWBERRY
BISCUITS



GOLDEN FLAKY
BISCUITS

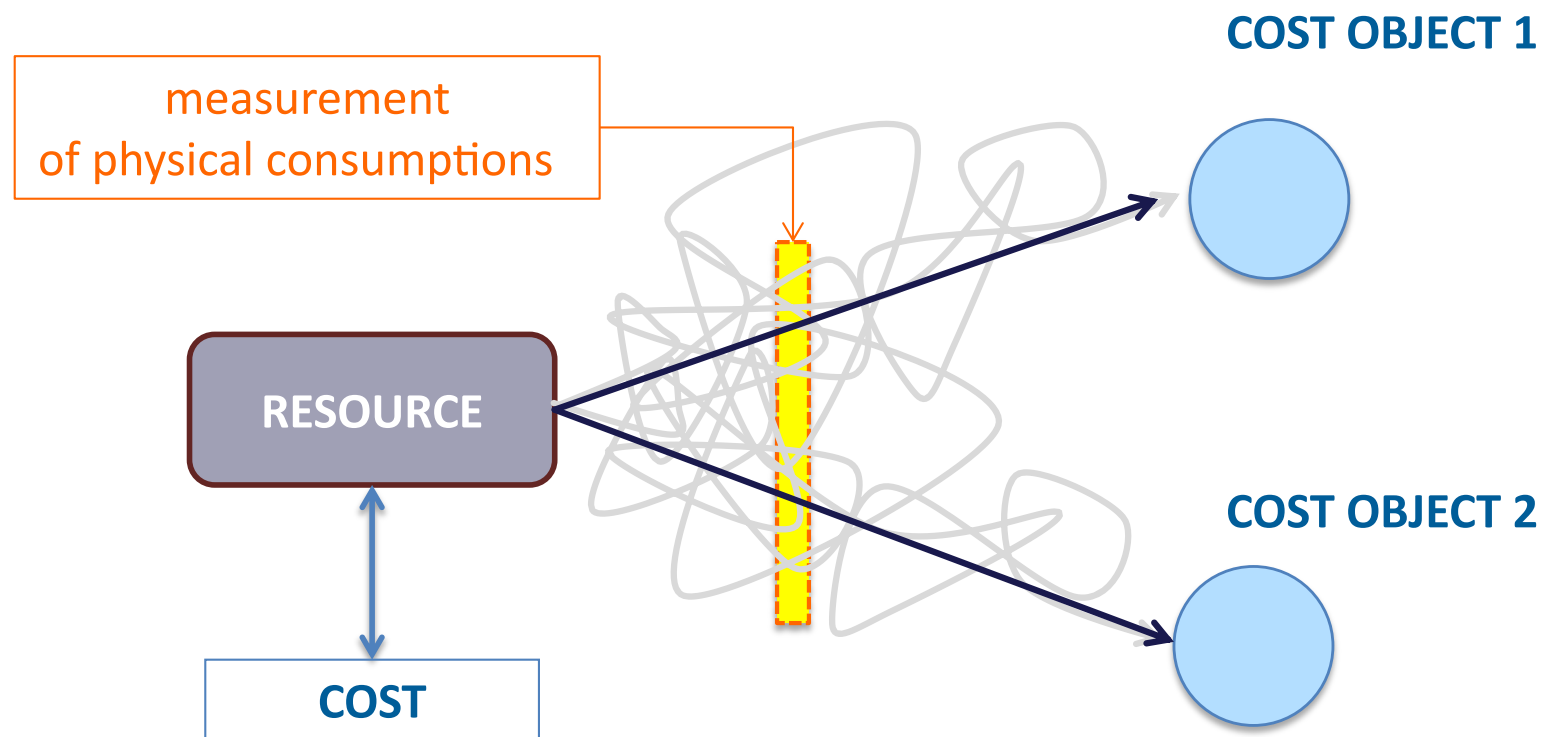


MULTIPLE USAGE



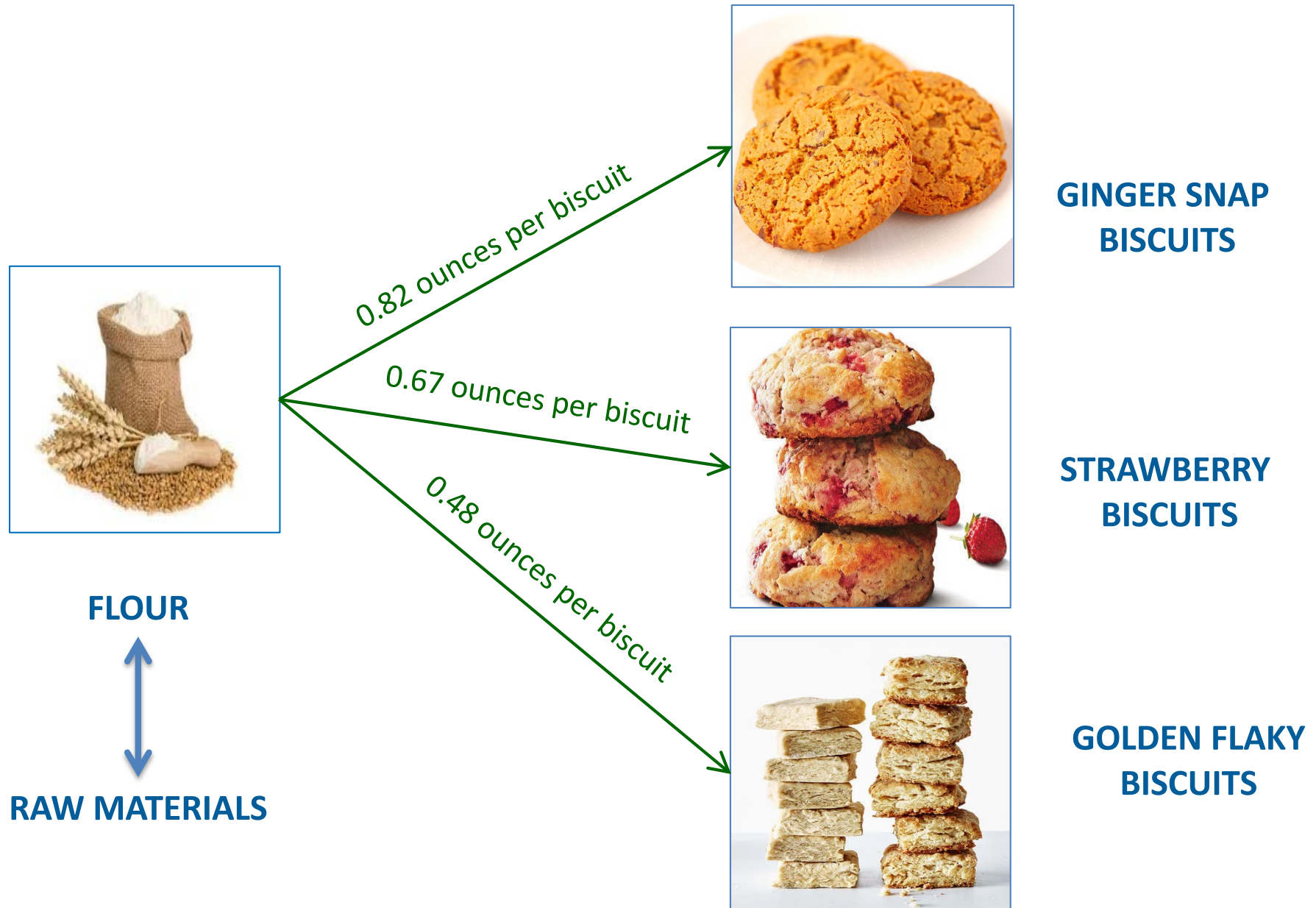
Normally a resource is used to support more than a cost object.

DIRECT COSTS – MEASUREMENT OF PHYSICAL CONSUMPTION

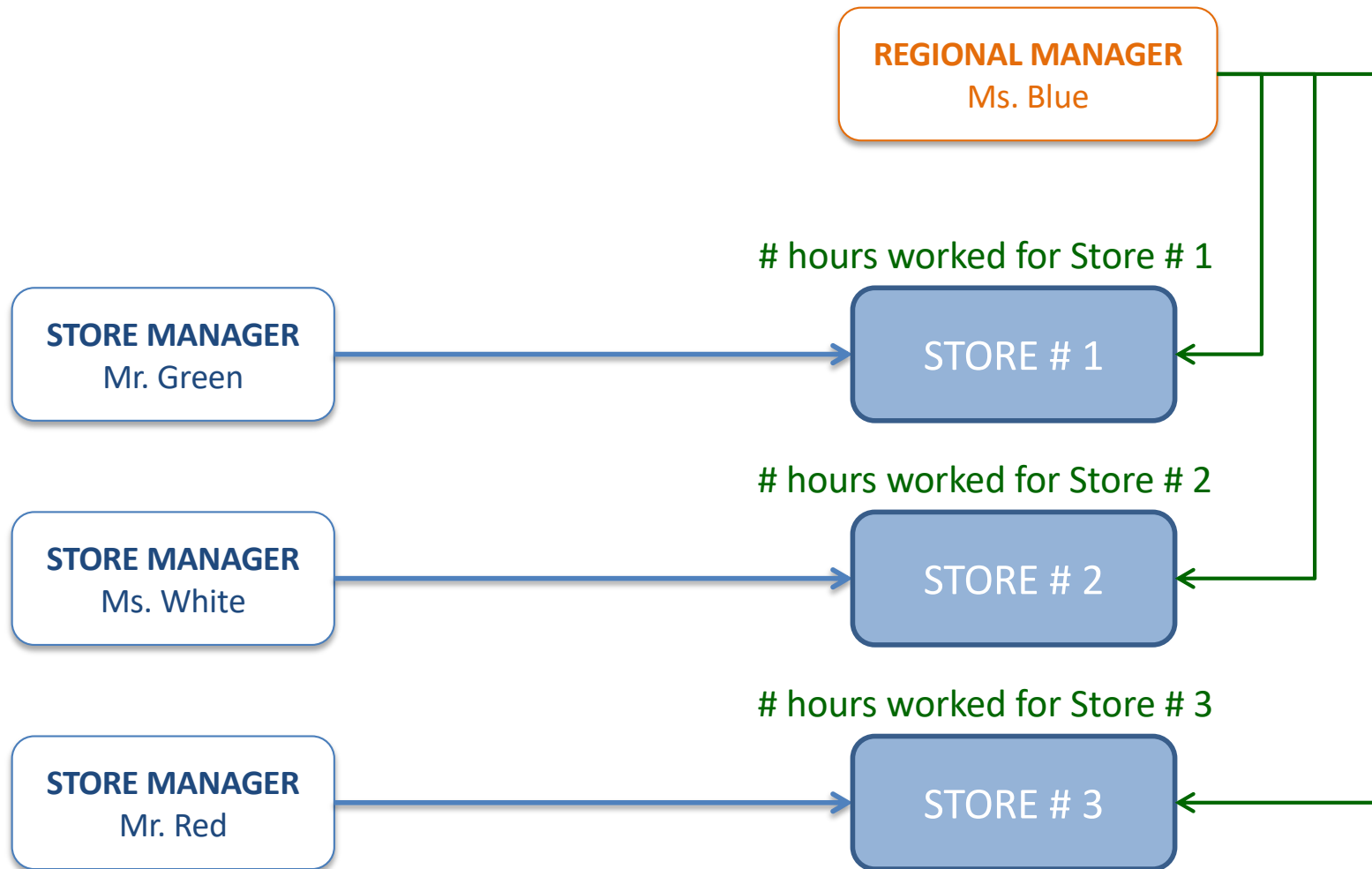


Normally a resource is used to support more than a cost object. In that case an unambiguous relation between the cost incurred and a specific cost object can be established only if it is possible to measure (in physical terms) the quantity of the resource consumed to serve the cost object considered.

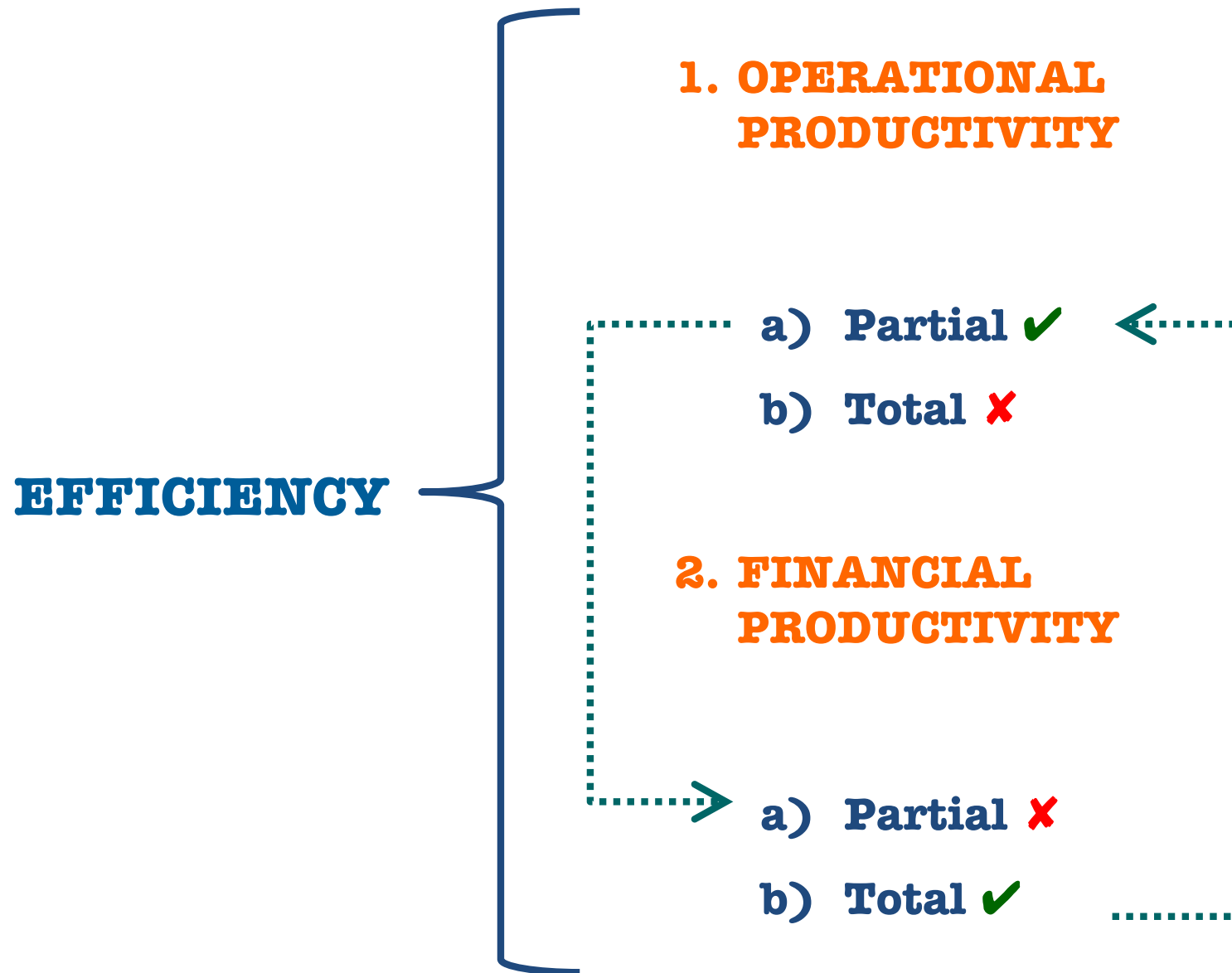
DIRECT COSTS – MEASUREMENT OF PHYSICAL CONSUMPTION



TWO DIFFERENT KINDS OF DIRECT COSTS



WHY IT IS DIFFICULT TO COMPUTE....



MEASUREMENT OF PHYSICAL CONSUMPTION

The measurement of resource consumption can take place in different ways:

- ✧ **Continuously** by means of tools such as electric meters, bar code readers, picking lists, material requisition forms, time report, activity log, time clock or other electronic system, etc.
- ✧ **Occasionally** through measurement of resource usage caused in a specific period by the production of a particular amount of product or the provision of a specific service.
- ✧ Developing specific **time-motions study** in which analysts determine the cost of a product or a service by means of direct observations of the consumption of resources caused by the activities performed.
- ✧ Using **statistical or parametrical approaches**

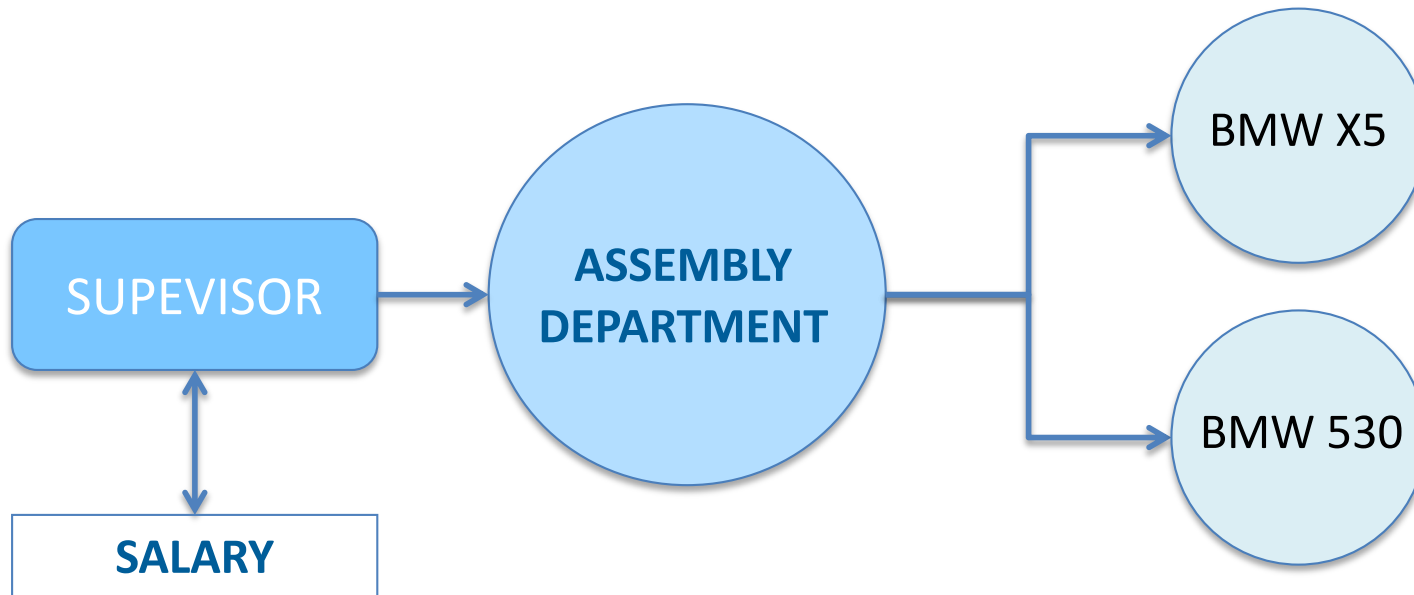
FACTORS AFFECTING DIRECT/INDIRECT COST CLASSIFICATIONS

Several factors affect the classification of a cost as direct or indirect:

- ✧ **Design of operations.** Classifying a cost as direct is easier if a company's facility (or some part of it) is used exclusively for a specific cost object, such as a specific product or a particular customer.
- ✧ **The materiality of the cost in question.** The smaller the amount of a cost—that is, the more immaterial the cost is—the less likely that it is economically feasible to trace that cost to a particular cost object.
- ✧ **Available information-gathering technology.** Improvements in information-gathering technology make it possible to consider more and more costs as direct costs. Bar codes, for example, allow manufacturing plants to treat certain low-cost materials such as clips and screws, which were previously classified as indirect costs, as direct costs of products.



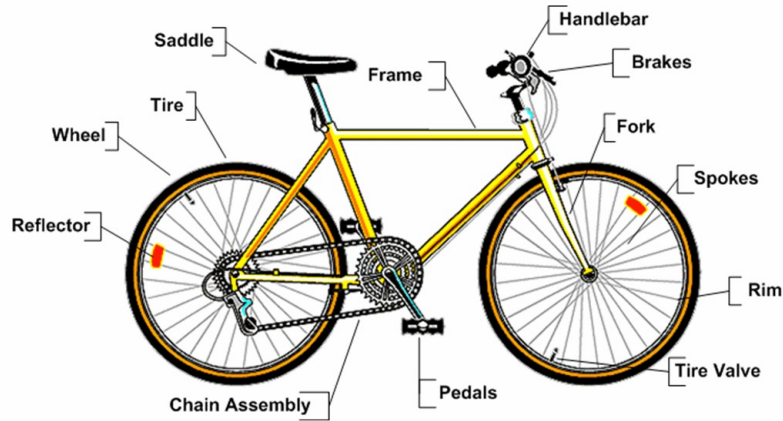
DIRECT/INDIRECT COST CLASSIFICATIONS: A CAUTION



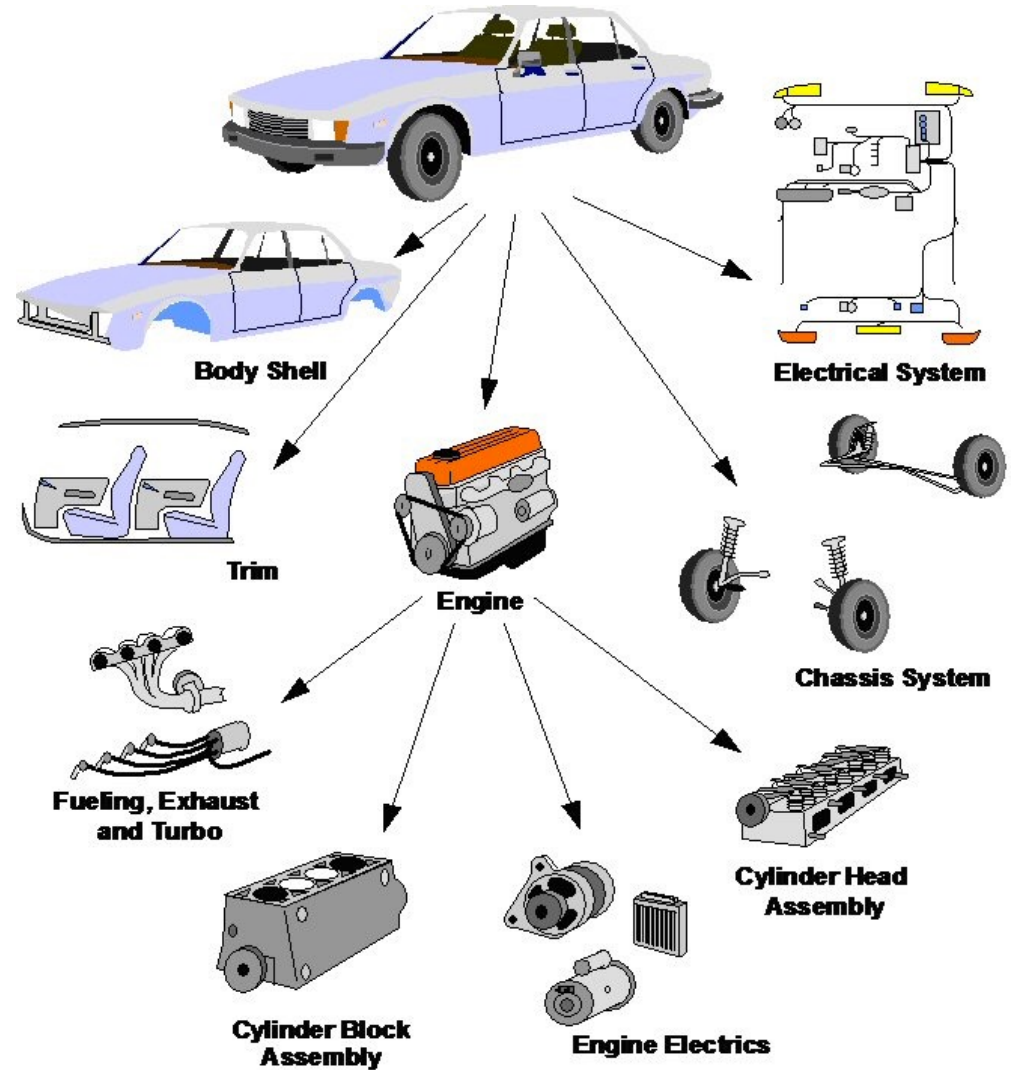
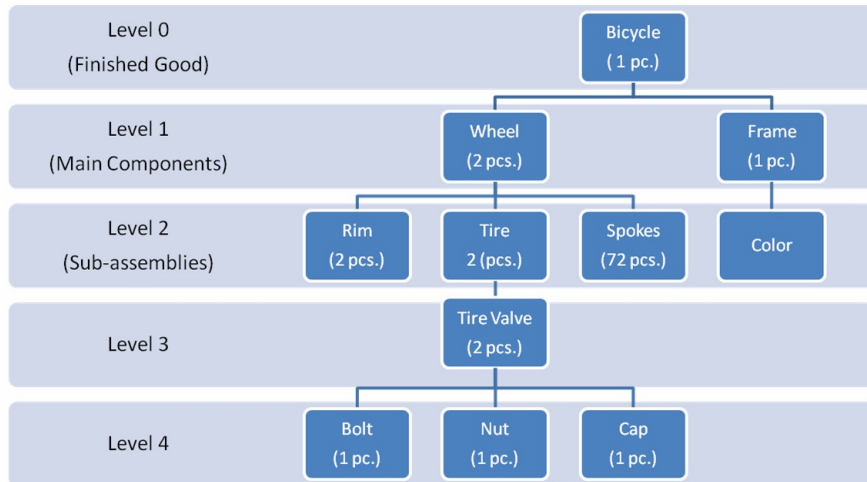
A specific cost may be both a direct cost of one cost object and an indirect cost of another cost object.

A useful rule to remember is that the broader the definition of the cost object—the assembly department rather than the X5 SAV—the higher the proportion of total costs that are direct costs and the more confidence a manager has in the accuracy of the resulting cost amounts.

BILL OF MATERIALS (B.O.M.)



Bicycle BOM (Bill of Materials)



DIFFERENT STANDARDS

How many corks are needed to cork a bottle of wine?



$$\frac{1 \text{ CORK}}{1 \text{ BOTTLE}} = 1$$



$$\frac{21 \text{ CORKS}}{18 \text{ BOTTLES}} = 1.3125$$



IDEAL VS NORMAL STANDARD

Companies set standards at one of two levels: ideal or normal.

- Ideal standards represent optimum levels of performance under perfect operating conditions.
- Normal standards represent efficient levels of performance that are attainable under expected operating conditions.

Some managers believe ideal standards will stimulate workers to ever-increasing improvement. However, most managers believe that ideal standards lower the morale of the entire workforce because they are difficult, if not impossible, to meet. Very few companies use ideal standards.

Most companies that use standards set them at a normal level. Properly set, normal standards should be rigorous but attainable. Normal standards allow for rest periods, machine breakdowns, and other “normal” contingencies in the production process.



SPOILAGE, SCRAP AND REWORK



Spoilage refers to unacceptable units that are discarded or sold for disposal value.

Scrap is the material left over from the manufacture of the product; it has little or no value.

Rework units are units produced that must be reworked into good units that can be sold in regular channels.

“Level” of the problem








Normal: *occurs under normal operating conditions; it is uncontrollable in the short term and is considered a normal part of production and product cost.*

→ the cost incurred is absorbed by the cost of good units produced.

Abnormal: *is in excess over the amount of normal spoilage expected under normal operating conditions.*

→ the cost incurred is charged as a loss to operations in the period detected.

SOURCE DOCUMENTS: BILL OF MATERIALS

Thomasville Furniture Industries, Inc.													CHANGES FOR 14521-211	
Bill of Materials														
PLANT <u>"T"</u>														
STYLE <u>14531-210</u>														
ARTICLE <u>GEORGIAN END TABLE</u>														
DATE <u>1-19-07</u>													SHEET <u>1</u> OF <u>2</u>	
LINE	NO. PCB.	DESCRIPTION	FINISH SIZE				W D T	ROUGH SIZE			FOOTAGE	SKETCH		
			L	W	T	BS		L	W	T				
1	14531-210 ONLY	1	TOP	26	20	13/16		1	27	21	9/16			
2		1/2	TOP CORE					1	17	47 1/2	3/4			
3		1	TOP CORE SIDE BANDS	47 1/2	2	3/4		1	47 1/2	2	4/4			
4		2	TOP CORE FR.T. & BK. BANDS	21	2	3/4		1	21	2	4/4			
5														
6		2	SIDE PANELS	22 3/8	41 5/16	3/4	21 3/8	4	23 7/8	21 3/4	5/8		1/4 POP CORE	
7		2	SIDE APRON RAIL	22 3/8	1 7/8	1 7/16	21 3/8	1	23 3/8	2 1/8	5/4			
8		1	BACK PANEL	16 3/8	41 5/16	3/4	15 3/8	4	17 7/8	21 3/4	5/8		1/4 POP CORE	
9		1	BACK APRON RAIL	16 3/8	1 7/8	1 7/16	15 3/8	1	17 3/8	2 1/8	5/4			
10		2	FRONT POST	22 3/4	2 1/2	2 1/2		1	23 3/4	2 3/4	3 pcs 5/4			
11		2	BACK POST	22 3/4	2 1/2	2 1/2		1	23 3/4	2 3/4	3 pcs 5/4			
12														
13	14531-210 ONLY	1	DRAWER FRONT	14 7/8	3 7/8	3/4		3	16 7/16	16 5/16	5/8		1/4 POP CORE	
14		2	DWR. SIDES	20	3	7/16		1	21	3 1/4	5/8			
15		1	DWR. BACK	14 1/16	2 7/8	7/16								
16		1	DWR. BOTTOM	14 1/4	19 13/16	3/16		1	15 3/4	20 7/8	R.C.			
17		1	DWR. GUIDE—FEMALE	20 1/2	1 1/2	9/16	19 13/16	1	21 1/2	2 1/4	4/4			
18		1	DWR. GUIDE—MALE	22 1/2	1	1/2		1	23 1/2	1 1/4	4/4			
19		1	DWR. HOWE PULL											
20														

SOURCE DOCUMENTS: TIME TICKET

TIME TICKET

Ticket Number B-309 Date June 6, 2010
Employee Name Dale Johnson Job Number #351
Operation Assembly Approved by Juanita Perez

Time Started	Time Completed	Hours Worked	Rate	Cost
8:00 a.m.	11:00 a.m.	3.00	\$10.00	\$30.00
Total Cost				\$30.00



Machine: Press 7 **Interval: 2nd Shift**

Report Range **From:** 4/2/2013 12:00:00 AM **To:** 4/26/2013 12:40:10 PM

AVAILABILITY **Interval Period:** 4/3/2013 8:00:00 AM To 4/3/2013 4:00:00 PM

A. Total Available Time	480	min
B. Planned Downtime	0	min
C. Net Available Time (A - B)	480	min
D. Unplanned Downtime	103	min
E. Operating Time (C - D)	377	min
F. Availability (E / C) x 100	78.6	%

PERFORMANCE EFFICIENCY

G. Total Cycles Run	21,703	cycles
H. Ideal Production Rate	3600.0	cycles/hr
Actual Production Rate (Calculated)	3,450	cycles/hr
Cycle Time	1.04	seconds
I. Performance Efficiency $((G / E) / (H / 60)) \times 100$	95.8	%

QUALITY RATE

J. Total Defects (Rework + Scrap)	0	parts
K. Quality Rate $((G - J) / G) \times 100$	100.0	%

OEE

Overall Equipment Effectiveness (OEE) by Tool $(F \times I \times K)$ Equipment Availability x Performance Efficiency x Quality Rate	75.4	%
---	------	---

DIRECT MATERIALS AND INDIRECT MATERIALS (CONSUMABLE)

Direct material is all of the physical items built into a product.

Direct materials are rolled into the total cost of goods produced, which is then subdivided into the cost of goods sold (which appears in the income statement) and ending inventory (which appears in the balance sheet).

The direct material classification typically includes all materials physically present in a finished product, which is raw materials and sub-assemblies. However, that is not the full extent of direct materials. In addition, direct material includes that amount of scrap and spoilage normally encountered during the production of goods.

Some costs are for materials that are not considered direct materials, and so are instead classified as indirect material costs. These materials are **so immaterial as not to be worth tracing to a specific product or cannot be clearly associated with a specific product**. Examples of indirect materials are:

- ✧ Rags and solvents used during the construction of a house
- ✧ The grease used on machines that manufacture products
- ✧ The thread used in clothing

DIRECT OR INDIRECT?



- Bottles (glass)
- Corks
- Screw caps
- Capsules
- Labels
- Packing paper
- Pallets
- Wooden caskets
- Descriptive cards
- Sales commissions
- Allowance for doubtful accounts
- Selling transport costs
- Bulk discount in goods (1/10)



WINERY'S VARIABLE COSTS



- Bottles
- Corks
- Capsules
- Labels
- Packing paper
- Pallets
- Wooden caskets
- Descriptive cards
- Sales commissions
- Allowance for doubtful accounts
- Selling transport costs
- Bulk discount in goods (1/10)

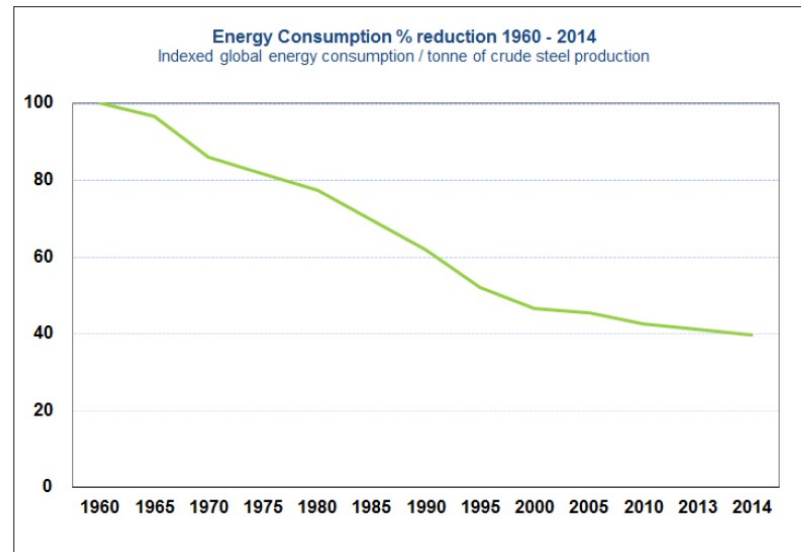
“MANUFACTURING”

“SELLING”

	“DIRECT”	“INDIRECT”
“MANUFACTURING”		
“SELLING”		

ENERGY USE IN THE STEEL INDUSTRY

The steel industry actively manages the use of energy. Energy conservation in steelmaking is crucial to ensure the competitiveness of the industry and to minimize environmental impacts, such as greenhouse gas emissions.



Steel production is energy intensive. However, sophisticated energy management systems ensure efficient use and recovery of energy throughout the steelmaking process for reuse, wherever possible. Improvements in energy efficiency have led to reductions of about 60% in energy required to produce a tonne of crude steel since 1960.

ENERGY USE IN THE STEEL INDUSTRY

Energy constitutes a significant portion of the cost of steel production, from 20% to 40% in some countries.

Thus, improvements in energy efficiency result in reduced production costs and thereby improved competitiveness.

The energy efficiency of steelmaking facilities vary depending on:

- ✧ production route,
- ✧ type of iron ore and coal used,
- ✧ the steel product mix,
- ✧ operation control technology, and
- ✧ material efficiency.

RESEARCH TIMESHEET

Timesheet

Please refer to Notes tab before completing

Full Name:	
Staff Category:	
Month & Year:	
Staff No:	
FTE (see note 5):	

Starter/Leaver Dates (see note 3)	
Start date:	
Leave date:	

Chargeable Activity		Week 1 Beginning								Week 2 Beginning							
		Hours Worked								Hours Worked							
		Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Project 1 - Title Project Type: Research Account No: Contract No:	RTD							-									-
	Demonstration							-									-
	Coordination							-									-
	Support							-									-
	Management							-									-
	Other							-									-
Project 2 - Title Project Type: Research Account No: Contract No:	RTD							-									-
	Demonstration							-									-
	Coordination							-									-
	Support							-									-
	Management							-									-
	Other							-									-
Project 3 - Title Project Type: Research Account No: Contract No:	RTD							-									-
	Demonstration							-									-
	Coordination							-									-
	Support							-									-
	Management							-									-
	Other							-									-
Project 4 - Title Project Type: Research Account No: Contract No:	RTD							-									-
	Demonstration							-									-
	Coordination							-									-
	Support							-									-
	Management							-									-
	Other							-									-
		Week 1								Week 2							
Non-chargeable Activity		Hours								Hours							
		Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Other Research Projects									-								-
Management and Administration (Excl. Mgt/Admin on FP7 Projects)									-								-
Teaching									-								-
Other (e.g. Consultancy)									-								-
		Week 1								Week 2							
Non-productive Time		Hours								Hours							
		Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Sick Leave (see note 4)									-								-
Annual Leave (see note 4)									-								-
Other non-productive time (e.g. parental leave, unpaid absence)									-								-
		Week 1								Week 2							
Total Productive (worked) hours																	
Total hours																	



AUDITOR TIMESHEET

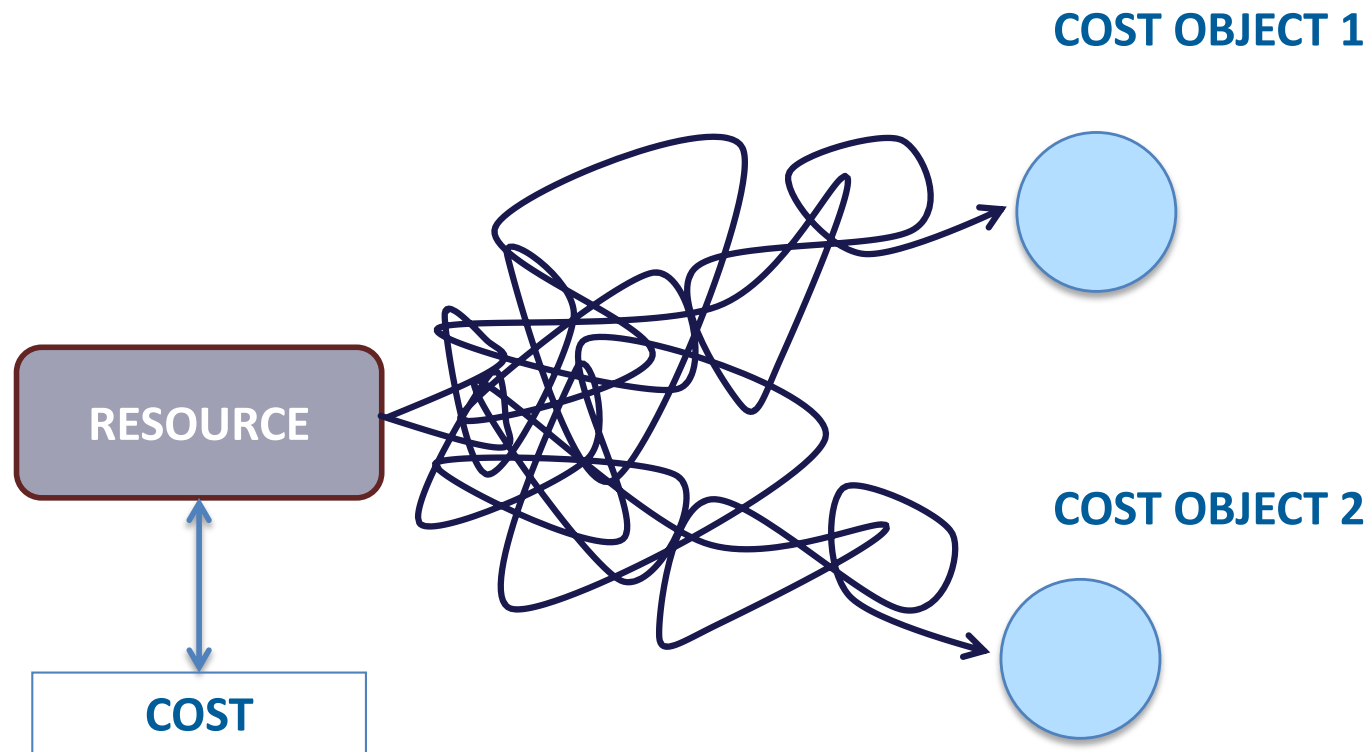
PMW: Rogers, Steven

Project	Task	Pay Type	Bill Type	Comment	Sun Aug 4	Mon Aug 5	Tue Aug 6	Wed Aug 7	Thu Aug 8	Fri Aug 9	Sat Aug 10	Totals
Corporate	Current											
Corporate	Other	Vacation	Standard	in NYC		8:00						8:00
Millstone Productions	Reqs	Regular	Standard	outline for manual				4:00				4:00
A&A Biscuit Co	Meetings	Regular	Standard	team meeting				1:30				1:30
A&A Biscuit Co	Meetings	Regular	Standard	team meeting			2:00					2:00
DalEx Inc.	Docs	Regular	Standard	online help content			6:00					6:00
	New											
		Sickday	Standard									0:00
		Regular	Standard									0:00
		Regular	Standard									0:00
Totals					0:00	8:00	8:00	5:30	0:00	0:00	0:00	21:30

[Save Changes](#)
[View Timesheet](#)
[Submit for Approval](#)
[Approval Report](#)

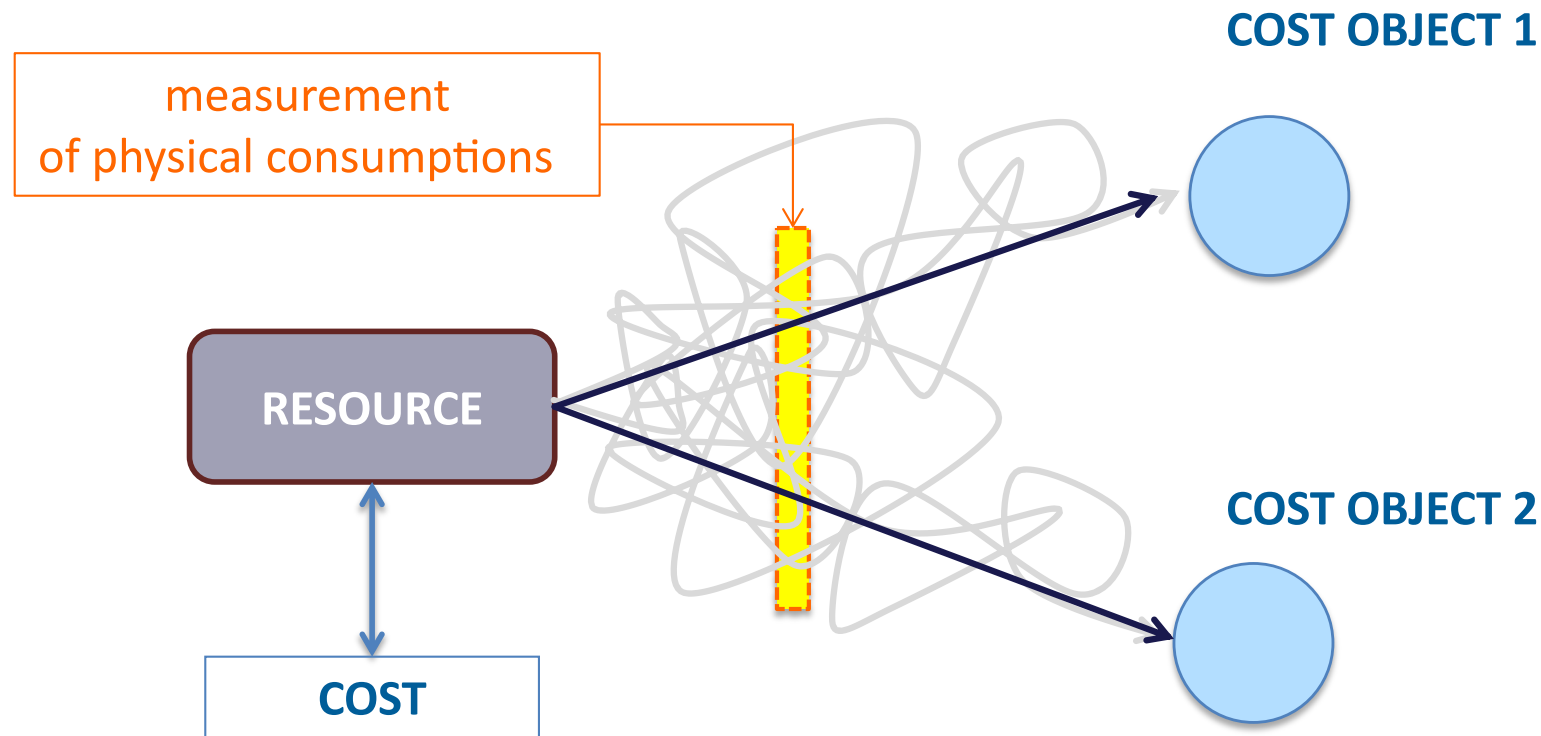
[<<](#)
[>>](#)

MULTIPLE USAGE



Normally a resource is used to support more than one cost object.

DIRECT COSTS – MEASUREMENT OF PHYSICAL CONSUMPTION



Normally a resource is used to support more than one cost object. In that case an unambiguous relation between the cost incurred and a specific cost object can be established only if it is possible to measure (in physical terms) the quantity of the resource consumed to serve the cost object considered.

MULTIPLE USAGE

Sometimes it is NOT technically or economically feasible to establish a clear, un-ambiguous relation between a resource (or a group of resources) consumed and the specific cost object considered.

In that case there are two possible options:

1. To limit the “scope” of the cost assigned to the cost object only to “direct costs”; all “indirect costs” are therefore necessarily considered “period costs”;
2. To proceed in assigning also a portion of “indirect costs” to the cost object using a specific “cost allocation” procedure.

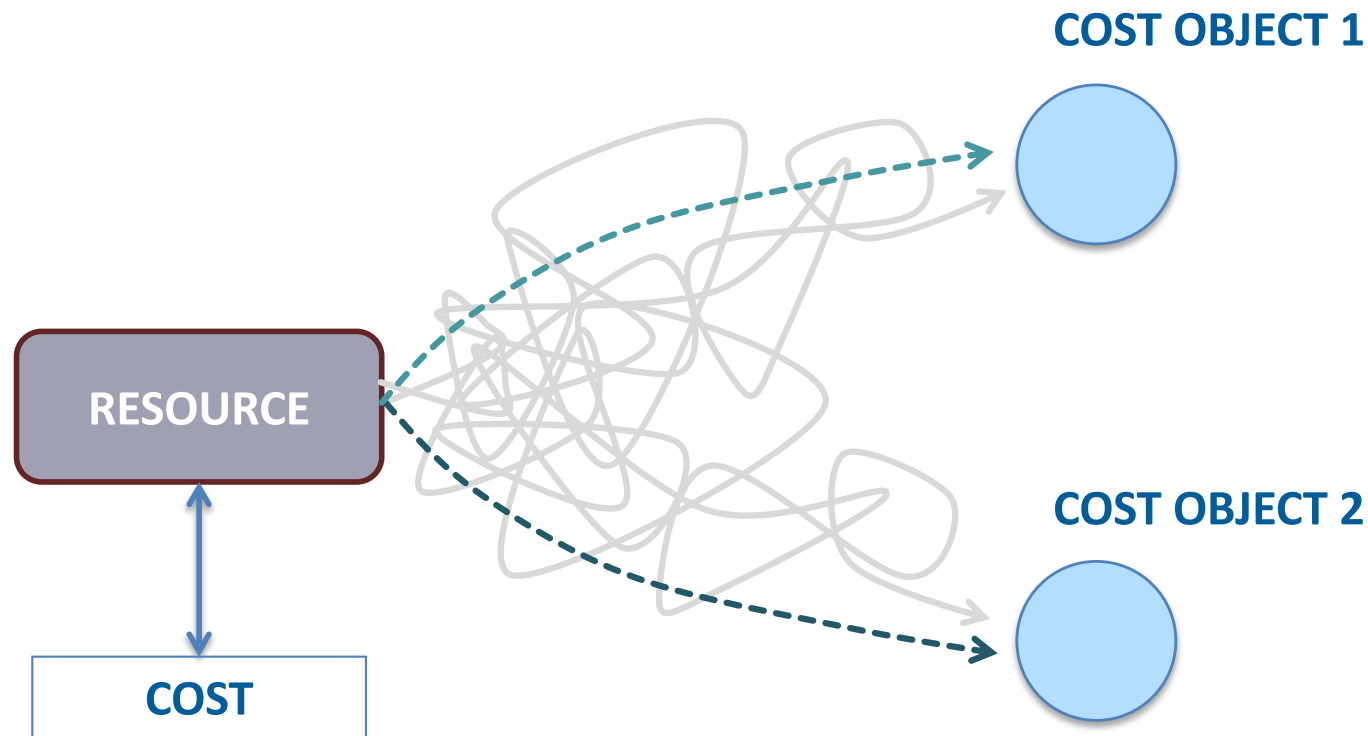


INDIRECT COSTS – NO ALLOCATION

	JOB 1	JOB 2	JOB 3	JOB ...	JOB N	Total
+ Sales Revenues	XXX	XXX	XXX	XXX	XXX	Σ
- Sales Commissions	XXX	XXX	XXX	XXX	XXX	Σ
<hr/>						
= Net Revenues	= XXX	= XXX	= XXX	= XXX	= XXX	= Σ
- Direct Materials	- XXX	- XXX	- XXX	- XXX	- XXX	Σ
<hr/>						
= First Margin	= XXX	= XXX	= XXX	= XXX	= XXX	= Σ
- Outsourced Work	- XXX	- XXX	- XXX	- XXX	- XXX	Σ
<hr/>						
= Second Margin	= XXX	= XXX	= XXX	= XXX	= XXX	= Σ
- Other Direct Costs	- XXX	- XXX	- XXX	- XXX	- XXX	Σ
- Direct Labor	- XXX	- XXX	- XXX	- XXX	- XXX	Σ
<hr/>						
= Job Orders Direct Margin	= XXX	= XXX	= XXX	= XXX	= XXX	= Σ
<hr/>						
- Manufacturing Overhead						- XXX
- Selling Overhead Expenses						- XXX
- Administrative Expenses						- XXX
- General Expenses						- XXX
<hr/>						
= Ebit						= XXX

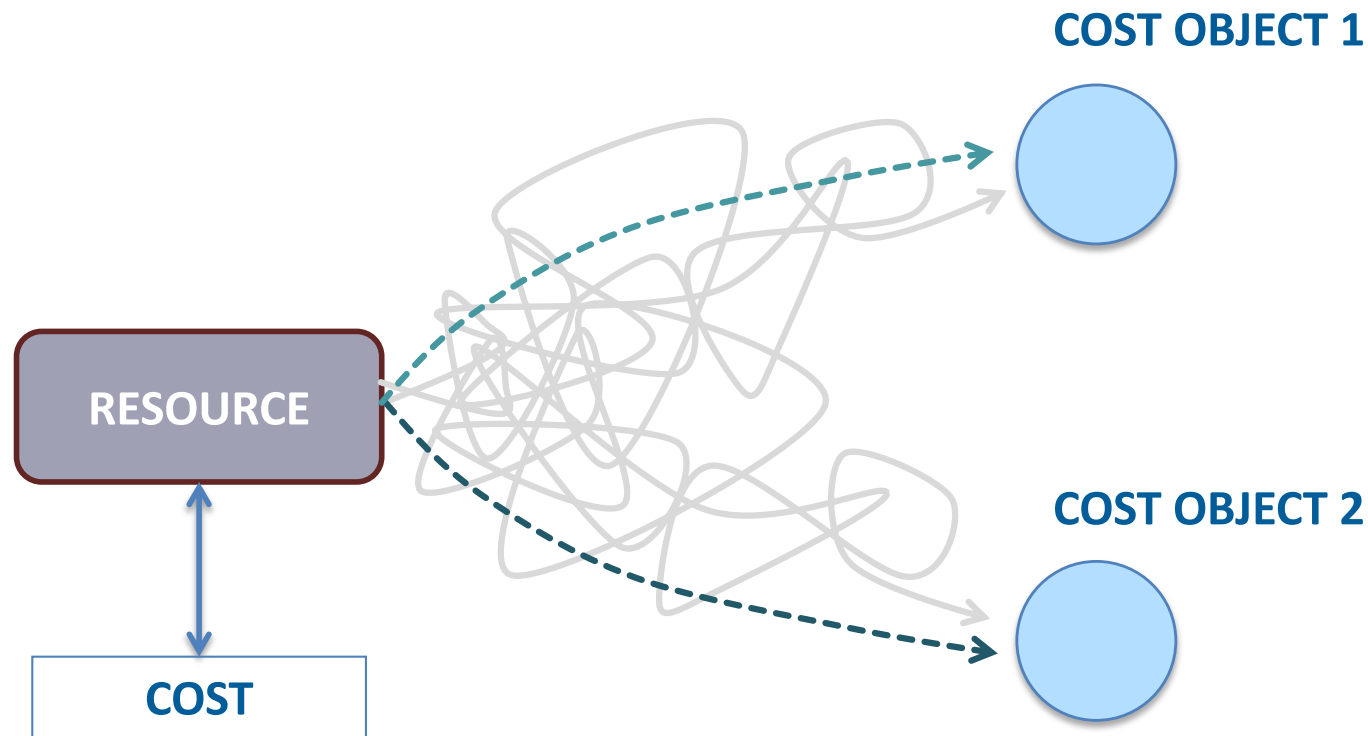


INDIRECT COSTS – ASSIGNING THEM TO COST OBJECT



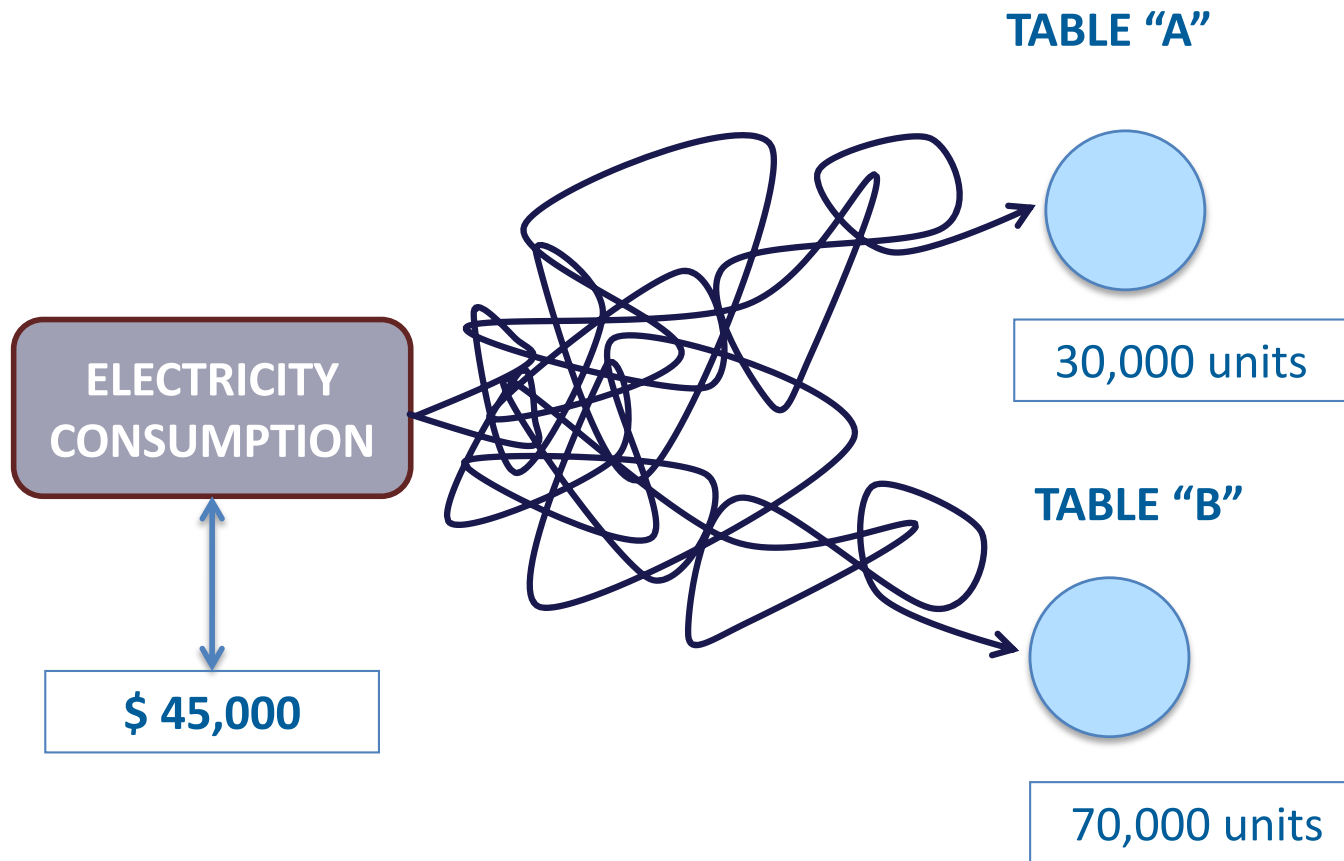
Cost allocation is the process of identifying, aggregating, and assigning **indirect costs** to several **cost objects**. The term "allocation" implies that there is no overly precise method available for charging a cost to a cost object (therefore one can not **trace** the costs to the cost object) we use instead an **"allocation base"**.

INDIRECT COSTS – ALLOCATION BASE

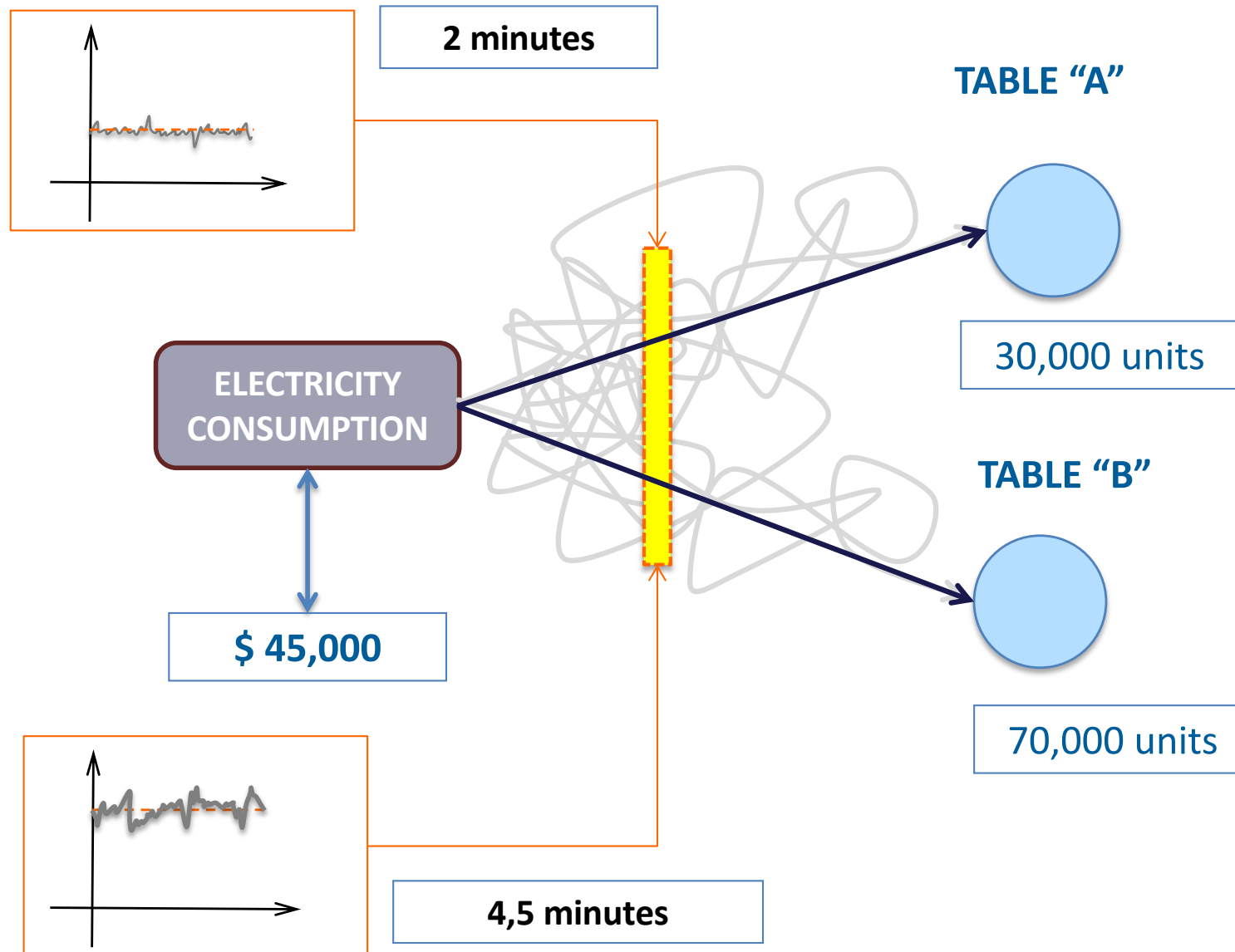


An allocation base is a parameter that could be used as a “**proxy**” of resource consumption. Therefore, in this instance, we do not measure the consumption, but we try to establish its value using a variable that - we believe - is correlated with the level of resource usage.

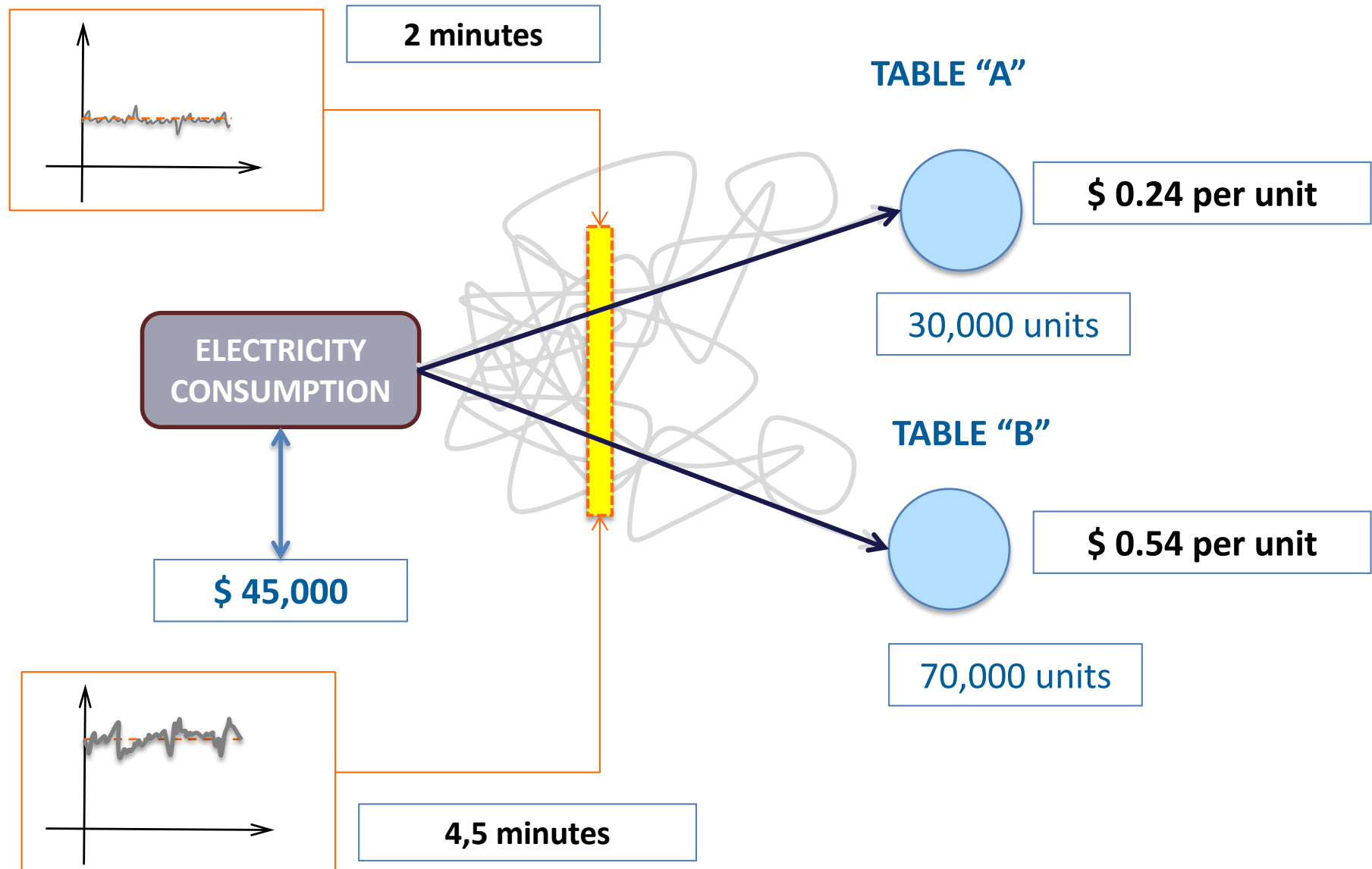
A SIMPLE EXAMPLE – ELECTRICITY COST DUE TO SANDING ACTIVITIES



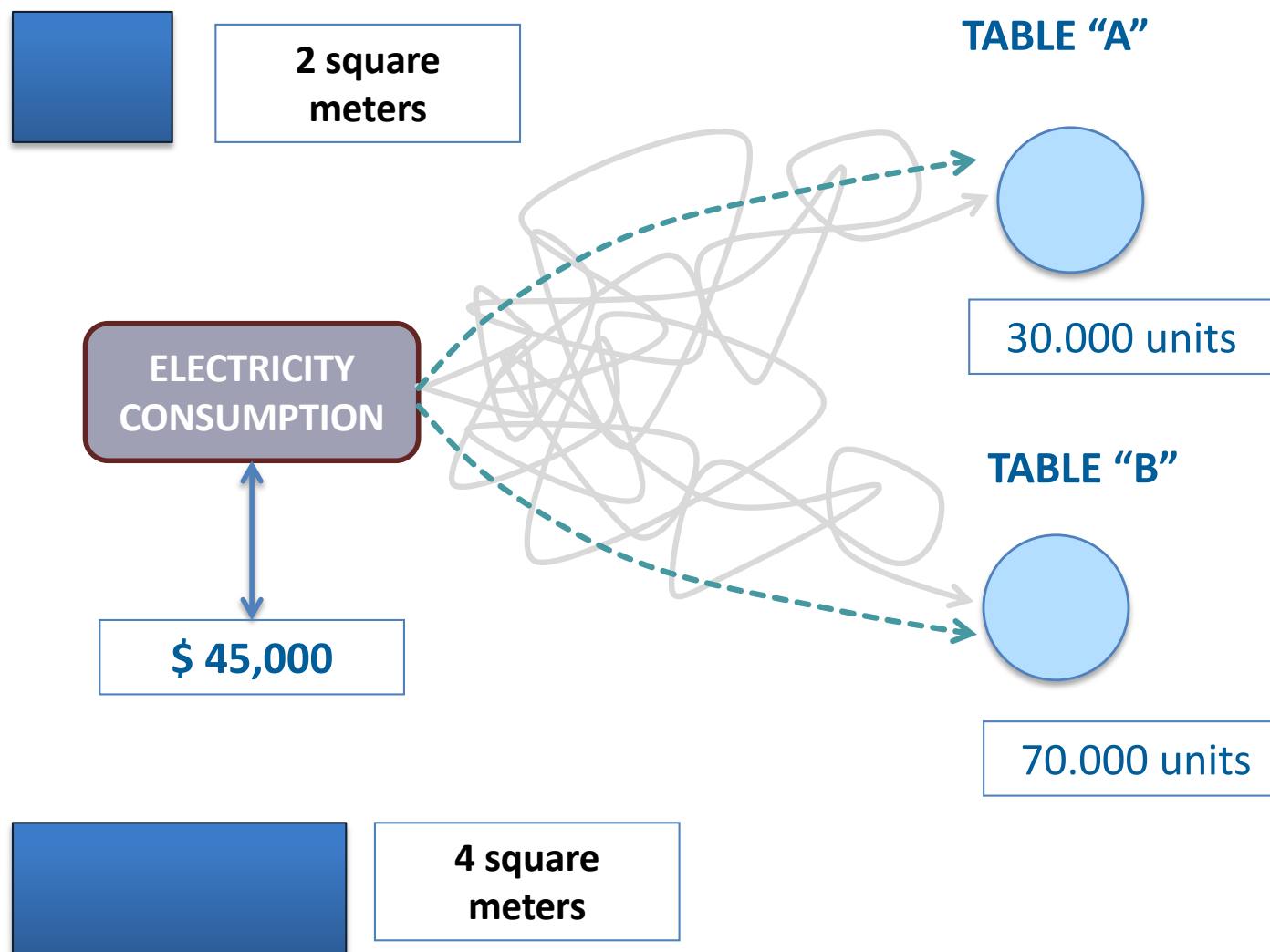
A SIMPLE EXAMPLE – MEASURING THE CONSUMPTION OF RESOURCE



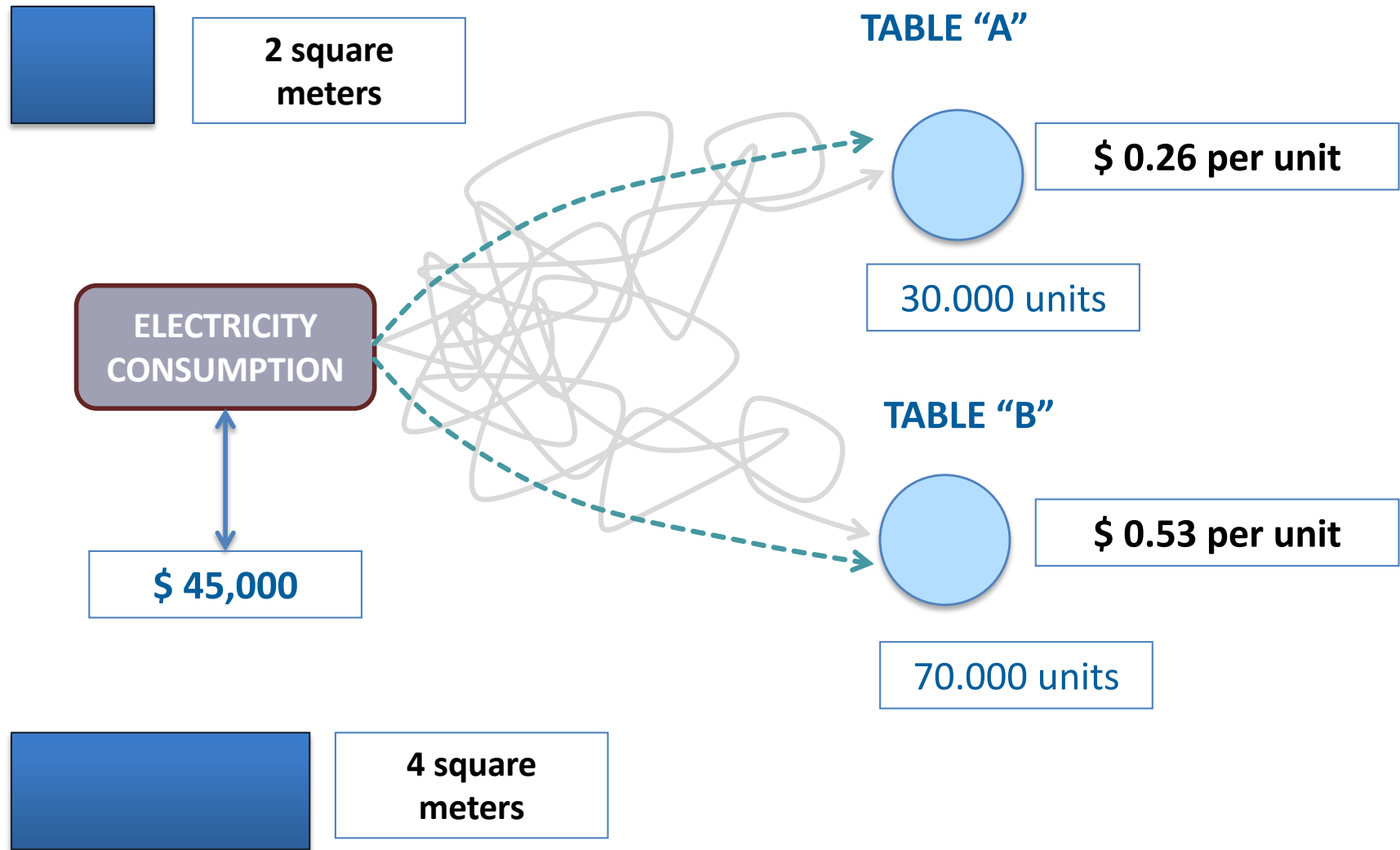
A SIMPLE EXAMPLE – MEASURING THE CONSUMPTION OF RESOURCE



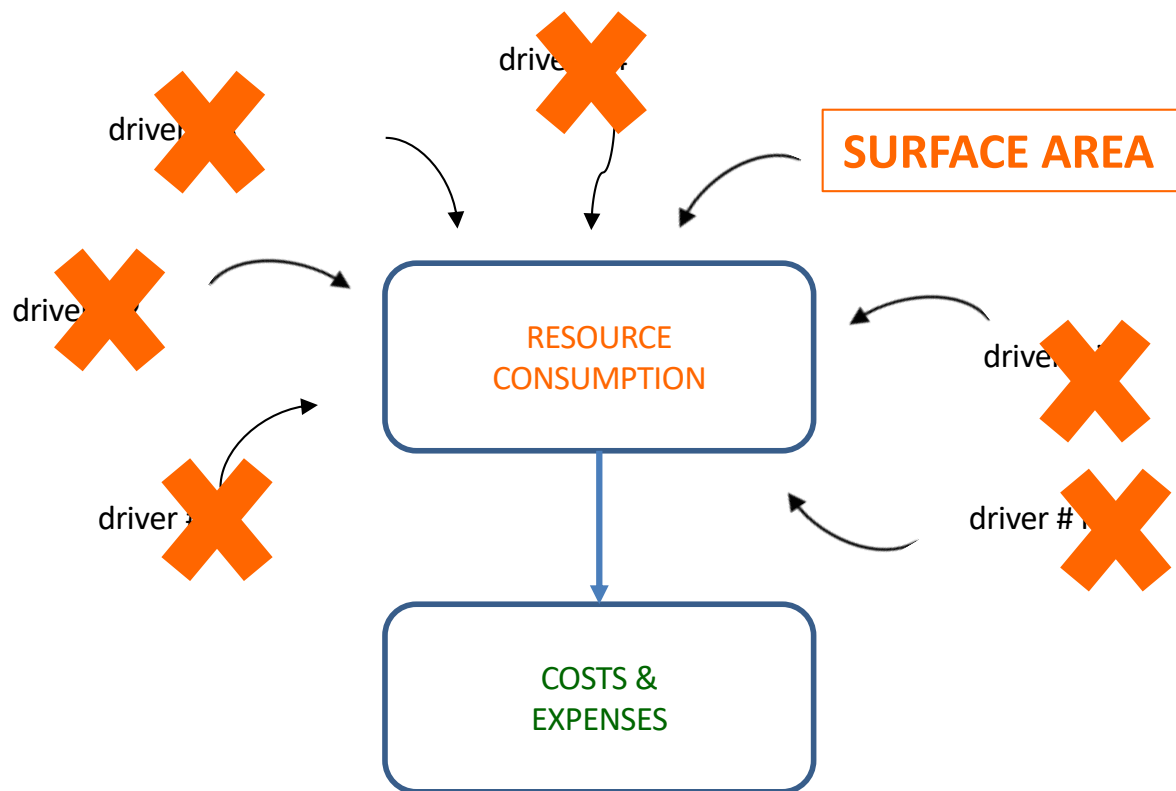
A SIMPLE EXAMPLE – USING A FAIR, REASONABLE PROXY



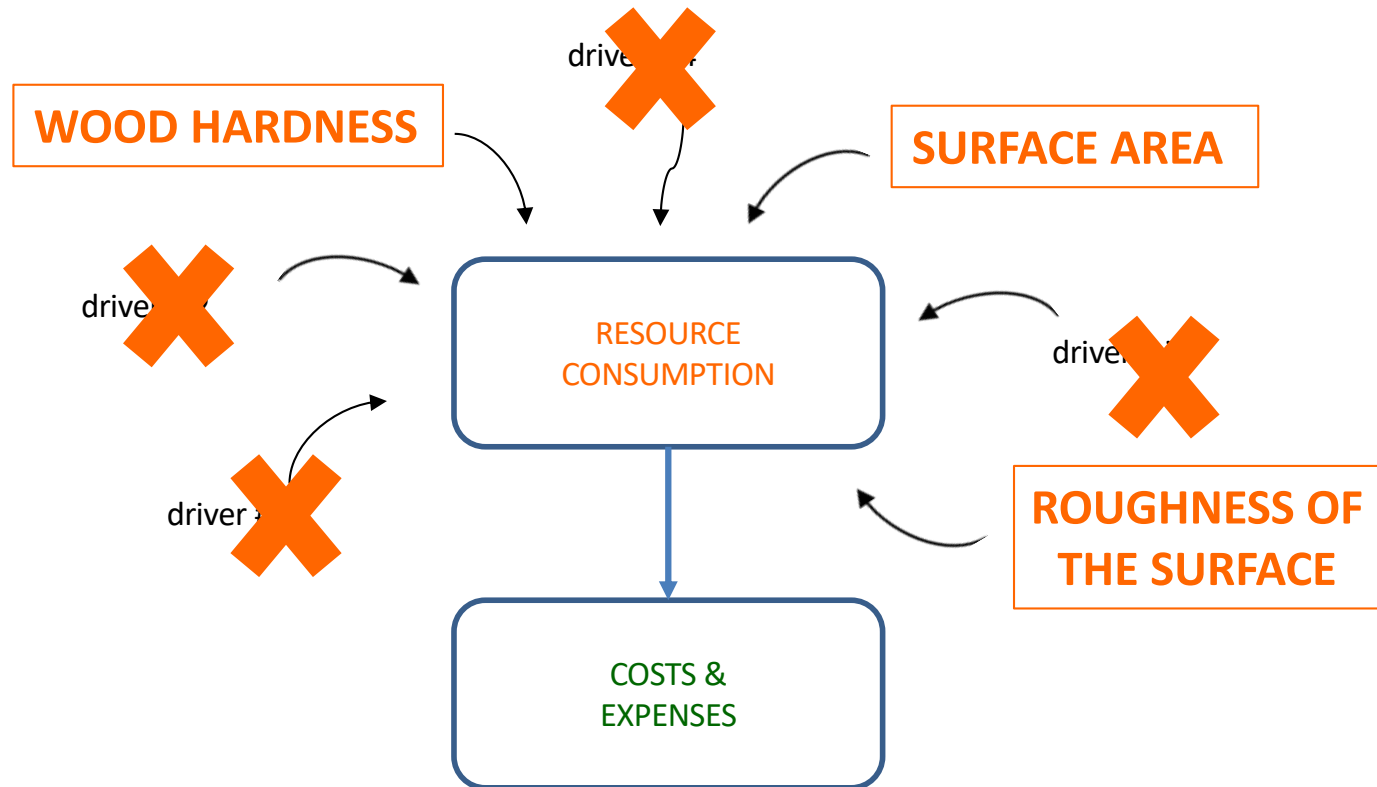
A SIMPLE EXAMPLE – USING A FAIR, REASONABLE PROXY



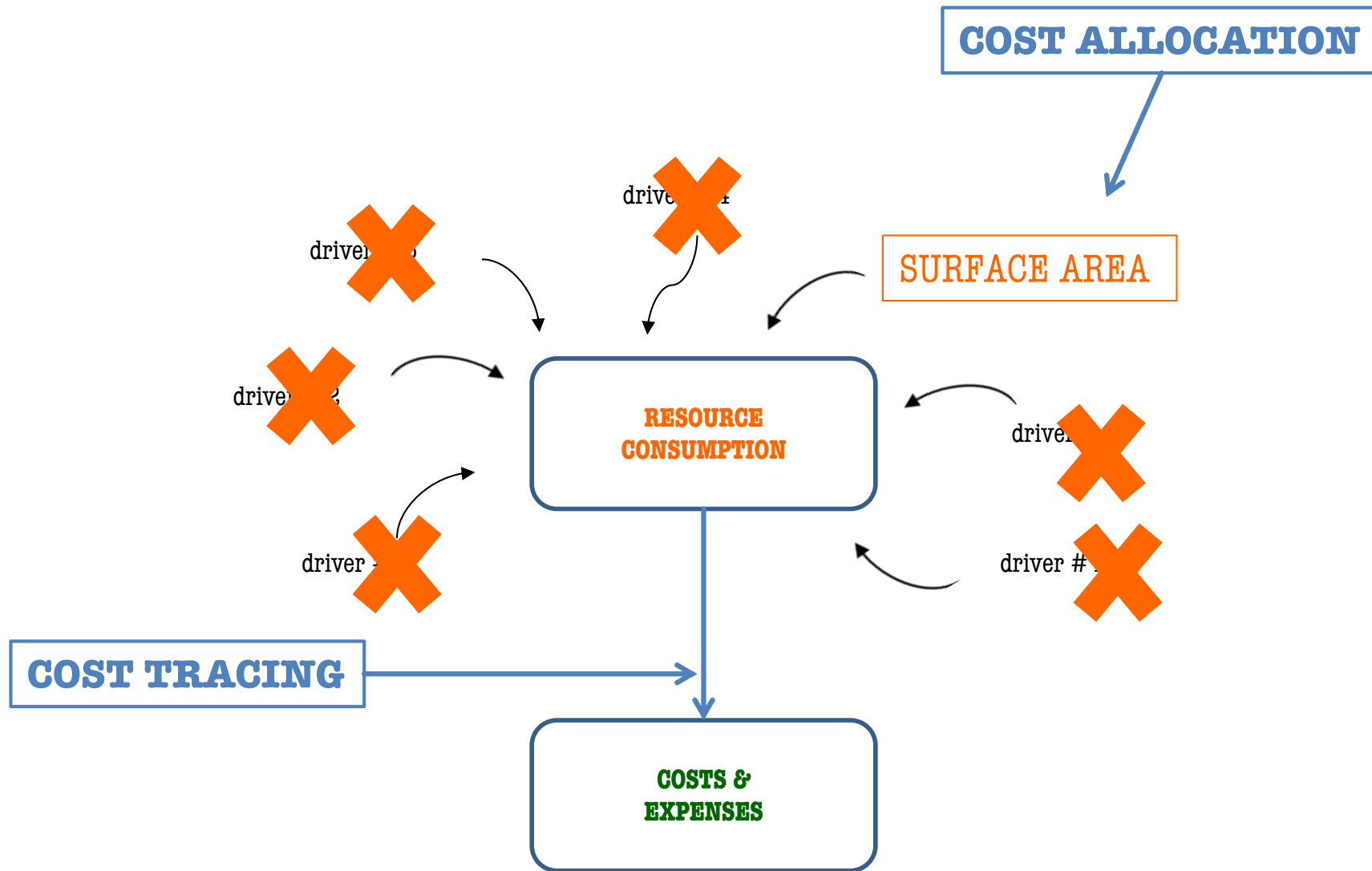
A SIMPLE EXAMPLE – WHAT IS THE DRIVER?



A SIMPLE EXAMPLE – WHAT IF MORE THAN ONE DRIVER EXIST?



COST TRACING VS COST ALLOCATION



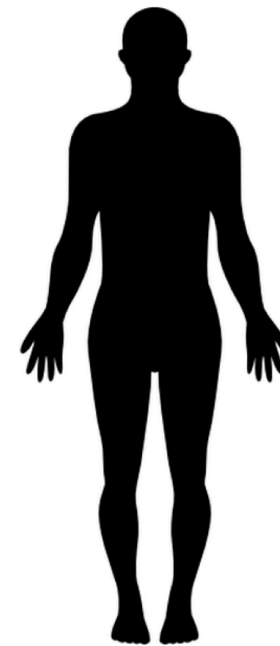
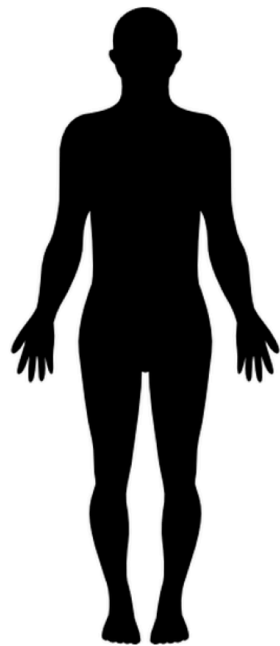
CROSSING THE TWO CLASSIFICATION CRITERIA

		Assignment of Costs to Cost Object	
		Direct Costs	Indirect Costs
Cost-Behavior Pattern	Variable Costs	<ul style="list-style-type: none"> • Cost object: BMW X5s produced Example: Tires used in assembly of automobile 	<ul style="list-style-type: none"> • Cost object: BMW X5s produced Example: Power costs at Spartanburg plant. Power usage is metered only to the plant, where multiple products are assembled.
	Fixed Costs	<ul style="list-style-type: none"> • Cost object: BMW X5s produced Example: Salary of supervisor on BMW X5 assembly line 	<ul style="list-style-type: none"> • Cost object: BMW X5s produced Example: Annual lease costs at Spartanburg plant. Lease is for whole plant, where multiple products are produced.

FONTE: Horngren-Datar-Rajan, "Cost Accounting. A Managerial Emphasis", Fourteenth Edition



COST RATE



COST RATE

The **cost rate** is a ratio in which the numerator is a monetary amount and the denominator is a different quantity, normally a physical quantity. The cost rate is, therefore always expressed in the form “euros per liter” or “dollars per unit,” “pounds per case,” “doubloons per square meter,” and so on...

The **direct cost rate** is a relationship in which the monetary amount, appearing in the numerator, and the physical quantity appearing in the denominator refer to the same resource (or group of resources), meaning that the measure placed in the denominator represents the quantity of resource (purchased or consumed) that is valued in the numerator. The rate tells us, then, how much a dose of that resource, whether purchased or consumed, cost.

The **indirect cost rate**, on the other hand, relates a monetary amount related to one or more resources whose consumption has not been measured (because the thing is either not technically possible or does not make economic sense). The physical measure placed at the numerator, therefore, does not represent a direct measure of the consumption of the resource at the denominator, but highlights a possible relationship that indirectly attempts to reconstruct the consumption relationship. Note that very often this parameter is, instead, representative of a resource for which the measurement of consumption has actually occurred. In fact, for convenience, measures that are already available are often employed because they are obtained through the need to impute the most significant resources directly to the cost objects.



THE COST RATE IN THE COST ALLOCATION PROCESS

COSTS TO BE ASSIGNED

ATTRIBUTION BASE

TOTAL MANUFACTURING COSTS

TOTAL DIRECT LABOR HOURS

MANUFACTURING VARIABLE OH

TOTAL DIRECT COSTS



COST TRACING – DIRECT MATERIALS

0.82 ounces per biscuit

0.02 \$ per ounce

DIRECT MATERIALS
QUANTITY

*

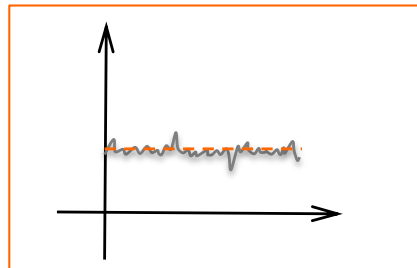
DIRECT MATERIALS
PRICE

Total quantity of material used

of product obtained

Total purchase cost

Total quantity of material acquired



COST TRACING – DIRECT MATERIALS

units, grams, liters, meters
of direct materials used in the period

units, grams, liters, meters
of product obtained

DIRECT MATERIALS
QUANTITY

*

value of the direct material
purchased in the period

units, grams, liters, meters
Of direct materials purchased

DIRECT MATERIALS
PRICE

DIRECT MATERIALS COST PER UNIT



DIRECT MATERIALS – STANDARD COSTING

The direct materials price standard is **the cost per unit of direct materials that should be incurred**. This standard should be based on the purchasing department's best estimate of the cost of raw materials. This cost is frequently based on current purchase prices. The price standard also includes an amount for related costs such as receiving, storing, and handling.

DIRECT MATERIALS
QUANTITY STANDARD

*

DIRECT MATERIALS
PRICE STANDARD

The direct materials quantity standard is the quantity of direct materials that should be used per unit of finished goods. **This standard is expressed as a physical measure**, such as pounds, barrels, or board feet. In setting the standard, **management considers both the quality and quantity of materials required** to manufacture the product. The standard **includes allowances for unavoidable waste and normal spoilage**.



COST TRACING – DIRECT LABOR

22.5 minutes per unit

0.45 \$ per minute

**DIRECT LABOR
QUANTITY**

*

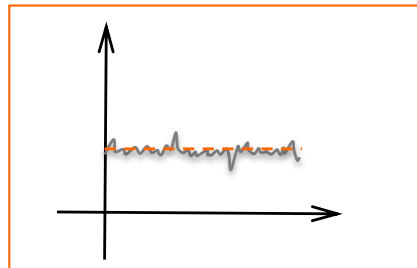
**DIRECT LABOR
PRICE (OR RATE)**

of hours of direc labor used

Wages, social security charges and fringe benefits

of product obtained

of hours of direc labor available



COST TRACING – DIRECT LABOR

time required to make the amount
of product obtained in the period

units, grams, liters, meters of
product obtained

DIRECT LABOR
EFFICIENCY

*

total wage & fringe benefits paid
to employees for the period

hours of work available

DIRECT LABOR
RATE

DIRECT LABOR COST PER UNIT



DIRECT LABOR – STANDARD COSTING

The direct labor price standard is **the rate per hour that should be incurred for direct labor**. This standard is based on current wage rates, adjusted for anticipated changes such as cost of living adjustments. The price standard also generally **includes employer payroll taxes and fringe benefits**, such as paid holidays and vacations. The direct labor price standard is also called the **direct labor rate standard**.

$$\text{DIRECT LABOR QUANTITY STANDARD} * \text{DIRECT LABOR PRICE STANDARD}$$

The direct labor quantity standard is **the time that should be required to make one unit of the product**. This standard is especially critical in labor-intensive companies. **Allowances should be made in this standard for rest periods, cleanup, machine setup, and machine downtime**. The direct labor quantity standard is also called the **direct labor efficiency standard**.



COST ALLOCATION – COST RATE

$$\frac{\text{AMOUNT OF COST TO BE ASSIGNED}}{\text{TOTAL ATTRIBUTION BASE}} *$$

OVERHEAD COST RATE

Attribution base
referring only
to Product j

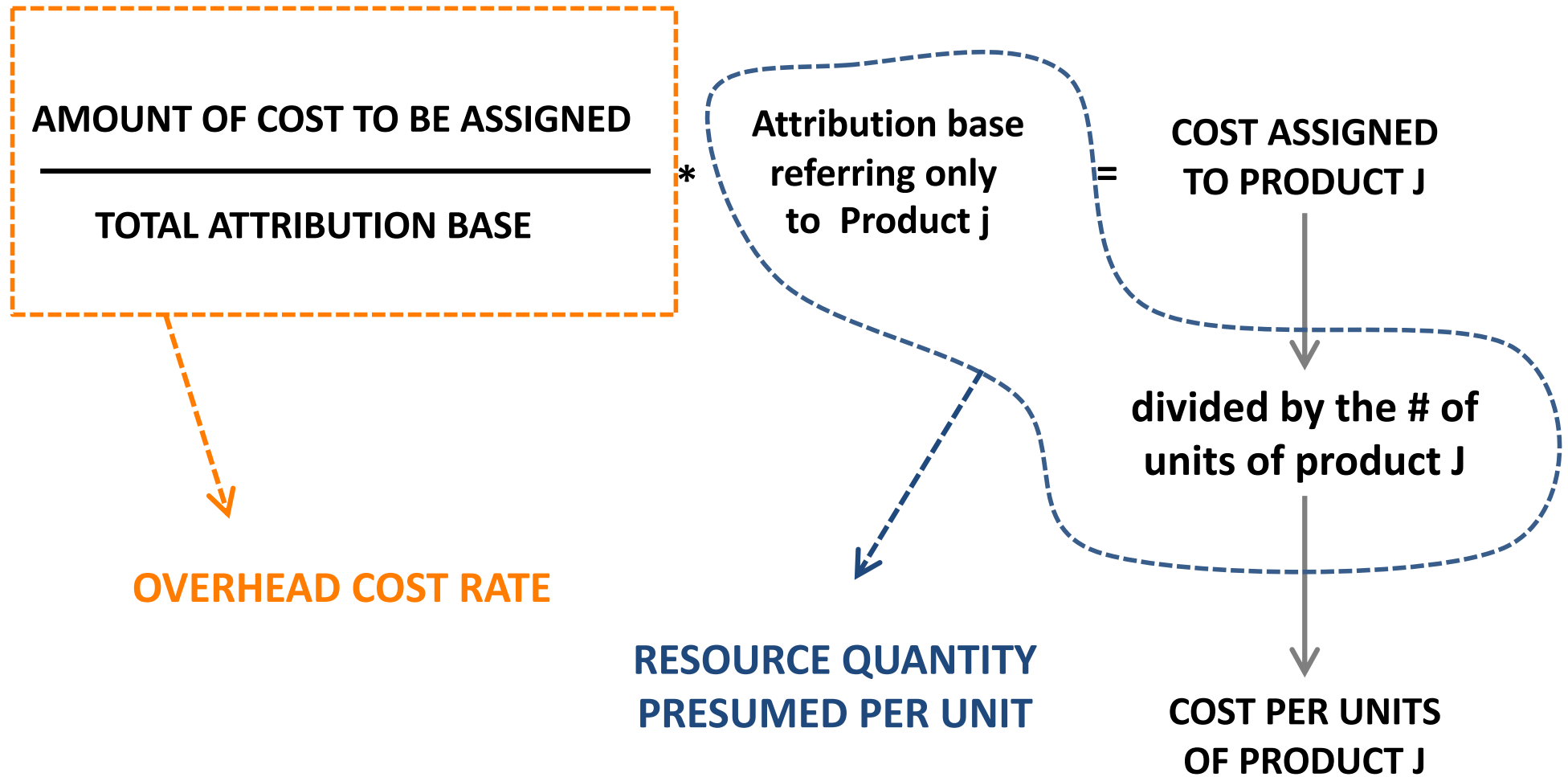
= COST ASSIGNED
TO PRODUCT J

↓
divided by the # of
units of product J

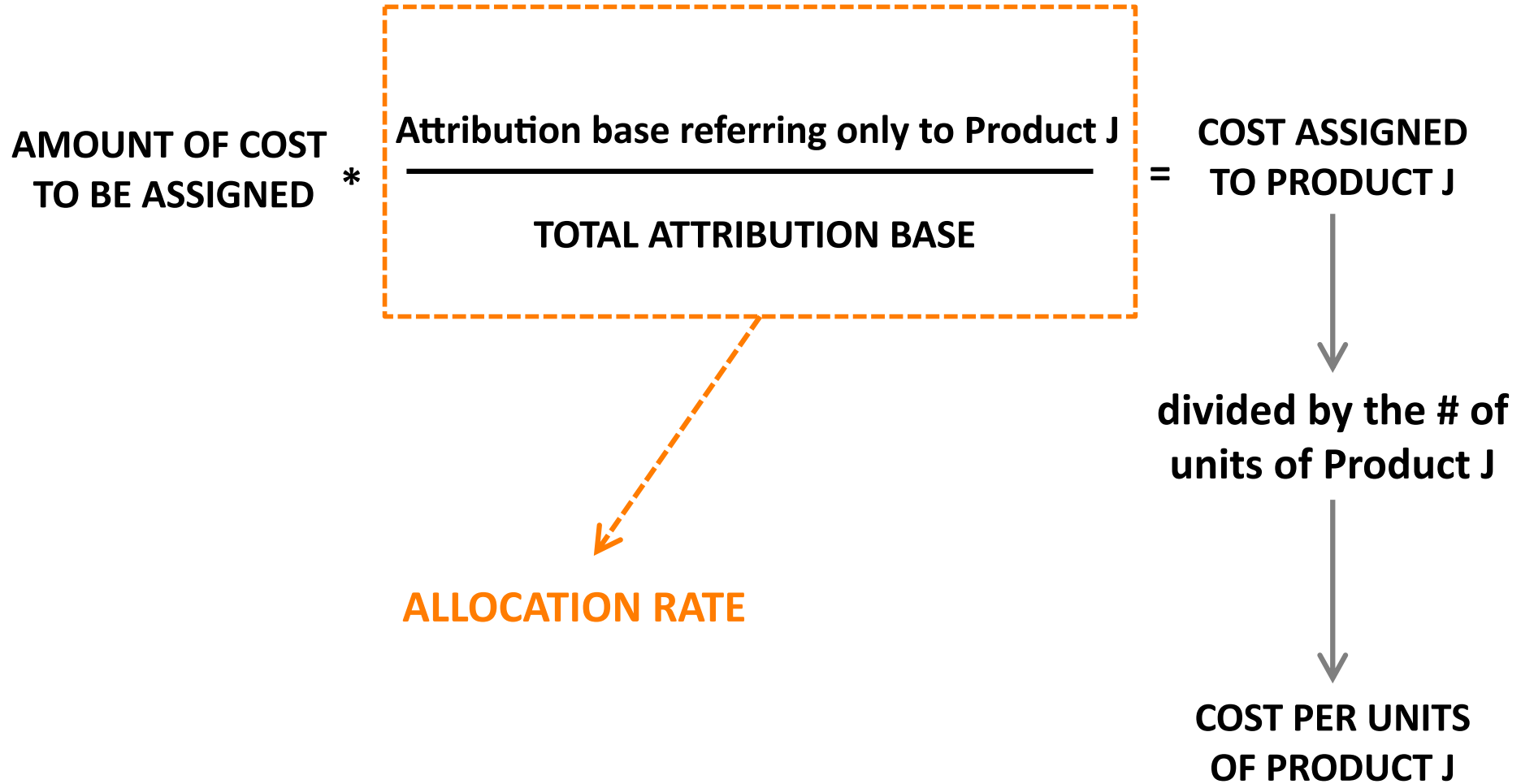
↓
COST PER UNITS
OF PRODUCT J



COST ALLOCATION – COST RATE

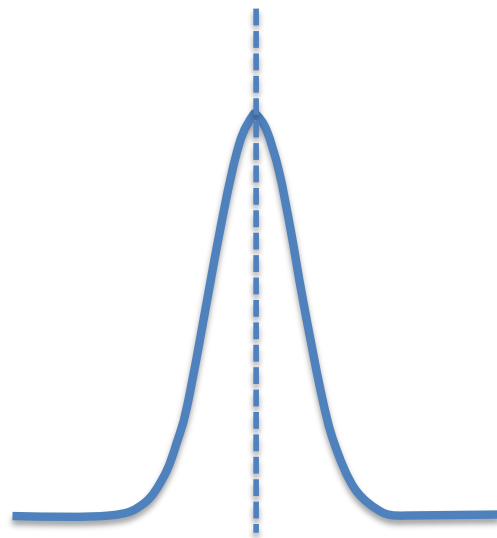


COST ALLOCATION – ALLOCATION RATE



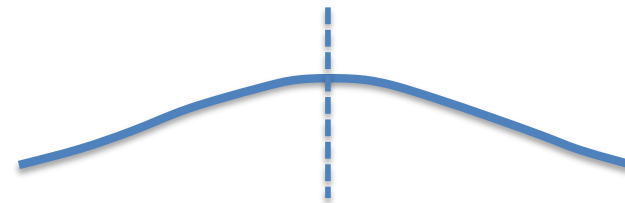
CLOTHING MANUFACTURER

In your opinion which of the two averages is more relevant for decision making?



5'10''

average height of the population

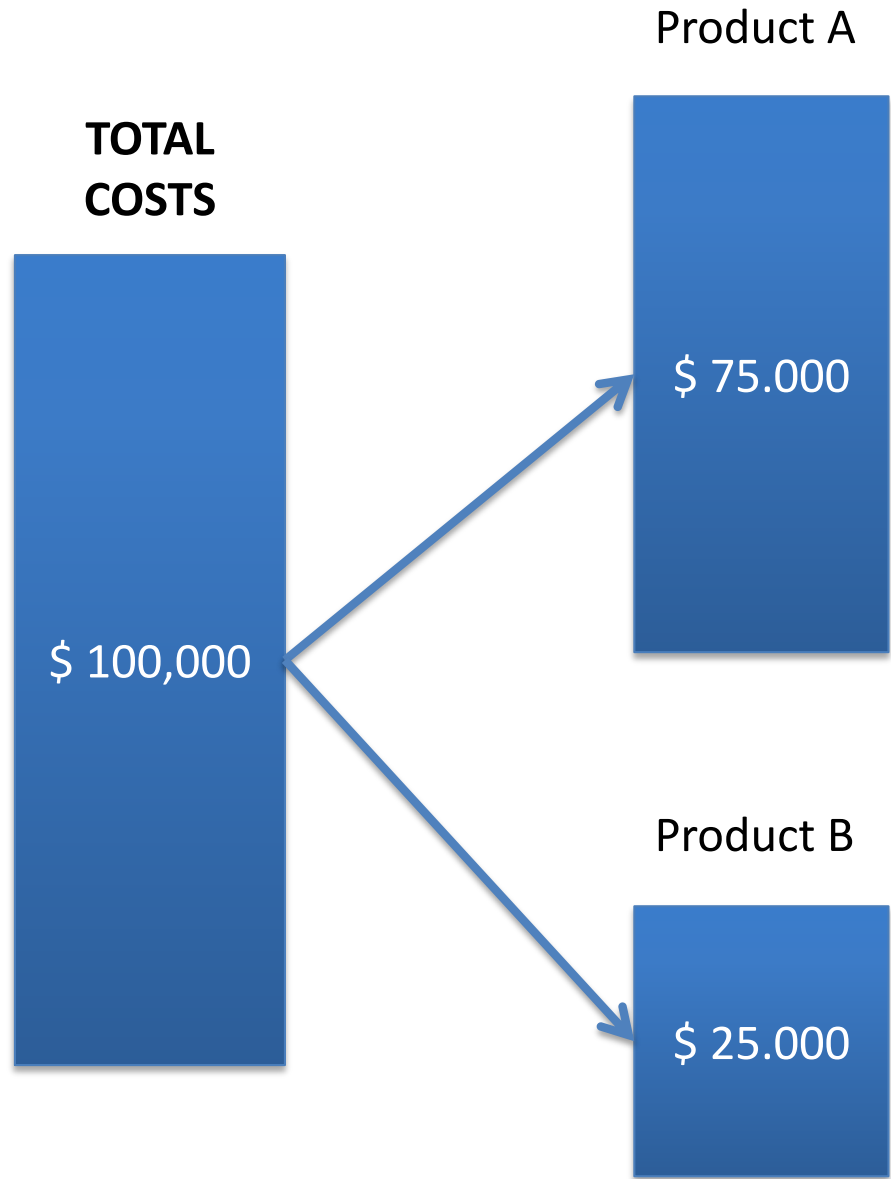


5'10''

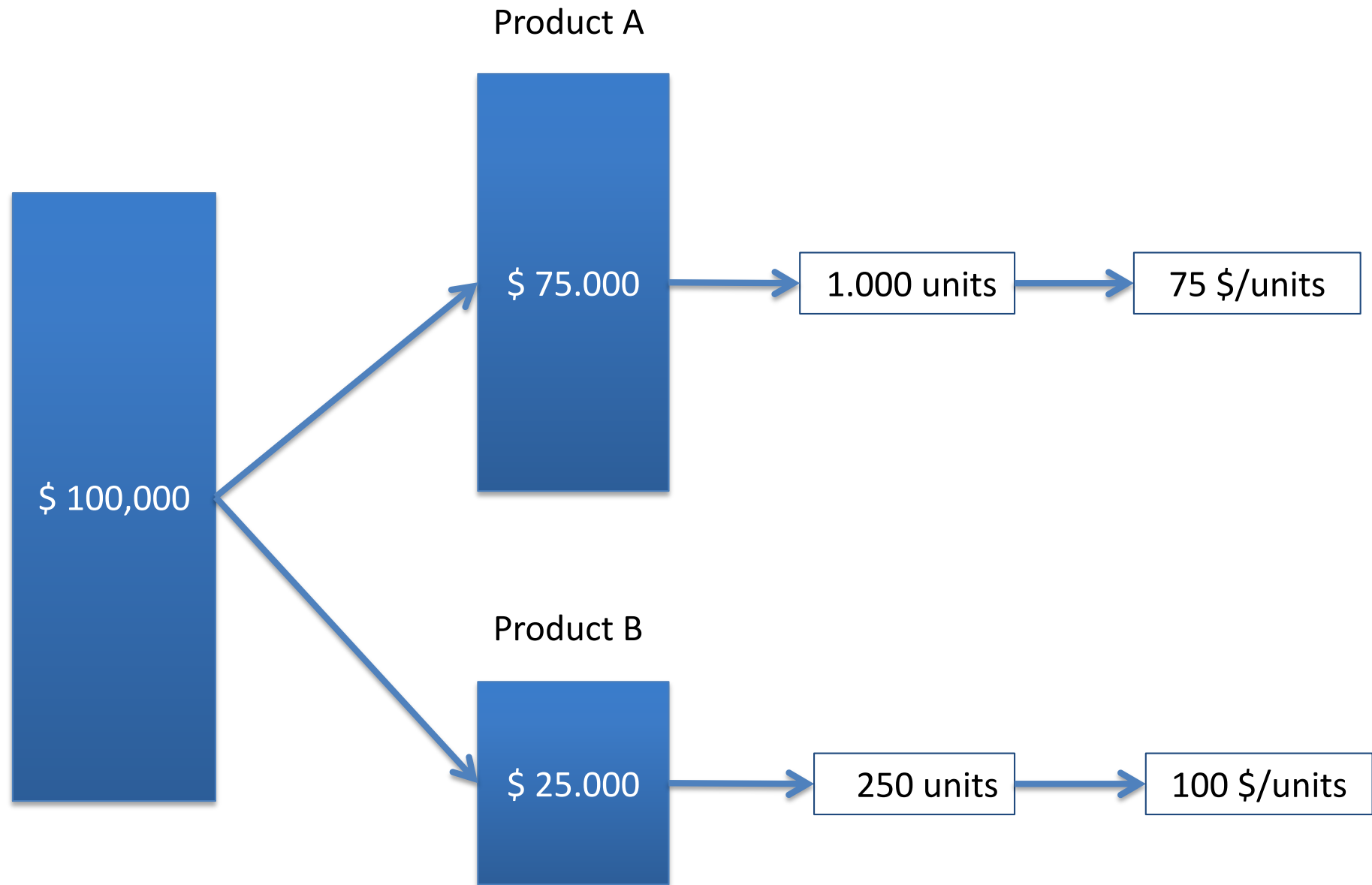
average height of the population



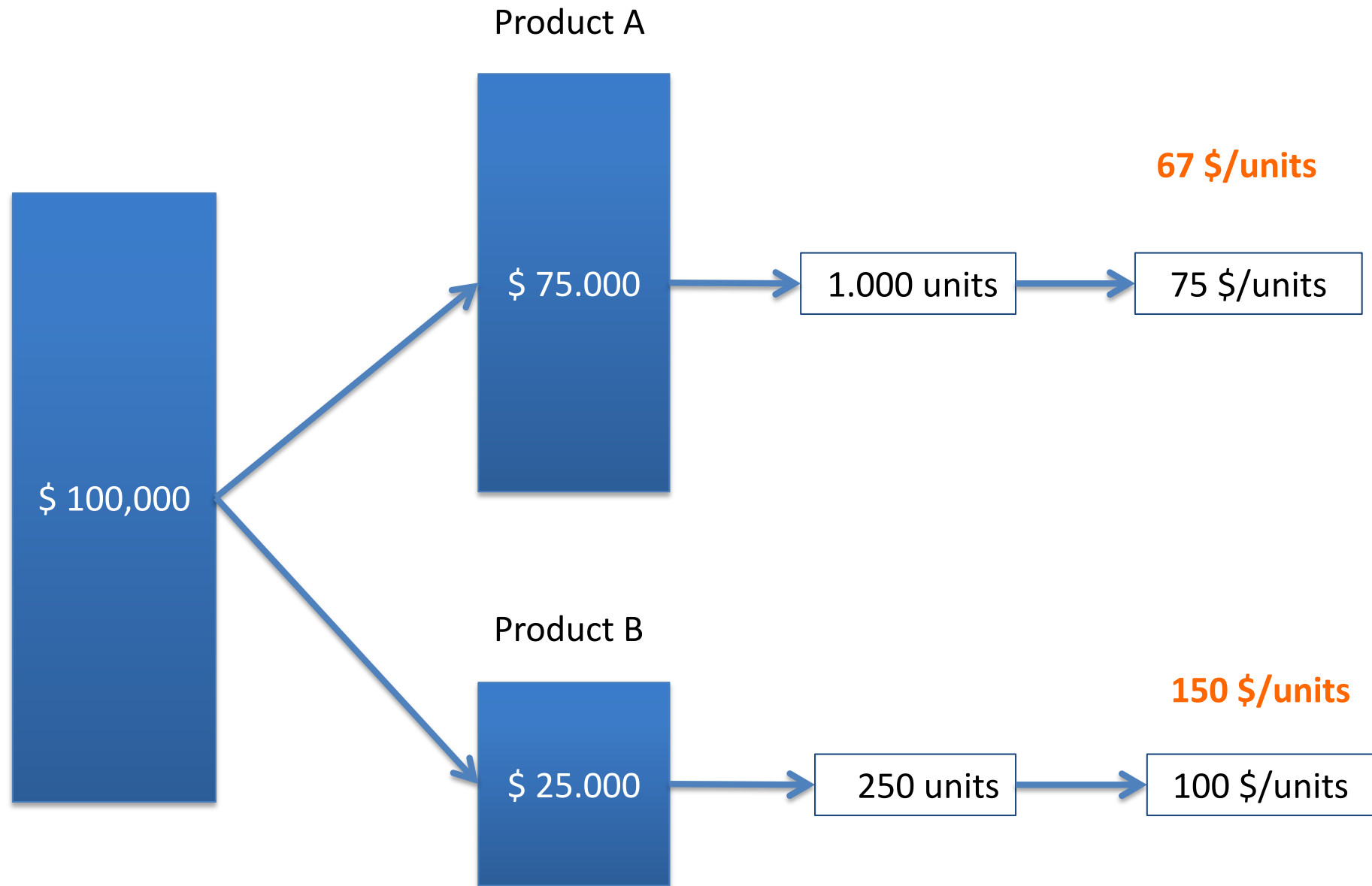
AN EXAMPLE ON COST ALLOCATION



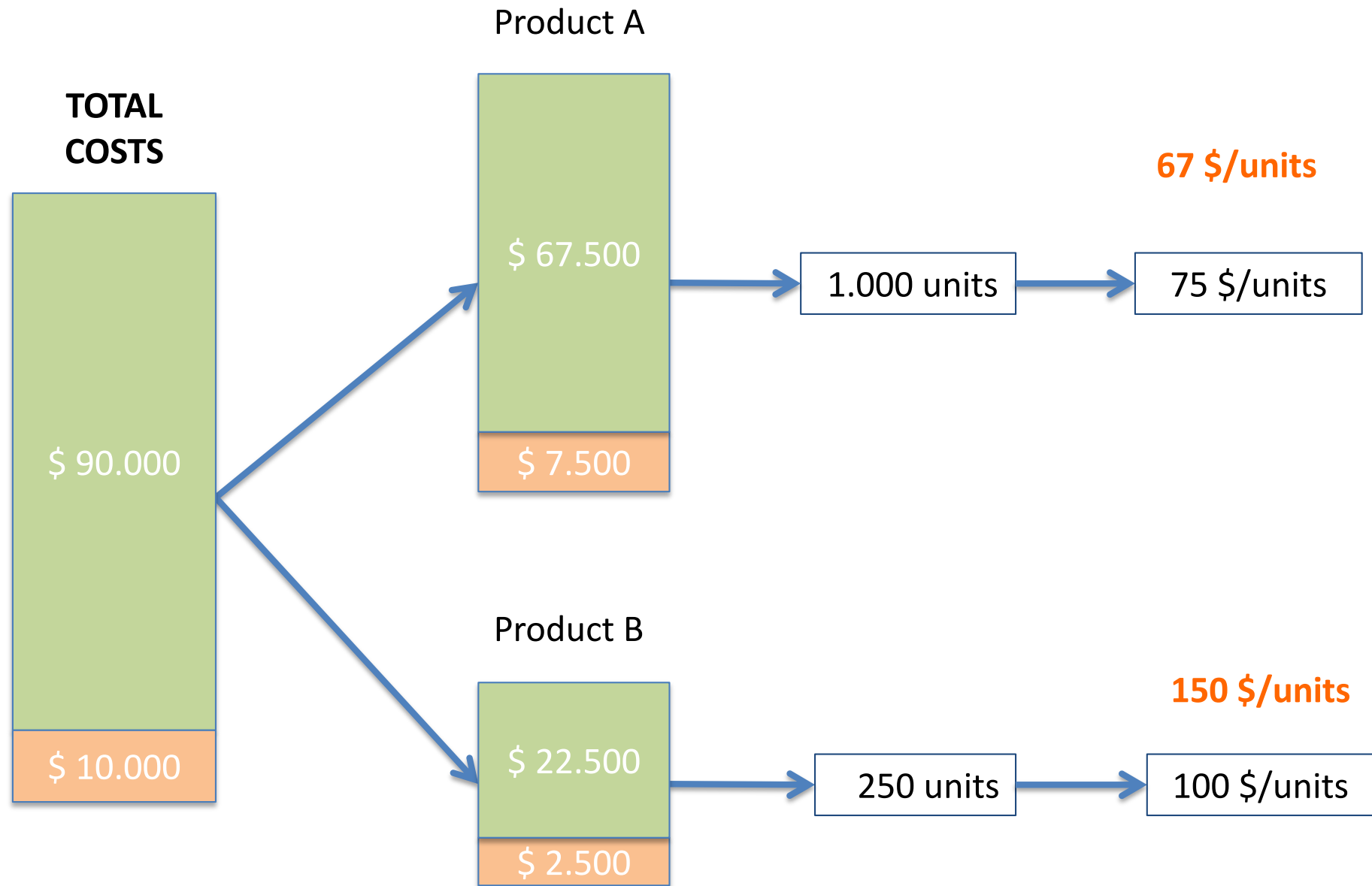
AN EXAMPLE ON COST ALLOCATION



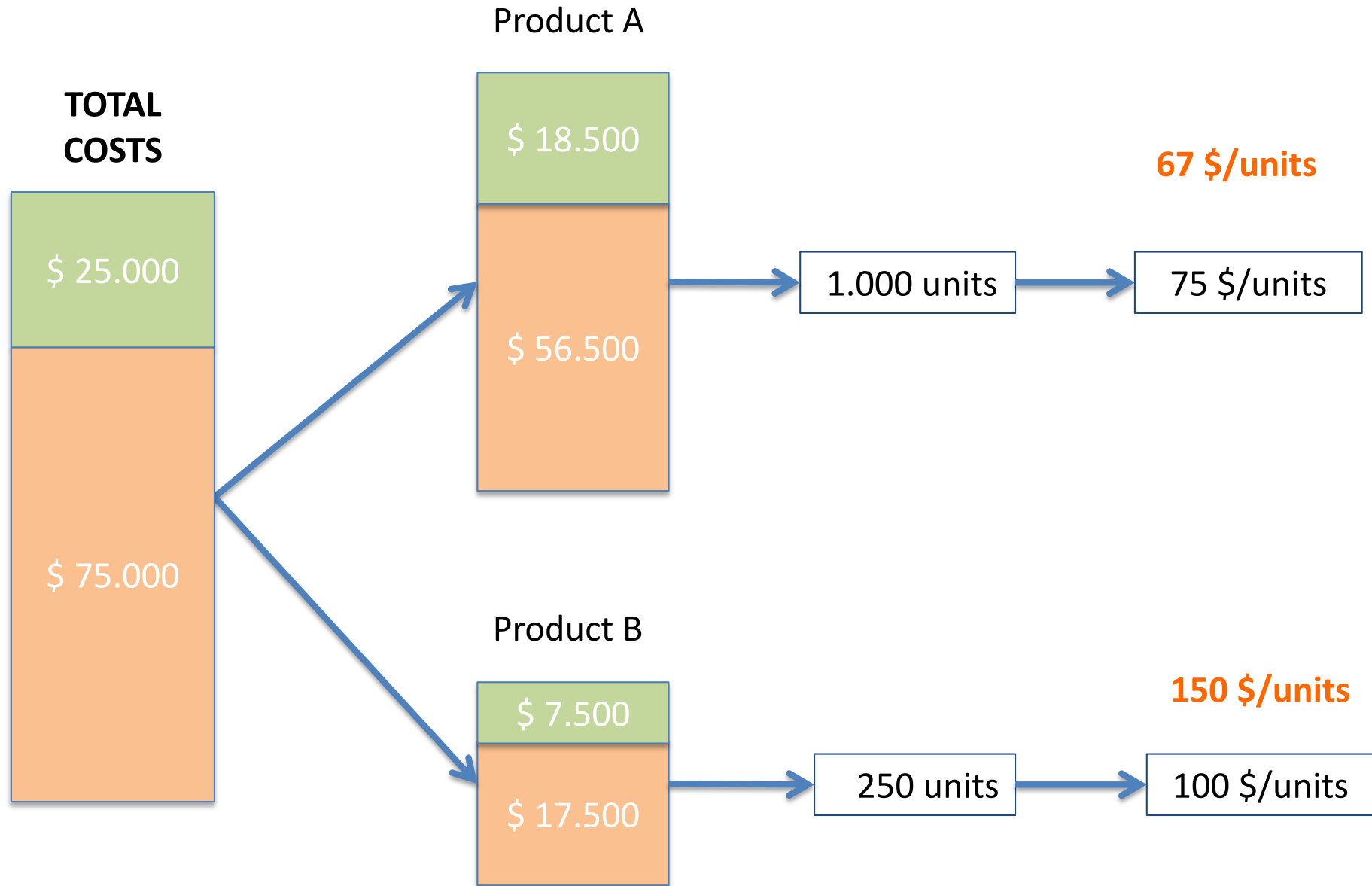
AN EXAMPLE ON COST ALLOCATION



PREVALENCE OF DIRECT COSTS

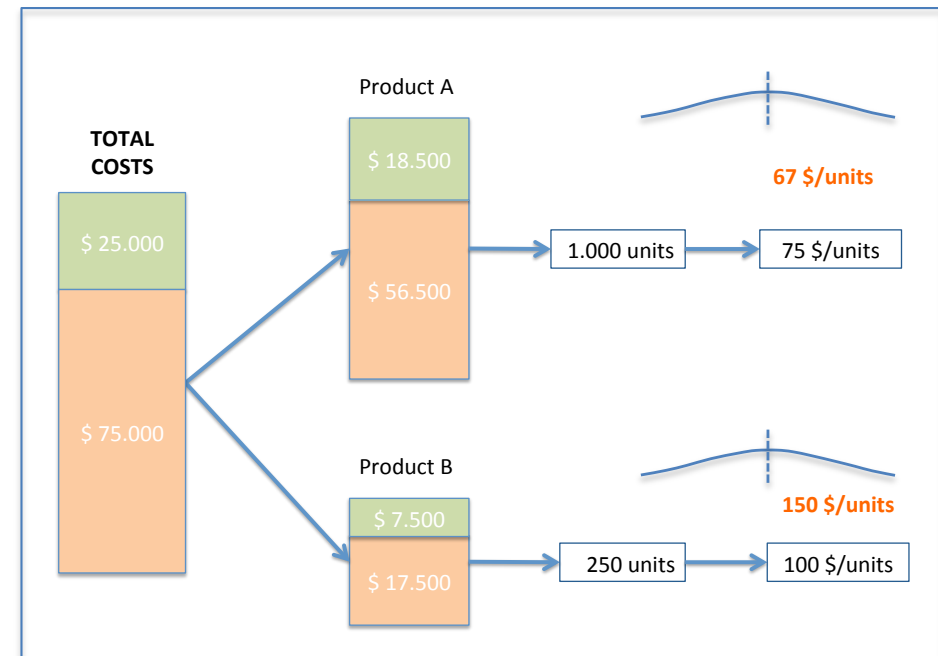
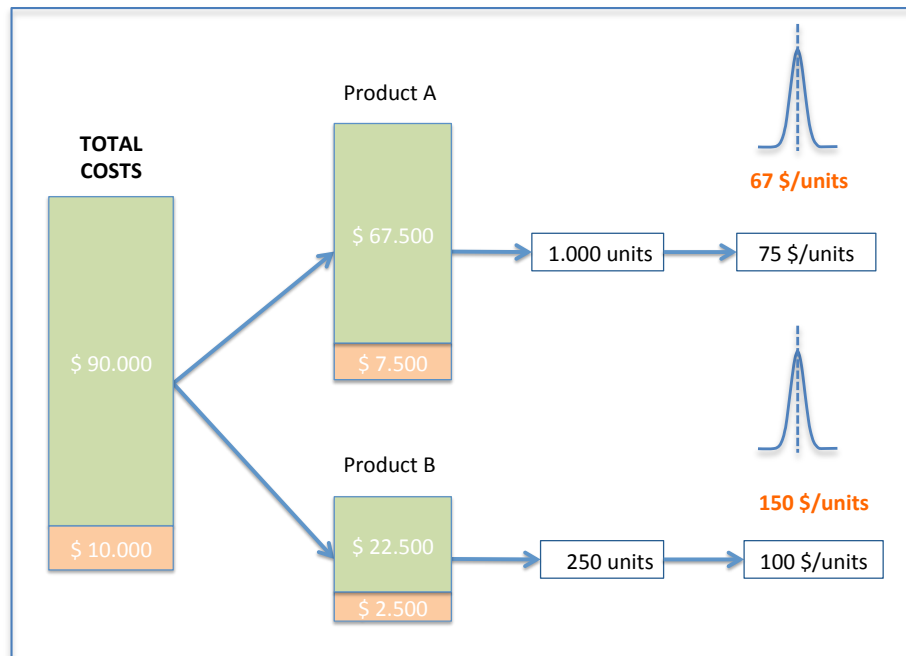


PREVALENCE OF INDIRECT COSTS

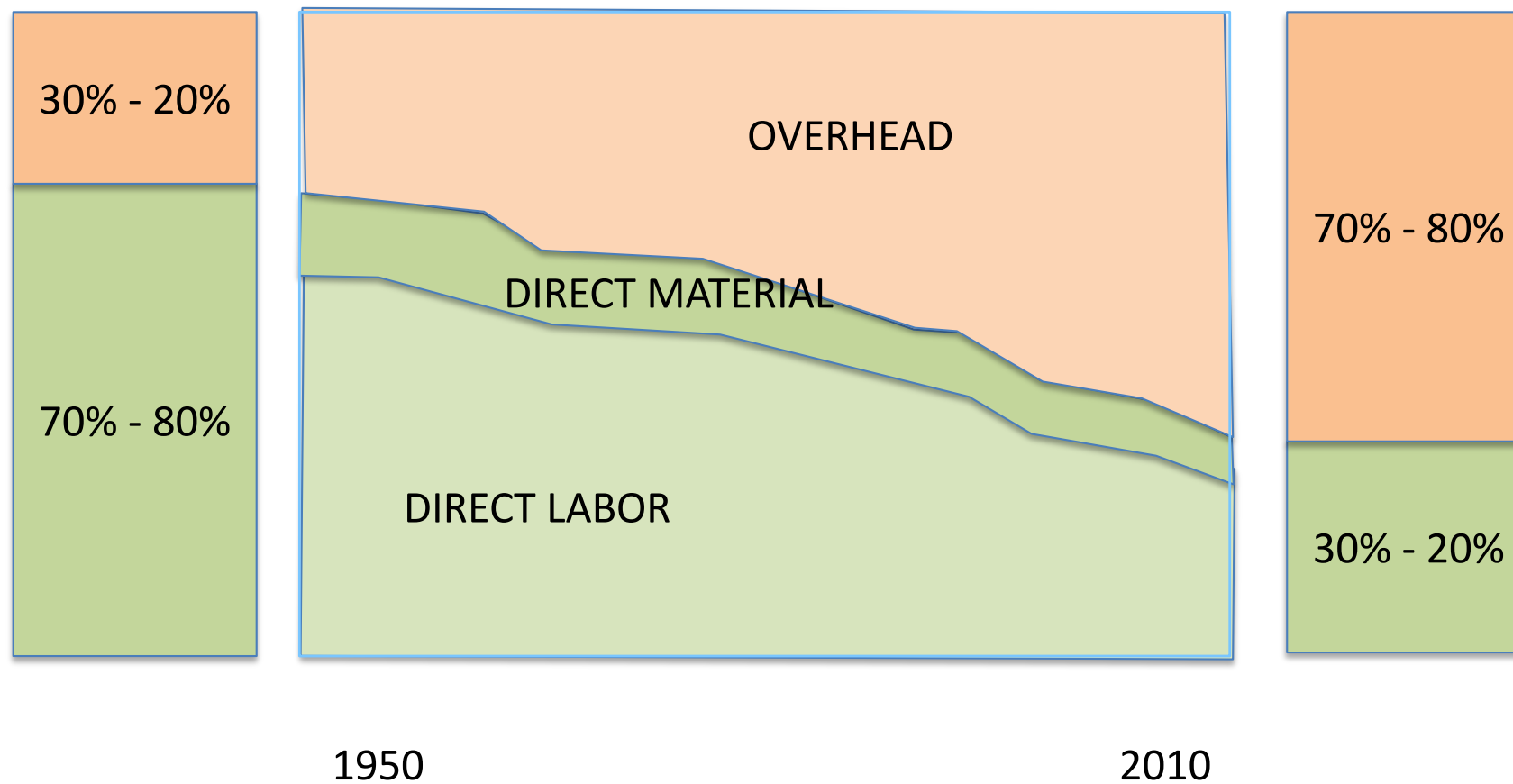


A COMPARISON BETWEEN THE TWO SITUATION

In your opinion which “cost figures” is more relevant for decision making?



INDIRECT COSTS ARE DISPLACING DIRECT COSTS



ASSIGNING COSTS TO PRODUCTS

	PRODUCT A	PRODUCT B
Unit produced & sold	10,000	10,000
Average selling price	\$ 150	\$ 50
Direct Material	\$ 10 per unit	\$ 15 per unit
Direct Labor	2 hours per unit	1 hours per unit
Direct labor cost	\$ 20 per hour	
Indirect Costs	\$ 600,000	



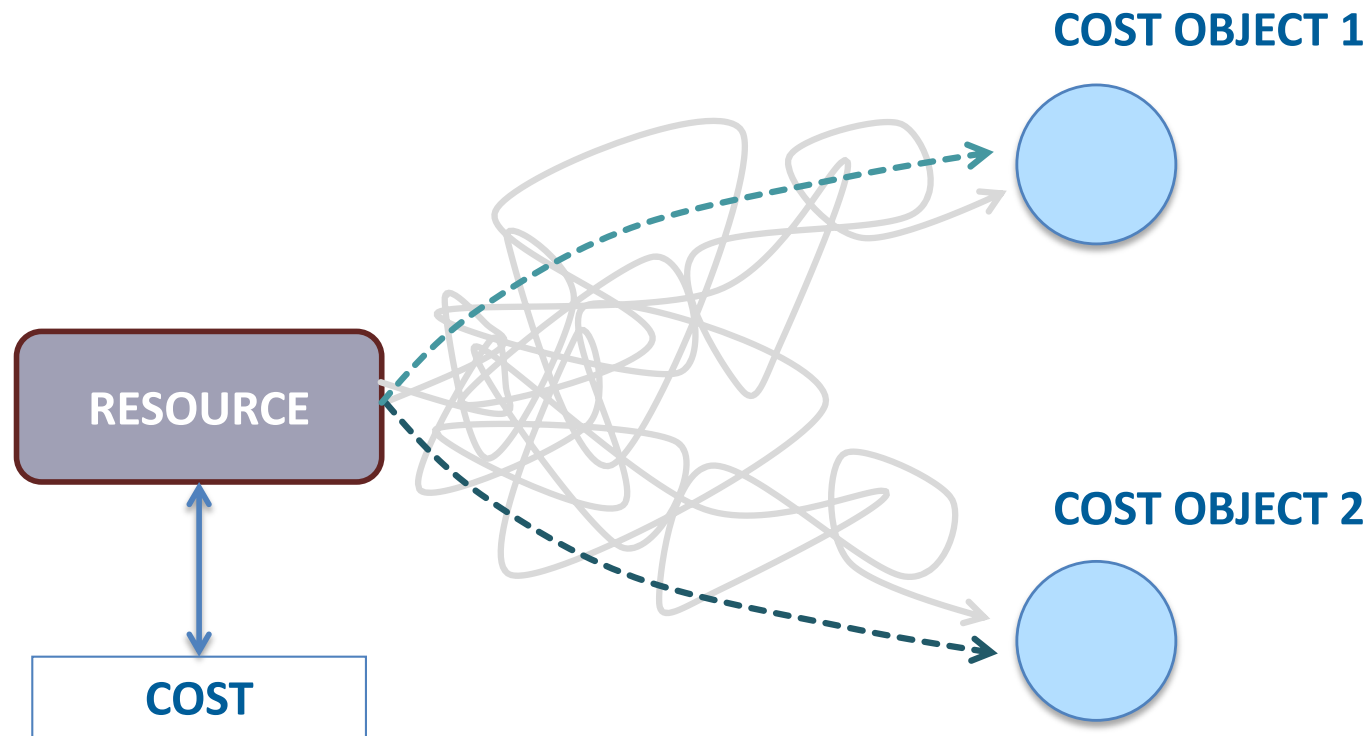


GUIDELINES FOR COST ALLOCATION

The logics and principles guiding the cost allocation process.



INDIRECT COSTS – COST ALLOCATION



Cost allocation is the process of identifying, aggregating, and assigning **indirect costs** to several **cost objects**. The term "allocation" implies that there is no overly precise method available for charging a cost to a cost object (therefore one can not **trace** the costs to the cost object) we use instead an **"allocation base"**.

INDIRECT COSTS ALLOCATION



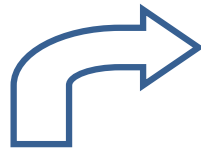
20.000 units



35.000 units



INDIRECT COSTS ALLOCATION



$$\text{v.c.u.} * Q_A$$

$$\frac{\text{VARIABLE COSTS}}{Q_A + Q_B} = \text{v.c.u.}$$



$$\text{v.c.u.} * Q_B$$



$$\frac{\text{v.c.u.} * Q_A}{Q_A}$$

20.000 units

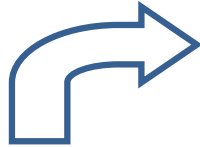


$$\frac{\text{v.c.u.} * Q_B}{Q_B}$$

35.000 units



INDIRECT COSTS ALLOCATION



\$ 18,000,000



200 units



350 units

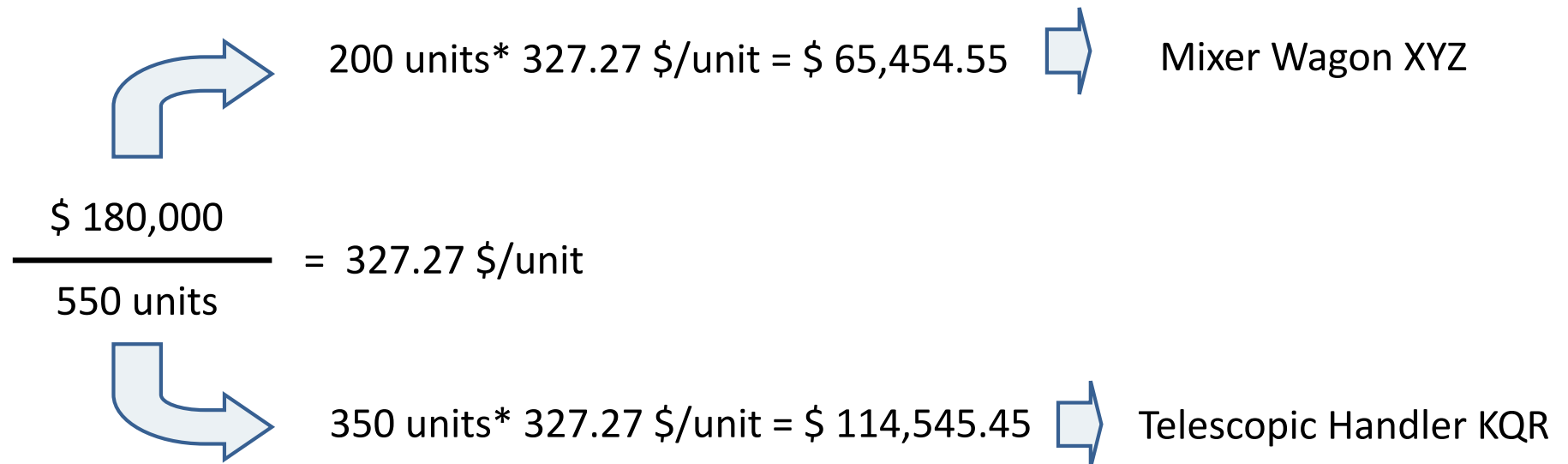


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GFIN OFF UNIVERSITÀ DEGLI STUDI DI TRIESTE

BRUNO DE ROSA
PARTNER E SCIENTIFIC DIRECTOR DYN@MIKA S.R.L.

IS THIS A VIABLE SOLUTION?



NO WAY!



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BRUNO DE ROSA
PARTNER E SCIENTIFIC DIRECTOR DYN@MIKA S.R.L.

INDIRECT COSTS ALLOCATION



2.000.000 units



3.500.000 units



PRICE AS “HOMOGENIZATION FACTOR”



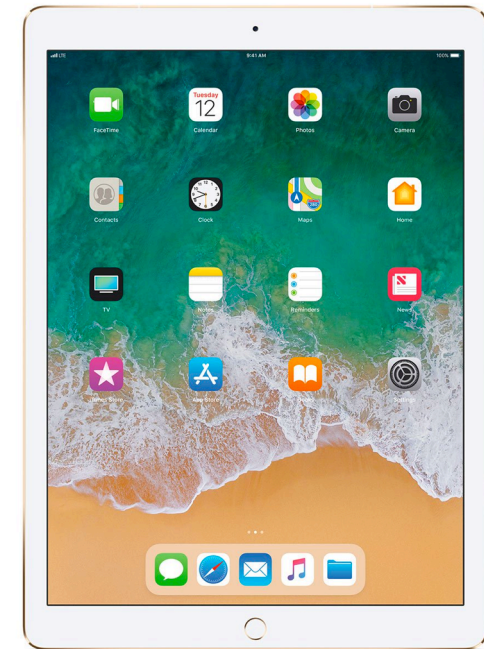
\$ 1,000

1 iPhone



\$ 2,000

2 iPhone equivalent



\$ 900

0,9 iPhone equivalent

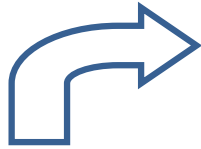
Break even point in units



Break even point in total dollars



INDIRECT COSTS ALLOCATION



$$v.c.u.^{\omega} * (Q_A * \omega_A)$$



$$\frac{v.c.u.^{\omega} * (Q_A * \omega_A)}{Q_A}$$

VARIABLE COSTS

$$= v.c.u.^{\omega}$$

$$\underbrace{Q_A * \omega_A}_{Q_A^{\omega}} + \underbrace{Q_B * \omega_B}_{Q_B^{\omega}}$$



$$v.c.u.^{\omega} * (Q_B * \omega_B)$$



$$\frac{v.c.u.^{\omega} * (Q_B * \omega_B)}{Q_B}$$



CRITERIA TO GUIDE COST ALLOCATION DECISION

1. **Cause and effect** - managers identify the variables that cause resources to be consumed.
2. **Benefits received** - managers identify the beneficiaries of the outputs of the cost object.
3. **Fairness or equity** - establishing a selling price that is deemed fair by contracting parties.
4. **Ability to bear** - advocates allocating costs in proportion to the cost object's ability to bear costs allocated to it.



CAUSE-AND-EFFECT

It identifies **variables that cause cost objects to incur costs**. Using this criterion, managers identify the variables that cause resources to be consumed.

For example, managers may use hours of testing as the variable when allocating the costs of a quality-testing area to products. Cost allocations based on the cause-and-effect criterion are likely to be the most credible to operating personnel.

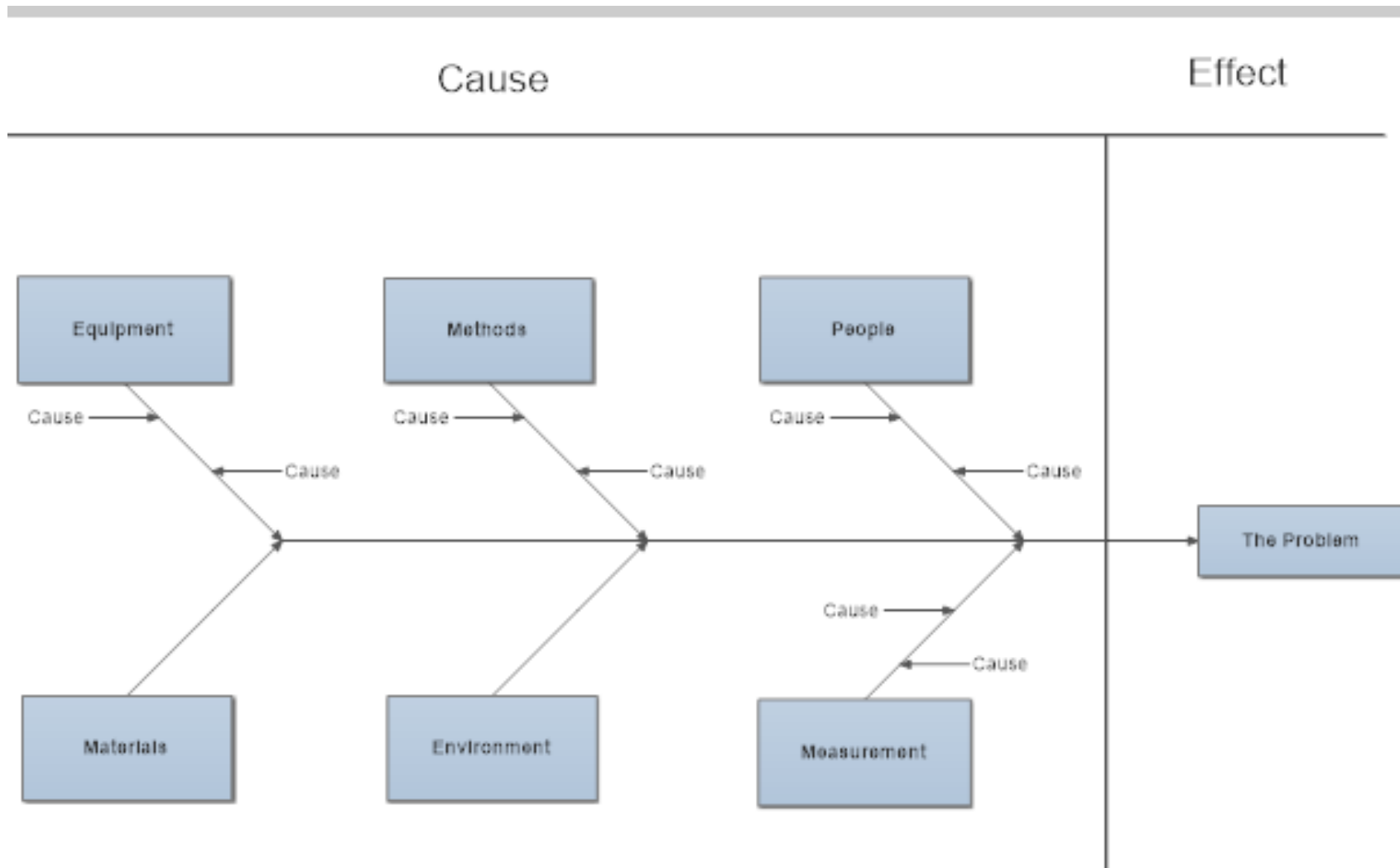
The cause-and-effect criterion is the primary one used in activity-based costing (ABC) applications. ABC systems use the concept of a cost hierarchy to identify the **cost drivers** that best demonstrate the cause-and effect relationship between each activity and the costs in the related cost pool. The cost drivers are then chosen as cost allocation bases.

It is generally the most preferred criterion.

We emphasize the superiority of the cause and-effect and the benefits-received criteria, especially when the purpose of cost allocation is economic decisions or motivation.



CAUSES AND EFFECTS RELATIONSHIPS



BENEFITS RECEIVED

Using this criterion, managers **identify the beneficiaries of the outputs of the cost object**. The costs of the cost object are allocated among the beneficiaries in proportion to the benefits each receives.

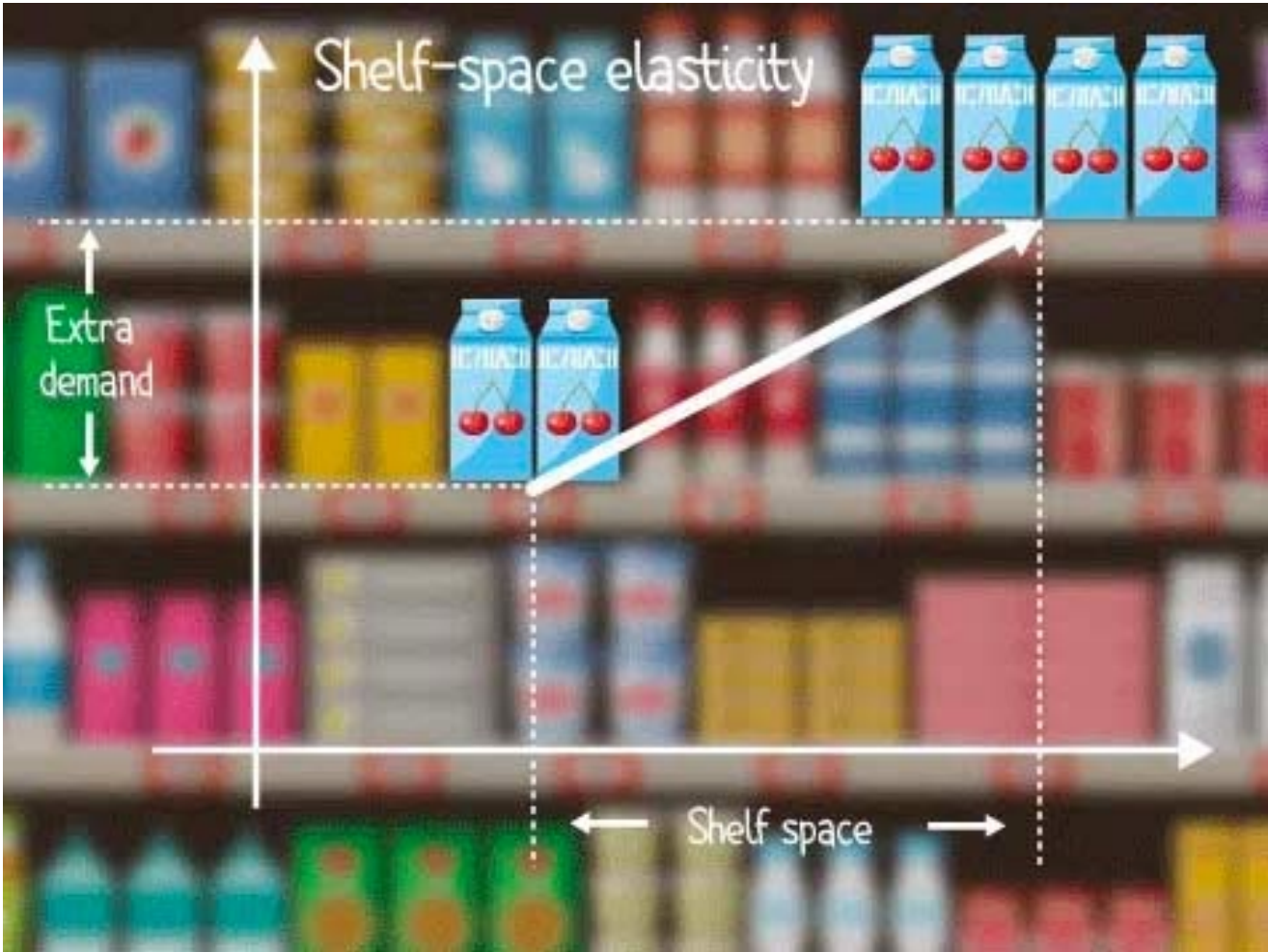
Consider a corporate wide advertising program that promotes the general image of the corporation rather than any individual product. The costs of this program may be allocated on the basis of division revenues; the higher the revenues, the higher the division's allocated cost of the advertising program. The rationale behind this allocation is that divisions with higher revenues apparently benefited from the advertising more than divisions with lower revenues and, therefore, ought to be allocated more of the advertising costs.

Think about the problem of assigning the cost of shelf space to a set of different products to be sold in a supermarket? Could be properly solved using the cause-and-effect relationship?

This criterion represent the most frequently used alternative when a cause-and-effect relationship cannot be determined.



SHELF MANAGEMENT



FAIRNESS OR EQUITY

This criterion is often cited in government contracts when **cost allocations are the basis for establishing a price satisfactory to the government and its suppliers.**

Cost allocation here is viewed as a "reasonable" or "fair" means of establishing a selling price in the minds of the contracting parties.

For most allocation decisions, fairness is a difficult-to-achieve objective rather than an operational criterion.

FAIRNESS IN NEGOTIATION



ABILITY TO BEAR

This criterion advocates allocating costs in proportion to the cost object's ability to bear costs allocated to it.

An example is the allocation of corporate executive salaries on the basis of division operating income. The presumption is that the more-profitable divisions have a greater ability to absorb corporate headquarters' costs. The more profitable divisions have a greater ability to bear costs. It subsidizes poor performers at the expense of the best performers.

It could be useful for “tax planning” purposes.

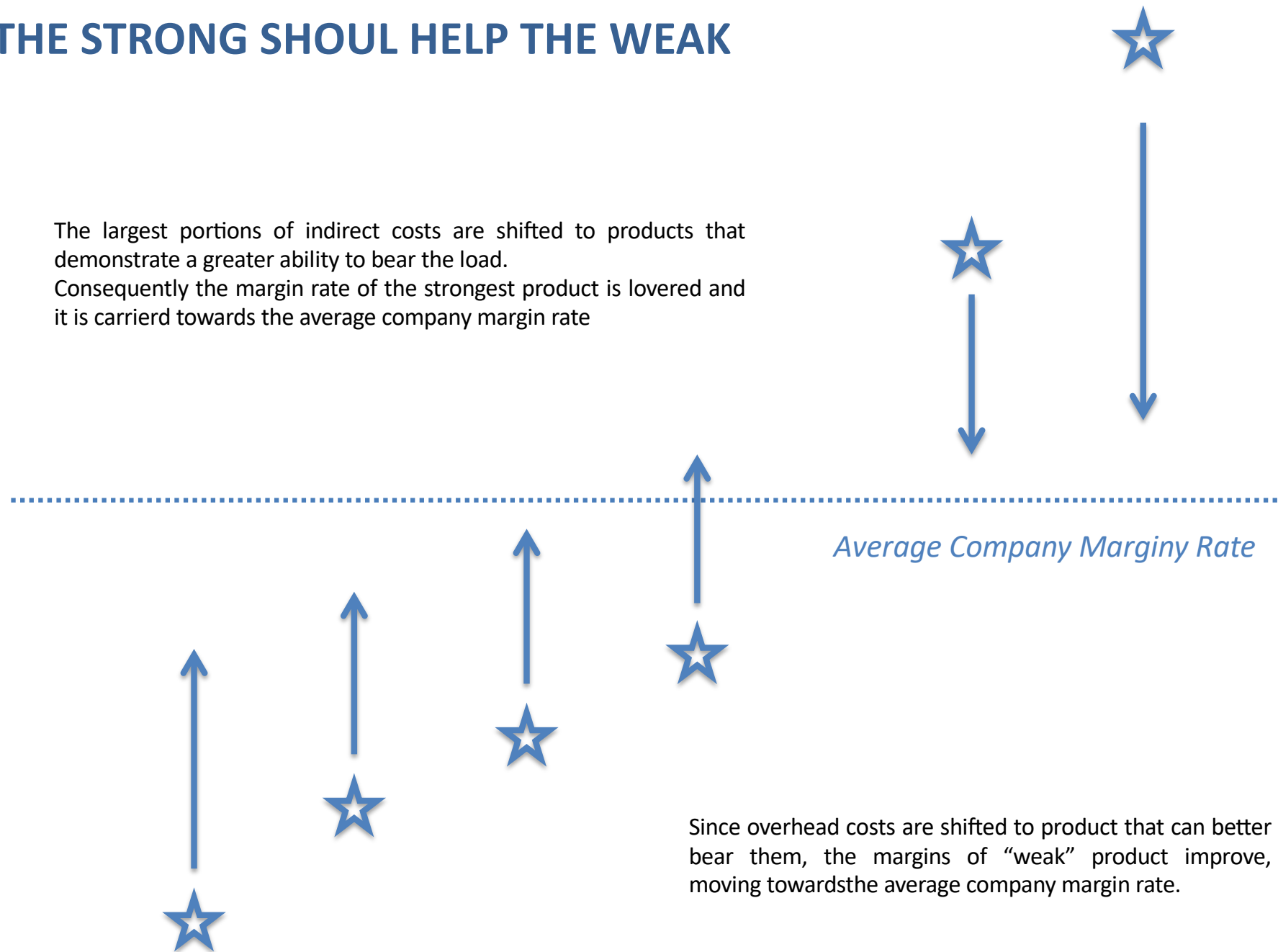
It is usually unacceptable because of its negative effect on managerial motivation.

THE STRONG SHOULD HELP THE WEAK



THE STRONG SHOULD HELP THE WEAK

The largest portions of indirect costs are shifted to products that demonstrate a greater ability to bear the load. Consequently the margin rate of the strongest product is lowered and it is carried towards the average company margin rate



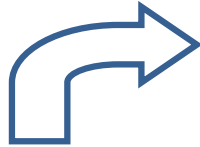
Since overhead costs are shifted to product that can better bear them, the margins of “weak” product improve, moving towards the average company margin rate.



QUANTITY OF DIRECT MATERIALS USED



WE NEED TO HOMOGENIZE QUANTITIES



\$ 180,000



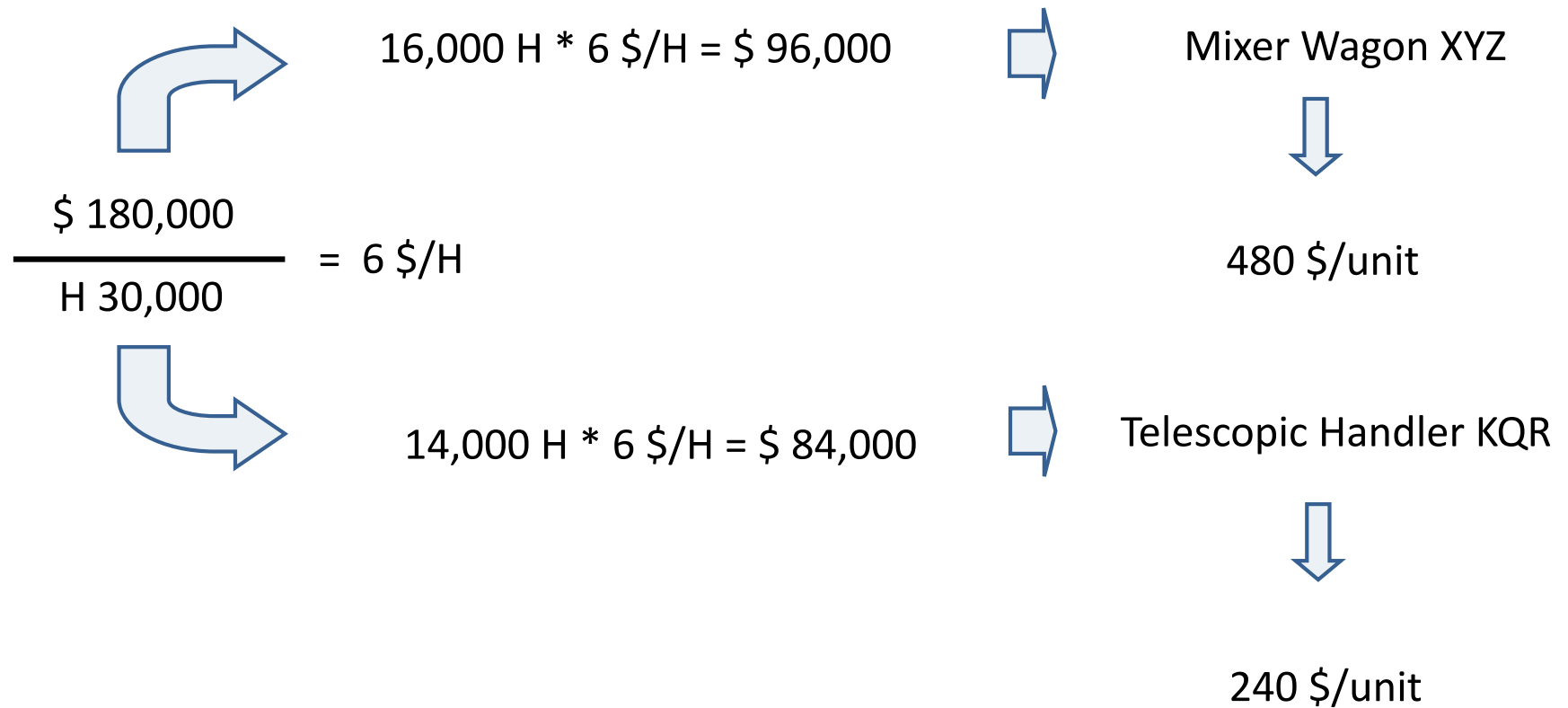
200 units 80 hours per unit \$ 50,000 per units



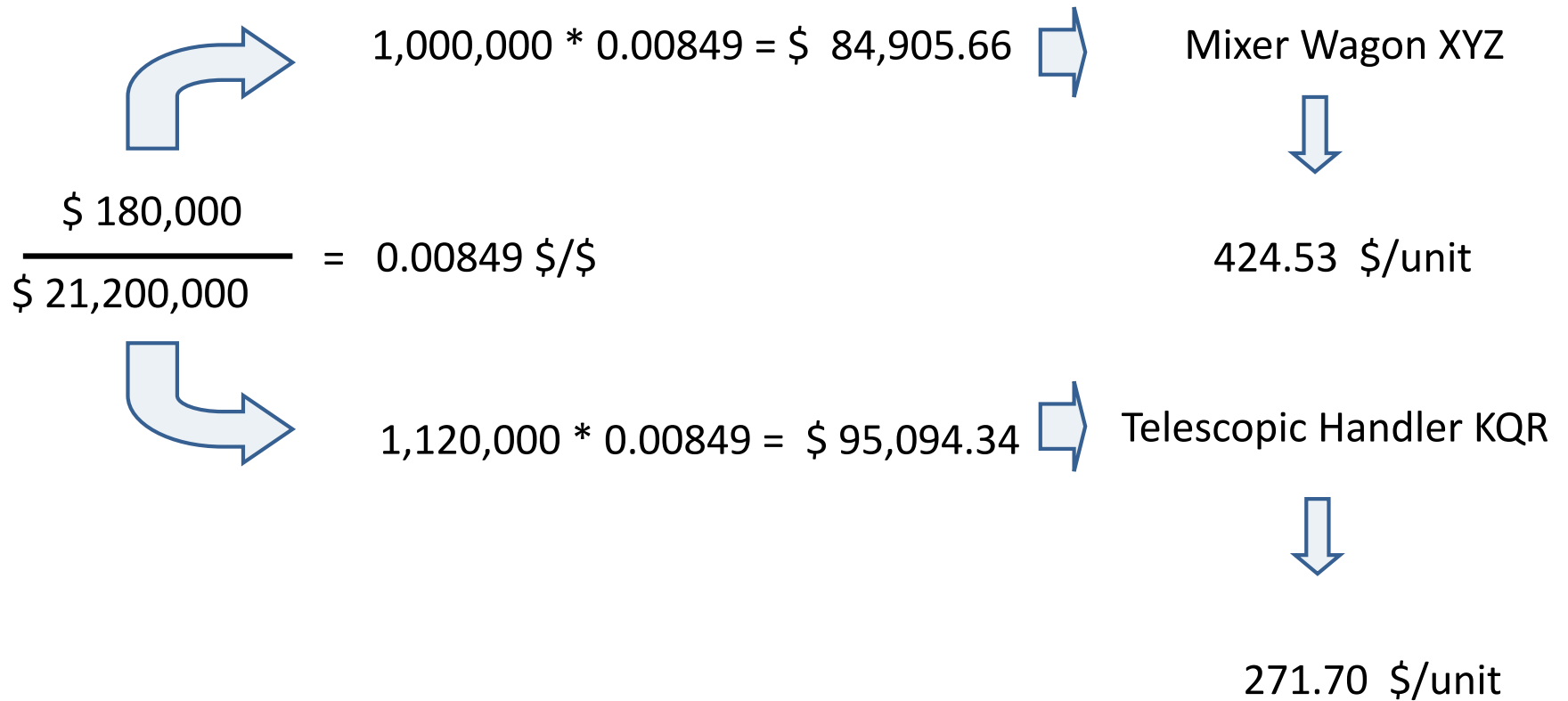
350 units 40 hours per unit \$ 32,000 per units



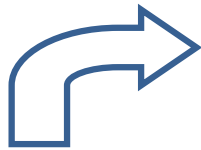
DIRECT LABOR HOURS AND MACHINE HOURS



DIRECT MATERIALS



INDIRECT COSTS ALLOCATION



$$\text{v.c.u.}^\omega * (Q_A * \omega_A)$$

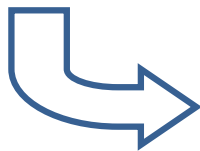


$$\frac{\text{v.c.u.}^\omega * (Q_A * \omega_A)}{Q_A}$$

VARIABLE COSTS

$$= \text{v.c.u.}^\Omega$$

$$\underbrace{Q_A * \omega_A}_{Q_A^\omega} + \underbrace{Q_B * \omega_B}_{Q_B^\omega}$$



$$\text{v.c.u.}^\omega * (Q_B * \omega_B)$$



$$\frac{\text{v.c.u.}^\omega * (Q_B * \omega_B)}{Q_B}$$

Material Handling Costs: The cost of handling and moving materials (e.g., forklift operations, storage, and transport within the factory) that increases as the volume of materials used rises.

Packaging Costs: Costs related to the packaging of materials for shipment or storage may be directly proportional to the quantity of materials being processed.

Inspection or Testing Costs: If materials require frequent inspection or testing as they are consumed (e.g., testing the quality of raw materials), these costs may increase with the quantity of materials used.

Consumable Supplies: The usage of consumable items like lubricants, adhesives, or other small supplies that are used in conjunction with materials and consumed as the production process proceeds.

Tools and Equipment Maintenance

Even if the workforce is fixed, the need for tools, equipment, and machinery maintenance can increase with the number of direct labour hours worked.

Cleaning Supplies: The need for cleaning materials (e.g., floor cleaners, disinfectants) increases with the number of workers and the length of time they work.

Safety Equipment: Items like gloves, safety glasses, earplugs, and helmets might be used more as direct labor hours increase, since workers are using more materials over time.

Consumable Items: Materials such as sandpaper, adhesives, lubricants, and paints used on the production floor are consumed more as workers are engaged in longer or more frequent work shifts.

Waste Management: The amount of waste generated on the production floor often correlates with the number of labor hours worked



VOLUME-BASED COST DRIVERS

Traditional systems use only volume-based cost drivers.

Volume-based cost drivers assume that **a product's consumption of overhead resources is directly related to units produced**. In other words, they assume that the overhead consumed by products is highly correlated with the number of units produced.

Typical volume-based cost drivers used by traditional systems are **units of output, direct labour hours and machine hours**.

These cost drivers are appropriate for measuring the consumption of expenses such as machine energy costs, depreciation related to machine usage, indirect labour employed in production centres and inspection costs where each item produced is subject to final inspection.

For example, machine hours are an appropriate cost driver for energy costs since if volume is increased by 10 per cent, machine hours are likely to increase by 10 per cent, thus causing 10 per cent more energy costs to be consumed. Similarly, an increase in volume of 10 per cent is likely to increase the consumption of direct labour hours by 10 per cent and, assuming that indirect labour hours are correlated with direct labour hours, 10 per cent more indirect labour costs will be consumed

VOLUME-BASED PARAMETERS

- Physical quantity of a specific raw material used
- Direc materials cost
- Direct labour hours
- Direct labour cost
- Prime cost (sum of direct materials cost and direct labour cost)
- Machine hours
- Machine hours cost
- Total direct cost
- Current value (revenue) of the products obtained
- Sales dollars
- Direct margin of the products obtained



TWO KINDS OF RESOURCES

Consumable Resources

The defining characteristic of a **consumable resource**, also called a **flexible resource**, is that its cost depends on the amount of resource that is used. Examples of consumable resources are wood in a furniture factory and iron ore in a steel mill. The cost of a consumable resource is often called a variable cost because the total cost depends on how much of the resource is consumed.

Capacity-Related Resources

The defining characteristic of a **capacity-related resource** is that its cost depends on the amount of resource capacity that is acquired and not on how much of the capacity is used. As the size of a proposed factory or warehouse increases, the associated capacity-related cost will increase. Examples of capacity-related costs are depreciation on production equipment (the capacity-related resource) and salaries paid to employees (the capacity-related resource) in a consultancy. The cost of a capacity-related resource is often called a fixed cost because the cost of the resource is independent of how much of the resource is used in the short run.



COST VARIABILITY IN THE LONG RUN

A company should base most of its important product decisions on estimates of the long-run, variable costs of individual products.

Whether costs are fixed or variable, of course, depends on the viewer's time horizon. **In the short run, virtually all costs are fixed:** materials have already been acquired, utilities have been turned on, and the workers have showed up for the day. **Over a long period, however, costs become variable:** machines and plants can be retired or sold, supervisors transferred.

Product decisions have long-term consequences for the organization. **Executives should therefore consider virtually all costs to be variable** when measuring product costs. That will require a new orientation for many managers. They must recognize that many costs traditionally thought of as fixed actually vary according to the diversity and complexity of products.

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

COMPUTING STRANGE NUMBERS

(A) Last four digit of my phone numbers

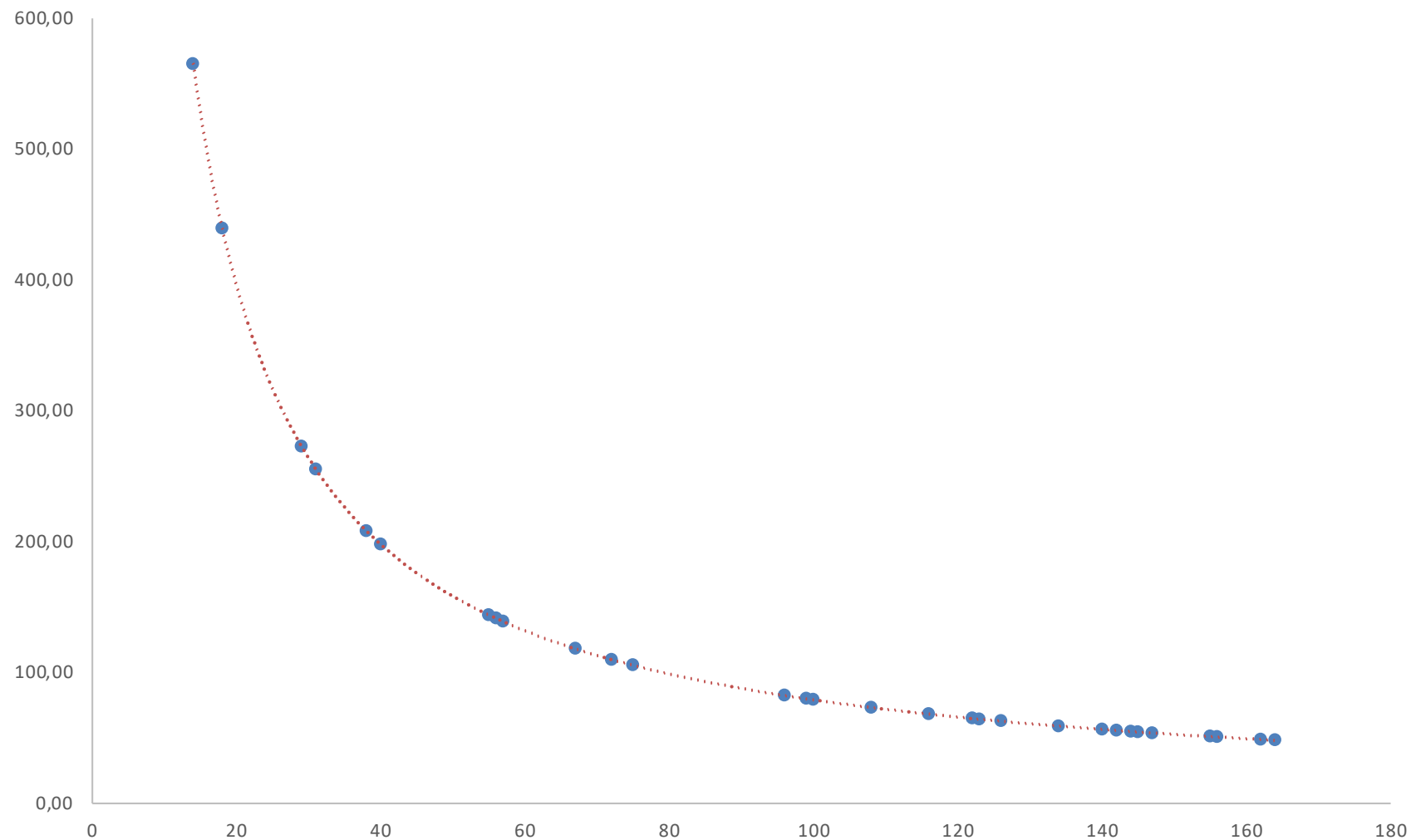
(B) Numbers of guys wearing a tie met by me during a specific day

01/11/2021	7914	31	255,29
02/11/2021	7914	14	565,29
03/11/2021	7914	144	54,96
04/11/2021	7914	140	56,53
05/11/2021	7914	162	48,85
06/11/2021	7914	75	105,52
07/11/2021	7914	142	55,73
08/11/2021	7914	72	109,92
09/11/2021	7914	57	138,84
10/11/2021	7914	122	64,87
11/11/2021	7914	116	68,22
12/11/2021	7914	134	59,06
13/11/2021	7914	100	79,14
14/11/2021	7914	147	53,84
15/11/2021	7914	96	82,44
16/11/2021	7914	126	62,81
17/11/2021	7914	56	141,32
18/11/2021	7914	99	79,94
19/11/2021	7914	108	73,28
20/11/2021	7914	67	118,12
21/11/2021	7914	123	64,34
22/11/2021	7914	156	50,73
23/11/2021	7914	55	143,89
24/11/2021	7914	29	272,90
25/11/2021	7914	155	51,06
26/11/2021	7914	164	48,26
27/11/2021	7914	18	439,67
28/11/2021	7914	145	54,58
29/11/2021	7914	40	197,85
30/11/2021	7914	38	208,26

(C) = (A) / (B)



COMPUTING STRANGE NUMBERS

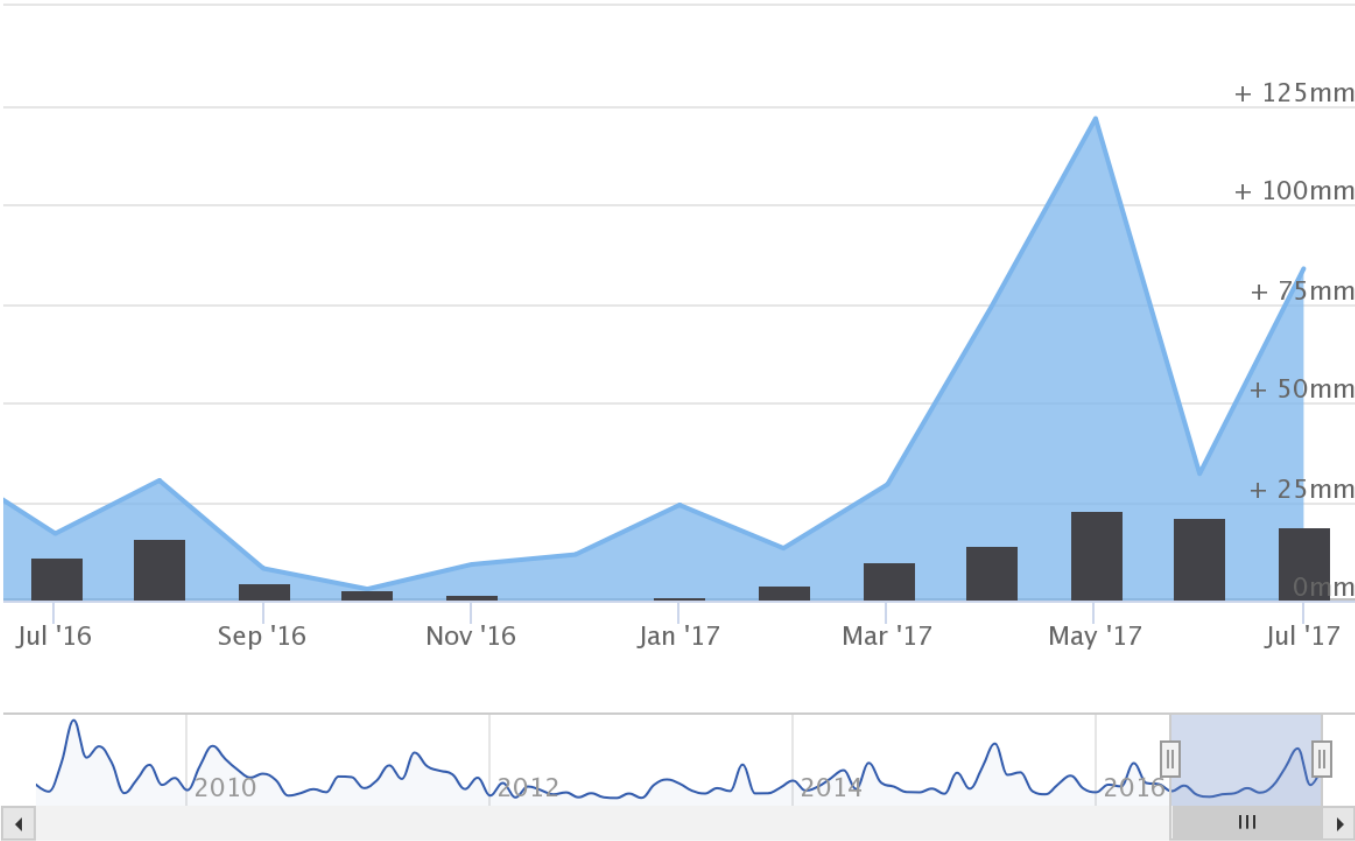


AVERAGE RAINFALL AMOUNT

Denver

Average Rainfall Amount (mm) and Rainy Days

Zoom 1m 3m 6m YTD 1y All



● Rain (mm) ● Days

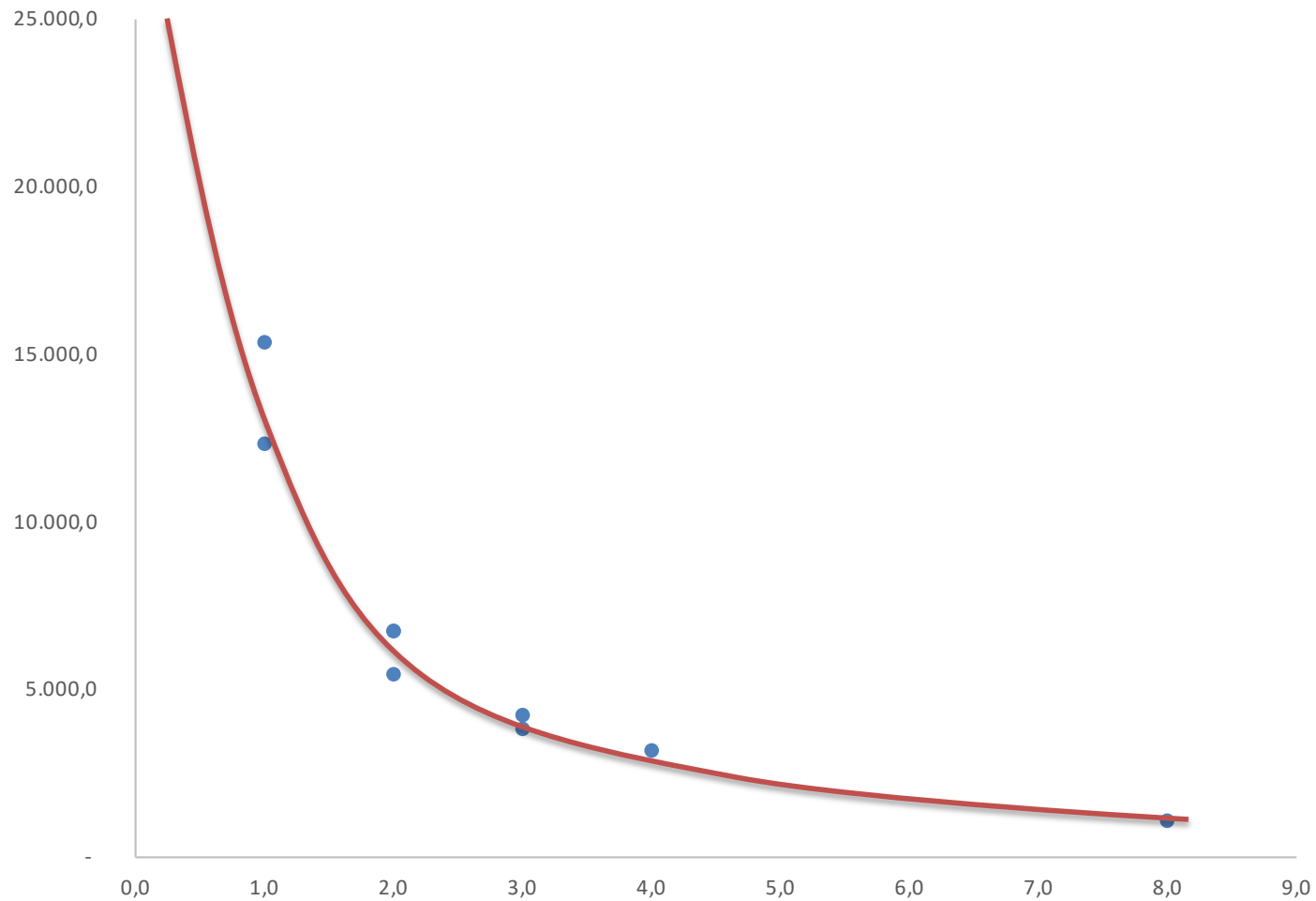
WorldWeatherOnline.com

DOES IT MAKE ANY SENSE?

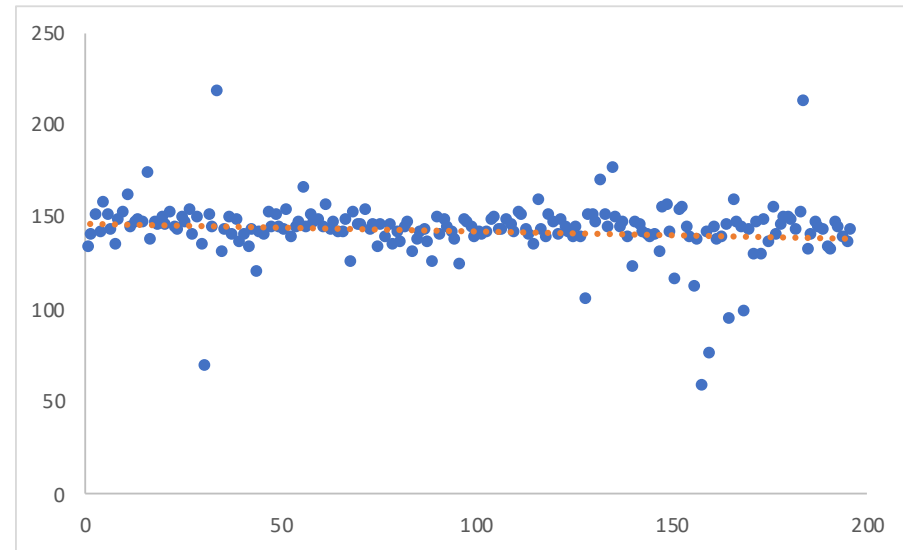
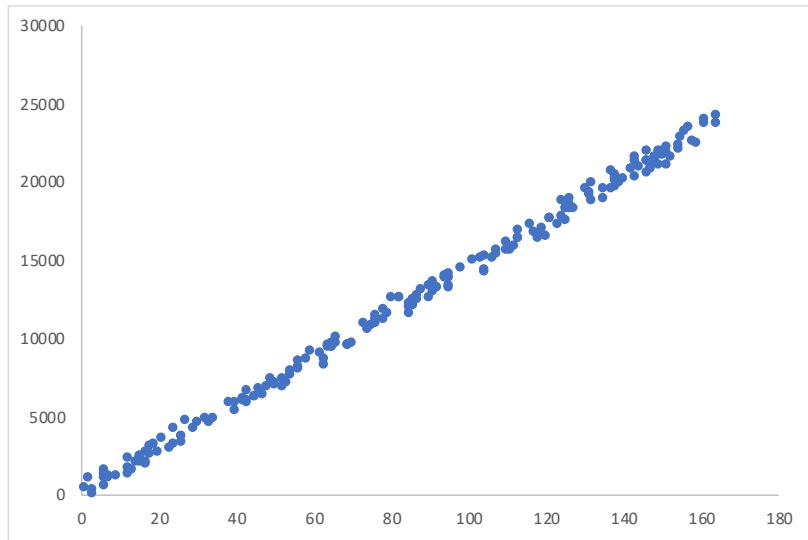
	STEPS	MM	STEPS/MM
01/10/2016	12.765	0,0	UNDEFINED
02/10/2016	15.344	1,0	15344,0
03/10/2016	13.455	2,0	6727,5
04/10/2016	12.320	1,0	12320,0
05/10/2016	18.650	0,0	UNDEFINED
06/10/2016	11.452	0,0	UNDEFINED
07/10/2016	13.421	0,0	UNDEFINED
08/10/2016	12.224	0,0	UNDEFINED
09/10/2016	13.267	0,0	UNDEFINED
10/10/2016	21.450	0,0	UNDEFINED
11/10/2016	18.659	0,0	UNDEFINED
12/10/2016	11.345	0,0	UNDEFINED
13/10/2016	8.650	0,0	UNDEFINED
14/10/2016	13.476	2,0	6738,0
15/10/2016	12.667	3,0	4222,3
16/10/2016	7.520	0,0	UNDEFINED
17/10/2016	22.768	0,0	UNDEFINED
18/10/2016	11.729	0,0	UNDEFINED
19/10/2016	8.600	8,0	1075,0
20/10/2016	20.812	0,0	UNDEFINED
21/10/2016	12.456	0,0	UNDEFINED
22/10/2016	14.526	0,0	UNDEFINED
23/10/2016	11.567	0,0	UNDEFINED
24/10/2016	10.987	0,0	UNDEFINED
25/10/2016	15.467	0,0	UNDEFINED
26/10/2016	10.879	2,0	5439,5
27/10/2016	11.456	3,0	3818,7
28/10/2016	12.670	4,0	3167,5
29/10/2016	16.728	0,0	UNDEFINED
30/10/2016	12.455	0,0	UNDEFINED
31/10/2016	14.580	0,0	UNDEFINED
October 2016	424.345	26,2	



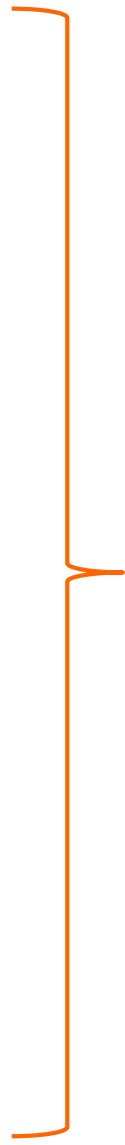
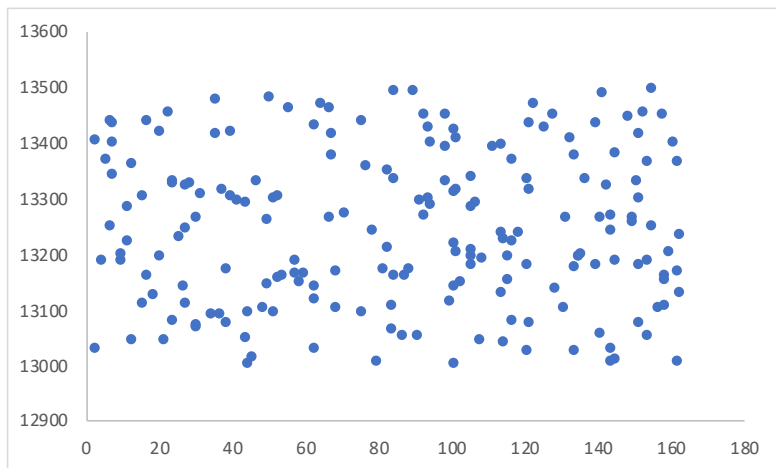
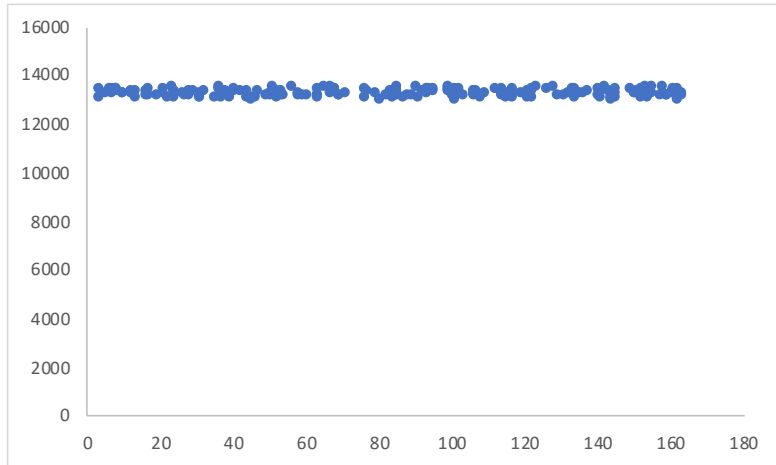
STEPS TAKEN / MM OF RAIN



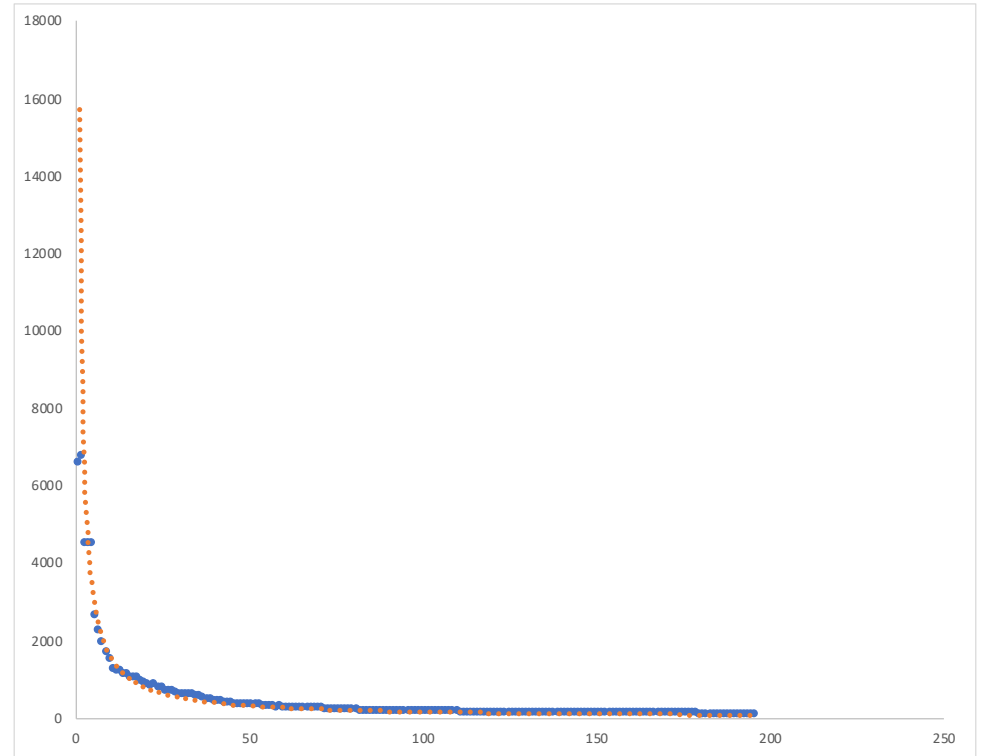
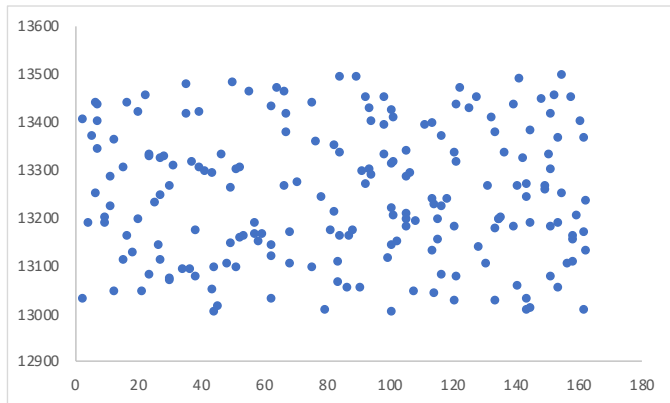
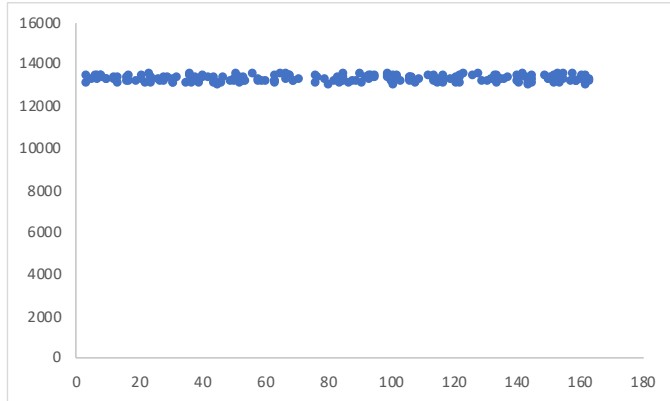
CORRELATED OR UNCORRELATED?



CORRELATED OR UNCORRELATED?

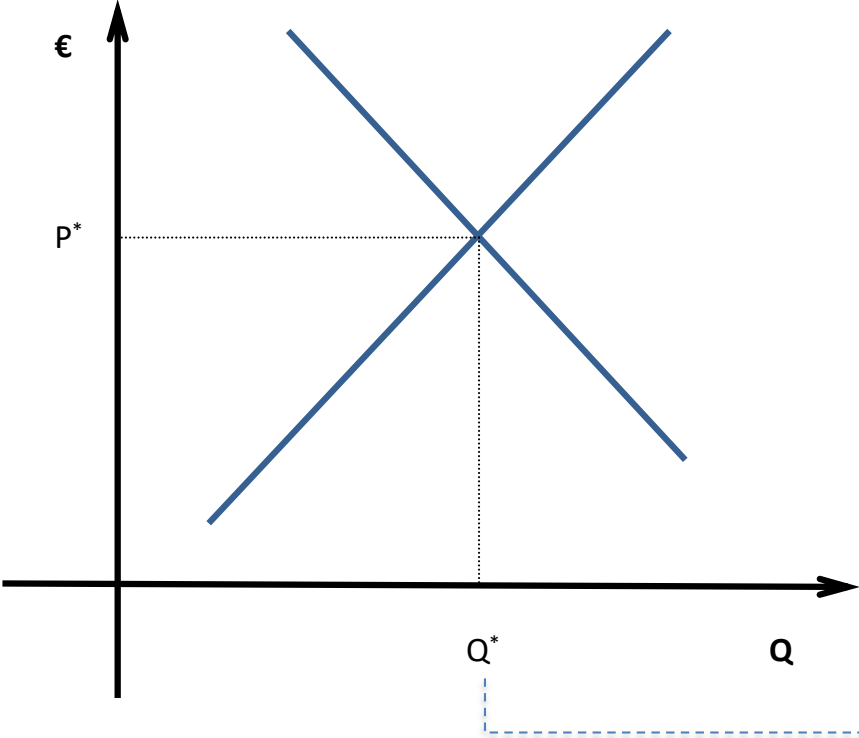


CORRELATED OR UNCORRELATED?

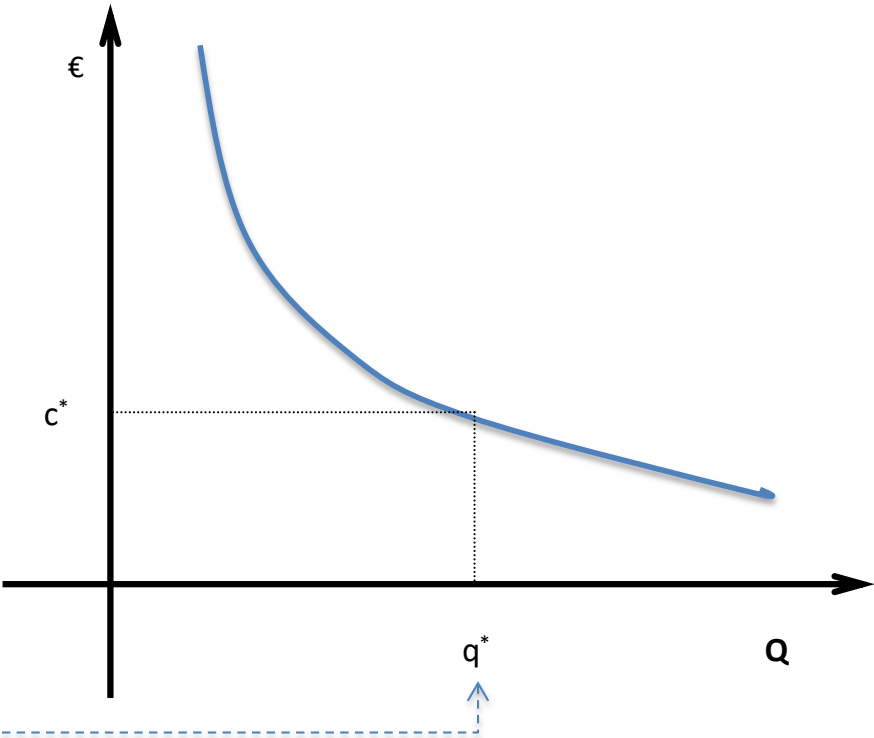


STARTING POINT

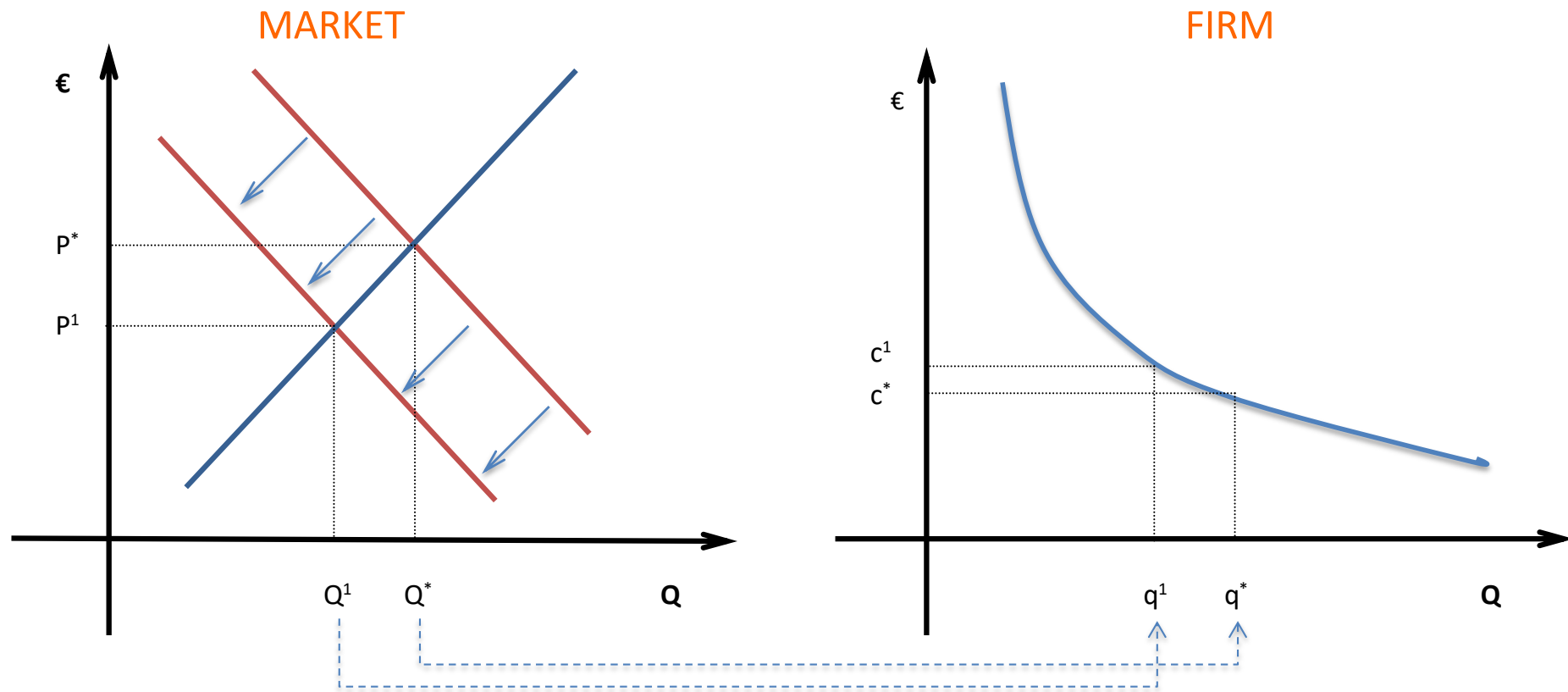
MARKET



FIRM

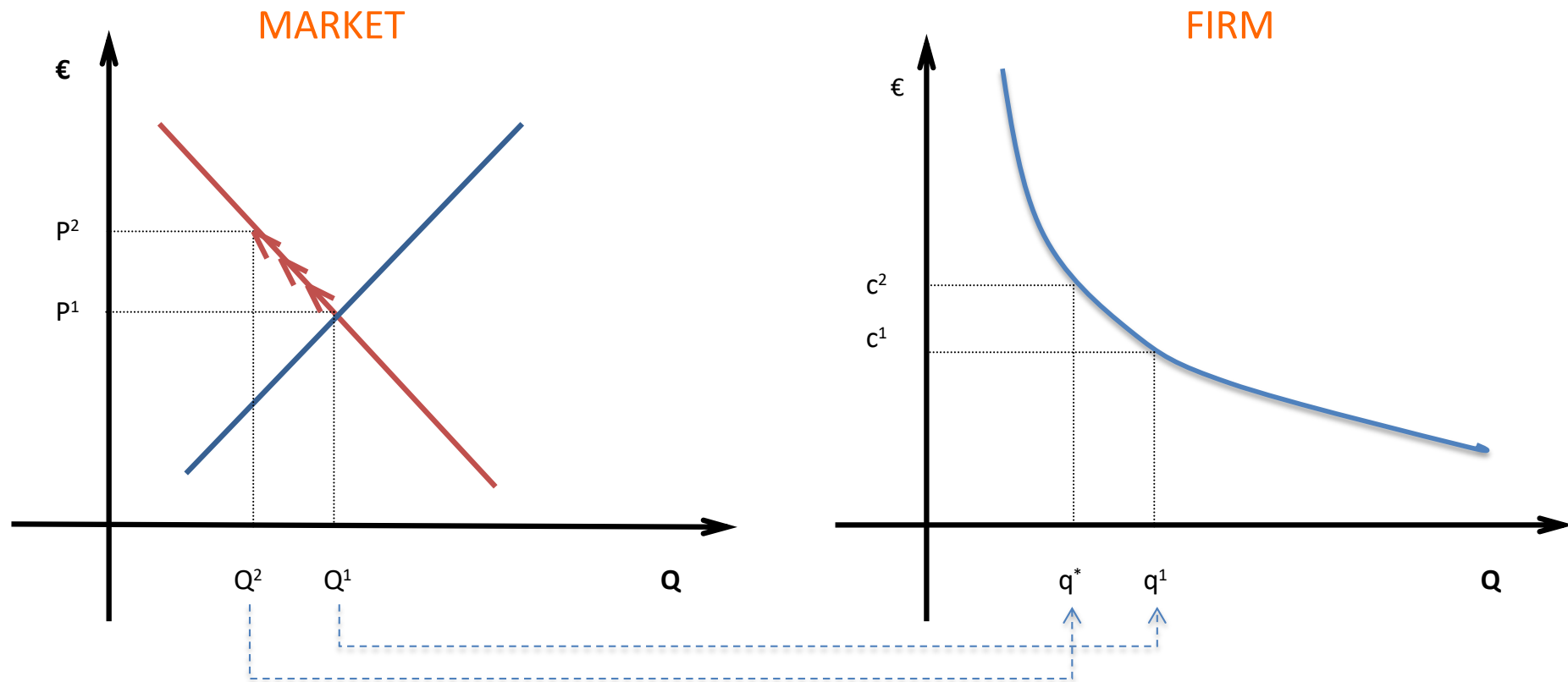


DEMAND SHOCK



A downturn in forecast demand creates idle capacity. The cost system reports higher costs.

DEATH SPIRAL



So management raises prices, which guarantees even less demand in the future and still higher idle capacity costs.

DEATH SPIRAL

Death spiral occurs when large fixed costs of a common resource are allocated to users who could decline to use that resource. As the allocated costs increase, some users choose to decrease use. Then the fixed costs are allocated to the remaining users, more of whom use less. This process repeats until no users are willing to pay the fixed costs.

Possible solutions to death spiral:

- ✓ When excess capacity exists, charge users only for variable costs.
- ✓ Reduce the total amount of fixed costs allocated

Death Spiral Example: Cost-based Contracts

- Defense contractors working on advanced technology incur large fixed cost over-runs that are allocated to each aircraft manufactured.
- Government reduces number of aircraft purchased and that causes average cost to increase on remaining orders.
- Government responds by ordering even fewer aircraft.
- Eventually, the entire project is abandoned before all fixed costs are recovered



WHY FULL ACTUAL COSTING IS DANGEROUS?

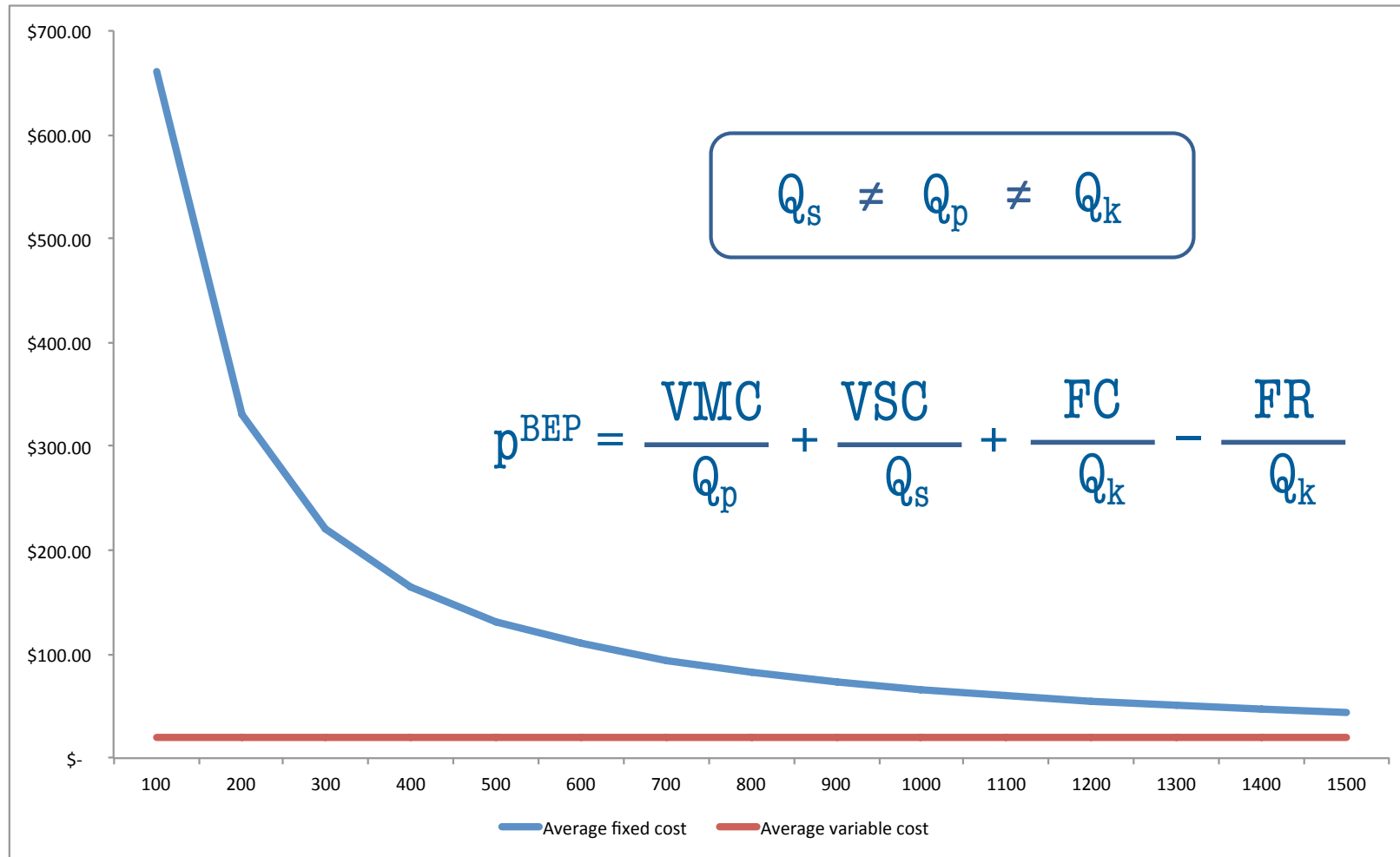
Too much fixed manufacturing overhead cost is, generally, applied to products.

If overhead rates are based on actual or budgeted activity and overhead includes significant fixed costs, then the unit product costs will fluctuate depending on the budgeted level of activity for the period. In general, if budgeted output falls, the overhead cost per unit will increase; it will appear that the products cost more to make. Managers may then be tempted to increase prices at the worst possible time—just as demand is falling.

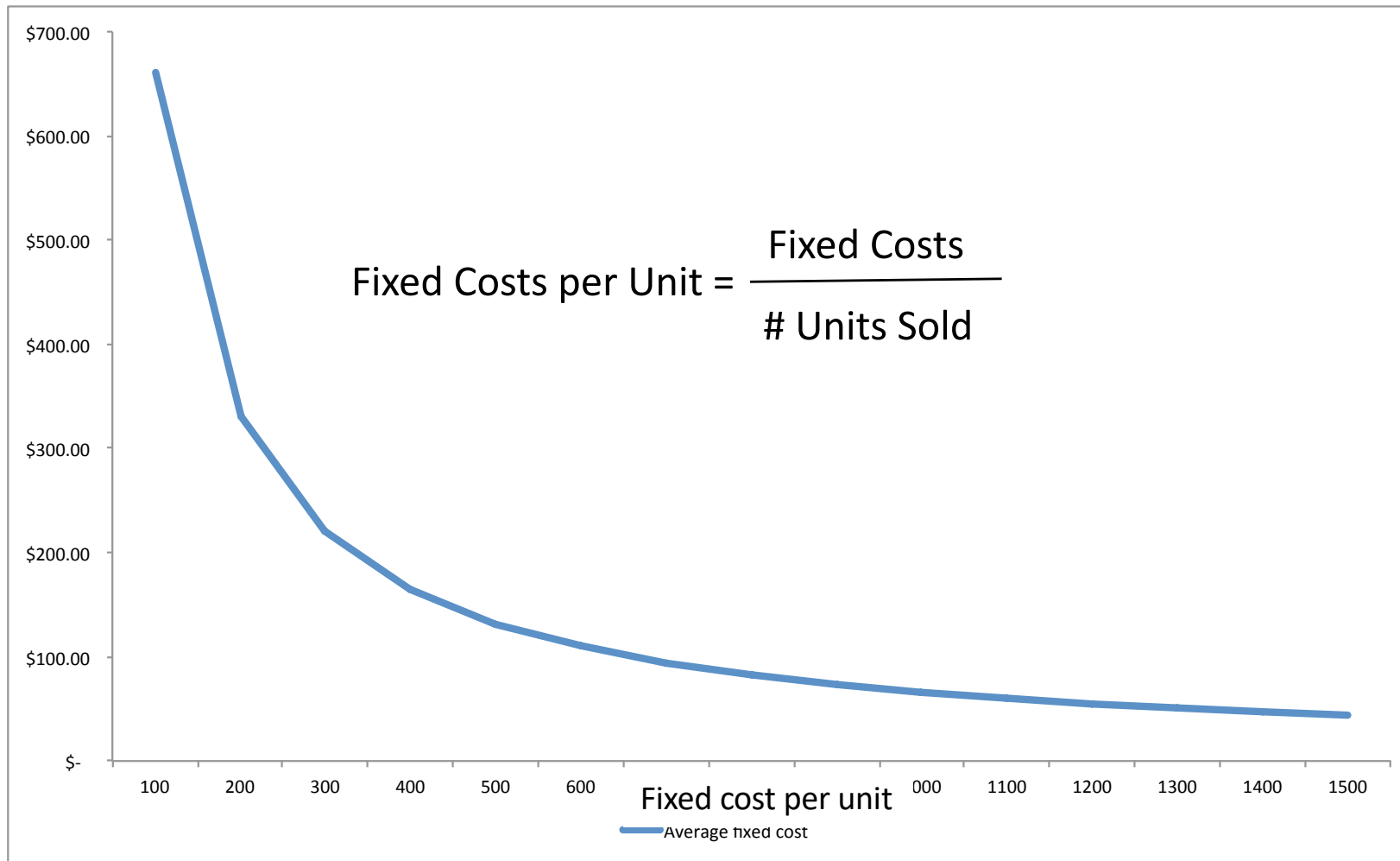
Under the traditional approach, products are charged for resources that they don't use. When the fixed costs of capacity are spread over actual or estimated activity, the units that are produced must shoulder the costs of unused capacity. That is why the applied overhead cost per unit increases as the level of activity falls.

Products should be charged only for the capacity that they use; they should not be charged for the capacity they don't use.

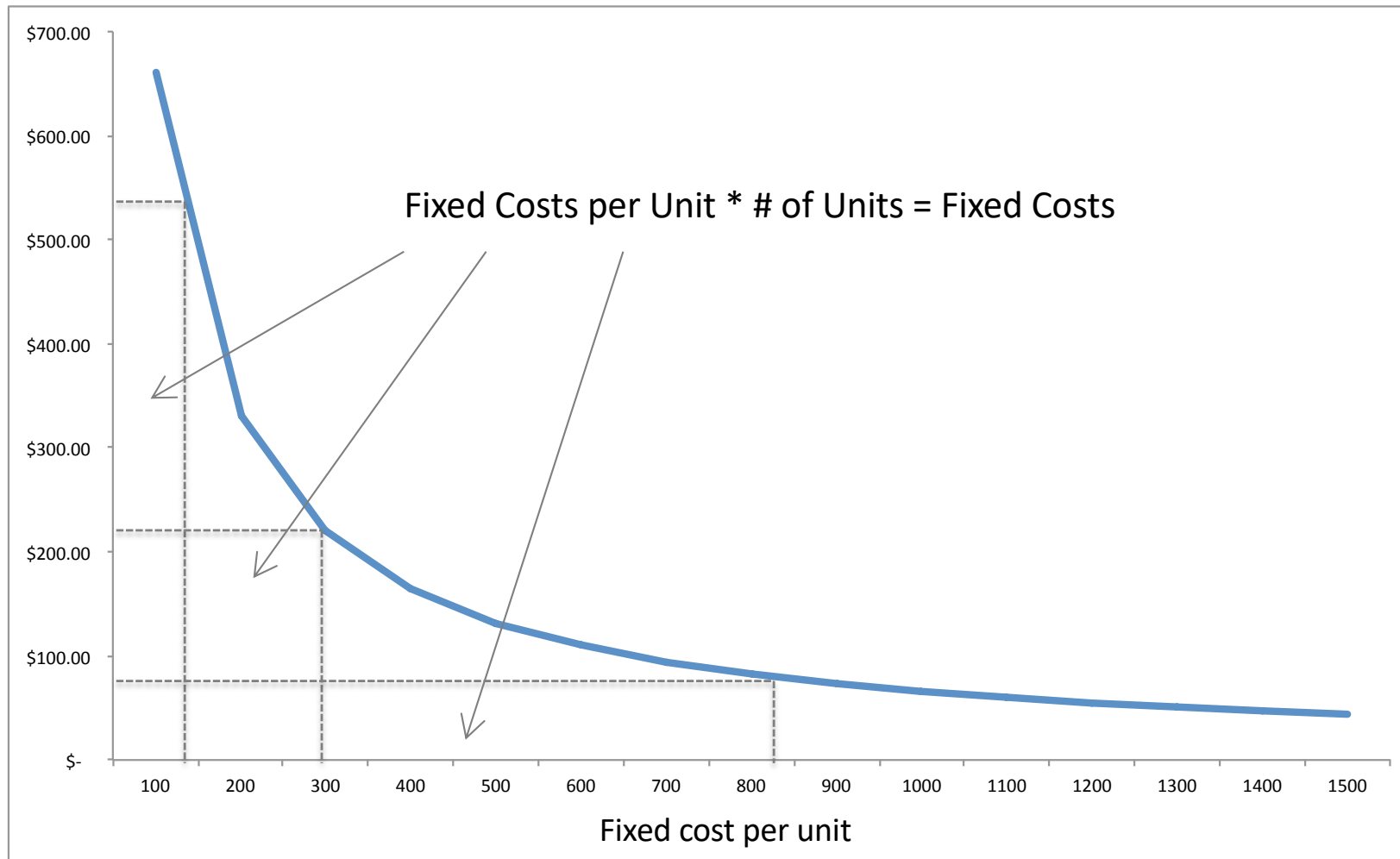
STEP 3 – BREAK-EVEN PRICE



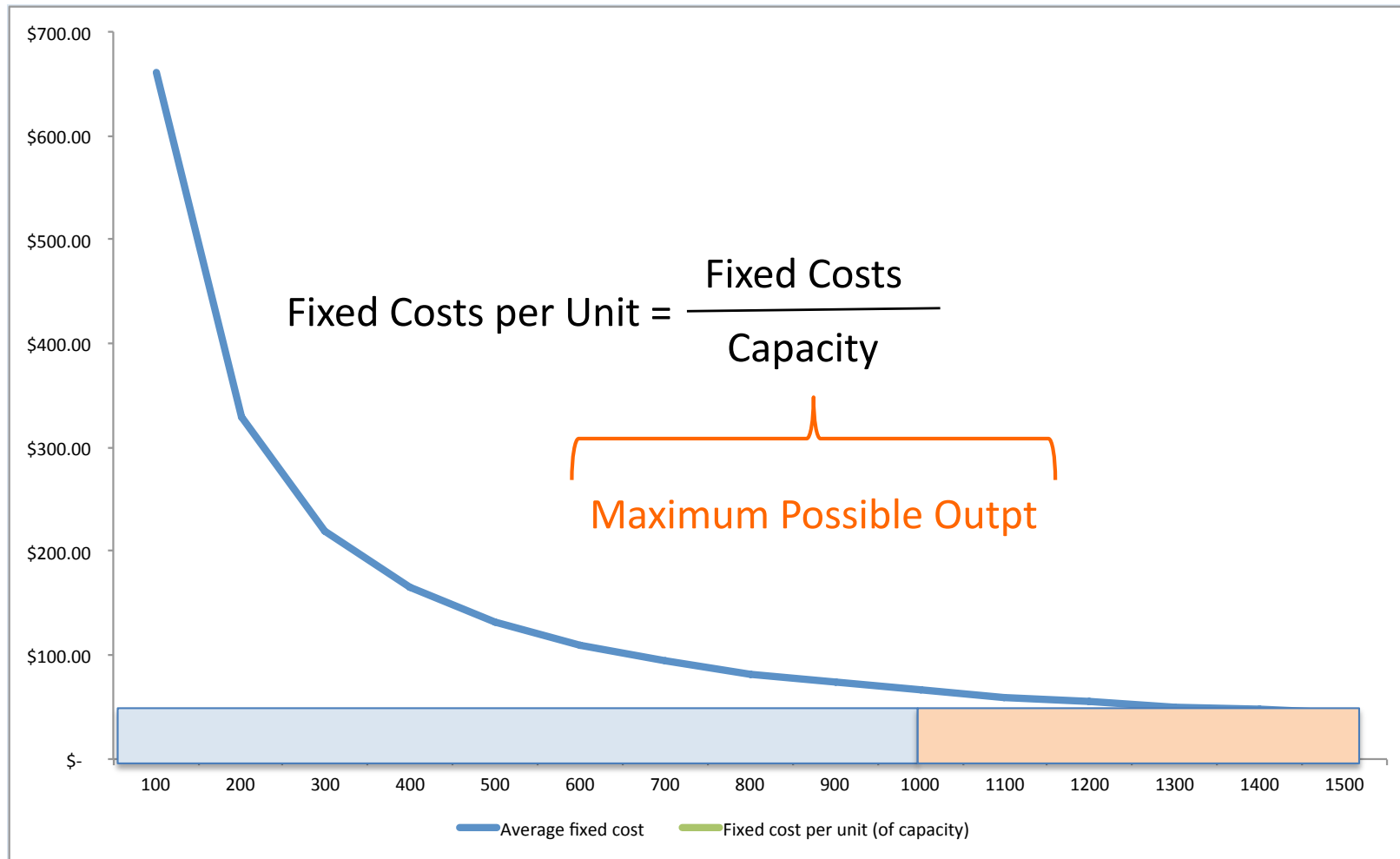
FULL ACTUAL COSTING



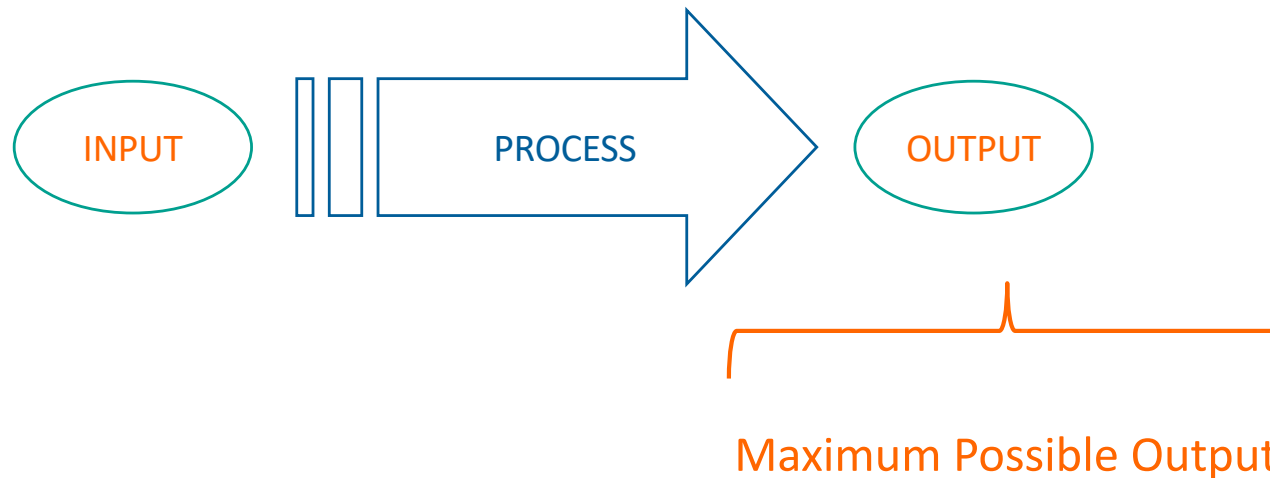
FULL ACTUAL COSTING



FULL NORMAL COSTING



UNDERSTANDING CAPACITY

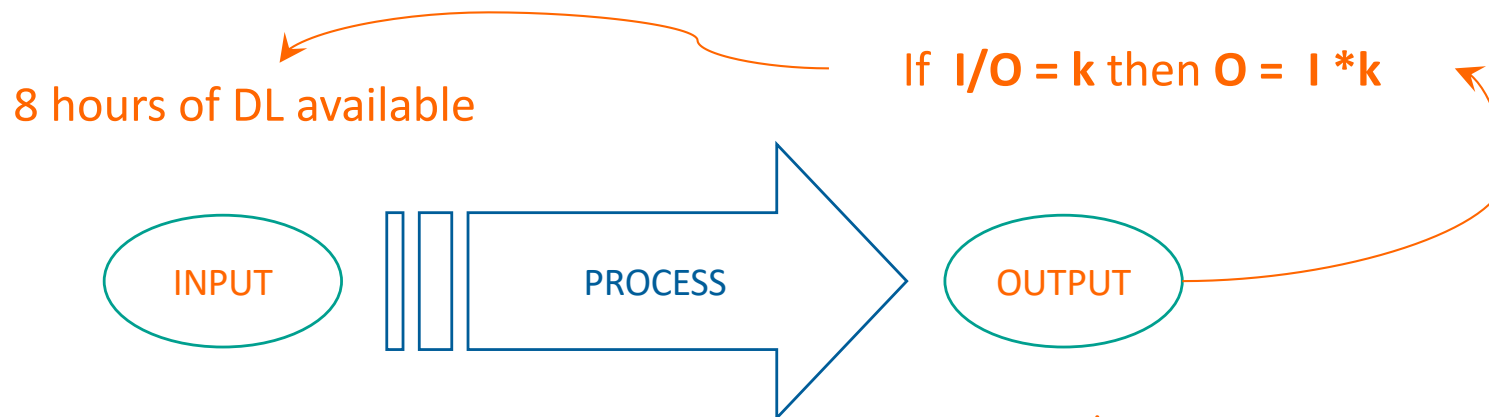


If the output is sufficiently homogeneous there is normally no problem in identifying a measure of capacity.

The capacity is in fact measured with the same unit of measure employed in order to measure the production set up or sold.

- # of units
- # of meters
- # of liters
- # of kilograms
- # of bottles
- # phone calls
- # document processed
- # invoices sent

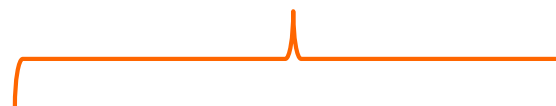
UNDERSTANDING CAPACITY



If, however, the output is made up of different products or services, heterogeneous in nature, then defining capacity directly in terms of potential output becomes difficult.

It is preferred, in that case, to provide a measure of capacity in terms of the resources available to carry out the production process.

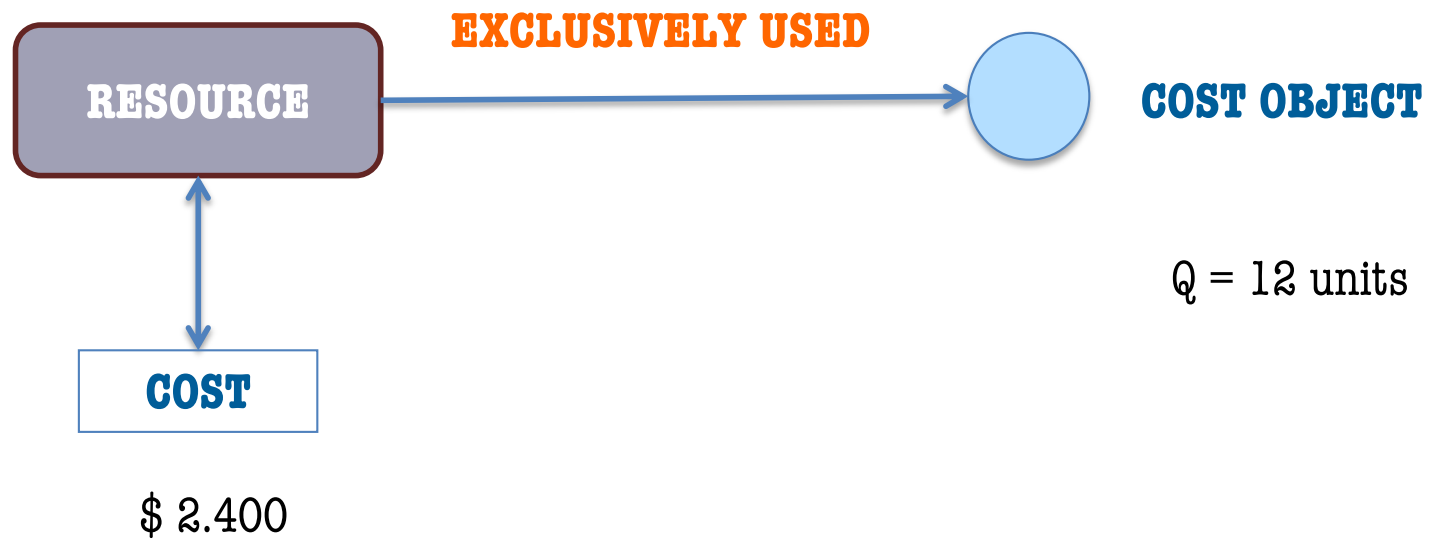
The step is made possible through the adoption of the assumption that resources work at a constant level of productivity over the period under consideration.



Maximum Possible Output

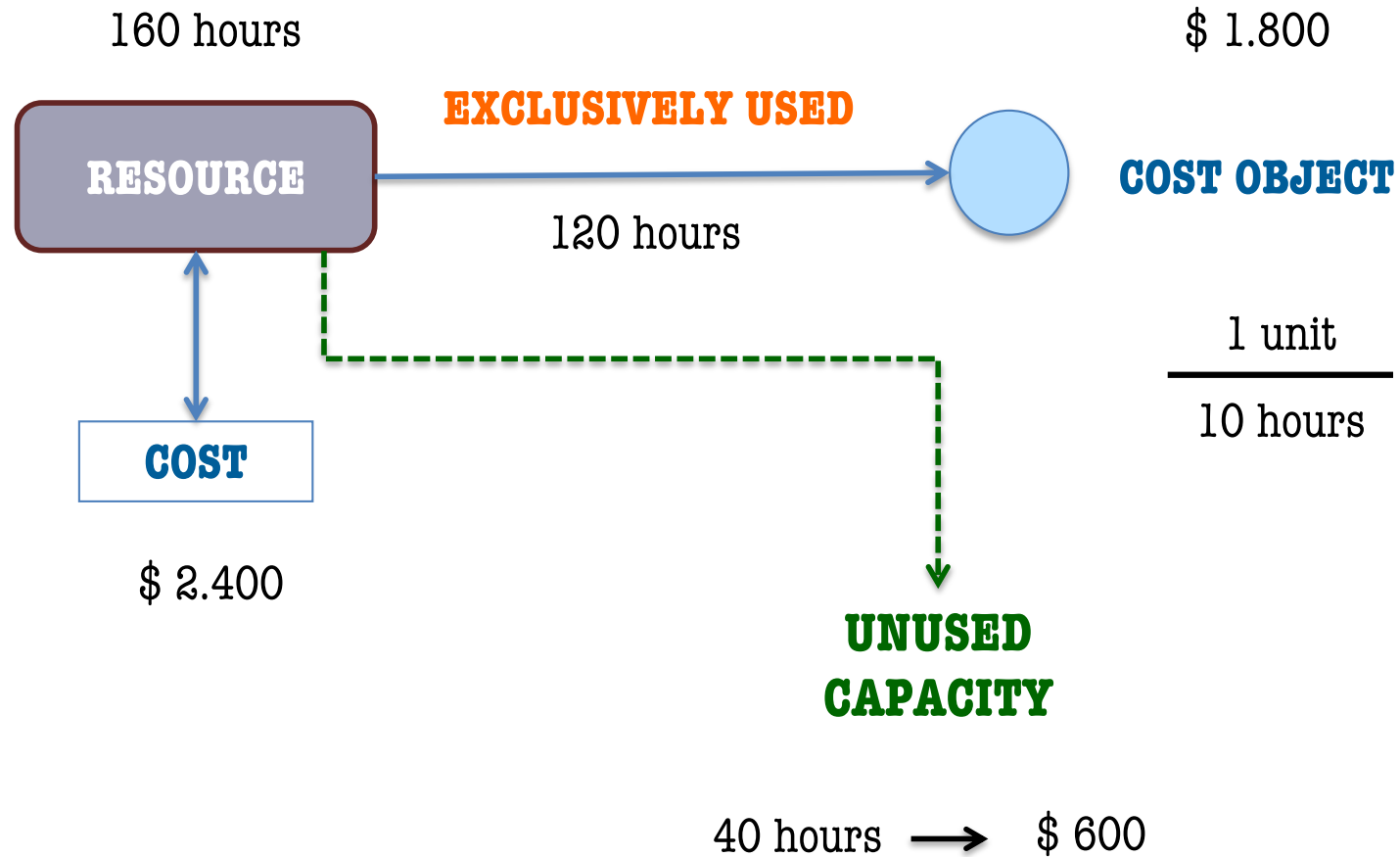
- 4 Product "A" 0 Product "B"
- 3 Product "A" 2 Product "B"
- 2 Product "A" 4 Product "B"
- 1 Product "A" 6 Product "B"
- 0 Product "A" 8 Product "B"

TRACING COSTS



TRACING FIXED COSTS

Q = 12 units
K = 16 units



DIFFERENT COST RATES

Budgeted cost: \$ 2,400

Actual cost: \$ 2,580

Budgeted hours: 140

Actual hours: 120

Available hours: 160

Worked hours: 170

$$\frac{\text{Budgeted Cost}}{\text{Budgeted Hours}} = 17,14 \text{ \$/h}$$

$$\frac{\text{Budgeted Cost}}{\text{Actual Hours}} = 20,00 \text{ \$/h}$$

$$\frac{\text{Budgeted Cost}}{\text{Available Hours}} = 15,00 \text{ \$/h}$$

$$\frac{\text{Actual Cost}}{\text{Actual Hours}} = 15,18 \text{ \$/h}$$



FIXED COST ALLOCATION



\$ 315,000

K = 525 units



Q = 200 units 80 DL hours per unit \$ 50,000 per units

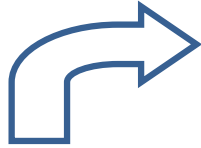


K = 1.050 units



Q = 350 units 40 DL hours per unit \$ 32,000 per units

INDIRECT COSTS ALLOCATION



$$F.C.U.^{\omega} * (Q_A * \omega_A)$$



$$\frac{F.C.U.^{\omega} * (Q_A * \omega_A)}{Q_A}$$

$$Q_A$$

FIXED COSTS

$$= F.C.U.^{\omega}$$

K^{ω}



$$F.C.U.^{\omega} * (Q_B * \omega_B)$$



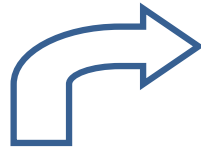
$$\frac{F.C.U.^{\omega} * (Q_B * \omega_B)}{Q_B}$$

$$Q_B$$

$$F.C.U.^{\omega} * [K^{\omega} - (Q_A * \omega_A) - (Q_B * \omega_B)]$$

UNUSED CAPACITY COST

INDIRECT COSTS ALLOCATION



$$5.25 \text{ \$/H} * (200 \text{ units} * 80 \text{ h/unit})$$



\$ 84,000

200 units

\$ 220,500

$$= 5.25 \text{ \$/H}$$

42,000 H



$$5.25 \text{ \$/H} * (350 \text{ units} * 40 \text{ h/unit})$$



\$ 73,500

350 units

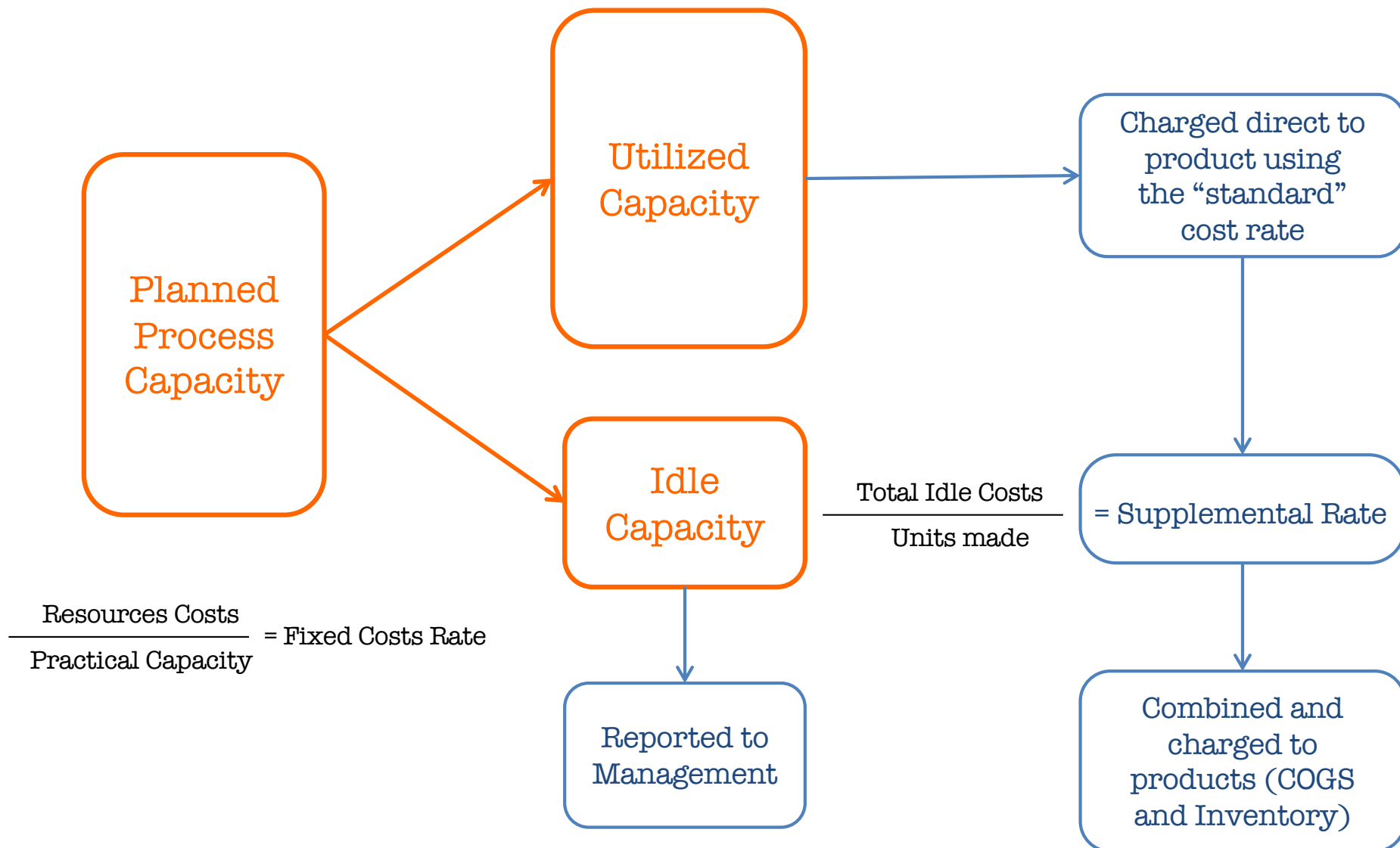


$$5.25 \text{ \$/H} * [42,000 \text{ h} - (200 \text{ units} * 80 \text{ h/unit}) - (350 \text{ units} * 40 \text{ h/unit})]$$

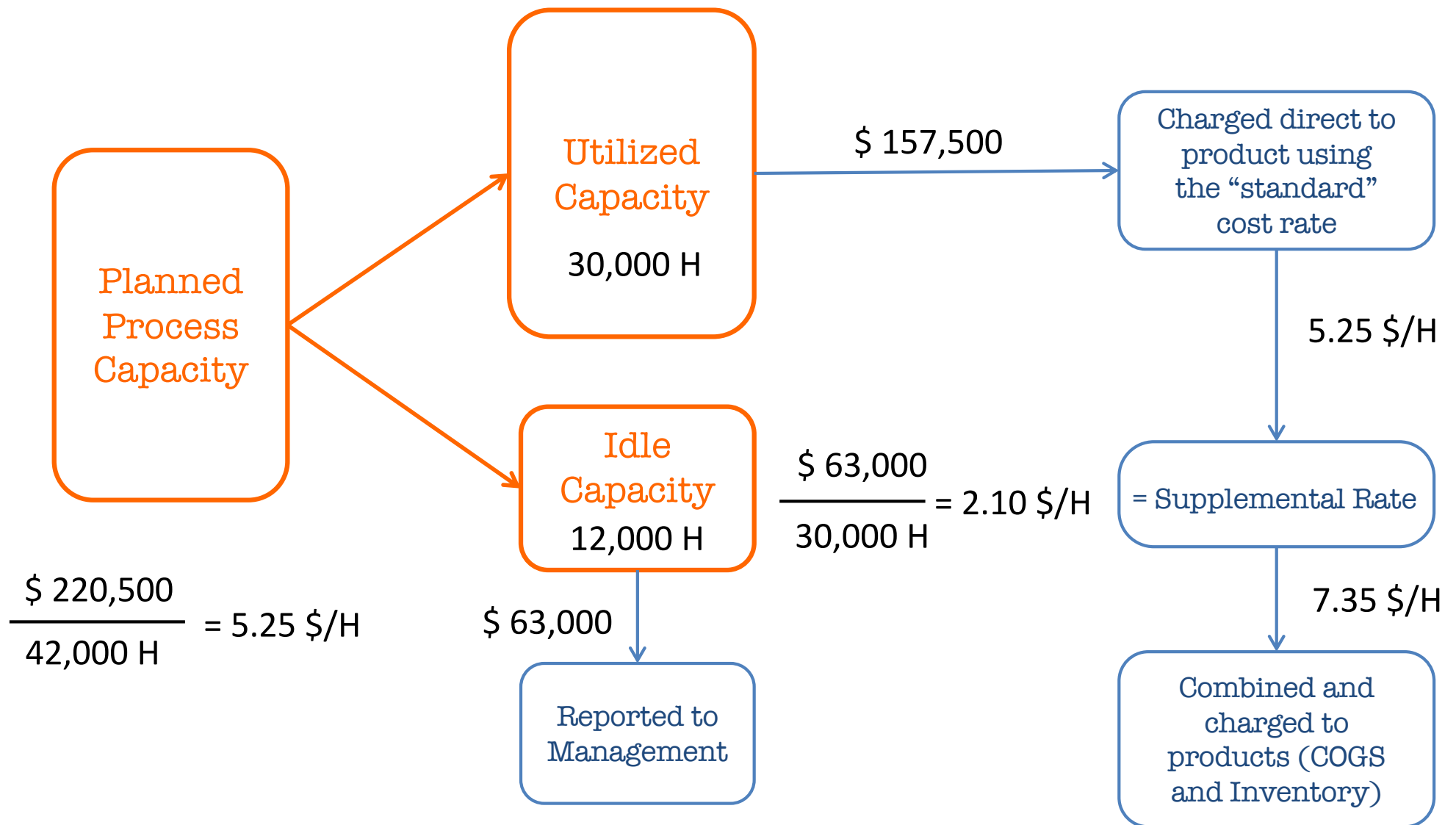
UNUSED CAPACITY COST



SUPPLEMENTAL RATE METHOD



SUPPLEMENTAL RATE METHOD



FULL NORMAL COSTING

330-10-30-1 The primary basis of accounting for inventories is cost, which has been defined generally as the price paid or consideration given to acquire an asset.

As applied to inventories, cost means in principle the sum of the applicable expenditures and charges directly or indirectly incurred in bringing an article to its existing condition and location.

It is understood to mean acquisition and production cost, and its determination involves many considerations.

330-10-30-2 Although principles for the determination of inventory costs may be easily stated, their application, particularly to such inventory items as work in process and finished goods, is difficult because of the variety of considerations in the allocation of costs and charges.

330-10-30-3 For example, variable production overheads are allocated to each unit of production on the basis of the actual use of the production facilities. However, the allocation of fixed production overheads to the costs of conversion is based on the normal capacity of the production facilities. Normal capacity refers to a range of production levels. Normal capacity is the production expected to be achieved over a number of periods or seasons under normal circumstances, taking into account the loss of capacity resulting from planned maintenance. Some variation in production levels from period to period is expected and establishes the range of normal capacity.



TWO DIFFERENT KINDS OF RESOURCES

CONSUMABLE RESOURCE

The defining characteristic of a consumable resource, also called a flexible resource, is that its cost depends on the amount of resource that is **used**. Examples of consumable resources are wood in a furniture factory and iron ore in a steel mill. The cost of a consumable resource is often called a variable cost because the total cost depends on how much of the resource is consumed.

CAPACITY-RELATED RESOURCE

The defining characteristic of a capacity-related resource is that its cost depends on the amount of resource capacity that is acquire (better: **deployed**) and not on how much of the capacity is used. As the size of a proposed factory or warehouse increases, the associated capacity-related cost will increase. Examples of capacity-related costs are depreciation on production equipment (the capacity-related resource) and salaries paid to employees (the capacity-related resource) in a consultancy. The cost of a capacity related resource is often called a fixed cost because the cost of the resource is independent of how much of the resource is used in the short run.

A PUSH APPROACH TO COSTING

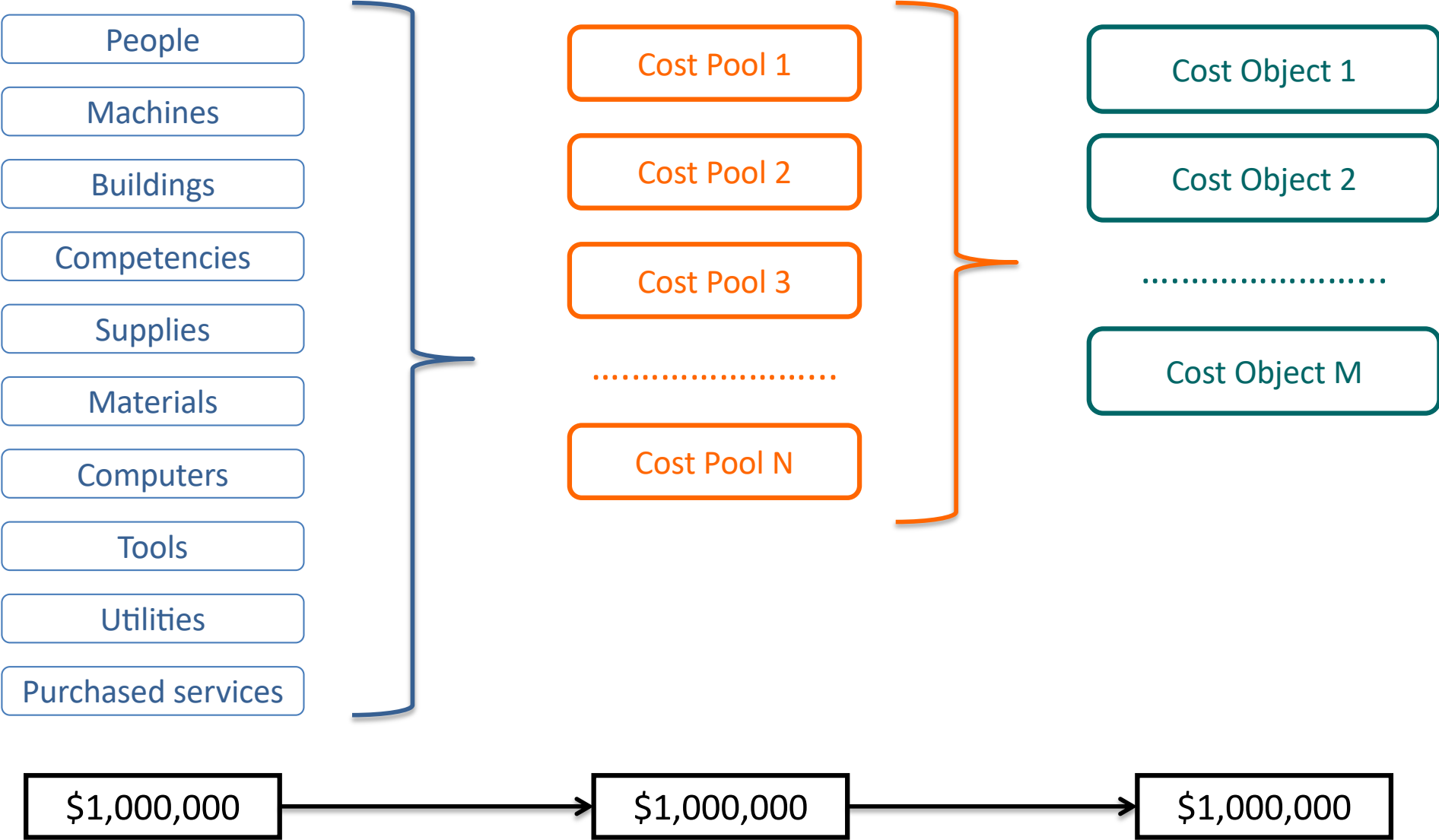
A push approach to costing means full absorption in which 100% of the expenses incurred during a time period are assigned to the activities performed, and all of those activity costs are in turn reassigned to the recipients or “cost objects” that consume them.

The expenses collected in the General Ledger (GL) accounting system (primarily from payments for purchases, employee payroll, and accrual-type journal entries like depreciation) equal the total amount when adding up all of the activity costs and the ultimate final cost object costs.

The push approach proportionately traces costs based on consumption relationships and is like a complete electrical circuit from the provider to the receiver. The benefit of this approach is that there’s a 100% complete reconciliation of the expenses to the officially reported financial results in total. Therefore, the cost amounts are credible overall and reasonably accurate.

With the push approach, estimates of driver quantities are acceptable since each assignment must normalize to 100%.

A PUSH APPROACH TO COSTING



A PUSH APPROACH TO COSTING

From: General Ledger

Chart-of-Accounts View			
Claims Processing Department			
	Actual	Plan	Favorable/ (unfavorable)
Salaries	\$621,400	\$600,000	\$(21,400)
Equipment	161,200	150,000	(11,200)
Travel expenses	58,000	60,000	2,000
Supplies	43,900	40,000	(3,900)
Use and occupancy	30,000	30,000	--
Total	\$914,500	\$880,000	\$(34,500)

To: ABC Database



Activity-Based View	
Claims Processing Dept	
Key/scan claims	\$ 31,500
Analyze claims	121,000
Suspend claims	32,500
Receive provider inquiries	101,500
Resolve member problems	83,400
Process batches	45,000
Determine eligibility	119,000
Make copies	145,500
Write correspondence	77,100
Attend training	158,000
Total	\$914,500

SHORTCOMINGS OF THE PUSH APPROACH

A downside of the push approach is that **the supplier of the resource capacity expenses (i.e., the “sending” spender of expenses) always recovers 100% of its incurred expenses.**

Therefore, if a support group such as information technology (IT) or Finance spends more than its budget, it becomes the receiving internal department’s problem, not theirs. **This doesn’t provide an incentive to the support group to reduce its expenses.** For example, if resources were added or paid overtime by IT or Finance to meet deadlines or performance measures, those receiving the allocation would bear the cost impact, no matter whose behavior caused the variance.

Another negative aspect of the push approach is that it is frequently capacity insensitive. That is, **there’s no obvious way to differentiate and classify individual resource capacities as used or unused (e.g., idle or excess).** Hence, **the final cost objects will be modestly overcosted for expenses that they didn’t cause or require.**



A PULL APPROACH TO COSTING

As a result of the shortcomings of the push approach, the pull approach was born.

Think of it as a **partial absorption of the resources' expenses**. With the pull approach, **senders of expenses can be viewed as mini profit centers in which agreed-upon rates for their services are established**, typically based on a budget of planned expenses and expected volumes.

Consumers of these services pay a fixed rate (i.e., price) for the actual volume that they consume—no more, no less. The pull approach opens a new world of arm's-length relationships between supporting centers and customer-facing departments. Customers, whether they are internal or external, often prefer this arrangement because it allows them to have some control over how much expense from their organization is planned for them as costs.

Additionally, internal service providers may favor this method because it can show the value of their services or the need for additional resources based on the over-recovery or under-recovery of their costs charged to their customers. For example, if an IT group were shown to be over-recovering its costs via these charge-outs by a large margin, this information could be used as justification for increased headcount or at least demonstrate that they are performing highly.



A PULL APPROACH TO COSTING

The pull approach also introduces a rudimentary measure of capacity utilization: the percent over/under cost recovery.

But a problem with the pull approach is that the correctness of the cost assignment is highly contingent on setting accurate rates. Imagine a cost assignment network that includes cross-charging in which estimated rates are applied. There would be multiple overrecoveries and underrecoveries of expenses, potentially large ones, because of faulty rates. The result would be a difference from the actual GL expense totals in aggregate, thereby questioning the overall credibility and understanding of the costs



PULL SYSTEMS

