

# MANAGEMENT ACCOUNTING

ACCOUNTING PROFESSION OPTION

For Rwandan Schools

Senior

5

Student's Book

EXPERIMENTAL VERSION



© 2023 Rwanda Basic Education Board

All rights reserved

This book is the property of the Government of Rwanda.

Credit must be provided to REB when the content is quoted

## FOREWORD

**Dear Student,**

Rwanda Basic Education Board (REB) is honored to present Senior 5 Management Accounting book for the students of Accounting Profession Option which serves as a guide to competence-based teaching and learning to ensure consistency and coherence in the learning of Management Accounting. The Rwandan educational philosophy is to ensure that you achieve full potential at every level of education which will prepare you to be well integrated in society and exploit employment opportunities.

The Government of Rwanda emphasizes the importance of aligning teaching and learning materials with the syllabus to facilitate your learning process. Many factors influence what you learn, how well you learn and the competences you acquire. Those factors include the relevance of the specific content, the quality of teachers' pedagogical approaches, the assessment strategies and the instructional materials available. In this book, we paid special attention to the activities that facilitate the learning process in which you can develop your ideas and make new discoveries during concrete activities carried out individually or in groups.

In competence-based curriculum, learning is considered as a process of active building and developing knowledge and meanings by the student where concepts are mainly introduced by an activity, situation or scenario that helps the student to construct knowledge, develop skills and acquire positive attitudes and values.

For efficiency use of this textbook, your role is to:

- **Work on given activities which lead to the development of skills;**
- **Share relevant information with other students through presentations, discussions, group work and other active learning techniques such as role play, case studies, investigation and research in the library, on internet or outside;**
- **Participate and take responsibility for your own learning;**
- **Draw conclusions based on the findings from the learning activities.**

To facilitate you in doing activities, the content of this book is self-explanatory so that you can easily use it yourself, acquire and assess your competences. The book is made of units as presented in the syllabus. Each unit has the following structure: the unit title and key unit competence are given and they are followed by the introductory activity before the development of managerial concepts that

are connected to real world problems more especially to production, finance, accounting and economics.

The development of each concept has the following points:

- **Learning activity which is a well set and simple activity to be done by students in order to generate the concept to be learnt;**
- **Main elements of the content to be emphasized;**
- **Worked examples; and**
- **Application activities to be done by the user to consolidate competences or to assess the achievement of objectives.**

Even though the book has some worked examples, you will succeed on the application activities depending on your ways of reading, questioning, thinking and handling calculations problems not by searching for similar-looking worked out examples.

Furthermore, to succeed in Management Accounting, you are asked to keep trying; sometimes you will find concepts that need to be worked at before you completely understand. The only way to really grasp such a concept is to think about it and work-related problems found in other reference books.

I wish to sincerely express my appreciation to the people who contributed towards the development of this book, particularly, REB staff, development partners, universities Lecturers and secondary school teachers for their technical support. A word of gratitude goes to Secondary Schools Head Teachers, Administration of different Universities (Public and Private Universities) and development partners who availed their staff for various activities.

Any comment or contribution for the improvement of this textbook for the next edition is welcomed.

**Dr. MBARUSHIMANA Nelson**

**Director General, REB.**

## ACKNOWLEDGEMENT

I wish to express my appreciation to the people who played a major role in the development of this Management Accounting book for Senior 5 students in Accounting Profession Option. It would not have been successful without active participation of different education stakeholders.

I owe gratitude to different universities and schools in Rwanda that allowed their staff to work with REB in the in-house textbooks production initiative.

I wish to extend my sincere gratitude to Universities Lecturers, Secondary school teachers and staff from different education partners whose efforts during writing exercise of this book were very much valuable.

Finally, my word of gratitude goes to the Rwanda Basic Education Board staffs who were involved in the whole process of in-house textbook elaboration.

**Joan MURUNGI.**

**Head of CTRLR Department.**

## ACCRONYMS AND ABBREVIATION

**FRW:** Francs Rwandais

**Ltd:** Limited

**Co.** Company

**BEP:** Break-Even Point

**P/V:** Profit- Volume Ratio

**CM:** Contribution margin ratio

**TV:** Television

**CVP:** Cost-Volume-Profit

**ABC:** Activity Based Costing

**PLC:** Public Listed Company

**b/d:** Brought down

**b/f:** Brought forward

**EFTPOS:** Electronic Funds Transfer at Point of Sale

**CIMA:** Chartered Institute of Management Accountants

**LIFO:** Last In, First Out

**FIFO:** First In, First Out

**GNP:** Gross National Product

**CEO:** Chief Executive Officer

**OLS:** Ordinary Least Square

**ZZB:** Zero-Based Budgeting

**ABB:** Activity Based Budgeting

**SIB:** Self-Imposed Budgeting

**MCV:** Material Cost Variance

**MPV:** Material Price variance

**MUV or MQV:** Material usage (or Quantity) Variance

**MYV:** Material Yield (or Sub-usage) Variance

**LCV:** Labor cost variance

**LRV:** Labor Rate Variance

**LEV:** Labor Efficiency (time) Variance

**LMV:** Labor Mix Variance

**LYV:** Labor Yield Variance

**FOV:** Fixed Overhead Variance

**EV:** Expenditure Variance

**W.I.P:** Work-In-Progress

**GDPR:** General Data Protection Regulation legislation

**VAT:** Value Added Tax

# TABLE OF CONTENT

<b>FOREWORD .....</b>	<b>i</b>
<b>ACKNOWLEDGEMENT .....</b>	<b>iii</b>
<b>ACCRONYMS AND ABBREVIATION .....</b>	<b>iv</b>
<b>Unit 1: THE STRUCTURE OF COSTING SYSTEM WITHIN AN ORGANIZATION .....</b>	<b>1</b>
1.1 Introduction to costing system.....	2
1.2. Information required in costing system.....	10
1.3. Types of costing system .....	13
End of unit assessment 1.....	17
<b>Unit 2: COST BEHAVIOR ANALYSIS .....</b>	<b>19</b>
2.1 Introduction to cost behavior .....	20
2.2. Cost-Volume-Profit (CVP) Analysis.....	30
End of unit assessment 2.....	41
<b>Unit 3: BASIC PRINCIPLE OF COSTING .....</b>	<b>43</b>
3.1. Costing methods .....	44
3.2. Decision making .....	78
End of unit assessment 3.....	101
<b>Unit 4: THE CASH MANAGEMENT PROCEDURES IN ORGANIZATION .....</b>	<b>102</b>
1.1. Introduction to cash management.....	103
4.2. Cash-flow statement .....	109
4.3. Use of financial and nonfinancial performance measures .....	124
End of unit assessment 4.....	136
<b>Unit 5: CASH BALANCES MANAGEMENT.....</b>	<b>137</b>
5.1 Liquidity and cash balance management tools .....	138
5.2. Explain and apply cash management measures .....	142
End of unit assessment 5.....	149



<b>Unit 6: IDENTIFICATION OF COST ACCOUNTS .....</b>	<b>150</b>
6.1. Introduction to cost accounts .....	151
6.2. Recording and analysis of information relating to cost accounts...	156
End of unit assessment 6.....	175
<b>BIBLIOGRAPHY .....</b>	<b>177</b>

# THE STRUCTURE OF COSTING SYSTEM WITHIN AN ORGANIZATION

**Key Unit Competence:** Explain the structure of costing system within an organization



## Introductory activity

The Brothers Ltd Co. is a hospitality company operating in Huye District. It has been hired by its potential customer Neza to serve her wedding ceremony. The company has been requested to perform different activities: decoration, meal provision and soft drinks to host such an event, transport facilities from the beginning to the end of the ceremony, as well as the coordination of ceremony and to entertain guests. Before signing a contract, The Brothers Ltd co. exhorted its accountant to firstly assess various costs that will occur for activities to be performed in order to set affordable price, but the company was not well informed about the number of people to be hosted for proper financial valuation of resources to be used in the job completion. Later the client informed the company that 750 people were approved to attend the wedding. The company policy is to compute the cost based on material used, skills required, direct expenses, overhead and the quality of service. However, accountant has revealed that the amount of money to be spent for individual item was structured as follows: meal as a product: FRW 3500 and soft drinks FRW 1,400 per person; decoration and transport as services were FRW 650,000 and FRW 300,000 respectively as fixed cost; and FRW 150,000 to Master of Ceremony (MC) for his coordinating and organizing role during the event.

### Question:

1. Basing on the above case study, what is about the scenario?
2. Outline different activities that require cost.
3. Define costing?
4. Explain the main costing methods as used in product costing

## 1.1 Introduction to costing system

### Learning Activity 1.1



Ruberwa is a sole trader producing and selling bread, juice and biscuits. Ruberwa as an entrepreneur does not have sufficient skills and necessary information to compute the cost of each product; he estimates the cost of product based only on ingredients recorded during the production process. While selling, he gets many customers due to the lower price resulting from a wrong costing system comparatively to surrounding businesses. Considering high sales and getting a lot of money in the pocket, he thinks that really, he will get high profit; unfortunately, he gets a loss at the end of the year in his financial statement. He decided to hire an accountant for monitoring and controlling existing costs so as to know the main cause of this problem. The accountant revealed that information used in computation of the cost of product was incomplete for each product because the owner only considered the portion of direct material cost recorded and did not consider labor cost, direct expenses and overhead incurred during and after the production process.

RUBERWA was surprised by the cost review report provided by the accountant, he later has been requested to calculate the cost of each product appropriately. In the next accounting period, RUBERWA recognized a significant profit resulting from good computation of the production cost and setting an affordable price.

### Questions

1. From the above scenario, what do you understand by a costing system?
2. Identify the lesson you learnt from this case study.
3. As an accountant of Ruberwa, explain the main advantages for installing a good costing system in your organization.

### 1.1.1. Definition of key concepts

Today different business and industry needs different methods for calculating, monitoring and controlling cost to meet their individual requirements. It is not possible to devise a single costing system to fulfill everybody's needs. Different methods of costing for different industries depending upon the type of manufacturing and their nature have been developed. Various methods

of ascertaining costs are available to suit the business needs. But the basic principles are the same in every method.

- **Product cost**

Product cost refers to the costs incurred to make or produce a product. These costs include direct labor, direct materials, direct expenses and overhead cost.

- **costing**

Costing' refers to the methods and processes of determining costs of a product manufactured or services rendered. or costing is the technique and process of ascertaining costs.

- **Costing system**

Costing system is that system in which we calculate different cost with different methods and also monitor cost for reducing wastages and misuse of resources. Costing system comprises of a set of forms, processes, controls and reports that are designed to aggregate and report to the management about revenue, costs and profitability. It ascertains product profitability and helps management in planning and control of business operations.

### 1.1.2. Characteristics of a good costing system

A good Costing System will consist of the following characteristics:

- The Costing System adopted in a particular organization must suit its nature and size of business and its information needs.
- The Costing System must be economical to the organization and the benefits derived from the system should be more than its cost of installation and operation.
- The system should be more flexible enough to take care of changing business situations and information needs of the organization.
- The system should be simple to understand and easy to operate. The users of costing data should be convinced of the Costing System from which the data is derived.
- The Costing System should ensure proper accounting for materials, labour and overheads and proper classification of transactions should be done at the level of recording.
- The Costing System should clearly mention the details of records to be maintained and the degree of accuracy of data required.
- Since the Costing System is for internal control purpose, it should meet the requirements of management and its information needs.
- The costing system should fix up the duties and responsibilities of costing department staff and the cooperation that can be sought from other departments.

### 1.1.3. Effective conditions for a good costing system installation

As a system designer, the cost accountant should be able to perceive the needs of the management at various levels and design such a system as will meet those needs promptly, effectively and efficiently. The following conditions and factors must be taken into account when designing a costing system:

- Preliminary investigations must be made before a system is installed. This help to discover weaknesses and inefficiencies
- For accuracy of cost records, a system of material cost, labour cost and production overhead cost is essential
- Nature of business enterprise must be put into consideration when designing a cost system accounting system. the system developed should be practical and must suit the business.
- The system must be cost effective in that the benefits derived from the system must be greater than the cost of running it.

The following factors must be taken into account before finalising the cost management system

- The system must be designed in such a way as to meet managerial information needs. There should be no duplication in reporting.
- The factory layout and production sequence. This is important for the identification of the sequence of production.
- The nature of material used affect the system adopted. This is because it affects the recording and issue of raw materials and method of pricing.
- Control exercise over production: the cost data must focus on specific areas of control so that any variance between actual and standard cost can be identified by the individual department.
- The deployment of workers, who may work as a team or as individuals. This affects the method of remuneration and analysis of time worked.
- Key personnel and office staff, their cooperation is vital for success of the system. In addition, the system needs to be simple and easy to understand to enhance acceptability.
- Need for uniformity; a business needs to observe the industrial norms and thus follow the industrial practices as regards the accounting.
- The cost benefit analysis should be carried out and it is only reasonable to run a system which has more benefits than cost.
- The system should be capable of adapting to changing conditions.
- It should be logical and simple.

#### **1.1.4. Advantages of installation a costing system.**

Cost accounting has now become the norm in most industries and firms. Almost all businesses rely on cost accounting information to supplement the information provided by financial accounting. In fact, cost accounting is essential not only to businessmen and the management but also to the economy as a whole.

##### **a. Measuring and Improving efficiency**

Cost accounting allows for data that enables the firm to measure efficiency. This is efficiency in respect to cost, time, expenses etc. Standard costing is then used to compare actual outcomes with the industry or economy standards to indicate changes in efficiency.

##### **b. Identification of Unprofitable Activities:**

Just because a firm is making overall profits, it does not mean all activities are profitable. Cost accounting system will help us identify the profitable and unprofitable activities of the firm. Activities that cause the firm losses can be made profitable or eliminated. This can happen due to the cost ascertainment done in cost accounting.

##### **c. Fixing the price**

Costing system makes the distinction between fixed and variable cost, which allows the firm to fix prices in different economic scenario. prices that we fix without the help of costing system can be too high or too Low and both cause losses to the business.

##### **c. Control over Stock**

Costing system helps with restocking and control over materials. Cost accounting system will help us determine the most ideal and economic re-order level and quantities. This will ensure that the firm is never overstocked or understocked.

##### **e. Evaluates the Reasons for Losses**

Every firm has to deal with periods of profits and losses, hence they must always evaluate or investigate the reasons for the losses suffered. This will help to tackle the problem or overcome the cause by some other means necessary. if the cause can not be eliminated then at least minimize the losses.

##### **f. Aids Future Planning**

One of the biggest advantages of cost accounting system is that it will help the management with future plans they may have. For any production or selling

plans, it is important to have detailed data about the machines, the labour capacity, output levels, levels of efficiency of each process.

### **1.1.5. Challenges in installing of costing system**

There are different challenges facing the business at the time of installation a Costing System:

#### **a. Lack of Support from Top Management**

The basic objective of Cost Accounting System is to provide necessary information to the internal management for the purpose of problem solving, decision making and control. Without support and recognition from the top management, the very purpose of Cost System is insignificant.

#### **b. Resistance from Existing Accounting Staff**

The existing accounting staff may resist the introduction of Cost Accounting System in the organization due to fear of losing job recognition and importance after the implementation of the system.

#### **c. Lack of Cooperation from other Departments**

The employees of other departments may not cooperate for the installation of Cost Accounting System due to fear of increase in workload as it brings-out inefficiency etc.

#### **d. Resistance from Operating Level Workers**

The foremen, supervisors, workers and other operating level staff may resent the introduction of cost system on the ground that it will increase their job responsibilities and paperwork and may fear that it may cause change in wage structure.

#### **e. Shortage of Trained Staff**

The installation and implementation of cost system requires trained, qualified and experienced staff which may not be available.

### **1.1.6. Overcoming challenges to costing system**

The management of business after finding the above challenges should set strategies to overcome them. The following are the proposed solutions:

- The management should be convinced of the benefits which can be derived by installation and operation of a Costing System.

- Non-cooperation and resistance can be overcome by explaining the simplicity and use of the system and should be assured that the system will benefit the organization and increase its profitability. They should be given assurance that the system will not reduce the importance of existing staff.
- To overcome resistance, the existing staff should be properly trained to take up the responsibilities in the Costing System
- All levels of staff and managers in the organization should be properly trained and made familiar with the Costing Procedures.
- The system should be simple to understand and easy to operate.
- The benefits derived from Costing System should be more than the costs incurred on its installation and operation.
- A qualified and experienced cost accountant should be assigned with responsibility to achieve the desired objectives of the Costing System. He should be capable of coordinating with other departments.
- The Costing System designed and installed should meet specific requirements of the concern and it should reduce unnecessary paperwork of the organization.
- Regular meetings with accounting staff and user departments will clarify all doubts about the system and eliminate ambiguity.

### 1.1.7. Steps for installing a good costing system

The steps to be taken into consideration in installing a costing system are given below:

#### a. Objective to be achieved through the Costing System

The costing system will be simple if the objective is only to determine cost, but it will have to be elaborated if the objective is to have information which will help management in exercising control and taking decisions.

#### b. Studying the Existing Organisation and Routine

In this connection the points to be noted are the nature of the business and of the operations or process carried on, extent of responsibility and authority attached to the various functions, the methods of dealing with wastage of materials, the system of time recording and the methods of computing and paying wage.

#### c. Deciding the Structure of Cost Accounts:

The structure of cost accounts should follow the natural production line; the sequence can be simple, analytical or synthetic.



#### **d. Determining the Cost Rates**

This entails a thorough study of factory conditions and decisions are to be made about classification of cost into direct and indirect, grouping of indirect costs into production, selling, administration etc., treatment of wastes of all kinds, methods of pricing issues, methods of recovering overheads and calculation of overhead rates.

#### **e. Introducing the System**

No costing system can be expected to function effectively unless co-operation of all the officials could be obtained. Before the system is implemented, the implications of the system should be explained to all indicating to them the benefits that will accrue to each and to the business as a whole.

#### **f. Organising the Cost Office**

It is always better that the cost office is situated adjacent to the factory so that delay in routing out documents or in clearing up discrepancies and doubts, is avoided. The costing staff must be allowed to have access to the works if they are to perform their duties properly.

### **1.1.8. Factors to consider for installation of a good costing system**

It is necessary that the costing system is properly installed in an organization. Costing system installed in an organization should be simple to understand, easy to operate, highly reliable and suitable to the organization. In designing and installation of a good costing system, the following factors should be given due consideration:

#### **a. Size of the firm**

Size of the firm is an extremely important factor in designing a cost accounting system. As the size of the firm and its business grows, the volume and complexity of the cost data also grows. In such situation, the cost accounting system should be capable of supplying such information.

#### **b. Manufacturing Process:**

Process of manufacturing changes from industry to industry. In some industries, there may be a continuous process of production while in some batch or job type of production may be in operation. A cost accounting system should be such that the manufacturing process is taken into consideration and cost data is collected accordingly.

### **c. Nature and Number of Products**

If a single product is produced, all costs like material, labor and indirect expenses can be directly allocated to that product. But if more than one product is manufactured, the question of allocation and apportionment as well as absorption of indirect expenses (Overheads) arises and hence the cost accounting system should be designed accordingly as more complex data will be required.

**d. Management Control Needs:** The designing of a cost accounting system in a business organization is guided by the management control requirements. The costing system should supply data to persons at different levels in the organization to take suitable action in their respective areas.

**e. Raw Materials:** The designing of a cost accounting system in a business is also guided by the raw materials required for production. The nature of raw materials and the degree of waste therein influence the designing of costing system. There are some materials which have a high degree of spoilage. The costing system should be such that identification of spoilage, keeping records of materials, pricing of the issues etc are taken into consideration.

**f. Organization Structure:** The structure of the organization also plays a vital role in designing a costing system. The system should correspond to the hierarchy of the organization.



### **Application activity 1.1**

1. What are the main characteristics of a good costing system?
2. Complete the following sentences by given terms :

**I. Costing refers to the techniques and processes of \_\_\_\_\_**

- A. ascertainment of costs.
- B. allocation of costs.
- C. apportionment of costs.
- D. distribution of costs.

**II. Cost of sales plus profit is \_\_\_\_\_.**

- A. selling price.
- B. value of finished product.
- C. value of goods produced.
- D. value of stocks

## 1.2. Information required in costing system

### Learning Activity 1.2



RAVIM Ltd is a manufacturing business which produces high-quality Soaps compared to existing soap market. The management is not able to determine the cost of one soap and it sets soap price in reference to the price of similar soap. At the end of six months, the company prepared interim financial statement and finds that it made a loss. The management hired an accountant for installation of a good costing system which could help the company to determine the cost of the product but the accountant has not found necessary data to install a good costing system and prepares a cost sheet which indicates the data needed in his exercise such as cost of material used, number of employees used, processing cost, number of hours available per day and overhead absorption cost, the wasted materials cost during the production process, water and electricity cost, pay rate per day, packaging cost, overhead cost and the quantity produced during this period. Accountant decides to meet with different business managers to collect necessary data related to production process and delivery. After this exercise he/ she gets necessary data that could allow him/her to determine the cost of each soap produced and get the opportunity to advise the managers on the strategies that they can use to reduce the cost of each department as well as the cost of the soap. This may include reducing the duplication use of resources and reusing existing resources.

### Questions

Identify information that an accountant needs to design a good costing system

#### 1.2.1 Identify information required in costing system.

A costing system should collect statistical data for significant operations, analyse the data, and make it available to the management to support managerial decision making.

Businesses or industries need sufficient information for installation of costing system in organization but the type of information required depends on whether you are a service, trading or manufacturing organization and how you have structured your cost system. Business needs the following information, including: volume, material quantities, expected output or yield, scrap factor, standard time, business capacity, labor hours available, material cost, labor cost and overhead etc

### 1.2.2. Explain information required in costing system

The availability of information is the lifeblood of any cost and management accounting system. It is vital that input information is properly controlled in order that output information is useful. Such information must be relevant for management's planning, control and decision-making purposes. The information used in cost and management accounting may be quantitative or qualitative.

- **Quantitative information** is information which may be measured in monetary terms or other physical units eg material may be expressed as FRW 200 or 500 Kilos. It is easily objectively expressed.
- **Qualitative information:** is that information which cannot be objectively expressed. It is therefore very difficult to quantify such information and for this reason, it is largely subjective. The management accounting mainly utilizes mixture of the two but mainly quantitative information.

The information required for installation a good costing system are:

- **Volume**

The volume levels usually drive the number of resources required or consumed by the organization. It is the starting point for any budgeting or forecasting exercise and is a critical element to determine capacity utilization and its impact on the cost structure of the organization.

- **Materials quantities**

This information is important for business organizations and will generally be found in the bill of materials. It provides the quantities required of each component or ingredient that is used to manufacture the product. In some service organizations, materials may also represent significant costs, for example, a power generation facility typically consumes a significant amount of carbon or fuel in the production of electricity.

- **Expected output or yield**

For process manufacturers, each product should have an expected or theoretical output for each process based on the key ingredient. In service organizations, the expected yield represents the expected output of a process based on a fixed level of input.

- **Scrap factor**

This factor will reflect how much materials are lost as a normal part of the process. Discrete manufacturers commonly use the scrap factor to recognize expected materials losses resulting from breakage, spillage, equipment failures, and operator errors.

- **Process parameters.**

Process parameters are used to determine the time standards, particularly for machine-paced operations. They generally describe the cycle time of the process such as bottles or capsules per minute and the number of workers required to run the operation. Process parameters vary significantly from industry to industry.

- **Business process Capacity.**

The team should determine the practical and available capacity of each major business process and how much of this capacity is being utilized. This information can help identify improvements in capacity utilization and is used to isolate the cost of excess capacity in the unit cost.

- **Materials costs.**

This cost represents the actual, standard, forecasted, or estimated cost of the material components or ingredients that are consumed by the product or service. The materials costs usually includes the purchase price of the goods plus other costs such as freight, insurance, royalty payments, tax, brokerage fees, and duties. In organizations that have high materials costs, focusing on this area can produce significant cost savings.

- **Labor and overhead costs.**

This information is necessary to calculate the labor and overhead rate that will be used to assign these costs to the items being measured. Usually organizations budget and collect labor and overhead costs by work areas or departments. The team should ensure that the way the organization is currently collecting actual costs is consistent with the system design.



### Application activity 1.2

1. Explain the information needed to design a good costing system in organization
2. Matching question

Match up the following services with their typical cost units

Service	cost Unit
Hotels/Guest house	Passenger-kilometer, tonne-kilometer
Education	Patient -Day
Hospital	Meal Served
Catering organization	full-time students
Road, rail and air transport services	Occupied bed -night

### 1.3. Types of costing system

#### Learning Activity 1.3



PIKU co. is a company which produces and provide different products such as manufacturing of modern plastic bucket, manufacturing motor vehicles, construction services and road maintenance, it receives two purchase orders, one for 2000 plastic buckets and second 5 motor vehicles and winning two tenders, one for construction a mega building house and second for road maintenance. The main problem in this company is to know the method that should be used to calculate the cost of each product.

Purchase order 1: For manufacturing plastic bucket, Kaneza requests 2000 plastic bucket of 10 liters with the following specification: 1000 plastic bucket should be in a yellow color and the remaining should be in a white color and the purchase order should be delivered within 15 days. And the payment will be made on condition that the company supplies all quantity required in time.

Purchase order 2: For manufacturing the motor vehicle, Muzika Ltd in its purchase order requests motor vehicle materials that can be used to manufacture 5 motor vehicle (V6 Tesla) and assembling will be done in its premises after physical testing; and the payment will be done based on batch tested.

Tender 1. Rwanda Housing Authority requests PIKU in its bidding documents to construct a mega Building in Kigali City and the payment will be done after completing this activity.

Tender 2. Road maintenance: Rwanda Housing Authority has contracted PIKU Co. to maintain the Huye – Kigali Road of 154 kilometers in a period of 1 year and the payment will be done on quarterly basis based on work done. Consider that the maintenance cost of 1 kilometer is FRW 3000,000.

#### Question

1. What do you understand by costing methods?
2. Explain costing methods that can be used on
  - a) purchase order one and two
  - b) tender one and two

### 1.3.1. Job Costing

**Job Costing:** This method is used in Industries or businesses where the production is per the requirements of the customer. In Job Order, the production is not on continuous basis, rather it is only when order from customers is received and made as per the specifications of the customers. Consequently, each job is different from the other one. Method used in such type of business organizations is the Job Costing or Job Order Costing.

A **costing system** is designed to suit the way goods are processed or manufactured or the way services are provided. Each organisation's costing method will therefore have unique features but costing methods of firms in the same line of business will more than likely have common aspects.

The objective of this method of costing is to determine the cost of each job by preparing a Job Cost Sheet. A job may be a product, unit, batch, sales order, project, contract, service, specific program or any other cost objective that is distinguishable clearly and unique in terms of materials and other services used. The cost of completed job will be the materials used for the job, the direct labor employed for the same and the production overheads and other overheads if any charged to the job

### 1.3.2. Batch Costing

**Batch Costing:** In the job costing, we have seen that the production is as per the orders of the

customers and according to the specifications mentioned by them. On the other hand, batch costing is used where units of a product are manufactured in batches and used in the assembly of the final product. Thus, components of products like television, radio sets, motor vehicle and other consumer goods are manufactured in batches to maintain uniformity in all respects.

It is not possible here to manufacture as per the requirements of customers and hence rather than manufacturing a single unit, several units of the component are manufactured as group. For example, rather than manufacturing a single unit, it will be always beneficial to manufacture say, 75,000 units of the component as it will reduce the cost of production substantially and bring standardization in the quality and other aspects of the product. The finished units are held in stock and normal inventory control techniques are used for controlling the inventory. Batch number is given to each batch manufactured and accordingly the cost is determined.



### 1.3.3. Service Costing

Cost Accounting has been traditionally associated with manufacturing companies. However, in the modern competitive market, cost accounting has been increasingly applied in service industries like banks, insurance companies, transportation organizations, electricity generating companies, hospitals, road transport and railway transport, hotels, road maintenance, educational institutions, road lighting, canteens, port trusts and several other service organizations. The costing method applied in these industries is known as 'Operating Costing'. operating costing is, 'that form of operating costing which applies where standardized services are provided either by an undertaking or by a service cost center within an undertaking'.

- **Nature of Operating Costing:**

The main objective of operating costing is to compute the cost of the services offered by the organization. For doing this, it is necessary to decide the cost unit in such cases. The cost units vary from industry to industry. For example, in goods transport industry, cost per tonne per kilometer is to be ascertained while in case of passenger transport, cost per passenger per kilometer is to be computed

### 1.3.4. Contract Costing

**Contract Costing:** Contract Costing is a method used in construction industry to find out the cost and profit of a particular construction assignment.

The principles of job costing are also applicable in contract costing. Contract Costing can be termed as an extension of Job Costing as each contract is nothing but a job completed. Contract Costing is used by concerns like construction firms, civil engineering contractors, and engineering firms. One of the important features of contract costing is that most of the expenses can be traced to a particular contract. Those expenses that cannot be traced to a particular contract are apportioned to the contract on some suitable basis.





### Application activity 1.3

1. Differentiate costing method from costing technique.
  2. Choose the best alternative.
- A. Which of the following organizations should not be advised to use service costing?**
- a) Freight rail company
  - b) IT department company
  - c) Catering company
  - d) Clothing company
- B. Operating costing is suitable for \_\_\_\_\_.**
- a) job order business.
  - b) contractors.
  - c) sugar industries.
  - d) service industries.
- C. Process costing is suitable for \_\_\_\_\_.**
- a) hospitals.
  - b) oil reefing firms.
  - c) transport firms.
  - d) brick laying firms.



### Skills Lab 1

Imagine in your school, students need to consume bread every day and no-one produces bread near the school. Your business club members bring the idea of bakery but none among the club members has information on what it requires to produce bread (ingredients, equipments, required skills etc),

As club members research on:

- 1) Ingredients
- 2) Equipments
- 3) Skills required in producing bread.



## End of unit assessment 1

1. Differentiate costing and costing system?
2. complete the following sentence with appropriate words

### A. Job costing is used in .....

- a) a) furniture making
- b) b) repair shoes
- c) c) press printing
- d) d) all the above

### B. In a job cost system, costs are accumulated

- a) On a monthly basis
- b) By specific job
- c) By department or process
- d) By kind of material used

### C. Operating costing is suitable for \_\_\_\_\_.

- a) job order business.
  - b) contractors.
  - c) sugar industries.
  - d) service industries.
1. Suggest the challenges faced during installation of a good costing system and propose the possible solution for each challenge.
  2. BAHO is a profit oriented business which produces and sells different products such as jeans clothing, Television Manufacturing, transport services and civil engineering contractors services , its sales and marketing department has the task to search for the market of its products.

On 1 January 2023 the company received a purchase order for 1000 jeans for men and 1000 jeans for women from Terimbere and each jeans should be delivered at 15000FRW.

On 1 January 2023 the company received a purchase order of 1200 Televisions from AGAHOZO TV shop and each television should be delivered at 200,000FRW and the payment will be done based on batch delivered.

15 January 2023 the management was contracted by REB for transporting students from their homes to their schools and payment was to be made when all students reached to their schools.

On 20th January 2023 won a tender of constructing model village in Nyamagabe. The contract specify the terms of payment, first term the company will receive a half of total amount and the remaining half will be paid after official handover

**Required**

- a) As cost accountant, some costing method are appropriate to the above case, highlight at least four and propose a brief explanation on the Indicator / activities for each costing method using BAHO case.

**Key Unit Competence:** Analyze Cost behavior for decision making



### Introductory activity

VUDUKA express Ltd is a transport company operating its business activities in Rwanda. It has a policy of increasing the numbers of customers and minimizing costs resulting to the rise of profit.

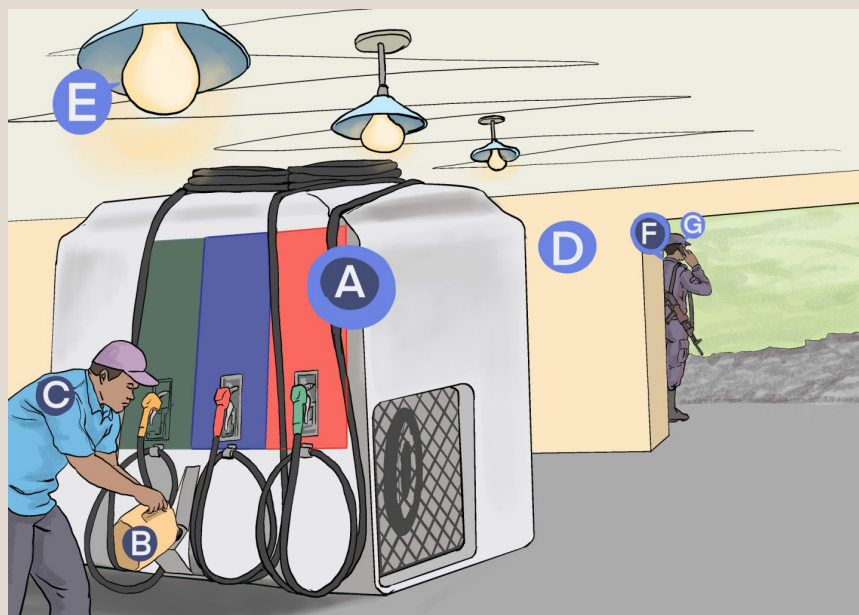
In June and July 2022 the company incurred different costs; variable and Fixed. for example in June the company purchased 2 coasters for FRW 10,000,000 each, in June and July the company rented 5 offices for FRW 100,000 each per month , June and July company paid taxes of FRW 80,000, in June salaries FRW 1,700,000 and in July salaries of FRW 2,000,000 ; June Paid electricity bills of FRW 150,000 and in July was FRW 200,000 and maintenance cost of FRW 400,000 in June and FRW 450,000 in July . It was noted that the company costs of fuel depend on the length of travel covered; but in June Fuel cost was FRW 1,100,000 and in July fuel cost was FRW 1,200,000 , Telephone bills in June was FRW 150,000 , the cost of telephone was FRW 100,000 and Airtime was FRW 50,000 but in July the cost of telephone remained constant and the cost of airtime was FRW 80,000. Additionally, the company keeps the drivers' allowances of FRW 800,000 per month for attracting and maintaining the drivers.

### Questions:

1. Differentiate fixed cost from variable cost.
2. Calculate:
  - Total Variable (June and July )
  - Fixed cost (June and July)
  - semi variable cost (June and July)

## 2.1 Introduction to cost behavior

### Learning Activity 2.1



### Question

Classify above costs based on its behaviour.

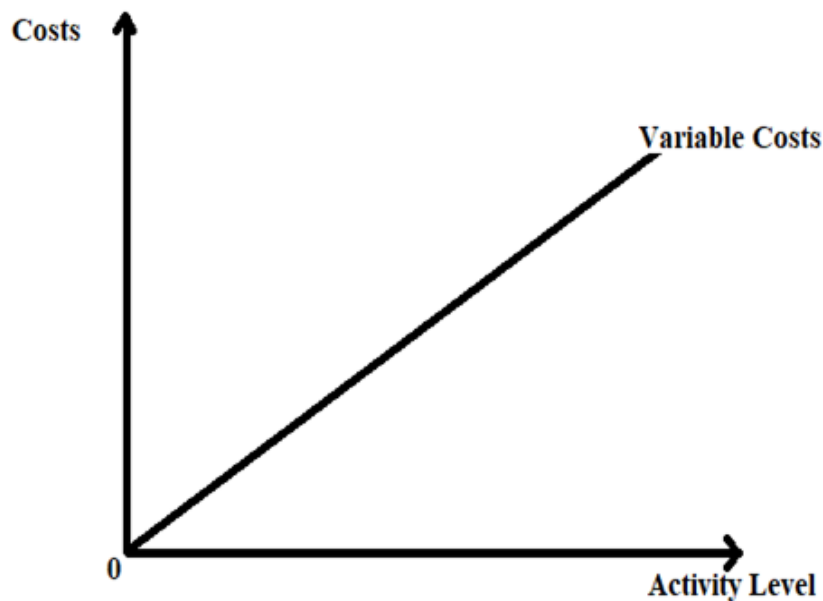
### 2.1.1 Main classification of cost behavior

**Cost behavior** refers to the change in costs (increase or decrease) as the output level changes, i.e. as we increase output, are the costs rising, dropping or remaining the same. Cost behavior can be used to produce various classifications of costs such as:

#### a. Variable Costs

Are costs that increase or decrease proportionately with the level of activity i.e. cost of an activity that changes with the level of output or level of activities. The total amount of variable cost tends to change in respect to changes in production volume but the variable cost per unit stays at the same level under the same level under the same manufacturing environment and production methods. For example if 1kg of a material is needed for each cost unit then 100,000 kg will be required for 100,000 units of production and 500,000 kg for 500,000 units of production. The total variable cost can be expressed as:

**Total variable cost = Variable cost per unit × number of units**



Note that with variable costs, the cost is zero when production level is zero. The cost increases in proportion due to the increase in the activity level, thus the variable cost function is represented by a straight line from the origin. The gradient of the function indicates the variable cost per unit.

### **b. Fixed Cost**

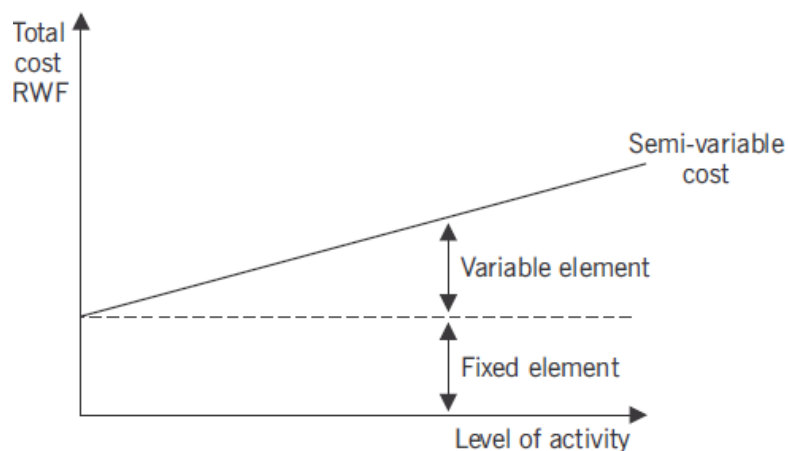
Fixed cost is the cost which does not vary with the change in the volume of activity in the short run. These costs are not affected by temporary fluctuation in activity of an enterprise. These are also known as period costs. This may include the rent of a factory or straight-line depreciation of plant and machinery.

The classification of cost into fixed and variable costs would **only** hold within a relevant range beyond which all costs are variable. The relevant range is the activity limits within which the cost behaviour can be predicted.

### **c. Semi variable costs**

Are costs with both a fixed and variable cost component. The fixed component is that portion which is constant irrespective of the level of activity.

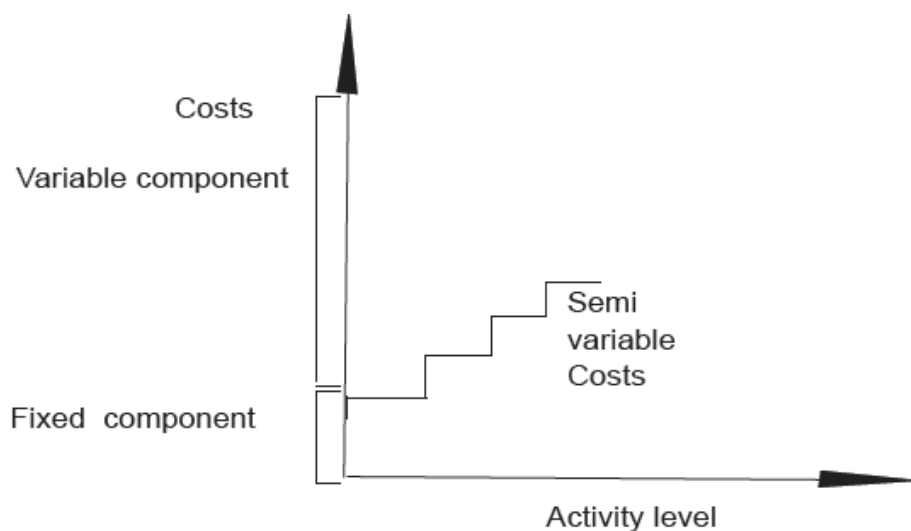
The fixed part of semi variable cost represent minimum fees for making particular item or services available . For example, a telephone bill includes a fixed element being the fixed line rental for the period and a variable element that will increase as the number of calls increase, the behavior of Semi variable cost is shown below:



### a. Stepped cost or Semi Fixed Costs

Are costs with both a fixed and variable cost component. The fixed component is that portion which is constant irrespective of the level of activity. They are variable within certain activity levels but are

Fixed within other activity levels as shown below:



Consider the depreciation of a machine which may be fixed if production remains below 1,000 units per month. If production exceeds 1,000 units, a second machine may be required, and the cost of depreciation (on two machines) would go up a step.

### 2.1.2. Calculating the fixed and variable elements of semi-variables costs.

A semi-variable cost is “a cost containing both fixed and variable elements and which is thus partly affected by fluctuations in the level of activity”. A typical example of a semi-variable cost is telephone charges containing a fixed element i.e rental of telephone instrument, and a variable element i.e the cost of telephone calls made.

Semi-variable cost should be separated into fixed and variable elements by using the three methods:

- a) Comparison method
- b) Least squares method or Regression method,
- c) High and low points or Range method

#### a. Comparison method

In this method, cost of two periods or two activity levels are compared. The difference in these costs is considered as variable cost because it is assumed that the fixed overhead of two periods or two activity levels is the same. From this difference of costs, variable cost per unit is calculated.

#### Cost function

The cost estimating function is a linear equation i.e an expression of the relationship between variables, the independent and the dependent variables.

$$Y = a + bX$$

- **Variable Cost per unit(b)** =  $\frac{\text{CHANGE IN COST}}{\text{CHANGE IN OUTPUT}}$
- Total cost = total fixed cost + total variable cost
- **Total Variable cost** = variable cost per unit x quantity
- Fixed cost(a) = total cost – total variable cost

#### Where:

**Y** represents the dependent variable or the total cost

**a** represents fixed cost component of the total cost (Constant amount)

**bX** represents the variable costs component of the total cost

**b** represents the unit variable cost (this is the gradient of the equation)

**X** represents independent variable or the output level



### Example

The manager of a shoe factory wishes to develop a method of forecasting the total costs in any period. The following past costs have been recorded at different levels of activity:

Period	Number of pairs of shoes	Total cost (Amount in FRW)
Period 1	11,000	11,150,000
Period 2	12,300	11,995,000

### Required:

- Calculate the variable cost per pair of shoes and show Fixed and Variable costs.
- What would be the total costs if the current year's estimate of 12,800 pairs of shoes were actually produced?

### Answer

- We know that  $Y = a + bx$  : total cost = total fixed cost + total variable cost

Total Variable cost = variable cost per unit x quantity

Fixed cost = total cost - total variable cost

$$b = \frac{\text{Change in total Costs}}{\text{change in out put}}$$

$$b = \frac{\text{Change in total costs}}{\text{Change in output}} = \frac{11,995,000 - 11,150,000}{12,300 - 11,000} = \frac{845,000}{1,300} = \text{FRW } 650 \text{ per pair}$$

Period	Number of pairs of shoes(X)	Total cost (Amount in FRW)	variable cost =bx(FRW)	Fixed Cost =a (FRW)
Period 1	11000	11,150,000	7,150,000	400,000
Period 2	12300	11,995,000	7,995,000	400,000

- Total cost of 12800 pairs of shoes :  $y = a + bx$

$$Y = 400,000 + 650(12800) = \text{FRW } 12,320,000$$

### a. Least square Methods

The least-squares method is a crucial statistical method that is used to find a regression line or a best-fit line for the given pattern. This method is described by an equation with specific parameters. The method of least squares is generously used in evaluation and regression. The general formulas used to compute fixed cost (a) and variable cost (b) are listed below. The equations are solved simultaneously to obtain the values.

$$(i) \quad \Sigma Y = na + \Sigma bX$$

$$(ii) \quad \Sigma YX = a\Sigma X + b\Sigma X^2$$

Or,

$$(i) \quad b = \frac{n\Sigma XY - \Sigma X \Sigma Y}{n\Sigma X^2 - (\Sigma X)^2}$$

$$(ii) \quad a = \frac{\Sigma Y}{n} - b \frac{\Sigma X}{n}$$

The following data relates to ABC Company limited for the half year period just ended.

months	output	Total cost
January	40	5100
February	45	5450
March	50	6050
April	40	5400
May	60	6850
June	55	6250

**Required:**

1. Determine the business **fixed** and **variable costs** for its manufacturing overheads by using least square method
2. Write down the cost equation in the form of  **$Y=a + bX$** .

## Answer

1. Determine the business **fixed** and **variable costs**

months	output	Total cost	$x^2$	XY
January	40	5100	1600	204000
February	45	5450	2025	245250
March	50	6050	2500	302500
April	40	5,400	1,600	216,000
May	60	6,850	3,600	411,000
June	55	6,250	3,025	343,750
	290	35,100	14,350	1,722,500

$$i) \Sigma Y = na + b \Sigma x$$

$$ii) \Sigma XY - a \Sigma X + b \Sigma X^2$$

$$i) 35100 = 6a + 290b$$

$$ii) 1722500 = 290a + 14350b$$

Multiply equation (i) by 290 and equation (ii) by 6, to eliminate one unknown variable

$$i) 35100 = 6a + 290b \dots\dots\dots \times 290 \dots\dots\dots 10179000 = 1740a + 84100b$$

$$ii) 1722500 = 290a + 14350b \dots\dots \times 6 \dots\dots\dots 10335000 = 1740a + 86100b$$

$$iii) \text{ Difference (new equation) } \qquad \qquad \qquad 156000 = 0 \quad 2000b$$

$$b = \frac{156000}{2000} = \text{FRW } 78$$

To obtain a, substitute b in equation (i)

$$v. 35100 = 6a + 290(78)$$

$$-6a = 22620 - 35100$$

$$-6a = -12480$$

$$a = \frac{-12480}{-6} = 2080$$

2. the cost equation in the form of  **$Y = a + bX$** ..... **$Y = 2080 + 78x$**

Or

Determine the business **fixed** and **variable costs**

$$(i) \ b = \frac{n\sum XY - \sum X \sum Y}{n\sum X^2 - (\sum X)^2}$$

$$(ii) \ a = \frac{\sum Y}{n} - b \frac{\sum X}{n}$$

$$b = \frac{6 \times 1722500}{6 \times 14350} - \frac{290 \times 35100}{290^2} = \frac{156000}{2000} = \text{FRW } 78$$

$$a = \frac{35100}{6} - 78 \frac{290}{6} = 5850 - 3770 = \text{FRW } 2080$$

2. Equation  $Y = 2080 + 78x$

### c. High-Low Method

This is a cost estimation based on the relationship between past cost and past level of activity. Variable cost is based on the relationship between costs at the highest level of activity and the lowest level of activity. The difference in cost between high and low activity level is taken to be the total variable cost from which the unit variable cost can be computed by dividing it by the change in output level.

The goal of the high-low method is to describe this line mathematically in the form of an equation stated as  $f(x) = a + bX$ , which requires calculating both the total fixed costs amount ( $a$ ) and per unit variable cost amount ( $b$ ). Four steps are required to achieve this using the high-low method:

**Step 1.** Identify the high and low activity levels and the corresponding costs from the data set.

**Step 2.** Calculate the variable cost per unit ( $b$ ).

**Step 3.** Calculate the total fixed cost ( $a$ ) or  $Y$

**Step 4.** State the results in equation form  $f(x) = Y = a + bX$ .

**Illustration:** The following is an extract of the cost data of loyal industries for the previous year; you are required to determine the variable rate and the fixed component and construct an equation estimating the total cost for the same company.

Reporting (Month)	Period Total Costs(FRW)	Production Level of Activity (Units Produced)
July	230,000	3,500
August	250,000	3,750
September	260,000	3,800
October	220,000	3,400
November	340,000	5,800
December	330,000	5,500
January	200,000	2,900
February	210,000	3,300
March	240,000	3,600
April	380,000	5,900
May	350,000	5,600
June	290,000	5,000

**Step 1. Identify the high and low activity levels from the data set.**

The highest level of activity (level of production) occurred in the month of April (5,900 units; FRW 380,000 production costs), and the lowest level of activity occurred in the month of January (2,900 units; FRW 200,000 production costs).

**Step 2. Calculate the variable cost per unit (b).**

$$\text{Unit variable cost (b)} = \frac{\text{Cost at Highest Level} - \text{Cost at Lowest Level}}{\text{Highest activity Level} - \text{Lowest activity Level}}$$

$$\frac{\text{FRW } 380,000 - \text{FRW } 200,000}{5,900 \text{ units} - 2,900 \text{ Units}}$$

$$= \frac{\text{FRW } 180,000}{3000 \text{ units}}$$

$$= \text{FRW } 60 \text{ per Unit}$$

### Step 3. Calculate the total fixed cost ( $fx$ ) or $Y$

After completing step 2, the equation to describe the line is partially complete and stated as  $Y = a + FRW60X$ . The goal of step 3 is to calculate a value for total fixed cost ( $a$ ). Simply select either the high or low activity level, and fill in the data to solve for  $a$  (total fixed costs), as shown. Using the low activity level of 2,900 units and FRW 200,000,

$$Y = a + bX$$

$$200,000 = a + (60 \times 2,900 \text{ units})$$

$$a = 200,000 - (60 \times 2,900 \text{ units})$$

$$a = 200,000 - 174,000$$

$$a = \text{FRW } 26,000$$

Thus total fixed costs total FRW 26,000. (Try this using the high activity level of 5,900 units and FRW 380,000. You will get the same result as long as the per unit variable cost is not rounded off.)

#### iv) State the results in equation form $f(x) = Y = a + bX$ .

We know from step 2 that the variable cost per unit is FRW 60, and from step 3 that total fixed cost is FRW 26,000. Thus we can state the equation used to estimate total costs as

$$f(x) \text{ or } Y = \text{FRW } 26,000 + \text{FRW } 60X$$



### Application activity 2.1

#### Question

1. The Cost per unit amount of three different production costs for Dalius Ltd are as follows:

production (Units)	Cost A	Cost B	Cost C
20,000	12.00	15.00	20.00
80,000	12.00	11.25	5.00

#### What type of cost is each of these three costs?

- a) Cost A is mixed, Cost B is variable, Cost C is mixed
- b) Cost A is fixed, Cost B is mixed, Cost C is variable.
- c) Cost A is fixed, Cost B is variable, Cost C is mixed.
- d) Cost A is variable, Cost B is mixed, Cost C is fixed

2. The following information is extracted from the books of INYANGE Industries Ltd for the year ended 31st December 2022.

Months	output	Mixed cost(FRW)
January	200	2000
February	150	1750
March	250	2250
April	300	2500
May	400	3000
June	500	3500
	1800	15000

You are required to separate the above costs into fixed and variable elements using the following methods of Ordinary Least Squares and High and low points or Range method.

## 2.2. Cost-Volume-Profit (CVP) Analysis.

### Learning Activity 2.2



Bank of Kigali is a commercial bank operating its business activities in Rwanda. It uses its Agents to provide good services to its customers. Bank of Kigali paid its agent a commission of 5% on deposit FRW 10,000 and the commission is only source of income to the Bank of Kigali agent. The Bank of Kigali agent fixed cost is FRW 200,000 per month (Salary and Rent) and variable cost is FRW 350 per client deposited FRW 10,000 and average number of client served per month is 4000 clients.

The Bank of Kigali has collected information about the customer satisfaction and revealed that the customers are complaining for the high bank charges on agent services.

The management of Bank of Kigali after a deep analysis of this situation, has just announced a revised payment schedule of 4% commission on deposit FRW 10,000. Fixed cost remains constant and variable cost has reduced to FRW 300 per client served and the bank expected that the average number of clients will increase to 5000 clients.

### Question

1. What do you understand by cost, volume profit?
2. Calculate the number of customers, the BK agent are able to serve at Break Even Point before and after revising the payment structure.
3. After revising the cost structure, BK agent set a targeted profit of FRW 500,000, how many customers the agent will be required to serve to get this profit.

## 2.2.1 Introduction to cost-volume Analysis

Cost-Volume-Profit analysis is the study of the effects on changes on future profit of changes in fixed cost, variable cost, sale price, quantity, and mix. There is a direct relationship between cost, volume of output and profit. CVP analysis examines the relationship of cost and profit to the volume of production to maximize the profit of the firm. It is a logical extension of marginal costing and is used as a very powerful tool by the management in the process of budgeting and profit planning.

### a. Elements of CVP analysis

CVP analysis establishes a relationship between cost, volume of output and profit. It evaluates the effect on profit due to changes in cost and volume of output. This analysis consists of several integral parts or components which are as follows:

- i) Marginal Cost equation
- ii) Contribution
- iii) Profit/volume (P/V) Ratio
- iv) Break-Even Point (BEP)
- v) Margin of safety

## 2.2.2. Marginal Costing

### a. Marginal Cost Equation

Marginal Cost Equation exhibits the relationship between contribution, fixed cost and profit. It explains that the excess of sales over the variable cost is the contribution towards fixed cost and profit. Marginal Cost Equation can be developed as follows:

$$\text{Sales (S)} = \text{Total Cost} + \text{Profit (P)}$$

or

$$\text{Total Cost} = \text{Fixed cost (F)} + \text{Variable Cost (V)}$$

$$\text{Therefore } S = F + V + P \text{ or } S - V = F + P$$

### b. Contribution

Contribution is the excess of sales over variable cost. More clearly, contribution is that portion of sales which remains after recovering the variable cost to that extent of sales. This contribution is available towards fixed cost and profit. Mathematically, contribution can be expressed as follows:



Sales	xxx
Less: Variable cost	xxx
<b>Contribution</b>	<b>xxx</b>
Less: Fixed cost	xxx
<b>Operating Profit</b>	<b>xxx</b>

Therefore

Sales - Variable cost = Contribution

Fixed cost + Profit = Contribution

Fixed cost - Loss = Contribution

**XYZ Ltd produces** 2,000 units of a product X, are sold at FRW 10 per unit, Variable cost of manufacturing the product is FRW 6 per unit and the total fixed cost is FRW 5,000. Calculate the contribution from the given data.

Sales	10
Less: Variable cost	6
<b>Contribution</b>	<b>4 X2000</b>
Less: Fixed cost	5000
<b>Operating Profit</b>	<b>3000</b>

**Total contribution = contribution per unity \* Quantity = 4X2000 = 8000 FRW**

#### a. Profit- Volume (P/V) Ratio / Contribution margin ratio

Profit-Volume ratio is the ratio of contribution and sales. It is generally expressed in percentage. It exhibits the percentage of contribution included in sales. It indicates the effects on the profit for a given change in sales. Mathematically, P/V Ratio can be expressed as follows:

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

When two sales and two profits are given

$$\text{P/V Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

**Illustration :** Consider the following contribution margin P/V Ratio format income statement of Alpha & Son Ltd.in which sales revenues, variable expenses, and contribution margin are expressed as percentage of sales.

Description	Total(FRW)	Per Unit(FRW)	Percent of Sales
Sales (400 units)	100,000	FRW250	100%
Less variable expenses	60,000FRW	150	60%
<b>Contribution margin</b>	<b>40,000 FRW</b>	<b>FRW100</b>	<b>40%</b>
Less fixed expenses	35,000		
Net operating income	5,000 FRW		

According to above data of Alpha & Son Ltd. the computations are:

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{40,000\text{FRW}}{100,000\text{FRW}} = 40\%$$

In a company that has only one product such as Alph & Son Ltd P/V ratio can also be calculated as follows:

$$\text{P/V Ratio} = \frac{\text{Unit contribution margin}}{\text{Unit selling price}} = \frac{\text{FRW } 100}{\text{FRW } 250} = 40\%$$

*The impact on net operating income of any given cash change in total sales can be computed in seconds by simply applying the CM ratio (P/V Ratio) to the cash change.*

For example if the Alpha & Son Ltd plans a FRW 30,000 increase in sales during the coming month, the contribution margin should increase by FRW 12,000 (30,000 INCREASED sales \* CM ratio of 40%). As we noted above, net operating income will also increase by FRW 12,000 if fixed costs do not change. This is verified by the following table:

Description	Sales Volume			Percent of Sales
	Present	Expected	Increase	
Sales	FRW 100,000	FRW 30,000	FRW 30,000	100%
Less variable expenses	FRW 60,000	FRW 78,000	FRW 18,000	60%
<b>Contribution margin</b>	<b>40,000</b>	<b>52,000</b>	<b>12,000</b>	<b>40%</b>
Less fixed expenses	35,000	35,000	0	
Net operating income	5,000	17,000*	12,000	

\* Expected net operating income of FRW 17,000 can also be calculated directly by using the following formula:

$$[P^* = (\text{Sales} \times \text{CM ratio}) - \text{Fixed Cost}]$$

P\* = Profit

### 2.2.3. Break - Even Point (BEP)

Breakeven point is the level of output or sales at which the business does not make profit nor incur loss. At that level, total revenue is equal to the total cost or **Break-even point** is point where the business is neither incurring profit nor loss. This is the turnover that enables enterprise to cover all expenses without profit or loss.

#### a. Break-Even Point Calculation

Break-Even point is the level of sales at which profit is zero. At break-Even point sales are equal to fixed cost plus variable cost (Sales = fixed cost + variable cost).

The break-Even point can be calculated using either Equation method or Contribution margin method.

##### – Equation method

The equation method centers on the contribution approach to the income statement.

According to the definition of Break Even point, Break Even point is the level of sales where profits are zero. Therefore the Break Even point can be computed by finding that point where sales just equal the total of the variable expenses plus fixed expenses and profit is zero.

#### Example:

Given data are as follow:

- Sales price per unit = FRW250
- Variable cost per unit = FRW150
- Total Fixed expenses = FRW35,000

Formula of Break Even Point: **Sales = Variable expenses + Fixed expenses + Profit**

$$\text{FRW } 250Q^* = \text{FRW } 150Q^* + \text{FRW } 35,000 + \text{FRW } 0$$

$$\text{FRW } 100Q = \text{FRW } 35000$$

$$Q = \text{FRW}35,000 / \text{FRW } 100$$

$$Q = 350 \text{ Units}$$

Q\* = Number (Quantity) of units sold.

The Break-Even point in sales dollars can be computed by multiplying the break-even level of unit sales by the selling price per unit. 350 Units × FRW 250 per unit = FRW 87,500

#### – Contribution margin method

The contribution margin method is actually a short cut conversion of the equation method already described. The approach centers on the idea discussed earlier that each unit sold provides a certain amount of contribution margin that goes toward covering fixed costs. To find out how many units must be sold to break even, divide the total fixed costs by the unit contribution margin.

$$\text{Break - Even point}_{(\text{Units})} = \frac{\text{Fixed Cost}}{\text{Contribution Per Unit}}$$

$$\text{FRW } 35,000 / \text{FRW } 100^* \text{ per unit} = 350 \text{ Units}$$

\*S250 (Sales) – FRW 150 (Variable exp.)

A variation of this method uses the CM ratio (P/V Ratio) instead of the unit contribution margin. The result is the Break-Even in total sales dollars rather than in total units sold.

$$\text{Break – Even point}_{(\text{Total Sales volume})} = \frac{\text{Fixed expenses}}{\text{PV Ratio}}$$

$$\text{Break – Even point}_{(\text{Total Sales volume})} = \frac{35,000}{0.4} = \text{Frw } 8,750$$

Example 1. Alpha bakery producing biscuits wants to evaluate the company performance based on information recorded. If its fixed cost are FRW 200,000 and its variable cost to produce one packet of biscuit is Rwf 2 and its selling price for each packet of biscuits is FRW 4, Calculate break even point of alpha bakery.

## Answer

$$\text{BEP in quantity} = \frac{\text{total fixed cost}}{\text{contribution per unit}}$$

$$\text{Contribution per unit} = \text{selling price} - \text{unit variable cost}$$

$$\text{Contribution per unit} = \text{FRW } 4 - \text{FRW } 2 = \text{FRW } 2$$

$$\text{BEP in Quantity} = \frac{\text{FRW } 200,000}{\text{FRW } 2} = \mathbf{100,000 \text{ packet of Biscuits}}$$

$$\text{Break even point in value} = 100,000 \times 4 = \text{FRW } 400,000$$

### b. Cost Volume Profit (CVP) Relationship in Graphic Form

The relationships among revenue, cost, profit and volume can be expressed graphically by preparing a cost-volume-profit (CVP) graph or break-even chart. A CVP graph highlights CVP relationships over wide ranges of activity and can give managers a perspective that can be obtained in no other way.

#### – Preparing a CVP Graph or Break-Even Chart

In a CVP graph sometimes called a break-even chart, unit volume is commonly represented on the horizontal (X) axis and cost and revenues on the vertical (Y) axis. Preparing a CVP graph involves plotting the total revenue and total cost curves and the point of intersection of the two is the the breakeven point.

#### Example1.

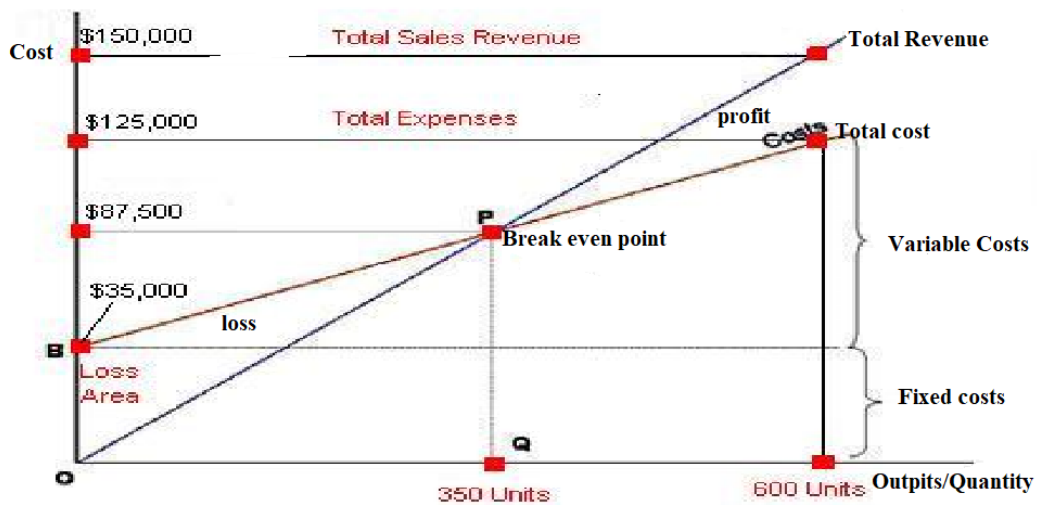
OLAN LTD is a bakery business which produces 600units (Cakes) and each Cake is sold at FRW 250 and the variable cost per unit is FRW 150. Calculate the breakeven point in quantity and in value and then plot these information on graph.

Fixed Cost	FRW 35,000
Variable costs (150×600)	<u>FRW 90,000</u>
Total Cost	FRW 125,000

$$\text{Contribution per unit} = \text{FRW } 250 - \text{FRW } 150 = \text{FRW } 100$$

$$\text{BEP in Quantity} = \frac{\text{FRW } 35,000}{\text{FRW } 1,000} = 350 \text{ Cakes}$$

$$\text{BEP in Value} = 350 \times 250 = \text{FRW } 87500$$



### c. Target Profit Analysis

Cost volume profit (CVP) formulas can be used to determine the sales volume needed to achieve a target profit.

#### Example:

**DANI Ltd has the following cost information in its books:**

- Sales price per unit = FRW 250
- variable cost per unit = FRW 150
- Total fixed expenses = FRW 35,000
- Target Profit = FRW 40,000

Required: How many units would have to be sold to earn a profit of 40,000?

#### Solution:

The CVP Equation Method:

Under equation method: Instead of solving the equation where profits are zero, we solve the equation where profits are FRW 40,000.

Sales = Variable expenses + Fixed expenses + Profit

$$250Q = 150Q + \text{FRW } 35,000 + \text{FRW } 40,000$$

$$100Q = \text{FRW } 75,000$$

$$Q = 75,000 / 100 \text{ per unit}$$

$$Q = 750 \text{ Units}$$

Thus the target profit can be achieved by selling 750 units per month, which represents FRW 187,500 in total sales (250\* 750 units).

#### d. The Contribution Margin Approach

A second approach involves expanding the contribution margin formula to include the target profit.

$$\text{Unit sales to attain target profit} = \frac{\text{Fixed cost} + \text{Target Profit}}{\text{Contribution Per Unit}}$$

This approach gives the same answer as the equation method since it is simply a short cut version of the equation method. Similarly, the sales value needed to attain the target profit can be computed as follows:

$$\text{cash sales to attain the target profit} = \frac{\text{Fixed expenses} + \text{Target Profit}}{\text{PV Ratio}}$$

$$\text{Cash sales to attain the target profit} = \frac{\text{FRW } 35,000 + \text{FRW } 40,000}{0.4} = \text{FRW } 187,500$$

#### e. Margin of Safety

The margin of safety is the excess of budgeted or actual sales over the breakeven volume of sales. It states the amount by which sales can drop before losses begin to be incurred. The higher the margin of safety, the lower the risk of not breaking even.

#### Margin of Safety Formula

The formula for the calculation of margin of safety in sales value is:

$$\text{Margin of Safety in sales value} = \text{Total budgeted or actual sales} - \text{Break - Even sales}$$

#### Illustration

Sales (400 units @ FRW 250) ----- FRW 100,000

Break even sales----- FRW 87,500

**Required:** Calculate margin of safety in sales value.

#### Solution

Sales (400 units @ FRW 250)                      FRW 100,000

Break even units (at 350 units)      FRW 87,500

Margin of safety in sales value                      FRW 12,500

### **Margin of safety as a percentage of sales**

Margin of safety as a percentage = [(Budgeted or Actual sales – Breakeven sales)/Budgeted or Actual sales]

$$\frac{12,500}{100,000} = 12.5\%$$

It means that at the current level of sales and with the company's current prices and cost structure, a reduction in sales of 12,500 FRW, or 12.5%, would result in just breaking even. In a single product firm, the margin of safety can also be expressed in terms of the number of units sold by dividing the margin of safety in dollars by the selling price per unit. In this case, the margin of safety is 50 units (12,500 ÷ 250 units = 50 units) or Budgeted or Actual sales units – Breakeven units

### **Limitations of breakeven analysis**

Breakeven analysis is a useful tool for problem solving and decision making, but some of the limitations should be noted:

1. The breakeven analysis assumes that cost and revenue behaviour patterns are known and that the change in activity levels can be represented by a straight line, which is not always the case.
2. It may not always be feasible to split costs into variable and fixed categories. Some costs show mixed behaviour.
3. The breakeven analysis assumes that fixed costs remain constant over the volume range under consideration. If that is not the case, then the graph of total costs will have a step in it where the fixed costs are expected to increase.
4. Breakeven analysis, as described so far in this book, assumes production and sales volumes are the same, so that there is no build-up of stocks and work-in-progress.
5. Breakeven charts and simple analyses can only deal with one product at a time.
6. It is assumed that cost behaviour depends entirely on volume. These limitations may be overcome by modifying the breakeven analysis.





## Application activity 2.2

### Q1. Choose the correct answer.

ABC Company sells shoes for FRW 450 per pair of shoes. The variable cost is FRW 200 per pair of shoes. The fixed costs are FRW 750,000. What is the breakeven in sales?

- a) FRW 750,000
- b) FRW 937,500
- c) FRW 1,350,000
- d) FRW 1,687,500

### Q2. IHIRWE Ltd has recorded the following semi-variable cost over the past six months:

Month	production Volume(million)	Total Cost (FRW in million)
January	3500	47000
February	2900	41000
March	3300	45000
April	3700	49000
May	4200	54000
June	4000	52000

Estimate IHIRWE Ltds' fixed cost and variable cost by using the high/low method.



## Skills Lab 2

Gs Ubumenyi has the policy of promoting entrepreneurship clubs, During the set up and the running of their student business club at their school, the school administrators committed to cover the fixed costs and other costs to be covered by entrepreneurship club members. The club has prepared a business estimates of operating a saloon business at school. In their business plan the following expected cost and revenues were presented.

Year	number clients	Total Cost (FRW)	Total revenue (FRW)
1	5,000	3,500,000	5,000,000
2	7,500	5,000,000	7,500,000

The management of Gs ubumenyi has approved the above business estimates and requested the students to determine the contribution of the school and that of the club members. After reviewing the above information, using comparison method:

1. Calculate the contribution (Variable costs) of students in this business
2. Calculate the contribution of the school (Fixed costs) in this business
3. Prepare a short report to be presented to the club members and the school management advising them on how their contribution would be collected.



## End of unit assessment 2

### Questions

1. Define break-even point.
2. Complete the following sentence by choosing the best answer from the choices given

An activity level that the company expects to operate at is called a

- a) Margin of Safety
- b) Relevant range
- c) Contribution margin
- d) Target net income

Over the last five years, Amahoro Ltd has recorded the following costs:

Year	Output	Cost FRW
2018	325.000	505.000
2019	375.000	580.000
2020	485.000	745.000
2021	535.000	820.000
2022	515.000	790.000

Amahoro Ltd wants to estimate the cost for 2023, when they expect to produce 52,000 units.

Q4. ABC Ltd provides below information to professional accountant to get his professional advise. The management requires the professional accountant to determine the break- even point in units and Value and to determine the quantity required to get a profit of FRW 1,200,000

Quantity(kg)	Price (FRW)	Variable cost(FRW)	Fixed cost(FRW)	Sales(FRW)
20,000	20	240,000	400 ,000	400 ,000
40,000	20	480,000	400 ,000	800 ,000
50,000	20	600,000	400 ,000	1000 ,000
60,000	20	720,000	400 ,000	1200 ,000
80,000	20	960,000	400 ,000	1600,000

- a) The management requires the professional accountant to determine the break- even point in units and in Value
- b) Determine the quantity required to get a profit of FRW 1,200,000

**Key Unit Competence:** Identify and recording cost accounts used in organization



### Introductory activity

“Making a profit on a project/product depends on pricing it correctly”. AKARABO located in Kimironko Kigali city, is one of the Kigali’s largest manufacturers of flat-screen televisions and mobile phones. In 2015, AKARABO sold FRW 15million from phone cover and FRW 20 million of cables of flat screen in Kigali city. Many of material used in shop of flat-screen for well looks, AKARABO Spends FRW 40 million Annually on the procurement of stand table of flat-screen, speakers, cables of mobile phone and other materials. Until 2020, AKARABO did not have a centralized procurement system to leverage its scale and to control supply costs. Instead, the company had a decentralized system riddled with wasteful spending and inefficiencies. To respond to these challenges, AKARABO hired its first chief procurement officer introducing activity-based costing (A.B.C) as solution. ABC Analysis of the company’s procurements system revealed that most company resources were applied to administrative and not strategic tasks. Furthermore, the administrative tasks were done manually and at very high cost. A team of manager and employees in AKARABO are responsible for costing and pricing of its flat-screen and mobile phone. For each product, account managers carefully examine and verify job costs as part of a competitive bidding process. AKARABO business managers are also responsible for identifying any potential problems with each product and determining any alternative necessary to unsure high quality, on time delivery within the original product budget. AKARABO received an order (command) for new product of producing a computer. Manager at AKARABO need to know how much it costs to manufacture its new product. Knowing the cost and profitability of new job helps manager pursue their business strategies.

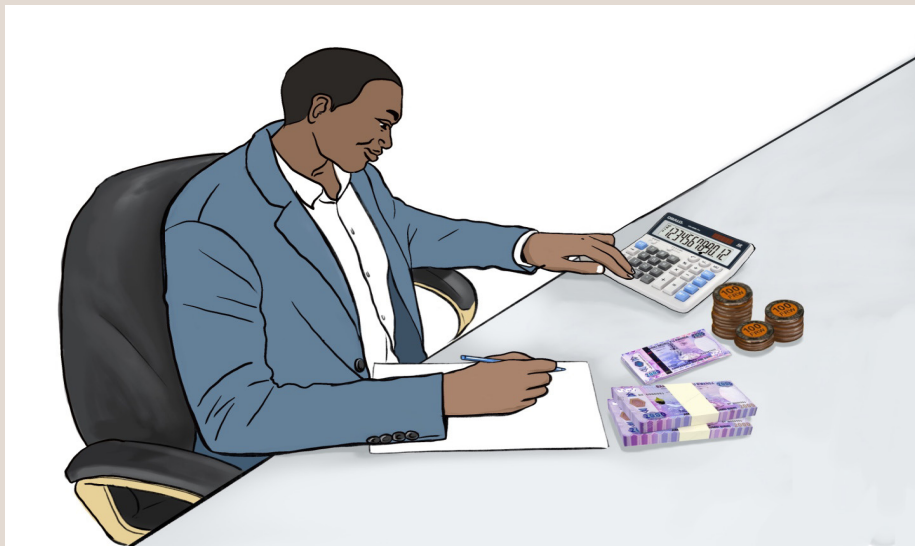
Of course, when making decisions, managers combine cost information with non-cost information such as personal observations of operations, and non-financial performance measures, such as quality and customer satisfaction.

### Questions

1. State the products produced by AKARABO manufacturing co..
2. What does the manager need for decision making?
3. According to your observation identify the costing methods that can be used from the above scenario.

## 3.1. Costing methods

### Learning Activity 3.1

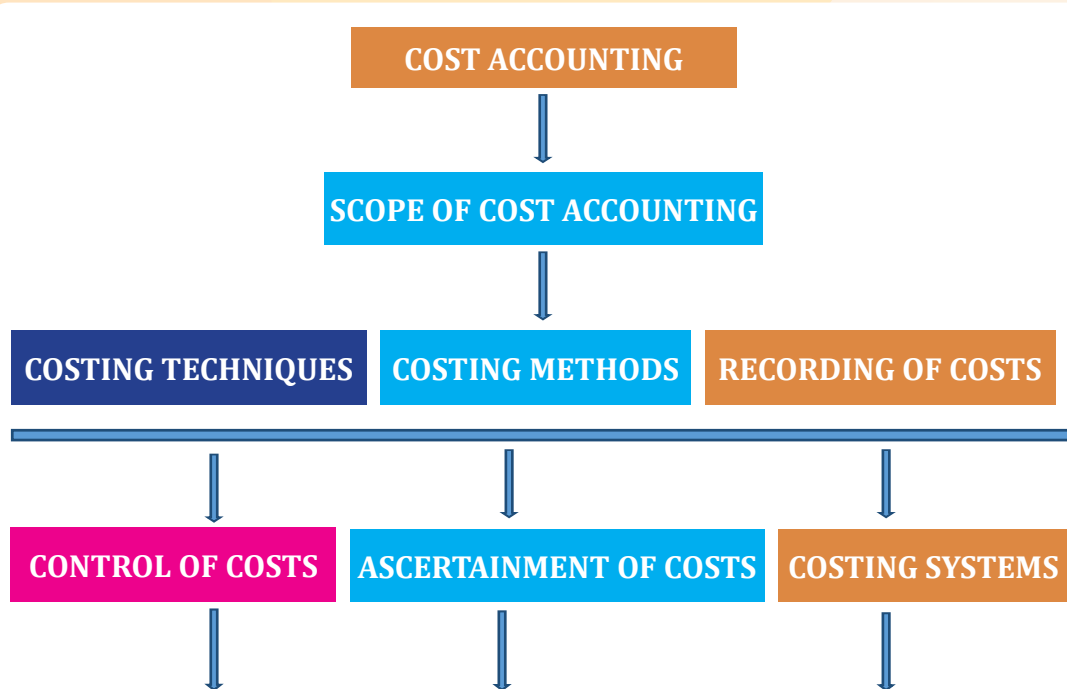


### Question

- a) What do you observe on the above picture?
- b) What do you think the man is going to do?

### 3.1.1. Introduction to costing methods

Costing methods is the approach or style or tactic adopted by an organization to collect cost data in a more appropriate manner so as to establish the total cost and cost per unit of final product produced or manufactured. The final product can either be physical goods or services.



Costing methods is an approach of cost data collection which is “under ascertainment of cost” umbrella and you know that ascertainment of cost aspect is a thematic sub-topic of scope of cost accounting as show in above diagram.

These are several methodologies utilized by different organizations, which is determined by the nature of products being manufactured. The viewpoint of the diverse needs of different organisations necessitates consideration of the criteria used in classifying the costing methods.

- **Characteristics of Costing Method**

The method is applicable to products which have common characteristics.

The ascertainment of cost in most of the times involves some repeated activities or repetitive processes.

The process of cost ascertainment is within a specific period of time usually a year.

- Costing methods entails both the determination of the overall cost and the unit profitability of the products.
- The activity of costing method is periodical in the sense that the aspect of cost ascertainment is limited to a specific accounting period.
- In addition to economic costs, the costing method incorporates other costs inform of normal and abnormal losses.

- **Advantages of costing method**

- a. Minimization of production cost**

By reducing inefficiencies associated with wastages and losses during production therefore minimizing overall cost incurred in production.

- b. Help in the profitability determination**

Ascertainment of the costs guides the producer to know exactly the total cost of the final product so as to set an appropriate profit margin in setting the selling price.

- c. Basis on purchase or manufacture of a component decision.**

The cost ascertainment approach is timely in guiding the management on whether it is economical to produce or purchase a certain component.

- d. Control of costs**

Costing methods help in comparing \previous year's cost level so as to manage the consumption of the economic resources. This can be achieved by use of budgeting tool.

- e. Tax matters**

Taxation of firm's profit by the government is pegged on the cost of production. This helps the government to ensure that fairness prevails to avoid over or under taxation.

- f. Bargaining power.**

The employee's or worker's union may use the cost of production as per cost ascertainment to argue their case.

- g. Delegation of responsibilities to employees.**

The workers are assigned their duties based on the costing method used. This helps in ensuring that no idle employees who are paid.

- h. Preparation of financial statements**

Costing method is a tool which is helpful in financial accounting during preparation of end of the year financial reports. This is because reports such as closing inventory for finished goods, work in progress and raw materials are associated with preparation of financial statements.

- i. Avoidance of collusion and fraud by workers**

Costing methods are ways of ensuring that material and other inputs are not misused by corrupted workers who may sell some to make personal gain at the expense of the quality of the goods being produced.

- **Disadvantages of costing methods**

Here are clarified limitations of the costing methods

- a. Historical data**

The data which is always readily available in the books of accounts of the business is the financial data which is historical which is not much needed for costing methods as they deal with the future decision making, for which the data is missing or scanty. This disparity in need gap curtails costing method procedures.

- b. Under-Utilized Capacity**

Costing methods works with the assumption that production capacity is fully utilized. If this is not the case, then the results presented at the end of the year will be misleading.

- c. Problem of over and under absorption of overheads**

Since costing methods is a process which has to do with estimation of the total cost of a product. Some aspects are standardized or pre-determined and so, when actual outcome takes place, it can be a case of over or under absorption of overheads. this brings inconvenience of planning.

- d. Lagged costing methods information**

Most of the times, costing require furnishing of timely information to the costing department which may not be the case for the various departments concerned with this exercise may have individual departmental challenges which can result to failure on timely costing exercise.

- e. Non-flexibility of a costing system.**

Some costing system which are concerned with recording of the costing information may be faulty or rigid and this hiccup may deny the objective of ascertaining of cost on a particular product, hence adversely affect costing method used.

### **3.1.2. Calculation based on costing methods**

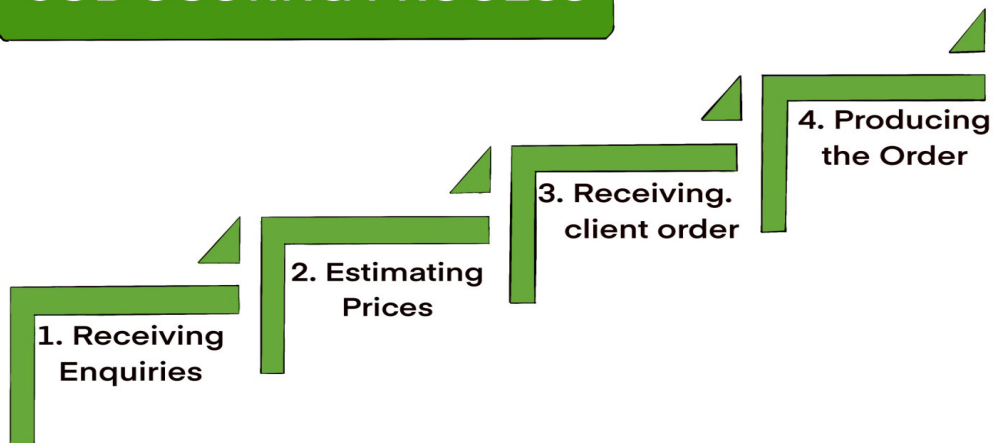
#### **A. Job Costing**

This method is also called as Job order costing method. This costing method is used in firms which work based on job work. There are some manufacturing units which undertake job work and are called as job order units. The main feature of these organizations is that they produce according to the requirements



and specifications of the customers. Each job may be different from each other. Production is only on specific order and there is no pre demand production. In this system, each job is treated separately and a job cost sheet is prepared to find out the cost of the job.

## JOB COSTING PROCESS



### Illustration

XYX Engineering ltd has three departments: preparation, machining and assembly. The budgeted direct labor hours for these three departments are 8,000, 12,000 and 10,000 respectively.

Factory fixed overheads are budgeted at FRW 180,000 for the year and variable overheads are as under:-

	FRW
Preparation	24,000
Machining	84,000
Assembly	60,000

The agreed hourly wage rate is:

	FRW
Preparation	12
Machining	20
Assembly	10

The following details relevant to job no.53 are also provided: -

	FRW
Raw materials from stock	8,500
Bought in components	2,700
Direct Labour hours	
Preparation	50 hours
Machining	200 hours
Assembly	120 hours
Painting by outside customer	FRW 3,200

Administration and selling Overheads are to be absorbed by adding 10% of all other costs. Profit is charged at 25% of total costs.

**You are required:** to determine the cost estimate for job.no.53

**ANSWERS:**

**XYZ ENGENNERING LTD**

**COST ESTIMETE FOR JOB NO:53**

**Direct materials**

	FRW	FRW
Raw material from store	8,500	
Bought in components	<u>2,700</u>	11,200

**Direct labour**

Preparation 50 hours at 12	600	
Machining 200 hours at 20	4,000	
Assembly 120 hours 10	1,200	5,800
Prime cost		17,000

**Production overhead**

Variable Overhead

Preparation 50 hours at 3	150
Machinery 200 hours 7	1,400

Assembly	120 hours @ 6	720	2,270
Variable cost			19,270
Fixed overheads	370 hours @ FRW 6		<u>2,220</u>
<b>FACTORY COST</b>			<b>21,490</b>
Administration and selling overheads (10%)			2,149
<b>TOTAL COST</b>			<b><u>23,639</u></b>
Profit			5,910
<b>Selling price</b>			<b><u>29,549</u></b>

### WORKINGS

1. Variable overheads absorption rate has been calculated as under:

#### Variable Overheads

	Hours worked	
Preparation	<u>24,000</u>	
	8000	FRW 3 Per hour
Machining	<u>84,000</u>	
	12,000	
		FRW 7 Per hour
Assembly	<u>60,000</u>	
	10,000	
		FRW 6 Per hour

2. Fixed overheads absorption rate has been calculated as under:

Fixed overhead	<u>180,000</u>
	8000+12000+10000
	<u>180000</u>
	30000
	FRW 6 Per hour

3. Total hours worked for job no 53 are:

$$50 + 200 + 120 = 370$$

4. Administration and selling overheads is 10% of FRW 21490 i.e FRW 2149

5. Profit is to be charged at 25% of total cost. it is 25% of FRW 23639 i.e :5,909,75 or 5910.

- **Characteristics of job costing**

Job costing is a costing method with the following features:

- a. The order is specific,**

It means that the task to be performed is subject to strict guidelines. There are terms of reference of the customer or client.

- b. It is possible to closely track the cost elements associated with the order.**

The job being performed is sufficiently diverse to allow the manufacturer to associate the specific input materials, labor, and overhead associated with that job completion.

- c. The executed jobs differ from each other.**

Since the customers are diverse, the jobs are also diverse. That is, they are not similar. This is because the manufacturer may be dealing with different customers or the same customer/client but with different types of orders.

- d. The overhead cost allocation is carried out according to the relevant criteria.**

The indirect costs associated with the production of the relevant order number are determined by a unique basis from the other orders such as area, size of the order, etc.

- e. Keeping a separate account for each job.**

Since the jobs are different in most cases, the accounts are required for each job. That is, all costs associated with that specific order are charged to that specific account with a unique account number, and the costs posted therein form the total cost for that order.

- a. The production process is not continuous**

Each order is independent of the next and therefore there is no continuity as with the process cost method. Therefore, the jobs are broken in the real sense. That is, an order is initiated based on an order placed by the customer.

- a. The profitability of each job is determined separately**

The profitability margin for each job is determined by the total cost of the inputs consumed by that particular job. So each job has its own cost calculation and determination of the profits from it.

- **Classification of job costing method**

Job costing method is further broken down to:

- a. Contract costing method**

Contract costing method is also known as terminal costing method and it involves doing some assignment with set specification for another person for payment.

The contract costing method of ascertaining cost for a contract. once the contract is completed as per the agreement of the two parties, the assignment is closed down.

- b. Factory costing method**

Factory job costing is entails undertaking a clients 'assignment or job in a factory. The focus is the assignment at hand and on its completion, the output is delivered to the client.

- c. Batch costing method**

Batch costing method is an approach of assigning costs on a task which is completed in batches. It entails manufacture of a large number of products or goods at the same time.

- **Advantages of job costing**

- Help in determining the level of profitability of company products in the future. The current record of how costs have been allocated to the current product provides a guide for determining the profit margins to be achieved.
- Having clear cost data available helps management determine the selling price of the end product (final product). The selling price set depends on the amount of cost accumulation, so when the cost is higher, the selling price is high and vice versa is true.
- Optimal allocation of economic resources. The job costing method is set in such a way that it is possible to monitor the use of the available resources. Thus, the manufacturer or producer is able to identify instances of waste and mistakes for each specific job and avoid such situations.
- Job costing assists in the adoption of predetermined overhead rates, which in turn assists in the application of the budgetary control system. That is, before the actual costs are incurred, the producer can plan earlier to know how to control the costs/inputs for the inputs needed estimated using the cost method provided.
- The job costing method encourages the activity of delegating tasks among employees. The job costing method helps in delegating tasks to be

performed by each employee in the workplace. Therefore, accountability to a department or an individual employee is enhanced.

- Avoidance of duplication. The manufacturer is able to separate one order from another and avoid duplication in production that can lead to wasted resources.
- Increased production efficiency. The manufacturer is able to assess the level of inputs and outputs and ensure that the former are minimized, improving the efficiency and quality of the final product.

- **Disadvantages of job costing method**

- Unnecessary expenses or costs incurred between two processes can be unavoidable. The job costing method is a difficult and costly/expensive endeavor for small businesses due to the lack of economies of scale.
- The job costing method does not consider any standard procedure for estimating the costs paid or incurred. This means that the jobs are different and are approached differently than in activity-based costing, in which the uniformity of the products prevails.
- The job costing method is not applicable/suitable for fast moving jobs. The category of short-lived jobs may not benefit from this costing method approach. Because the cost efficiency is naturally low.
- The job costing method requires a lot of paperwork to accomplish a specific task. There are several logistics areas that require a lot of paperwork when estimating a job to capture all the details of the cost elements. This is a cumbersome approach.
- The job costing method is sunken or historical in nature. Sunk costs are costs that have already been incurred and are never suitable for future decisions. You see the producer relies on the already completed tasks according to past records showing the incurred/actual costs of similar type of work and therefore is not a suitable tool for future decisions.

## **B. Process costing method**

- **Definition**

Process costing is a form of operational costing used when cost units go through a series of clearly defined processes before the final product is completed. The main feature of this method is that the finished output of one process becomes the input of the next process. In this case, all costs (direct and indirect) are charged to each process.

This method is used in industries like chemicals, soaps, paper, paints, oil products, etc

- **Elements of process cost**

Final goods are produced after a specific number of processes. An account is kept for each process or operation. All costs incurred to complete a process are debited to process account.

The elements of process cost are:

- **Materials**

In process costing, raw material is issued to process 1, where after processing it is transferred to process 2 and so on. Some more materials are added to the original material at each process. The materials used at each process are debited to the respective process account.

- **Labor**

Direct labor of each process is debited to the respective process account.

- **Direct expenses**

Expenses incurred in respect of any particular process are debited to the process account.

An example of direct expenses is packing cost of biscuits.

- **Production overhead**

In process costing, the proportion of production overhead is comparatively high. Each process is charged with a reasonable share of production overhead.

**Example 1:**

The manufacture of product 'G' requires three distinct processes numbered 1-3. On completion, the product is passed from process 3 to finished goods stock. The following information was obtained in respect of product 'G' for the month of July.

3,000 units of raw material at FRW 25 were issued to process 1 and costs incurred are given below:

ELEMENT OF COST	PROCESS			TOTAL
	1	2	3	
	FRW	FRW	FRW	FRW
Direct material	5,000	12,000	18,000	35,000
Direct labor	30,000	20,000	10,000	60,000
Direct expenses	2,800	5,200	2,000	10,000
Production overheads	-	-	-	90,000

Production overhead is absorbed by each process at 150% of direct labor. There was no stock of raw material or work-in-progress either at the beginning or at the end of the period.

You are required to prepare the process accounts.

### ANSWER

Dr		PROCESS 1			Cr		
	Units	Cost per unit	Amount		Units	Cost per unit	Amount
Units introduced	3,000	FRW 25	FRW 75,000	Process 2 – output transferred	3,000	FRW 52.6	FRW 157,800
Direct material			5,000				
Direct labor			30,000				
Direct expenses			2,800				
Production overhead			45,000				
	3,000		157,800		3,000		157,800



**Process 2- output transferred Cost per unit =  $157,800 \div 3,000 = 52.6$**

Dr				PROCESS 2				Cr		
	Units	Cost per unit	Amount		Units	Cost per unit	Amount			
Process 1	3,000	FRW 52.6	FRW 157,800	Process 2 -output transferred	3,000	FRW 75	FRW 225,000			
Direct material			12,000							
Direct labor			20,000							
Direct expenses			5,200							
Production overhead			30,000							
	3,000		225,000		3,000		225,000			

Dr				PROCESS 3				Cr		
	Units	Cost per unit	Amount		Units	Cost per unit	Amount			
Process 2	3,000	FRW 75	FRW 225,000	Finished goods stock	3,000	FRW 90	FRW 270,000			
Direct material			18,000							
Direct labor			10,000							
Direct expenses			2,000							
Production overhead			15,000							
	3,000		270,000		3,000		270,000			

### FINISHED GOODS STOCK ACCOUNT

	Units	Cost per unit	Amount		Units	Cost per unit	Amount
Process 3-output transferred	3,000	FRW 90	FRW 270,000				

- **Process loss, scrap and waste**

These terms are used frequently in process costing. Mostly the quantity or weight of output of a process is less than input of that process. The loss of weight or volume arises in the course of manufacture. This loss mainly arises where distillation or disintegration by heat or chemical action is involved. The reasons of this loss are evaporation, residuals, ash, spoilage.

### **C. PROCESS LOSS**

This is the loss of weight or volume of material during a process.

It may be *Normal process loss* or *abnormal process loss*.

*Normal process loss* represents the loss which is expected under normal conditions. This loss is unavoidable in view of the nature of the production process. This loss is caused by such factors as evaporation and this is calculated in advance on the basis of past experience.

The cost of normal loss is absorbed in the cost of production for good production. If defective units in respect of normal loss can be sold for at a reduced value then the proceeds (amount you get after selling ) of these units are subtracted from total cost of good products. In this case the following formulas are used.

**Cost per unit=Total Process Cost/Estimated Production**

$$\text{Cost per unit} = \frac{(\text{Total process cost} - \text{Scrap value of Normal loss})}{\text{Estimated Production}}$$

*Abnormal process loss* represents the loss which occurs under abnormal conditions. Abnormal loss cannot be foreseen. The main causes of abnormal loss are plant breakdown, industrial accidents, inefficiency of workers or defective raw materials. If actual loss is greater than the normal loss then this difference is called as abnormal process loss. Abnormal process loss is costed on the same basis as good production.

It is treated as:

– **Value of Abnormal Loss**

Dr: Abnormal Loss Account

Cr: Process Account

– **Scrap value of abnormal loss**

Dr: Scrap Debtors Account

Cr: Abnormal Loss Account

The balance in the abnormal loss account is transferred to the profit and loss account at the end of the year.

### **ABNORMAL GAIN**

If normal process loss is less than expectations then the difference between the actual loss and normal loss is known as **abnormal gain**. The value of abnormal gain is calculated on the same basis as good production.

It is treated as:

- **Value of Abnormal Gain**

Dr: Process Account

Cr: Abnormal Gain Account

- **waste**

Waste is the material arising in production process that has no value. It means waste refers to anything which has no value.

If waste is part of the normal loss then the cost will be absorbed by the good production and in case of abnormal loss, it will be transferred to abnormal loss account.

- **scrap**

Scrap is the material that can no longer be used for its original purpose (e.g. broken parts).

It can be sold at much lower price than the cost. The income from sale of scrap is taken into consideration and process loss is reduced by that amount.

### **Example 2**

In the manufacture of product “Pee”, 2,000 kg of material at FRW 5 per kg were supplied to process 1. Labor costs amounted to FRW 3,000 and production overheads of FRW 2,300 were incurred. The normal loss has been estimated at 10%. The actual production was 1,750 kg.

Prepare the process account and calculate cost per unit.

## Answer

Dr		PROCESS 1 ACCOUNT				Cr		
	Units (kg)	Cost per unit FRW	Amount FRW		Units(kg)	Cost per unit FRW	Amount FRW	
Direct material	2,000	5	10,000	Normal loss	200	-	-	
Direct labor			3,000	Abnormal loss	50	8.5	425	
Product. OH			2,300	Process 2 – output transferred	1,750	8.5	14,875	
	2,000		15,300		2,000		15,300	

Normal loss calculation

Estimated loss 10% of 2,000 kg = 200kg

Abnormal loss calculation

Estimated production (2,000-200) = 1,800 kg

Actual production 1,750 kg

Abnormal loss 50 kg

Unit cost of normal production

Cost per unit = Total process cost / Estimated production  
 = FRW 15,300 / 1,800 = FRW 8.5

Value of abnormal loss = 50 kg \* FRW 8.5 = FRW 425

Value of good production = 1,750kg \* FRW 8.5 = FRW 14,875

### Abnormal Loss Account

	Units (kg)	Cost per unit FRW	Amount FRW		Units(kg)	Cost per unit FRW	Amount FRW
Process 1A/c	50	8.5	425				

### EXAMPLE 3

Assume the same data as in example 2 except that the scrap value of normal loss and abnormal loss was FRW1.8 per kg. Prepare the process 1 account and calculate cost per unit.

Dr		PROCESS 1 ACCOUNT				Cr		
	Units (kg)	Cost per unit FRW	Amount FRW		Units(kg)	Cost per unit FRW	Amount FRW	
Direct materials	2,000	5	10,000	Normal loss	200	1.8	360	
Direct labor			3,000	Abnormal loss	50	8.3	415	
Product.OH			2,300	Process 1 –output transferred	1,750	8.3	14,525	
	2,000		15,300		2,000		15,300	

Unit cost of Normal Production

Cost per unit= (Total process cost-Scrap value of normal loss)/Estimated production

$$= \text{FRW } (15,300-360) / 1,800 = \text{FRW } 8.3$$

Dr		Abnormal Loss Account				Cr		
	Units (kg)	Cost per unit FRW	Amount FRW		Units(kg)	Cost per unit FRW	Amount FRW	
Process 1A/c	50	8.3	415	Scrap Debtors a/c	50	1.8	90	
				Profit and loss a/c			325	
	50		415		50		415	

### Example 4:

Assume the same data in example 2 except that the scrap value of normal loss was FRW 1.8 per kg and actual production was 1,830 units. Calculate the normal gain and show the relevant accounts.

**Answer**

Expected production= 1,800 kg

Actual production = 1830 kg

Abnormal gain = 30 kg

**Note:** If actual production is greater than expected production then this excessive production is the abnormal gain.

Cost per unit will be the same as in example 3.

Dr		PROCESS 1 ACCOUNT				Cr	
	Units (kg)	Cost per unit FRW	Amount FRW		Units(kg)	Cost per unit FRW	Amount FRW
Direct Materials	2,000	5	10,000	Normal loss	200	1.8	360
Direct Labor			3,000	Process 1 –output transferred			
Product OH			2,300		1,830	8.3	15,189
Abnormal gain	30	8.3	249				
	2,030		15,549		2,030		15,549

Dr		Abnormal Gain Account		Cr	
Units (kg)	Cost per unit FRW	Amount FRW	Units(kg)	Cost per unit RWF	Amount FRW
			Process 1 a/c 30	8.3	249
			30		249

**– JOINT PRODUCTS AND BY-PRODUCTS**

These represent outputs that simultaneously result from some joint process. Joint products are two or more products which are output from the same processing operation but are not distinguishable up to their point of separation. This point of separation is known as split-off – point or separation point.

Before this point of separation, one cannot distinguish the products involved because they are in mixed form and all costs incurred cannot be attributed to any product. They form the main or target products the firm plans to produce.

An increase in the output of one product will bring about an increase in the quantity of others, or vice versa, but not necessarily in the same proportion. Joint products may be sold off immediately after the split – off point or may be further processed if they are not in saleable condition. At whatever stage joint products are sold, they have a substantial sales value as compared to by-products.

A by-product is that which is similarly produced at the same time and from the same process as the main product. The by-product has low sales value compared to the main product and is usually incidental to the process. They are not always the company's target and cannot influence the manager's production decision as to whether the main product should be produced or not. Examples of industries that produce both joint and by-products include chemicals, oil refining, mining, flour milling and gas manufacturing. Specific examples of such products include petrol, paraffin and grease which represents a by-product.

The major distinguishing features of joint-products and by-products are Joint products have substantial sales value whereas by-products have minor sales value. Joint products are the major or main products of the firm and form manufacturing objective of the firm but by-products are incidental products to the production process. Joint products influence the production decision of the firm since they are major products whereas by-products don't influence production decision. **Accounting for Joint products:**

The major constraint in accounting for joint products is the presence of **joint or common costs** that have been incurred prior the split-off point which cannot be identified with joint products. Since the aim of costing is to ascertain each product's unit cost, then common costs must be apportioned or allocated to joint products.

Such apportionment is necessary for two reasons including providing product valuations required for financial accounting, and other regulations.

Coordinating the activities of decision – makers in a decentralized organization.

Though many scholars have come up with many methods used to assign joint costs to joint products, none of them is superior to the other but their applicability is influenced by certain factors.

The following methods are commonly used to assign joint costs:

- 1) Physical units/measures method.
- 2) Sales value or market value method

#### D. Physical units method

Under this method, common or joint costs are assigned to products on the basis of volume of output. Joint costs are allocated in proportion to the number of units produced or their relative weights. For this method to be suitable quantity of the joint products must be in the same state or else, the method cannot be applied.

$$\text{Costs apportioned to each product} = \frac{\text{Total units of each product} \times \text{Joint costs}}{\text{Total units of all products}}$$

The major weakness of this method is that it assumes that all products are equal in terms of value. Costs are therefore assigned to products in equal proportions which is very unrealistic because products cannot be equal in terms of value and even resources required to produce each. Since the method does not assign joint costs to products on the basis of revenue generating power of individual products, cost information will mislead decision makers.

#### Example 1:

A manufacturing firm produces three products ( K, M & P) through a joint process. Prior to the split – off point, common or joint costs amounting to FRW 24,000,000 were incurred. The units produced according to each product are as follows:-

Product	No. of Kilograms
K	80,000
M	120,000
P	40,000

The firm uses physical units method for apportioning joint costs to joint products.

**Required:** Apportion joint costs and determine the unit cost of each product.



## Solution

Product	Weight	Share of joint costs FRW	Unit cost FRW
K	80,000	$\frac{80,000 \times 24,000,000}{240,000} = 8,000,000$	$\frac{8,000,000}{80,000} = 100$
M	120,000	$\frac{120,000 \times 24,000,000}{240,000} = 12,000,000$	$\frac{12,000,000}{120,000} = 100$
P	40,000	$\frac{40,000 \times 24,000,000}{240,000} = 4,000,000$	$\frac{4,000,000}{40,000} = 100$
Total	240,000		

### E. Sales value method:

This method apportions or assigns joint costs to joint products on the basis of value attached to each joint product. The ratio of sales value of each product at split-off to total sales of all joint products is ascertained and multiplied by the joint costs incurred. The resulting amount will represent the joint costs assigned to each joint product. The formula is given below:

$$\text{Joint cost apportionments} = \frac{\text{Total sales value of each product} \times \text{Joint costs}}{\text{Total sales value of all products}}$$

This method addresses the shortcomings of physical units method because the assignment of joint costs to products depends on the value of each joint product and therefore, joint products cannot have a uniform unit cost.

### Illustration:

Using the same data in example 1, assume the company selling prices of joint products are as follows:

Product	No. of Kilograms	Unit selling price (FRW)
K	80,000	2,000
M	120,000	500
P	40,000	2,500

**Required:** Apportion joint costs and determine the unit cost of each Product.

**Solution:**

Product	Units	Unit Sales price	Sales value (FRW'000)	Ratio	Cost apportioned	Unit cost
K	80,000	2,000	160,000	50.00%	12,000,000	150,000
M	120,000	500	60,000	18.75%	4,500,000	37.50
P	40,000	2,500	100,000	31.25%	7,500,000	187.50
<b>Total</b>	<b>240,000</b>		<b>320,000</b>	<b>100%</b>	<b>24,000,000</b>	

**Note:** Sales value = Units involved \* unit selling price.

Ratio= Individual product sales/Total sales \* 100

Unit cost = Cost apportioned/individual units of product.

## F. Accounting for By-product costing

Because by-products are generally of secondary importance, cost allocation differs from that applied to joint products. Common methods used are:

- By-product receipts are treated as incidental or other income. Other income realized from sale of by-product is transferred to profit and loss account as miscellaneous income.
- By-product net realizable value is deducted from the total cost of joint products

Here, the sales revenue or proceeds received from the sale of the by-product are credited to the total production costs of manufacturing the main product. If there are any selling and distribution costs incurred for selling the by-product, the same are deducted from the sales value of the by-products and the net amount is either credited to process account or is deducted from the total cost. When a by-product requires further processing after split-off, the processing cost as well as selling cost, if any is deducted from the same value, and the net value of the by-product is deducted from the cost of the main product or credited to the relevant process account.

- By-product sales being treated as additional sales hence increasing turnover figures of the firm.

## Illustration

A company processes 2,400kg of beef in a month and this was sold at FRW 1,000. per kilogram. The total costs of products arising from the main production process were FRW 1,750,000. 6,000kg of bones were obtained and sold at FRW 80 per kilogram. The company spent FRW 22. per kilo for packing and distribution of the bones.

## Required

Prepare the income statement for the firm using at least three different methods of accounting for by-product costing.

## Solution

a) Treating by-product income as miscellaneous revenue		
	FRW	
Sales of main product (2,400kgs * FRW 1,000)	2,400,000	
Less: Production costs (joint costs)	1,750,000	
Gross profit	650,000	
Add: by-product revenue 6,000 (80-22)	348,000	
Total profit	998,000	
b) Treating by-product income as deduction from production costs		
Sales of main product (2,400kgs * 1,000/=)	2,400,000	
Less: Production costs (joint costs) 1,750,000		
Deduct by product revenue 348,000	1,402,000	
Total profit	998,000	
c) Joint product revenue as additional sales to the main product sales		
Sales of main product (2,400kgs * 1,000/=)	2,400,000	
Add by-product sales (6,000kgs * 80/=)	480,000	2,880,000
Less: production costs (joint costs)	1,750,000	
By-product costs	132,000	1,882,000
Total profit	998,000	

## G. Services costing

### Definition

The term service costing or operating costing refers to the calculation of the total operating costs incurred for each unit of the intangible product. These intangible products or services can either be in the form of internal services provided by industries as activities supporting the production of goods. Or in the form of external services offered by the companies in the service sector as an essential product for customers.

Service costing is an essential concept because every service organization needs to determine its business overheads. It is intended to ensure fair pricing of the products or services; and to maintain control of its fixed and variable costs.

### COST UNIT

NATURE OF SERVICE ORGANIZATION	COST UNIT
Transport	Tonne-kilometre/passenger-seat, passenger-Kilometre, kilometres travelled/ per hour/per trip.
Hospitals	Patient-beds, patient-days, number of operations
Electricity	Kilowatt-hours
Hotels	Occupied bed-night
Restaurants	Meals served
Gas	Per cubic meter/ per kilogram
Street lighting	Per lamp/ per point
Canteen	Per Meal/per person
Entertainment in Cinema or theatre	Per Ticket-show

Calculation of cost per unit: The formula for computing the cost of each service unit (i.e, cost per unit)is given below

$$\text{Cost per service unit} = \frac{\text{Total cost for the period}}{\text{Number of service units in the period}}$$

In addition, we will discuss transportation cost as an example of service costing.

Therefore, in this section we will look at the calculation of transport costs. Transportation is one of the most important service industries nowadays, and it is important to have an insight into the pro forma to determine the operating costs of such organisations :

<b>PARTICULARS</b>	<b>T o t a l (FRW)</b>	<b>Per (FRW) Unit</b>
Fixed costs		
Licence fee	X	X
Garage Rent	X	X
Interest on Capital	X	X
Motor Vehicle Tax/Road Tax	X	X
Administration cost/General supervision	X	X
Insurance	X	X
Depreciation	X	X
<b>TOTAL</b>	<b>X</b>	<b>X</b>
Semi-Variable Costs:		
Overhauling	X	X
Repair and Maintenance	X	X
Tyres and tubes	X	X
Painting	X	X
<b>TOTAL</b>	<b>X</b>	<b>X</b>
Variable costs:		
Driver's wages	X	X
Conductor's wages	X	X
Cleaner's wages	X	X
Petrol/Diesel	X	X
Engine Oil	X	X
Grease /lubricating Oil	X	X
<b>(C) TOTAL</b>	<b>X</b>	<b>X</b>
<b>Grand Total (A+B+C)</b>	<b>X</b>	<b>X</b>

**Illustration:**

PARTICULARS	VEHICLE
No. of Vehicles	5
Cost of Each Vehicle	FRW 200,000
Garage Rent (Monthly)	FRW 5,000
Depreciation	12%p.a
Insurance (Yearly)	FRW 28,800
Licence fee	FRW 3,000
Overhauling (monthly)	FRW 7,500
Diesel	FRW 50 per trip each way
General Supervision	FRW 7,200 p.a
Drivers' Wages (Monthly)	FRW 10,000
Engine Oil (Monthly)	FRW 1,500

**Note that:**

We have assumed that the licence fee was calculated every month. Also, each vehicle has the capacity of 2-tonne of goods.

If, each vehicle covers a distance of a 100 miles each way daily to and from the city; each vehicle runs on an average of 20 days a month; and while going to the city, the capacity was full and while returning the capacity is 25% occupied; find out the following:

Operating cost per tonne-mile; and Rate per trip to be charged, if the company plans to make 40% profit on freightage.

**ANSWER:**

PARTICULARS	TOTAL (FRW)	PER UNIT (FRW)
Licence fee	3,000	0.12
Garage rent	5,000	0.20
General supervision	600	0.02
Insurance	2,400	0.10
Depreciation	10,000	0.40
TOTAL	21,000	0.84
Semi-variable costs:		
Overhauling	7,500	0.30
Total	7,500	0.30

Variable costs:		
Driver's Wages	10,000	0.40
Diesel	10,000	0.40
Engine Oil	1,500	0.06
TOTAL	21,500	0.86
Grand TOTAL (A+B+C)	50,000	2.00

## WORKINGS

### No. of Cost Units:

On the first way of the trip: 100% capacity was occupied, i.e., 2-tonnes  
 No. of Cost Units = Distance \* Capacity Occupied \* Working Days \* No. of Vehicles  
 No. of Cost Units =  $100 * 2 * 20 * 5 = 20,000$  tonne-miles

On the second way of the trip: 25% capacity was occupied, i.e., 0.5-tonnes; Similarly,  
 No. of Cost Units =  $100 * 0.5 * 20 * 5 = 5,000$  tonne-miles

Hence, Total No. of Cost Units =  $20,000 + 5,000 = 25,000$  tonne-miles

### General Supervision:

It is given annually, therefore;

Monthly expense on general supervision =  $7200 / 12 = \text{FRW } 600$

### Insurance:

It is given annually, therefore;

Monthly expense on insurance =  $28800 / 12 = \text{FRW } 2400$

### Depreciation:

It is given annually, therefore; Monthly depreciation =  $(\text{Total Cost of 5 Vehicles} * \text{Rate of Depreciation}) / (100 * 12)$

Monthly depreciation =  $(1000000 * 12) / (100 * 12) = \text{FRW } 10000$

### Diesel:

Monthly expense on diesel = Cost per Trip \* No. of Ways per Trip \* No. of Working Days \* No. of Vehicles

Monthly expense on diesel =  $50 * 2 * 20 * 5 = \text{FRW } 10000$

## H. Activity Based Costing (ABC)

Many companies use a traditional cost system such as job-order costing or process costing, or some hybrid of the two. This traditional system may provide distorted product cost information. In fact, companies selling multiple products are making critical decisions about product pricing, making bids, or product mix, based on inaccurate cost data. These prime costs are traceable to individual products, and most conventional cost systems are designed to ensure that this tracing takes place.

The problem is not with assigning the costs of direct labor or direct materials, but, the assignment of overhead costs to individual products is the main issue. Using the traditional methods of assigning overhead costs to products where a single predetermined overhead rate based on any single activity measure, can produce distorted product costs. The growth in the automation of manufacturing (such as increased use of robotics, high-tech machinery, and other computer-driven processes) has changed the nature of manufacturing and the composition of total product cost. The significance of direct labor cost has diminished and overhead costs have increased. In this environment, overhead application rates based on direct labor or any other volume-based cost driver may not provide accurate overhead charges since they no longer represent cause and effect relationships between output and overhead costs.

Activity-based costing (ABC) attempts to get around this problem. An ABC system assigns costs to products based on the product's use of activities, not product volume. It has proved to produce more accurate product costing results in an environment where there is diversity in product line and services coming out of the same shop. A recent survey by the Institute of Management Accounting shows that over 30 percent of the companies which responded currently are using ABC systems to replace their existing traditional cost systems.

An activity-based cost system is one which first traces costs to activities and then to products. Traditional product costing also involves two stages, but in the first stage costs are traced to departments, not to activities. In both traditional and activity-based costing, the second stage consists of tracing costs to the product.

The principal difference between the two methods is the number of cost drivers used. Activity-based costing uses a much larger number of cost drivers than the one or two volume-based cost drivers typical in a conventional system. In fact, the approach separates overhead costs into overhead cost pools, where each cost pool is associated with a different cost driver. Then a predetermined overhead rate is computed for each cost pool and each cost driver. In consequence, this method has enhanced accuracy.



Activity-based costing (ABC) is not an alternative costing system to job costing or process costing. It focuses on activities as the principal cost objects. ABC is a method of assigning costs to goods and services that assumes all costs are caused by the activities used to produce those goods and services. This method provides more insight into the causes of costs than conventional costing methods.

Conventional costing methods divide the total costs by the number of units to compute a unit cost. In contrast, activity-based costing starts with the detailed activities required to produce a product or service and computes a product's cost using the following *four* steps:

1. Identify the activities that consume resources and assign costs to those activities. **Inspection** would be an activity, for example.
2. Identify the cost driver (s) associated with each activity or group of activities, known as a **cost pool**. A cost driver is a factor that causes, or "drives," an activity's costs. The *number of inspections* would be a cost driver. So could the number of times a new drawing is needed because a product has been redesigned.
3. Calculate an applied rate for each activity pool. The **pool rate** could be for example the cost per purchase order.
4. Assign costs to products by multiplying the cost pool rate by the number of cost driver units consumed by the product. For example, the cost per inspection *times* the number of inspections required for Product X for the month of March would measure the cost of inspection activity for Product X for March.

**Note:** ABC is also applicable to service, merchandising, and nonprofit sectors as well as manufacturing companies.

### **First-Stage Procedure:**

In the first stage of activity-based costing, overhead costs are divided into homogeneous cost pools. A **homogeneous** cost pool is a collection of overhead costs for which cost variations can be explained by a single cost driver. Overhead activities are homogeneous whenever they have the same consumption ratios for all products.

Once a cost pool is defined, the cost per unit of the cost driver is computed for that pool. This is referred to as the **pool rate**. Computation of the pool rate completes the first stage. Thus, the first stage produces two outcomes: (1) a set of homogeneous cost pools and (2) a pool rate.

### **Second-Stage Procedure:**

In the second stage, the costs of each overhead pool are traced to products. This is done using the pool rate computed in the first stage and the measure of the amount of resources consumed by each product. This measure is simply the quantity of the cost driver used by each product. In our example, that would be the number of production runs and machine hours used by each product. Thus, the overhead assigned from each cost pool to each product is computed as follows:

**Applied overhead = Pool rate x Cost driver units used**

The total overhead cost per unit of product is obtained by first tracing the overhead costs from the pools to the individual products. This total is then divided by the number of units produced. The result is the unit overhead cost. Adding the per-unit overhead cost to the per-unit prime cost yields the **manufacturing cost per unit**. Illustration see (Team Ltd below)

### **Advantages of ABC method :**

1. The complexity of manufacturing has increased, with wider product ranges, shorter product life cycles and more complex production processes. **ABC recognises this complexity with its multiple cost drivers.**
2. In a more competitive environment, companies must be able to assess product profitability realistically. **ABC facilitates a good understanding of what drives overheads costs.**
3. In modern manufacturing systems, overheads functions include a lot of non-factory floor activities such as product design, quality control, production planning and customer services. ABC is concerned with all overhead cost and so it can take management accounting beyond its traditional floor boundaries.

### **Disadvantages of (ABC)/criticisms of( ABC)**

1. Cost apportionment may still be required at the cost pooling stage for shared items of cost, such as rent, rate, building depreciation. Apportionment can be an arbitrary way of sharing costs
2. A single cost driver may not explain the cost behaviour of all items in a cost pool. An activity may have two or more cost drivers.
3. Unless cost are 'driven' by an activity that is measurable in quantitative terms, cost drivers cannot be used.

4. There must be reason for using a system of ABC must provide meaningful product costs or extra information that managements will use. If management is not going to use ABC information for any practical purpose, a traditional absorption costing system would be simpler to operate and just as good.
5. The cost of implementing and maintaining an ABC system can exceed the benefits of improved accuracy in product costs.
6. Implementing ABC is often problematic due to problems with understanding activities and their costs.
7. ABC is an absorption costing which has only limited value for management accounting purpose.

**Illustration:**

Team ltd manufacture four products W,X,Y and Z. Output and cost data for the period just ending are as follows :

Product	Output (units)	No.of Production runs in a period.	No.of material orders made	Material cost per units (FRW)	Direct labour hours per unit.	Machine hours per unit.
W	10	2	2	20	1	1
X	10	2	2	80	3	3
Y	100	5	5	20	1	1
Z	100	5	5	80	3	3

Direct labour cost per hour = FRW 5

Overheads cost (common costs)	FRW' (000)
Overheads variable costs	3,080
Set- up costs	10,920
Scheduling costs	9,100
Material handling costs	<u>7,700</u>
	<b>30,800</b>

## REQUIRED

Use both traditional /conventional cost system and ABC systems to determine the cost of each product.

Compare the results got using the two systems and comment accordingly.

## ANSWER:

A) Using traditional costing system direct labour hour or machine hours can be used as bases of apportionment and hence the product cost would be as follows :

Total number of machine /labour hours is determined as follow :

PRODUCT	OUTPUT	HOURS PER UNIT	TOTAL HOURS
W	10	1	10
X	10	3	30
Y	100	1	100
Z	100	3	<u>300</u>
<b>TOTAL</b>			<b>440</b>

Overhead absorption rate (O.A.R)=Overheads cost/no.of Direct labour hours, machine hours

$$= \frac{30,800,000}{440}$$

FRW 70,000/ direct labour hour or machine hour

Determination of each product'

	W	X	Y	Z	TOTAL
COSTS(000)	FRW	FRW	FRW	FRW	FRW
Direct material	200	800	2,000	8,000	11,000
Direct labour	50	150	500	1,500	2,200
Overheads costs	700	2,100	7,000	2,100	30,800
<b>Total production costs</b>	<b>950</b>	<b>3,050</b>	<b>9,500</b>	<b>30,500</b>	<b>44,000</b>

Overhead absorbed by each product =number of hours per unit\*O.A.R

$$\text{Cost per unit} = \frac{\text{total production costs}}{\text{Units produced}}$$

	W	X	Y	Z
Unit produced	10	10	100	100
Cost per unit=	$\frac{950,000}{10}$	$\frac{305,000}{10}$	$\frac{9,500,000}{10}$	$\frac{30,500,000}{10}$
	=95,000	=30,500	=950,000	=3,050,000

(b) Using ABC, and assuming that the number of production runs is the cost driver for set up cost and scheduling cost, number of orders for material handling costs and that machine hours are the cost drivers for overheads variable costs.

**ANSWER :**

**Cost driver rate=** Overheads/ Quantity of cost driver

FRW(000)                      (000)

1.  $3,080 \div 440$  Machine hours= FRW 7 per machine hour.
2.  $10,920 \div 14$  production runs= FRW 780 per production run
3.  $9,100 \div 14$  production run = FRW 650 per production run
4.  $7,700 \div 14$  no.of orders = FRW 550 per order

	W	X	Y	Z
Cost (000)	FRW	FRW	FRW	FRW
Direct material	200	800	2000	8,000
Direct labour cost	50	150	500	1,500
Variable overheads	70	210	700	2,100
Set up costs	1,560	1,560	3,900	3,900
Scheduling costs	1,300	1,300	3,250	2,350
Material handling costs	<u>1,100</u>	<u>1,100</u>	<u>2,750</u>	<u>2,750</u>
<b>Production costs</b>	<b><u>4,280</u></b>	<b><u>5,120</u></b>	<b><u>13,100</u></b>	<b><u>20,600</u></b>
Unit produced	10	10	100	100
<b>Unit costs</b>	<b>428</b>	<b>512</b>	<b>131</b>	<b>215</b>

$$\text{Cost per unit} = \frac{\text{total production costs}}{\text{Units produced}}$$

Overhead assigned to products=Cost driver rate\*number of activities.

**E.g.** Set up costs has been absorbed as follows :

Product W=2(production runs)\*780,000=(cost driver rate)=1,560,000

Product X=2(production runs)\*780,000=(cost driver rate)=1,560,000

Product Y=5(production runs)\*780,000=(cost driver rate)=3,900000

Product W=5(production runs)\*780,000=(cost driver rate)=3,900000

### SUMMARY OF THE COMPARISONS :

	Traditional unit cost	ABC unit cost	Difference per unit	Difference in Total (unit cost*units)
Product	FRW(000)	FRW(000)	FRW(000)	FRW(000)
W	95	428	+333	+3,330
X	305	512	+207	+2,070
Y	95	131	+36	+3,600
Z	305	215	-90	-9,000

The figures suggest that the traditional volume related costing system gives misleading cost information. It underallocates overhead cost to low-volume products (i.e W&X with ten units of output) and over allocates overheads to higher volume products (i.e Z in particular) This confirms the earlier statements made.



### Application activity 3.1

#### 1. Choose the correct sentence related to activity-based costing

- ABC uses a plant-wide overhead rate to assign overhead
- ABC is not expensive to implement
- ABC typically applies overhead cost using direct labor-hours
- ABC uses multiple activity rates

#### 2. Which of the following is a limitation of activity-based costing

- costs are accumulated by each major activity
- A variety of activity measures are used

- c) All cost in an activity cost pool pertain to a single activity
- d) Activity-based costing relies on the assumption that the cost in each cost pool is strictly proportional to its cost measure

**3. Define the following concepts:**

- 1. By-product
- 2. Joint product

**4. Vehicle carries 8 tonnes on a trip and delivers as follows:**

3tonnes after 20km, 2tonnes after a further 10km, and the remaining 5tonnes after a further 30km, it then returns empty, covering a distance of 60km. The following information in respect of costs is provided

	FRW
Fuel and lubricants	100
Wages driver	150
Mate	80

Share of annual costs like insurance, maintenance, administration, depreciation etc. charged to this trip amounts to FRW 320

You are required to calculate:

- a) Cost per tonne-kilometre
- b) Cost per kilometre.

### 3.2. Decision making

#### Learning Activity 3.2



RTS Ltd is a manufacturing company which produces and sells radios. It has two main challenges such as setting competitive market price and a stiff competition with foreign companies. The management has hired a cost accountant to set different pricing strategies. The cost accountant has proposed and submitted the following strategies for decision making purpose:

- 1. The company should set the price based on cost of materials used during production process and the cost of each activity required to complete the production and delivery of product to the customer as well; as a result, the price becomes high compared to the market price of similar radios and the contribution margin has negative figures.

2. The company should set the price based on cost of additional unit; and a consider the fixed cost absorbed during the production process, then marginal contribution has a positive figures and net operating profit.
3. The company set the price based on cost of last unit produced and considers the fixed cost absorbed during the production process; in this case the contribution margin is positive and net operating loss.
4. The company should purchase radio materials from foreign specialized company and assemble them locally, this strategy reduces 3% on existing cost. The contribution margin is positive and net operating profit has a negative figure.
5. The company should purchase radios from specialized foreign company and resell them to the market, in case of adopting this strategy, the selling price of imported radios is less than the variable cost required to produce a radio. In that case the contribution margin has negative figures and net operating loss

After a deep analysis, the management of company has selected the strategy which brings to the company a positive contribution and a positive net operating profit.

### Question

1. Identify the costing techniques used on each price strategy
2. From this case study, select the pricing strategies, the company may adopt and justify the reasons.

### 3.2.1. Introduction to decision making

In management accounting, decision-making may be simply defined as choosing the best course of action among the alternatives available. If there are no alternatives, then no decision is required. The assumption is that the best decision is the one that generates the most revenue or the least amount of cost.

The process of making decisions is generally considered to involve the following steps:

- i) Identify the various alternatives for a given type of decision.
- ii) Obtain the necessary data necessary to evaluate the various alternatives.
- iii) Analyze and determine the consequences of each alternative.



- iv) Select the alternative that appears to best achieve the desired goals or objectives.
- v) Implement the chosen alternative.
- vi) At an appropriate time, evaluate the results of the decisions against standards or other desired results.

Respond to the variances

In management accounting, it is useful to classify decisions as:

**1. Strategic and tactical**  
**2. Short-run and long-run Strategic and Tactical Decisions**

In management accounting, the objective is not necessarily to make the best decision but to make a good decision. Because of complex interacting relationships, it is very difficult, even if possible, to determine the best decision. Management decision-making is highly subjective.

Whether a decision is good or acceptable depends on the goals and objectives of management. Consequently, a prerequisite to decision-making is that management have set the organization's goals and objectives. For example, management must decide strategic objectives such as the company's product line, pricing strategy, quality of product, willingness to assume risk and profit objective. In setting goals and objectives, it is useful to distinguish between strategic and tactical decisions. Strategic decisions are broad-based, qualitative type of decisions which include or reflect goals and objectives. Strategic decisions are non quantitative in nature. Strategic decisions are based on the subjective thinking of management concerning goals and objectives. Examples of strategic decisions and tactical decisions from a management accounting point of view include:

Decision items	Strategic Decision	Tactical decision
Cash	Maintain minimum level without excessive Risk	Keep specific level of cash
Account receivable	Policy on selling on credit	Specific credit terms
Inventory	Maintenain safety stock	Specific level of inventory
Price	Be volume dealer by setting price lower than competition	Set specific price

### 3.2.2. Marginal costing and decision making

Marginal costing, as one of the tools of management accounting helps management in making certain decisions. It provides management with information regarding the behavior of costs and the incidence of such costs on the profitability of an undertaking. Marginal costing is the ascertainment of marginal costs by differentiating between fixed costs and variable costs and to see the effects on profit of changes in volume or type of output. Thus, marginal costing includes two things i.e. The ascertainment marginal cost and the cost volume profit relationship. In this technique of costing only variable costs are charged to operations, processes or products leaving all indirect costs to be written off against profits in the period in which they arise.

#### A. Ascertainment of marginal cost

Marginal cost is incremental/additional cost of production which arises due to one –unit increase in production quantity. Variable costs have direct relationship with the volume of output and fixed costs remains constant irrespective of volume of production.

Details	Amount(FRW)	Amount (FRW)
<b>Sales</b>		<b>Xxx</b>
<b>less Marginal cost</b>		
Direct material cost	xxx	
Direct labor cost	xxx	
Direct Expenses	xxx	
Variable overhead	xxx	(xxx)
<b>Contribution</b>		<b>Xxx</b>
Less Fixed Cost		(xxx)
<b>Profit or Loss</b>		<b>Xxxx</b>

#### B. Cost volume profit relationship

After ascertaining marginal cost it becomes necessary for us to see the other aspect of marginal costing i.e. cost volume profit relationship. It is a known fact that if volume of a product is increased, the cost will decrease and profit will increase and vice-versa will be true if volume is decreased.

## – Marginal costing decisions

### • Contribution

Contribution is the reward for the efforts of the entrepreneur or owner of a business concern. From this, one can get in his mind that contribution means profit. But it is not so.

Contribution is helpful in determination of profitability of the products and/or priorities for profitability of the products. When there are two or more products, the product having more contribution is more profitable.

For example: The following are three products with selling price and cost details:

Particulars	Product A	Product B	Product C
selling Price	100	150	200
Variable cost	50	70	100
<b>contribution</b>	<b>50</b>	<b>80</b>	<b>100</b>

In the above example, one can say that the product 'C' is more profitable because, it has more contribution. This proposition of product having more contribution is more profitable is valid, as long as, there are no limitations on any factor of production.

### • CHOICE OF A PRODUCT FROM VARIOUS ALTERNATIVES

A company can produce different types of goods on a machine, in this case the choice is to be made from various alternatives. The company will prefer to produce that product which gives maximum contribution.

#### Illustration:

ABC Ltd is a manufacturing company which can produce three products A, B and C on Machine "P". The following information is provided in respect of these three products for a specific period.

Details	A (FRW)	B (FRW)	C (FRW)
Sales	150,000	220,000	240,000
<b>Variable Cost</b>			
Material	50,000	120,000	150,000

Labor	25,000	40,000	30,000
Variable Over head	12,000	20,000	15,000

You are required to advise the company regarding the choice of best product.

### ANSWER

	A (FRW)	FRW	B(FRW)	FRW	C(FRW)	FRW
Sales		150,000		220,000		240,000
Variable Cost						
Material	50,000		120,000		150,000	
Labor	25,000		40,000		30,000	
Variable Over head	12,000	87,000	20,000	180,000	15,000	195,000
Contribution		63,000		40,000		45,000

The company should produce A because this product has maximum contribution. The ranking of these products from the point of view of contribution will be:

### Product

A :1<sup>st</sup> B:3<sup>rd</sup> C:2<sup>nd</sup>

The profit from these products will be:

	A(FRW)	FRW	B(FRW)	FRW	C(FRW)	FRW
Sales		150,000		220,000		240,000
Variable Cost						
Material	50,000		120,000		150,000	
Labor	25,000		40,000		30,000	
Variable Over head	12,000	87,000	20,000	180,000	15,000	195,000
Contribution		63,000		40,000		45,000
Less fixed		35,000		35,000		35,000
Profit		28,000		5,000		10,000

1<sup>st</sup>

3<sup>rd</sup>

2<sup>nd</sup>

• **ACCEPTANCE AND REJECTION OF A SPECIAL ORDER**

Sometimes, a company has to decide regarding the acceptance or rejection of a special order. In this case also the gain or loss on contribution is the decision factor .

EXPO Ltd manufactures a product Zed which they sell for FRW 25 per unit. Current output is 20,000 units per month which represent a 100% of the capacity. They received an order of 2,000 units which they can produce by working extra time during the month.

The selling price is FRW 48,000.

The total quantity of the last month were FRW 420,000 which include fixed costs of FRW 70,000. If the special order for 2,000 units is received, then the variable cost per unit will increase by 20% but the fixed cost will remain unchanged. You are required to advise the company whether to accept or reject this order.

**Answer**

	FRW
Total Cost of last month	420,000
less fixed cost	70,000
Variable costs	350,000
Number of Units produced	20,000

Variable cost per Unit =  $\frac{350,000}{20,000}$  = FRW 17.50

Add increase in Variable cost (20% of FRW 17.50 ) FRW 3.50

Variable Cost for special order per unit FRW 21.00

**Special order**

Marginal Cost Statement for 2,000 units

	FRW
Sales	48,000
Less Marginal Cost (21X2000)	<del>(42,000)</del> <u>(42,000)</u>
Contribution	<u>6,000</u>

This order will increase the contribution of the current month by FRW 6000 .so it should be accepted. The final decision also depends upon some other factors like the willingness of the workers to work for extra time and the possibility of the repeat orders from the same customers.

- **DROPPING A PRODUCT**

If a company has a range of products and one of which is deemed to be unprofitable, the company may consider to drop this product and to increase the production of more profitable products.

Example . a company produces three products for which the following data have been provided :

Details	X (FRW)	Y(FRW)	Z(FRW)	Total FRW
Sales	250,000	180,000	150,000	580,000
Total Cost	200,000	200,000	120,000	520,000
Profit / (Loss)	50,000	(20,000)	30,000	60,000

Total cost comprises of 75% Variable cost and 25% fixed cost

The director of company consider that the product “Y” Shows a loss, so it should be discontinued. You are required to advise the management whether to drop the product “Y” or not?

**ANSWER**

Details	X (FRW)	Y (FRW)	Z (FRW)	Total (FRW)
Sales	250,000	180,000	150,000	580,000
Variable cost(75%)	150,000	150,000	90,000	390,000
Fixed Cost (25%)	50,000	50,000	30,000	130,000
Total Cost	200,000	<b>200,000</b>	120,000	520,000

- **MARGINAL COST STATEMENT PRODUCT**

Sales	250,000	180,000	150,000	580,000
Variable cost(75%)	150,000	150,000	90,000	390,000
contribution	100,000	30,000	60,000	190,000
less fixed cost				130,000
Profit				60,000

If the product “Y” is dropped then the position would be as under

contribution X	100,000
----------------	---------

contribution Z	60,000
TOT contribution	160,000
LESS fixed cost	130,000
Profit	30,000

The dropping of product “Y” reduces the profit of the company from FRW 60,000 to FRW 30,000 which is the amount of contribution lost from product Y. In this situation the product Y should not be dropped in spite of the fact that it gives a loss FRW 20,000. If the sales of other products can be increased then the product Y can be dropped and same resources should then be used to increase the production of X and Z.

- **Make or Buy Decisions**

When the management is confronted with the problem whether it would be economical to purchase a component or a product from outside sources, or to manufacture it internally, marginal cost analysis renders useful assistance in the matter. Under such circumstances, a misleading decision would be taken on the basis of the total cost analysis. In case the proposal is to buy from outside then, what is already being made, then the price quoted by the outsider should be lower than the marginal cost of manufacturing it internally. If the proposal is to make something what is being purchased outside, the cost of making should include all additional costs like depreciation on new plant, interest on capital involved and that cost should be compared with the purchase price.

The decision to make or buy is based on comparison of the marginal cost of manufacturing internally and the purchase price of an external supplier of the component. The choice is guided by the objective of minimizing cost and hence choose the option which is cheaper.

### Illustration

A T.V. manufacturing company finds that while it incurs costs to make component X, the same is available in the market at FRW 5.75 each, with all assurance of continued supply. The breakdown of cost per unit incurred by the company is:

Details	FRW
Materials	2.75
Labour	1.75
Variable overheads	0.50
Depreciation and other fixed cost	1.25
	6.25

- a) Should the company make or buy the component?  
 b) What should be your decision if the supplier offered component at FRW 4.85 each?

**Answer**

Details	FRW/EACH
Materials	2.75
Labour	1.75
Variable overheads	0.50
Total	5.00

- a) The purchase cost of the above component is FRW 5.75 each. If the company is having spare capacity which cannot be filled with more profitable jobs, it is recommended that the above component be manufactured in the company since the marginal cost at FRW 5.00 each is less than the purchase cost of FRW 5.75.
- b) In the event that the purchase cost is FRW 4.85 each which is less than the marginal cost of FRW 5.00 each, it is recommended that the component be bought from the supplier as this results in a saving of FRW 0.15 each. The spare capacity thus available can be utilised for other purposes, as far as possible.

**3.2.3. Absorption costing and decision making**

Absorption costing means that all of the manufacturing costs are absorbed by the total units produced. In short, the cost of a finished unit in inventory will include direct materials, direct labour, and both variable and fixed manufacturing overhead. As a result, absorption costing is also referred to as full costing or the full absorption method. Absorption costing is often contrasted with variable costing or direct costing. Under variable or direct costing, the fixed manufacturing overhead costs are not allocated to the products manufactured. Variable costing is often useful for management’s decision-making. However, absorption costing is required for external financial reporting and for income tax reporting. It is also referred to as full- cost technique

**A. PROFIT CALCULATION FROM ABSORPTION COSTING**

Absorption costing is a costing technique that includes all manufacturing costs, in the form of direct materials, direct labour, and both variable and fixed manufacturing overheads, while determining the cost per unit of a product.

In the context of costing of a product/service, an absorption costing considers



a share of all costs incurred by a business to each of its products/services. In absorption costing technique; costs are classified according to their functions. The gross profit is calculated after deducting production costs from sales and from gross profit, costs incurred in relation to other business functions are deducted to arrive at the net profit. Absorption costing gives better information for pricing products as it includes both variable and fixed costs.

Absorption costing technique absorbed fixed manufacturing overhead into the cost of goods produced and are only charged against profit in the period in which those goods are sold. In absorption costing income statement, adjustment pertaining to under or over-absorption of overheads is also made to arrive at the profit. Absorption costing is a simple and fundamental method of ascertaining the cost of a product or service.

- **Inventory valuation**

Finished goods inventories are over-stated in absorption costing as it includes one more cost element in inventory value than under variable costing, i.e the fixed manufacturing cost.

Inventory value under absorption costing

$$= \text{Direct material} + \text{Direct labour} + \text{variable manufacturing costs} + \text{Fixed manufacturing costs}$$

**The differences between the profits revealed by absorption costing and marginal costing can be computed with the help of the following formula:**

$$\frac{\text{Production Cost}}{\text{Denominator used for utilisation}} \times \text{Volume produced} - \text{volume sold}$$

**Illustration**

A company makes and sells a single product. At the beginning of period 1, there was no opening stock of the product, for which the variable production cost was FRW 4 and the sale price was FRW 6 per unit. Fixed costs are FRW 2,000 per period of which FRW 1,500 are fixed production costs. The following details are available:

Details	period 1	period 2
SALES	1,200 Units	1,800 units
production	1,500 units	1,500 units

What would be the profit in each period using -

- a) Absorption costing. (Assume normal output is 1,500 units per period); and
- b) Marginal costing?

**Answer**

**a. Absorption Costing Method**

The absorption rate for fixed production overhead is:  $= \left( \frac{1500}{1500} \right) = 1 \text{Rwf /unit}$

	Period 1		period 2		Total
Sales		7,200		10800	18000
production cost					
variable cost @ FRW 4	6,000		6,000		12,000
Fixed cost @1Rwf	1,500		1,500		3,000
@5	7,500		7,500		15,000
add :Opening stock	0		1,500		1,500
	7,500		9,000		16,500
less closing stock	1,500		0		1,500
product cost of sales	6,000		9,000		15,000
other Cost	500		500		1000
total cost of sales		6,500		9,500	16,000
<b>Profit</b>		700		1,300	2,000

**b. Marginal Cost Method:**

	Period 1		period 2		Total
Sales		7,200		10,800	
production cost					
variable cost @4FRW	6,000		6,000		12,000
add :Opening stock	0		1200		1,200
	6,000		7200		13,200
less closing stock	1,200		0		1,200

product cost of sales		4,800		7,200	12,000
contribution		2,400		3,600	6,000
fixed cost		2,000		2,000	4,000
Profit		400		1,600	2,000

## B. Absorption Decision making

### 1. Profit planning

There are four ways in which profit performance of a business can be improved: by increasing volume, by increasing selling price; by decreasing variable costs; and by decreasing fixed costs. Profit planning is the planning of future operations to attain maximum profit or to maintain a specified level of profit. Profitability of the different sectors of the business whenever there is a change in selling price, variable costs or fixed cost absorbed. Best product is product which generates a high profit compare to others

### 2. Evaluation of Performance

The various section of a concern such as a department, a product line, or a particular market or sales division, have different revenue earning potentialities. A company always concentrates on the departments or product lines which yield more net profit than others. The performance of each such sector can be brought out by means of higher profit generation. The analysis will help the company to take decision that will maximise the profits.

### 3. Alternative Use of Production Facilities

When alternative use of production facilities or alternative methods of manufacturing a product are available, contribution analysis should be used to arrive at the final choice. The alternative which will yield highest contribution shall generally and obviously be selected.

#### 3.2.4. Break-even point and decision making

##### 1. Contribution

The **contribution** from a product is the amount by which its selling price exceeds its variable cost. The idea of contribution is central to breakeven analysis in evaluating the effects of various decisions. Once the **contribution per unit** is known it can be compared with the **fixed costs**. The business does not begin to make a profit until the fixed costs are covered, so the formula is applied as:

$$\text{Breakeven point} = \frac{\text{Fixed cost}}{\text{contribution per unit}}$$

### Covering fixed costs and making a profit

To find the level of sales necessary to cover fixed costs and make a specified profit a knowledge of selling price per unit, variable cost per unit, and the fixed costs together with the desired profit. These are set out in the data table.

#### Example 1.

AKEZA produces the following cost data related to the production of product Y.

Data	FRW
Selling price per unit	80
Variable cost per unit 30	30
Fixed cost	3,000
Desired level of profit	4,000

- Calculate the break evenpoint ?
- Calculate the level of output that can help the company to generate FRW 4,000 as a profit?

#### ANSWER

Contribution = 80 - 30 = FRW 50

Break even point in quantity =  $\frac{3000}{50}$  = FRW 600

Output Level at a profit of FRW 4,000 =  $\frac{3000+4000}{50\text{frw}}$  = 1400 units

## 2. Sensitivity Analysis

Beyond the breakeven point the fixed costs are covered and the sales of further units are making a contribution to profit. The higher the contribution per unit, the greater the profit from any particular level of activity

### a. Margin of safety

The **margin of safety** has been defined as the difference between the **breakeven sales** and the normal level of sales, measured in units or in Cash of sales.

### b. Change in selling price

If the selling price per unit increases and costs remain constant, then the contribution per unit will increase and the breakeven volume will be lower. Take as an example the dry-cleaning business of the previous illustration

### c. Change in variable cost

The effect of a change in variable cost is very similar to the effect of a change in selling price. If the variable cost per unit increases, then the contribution per unit will decrease, with the result that more items will have to be sold in order to reach the breakeven point. If it is possible to reduce variable costs, then the contribution per unit will increase. The enterprise will reach the breakeven point at a lower level of activity and will then be earning profits at a faster rate.

### d. Change in fixed costs

If **fixed costs** increase, then more units have to be sold in order to reach the breakeven point. Where the fixed costs of an operation are relatively high, there is a perception of greater risk because a cutback in activity for any reason is more likely to lead to a loss. Where an organisation has relatively low fixed costs, there may be less concern about margins of safety because the breakeven point is correspondingly lower.

## 3. Profit Volume Ratio (P/V Ratio) or Contribution Ratio:

The P/V ratio is very important ratio studying the profitability of operations of a business and established relationship between the contribution and sales. In order to find out which product is most profitable, we have to calculate the profit-volume ratio of the different products. The product which gives the maximum P/V ratio is the most profitable. Every concern tries to maximise P/V ratio, as higher P/V ratio gives an indication of more profit. It can be increased by: Increasing the selling price of the product.

- i) Decreasing the variable cost of the product and
- ii) Shifting to the production of those products which are more profitable or having more P/V ratio. With the help of this ratio variable costs can also be calculated by the following: Variable costs = Sales(1-P/V ratio)

For example: **Gross profit ratio:** It may be expressed as:

- Sales is 4 times that of gross profit
- Gross profit ratio is 25%

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \quad \text{or} \quad \text{P/V Ratio} = \frac{\text{Changes in profit or contribution}}{\text{Change in sales}}$$

#### 4. Margin of Safety

Margin of safety is the difference between the actual sales and sales at breakeven point. At breakeven point, we have seen there is no profit or loss. It is only after the breakeven point that the business starts making profit. The more the actual sales are from the breakeven point the more margin of safety will be. Margin of safety indicates the strength of the business. If the production or sales are increased from the breakeven point the margin of safety will increase. The more the margin of safety the more beneficial it is for the business. Every concern tries to increase the margin of safety in order to increase the strength of the business. Margin of safety can be increased by the following steps: Increase the level of production, Increase the selling price, Reduce the fixed costs or variable costs or both, Substitute the existing product by more profitable products.

Margin of Safety in sales = **Total Sales - Break Even Sales (1)**

**Total Sales = Break Even Sales + Margin of Safety Sales (2)**

#### Illustration

Magasin Sport Class is a sports material manufacturing company and has budgeted the following revenues and costs data for the coming year.

	Amount ( FRW)
Sales	100,000
Variable Cost	40,000
Fixed cost	50,000

#### Calculate

- a) P/V Ratio, B.E.P in sales and Margin of Safety in sales
- b) Evaluate the effect of the policy adopted on the profitability
  - i) 20% increase in sales volume
  - ii) 20% decrease in sales volume
  - iii) 5% increase in variable costs
  - iv) 5% decrease in variable costs
  - v) 10% increase in fixed costs

## Answer

a) P/V ratio, B.E.P and Margin of Safety

Contribution = Sales – Variable cost

$$= 1,00,000 - 40,000 = \text{FRW } 60,000$$

P/V Ratio = (Contribution / Sales) x 100

$$= (60,000 / 1,00,000) \times 100 = 60\%$$

B.E.P sales = Fixed cost / PV ratio

$$= 50,000 / 60\% = \text{FRW } 83,333$$

Margin of Safety = Total sales – B.E.P sales

$$= 1,00,000 - 83,333 = \text{FRW } 16,667 \text{ This is considered as a profit}$$

	Contribution	P/V ratio	BEP in Sales	Margin of safety
(i) Increase in volume by 20%	120,000 - 48,000 =72000	(72,000/1,20,000) * 100 =60%	(50,000/60%) =83,333	1,20,000 - 83,333 = 36667
(ii) Decrease in volume by 20%	80,000 - 32,000 = 48000	(48,000/80,000) * 100= 60%	(50,000/60%) =83,333	80,000 - 83,333 = (3333)
(iii) 5% increase in variable	100,000 - 42,000 = 58000	(58,000/100,000) * 100 =58%	(50,000/58%) =86,207	1,00,000 - 86,207 =13,793
(iv) 5% decrease in variable	100,000 - 38,000 =62000	(62,000/100,000) *100 =62%	(50,000 / 62%) =80,645	1,00,000 - 80,645 = 19,355
(v) 10% increase in fixed	100,000 - 40,000 =60000	(60,000 / 100,000) * 100 =60%	(55,000/60%) =91,667	1,00,000 - 91,667 = 8,333

### 3.2.5. Activity-Based costing and decision making

The features of ABC are as under

- i) Activity-based costing (ABC) is a two-stage product costing method that first assigns costs to activities and then allocates them to products based on each product's consumption of activities.

- ii) Activity-based costing is based on the concept that products consume activities and activities consume resources.
- iii) Activity-based costing can be used by any organization that wants a better understanding of the costs of the goods and services it provides, including manufacturing, service, and even nonprofit organizations.

## USES OF ACTIVITY BASED COSTING

The areas in which activity based information is used for decision making are as under: -

1. **Activity costs:** ABC is designed to track the cost of activities, so we can use it to see if activity costs are in line with industry standards. If not, ABC is an excellent feedback tool for measuring the ongoing cost of specific services as management focuses on cost reduction.
2. **Customer profitability:** Though most of the costs incurred for individual customers are simply product costs, there is also an overhead component, such as unusually high customer service levels, product return handling, and cooperative marketing agreements. An ABC system can sort through these additional overhead costs and determine which customers are providing a reasonable profit. This analysis may result in some unprofitable customers being turned away, or more emphasis being placed on those customers who are contributing more in profits.
3. **Distribution cost:** Organisation uses a variety of distribution channels to sell its products, such as retail, Internet, distributors, and mail order catalogs. Most of the structural cost of maintaining a distribution channel is overhead, so if we can make a reasonable determination of which distribution channels are using overhead, we can make decisions to alter how distribution channels are used, or even to drop unprofitable channels.
4. **Make or buy:** ABC enables the manager to decide whether he should get the activity done within the firm or outsource it. Outsourcing may be done if the firm is incurring higher overhead costs as compared to the outsourcer or vice-versa.
5. **Margins:** With proper overhead allocation from an ABC system, we can determine the margins of various products, product lines, and entire subsidiaries. This can be quite useful for determining where to position company resources to earn the largest margins.
6. **Minimum price:** Product pricing is really based on the price that the market will bear, but the marketing manager should know what the cost of the product is, in order to avoid selling a product that will lose a



company money on every sale. ABC is very good for determining which overhead costs should be included in this minimum cost, depending upon the circumstances under which products are being sold.

### 3.2.6. Processing costing and decision making

#### Process costing Decisions.

##### 1. Sell or Process-Further

Decision rule: when incremental revenues exceed incremental costs (may also need to consider opportunity costs), the company should further process the products. Do not assume all separable costs in joint-cost allocations are always incremental costs.

#### Illustration

DG Ltd is a souvenir supplier which makes and sells gold coins. The gold coins are finished either rough or further polished.

- Rough gold coin can be sold for FRW 800 each and the polished gold coin can be sold for FRW 1,000 each.
- Platinum, the direct material, costs FRW 120 per pound.
- Processing costs are FRW 16,000 to convert 40 pounds of platinum into 80 rough gold coins.
- Fixed manufacturing cost amounted to FRW 120 per gold coin.
- For polished gold coin, it needs an additional processing cost of FRW 250 each. However, it does not need additional platinum and fixed manufacturing overheads.

**Required:** Should DG Ltd further process rough gold coin into polished gold coin?

#### ANSWER

Relevant Information	FRW
Incremental Revenue (1,000 - 800 FRW)	200
Incremental Cost	(250)
Net effect	(50)

I cannot advise DG Ltd to further process this rough gold coins because there is a negative effect of FRW 50 for further processing.

## 2. Make or Buy Decisions

Decisions about whether a producer of goods or services will make it internally or outsource. Surveys of companies indicate that managers consider quality, dependability of suppliers, and costs as the most important factors in the make-or-buy decision.

**Example** .ABC firm can purchase a spare part from an outside source at FRW 6500 per unit. There is a proposal that the spare part be produced in the factory itself and cost of processing has identified and recorded. For the purpose of making the spare part a machine costing FRW 1,000,000 with an annual capacity of 20,000 units and a life of 10 years, will be required. Materials required will be FRW 1,750 per unit and wages FRW 1,900 per unit, direct, Expenses for FRW 1,000 per unit Variable overheads are FRW 1,250. Advise the firm whether the proposal should be accepted.

### Answer

Purchase price		FRW 6500	
Variable cost	FRW		
MATERIAL COST	1,750		
Labor Cost /wages	1,900		
Direct expenses	2,000		
Variable overhead	1,250	(6,900)	
Contribution form purchase outside		FRW (400)	

Advice the firm whether the proposal should be accepted,

The proposal should not be accepted because the company has obtained a negative contribution of FRW 400. The firm should continue to purchase spare part outside instead of producing them internally.

## 3. Dropping a product

A Manufacturing company has a range of products and if one of which is deemed to be unprofitable, due to high processing cost, the company may consider to drop this product and to increase the production of more profitable products.

### 3.2.7. CVP and decision making

#### Cost Volume Profit decisions

##### 1. Special order to use up spare capacity

In the short term, a business must ensure that the revenue from each item of activity at least covers variable costs and makes a contribution to fixed costs. Once the fixed costs are covered by contribution, the greater the level of activity, the higher the profit.

When the business reaches full capacity there will be a new element of fixed cost to consider should the business decide to increase its capacity. If there is no increase in capacity, then the business should concentrate on those activities producing the highest contribution per unit or per item. The special order is acceptable provided the sales price per item covers the variable costs per item and provided there is no alternative use for the spare capacity which could result in a higher contribution per item.

##### 2. Abandonment of a line of business

The allocation of fixed costs to products is a process which is somewhat arbitrary in nature, and is not relevant to decision making because the fixed costs are incurred irrespective of whether any business activity takes place. When a line of business comes under scrutiny as to its profitability, cost-volume-profit analysis shows that in the short term it is worth continuing with the line if it makes a contribution to fixed costs. If the line of business is abandoned and nothing better takes its place, then that contribution is lost but the fixed costs run on regardless.

##### 3. Existence of a limiting factor

In the short term, it may be that one of the inputs to a business activity is restricted in its availability. There may be a shortage of raw materials or a limited supply of skilled labour. There may be a delivery delay on machinery or a planning restriction which prevents the . The item which is restricted in availability is called the **limiting factor**. Cost-volume-profit analysis shows that maximisation of profit will occur if the activity is chosen which gives the highest contribution per unit of limiting factor.

#### 4. In-house activity versus bought-in contract

For a manufacturing business, there may be a decision between making a component in-house as compared with buying the item ready-made. Cost-volume-profit analysis shows that the decision should be based on comparison of variable costs per unit, relating this to the difference in fixed costs between the options.



#### Application activity 3.2

Q1. A business has budgeted sales of its single product of 38,000 units. The selling price per unit is FRW 57,000 and the variable costs production are FRW 45,000. The fixed costs of the business are FRW 360,000,000. Choose the correct breakeven point in units from the following.

- A 3,529
- B 8,000
- C 9,474
- D 30,000

Q2. ABC Ltd produces four products (P, Q, R and S) and the following details are provided:

	P	Q	R	S
Contribution per unit	FRW12,000	FRW15,000	FRW9,000	FRW14,000
Materials per unit	3kg	4kg	1kg	2kg
Labour hours per unit	5hrs	3hrs	1hr	2hrs
Machine hours per unit	3hrs	2hrs	2hrs	4hrs
Maximum demand (units)	2,000	6,000	1,000	4,000

Machine hours are limited to 38,000 hours. Labour hours are limited to 40,000 hours and materials are limited to 30,000kg. Determine whether any of the resource limits will prevent the maximum demand being produced.

### Skills Lab 3



Senior five accountancy students started business club named “Birashoboka” by using their money. They invested in Piggery and Poultry. The financial information related to business income and expenditure are indicated in this table below.

	Piggery (FRW)	Poultry (FRW)
Selling price	100,000	10,000
Sales	50	150
Labour cost(each )	20,000	3,000
Material cost	30,000	3,000
Direct expenses	25,000	1,000
Variable overhead	500	500
Fixed cost	1,000,000	1,500,000

Three Senior five students as owners and the supervisors of these projects, They find it difficult to run both projects because of their limited number that is insufficient to share all their routine responsibilities of keeping hens and pigs. Some pigs and hens started dying because of little care given to them. The headmaster of the school has advised the students to perform only one project because he found that it is difficult to manage both at ago. In the annual general meeting, the club management has decided to drop one business and continue with one which is more profitable.

Imagine you are one the management team and you are requested to explain to the entire club members on which project to maintain, what would you say while selecting the best project? Draft a summary report and use the following methods to inform your decision / communication to the club.

- Marginal contribution
- Breakeven point
- Net profit by using marginal costing



### End of unit assessment 3

1. Define margin of safety?
2. A business has fixed costs of FRW 910million. It produces and sells a single product at a selling price of FRW 24,000 and the variable costs of production and sales are FRW 17,000 per unit. How many units of the product must the business produce and sell in order to make a profit of FRW 500 million?
  - A 909,993
  - B 130,000
  - C 201,429
  - D 22,195
3. NYIRANEZA's sales turnover and profit during two years were as follow :

Year	Sales	Profit
	<b>FRW</b>	<b>FRW</b>
1	300.000	40.000
2	340.000	50.000

Calculate

- i) P/V Ratio
- ii) BreakEven Point
- iii) The sales required to earn a profit of FRW 80,000
- iv) The profit when sales are FRW 5,00,000
- v) Margin of safety at a point of sales of FRW1,000,000.

# Unit

# 4

## THE CASH MANAGEMENT PROCEDURES IN ORGANIZATION

**Key unit competence:** Describe the cash management procedures in organization



### Introductory activity



1. Analyze the above picture and answer the questions that follow:
  - i) Identify the different activities shown on above picture.
  - ii) Which kind of agents intervening in the specified activities?
  - iii) Are all agents having the same intention? Which ones and in which way?
  - iv) Which **cash management procedures** are involved in the above activities?

## 1.1. Introduction to cash management

### Learning Activity 4.1



HEMA PLC is profit oriented company processing many products from two cereals, which are maize and wheat, for sales in Rwanda. The products produced in that enterprise are Maize flour super, Maize flour Bugesera, Wheat flour porridge and Wheat Flour Baker all of which were experiencing sharp growth of sales and profitability to the whole business.

In the post Covid-19 period, HEMA PLC improved its organizational management strategy and announced an implementation plan of 2 years. The plan shows that Cash receipts from sales and Investments are estimated to be FRW 10,000,000 and FRW 35,500,000, respectively; FRW 12,500,000 cash payments on supplies; Salaries of FRW 25,000,000 payables in the period in which they occur; Other cash payments estimated as being FRW 4,200,000 and Opening cash balance was FRW 300,000. Because of external factors from business environment which made cereals to become scarce, HEMA PLC borrowed FRW 3,000,000, as liquid cash, from its Comercial bank to finance its new strategy. Its strategic restructuring of the management strategy, the expected results are high financial and non-financial performance. As shown in the financial statements and other report of performance, as the story of HEMA PLC illustrates, management accountant must understand how cash management procedures are followed, analyzed, and reported to managerial decision makers. Management accountant must be able reconcile financial and nonfinancial information from various business activities for internal and external reporting.

#### Questions:

1. According to the story of HEMA PLC explain the situation faced up to liquidity borrowing.
2. Name the management accounting terms used in HEMA PLC story.

### 4.1.1. Definition of concepts

#### a. Cash-flows

Cash flows are inflows and outflows in cash equivalent. These cash equivalent are cash received and paid on operating, investing, or financing activities in the statement of cash flows, and depending also on the nature of the transaction.



These cash equivalents consist of the temporary investments of cash not required at present by the business, such as funds put on short-term deposit with a bank. Such investments must be readily convertible into cash, or available as cash within three months.

### **b. Cash management**

Cash management is about dealing with liquidity management and the investment of funds. Cash management function ensures that minimum requirements for liquidity in the organization are met and that any investments are within the organization's rules and regulations, as well as offering the best return, risk and liquidity available.

### **c. Cash flow statement**

**Cash flow statement** is a statement that provides valuable information about a company's gross payments and receipts and allows insights into its future income needs.

Frank W. (2005) notes that Cash-Flow shows us exactly where the cash has come from during the year, exactly what we have done with it and helps us to throw some light on to the cash situation. For him, it is important to ensure that:

- Sufficient profits are made to finance the business activities.
- Sufficient cash funds are available as and when needed.

#### **4.1.2. Types of cash flow activities**

The three categories of cash flow activities are operating activities, investing activities, and financing activities. Operating activities include cash activities related to net income. Investing activities include cash activities related to noncurrent assets. Financing activities include cash activities related to noncurrent liabilities and owners' equity.

**Operating activities** include cash activities related to net income. For example, cash generated from the sale of goods (revenue) and cash paid for merchandise (expense) are operating activities because revenues and expenses are included in net income.

**Investing activities** include cash activities related to noncurrent assets. Noncurrent assets include (1) long-term investments; (2) property, plant, and equipment; and (3) the principal amount of loans made to other entities. For example, cash generated from the sale of land and cash paid for an investment in another company are included in this category.

**Financing activities** include cash activities related to noncurrent liabilities and owners' equity. Noncurrent liabilities and owners' equity items include (1) the principal amount of long-term debt, (2) stock sales and repurchases, and (3) dividend payments. (Note that interest paid on long-term debt is included in operating activities.)

### Examples of Cash-flow Activity by category

#### Operating Activity (activities related to net income)

Cash receipts from the following: 1) Sales of goods or services, 2), 3);

Cash payments for the following: 1) Merchandise purchases from suppliers, 2) material used to manufacture products, 3) employee payroll, 4) interests paid to lenders, 5) Income taxes, 6) other operating expenses.

#### Investing activities (activities related to noncurrent assets)

Cash receipts from the following: 1) Sale of long-term Investment (e.g., bonds and stocks of other companies), 2) sale of property, equipment, and plant, 3) collection of principal for loans made to other entities

Cash payments for the following: 1) Purchase of long-term Investment (e.g., bonds and stocks of other companies), 2) purchase of property, plant and Equipment, 3) loans made to other entities

#### Financing activities (related to noncurrent liabilities and owners' equity)

Cash receipts from the following: 1) Issuance of notes (e.g., a loan with bank), 2) issuance of bonds, 3) issuance of common bonds,

Cash payments for the following: 1) principal amount of loans, principal amount of bonds, 3) repurchase of common stocks (treasury stocks), 4) cash dividends.

**Example** of Cash Activity at UMUMARARUNGU Company and UWINEZA Company. UMUMARARUNGU Company and UWINEZA Company are wholesale business which has stores of cooking oil and throughout Kigali. A review of the statements of cash flows for both companies reveals the following cash activities. Positive amounts are cash inflows, and negative amounts are cash outflows.

	UMUMARARUNGU Company	UWINEZA Company
Operating activities	FRW 4,585	FRW 3, 852
Investing activities	(1,012)	(2,184)
Financing activities	(4,451)	(1,651)
Net change in cash	FRW (878)	FRW 17

This information shows that both companies generated significant amounts of cash from daily operating activities; FRW 4,585 for UMUMARARUNGU Company and FRW 3,852 for UWINEZA Company. It is interesting to note both companies spent significant amounts of cash to acquire property and equipment and long-term investments as reflected in the negative investing activities amounts. For both companies, a significant amount of cash outflows from financing activities were for the repurchase of common stock. Apparently, both companies chose to return cash to owners by repurchasing stock.

### 4.1.3. Objectives of cash management

The prime objective of cash management is to channelize the flow of cash from the surplus to deficit units to maintain the appropriate liquidity position of the organization. Other important objectives of cash management are discussed as follows:

#### a. Planning of Cash Flows

This objective refers to scheduling the cash inflow and outflow of an organization over a period of time. The planning of cash flow helps in maintaining an adequate amount of capital to finance day-to-day- functions of the organization.

#### b. Synchronizing Cash Flows

This objective refers to developing equilibrium between inflow and outflow of cash in the business. If the amount of cash receipts (inflow) is equal to the cash payment (outflow) then there would be no requirement of holding extra cash.

#### c. Optimizing Cash Holding

This objective refers to determining the appropriate amount of cash to be kept in the business to meet the contingency needs. It is the duty of the finance manager to decide the optimal cash holding to avoid any excess or deficit of cash.

### 4.1.4. Tools of cash management

Cash management tools are financial management mechanism that determine the expected cash inflows and cash requirements. They assist the business in determining the optimum level of cash. There are a number of tools that cash managers can draw on to support an efficient cash management structure.

These include:

**Working capital tools** to improve the liquidity available to the organizations using only commercial flows, and not requiring the assistance of any external financial institution.

**Control over the cycle of payments and receipts** to reduce the volatility of intra-month cash balances and improve application of corporate policies regarding supplier and customer payment terms.

**Internal processes to accelerate the allocation of receipts to customer accounts**, thereby increasing the liquidity available for corporate uses and better customer credit management.

**An optimized banking structure** that uses a limited number of banks and bank accounts,

**Structures** that concentrate available balances in fewer locations and thereby enabling economies of scale, greater risk diversification and a reduction in operational risk.

#### 4.1.5. Techniques of cash-flow management

There are various techniques of cash-flow management used in an organization. Some of the cash-flow management techniques are mainly related to

- 1) Accelerating Cash Inflows and
- 2) Slowing Cash Outflows.

***Accelerating cash inflows includes:***

- a) Prompting Customers for Timely Payment,
- b) Quick Conversion of Payment into Cash,
- c) Improving Average Collection Period;

***Slowing cash outflows includes:***

- a) Paying on Last Date,
- b) Paying by Draft,
- c) Centralisation of Payment,
- d) Adjusting Payroll Funds,
- e) Use of Float.

Also, some additional cash-flow management techniques include:

- 1) Effective Inventory Management,
- 2) Minimizing Operational Cost,
- 3) Reducing the Time Span of Production Cycle,
- 4) Fast Cash Transaction,
- 5) Speedy Conversion of Securities into Cash,

- 6) Effective Management of Account Receivable,
- 7) Concentration Banking,
- 8) Lock-Box System.

#### 4.1.7. Purpose of cash management

##### a. To Control Cash Flows

This purpose is clear-cut because most business owners want to increase the amount of money flowing into their business and at the same time minimizing the cash leaving their business, by reducing operational expenses and other costs. A currency recycler, for example, recycles the same cash that comes in through transactions to fund the employee floats and cash registers.

##### b. To Optimize Cash Levels for the Business

Optimizing cash levels is essential to control the cash flow. If the business inflow in terms of cash are not available for use (e.g., when the business manager has outstanding unpaid invoices or money is held in the cash registers), he may not have liquidity that business needs. The cash management system allows optimizing the cash levels by creating a better liquidity. A good example is the store float. If the manager of the company is unsure about what the inflows will look like for the day, he might set the float higher than he need to. However, the money is held in the petty cash fund or smart safe, when it could be paying debts or held in a deposit account earning interests. Equally, if the manager of the company puts all his/her cash on deposit, he/she has hampered his/her liquidity. When an unexpected cost comes up, he/she may find him/her-self without the cash to cover them.

Thus, the need of any cash management software which might have functions that help optimize the cash levels, including:

**Cash analytics:** Provide data around the movement of cash from tills to vault holdings. This allows to manage cash balances, reconciliation, and deposit reporting more effectively.

**Cash forecasting:** Provides insights into trends to forecast the cash needs and replenishments, while enabling to see cash on hand and what one need on a frequent basis to operate the business efficiently.

**Cash status:** Gives the view into the available cash on hand and frequency of denomination usage. One would better understand which notes and coins are most in demand, so that he/she may always have enough cash on hand.

### c. To Enable More Efficient Cash Planning

The right cash management system helps optimize cash and this allows cash manager to plan more effectively. The use of Automated cash management systems to collect and provide data, will help to make more informed decisions.

### d. To enable more Effective Cash Management

A good management system allows the business owner to see cash movements through the business, giving him/her a bird's eye view of where and when cash is leaving the business and where and when it's entering. The business owner will also make better decisions about how to manage cashflow in the business, such as when to deposit it or how much to hold back. All of his/her decisions will be backed by data to both streamline and improve cash management and cashflows.



#### Application activity 4.1

1. Define the following concepts:
  - Cash flows
  - Cash flow statement
  - Cash management
2. Which section of the statement of cash flows is regarded by most financial experts to be most important?
3. State the objectives of cash management
4. Explain the purpose of cash management

## 4.2. Cash-flow statement



### Learning Activity 4.2

John Karamaga, CEO and founder of Home Furniture Company has reviewed the company's income statement and balance sheet for the most recent fiscal year ended December 31, 2021. Home furniture Company has grown rapidly this year, with sales and net income showing significant gains compared to 2020. Although John is satisfied with the increase in profitability, he noticed a significant decline in cash. John decides to pursue this with Linda Uwimana (CFO) and Steve Kayira (treasurer) in their regular meeting:

John

I just received the income statement and balance sheet for 2021. Profits look great, but our cash position seems to have deteriorated. We had FRW130,000 in cash to start the year and ended with only FRW32,000. I noticed cash was declining throughout the year when I reviewed our monthly financial statements, but I'm concerned about how far our cash balance has dropped.

Steve

You're right, John. We encountered cash flow problems several times throughout the year despite increased sales and profits. On several occasions, I had to delay payments to creditors because of cash flow issues.

John

Seems to me we shouldn't have this problem. Where is our cash going?

Linda

Good question. Let me round up our cash flow information for the year.

I'll have something for you by next week.

John

Great! I'd like to start next week's meeting by discussing how much cash we generated in 2021 from our daily operations. I realize net income is shown on an accrual basis, but I'd like to know how much net income was received in the form of cash.

Linda

No problem. I'll have it for you next week.

### Question

- a) What kind of employees are having discussion?
- b) Which finance report must be prepared by Steve, Joh and Linda ?
- c) Which are the ways in which cash flows are reported? Give ideas.

### 4.2.1. Purpose of cash-flow statement

Financial accounting courses covered in the first three statements in detail and often provide an overview of the statement of cash flows. The preparation of cash flows statement and using the resulting cash flow information for analytical purposes, leads to the purpose of information provided in the statement of cash flows.



**The purpose of the statement of cash flows** is to provide a summary of cash inflows and cash outflows information for a period of time and to reconcile the difference between beginning and ending cash balances shown on the statement of financial position.

#### 4.2.2. Steps of preparing the cash-flow statement

The four steps required to prepare the statement of cash flows are described as follows:

##### **Step 1.**

Prepare the operating activities section by converting net income from an accrual basis to a cash basis. This step will be done using indirect method throughout this chapter. The indirect method begins with net income from the income statement and makes several adjustments related to changes in current assets, current liabilities, and other items to arrive at cash provided by operating activities (or used by operating activities if the result is a cash outflow). Cash provided by operating activities represents net income on a cash basis. It tells the reader how much cash was received from the daily operations of the business.

##### **Step 2.**

Prepare the investing activities section by presenting cash activity for noncurrent assets.

This step focuses on the effect changes in noncurrent assets have on cash. Noncurrent asset balances found on the the statement of financial position or balance sheet, coupled with other information (e.g., cash proceeds from sale of equipment) are used to perform this step.

##### **Step 3.**

Prepare the financing activities section by presenting cash activity for noncurrent liabilities and owners' equity. This step focuses on the effect changes in noncurrent liabilities and owners' equity have on cash. Noncurrent liabilities and owners' equity balances found on the balance sheet, coupled with other information (e.g., cash dividends paid) are used to perform this step.

##### **Step 4.**

**Reconcile the change in cash.** Each section of the statement of cash flows described in steps 1, 2, and 3, will show the total cash provided by (increase) or used by (decrease) the activity. Step 4 simply confirms that the net of these changes equates to the change in cash on the statement of financial position/ balance sheet.



### Example 1,

Using the information extracted in the accounting information system of Home Furniture Company, assume the balance sheet shows cash totaled FRW100 at the end of last year from 2020 and FRW140 at the end of the current year 2021. Thus cash increased by FRW40 over the course of the current year. Step 4 reconciles this change with the changes shown in the three sections of the statement of cash flows. Suppose operating activities provided cash of FRW170, investing activities used cash of FRW160, and financing activities *provided* cash of FRW30. These 3 amounts netted together reconcile to the FRW40 increase in cash shown on the balance sheet (= FRW170 – FRW160 + FRW30).

### 4.2.3. Methods used to prepare the cash-flow statements

There are two Methods of preparing a cashflow statement:

#### a. Direct method for the preparation of cash flow statement

The direct method for creating a cash flow statement reports major classes of gross cash receipts and payments (Cash inflow and cash outflow). At the end of that given period, the business will have a surplus if cash inflows are more than the cash outflows or deficit if cash inflows are less than the cash outflows.

#### Illustration:

Prepare Iraguha's cash flow for the years 2015, 2016, 2017 and 2018, given the following information below:

Cash balance b/d or b/f in January 2015 was FRW 15,000,000

Yearly rent income was FRW 5,000,000

Yearly credit sales to be paid in the next year were FRW 4,000,000

Sold a business van in 2016 FRW 14,500,000

Yearly commission received was FRW 3,000,000

Yearly cash sales FRW 10,000,000

Yearly cash purchases FRW 12,000,000

Bought a truck in 2015 for FRW 800,000

Yearly salaries and wages FRW 5,000,000

Bought machinery worth FRW 15,000,000, payment of FRW 8,000,000 was made in 2015 and the balance was paid in two equal instalments during the month of February and March.

## Solution

### IRAGUHA'S CASH FLOW STATEMENT FOR 2015, 2016, 2017 and 2018

Details	2015	2016	2017	2018
<b>cash inflows</b>				
<b>cash balance b/d</b>	15,000,000	7,200,000	23,200,000	24,700,000
Rent income	5,000,000	5,000,000	5,000,000	5,000,000
Credit sales		4,000,000	4,000,000	4,000,000
Sales of Van		14,500,000		
Commission received	3,000,000	3,000,000	3,000,000	3,000,000
Cash sales	10,000,000	10,000,000	10,000,000	10,000,000
<b>Total cash inflows (A)</b>	<b>33,000,000</b>	<b>43,700,000</b>	<b>45,200,000</b>	<b>46,700,000</b>
<b>Cash outflows</b>				
Cash purchases	12,000,000	12,000,000	12,000,000	12,000,000
Truck	800,000			
Salaries/ wages	5,000,000	5,000,000	5,000,000	5,000,000
Machinery	8,000,000	3,500,000	3,500,000	
<b>Total cash outflows (B)</b>	<b>25,800,000</b>	<b>20,500,000</b>	<b>20,500,000</b>	<b>17,000,000</b>
Cash balance c/d (A-B)	7,200,000	23,200,000	24,700,000	29,700,000
Net Position				29,700,000

#### b. Indirect method for the preparation of cash flow statement

The indirect method uses net-income as a starting point, makes adjustments for all transactions for non-cash items, then adjusts from all cash-based transactions. An increase in current asset account is subtracted from net income, and an increase in a current liability account is added back to net income. This method converts accrual-basis net income (or loss) into cash flow by using a series of additions and deductions.

#### 4.2.3. Prepare cash-flow statement

As stated earlier, the information needed to prepare the statement of cash flows includes the statement of financial position, income statement, and other selected data.

## Illustration

Using the financial statement's information below and Other additional data of Home Furniture Company for 2021, let's prepare the statement of cash flows as follows:

Sold equipment with a book value of FRW11,000 (= FRW21,000 cost – FRW10,000 accumulated depreciation) for FRW5,000 cash, purchased equipment for FRW67,000 cash, Long-term investments were purchased for FRW12,000 cash. There were no sales of long-term investments, Bonds were paid with a principal amount of FRW18,000, Issued common stock for FRW4,000 cash, Declared and paid FRW32,000 in cash dividends

With these information provided, we can start preparing the statement of cash flows using the indirect method. It is important to note that all positive amounts shown in the statement of cash flows denote an *increase* in cash, and all negative amounts denote a *decrease* in cash.

### Furniture Company, statement of financial position as at December 31<sup>st</sup>,2020 and December 31<sup>st</sup>, 2021

	2021	2020	Changes in Assets, Liability, and Equity from 2020 to 2021 Increase(decrease)
<b>Assets</b>			
<b>Current Assets:</b>			
Cash	FRW 32,000	F R W 130,000	FRW (98,000)
Accounts receivable	85,000	25,000	60,000
Merchandise inventory	126,000	60,000	66,000
Prepaid expenses	18,000	20,000	(2,000)
<b>Noncurrent assets</b>			
Property, plant, and equipment	956,000	910,000	46,000
Accumulated depreciation	(299,000)	(285,000)	(14,000)
Long-term investments	<u>70,000</u>	<u>58,000</u>	12,000
<b>Total Assets</b>	<u><b>F R W</b></u> <u><b>988,000</b></u>	<u><b>F R W</b></u> <u><b>918,000</b></u>	

<b>Liabilities and Owner's equity</b>			
<b>Current Liabilities</b>			
Account payable	FRW 16,000	FRW 15,000	FRW 1,000
Income tax payable	39,000	48,000	(9,000)
<b>Noncurrent liabilities</b>			
Bonds payable	87,000	105,000	(18,000)
<b>Owner's equity</b>			
Common stock	414,000	410,000	4,000
Retained earnings	<u>432,000</u>	<u>3,400,000</u>	92,000
<b>Total liabilities and owners' equity</b>	<b><u>FRW 988,000</u></b>	<b><u>FRW 918,000</u></b>	

Home Furniture Company's Income Statement, for the Year Ended December 31<sup>st</sup>, 2021

Sales	FRW 900,000
Cost of goods sold	<u>546,000</u>
<b>Gross margin</b>	<b>FRW 354,000</b>
Selling and administrative expenses	120,000
Depreciation expenses	<u>24,000</u>
<b>Operating income</b>	<b>FRW 210,000</b>
Interest expenses	15,000
Loss on sale of equipment	<u>6,000</u>
<b>Income before taxes</b>	<b>FRW 189,000</b>
Income tax expenses	<u>65,000</u>
<b>Net Income</b>	<b><u>FRW 124,000</u></b>

### Step 1: Prepare the Operating Activities Section

The Format of Cash Flows from Operating activities

Cash Flows from operating activities	
Net income (from income statement)	FRW XXX
Adjustments (to convert net income to cash provided by operating activities)	

1. add back expenses that do not impact cash such as depreciation and amortization expenses	XXX
2. Add back losses and deduct gains related to investing activities	XXX
3. Add and subtract changes in current assets (except cash) and current liabilities using the adjustment rules	XXX
Cash provided by (used by) operating activities	FRW XXX

The first adjustment to net income involves adding back expenses that do not affect cash (often called noncash expenses). The second adjustment to net income involves adding back losses and deducting gains related to investing activities. However, this loss is not related to the daily operations of the business. Remember, we are trying to find the cash provided by operating activities in this section of the statement of cash flows. Since equipment is a noncurrent asset, cash activity related to the disposal of equipment should be included in the investment activities section of the statement of cash flows. The third type of adjustment to net income involves analyzing the changes in all current assets (except cash) and current liabilities from the beginning of the period to the end of the period. Two important rules must be followed to determine how the change is reflected as an adjustment to net income.

Study these two rules carefully:

1. Current assets. Increases in current assets are deducted from net income; decreases in current assets are added to net income.
2. Current liabilities. Increases in current liabilities are added to net income; decreases in current liabilities are deducted from net income.

### Operating Activities Section of Statement of Cash Flows for Home Furniture Company

Cash flows from operating activities	
Net income	FRW 124,000
Adjustments (to convert net income to cash provided by operating activities)	
Add back depreciation expenses	6,000
Add back loss on sale of equipment	6,000
Increase in accounts receivable	<b>(60,000)</b>

3.2 Increase in merchandise inventory	<b>(66,000)</b>
3.3 Decrease in prepaid expenses	<b>2,000</b>
3.4 Increase in accounts payable	<b>1,000</b>
3.5 income tax paid	<b>(9,000)</b>
<b>Cash provided by operating activities</b>	<b>FRW 22,000</b>

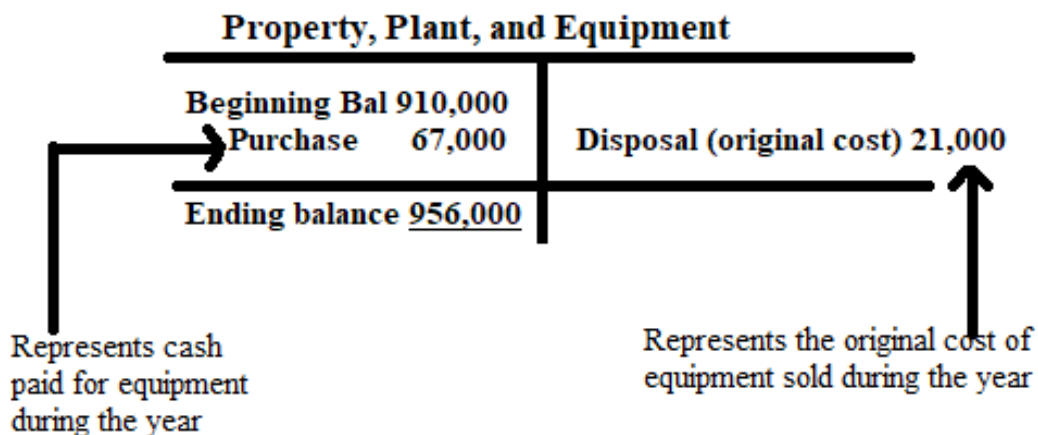
With the above information, Home Furniture Company received FRW 22,000 in cash for the year related to daily operations of the business.

### Step 2: Prepare the Investing Activities Section

Now that we have completed the operating activities section for Home Furniture Company, the next step is to prepare the investing activities section. The statement of cash flows focuses on cash activities related to noncurrent assets. Three noncurrent asset items must be analyzed to determine how to present cash flow information in the investing activities section.

#### 1. Property, plant, and equipment increased by FRW46,000.

The additional information provided for 2021 indicates two types of transactions which caused this increase. First, the company purchased equipment for FRW67,000 cash and Second, the company sold equipment for FRW5,000 cash (often called a disposal of equipment). The net effect of these 2 entries is an increase of FRW46,000 (= FRW67,000 – FRW21,000). This is summarized in the following T-account:



**2. Accumulated depreciation decreased noncurrent assets by FRW14,000.**

Two items caused the change in the accumulated depreciation account. First, the sale of equipment during the year caused the company to take FRW10,000 in accumulated depreciation off the books. Second, FRW24,000 in depreciation expense was recorded during the year (with a corresponding entry to accumulated depreciation). This information is summarized in the following T-account:

<b>Accumulated Depreciation</b>			
		Beginning balance	285,00
<b>Disposal</b>	<b>10,000</b>	<b>Depreciation expense</b>	<b>24,000</b>
		Ending balance	<u>299,000</u>

Accumulated depreciation taken off the books for equipment sold during the year

Depreciation expense recorded for the year

How is accumulated depreciation information used in the statement of cash flows for Home Furniture Company?

<b>Book value of equipment sold</b>	<b>FRW 11,000 (=FRW 21,000 costs-10,000 accumulated depreciation)</b>
Loss on sale of equipment	(6,000)
Cash proceeds from sale of equipment	<u>FRW 5,000</u>

**3. Long-term investments increased by FRW12,000.**

The additional information provided for 2021 indicates there were no sales of long-term investments during the year. The increase of FRW12,000 is solely from purchasing long-term investments with cash.

The following paragraph shows the three investing activities described previously:

1. a FRW67,000 decrease in cash from the purchase of equipment,
2. a FRW5,000 increase in cash from the sale of equipment, and
3. a FRW12,000 decrease in cash from the purchase of long-term investments.

There is also the impact of these three items on cash and the resulting cash used by investing activities of FRW74,000.

<b>Cash flows from investing activities</b>	
Purchase of equipment	FRW (67,000)
Proceeds from sale of equipment	5,000
Purchase of long-term investments	<u>(12,000)</u>
<b>Cash used by investing activities</b>	<b><u>FRW (74,000)</u></b>

The company used FRW 74,000 in cash for investing activities.

### Step 3: Prepare the Financing Activities Section

What information is used for this section, and how is it prepared? The financing activities section of the statement of cash flows focuses on cash activities related to noncurrent liabilities and owners' equity (i.e., cash activities related to long-term company financing). One noncurrent liability item (bonds payable) and two owners' equity items (common stock and retained earnings) must be analyzed to determine how to present cash flow information in the financing activities section. How is this information used in the statement of cash flows?

<b>Cash flows from financing activities</b>	
Principal payment on bonds	FRW (18,000)
Proceeds from issuance of common stock	4,000
Payment of cash dividends	<u>(32,000)</u>
<b>Cash used by financing activities</b>	<b><u>FRW (46,000)</u></b>





### 4.2.5. Cash-flow information analysis

Companies and analysts tend to use income statement and balance sheet information to evaluate financial performance. In fact, financial results presented to the investing public typically focus on earnings per share. Analysis of cash flow information is becoming increasingly important to managers, auditors, and financial analysts. Three common cash flow measures used to evaluate organizations are (1) operating cash flow ratio, (2) capital expenditure ratio, and (3) free cash flow.

#### Example

The following statement of cash flow for L. Holmes Ltd., were prepared for the period ending 31 January 2022

	<i>L. Holmes Ltd.</i>
<b>Operating activities</b>	<i>FRW3,852</i>
<b>Investing activities</b>	<i>(2,184)</i>
<b>Financing activities</b>	<i>(1,651)</i>
<b>Net change in cash</b>	<i>FRW(17)</i>

#### – THE OPERATING CASH FLOW RATIO

Is cash provided by operating activities divided by current liabilities. This ratio measures the company's ability to generate enough cash from daily operations over the course of a year to cover current obligations. Although similar to the commonly used current ratio, this ratio replaces current assets in the numerator with cash provided by operating activities. The operating cash flow ratio is as follows for *L. Holmes Ltd.*:

The numerator, **cash provided by operating activities**, comes from the bottom of the operating activities section of the statement of cash flows. The denominator, **current liabilities**, comes from the liabilities section of the statement of financial position/balance sheet.

<b>Operating Cash Flow Ratio</b>	<b>Cash Provided by operating Activities/ Current Liabilities</b>
<b>=</b>	
<i>L. Holmes Ltd.</i>	<i>0.54</i>
<b>=</b>	FRW 3,852/FRW 7,119

– **CAPITAL EXPENDITURE RATIO**

Is cash provided by operating activities divided by capital expenditures. This ratio measures the company's ability to generate enough cash from daily operations to cover capital expenditures. A ratio in excess of 1.0, for example, indicates the company was able to generate enough operating cash to cover investments in property, plant, and equipment. The capital expenditure ratio for **L. Holmes Ltd.** is as follows:

<b>Operating Cash Flow Ratio</b>	=	<b>Cash Provided by operating Activities/Capital expenditures</b>
<b>L. Holmes Ltd.</b>	<b>1.8 =</b>	FRW 3,852/2,184

– **FREE CASH FLOW ANALYSIS**

Free cash flow is cash provided by operating activities minus capital expenditures as follows:

**Free cash flow = Cash provided by operating activities – Capital expenditures**

The cash provided by operating activities comes from the bottom of the operating activities section of the statement of cash flows. The capital expenditures amount comes from information within the investing activities section of the statement of cash flows. The free cash flow amount is calculated using information from each company's statement of cash flows.

<b>Free cash flow =</b>		<b>Cash Provided by operating Activities - Capital expenditures</b>
<b>L. Holmes Ltd.</b>	<b>FRW 1,668 =</b>	FRW 3,852 - 2,184

The results tell us that the company generates enough cash (**FRW 1,668**) from daily operations to cover capital expenditures (**FRW 2,184**)



## Application activity 3.2

### Question 1

Define the following ratios, and how they are calculated.

- Free cash flow ratio
- capital expenditure ratio
- operating cash flow ratio

### Question 2

The following information is from the consolidated statement of cash flows for BMC Motors for the year ended December 31, 2022

Net cash used in operating activities	FRW (16,856)
Net cash provided by investing activities	8,565
Net cash provided by financing activities	3,480
Effect of exchange rate changes on cash and cash equivalents	(85)
Reclassified cash and cash equivalents	(371)
Net decrease in cash and cash equivalents	FRW (5,267)
Cash and equivalents at the beginning of the year	35,993
Cash and cash equivalents at the end of the year	<u>FRW 30,726</u>

### Required:

An investment advisor recently reviewed BMC Motors' statement of cash flows and statement of financial position and stated: "BMC Motors is doing great! They are holding cash of more than FRW 30,000. There is no cash flow problem with this company!"

Do you agree with this statement? Support your conclusion with an analysis of BMC Motors' cash flows.

### Question 3

Using the statement of financial position and income statement attached herewith, you are required to prepare the statement of cash flows using the indirect method

### Dusabe D., income statement for the Year ended 31 December 2022

	FRW	FRW
Gross profit		44,700
<i>Add</i> Discounts received	410	
Profit on sale of Van	<u>620</u>	<u>1,030</u>
		45,730
<i>Less</i> expenses		
Motor expenses	1,940	
Wages	17,200	
General expenses	830	
Bad debts	520	
Increase in doubtful debt provision	200	
Depreciation: Van	<u>1,800</u>	<u>22,490</u>
		<b><u>23,240</u></b>

## 4.3. Use of financial and nonfinancial performance measures

### Learning Activity 4.3



Sandy Masaka is the CEO of a fast-food restaurant called Chicken Remix. The company operates five restaurants throughout Kigali City and is choosing between two suppliers of soft drinks: ABC Fizz Ltd and BIG Fizz Ltd. Consumer surveys indicate no significant preference between the two. Sandy is meeting with Dave Gasana, the CFO, and Karen Mugwiza, the purchasing manager, to discuss the company's options. Chicken Remix is facing a supplier choice decision which is common to many companies. Financial stability is an important factor in choosing on a supplier, along with the quality of product and reliability of service. Chicken Remix must analyse financial information for ABC Fizz Ltd and BIG Fizz Ltd to determine the financial condition of each company. The analysis of a company's financial information typically follows a three-pronged approach. First, trends within a company's own financial information are analyzed, such as sales and earnings from one year to the next, using two methods. Second, financial measures are compared between competitors. Finally, the ratios are analysed and are compared to industry averages.

## Question

What should be the accounting responsibilities of each person attending the meeting?

Do you have any idea about the kind of analysis which might be made by Finance Department?

Which one may be appropriate?

### 4.3.1. Introduction to Financial and non-financial performance measures

For any business which is a going concern, the owner is always afraid of business activities performances. For different reasons the performances are measured on one hand using financial criteria (statistical) and non financial measures (Qualitative assumptions) on other hand.

### 4.3.2. Financial performance measures

#### a. Trend analysis

Trend analysis evaluates an organization's financial information over a period of time. Periods may be measured in months, quarters, or years, depending on the circumstances. The goal is to calculate and analyze the amount change and percent change from one period to the next. Trend analysis is often used to evaluate each line item on the income statement and statement of financial position. **The percent change** is calculated as the current year amount minus the base year amount, divided by the base year amount.

**Example:** The following shows ABC Fizz Ltd.'s income statement trend analysis or horizontal analysis

ABC Fizz Ltd.'s income Statement. for the periods Ended December 31 <sup>st</sup>				
Increase(decrease) from 2020 to 2021				
	2021	2020	Amount Change	Percent
Net Sales	FRW 35,119	FRW 30,990	FRW 4,129	13.3%
Cost of goods sold	<u>12,693</u>	<u>11,088</u>	<u>1,605</u>	14.5%
<b>Gross margin</b>	<b>FRW 22,426</b>	<b>FRW 19,902</b>	<b>FRW 2,524</b>	<b>12.7%</b>
Selling and administrative expenses	13,158	11,358	1,800	15.8%

Other operating expenses	<u>819</u>	<u>313</u>	<u>506</u>	161.7%
<b>Operating income</b>	<b>FRW 8,449</b>	<b>FRW 8,231</b>	<b>FRW 218</b>	<b>2.6%</b>
Interest expense	733	355	378	106.5%
Other income (expenses; net)	<u>6,477</u>	<u>988</u>	<u>5,489</u>	555.6%
<b>Income before taxes</b>	<b>F R W 14,193</b>	<b>FRW 8,864</b>	<b>FRW 5,329</b>	<b>60.1%</b>
Income tax expense	<u>2,384</u>	<u>2,040</u>	<u>344</u>	16.9%
<b>Net income</b>	<b><u>F R W 11,809</u></b>	<b><u>FRW 6,824</u></b>	<b><u>FRW 4,985</u></b>	<b>73.1%</b>

Net sales increased by  $(\frac{\text{FRW } 4,129}{\text{FRW } 30,990} =) 13.3\%$ , and Cost of Goods sold increased 14.5%, resulting in a 12.7% increase in gross margin. Good news for ABC Fizz Ltd! Selling and administrative expenses increased 15.8%, while other operating expenses increased 161.7%. operating income increased 2.6%, interest expense increased 106.5%, and other income increased 555.6% (related to a one-time acquisition gain). Income before taxes increased 60.1% resulting in a 16.9% increase in income tax expense. Net income increased a substantial 73.1% (much of this was related to a one-time acquisition gain).

## b. Common-size analysis of Financial statement

Common-size analysis (also called vertical analysis) converts each line of financial statement data to an easily comparable, or common-size, amount measured as a percent. This is done by stating income statement items as a percent of net sales and statement of financial position items as a percent of total assets (or total liabilities and shareholders' equity). For example, ABC Fizz Ltd had net income of FRW 11,809 and net sales of FRW 35,119 for 2020. The common-size percent is simply net income divided by net sales, or 33.6 percent (= FRW 1,809 / FRW 35,119).

There are two reasons to use common-size analysis:

1. To evaluate information from one period to the next within a company and
2. To evaluate a company relative to its competitors.

Common-size analysis answers such questions as "how do our current assets as a percentage of total assets compare with last year?" and "how does our net income as a percentage of net sales compare with that of our competitors?"

**Example:** The following presents the common-size analysis for ABC Fizz Ltd.'s income statement. As you look at these figures, notice that net sales are used as the base for the income Statement. That is, for the income statement, each item is measured as a percent of net sales.

ABC Fizz Ltd.'s Income Statement for the Years ended December 31, 2020 and 2021				
	2021		2020	
	Amount	Percent	Amount	Percent
<b>Net sales</b>	F R W 35,119	100%	F R W 30,990	100%
<b>Cost of goods sold</b>	<u>12,693</u>	<u>36.1%</u>	<u>11,088</u>	35.8%
<b>Gross margin</b>	F R W 22,426	63.9%	F R W 19,902	64.2%
<b>Selling and administrative expenses</b>	13,158	37.5%	11,358	36.7%
<b>Other operating expenses</b>	<u>819</u>	<u>2.3%</u>	<u>313</u>	1.0%
<b>Operating income</b>	FRW 8,449	24.1%	F R W 8,231	26.6%
<b>Interest expense</b>	733	2.1	355	1.1%
<b>Other income (expense, net)</b>	<u>6,477</u>	<u>18.4%</u>	<u>988</u>	3.2%
<b>Income before taxes</b>	F R W 14,193	40.4%	F R W 8,864	28.6%
<b>Income tax expense</b>	2,384	6.8%	2,040	6.6%
<b>Net income</b>	F R W 11,809	33.6%	F R W 6,824	22.0%

Cost of goods sold increased from 35.8% of net sales in 2020 to 36.1% in 2021, which resulted in a decrease in gross margin from 64.2% to 63.9%. selling and administrative expenses increased from 36.7% to 37.5%, while other operating expenses increased from 1% to 2.3%. operating income decreased from 26.6% to 24.1%. interest expense increased from 1.1% to 2.1% and other income increased from 3.2% to 18.4%. income before taxes increased from 28.6% to 40.4%. income taxes increased slightly. Net income increased from 22% to 33.6%.

In general, managers prefer expenses as a percentage of net sales to decrease over time, and profit figures as a percent of net sales to increase over time.



### C. Ratio analysis

Although trends and common-size analysis provides an excellent starting point for analyzing financial information, managers, investors, and other stakeholders also use various ratios to assess the financial performance and financial condition of organizations.

The four categories of ratios presented in this point are as follows:

- Ratios used to measure profitability (focus is on the income statement)
- Ratios used to measure short-term liquidity (focus is on short-term liabilities)
- Ratios used to measure long-term solvency (focus is on long-term liabilities)
- Ratios used to measure market valuation (focus is on market value of the company)

#### Profitability Measures for ABC Fizz Ltd for the year ended December 31, 2020

- **Gross margin ratio** indicates the gross margin generated for each Rwandan franc in net sales and is calculated as gross margin (which is net sales minus cost of goods sold) divided by net sales

$$\text{Gross Margin Ratio} = \frac{(\text{Net Sale} - \text{Cost of goods sold})}{\text{Net sales}} = \frac{\text{Frw } 22,426}{35,119} = 0.639$$

$\approx 64 \text{ percent}$

- **Profit margin ratio** indicates the profit generated for each Rwandan franc in net sales and It is calculated as net income divided by net sales:

$$\text{Profit margin ratio} = \frac{\text{Net Income}}{\text{Net sales}} = \frac{\text{Frw } 11,809}{35,119} = 0.34 \approx 33.6 \text{ percent}$$

#### ABC Fizz Ltd, as at December 31, Statement of Financial position

	2021		2020	
	Amount	Percent	Amount	Percent
<b>Assets</b>				
<b>Current assets</b>				
Cash and cash equivalents	FRW 11,199	15.4%	FRW 9,151	18.8%
Marketable Securities	138	0.2%	62	0.1%
Accounts receivable (net)	4,430	6.1%	3,758	7.7%
Merchandise inventory	2,650	3.6%	2,354	4.8%
Other current assets	3,162	4.3%	2,226	4.6%

<b>Noncurrent assets</b>				
Long-term investments	9,706	13.3%	8,731	17.9%
Property, plant and equipment(net)	14,727	20.2%	9,561	19.6%
Intangible assets	<u>26,909</u>	<u>36.9%</u>	<u>12,828</u>	<u>26.4%</u>
<b>Total assets</b>	<b>FRW 72,921</b>	<b>100%</b>	<b>FRW 48,671</b>	<b>100%</b>
<b>Liabilities and shareholder's equity</b>				
<b>Current liabilities</b>				
Accounts payable and accrued liabilities	FRW 8,859	12.1%	FRW 6,657	13.7%
Loans and notes payable	8100	11.1%	6,749	13.9%
Other liabilities	1,549	2.1%	315	0.6%
<b>Noncurrent liabilities</b>				
Long-term debt	14,041	19.3%	5,059	10.4%
Other liabilities and deferred taxes	9,055	12.4%	4,545	9.3%
Shareholder's equity				
Common stock	10,937	15%	9,417	19.3%
Retained earnings	49,592	68%	42,084	86.5%
Accumulated other income (loss)	(1,450)	(2%)	(757)	(1.6%)
Treasury stock	(27,762)	(38.1%)	(25,398)	(52.2%)
<b>Total liabilities and shareholder's equity</b>	<b>FRW 72,921</b>	<b>100%</b>	<b>FRW48,671</b>	<b>100%</b>

- **Return on assets** indicates how much net income was generated from each Rwandan franc in average assets invested. Return on assets is net income divided by average total assets:

$$\text{Return on Asset ratio} = \frac{\text{Net income}}{\text{Average total assets}} = \frac{\text{Frw } 11,809}{\left\{ \frac{72,921 + 48,671}{2} \right\}} = 19.4 \text{ percent}$$

- **Return on common shareholder's equity ratio** indicates how much net income was generated from each Rwandan Franc of common shareholders' equity. If the company does not have any outstanding preferred stock, as is the case with ABC Fizz Ltd, the preferred dividends amount is zero. Average common shareholders' equity in the denominator is found by adding together all items in the shareholders' equity section of the statement of financial position at the end of the

current year and previous year (2020 and 2021 for this example), except preferred stock items, and dividing by two.

$$\text{Return on common shareholder} = \frac{11809}{\frac{(10937 + 49592 - 1450 - 27762 + 9417 + 42084 - 757 - 25398)}{2}}$$

**=41.7 percent for 2020 year**

- **Short-Term Liquidity Measures**

- **Current ratio** indicates whether a company has sufficient current assets to cover current liabilities. It is found by dividing current assets by current liabilities (Current assts/current liabilities). In general, a current ratio above 2 to 1 is preferable, which indicates the company has sufficient current assets to cover current liabilities. However, finding the ideal minimum current ratio is dependent on many factors, such as the industry, the overall financial condition of the company and the composition of the company's current assets and current liabilities. Because of variations in these factors from one company to the next, a more stringent measure of short-term liquidity is often used.

$$\text{Current ratio} = \frac{(11199 + 138 + 4430 + 2650 + 3162)}{(8859 + 8100 + 1549)} = \text{Frw 1.17 to 1}$$

- **Quick ratio** (also called *acid-test ratio*) indicates whether a company has sufficient quick assets to cover current liabilities. The quick ratio is quick assets divided by current liabilities (current assets – Inventory / current liabilities).

$$\text{Quick ratio} = \frac{(11199 + 138 + 4430)}{(8859 + 8100 + 1549)} = \text{Frw 0.85 in 2020 year}$$

The quick ratio indicates that ABC Fizz Ltd had FRW 0.85 in quick assets for every Rwandan franc in current liabilities.

- **Receivables Turnover Ratio** indicates how many times receivables are collected in a given period. Receivables Turnover Ratio is found by dividing credit sales by average accounts receivable (credit sales/ accounts receivables).

$$\text{Receivable Turnover Ratio} = \left\{ \frac{35119}{\frac{(4430+3758)}{2}} \right\} = 8.5 \text{ times in 2020 year}$$

- **Inventory Turnover Ratio** indicates how many times inventory is sold and restocked in a given period. It is calculated as cost of goods sold divided by average inventory(cost of sales/average inventory)

$$\text{Inventory Turnover ratio} = \frac{12793}{\left(\frac{2650 + 2354}{2}\right)} = 5.07 \text{ times}$$

The inventory turnover ratio indicates that ABC Fizz Ltd sold and restocked inventory 5.07 times during 2021

- **Long-Term Solvency Measures**

- **Debt to Assets ratio** indicates the percentage of assets funded by creditors and is used to evaluate the financial leverage of a company. The higher the percentage, the higher the financial leverage automatically the higher the percentage of assets funded by the shareholder. Debt to assets is found by dividing total liabilities by total assets:

$$\text{Debt to assets ratio} = \frac{(8859 + 8100 + 1549 + 14041 + 9055)}{72921} = 0.57 \text{ to } 1$$

- **The debt to equity ratio** indicates the amount of debt incurred for each Rwandan franc that owners provide. The debt to equity ratio is total liabilities divided by total shareholders' equity indicates the company's ability to cover its interest expense related to long-term debt with current period earnings. This ratio indicates the amount of debt incurred for each Rwandan franc that owners provide. It also measures the balance of liabilities and shareholders' equity used to fund assets.

The debt to equity ratio is total liabilities divided by total shareholders' equity

The **debt to equity ratio** for ABC Fizz Ltd is calculated as follows

$$\text{Debt to equity ratio} = \frac{(8859 + 8100 + 1549 + 14041 + 9055)}{(10937 + 49592 - 1450 - 27762)} = \text{Frw } 1.33 \text{ to } 1$$

The debt to equity ratio indicates that ABC Fizz Ltd had FRW 1.33 in liabilities for each Rwandan in shareholders' equity.

- **Market Valuation Measures**

- **Market capitalization (also called market cap)** indicates the value of a company at a point in time. is determined by multiplying market price per share times the number of shares outstanding.
- **The price-earnings ratio (also called P/E ratio)** indicates the premium investors are willing to pay for shares of stock relative to the company's earnings. The price-earnings ratio is found by dividing market price per share by earnings per share.

### 4.3.3. Non-financial performance measures

Many organizations use a mix of financial and nonfinancial measures to evaluate performance. For example, airlines companies track on-time arrival percentages carefully, and delivery companies such as those ones which deliver goods purchased online, monitor percentages of on-time deliveries. **The balanced scorecard** uses several alternative measures to evaluate performance.

The balanced scorecard is a balanced set of measures that organizations use to motivate employees and evaluate performance. These measures are typically separated into four perspectives:

**Financial perspective**, measures that shareholders, creditors, and other stakeholders use to evaluate financial performance.

**Internal business process perspective**, measures that management uses to evaluate efficiency of existing business processes.

**Learning and growth perspective**, measures that management uses to evaluate effectiveness of employee training.

**Customer perspective**, measures that management uses to evaluate whether the organization is meeting customer expectations.



#### Application activity 4.3

##### Question 1

Ruhinguka Corneille, has the following statement of financial position as at 31 December 2022 and 31 December 2021,

	2021	2022
	Amount	Amount
<b>Assets</b>		
<b>Current assets</b>		
Cash and cash equivalents	FRW 11,199	FRW 9,151
Marketable Securities	138	62
Accounts receivable (net)	4,430	3,758
Merchandise inventory	2,650	2,354
Other current assets	3,162	2,226
<b>Noncurrent assets</b>		
Long-term investments	9,706	8,731
Property, plant and equipment(net)	14,727	9,561
Intangible assets	26,909	12,828
<b>Total assets</b>	<b>FRW 72,921</b>	<b>FRW 48,671</b>

<b>Liabilities and shareholder's equity</b>		
<b>Current liabilities</b>		
Accounts payable and accrued liabilities	FRW 8,859	FRW 6,657
Loans and notes payable	8100	6,749
Other liabilities	1,549	315
<b>Noncurrent liabilities</b>		
Long-term debt	14,041	5,059
Other liabilities and deferred taxes	9,055	4,545
<b>Shareholder's equity</b>		
Common stock	10,937	9,417
Retained earnings	49,592	42,084
Accumulated other income (loss)	(1,450)	(757)
Treasury stock	(27,762)	(25,398)
<b>Total liabilities and shareholder's equity</b>	<b>FRW 72,921</b>	<b>FRW 48,671</b>

And the following Income Statement, Ruhinguka Corneille, for the year ended 31 December 2022 and 31 December 2021

	<b>2022</b>	<b>2021</b>
Net Sales	FRW 35,119	FRW 30,990
Cost of goods sold	12,693	11,088
<b>Gross margin</b>	<b>FRW 22,426</b>	<b>FRW 19,902</b>
Selling and administrative expenses	13,158	11,358
Other operating expenses	819	313
<b>Operating income</b>	<b>FRW 8,449</b>	<b>FRW 8,231</b>
Interest expense	733	355
Other income (expenses; net)	6,477	988
<b>Income before taxes</b>	<b>FRW 14,193</b>	<b>FRW 8,864</b>
Income tax expense	2,384	2,040
<b>Net income</b>	<b>FRW 11,809</b>	<b>FRW 6,824</b>

## Required

Use the above financial statement and answer the following question

- Demonstrate a meaningful trend analysis. Explain how the percent change from one period to the next is calculated.
- Using the appropriate information from above financial statement show your financial analysis and interpretation with the common-size analysis.
- Name and explain three ratios used to evaluate profitability. Assess at least two of the profitability ratios and interpret them with the use of above financial information.

### Skills Lab 4



Students visit one of businesses operating near their school “MUGABO ENTERPRISE”. One businessman called Mugabo presents to them the financial statements of his Enterprise for the year ended 31 January 2021 and 31 January 2022 as follow:

**Mugabo Enterprise**  
**Statement of Financial Position (Balance Sheet)**  
**As at 31 January**

	2021 FRW '000'	2022 FRW '000'
<b>Assets:</b>		
Non-current assets (net book value)	11,000	14,000
<b>Current assets:</b>	2,000	3,000
Inventory	2,500	2,800
Trade receivables	-	500
Bank balance	4,500	6,300
<b>Total assets</b>	<b>15,500</b>	<b>20.300</b>

<b>Equity and liabilities:</b>		
<b>Capital and reserves</b>		
1,000,000 ordinary shares	10,000	10,000
FRW 10 each	3,000	4,100
Revenue reserves	13,000	14,100
<b>Non-current liabilities:</b>		
8% debentures	-	5,000
<b>Current liabilities:</b>		
Trade payables	1,500	1,200
Bank overdraft	1,000	-
	2,500	1,200
	15,500	20,300
<b>Total capital and liabilities</b>		

### Mugabo Enterprise Income Statement for the year ended 31 January

	2021	2022
	FRW '000'	FRW '000'
Sales	20,000	28,000
Cost of sales	<u>(15,000)</u>	<u>(21,000)</u>
Gross profit	5,000	7,000
Administration expenses	(3,800)	(4,600)
Finance costs	=	<u>(4,000)</u>
Net profit	<u>1,200</u>	<u>2,000</u>



Inventory on 1 February 2020 was FRW 5,000,000

**You are Required to calculate for 2021 and 2022 the:**

- i) Gross profit margin
- ii) Inventory turnover
- iii) Return on sales
- iv) Acid test ratio
- v) Current ratio



#### End of unit assessment 4

##### Question 1

- a) What are the 3 general areas or aspects which analysts are normally concerned about?

**Question 2: Which of the following ratios includes a component that is not from the Statement of financial position balance sheet?**

- a) Acid-test ratio
- b) Debt ratio
- c) Accounts receivable turnover
- d) Current ratio

##### Question 3:

- Use the Free cash flow ratio to explain and interpret the cash flows changes from one period to the next
- With the information from above financial statements, produce your financial analysis and interpretation of cash flows with the capital expenditure ratio

**Key Unit competence:** Use effectively and efficiently cash balances for better management



### Introductory activity

MK Ltd is an enterprise which sells agro-processed goods such as packed maize flour, soya oil and sorghum flour at Rwamagana. Raw materials used to make maize flour are purchased from Ngoma farmers, soya grains are imported from Zambia and payment transfers are done electronically while sorghum cereals are supplied by a trader from Musanze who require direct cash payment. The acquisition of raw materials is managed by Linda M. who is the chief accountant. Rutayisire who manages the department of Human Resources had submitted payroll for the month of January 2022 and M. Kayisire, Chief Finance Officer prepared the statement of cash flows. The department of finance has a cash balance of FRW 50 millions as at 31 December 2021. During January, cash receipts are estimated to be FRW 15 millions, cash payments FRW 26m and a depreciation charge of FRW 7 millions. Goods produced are sold both for cash as well as on credit. In the case of credit sales, the pending bills are realised at a later date. This cycle continues to be repeated in an accounting year several times. Thus, the flow of cash in a business passes through various channels. The magnitude of the flows in terms of time (days) may be depicted in the analysis made by M. Kayisire.

### Question

- a) Which is the report that provides the appropriate financial information used to measure the use of cash for good management?
- b) What should be the appropriate procedures for cash balances management?

## 5.1 Liquidity and cash balance management tools

### Learning Activity 5.1



#### Questions:

- What should be the appropriate responsibilities of the lady with question mark signs?
- The EBM as a cash and inventory management tool may help in what kind of cash flows?

### 5.1.1 Definition of liquidity

Liquidity is the amount of cash a company can obtain quickly to settle its debts (and possibly to meet other unforeseen demands for cash payments too). It is the ability of a company to pay its suppliers on time, meet its operational costs such as wages and salaries and to pay any longer-term outstanding amounts such as loan repayments.

### 5.1.2. Liquidity assets

- **Cash**

Cash is the most liquid asset possible as it is already in the form of money. This includes physical cash, savings account balances, and checking account balances. It also includes cash from foreign countries, though some foreign currency may be difficult to convert to a more local currency.

- **Inventory**

Inventory is a liquid asset because it gets converted to cash as part of normal business operations. However, the business slows in a recession and inventory may not be as liquid.

- **Short-term investment**

A short-term investment is a highly liquid financial asset to mean that it can be easily converted to cash. Short-term investments are commonly called marketable securities or temporary investments. Most are converted to cash, or sold, within 12 months of the investment being made.

- **Fixed term**

Are deposits with a bank or building society for example, six month deposits with a bank. Term deposit is a type of savings Account which holds a specific amount of money for a specified duration i.e. 1 month, 2 months or longer at a pre- agreed interest rate with the bank.

- **Trades receivables**

There are defined as the amount owed to a business by its customers following the sale of goods or services on credit. Also known as accounts receivable, trade receivables are classified as current assets on the statement of financial position/balance sheet.

### 5.1.3. Cash balance Management Tools

#### **Checking/current account**

It's a bank account used for everyday deposits and withdrawals. It means all transactions related to putting money into the bank account and taking them out using a cheque or using your debit card in the place of cash.

#### **Money market account**

Money market accounts (MMA) are offered by banks and credit unions and provide the benefits and features of both savings and checking accounts. Money market account are suited for short-term goals rather than long-term financial planning.

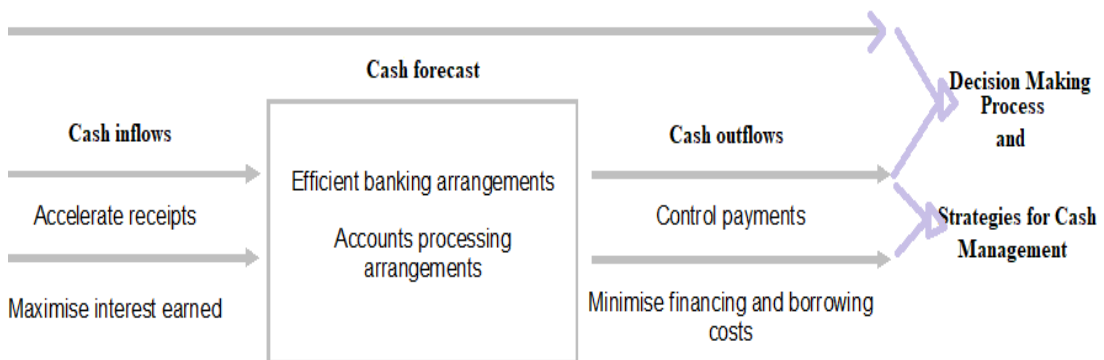
## Certificate of deposit

A certificate of deposit (CD) is a savings product that earns interest on a lump sum for a fixed period of time. CDs differ from savings accounts because the money must remain untouched for the entirety of their term or risk penalty fees or lost interest. CDs usually have higher interest rates than savings accounts as an incentive for lost liquidity.

## Saving bonds

Savings bonds are debt securities issued by the Treasury Department in Central Bank to help pay for the Government's borrowing needs. Government savings bonds are considered one of the safest investments because they are backed by the full faith and credit of the Central Government, especially the Ministry of Finance.

### 5.1.4. Make informed decisions regarding the management of cash balances within an organization



The elements of effective cash management based on the efficient decision making include:

- Accurate and timely cash flow analysis and forecasting as the efficient decision making process,
- Maximizing returns from cash balances as the receipts acceleration strategy
- Minimizing financing and borrowing costs as a good strategy to manage outflows
- Efficient banking arrangements. For example, centralization and rationalization of bank accounts enables economies of scale and a reduction in bank fees and administration costs, while access to electronic payment and collection methods increases efficiency.

- e) Efficient accounts processing arrangements for receipts and payments reduce transaction costs. For example, centralized infrastructure for accounts processing enables economies of scale benefits to be achieved, while the use of a central financial system minimizes risks associated with accessing and using information from disparate systems.
- f) Efficient management and collection of receivables/debtors
- g) Effective control of payments and disbursements.

### **5.1.1. Characteristics of the main types of cash receipts and payments**

#### **a. Regular revenue receipts**

Revenue receipts can be defined as those receipts which neither create any liability nor cause any reduction in the assets of the government. They are regular and recurring in nature and the government receives them in the normal course of activities.

#### **b. Capital receipts**

Capital receipts are receipts that create liabilities or reduce financial assets. They also refer to incoming cash flows. Capital receipts can be both non-debt and debt receipts. Loans from the banks or public entities, foreign financial market or Central bank form a crucial part of capital receipts.

#### **c. Exceptional receipts and payments**

It means any cash received by or paid to or for the account of any person not in the ordinary course of business, including tax refunds, pension plan reversions, proceeds of insurance (other than proceeds of business interruption insurance to the extent such proceeds constitute compensation for lost earnings), condemnation awards (and payments in lieu thereof), indemnity payments and any purchase price adjustments. These receipts and payments depend on how the receipt or payment is important or critical to the ordinary course of business. Examples are taxes, pension fees, insurance premium, indemnity fees.

#### **d. Drawings.**

It refers to the act of withdrawing cash or assets from the company by the owner(s) for personal use.



### Application activity 5.1

#### Question 1: Choose the best answer.

In a retail business, where payment is received from customers by cash, cheque and debit/credit card, what reconciliation should be carried out at the end of each day?

- A. Reconciliation to bank statement
- B. Reconciliation to trade receivables
- C. Reconciliation to cash book
- D. Reconciliation to amount of cash/cheques/credit card vouchers

#### Question 2

Analyze the elements of an informed decisions process regarding the management of cash balances within an organization.

## 5.2. Explain and apply cash management measures



### Learning Activity 5.2

A sole trader is making FRW 40,000 a year profits. However, his drawings have been over FRW 60,000 a year for some time.

A company has been over-generous with credit terms to debtors, and last year extended the time in which debtors could pay from one month to three months. In addition, it has a few customers who are not creditworthy and such sales may result in bad debts in the future.

A partnership whose products will not be on the market for quite a long time has invested in some very expensive machinery. A lot of money has been spent now, but no income will result in the near future.

In all of these cases, each of the businesses could easily run out of cash. In fact, many businesses fail and are wound up because of cash shortages, despite adequate profits being made. cash management measures can help to signal the development of such problems.

#### Question

What do many people think about profitability at the end of the year?

### 5.2.1. Cash management measures.

- **Current ratio**

The standard test of liquidity is the current ratio. Recall that the working capital of the business is the current assets of the business less the current liabilities.

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

When calculated, the ratio may be expressed as either a ratio to 1, with current liabilities being set to 1, or as a 'number of times', representing the relative size of the amount of total current assets compared with total current liabilities.

**For example**, see 4.3.6, B.1

- **Quick ratio**

Provided that creditors and debtors are paid at approximately the same time, a view might be made as to whether the business has sufficient liquid resources to meet its current liabilities. This ratio should ideally be at least 1 for companies with a slow inventory turnover. For companies with a fast inventory turnover, a quick ratio can be less than 1 without indicating that the company is in cash flow difficulties.

$$\text{Quick ratio or acid test ratio} = \frac{\text{Current assets} - \text{inventories}}{\text{Current liabilities}}$$

**For example** see 4.3.6,

- **Inventory holding ratio**

It is useful for management to have an indication of how long inventory is being held. In some businesses, inventory must be sold, or turned over, quickly, for example, if it consists of perishable foods. However, in other businesses, inventory may be held for some considerable time before it is sold (eg in the construction industry).

$$\text{Inventory Holding period} = \frac{\text{Average inventory}}{\text{Cost of sales}} \times 365 \text{ days}$$

**For example** see 4.3.6,

- **Trade receivable collection period ratio**

The trade receivables collection period ratio, also known as 'trade receivables' days, is a measure that shows how long it is taking for the trade receivables of the business to pay.



$$\text{Trade receivable' collection period} = \frac{\text{Trade receivables}}{\text{Credit sales}} \times 365 \text{ days}$$

**Example** (Mariam Manufacturing Ltd below)

- **Trade payables' payment period ratio**

The trade payables' payment period ratio, or trade payables' days, indicates how long a business takes to pay its trade payables.

$$\text{Trade payables' payment period} = \frac{\text{Trade payables}}{\text{Credit purchases}} \times 365 \text{ days}$$

A long trade payables period means that the business is delaying payment to its suppliers. This could be viewed as sensible cash flow management as the business is using its suppliers as a form of finance or it could be indicative of a business that is having cash flow difficulties and is unable to pay.

**Example** (Mariam Manufacturing Ltd below)

- **Cash operating cycle/ratio**

It measures the length of time taken for funds to flow through the organization. It is the period of time between the time cash is paid out for raw materials and the time cash is received from customers for goods sold. We can use the inventory, trade receivables and trade payables ratios to calculate the cash operating cycle of a business in days as follows:

	Days
Inventory holding period	X
Trade receivables' collection period	<u>X</u>
	X
Less trade payables' payment period	(X)
Cash operating cycle	<u>X</u>

**Illustration:**

Set out below are the statement of profit or loss and statement of financial position for Mariam Manufacturing Ltd:

**Mariam Manufacturing Ltd, Statement of profit or loss for the year ended December 31, 2020**

Revenue	FRW 1,350,000
Cost of goods sold	<u>837,200</u>
<b>Gross profit</b>	<b>513,200</b>
Less expenses	<u>274,200</u>
Profit from operations	<u>239,200</u>

**Statement of financial position/Balance sheet as at December 31, 2020 for Mariam Manufacturing Ltd**

Non-current assets	FRW	2,428,300
Current assets		
Inventory	156,300	
Trade receivables	225,000	
Cash and cash equivalents	10,200	
	391,500	
Trade payables	<u>(169,800)</u>	
Net current assets		<u>221,700</u>
<b>TOTAL</b>		<b><u>2,650,000</u></b>
Equity		<u>2,000,000</u>
Retained earnings		<u>650,000</u>
<b>TOTAL</b>		<b>2,650,000</b>

Let's calculate the individual working capital ratios,

$$\text{Inventory holding period} = \frac{156,300}{837,200} \times 365 = 68 \text{ days}$$

$$\text{Trade receivables' collection period} = \frac{\text{FRW } 225,000}{1,350,400} \times 365 = 61 \text{ days}$$

$$\text{Trade payables' payment period} = \frac{\text{FRW } 169,800}{837,200} = 365 = 74 \text{ days}$$

We can use the inventory, trade receivables and trade payables ratios to calculate the cash operating cycle or cash ratio for Mariam Manufacturing Ltd, as follows:

	Days
Inventory holding period	68
Trade receivables' collection period	<u>61</u>
	<b>129</b>
Less trade payables' payment period	(74)
<b>Cash operating cycle</b>	<b><u>55</u></b>

Therefore, 55 days elapse between Mariam Manufacturing Ltd paying for its raw materials and then getting cash in from the customer who has purchased the goods that these materials have been made into.

### 5.2.2. Statutory and other regulations relating to the management of cash balances

In the organisations, treasury function is responsible for dealing with cash management and the investment of funds. It is this function of the organization which has the responsibility for ensuring the minimum requirements for cash in the organization are met and any investments within the organization's rules, regulations offer the best return, low risk and ensure liquidity availability.

The treasury function actions in an organization including:

1. Centralized cash management avoids having a mix of cash surpluses and overdrafts in different localized bank accounts,
2. Larger volumes of cash are available to invest so that better rates can be negotiated,
3. Borrowing can be arranged in bulk at lower interest rates than for smaller borrowings,
4. A centralized pool of buffer funds will be smaller than the sum of the separate buffer funds that would be held by the individual operations,
5. A separate team will be able to monitor performance of the function more effectively.

## – Procedures for dealing with cash

- **Reconciliation of cash received**

When payments are received in the form of cash, cheques, debit or credit cards, then a list of all receipts taken during the day must be kept and this list must then be reconciled with the amount of cash in the till, cash box or safe at the end of the day.

- **Physical safeguards**

The cheque or cash should be kept under lock and key, either in a cash box, lockable till or safe with only authorised individuals having access to the keys.

- **Checking for valid payment**

If cheques are accepted as payment, then they must be supported by a valid cheque guarantee card and be correctly drawn up, dated and signed. If debit or credit cards are accepted, then basic checks should be made on the card and signature, and authorisation must be sought for payments which exceed the floor limit.

- **Banking procedures**

Any cash, cheques, debit and credit card vouchers (if the business does not use Electronic Funds Transfer at Point of Sale (EFTPOS)) should be banked as soon as possible. This helps the business in not only the money being used by employees for unauthorized purposes it is earning for the business the maximum amount of interest. If it is not possible to bank the takings until the following day, then either the cash must be left in a locked safe overnight or in the bank's overnight safe.

- **Recording procedures**

For security purposes, the paying-in slip for the bank should be made out by someone other than the person paying the money into the bank. The total on the paying-in slip should also be reconciled to the till records or cash list for the day.



## Application activity 5.2

### Question 1

What is the difference between the formulae for the current ratio and the acid test ratio?

### Question 2

**Which of the following is the quick ratio?**

- a) Current assets/Current liabilities
- b) Current assets less inventories/Current liabilities
- c) Profit/revenues
- d) Trade receivables/Credit sales

### Question 3:

A business has a cash operating cycle of 65 days. Its inventory holding period is 38 days and its trade payables' payment period is 45 days.

### Required

What is the trade receivables' collection period in days?

- a. 7 days, b. 20 days, c. 27 days, d. 72 days



## Skills Lab 5

With the reference to successful entrepreneurs operating in Rwanda, MUKARUTESI Ltd is an enterprise which sells agro-processed goods such as packed wheat flour, palm oil, maize flour at Rwamagana. Raw materials used to make maize flour are purchased from Ngoma farmers, soya grains are imported from Zambia and payment transfers are done electronically while sorghum cereals are supplied by a trader from Musanze who require direct cash payment. The acquisition of raw materials is managed by Linda M. who is the chief accountant. Rutayisire who manages the department of Human Resources had submitted payroll for the year 2022 and M. MUKARUTESI Ltd, Chief Finance Officer prepared the statement of cash flows. The department of finance has a cash balance of FRW 50 millions as at 31 December 2022 During January 2023, cash receipts are estimated to be FRW 25 million, cash payments FRW 26m and a depreciation charge of FRW 7 millions.

Goods produced are sold both for cash as well as on credit. In the case of credit sales, the pending bills are realized at a later date. This cycle continues to be repeated in an accounting year several times. Thus, the flow of cash in a business passes through various channels. The magnitude of the flows in terms of time (days) may be depicted in the analysis made by MUKARUTESI Ltd.

### Required

- Think of a financial statement that is appropriate to report this financial information.
- What will be the forecast cash balance for 31 January 2023?
  - a) FRW 61m
  - b) (FRW 11m)
  - c) FRWF 39m
  - d) FRWF 32m



## End of unit assessment 5

### Question 1

1. What do you think is meant by 'cash'? (Hint: which are the truly liquid assets?)
2. Can you think of any more examples? Spend a minute thinking about this and then write down any you come up with.

### Question 2:

A business has an inventory holding period of 84 days, a trade receivables' collection period of 51 days and a trade payables' payment period of 43 days.

### Required:

What is the cash operating cycle in days?

- a. 10 days, b. 76 days, c. 92 days, d. 178 days

**Key unit competence:** Identify and recording cost accounts used in organization



### Introductory activity

URURABO MANUFACTURING PLC located in Musanze, manufacturing three products: biscuits, banana juice and banana beer using many different costs. During the year 2020, it made a number of transactions like payment of workers, purchase of raw materials and others activities for producing a product. But they did not know how much was used for producing each product. This is because it was not aware of cost used in purchasing of raw materials during the period and transport made. URURABO also had no idea on other expenditures for the same period. Besides, it was very hard for URURABO to know what to plan for the forthcoming year. It advised itself to go for deep checking on invoices for the period, but failed because some invoices were missing! Due to that critical situation.

### Questions?

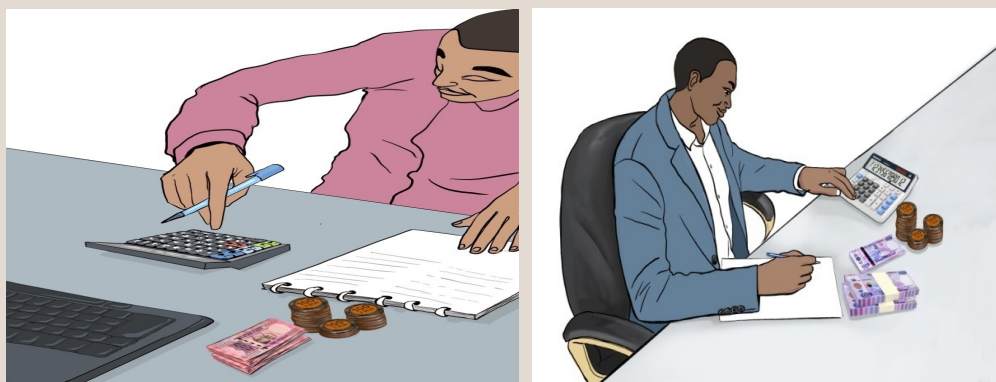
1. What was the mistake URURABO MANUFACTURING PLC did?
2. What do you think as a sustainable answer to avoid that mistake from happening again?

## 6.1. Introduction to cost accounts

### Learning Activity 6.1



Analyse the picture below and answer questions that follow:



#### Question:

1. According to your observation, what do you see in this picture?
2. What are they doing?

### 6.1.1. Inter-locking accounting system

A control account is a summary account in the general ledger that is supported in details by individual accounts in a subsidiary ledger.

In cost accounting the cost books are basically maintained under the two systems namely Non-Integral or non-integrated cost accounting or **Inter-locking accounts** and Integral or **integrated cost accounting**.

It is known as non-integrated accounting system referring to a traditional system. Under this system, the enterprise keeps separate cost accounts from financial accounts. The cost ledgers are quite independent of the financial ledgers. In other words, Interlocking accounting system is a system in which company records its transactions on the basis of financial accounting principles and cost accounting principles separately. It means there will be two records of accounts; one is financial accounts record and second is cost accounts record.

The cost accounts use the same basic data as the financial accounts but frequently adopt different bases for matters such as depreciation and stock valuation. Interlocking accounts is a system in which the cost accounts are distinct from the financial, the two sets of accounts being kept continuously in agreement by the use of control accounts.



The separate ledgers are kept and cost accounts display the following features:

- a) There are no double entries that span the two ledgers
- b) There is control account (General ledger adjustment account) in the cost ledger. This account helps to complete the double entry and make the cost ledger self-balancing.
- c) The financial ledger is the normal ledger that is found in bookkeeping. It is not in any way affected by the existence of the cost ledger.

**The financial accounting department maintain the following financial ledgers:**

- a) **General ledger** that contains all real, nominal and personal accounts except for account receivable and account payable.
- b) **Accounts receivable ledger** that has all personal accounts of trade debtors
- c) **Accounts payable ledger** that has all personal accounts of trade creditors.

**The cost accounting department maintains the following cost ledgers:**

- a) **Store ledger** containing all accounts of individual items of raw materials, components and consumable stores.
- b) **Work-in-progress ledger** containing all cost of material, wages and overheads for each job or manufacturing in progress are posted to the respective job accounts in this ledger.
- c) **Finished goods/stock ledger** containing accounts of all types of finished goods. A separate account is opened for each type of finished product.
- d) **Cost ledger:** recording impersonal accounts i.e accounts relating to income and expenditure.

## CONTROL ACCOUNTS

A control account is a summary account where entries are made for totals of transactions for a period and kept for each subsidiary ledger.

The main purpose of cost control accounts is to minimize and detect accounting errors such as non-posting, incorrect postings, check that all effective expenditure is accounted for in the cost accounts with double entry proof, provide an effective system of internal check since there is cross checking of work done by different persons. This leads to greater accuracy of records, summarize masses of detailed information contained in the subsidiary ledger and this provides immense help to management in policy formulation and facilitate compilation of financial accounts and reconciliation with financial accounts.

### – Advantage of interlocking accounting system

Main benefit of interlocking accounting system is for big companies to keep double record by independent accountants. So, there is less chance of fraud and mistake because in reconciliation process, such fraud and mistake can be found by auditor.

### – Disadvantages of interlocking accounting system

Hence we keep double set of accounts (cost and financial ) we therefore need the reconciliation of cost and financial accounts for finding the reason of not matching of cost accounts records with financial accounts records from the same period of time. Due to its separate accounting staff for keeping two separate sets of accounts, the system becomes costly. Finally the periodic result (cost profit and financial profit) from both systems confuses the users.

## 6.1.2. Integrated accounting system

Integrated accounting is defined by the Chartered Institute of Management Accountants (CIMA) as “a collection of accounting records that offers financial and cost accounts using a common data input for all accounting purposes.” This is a single accounting system which contains both financial and cost accounts that is, there is no division between financial and cost accounts.

### – Advantages of integrated system

- Accounting policies are standardized
- There is no need for duplication source documents
- There is no problem of reconciliation as there will only be one profit amount.
- Cost data can be presented promptly and regularly
- The system is economical and easy to understand
- Integrated accounting helps in widening the outlook of the accountant and his staff and in return they appreciate the entire accounting system.
- All cost data and accounts are automatically checked and thus cost figures are accurate.
- All the accounts are maintained in an objective form; the process of cost ascertainment and cost control is facilitated.

### – Disadvantages of integrated system

- It is costly system
- Integrated accounting system is comparatively more sophisticated and hence its handling requires trained and more efficient persons
- Not suitable if cost and financial data are required to be separately presented.

– **Factors that should be considered before established an integrated cost accounting system.**

- **Degree of integration**

This should be determined early in advance. Some business firms may integrate up to the stage of prime cost or factory cost. On the other hand, many undertakings integrate the whole of the records.

- **Provisions for accrued expenses,**

Prepayments and stocks should be dealt with by transfer to suitable suspense accounts, so that the balance remaining in each control account represents the charges for the period.

- **Control accounts**

In place of classifying expenditure according to its nature, control accounts may be prepared for each of the elements of cost, such as ;material control account, direct labour control account, factory overheads control account, administration overhead control account, selling and distribution overheads control account.

- **Cost accumulation purposes**

Full details about the cost the cost data are provided to the cost accounting department so as to achieve the following objectives. To form the basis of journal entries so that the control accounts can be charged to suitable revenue accounts resulting into a cost of sales accounts and to provide the necessary costing data.

– **Comparison between integrated system and interlocking system**

INTEGRATED SYSTEM	INTERLOCKING SYSTEM
<p><b>EFFICIENT RECORDING</b></p> <p>As transactions are only required to be recorded once, it saves time and resources of the organisation.</p>	<p><b>INEFFICIENT RECORDING</b></p> <p>Transactions are recorded separately in cost accounting ledger and financial accounting ledger, therefore more time and resources are required for data input.</p>
<p><b>INEFFICIENT REPORTING</b></p> <p>As same set of ledger accounts is used for both financial and cost accounting hence more time is required to arrange and customize the data for reporting purposes.</p>	<p><b>EFFICIENT REPORTING</b></p> <p>As each set of ledger accounts is designed to meet its relevant information needs, less time is required in making financial accounting and cost accounting reports</p>

<p><b>LESS DETAILED ANALYSIS</b></p> <p>As same set of ledger accounts is used for both financial and cost accounting purposes, it is difficult to do specialized detailed analysis.</p>	<p><b>MORE DETAILED ANALYSIS</b></p> <p>As each set of ledger accounts supports its relevant information needs resulting in better and more detailed analysis.</p>
<p><b>NO DUPLICATION OF RECORD</b></p> <p>As there is only one set of ledger accounts, there is no need for reconciliation.</p>	<p><b>DUPLICATION OF RECORD AND NEED FOR RECONCILIATION</b></p> <p>As there are two sets of ledger accounts, both records need to be reconciled periodically to ensure accuracy of record keeping in both sets of ledgers.</p> <p>Control accounts are often used for reconciliation purposes</p>



### Application activity 6.1

1. Explain the meaning of the following terms in regard to the cost and financial accounting systems:
  - i) integrated cost accounts
  - ii) interlocking cost accounts
  - iii) cost ledger control account
2. Identify two factors that should be considered before establishing an integrated cost accounting system.

## 6.2. Recording and analysis of information relating to cost accounts.

### Learning Activity 6.2



We have many professions and careers to be engaged in. Some people become teachers, medical doctors, other people become engineers and yet others work as priests, pastors, sheikhs, traders or farmers. In the business world, some of the mostly heads or leaders of business companies are accountants by profession. What accountants do is very important for every business or enterprise because accountants help in the management of finances for a service enterprise or a manufacturing company. As a manager of manufacturing company, you don't need to be an accountant by profession but you need to have basic knowledge and skills of recording and analyzing accounting information. The need to know the basics of accounting is crucial even if you are running a small enterprise and cannot afford to employ a fulltime accountant. Knowledge of accounting also helps you make informed decisions, because accounting is the language of all kind of business.

### Questions

1. What do you think accountants do?
2. What do you think the accounting is for?
3. Is it necessary for company to record and analyze accounting information?

### 6.2.1. Recording by inter-locking system.

This is a system of cost accounting in which the cost accounts have no double entry connection with the financial accounts but use the same basic data.

Under this system, cost ledger and financial ledger are maintained separately.

Cost profit and financial profit do not agree in most of the cases and these are reconciled at the end of the year. Cost ledger contains only impersonal accounts.

There are normally four ledgers in costing department:

1. **Cost ledger,**
2. **Store ledger,**
3. **Work-in-progress ledger and**
4. **Finished goods ledger.**

For all these ledger, one control account is maintained in the cost ledger.

The main cost control accounts maintained in the cost ledger are:

### **1. General ledger adjustment account**

This account is also called “**Cost ledger control account**” or “**cost ledger contra account**”

This account takes place of the personal accounts because in cost ledger only impersonal accounts are maintained. All entries from financial accounts to cost accounts should pass through this account.

The main objective of this account is to complete the double entry in the cost ledger.

Any entry which is to be made in real accounts or personal accounts is made in this account.

The balance in the “general ledger adjustment account “ represents the total of all the balances of the impersonal accounts.

### **2. Stores ledger control account**

This account shows the receipt of materials purchased and issues of materials to production department.

The returns of materials to suppliers or returns from production department are also recorded in this account.

### **3. Wages control account**

It is under this account that all types of wages and labour cost incurred are recorded. this accounts acts as a clearing house for wages incurred and absorbed. direct wages are normally transferred to work-in- progress accounts and indirect wages are transferred to respective overheads control accounts. This account shows the total wages paid to the employees.

This account does not have any closing balance.

### **4. Production Overhead Account**

This account shows the production overhead expenditure incurred and charged to production.

This accounts contains the factory expenses.it is debited with indirect expenses and credited with the amount of overheads recovered. Overheads allocated to work-in-progress are carried over to next period. The balance in the control represents under or over absorption and is transferred to costing profit and loss accounts.

### **5. Administration Overhead Account**

This account shows the administration overhead expenditure incurred and charged.

The administrative overheads incurred is debited on this accounts and credited with the amount of overheads recovered, any balance on account is transferred to costing profit and loss account.

### **6. Selling and Distribution Overhead Account**

This account shows the Selling and distribution overhead expenditure incurred and charged.

Selling and distribution costs are debited to this account and the credit side captures the overheads recovered from goods sold. In case of any balance on this account, it is transferred to costing profit and loss account.

### **7. Work-in-progress Ledger control Account**

This account shows the material cost, direct wages, production overhead allocated and cost of finished goods.

The balance in this account represents the value of the Work-In-Progress at the end of the year.

### **8. Finished goods Ledger control Account**

This account shows the material cost of completed jobs and cost of finished goods sold.

### **9. Cost of Sales Account**

This account shows the total cost of goods sold during a specific year.

### **10. Costing Profit and Loss Account**

This account shows the sales, total cost of sales, adjustments regarding over or under charge of overheads and costing profit for a specific year.

## FOR EXAMPLE

### 1. Materials

a) Purchase of materials for stock (cash or credit basis)

Dr Stores ledger control a/c

Cr General Ledger adjustment a/c

b) Returns to suppliers:

Dr General Ledger adjustment a/c

Cr stores ledger control a/c

c) Material purchased for a specific job ( i. e direct issue)

Dr Work-in-progress control a/c

Cr General ledger adjustment a/c

d) Direct material issued from stores to job

Dr Work- in- progress control a/c

Cr stores ledger control a/c

e) Material returned from jobs to stores:

Dr Stores ledger control a/c

Cr Work-in- progress control a/c

f) Issue of indirect materials:

Dr Factory overheads control a/c

Cr stores ledger control a/c

g) Transfer of material from one job to another:

Dr Receiving job a/c

Cr giving job a/c

h) Normal wastage of material and stores:

Dr Factory overheads control a/c

Cr stores ledger control a/c

i) Abnormal wastage of materials:

Dr Costing P & L a/c

Cr stores ledger control a/c



j) Abnormal gain of materials:

Dr Stores ledger control a/c

Cr costing P & L a/c

## **2. LABOUR**

a) Payment of direct wages:

Dr Wages control a/c

Cr General ledger adjustment a/c

b) Allocation of direct labour:

Dr Work-in- progress a/c

Cr wage control a/c

c) Payment of indirect labour cost:

Dr Wages control a/c

Cr To General ledger adjustment a/c

d) Allocation of indirect labour cost:

Dr Overheads control a/c

Cr wages control a/c

e) Normal Idle time cost :

Dr Factory overheads control a/c

Cr wages control a/c

f) Abnormal Idles time cost:

Dr Costing P & L a/c

Cr wages control a/c

## **3. DIRECT EXPENSES**

Dr Work-in-progress control a/c

Cr General ledger adjustment a/c

#### 4. OVERHEADS

a) for recording overheads incurred and accrued:

Dr Factory control a/c

Dr Administration control a/c

Dr Selling and distribution control a/c

Cr To General ledger adjustments a/c

b) Allocation of factory overheads:

Dr Work- in-progress control a/c

Cr Factory overheads control a/c

c) Absorption of administration overheads

Dr Finished stock ledger control a/c

Cr administration overheads control a/c

d) absorption of selling and distribution overheads

Dr cost of sales a/c

Cr selling and distribution overheads control a/c

e) If under/over absorbed amounts are carried forward to subsequent year, the balance of each overheads a/c will have to be transferred to respective overheads suspense (or reserve) account as follows

i) Dr production overheads a/c

Cr productions overheads suspense a/c

( for over recovery)

ii) Dr Administration overheads suspense a/c

Cr administration overheads a/c

(for under recovery)

iii) Dr selling and distribution overheads suspense a/c

Cr selling and distribution overheads a/c

(for under recovery)

f) In case of under/over absorbed are transferred to costing P& L a/c then the relevant entries will be as follows:

i) For over recovery.

Dr Overhead control a/c

Cr costing profit and loss a/c

ii) For under recovery

Dr costing P&L a/c

Cr Overhead control a/c

## **5. FINISHED GOODS or COMPLETED JOBS**

### **a. Transfer of completed jobs or finished goods produced to finished goods ledger**

Dr Finished stock ledger control a/c

Cr work-in-progress control a/c

### **b. Transfer of finished goods sold:**

Dr Cost of sales a/c

Cr finished stock ledger control a/c

### **c. Transfer of cost of sales a/c to P&L a/c**

Dr costing P&L a/c

Cr cost of sales a/c

### **d) To records sales:**

Dr General ledger adjustment a/c

Cr costing P&L a/c

## **6. TRANSFER OF PROFIT OR LOSS**

### **a. In case of profit**

Dr Costing P&L a/c

Cr To General ledger adjustment a/c

**b. In case of loss:**

Dr General ledger adjustment a/c

Cr To Costing P&L a/c

**TREATMENT OF CARRIAGE INWARDS**

The carriage inwards should be normally added to the purchase price of materials. However, this expenses can be also recovered through production overhead. In this case:

**Carriage Inward**

**Dr:** Production overhead account

**Cr:** General ledger adjustment account

**CAPITAL ORDERS**

If capital expenditure is incurred, it is transferred to an appropriate asset account. The improvements to plant and machinery, tools and buildings are mostly carried out by the workers of a manufacturing company. A capital order account is opened for each item of capital work to be performed and all expenditure incurred is charged to that capital order.

When a capital order is completed, the entries are made as under,

**Dr:** Capital order account

**Cr:** Work-in-progress ledger account.

The asset when capitalized is transferred to the financial ledger by the following order:

**Dr:** General ledger adjustment account

**Cr:** Capital order account.

**SPECIAL REPAIRS ORDERS**

Sometimes special repairs orders are received by the production department.

When the repairs are completed, these repairs orders are closed.

On completion, the following entries are made:

**Dr:** Special repairs order account

**Cr:** Work-in-progress ledger control account.

The cost of the repair is then charged to the department for which the work was carried out. In this case:

**Dr:** The respective department (e.g. production O.H account or selling and distribution O.H account)

**Cr:** Special repairs order account.

**EXAMPLE: Prepare journal entries in the cost books maintained on non-integrated system for the following:**

- i) Issue of materials FRW
  - Direct 55,000
  - Indirect 15,000
- ii) Allocation of wages
  - Direct 2,000
  - Indirect 4,000
- iii) Under/over absorbed overheads:
  - Factory (over) 20,000
  - Administration (under) 10,000

**Answer**

	DR (FRW)	CR(FRW)
i) Work-in-progress ledger control A/C	55,000	
Factory Overhead Control A/C	15,000	
store ledger control A/C		70,000
<i>Being issue of materials</i>		
ii) Work-in-progress ledger control A/C	2,000	
Factory Overhead Control A/C	4,000	
wages control A/C		6,000
<i>Being allocation of wages and salary</i>		
iii) Factory Overheads Control A/C	20,000	
Costing Profit and Loss A/C		20,000
<i>Being transfer of over absorption of overheads</i>		
Costing Profit and Loss A/C	10,000	
Administration Overheads control A/C		10,000
<i>Being transfer of under absorption of overheads</i>		

## 6.2.2. Reconciliation of cost and financial accounts

In case of interlocking accounts, the difference can arise between the profits shown by the cost accounts and the financial accounts. It is essential to reconcile it these differences to ensure that there are no errors in both sets of accounts.

The differences in financial and costing profit can arise due to the following items:

### a. Items shown only by one set of accounts

There are some items which appear only in one set of accounts.

Some items appear only in the financial accounts and similarly some items appear only in the cost accounts.

The following items appear only in the financial accounts:

#### \* **Financial expenses**

1. Fines and penalties
2. Donations
3. Interest on bank loans
4. Stamp duty paid on issue of shares
5. Losses from sale of fixed assets

#### \* **Financial income**

1. Rent receivable
2. Interest received on bank deposits
3. Dividends received
4. Profit from sale of fixed assets

The following items appear only in cost accounts:

\* **Notional interest:** is that interest which is charged by the management on the capital invested by the Owners (the main purpose of this charge is to show the nominal cost of the capital employed in the business rather than investing it outside the business)

\* **Notional rent:** shows the nominal rent charge of premises owned by the company.

This shows the cost of these premises rather than renting these premises to outsiders.

**Note:** Notional interest and notional rent do not affect reconciliation between financial and cost accounts, because in the reconciliation statement we start with costing profit.

## b. Difference bases of stock valuation

Different bases of stock valuation are adopted in the financial accounts and cost accounts.

In financial accounting, stock is valued either at cost or net realisable value whichever is the lower.

In cost accounting, different methods of stock valuation are adopted (LIFO, FIFO, Average price, AVCO,...)

The differences in stock valuation will affect the profits or losses shown by the two sets of accounts.

	Financial Accounting	Cost Accounting
Opening stock	X greater than	Y the difference should be debited to the reconciliation statement
Opening stock	X Less than	Y the difference should be credited to the reconciliation statement
Closing stock	X greater than	Y the difference should be credited to the reconciliation statement
Closing stock	X less than	Y the difference should be debited to the reconciliation statement

- **X: is financial Accounting**
- **Y: is cost accounting**

## c. Overheads

In the financial accounts, the actual overhead expenses are charged to profit and loss account.

In cost accounts the overheads are absorbed at predetermined rates. The differences in overheads affect the reconciliation between the financial and cost account.

If overheads charged in financial accounts are greater than cost accounts, then this difference should be debited to reconciliation statement and vice versa.

A memorandum reconciliation account is prepared to reconcile financial profit and cost accounting profit.

The following procedure is adopted in this case:

- Start with the costing profit
- Insert the differences on the debit and credit sides
- The balancing figure will be identical to the financial profit

### 6.2.3. Memorandum reconciliation account

Reconciliation of Cost and Financial Accounts is the process to find all the reasons behind disagreement in profit which is calculated as per cost accounts and as per financial accounts. A reconciliation statement is a statement which is prepared to reconcile the profit as per cost accounts with the profit as per financial accounts by suitably treating the causes for the difference between the cost and financial profit.

#### – Reconciliation Memorandum account format

Profit as per cost accounts		XXXX
<b>Add:</b> Excess of opening stock value in cost A/C over financial A/Cs		XXXX
Excess of closing stock value in financial A/Cs over cost A/Cs		XXXX
Excess of depreciation charge in cost A/C over financial A/C		XXXX
Dividends received		XXXX
Profit on sales of fixed assets		XXXX
Interest received (other income)		XXXX
		<u>XXXX</u>
		<u>XXXX</u>
<b>Less:</b> Excess of opening stock value in Financial A/C over cost A/Cs		(XXXX)
Excess of closing stock value in cost A/Cs over financial A/Cs		(XXXX)
Excess of depreciation charge in cost A/C over financial A/Cs		(XXXX)
Dividends Paid/proposed		(XXXX)
Interest Paid		(XXXX)
Tax Paid		(XXXX)
<b>PROFIT AS PER FINANCIAL A/Cs</b>		<b><u>XXXX</u></b>

#### Illustration.

The cost accounting profit of XYZ Ltd for the year ended 31st December 2020 was FRW 46,000 whereas the financial profit for the same period was FRW 60,000. You are required to prepare a reconciliation statement given the following information:



\* The cost accounting records show:

- The opening and closing stocks were FRW 115,000 and FRW 154,000 respectively,
- Production overheads recovered was FRW 68,000
- Administration overhead was absorbed at 5% of sales
- Selling and distribution overhead was recovered at 7½% of sales
- Notional rent and interest on capital were FRW8,000 and FRW 6,000 respectively.

The financial trading and profit and loss account XYZ Ltd for the year ending December 31, 2020 was as under:

FRW	FRW
Opening stock.....140,000	Sales..... 1,000,000
<b>Add Purchases of materials.....560,000</b>	
= <i>Available for use..... 700,000</i>	
<b>Less Closing stock..... 160,000</b>	
= <i>Materials consumed.....540,000</i>	
<b>Add direct wages.....240,000</b>	
= <i>Prime cost..... 780, 000</i>	
<b>Add Production overheads..... 70,000</b>	
= <i>Factory cost..... 850,000</i>	
<b>Balance c/d <i>Gross profits</i>..... <u>150,000</u></b>	
<b><u>1,000,000</u></b>	<b><u>1,000,000</u></b>
Discount allowed.....8,000	Gross profit..... 150,000
Administration expenses.....55,000	Discount received..... 15,000
Debenture interest.....5,000	Dividend received..... 18,000
Selling and distribution expenses.....67,000	Interest received..... 12,000
<b>Balance c/d <i>Gross profits</i>..... <u>60,000</u></b>	
<b><u>195,000</u></b>	<b><u>195,000</u></b>

### Answer

### Workings

Administration overhead charged in cost accounts was 5% of sales:

$$1,000,000 \times 5\% = \text{FRW } 50,000$$

Selling and distribution overhead charged in cost account 7.5% of sales:

$$1,000,000 \times 7.5\% = \text{FRW } 75,000$$

**Note:** Notional rent and notional interest on capital do not affect reconciliation statement

## MEMORANDUM RECONCILIATION ACCOUNT

MEMORANDUM RECONCILIATION ACCOUNT			
	FRW	FRW	
<b><u>Items not debited in cost acc.</u></b>			Profit as per cost account..... 46,000
Discount allowed.....8,000			<b><u>Items not credited in cost acc.</u></b>
Debenture interest.....5,000...	13,000		Discount received.....15,000
Difference in opening stocks (140,000–115,000)	25,000		Dividend received.....18,000
<b><u>Overheads not recovered in cost acc</u></b> (under recovered)			Interest received..... 12,000. 45,000
Production overheads.....2,000			Difference inclosing stocks (160,000-154,000) 6,000
Administration overheads.....5,000.....7,000			<b><u>Overheads not recovered in cost acc</u></b> (over recovered)
<b>Balance c/d (Financial profit): .....</b>	<b>60,000</b>		Selling and distribution overhead (over recovered) 8,000
		<b>105,000</b>	
			<b>105,000</b>

Alternative method (vertical format)

## MEMORANDUM RECONCILIATION ACCOUNT

Profits as per cost accounts.....	46,000
<b><u>Add: i) Items not credited in cost accounts:</u></b>	
Discount received.....15,000	
Dividend received.....18,000	
Interest received.....12,000.....45,000	
ii) Difference in closing stocks (160,000-154,000) :.....6,000	
iii) Selling and distribution overhead over recovered.....8,000.....	<u>59,000</u>
	105,000
<b><u>Less: i) Items not debited in cost accounts:</u></b>	
Discount allowed.....8,000	
Debenture interest.....5,000.....13,000	
Difference in opening stocks (140,000–115,000)..... 25,000	
<b><u>Overheads under recovered in cost accounts</u></b>	
Production overheads.....2,000	
Administration overheads.....5,000.....7,000.....	<u>45,000</u>
<b>Financial profit (balance c/d).....</b>	<b><u>60,000</u></b>
	105,000

### 6.2.4. Integrated accounts /integrated system.

This is a single set of account which provides both financial and cost accounting information This system is also known as integrated accounting system.

Under this system, personal and impersonal accounts are maintained in the ledger.

Cost profit and financial profit are similar and there is no need of reconciling the cost and financial acc.

Although, the usual real and personal accounts are maintained but the nominal accounts follow the principles of cost accounting system. It means there are accounts for stock, production, administration, selling and distribution overheads followed by such final accounts as cost of sales, profit and loss etc

In integrated accounting system, the following two methods can be adopted:

- a) The double entry method
- b) The third entry method

### The double entry method

In this system, the cost ledger includes the creditors' control account, the cash account, the provision for depreciation account and the debtors' control account in place of the general ledger cost control account.

### The third entry method

This method is similar to the double entry method but incorporates an extra account called the cost control account in which the costs are collected that can be analysed in memorandum account which is outside the double entry system.

The cost control account then enables the costs to be charged to finished goods account and other accounts by using it as the double entry

### Materials

S. No	Transactions	Integrated Accounting Entry
1	Materials purchased for stock on cash	Store Ledger Control A/c Dr. To Cash A/c
2.	Materials purchased for stock on credit	Store Ledger Control A/c Dr. To Creditor A/c
3	Materials purchased for specific jobs	Work-in-progress Ledger Control A/c Dr. To Cash or Creditor A/c
4	Materials returned to supplier	Creditor A/c Dr. To Store Ledger Control A/c
5	Payment to creditors	Creditor A/c Dr. To Cash or Bank A/c
6	Issue of direct materials to production	Work-in-progress Ledger Control A/c Dr. To Store Ledger Control A/c
7	Issue of indirect materials to production	Factory Overhead Control A/c Dr. To Store Ledger Control A/c
8	Return of direct materials from production to stores	Store Ledger Control A/c Dr. To Work-in-progress Ledger Control A/c
9	Return of Indirect materials	Store Ledger Control A/c Dr. To Factory Overhead Control A/c
10	Abnormal loss of materials on stock taking	Profit and Loss A/c Dr. To Store Ledger Control A/c
11	Normal loss of material on physical stock taking	Factory Overhead A/c Dr. To Store Ledger Control A/c

## Labor

S. No	Transactions	Integrated Accounting Entry
1	Wages paid	Wages Control A/c Dr. To Cash A/c
2	Allocating to direct wages	Work-in-progress Control A/c Dr. To Wages Control A/c
3	Allocating to indirect wages (factory, admn. and selling & distribution)	Factory Overhead Control A/c Dr. Admn. Overhead Control A/c Dr. Selling & Distribution Control A/c Dr. To Wages Control A/c

## Direct expense

S. No	Transactions	Integrated Accounting Entry
1	Direct expenses incurred	Work-in-progress A/c Dr. To Cash or Creditors A/c

## Overheads

S. No	Transactions	Integrated Accounting Entry
1	Indirect expenses incurred	Respective Overhead Control A/c Dr. To Cash or Creditors A/c
2	Absorption of production overheads	Work-in-progress Control A/c Dr. To Factory Overhead Control A/c
3	Absorption of administration overheads	Finished Goods Control A/c Dr. To Administration Overhead Control A/c
4	Absorption of selling & distribution	Cost of Sales A/c Dr. To Selling & distribution Control A/c
5	Over-absorption of overheads	Respective Overhead A/c Dr. To Overhead adjustment A/c or Profit & loss A/c
6	Under-absorption of overheads	Overhead Adjustment or P&L A/c Dr. To Respective Overhead Control A/c

## Other transaction

S. No	Transactions	Integrated Accounting Entry
1	Finished goods produced	Finished Goods Control A/c Dr. To Work-in-progress Control A/c
2	Recording cost of goods sold	Cost of sales A/c Dr. To Finished Goods Control A/c  Profit & Loss A/c Dr. To Cost of Sales A/c
3	Recording Sales	Cash or Debtors A/c Dr. To Profit & Loss A/c
4	Abnormal wastage in production	Profit & Loss A/c Dr. To Work-in-progress Control A/c

## Illustration

URURABO Enterprise operates an integrated system of accounting.

Journalize the following transactions:

- 1/1/2022. Raw material purchased (50% on credit) FRW 300,000
- 2/1/2022. Material issued to production FRW 200,000
- 3/2/2022. Wages paid (50%Direct) FRW 100,000
- 4/2/2022. Wages charged to production FRW 50,000
- 5/2/2022. Factory overheads incurred FRW 40,000
- 6/2/2022. Factory overheads charged to production FRW 50,000
- 7/2/2022. Selling and Distribution overheads incurred FRW 20,000
- 8/2/2022. Finished goods at cost FRW 250,000
- 9/2/2022. Sales (50%credit) FRW 375000
- 10/2/200. Closing stock nil
- 11/2/2022. Receipts from debtors FRW 100,000
- 12/2/2022. Payments to creditors FRW 100,000

## ANSWER

### Journal Entries (integrated system)

Date	Particulars	Dr (FRW)	Cr (FRW)
1/2/2022	Stores ledger control A/C		
	sundry creditorsA/C		
	cash (or bank) A/C	300,000	150,000
	<b>(Being raw material purchased 50% on credit)</b>		150,000
2/2/2022	Work- in- progress control A/C		
	store ledger control A/C		
		200,000	
	<b>(Being material issued to production)</b>		200,000

3/2/2022	Wages control A/C Cash A/C <b>(Being wages paid)</b>	100,000	100,000
4/2/2022	Work-in-progress control A/C wages control A/C <b>(Being wages charged to production)</b>	50,000	50,000
5/2/2022	Factory overheads control A/C wages control A/C <b>(Being factory overheads charged to production)</b>	50,000	50,000
6/2/2022	Factory Overheads control A/C cash A/C <b>(Being factory overheads incurred)</b>	40,000	40,000
7/2/2022	Work-in-progress control A/C factory overheads control A/C <b>(Being work overheads absorbed by production)</b>	50,000	50,000
8/2/2022	Selling and distribution overheads control A/C cash A/C <b>(Being selling expenses paid)</b>	20,000	20,000
9/2/2022	Finished stock ledger control A/C Work-in-progress control A/C <b>(Being cost of completed output transferred to finished stock)</b>	250,000	250,000

<b>10/2/22</b>	Cost of sales A/C finished stock ledger control A/C selling and distribution overheads A/C <b>(Being cost of goods sold)</b>	270,000	250,000 20,000
<b>11/2/2022</b>	Sundry debtors A/C Cash (or bank) sales A/C <b>(Being goods sold 50% on credit)</b>	187,500 187,500	375000
<b>12/2/2022</b>	Cash (or bank)A/C sundry debtorsA/C <b>(Being receipts from debtors A/C)</b>	100,000	100,000
<b>13/2/2022</b>	Sundry Creditors A/C cash (or bank)A/C <b>(Being payment made to creditors)</b>	100,000	100,000



### Application activity 6.2

- 1) Explain the meaning of the following terms in the context of cost accounting under interlocking system.
  - a) Notional rent
  - b) Dividends received
  - c) Notional interest
  - d) The double entry method
  - e) The third entry method
- 2) Outline the advantages to a business firm of using an integrated cost accounting system.
- 3) State possible causes of differences between reported profit in cost accounting and financial accounting under the non-integrated cost accounting system.



## Skills Lab 6



Identify any Manufacturing Company in around your location. Visit that company and find out if the company keeps any records. Identify the records that are kept and the kind of company information such records capture. Analyze the identified records, interpret them and advice this company on what to do to be able to earn desired profit. Generate a report of your findings.



## End of unit assessment 6

### I. Choose the correct answer

- 1) Issue of material is credited to:
  - a) Stores ledger control A/C
  - b) Work-in progress control A/C
  - c) Overheads control A/C
  - d) Cost ledger A/C
- 2) The cost of materials, wages and overheads of each job undertaken is posted in
  - a) General ledger adjustment account
  - b) Stores ledger control accounts
  - c) Work- in-progress ledger
  - d) Finished goods control account
- 3) Non-integrated system of accounting is also known as
  - a) Cost ledger accounting
  - b) Interlocking accounting system
  - c) Cost ledger accounting or interlocking accounting system
  - d) Cost Centre accounting
- 4) Ledger control account is :
  - a) An account in the cost ledger to record financial accounting items
  - b) An accounting in financial ledger to record financial accounting items
  - c) An account that summarized outstanding payables balances
  - d) An accounting that summarizes outstanding receivables balances



The financial accounts of NMG manufacturing Company showed a profit of FRW 22,700 and for the same period the cost accounts showed a profit of FRW 23,100. Comparison of the two sets of accounts revealed the following:

a) Stock valuations:

Particulars		Cost Accounts FRW	Financial Accounts FRW
Raw materials	Opening stock	6,800	7,200
	Closing stock	5,400	5,100
Finished goods	Opening stock	13,200	12,900
	Closing stock	11,400	11,100

No rent is shown in the financial accounts but a notional rent of FRW 1,500 was charged in the cost accounts during the period.

- b) During the period the company sold an old machine and made a loss of FRW 2,100 on the sale. This was not recorded in the cost accounts.
- c) Depreciation charge in the financial accounts was FRW 2,500 based on the straightline method. In the cost accounts depreciation was charged at a rate of FRW 5 per unit produced. During the period, the company produced 600 units.
- d) Other items appearing only in financial accounts include:
- Dividends received FRW 1,300
  - Interests paid of FRW 800
  - Corporation tax paid FRW 3,300
  - Interest income FRW 1,900
  - Company donations FRW 800
  - Dividends paid FRW 700
  - Miscellaneous income FRW 2,800

Required: Prepare a Memorandum reconciliation account for NMG manufacturing company.

## BIBLIOGRAPHY

- 1) BOUQUIN, H. (Aout 2006). *Comptabilité de gestion*. Paris: Economics loterry.
- 2) Bwisa, P. H. (2011). *Entrepreneurship theory and practice*. Kenyan perspective Nairobi Kenya.: Jomo Kenyatta foundation.
- 3) Charles T.Horngren, S. M. (Eleventh Edition, 2003). *Cost Accounting (Managerial Emphasis)*, . Prentice hall.
- 4) D, W. (2008). *Foundation of Accounting*. Nairobi: East African Education Publisher Ltd.
- 5) Drury, C. (2001). *Costing-An introduction* (Vol. fourth edition ). Oxford: Aden group,.
- 6) George Manu, R. N. (2008). *Know About Business*. Turin, Italy: International Training Centre of the ILO.
- 7) GRANDGUILLOT, B. &. (2001). *Comptabilité analytique* (Vol. 4eme edition ). Gualino eduteur.
- 8) GRANDGUILLOT, B. (2001). *Comptabilité analytique* . Gualino editeur.
- 9) GROVES, M. P. (2006). *Company accounts,(Analysis,interpretation and understanding)* . Etiennes.
- 10) ICPAR . (December 2018). *Managing Costs and Cashflows* . London :: BBP Learning Media Ltd.
- 11) ICPAR. (August 2018,2019). *Management Accounting, Certified Accounting Technician (CAT)*. BPP Learning Media ltd.
- 12) ICPAR. (2018). *Principles of Costing / Stage 1*. London : BBP Learning Media ltd.
- 13) J.MADEGOWDA. (2007). *Cost Accounting* . Mumbai:: Himalaya Publishing Ltd.
- 14) Jourdain, L. D. (2003). *Comptabilité Analytique de gestion*. 4 eme édition: édition DUNOD.
- 15) Kennedy, J.-Y. E. (1998). *Lexique bilingue de la comptabilité et de la finance*. ED,POCKET.
- 16) Lynne Butel, L. C. (1998). *Business functions an active learning approach*. oxford.United Kingdom:: Blacwell Publishers ltd.
- 17) MAHESHWARI, S. M. ( ninth edition 2005). *Advenced accountancy*. VIKAS Publishing house: PVT LTD.
- 18) Mary, G. (2010). *Ways of Thinking About Our Values in Work place". Giving Voice to Values*. Babson College .

- 19) MHL. (2004). *Production services limited, couventry zrinski*. sixth edition.
- 20) N.A.Salemi. (2013). *Cost Accounting Simplified*. Nairobi: Salemi Publication Ltd.
- 21) Peter Hagan, A. B. (2003). *Higher Business Management* . Scotland. UK:: J&L composition.
- 22) SANGSTER, F. &. (2002,2005). *Business accounting*. ninth edition: Prentice hall.
- 23) Ssempija, M. (2011). *Entrepreneurship Education for Advance level and business institutions*. Kampala. Uganda: Book shop Africa.
- 24) T.Horngren, C. ( 2003). *Cost Accounting(Managerial emphasis)*. eleventh edition : prentice hall.
- 25) [www.icsi.edu](http://www.icsi.edu).