

Engineering Economy

Cost & Benefit

-DEI-

Cost

Hansen and Mowen (2003) : “Cost is *the cash or cash equivalent value sacrificed for goods and services that are expected to bring a current or future benefit to organization*”

The classification of cost

time

history

Predictive

actual

use

investment

Operation

Maintenance

product

fabrication

commercial

Volume

Fix

Variable

Clasification by time

- **Historical cost** → *Money spent and proved by historical records of spending acitvity ex: anual bookkeeping*
- **Predictive cost** →
 - *the estimated costs which will be incurred if the acitvity is conducted ex: cost budgeting for project*

Clasificación by time

- **Actual cost**, a cost which was already incurred
 - **Sunk cost**
 - *a cost that has occurred in the past* and has no relevance to estimates of future costs and revenues related to an alternative course of action.
 - **Opportunity cost**
 - a cost measured *as the loss of potential benefits* by choosing one course of action over another
 - the monetary advantage

Clasification by use

- **Investment cost** → preparing business needs
- **Operational Cost** → a cost which will be incurred to run business activity
- **Maintenance cost** → maintain the facility performance to be ready for running the business well

Classification by product

- Fabrication

- Prime Cost

- *direct material (DM)*
 - *direct labor (DL)*

- Overhead (OH)

- *indirect material*
 - *indirect labor*
 - *other*



Manufacturing
cost

Classification by product

Direct—a cost which is incurred for the benefit of one specific product (cost object)

– can be measured and allocated to a specific work activity

Indirect—a cost which is incurred for the benefit of more than one cost object or which *cannot be easily or efficiently traced to a specific cost object*

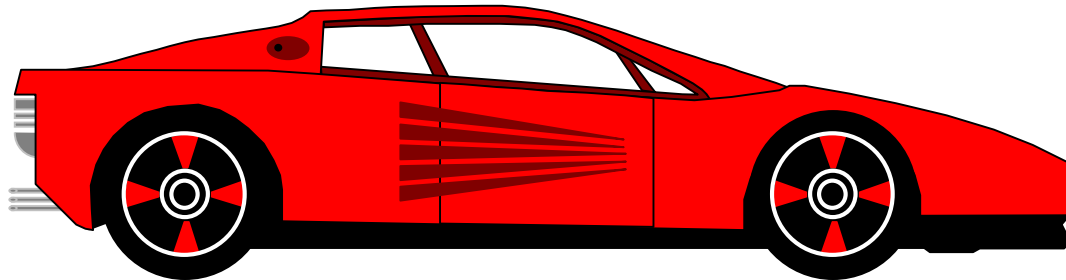
Classification by product

“Direct costs can be traced to a specific cost object”

“indirect costs benefit more than one cost object”

Direct Materials

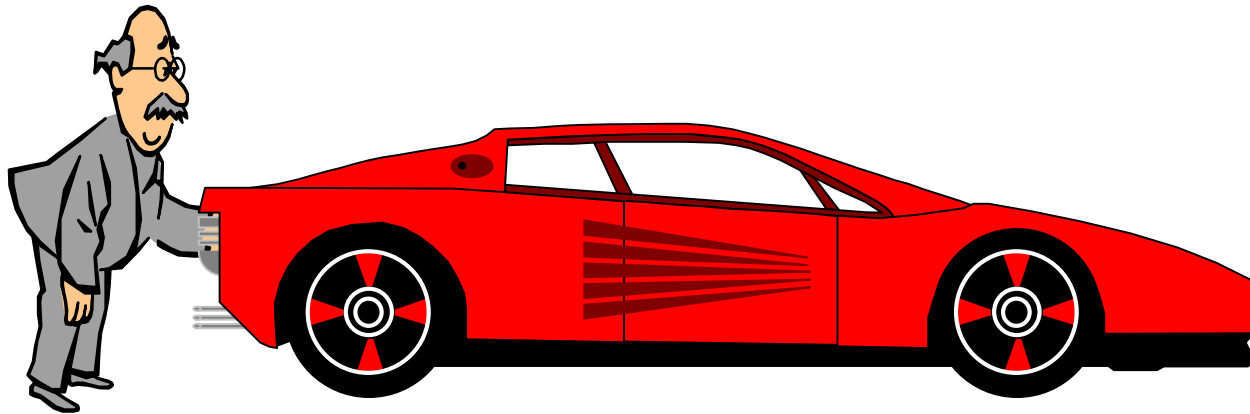
Those materials that become an integral part of the product and that can be conveniently traced directly to it.



Example: A radio installed in an automobile

Direct Labor

Those labor costs that can be easily traced to individual units of product.

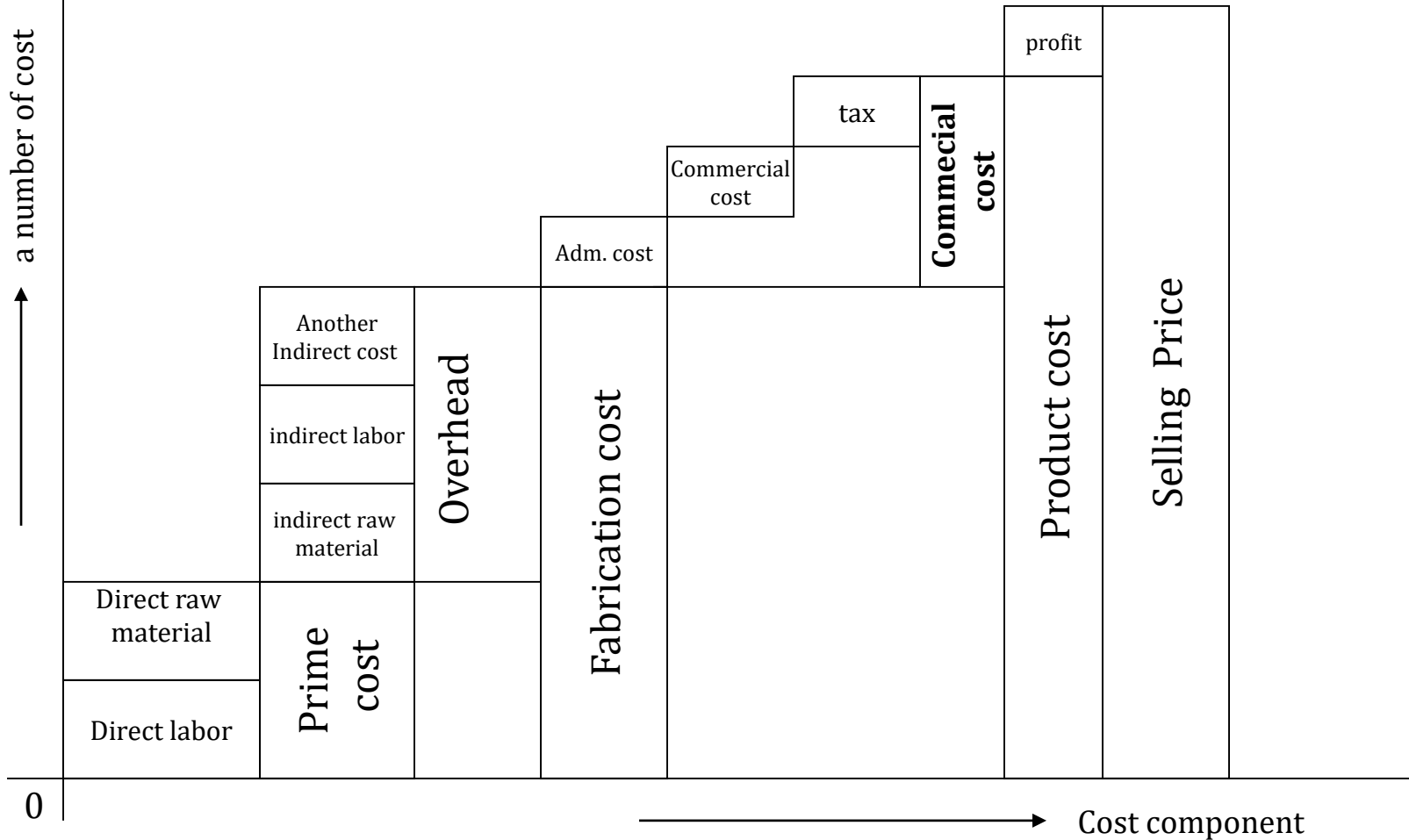


Example: Wages paid to automobile assembly workers

Classification by product

- **Comercial (non manufacturing cost)**
 - *general and administration cost*
 - *commercial tax*
 - *Corporate & individual tax*

Cost Classification



Cost classified by product

Classification by Volume

- **Fixed cost**

- a cost which does not change as the volume of activity (production) changes

- **Variable cost**

- a cost which changes with changes in the volume of activity



Classification by Volume

“Variable costs change with volume”

“fixed costs stay constant within a relevant range of activity”

Benefit

Direct
benefit

Indirect
benefit

Tangible
benefit

Intangible
benefit

Direct & Indirect Benefit

 **Direct Benefit: benefit which can be obtained and enjoyed directly**

example:

- The construction project of flyover
- The construction project of railway
- The protection of flood area

 **Indirect benefit → multiplier effect**

example:

- The decrease of rupiah's value against dollar

Tangible & Intangible

- ***Tangible benefit:*** benefit which can be measured in monetary terms
- ***intangible benefit:*** benefit which can't be measured in monetary terms. Example:
 - The police has already arrested the criminal
 - The project construction of Antapani fly over will minimize the traveling time

Investment

Money allocated in order to gain a profit in the future.

Investment categorized by:

financial asset:

- Certificate of deposit, securities, market stock, bonds

Real assets.

- Purchasing productive asset, build a new plant, opening the mine, plantation etc.

Exercise

Assuming Kreatif “gerage” has recorded monthly expense as follow : :

- Purchase wood 1 m3 Rp 700.000,-
- Purchase 6 plywood Rp 250.000,-
- Purchase glue, nail and another equipments Rp 150.000,-
- Labor cost for 10 tables Rp 600.000,-
- Pay electricity bills Rp 200.000,- which the allocation is 50% for running the business and 40% for lighting
- Pay bills for call monthly Rp 100.000,-
- Labor cost for 15 tables Rp 900.000,-
- Pay supervisor salary Rp 1.000.000,- / month
- Machinery depreciation and others Rp 500.000,- /month.

Questions:

- If all the purchased material is perfectly used, then analyze these problems as follow:
 1. Classify the expenses by prime cost and overhead
 2. Count production cost for 1 unit of table or chair
 3. Classify cost by fix and variable cost
 4. Count BEP while selling price is 3000/ unit

Answer

- Cost is clasiffied by prime and overhead cost

Prime cost:

Direct material:

- 1 m3 cublicle wood = Rp 700.000
- 6 plywoods =Rp 250.000

Direct Labor:

- labor cost fot 10 tables =Rp 600.000
- labor cost for 15 tables =Rp 900.000

Prime cost total Rp 2.450.000

Overhead cost:

Indirect material:

-glue, nails etc = Rp 150.000

Indirect labor:

-supervisor salary =Rp 1.000.000

-electricity bills =Rp 200.000

others

-phone bills =Rp 100.000

-depreciation =Rp 500.000

total overhead Rp 1.950.000

- Production= primer +overhead = 4.400.000

Production cost for 1 table

Total Production cost for 1 table=
total production cost/ total production per unit

thus production cost for 1 table =

Rp.4.400.000/ 25 unit meja= Rp.176.000/unit

Cost classification by fix and variable cost

Fix cost:

-electricity for lighting (40%)	= Rp	80.000
-phone bills	=Rp	100.000
-salary for supervisor or officer	=Rp	1.000.000
-machinery depreciation	=Rp	<u>500.000</u>
Total fix cost	Rp	1.680.000

Variable

-labor cost (table/unit)	= Rp	1.500.000
-wood (@25 unit/table)	=Rp	700.000
-6 plywoods	=Rp	250.000
-glue, nail etc	=Rp	150.000
-electricity 60%	=Rp	<u>120.000</u>
Total of variable cost	Rp	2.720.000

Thus variable cost/ unit product =

Total Variable cost / total production

2.720.000 / 25 unit = Rp. 108.800

Unit of production during BEP

$$\text{BEP} = \text{FC} / (\text{S} - \text{variable cost per unit})$$

while S= the production cost for 1 table is Rp 300.000

$$\text{BEP} = \text{Rp } 1.680.000 / (\text{Rp } 300.000 - \text{Rp } 108.800)$$

$$\text{BEP} = 8,78 \text{ unit} \approx 9 \text{ unit}$$