



OTHER COSTING TECHNIQUES

OVERVIEW

Other Costing Methods

Joint Product
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Products



THROUGHPUT ACCOUNTING

Throughput accounting

- ▶ Throughput accounting is very similar to marginal costing, but it can be used to make longer-term decisions about capacity/production equipment.
- ▶ Throughput accounting is based on three concepts:
 - i. throughput,
 - ii. inventory (or investment) and
 - iii. operating expenses.

Throughput

- ▶ In throughput accounting, the **only cost** that is deemed to relate to volume of output is the **direct material cost**. All other costs (including all labour costs) are **deemed to be fixed**.

These fixed costs may be called **Total Factory Costs (TFC)**.

- ▶ The aim of throughput accounting is to maximise this measure of throughput contribution.

$$\text{Throughput contribution} = \text{Revenue} - \text{Direct Material Costs}$$

Inventory Valuation

- ▶ Inventory should be valued at the purchase cost of its raw materials and bought-in parts.
- ▶ It should not include any other costs, not even labour costs.
- ▶ No value is added by the production process, not even by labour, until the item is sold.

Example

- ▶ A company makes 1,000 units of an item during a period and sells 800 units for \$8,000. Costs of production were as follows:

	\$
Materials	3,000
Direct labour	2,000
Fixed production overhead	1,000
Other overhead	1,000.

Actual production volume and production overhead expenditure were both the same as budgeted.

Required:

Calculate the profit for the period using: (a) absorption costing (b) marginal costing (c) throughput accounting

Solution

Absorption costing

- ▶ Value of closing inventory = \$1,200

	\$
▶ Sales	8,000
▶ Cost of sales (6000-1200)	<u>(4,800)</u>
Gross profit	3,200
Non-production OH	<u>(1,000)</u>
Profit	<u>2,200</u>

Marginal costing

- ▶ Value of closing inventory = \$1,000

	\$
▶ Sales	8,000
▶ Cost of sales (5000-1000)	<u>(4,000)</u>
▶ Contribution	4,000
▶ Fixed overhead	(1,000)
▶ Non-production OH	<u>(1,000)</u>
▶ Profit	<u>2,000</u>

- ▶ Throughput accounting
- ▶ Value of closing inventory = \$600

	\$
▶ Sales	8,000
▶ Cost of sales	<u>(2,400)</u>
▶ Throughput	5,600
▶ Operating expenses	<u>(4,000)</u>
▶ Profit	<u>1,600</u>

Multi-product decision making in throughput accounting

- ▶ If the business has more capacity than the customer demand, it should produce to meet the demand in full.
- ▶ If the business has a constraint that prevents it from meeting customer demand in full, it should make the most profitable use that it can of the constraining resource. This means giving priority to those products earning the **highest throughput contribution for each unit of the constraining resource** that it requires. This constraint is called a **bottleneck**.

Note: In throughput accounting the approach should be to maximise the throughput contribution earned.

Optimal production: allocating scarce resources

- ▶ **Step 1:** identify the bottleneck constraint.
- ▶ **Step 2:** calculate the throughput contribution per unit for each product.
- ▶ **Step 3:** calculate the throughput contribution per unit of the bottleneck resource for each product.
- ▶ **Step 4:** rank the products in order of the throughput contribution per unit of the bottleneck resource.
- ▶ **Step 5:** allocate resources using this ranking and answer the question

Example

The following data relates to two products manufactured by DJ

	Product X	Product Y
Selling price per unit	\$15	\$20
Direct material cost per unit	\$10	\$11
Maximum demand (units)	25,000	30,000
Time required on the bottleneck (hours per unit)	2	6

The firm has 80,000 bottleneck hours available each period. Total factory costs amount to \$128,000 in the period.

Required:

Calculate the optimum product mix and the maximum profit.

Solution

	\$	\$
	X	Y
Selling price	15	20
Direct material	(10)	(11)
Throughput	<u>5</u>	<u>9</u>
No. of bottleneck hours per unit	2	6
Return per factory hour	2.50	1.50
	1st	2nd

Product	Units	Bottleneck hrs per unit	Bottleneck hrs	Throughput \$
Product X	25,000	2	50,000	125,000
Product Y	5,000	6	30,000 (Bal)	45,000
			80,000	170,000
Total Factory Cost				128,000
Gross Profit				42,000

Throughput accounting measures

Return per factory hour

=

Throughput contribution

Product' s time on the bottleneck resource

Cost per factory hour

=

Total factory cost

Total time on the bottleneck resource

Throughput accounting
ratio

=

Return per factory hour

Cost per factory hour

Criticism of throughput accounting

- ▶ A criticism of throughput accounting is that it concentrates on the short term, when a business has a fixed supply of resources and operating expenses are largely fixed.
- ▶ It is more difficult to apply throughput accounting concepts to the longer term, when all costs are variable, and vary with the volume of production and sales or another cost driver.
- ▶ Activity based costing, might be more appropriate for measuring and controlling performance from a longer-term perspective.



JOINT-PRODUCT COSTING

Joint Product Costing

There are two main types of costing system:

- i. **Specific order costing**, where the costs of distinct products or services are collected. Individual cost units are different according to individual customer's requirements. **Batch costing** is also a form of specific order costing, although costs will be attributed to specific batches rather than specific orders or customers.
- ii. **Continuous costing**, where a series of similar products or services are produced. Costs are collected and averaged over the number of products or services produced to arrive at a cost per unit.

Joint Product Costing is an example of Continuous Costing

Joint Products

- ▶ Some products may be produced at the same time in the same process before being separated for sale or further individual processing. These products are known as **joint products** and the separation point is known as the **split-off point**.

For example, different types of carbonated drinks might use a common starting process where syrup, sweeteners and malt are added before they are split up and individual flavorings added

- ▶ **Joint costs** are the total of the raw material, labor, and overhead costs incurred **up to the initial split-off point**.

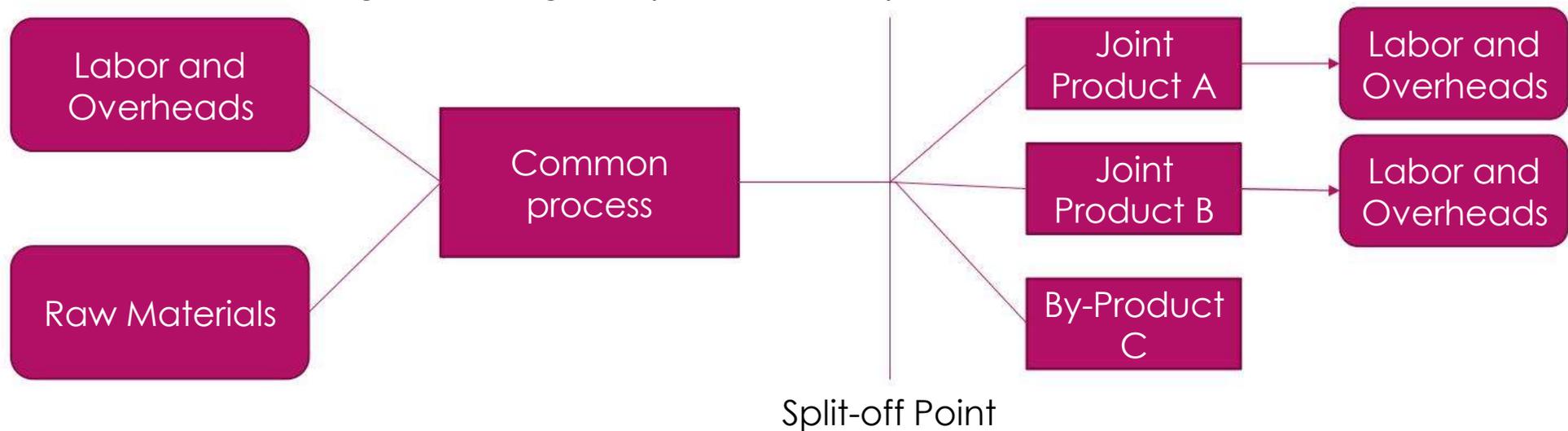
Joint Costs and Common Costs

- ▶ A joint cost is the cost of a process that results in more than one main product.
- ▶ A common cost is a cost relating to more than one product or service.

The joint costs can not normally be directly attributable to individual joint products or by-products. Therefore, arbitrary allocations may have to be used instead.

Joint Products and By-Products

- ▶ **Joint Products** are two or more products produced by the same process and separated in processing, each having a sufficiently high saleable value to merit recognition as a main product.
- ▶ A **By-Product** is output of some value produced incidentally in manufacturing something else (main product)



Methods of Joint Cost apportionment

There are many ways in which joint costs can be apportioned to products such as:

- ▶ Physical measurement
- ▶ Market value at point of separation
- ▶ Net realisable value/net relative sales value

In turn, the methods will result in different inventory valuations and, therefore, different recorded profits.

Example

An organisation produces two joint products Product A and Product B. The total joint costs are \$750 and the following information is provided on each product:

	Kgs produced	Kgs sold	Selling price per kg	Joint Cost
Product A	100	80	\$5	
Product B	200	150	\$2	\$750

Apportion the joint costs between the products using the following apportionment methods:

- ▶ physical measurement
- ▶ market value at point of separation
- ▶ net realisable value/net relative sales value

Solution-Appportionment by physical measurement

Particulars	Product A		Product B		Total
Sales	80 × \$5.00	400	150 × \$2.00	300	700
Cost of sales	80 × \$2.50	(200)	150 × \$2.50	(375)	(575)
Profit/(Loss)		200		(75)	125
Value of closing inventory	20 × \$2.50	50	50 × \$2.50	125	
Total share of joint costs (Cost of sales + inventory)		250			500

Particulars		Amount (\$)
Sales value of product A	100 × \$5	500
Sales value of product B	200 × \$2	400
Joint Cost		(750)
Profit		150

$$\frac{\text{Joint cost}}{\text{Kgs produced}} = \$750/300$$

$$= \$2.50 \text{ per kg for A and B}$$

Apportionment by market value at point of separation

Particulars	Sales value of production	Proportion	Joint cost apportionment	Per kg
A 100 × \$5	500	5/9	417	4.17
B 200 × \$2	400	4/9	333	1.67

Particulars	A	B	Total
Sales	400	300	700
Cost of sales	(333.6)	(250.5)	(584.1)
Profit	66.4	49.5	115.9
Profit/Sales	16.6%	16.5%	
Closing Inventory	83 (20x4.17)	83 (50x1.67)	

Apportionment by net realisable value

This approach should be used in situations where the sales value at the split-off point is not known

Further processing costs

\$280 + \$2.00 per kg

\$160 + \$1.40 per kg

Selling price after further processing

\$8.40

\$4.50

Apportionment of joint costs:	Product A	Product B
Final sales value of production (100 × \$8.40; 200 × \$4.50)	840	900
Further processing cost 280 + (100 × \$2); 160 + (200 × \$1.40)	480	440
	360	460

Apportionment by net realisable value

Particulars	Product A	Product B
Joint cost apportionment (360 : 460)	329	421
Joint cost per kg	\$3.29	\$2.10

Particulars	Amount \$	Amount \$
Sales		700
Joint Cost	750	
Less: Closing inventory	(171)	(579)
A $20 \times \$3.29 = 66$		
B $50 \times \$2.10 = 105$		
Profit		121

Accounting for Joint Products

- ▶ **Physical measurement of joint products:** Joint costs can be apportioned to the units of output of each joint product. When the unit of measurement is different, e.g. liters and kilos, some method should be found of expressing them in a common unit. Some joint costs are not incurred equally for all joint products: such costs can be separated and apportioned by introducing weighting factors. Alternatively, a technical estimate of relative usage by each product may be made by the organisation.
- ▶ **Market value:** Joint costs can be apportioned on the basis of the market value of each joint product at the point of separation. The effect is to make each product appear to be equally profitable.
- ▶ **Net realisable value:** Where certain products are processed after the point of separation, further processing costs may be deducted from the market values before joint costs are apportioned.

Accounting for By-Products

Any of the following methods may be adopted:

- ▶ the proceeds from the sale of the by-product may be treated as pure profit, or
- ▶ the proceeds from the sale, less any handling and selling expenses, may be used to reduce the cost of the main products.

If a by-product needs further processing to improve its marketability, the cost will be deducted in arriving at net revenue

Joint costs in decision making

The main decisions involving joint products are:

- ▶ To carry out the whole process or not. This decision is made by considering the total revenues and costs of the process. A decision cannot be taken to just process some of the products as all products are produced simultaneously. The basis of common cost apportionment is irrelevant but the common costs in total are relevant. E.g.: Milk and milk products
- ▶ Whether or not to further process products. This decision is based on the incremental costs and incremental revenues of further processing. Revenue and cost at the split-off point are irrelevant to the decision as they will not change. E.g.: Leather in Jackets and belts



DIGITAL COSTING

Costing Digital Products

- ▶ A digital product typically refers to a product that is stored, delivered and consumed in an electronic format.

For example, a company may release a game that can be played on its website or via IOS or Android apps. A digital product can also refer to digital media that will be distributed such as a television programme or music album.

Digital products as bundles of features

- ▶ Features can be added and changed by individual consumers giving each user a bespoke experience through choosing the features that they want and don't want. For example: Computer or Console Games
- ▶ It may even be that features become products in their own right when unbundled from the product. For example: Facebook's messenger

Digital Products V/s Physical Products

Where they differ	Physical Products	Digital Products
Marginal cost	Key element of total cost	Virtually zero
Standard costing	Key to determining total cost	Few applicable standards
Overheads	Absorbed based on activity drivers	Drivers difficult to determine
Pricing	Cost drives prices	Target price might drive target cost
Timing of costs	Upfront and predictable	Spread over product life and harder to estimate

Typical Costs and Cost Patterns

- ▶ **Staff costs:** Many staff costs will be specific to the product or project. E.g.: Mobile phone app design
- ▶ **Infrastructure, platform and payment types:** There will be costs associated with the platform on which digital products will be launched. Infrastructure services include infrastructural components such as where the app is hosted, where data is stored and how the data is delivered. E.g.: Cost of Servers, Data Storage, etc.

Each payment type added to the product would incur additional costs for the product.
- ▶ **Functionality:** Individual product functions may be costed separately. For example, in a mobile phone app there may be a payment function for accessing additional content.
- ▶ **Design and development:** There may be shareable design elements for products. Many computer games, for example, use the same game 'engine'. For example, the Frostbite engine is used in games as varied as FIFA, Battlefield and Need for Speed.

Typical Costs and Cost Patterns

- ▶ **Marketing:** Many digital products will be allocated a fixed marketing budget which will need to be carefully planned.
- ▶ **IT Support services and testing:** IT specific maintenance costs for infrastructure and Testing will be the key factors and costs before the digital product is launched.
- ▶ **Royalty and license costs:** There may also be royalty and license costs for the product. License fees tend to be a fixed amount paid on production of the product pre-launch.
- ▶ **Inventory costs:** A major advantage of digital products is that there will be no inventory of the product.
- ▶ **Administrative services:** Administrative costs are the most difficult to anticipate as they will largely depend and differ based on each individual app.

Digital products and decision making

Cost benefit analysis for launching new products, will be complicated for digital products due to many problems such as:

- ▶ **The timing and frequency of costs:** Forecasts will have to be made for the time taken for each activity, the number of staff required for each element, prospective sales volumes, etc.
E.g.: Development Costs, Royalties, Costs of updates or change of platforms.
- ▶ **Costs for shared functions:** Few costs may have to be shared and absorbed across a number of products and it can be difficult to determine the drivers associated with these costs
- ▶ **Determining benefits:** It will be complicated to determine the benefits of the product, because of the unknown lifespan of the product and the fact that the same product can be sold over and over again.

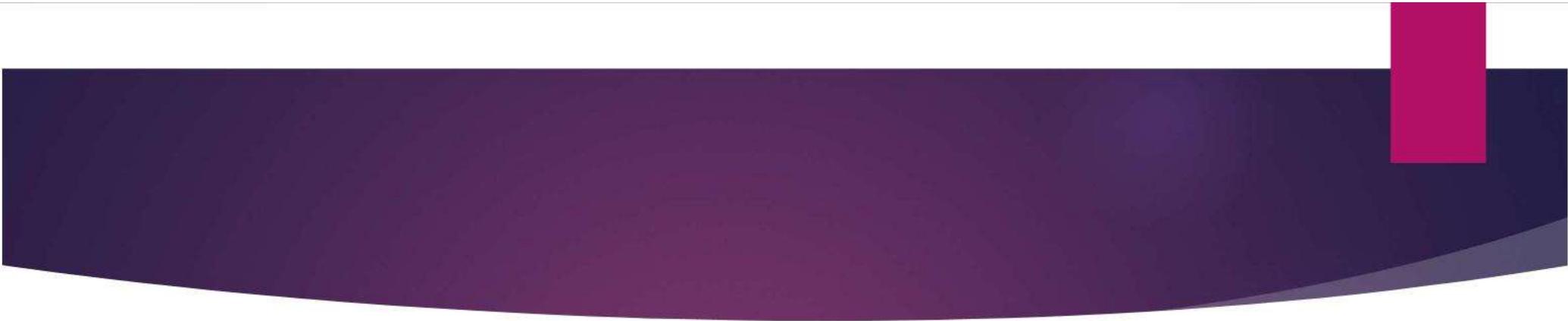
Digital costing

- ▶ **Digital costing systems** use technology to allow them to understand and 'read' product designs and plans in order to find the best components to achieve product goals. They can gather and feed information into manufacturing items to make the entire operation more efficient, flexible and effective.
- ▶ The systems can provide information on marginal, total and average product costs that are much more detailed than those produced from non-digital systems, the information is obtained more quickly and product costs become more accurate

These can bring large operational and strategic benefits to organisations who employ such systems.

Benefits of Digital Costing Systems

- ▶ A Streamlined system
- ▶ Accessibility to important Financial Information
- ▶ Ease of use and improved speed and productivity
- ▶ Increased data security
- ▶ Cost-Effective
- ▶ Reliability and Scalability
- ▶ Facilitate standardization



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