



Course Instructor: Engr. Saeeda Kanwal

# Chapter Outcome

*After reading this chapter, you should, in simple cases:*

- *be able to calculate the cost of labor;*
- *understand the concept of overheads and the different ways in which they may be distributed;*
- *be able to determine how much it costs to produce a particular product or provide a specific service;*
- *understand how to produce a budget and a cash flow forecast, and how to monitor them.*

# Cost of Labor

Suppose you decide to set up a company that makes computers. The company buys items like processor boards, memory chips, hard disks, and so on.

It then assembles the machines, installs and configures the software, and delivers the computer to the customer.

There is no problem in working out the cost of the components that go into the computers. What is more difficult is working out the cost of labor.

# Cost of Labor.....

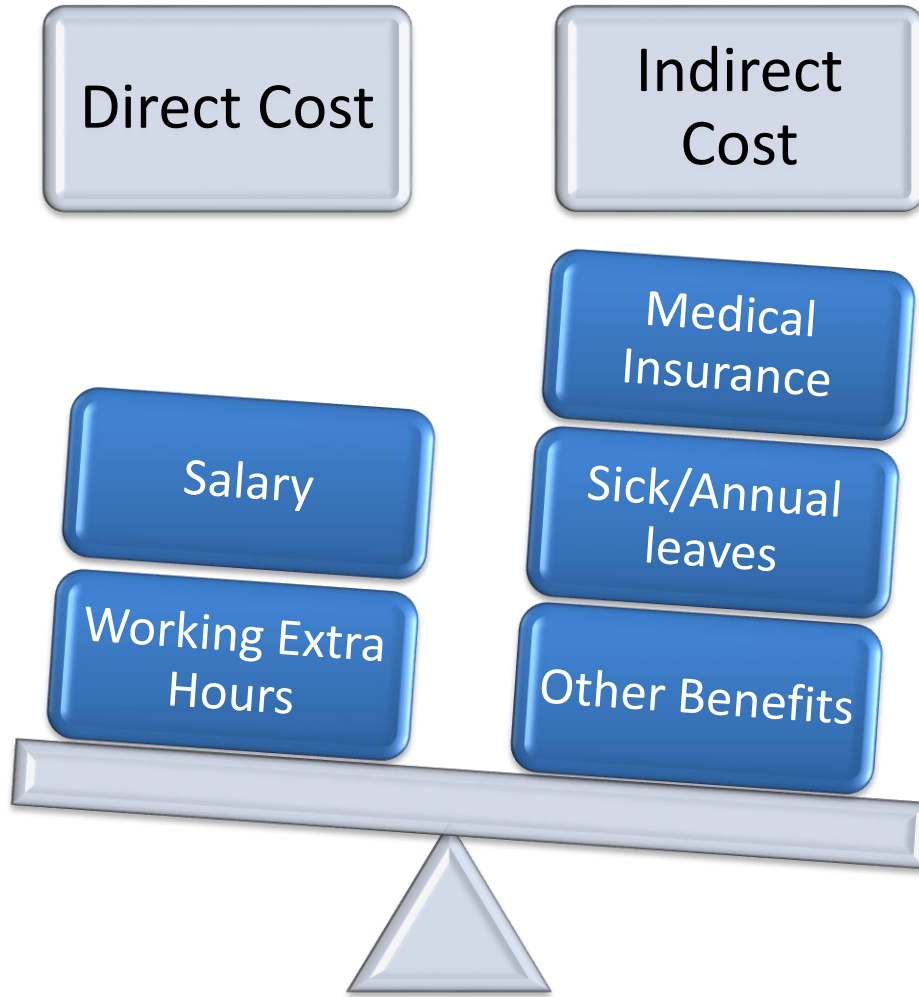
The cost of employing someone is more than just the cost of their salary. In most countries, employers are required to pay a tax for every employee.

This tax is known as *employers' National Insurance Contribution* (in the UK) or *Social Security contribution* (in USA); it is proportional to the employee's salary.

In some countries, this contribution may be as large as 60% of the salary, while in others it is much smaller.

In the UK the rules for calculating the national insurance contribution are complicated and change frequently, but for simplicity we shall take it as 10% of the salary.

# Cost of Labor.....



## Pension



# Cost of Labor.....

There are other costs associated with an employee, like a *pension scheme*, to which the company makes a contribution on behalf of each employee.


The company may also provide *medical insurance* for its employees. Senior employees may be provided with a *car* or *other benefits*.

The total cost of employing a person, the salary plus employers' social security contributions plus any other costs is sometimes known as the employee's *payroll cost* or *direct cost*.

Suppose that a technician who assemble the computers and is paid an annual salary of £20,000, then his payroll costs are £22,000.

## Salary Certificate and Tax Deduction

**Name :** Saeeda Kanwal  
**Designation :** Lecturer (Computer Science)  
**Business Unit :** Karachi

**Ref :** 11K-517/NU-R/18  
**CNIC :**   
**NTN :**

This is to certify that following payments were made under head "Salary" for the period from July 2018 to June 2019

### Payments:

Salary

Allowances

**Total Payments**



It is further certified that following deductions were made during the above mentioned period.

### Deductions:

<b>Provident Fund</b>	<b>Rs. 20,737.00</b>
<b>(Employee Share)</b>	Twenty Thousand Seven Hundred And Thirty-Seven Rupees Only
<b>Income Tax (u/s 149)</b>	<b>Rs. 600.00</b>
	Six Hundred Rupees Only

The amount deducted as Income tax u/s 149 of the Income Tax Ordinance, 2001 was deposited in Government Treasury by the employer.

**Date: October 01, 2019**

This is a computer generated "Salary Certificate and Tax Deduction" report and requires no signature

# Cost of Labor.....

To calculate the cost of the time the technician spends assembling a computer, the annual payroll cost is not very helpful.

Instead we need to know the cost per hour. This is not so simple to calculate. First, we need to calculate how many days we can expect the technician to work.

There are 52 weeks in a year. Assuming the company works a five-day week, there will be 260 week days.

However, the company will be closed for public holidays. The number of public holidays varies from country to country and even within a country.



# Cost of Labor.....

Additionally, employees also get some amount of paid leave. They may also miss some working days because of sickness, which is hard to predict in advance.

Finally, there maybe some days in the year when, due to scheduling difficulties, there will be no revenue-earning work available for the employee.

*Table 7.1* shows how all these factors can be taken into account to obtain a figure for the number of revenue-earning working hours over a period of one year.

# Cost of Labor.....

TABLE 7.1 *Calculation of the number of revenue-earning hours in a year*

(1)Total number of weekdays	260
(2)Public holidays	10
(3)Annual leave	20
(4)Sick leave	5
(5)Unproductive time	10
(6)Total non-revenue-earning time (2) + (3) + (4) + (5)	45
Total number of revenue earning days (1) – (6) = (7)	215
Total number of hours available (7) x7(Hours/day)	1505
Direct cost of the technician is	£22,000/year
thus cost/hour of their time is	£22000/1505 = £14.62

# Overheads

Costs that cannot be directly associated with a particular product are known as *overheads*. They are costs that ultimately the business has to pay and have to be added to the direct costs of the products.

Consider a company who assembles computers. It has three technicians and a part-time secretary. It makes three models of computers. It owns a van for delivery of computers to customers.

*Table 7.2* shows the cost of the components, number of hours of technician time to build one, and the expected sales of that model over the next year.

# Cost of Labor.....

TABLE 7.2 *Direct costs & expected sales for the different computer models*

Model	Cost of components (£)	Technician time hours	Expected sales
Basic	200	10	200
Advanced	300	12	100
Professional	400	15	50

# Overheads.....

We will show how this scenario might lead to annual overheads of £63,500, which the company has to recover from its sales.

There are at least three commonly used ways that we might spread these overheads over the computers sold.

The simplest way is to allocate the same overhead to each computer sold, regardless of the cost of the components or the amount of labor involved.

# Overheads.....

Since we expect to sell 350 units, this means overhead per computer =  $\text{£}63,500/350 = \text{£}181.43$

- This means that the Basic model would cost:

$$\text{£}181.43 + \text{£}200 + 10 \times \text{£}14.62 = \text{£}527.63$$

- The Advanced model would cost:

$$\text{£}181.43 + \text{£}300 + 12 \times \text{£}14.62 = \text{£}656.87$$

- and the Professional model would cost:

$$\text{£}181.43 + \text{£}400 + 15 \times \text{£}14.62 = \text{£}800.73$$

$$\text{£}14.62 = \text{cost of labor/Hour}$$

# Cost of Labor.....

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# Overheads.....

The second way of allocating the overhead is to make it proportional to the number of hours of labor involved.

This means adding an overhead component to the cost of an hour of a technician's time.

Since we have three technicians, each supplying 1,505 hours of productive labor per year, we need to add

$$£63,500 / (3 \times 1505) = \text{£}14.06$$

to the cost of an hour's labor, making it up to

$$£14.62 + £14.06 = \text{£}28.68.$$

# Overheads....

Now the cost of the three models comes out at:

- $£200 + 10 \times £28.68 = £486.80$  (Basic)
- $£300 + 12 \times £28.68 = £644.16$  (Advanced)
- $£400 + 15 \times £28.68 = £830.20$  (Professional)

# Overheads.....

Finally, we can distribute the overhead in proportion to the total cost, that is, taking into account the cost of parts as well as the cost of labor.

This means that we take the direct cost (parts and labor) and add on a fixed percentage.

To calculate this % we divide the total overhead by the total direct cost of all the units we expect to sell, that is,

$$63,500 / (200 \times 346.20^* + 100 \times 475.44 + 50 \times 619.30) = 0.43\%$$

\* $200 + 14.62 \times (10)$

# Overheads.....

This means the cost of the

Basic model is  $346.20 \times 0.43 = 148.87$ ,  $346.20 + 148.87 = \text{£ } 495.06$  **OR**

$\text{£}346.20 \times 1.43 = \text{£}495.06$

of the Advanced model,  $\text{£}475.44 \times 1.43 = \text{£}679.88$

and of the Professional model,  $\text{£}619.3 \times 1.43 = \text{£}885.17$

*Table 7.3* summarizes the cost (to the nearest pound) of the three different models according to the three different ways of distributing the overheads.

# Cost of Labor.....

TABLE 7.3 *Effects of different overhead calculations*

Model	Fixed overhead	Overhead proportional to labor content	Overhead proportional to total direct cost
Basic	528	487	495
Advanced	656	644	680
Professional	800	830	886

# Overheads.....

The costs calculated in this way can form the basis for pricing the computers.

Certainly, computers should not be sold at prices that are lower than the costs.

More commonly, the prices will be set on the basis of how much customers will be willing to pay, and this depends very much on the competition.

The cost calculations will, however, show us where our costs lie and how to reduce them so that we can sell our products more cheaply

# Budgeting



# Budgeting

A budget is a financial plan showing the expected income and expenditure for an organization over a specific period, typically one financial year.

As a simple example, we consider the company that assembles and sells computers.

Table 7.4 shows an estimate of the company's costs and its income over a year of operations.



**TABLE 7.4** *An example budget***Overhead Expenditure**

Owner's payroll costs	42,000
Secretary's payroll costs (part time)	8,000
Costs of van (including depreciation)	3,500
Internet connection, telephone, postage, etc.	1,000
Advertising	2,000
Premises (heating and lighting, rent, rates, etc.)	4,500
Professional fees	1,000
Insurance	500

<b>Total overheads</b>	<b>63,500</b>
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**Operating costs**

Technicians' payroll costs	66,000
Bought-in components	90,000

<b>Total manufacturing costs</b>	<b>156,000</b>
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<b>Total costs</b>	<b>219,500</b>
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**Sales income**

Basic model (200 @ £595)	119,000
Advanced model (100 @ £795)	79,500
Professional model (50 @ £895)	44,750

<b>Total sales</b>	<b>243,250</b>
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<b>Profit</b>	<b>24,750</b>
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# Budgeting...

Most of the entries for overhead expenditure are obvious enough, but two items may require some explanation.

The company is run by its owner and for reasons like taxation and social security, owners should treat themselves as employees and pay themselves a salary, rather than attempt to live on the company's profits.

This is the item labelled '*Owner's payroll costs*'. The services of an accountant will be necessary to prepare the annual accounts and give advice from time to time.

# Budgeting...

The advice of a lawyer may also be necessary from time to time.

These items are covered under the heading '*Professional fees*'.

Finally, employers are legally required to carry insurance to cover any claim against them for injuries suffered by employees during the course of their employment.

Other insurance, against theft from the company's premises for example, may also be necessary. This explains the heading '*Insurance*'.

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# Budgeting...

The overheads is the figure that we used in the previous section when calculating the costs of the different models of computers.

*'Operating costs'* is also called *'fixed costs'*, is the costs that the company incurs even if it doesn't sell a single computer.

The cost of *components*, in contrast, is a variable cost and will increase if we sell more computers than we expect, or decrease if we sell fewer.

The cost of the technicians can also be adjusted to match the sales volumes.

# Budgeting...

The *sales income* is based on the company's best estimate of how many computers it can sell and at what price.

We note that the prices are not directly related to the costs (by whatever method of calculation).

Once a budget has been agreed, it should be used to monitor the company's financial progress.



The first step is to break it down to show monthly income and expenditure. A budget broken down in this way is sometimes called a *profiled budget*.

# Budgeting...

At the end of each month, the management then compares what has actually happened during the month with what was planned in the budget.

Where there are exceptions, that is cases where income or expenditure differ significantly from what was planned, the management will investigate the reasons for the exceptions and decide what action, if any, to take.

For example, if sales income is lower than what predicted, managers may decide to do advertising or decide to cut costs by reducing staff (Downsizing).

# Cash Flow Forecast

A company may be very profitable but unable to pay its bills. For that reason, it may be forced into receivership.

This apparent paradox typically arises because bills have to be paid, in particular staff have to be paid salaries, before the income they generate is received.

In order to avoid this difficulty businesses need to prepare cash flow forecasts, that is, estimates of the amount of money that will flow into and out of the company each month.



# Cash Flow Forecast.....

Table 7.5 shows a cash flow forecast for our example company's operations. In order to keep the overall picture clear, we have only shown a six-month forecast.

In practice, companies normally try to forecast twelve months ahead. We have also made the rather unrealistic assumption that the company is launching into its operations at full stretch from day 1.

Finally, because sales and energy costs are both seasonal, we have assumed that the company is starting operations on 1 January.

# Cash flow Forecast

	Month 1	Month 2	Month 3
<b>Opening Balance</b>	Equals closing balance of the previous month		
<b><u>Inflows</u></b>			
<b>Inflow A</b>			
<b>Inflow B</b>			
<b>Total Cash Inflows</b>	= sum of all Inflows so Inflow A + Inflow B		
<b><u>Outflows</u></b>			
<b>Outflow A</b>			
<b>Outflow B</b>			
<b>Outflow C</b>			
<b>Outflow D</b>			
<b>Total Cash Outflows</b>	= sum of all Outflow so Outflow A through D		
<b>Net Cash Flow</b>	= Inflows - Outflows		
<b>Closing Balance</b>	Opening balance + Net Cash Flow		

**TABLE 7.5** *A six-month cash flow prediction*

<b>Month</b>	<b>Jan</b>	<b>Feb</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>
<b>Cash outflow</b>						
Rent and property taxes	500			500		
Energy costs		400	400	300	200	200
Payroll costs	9,666	9,666	9,666	9,666	9,666	9,666
Communications		83	83	83	83	83
Insurance	500					
Components		4,000	7,000	10,000	10,000	10,000
Advertising		500		250		500
Road tax and insurance on van	700					
Professional fees			300			
Van operating costs	100	100	100	100	100	100
<b>Monthly cash outflow</b>	<b>11,466</b>	<b>15,349</b>	<b>17,549</b>	<b>20,899</b>	<b>20,049</b>	<b>20,549</b>
<b>Cash inflow</b>						
Income from retail sales	5,000	5,000	5,000	5,000	5,000	5,000
Income from trade sales		5,000	7,000	10,000	15,000	18,000
<b>Monthly cash inflow</b>	<b>5,000</b>	<b>10,000</b>	<b>12,000</b>	<b>15,000</b>	<b>20,000</b>	<b>23,000</b>
<b>Net monthly cash flow</b>	<b>(6,466)</b>	<b>(5,349)</b>	<b>(5,549)</b>	<b>(5,899)</b>	<b>(49)</b>	<b>2,451</b>
<b>Cumulative cash flow</b>	<b>(6,466)</b>	<b>(11,815)</b>	<b>(17,364)</b>	<b>(23,263)</b>	<b>(23,312)</b>	<b>(22,861)</b>

# Cash Flow Forecast.....

The figures in each cell show the amount of cash entering or leaving the company during that month, under the heading given at the left-hand end of each row.

Thus the figure of £500 given in the 'January' column and the 'Insurance' row means that an insurance premium of £500 will be paid sometime in January.

The figure of £7,000 in the 'March' column and the 'Income from trade sales' row means that £7,000 will enter the company's bank account in March as a result of trade customers paying invoices.

# Cash Flow Forecast.....

We have assumed that retail sales, that is sales to individuals, are paid for immediately and that these run at a steady level of £5,000 per month throughout the period.

Trade sales, that is sales to businesses, are typically paid for in the month following delivery. We expect these sales to increase steadily during the period.

# Cash Flow Forecast.....

The total receivables for the six-month period is estimated to be £85,000.

Since trade sales made in month 6 will not appear in this figure, it looks as though the sales for the period are estimated to be around £105,000.

The budget (Table 7.4) is based on total sales of £243,250,

leaving £138,250 to be earned in the second six months as the demand both from consumers & from businesses is traditionally at its highest in September, October and November.

**TABLE 7.4** *An example budget***Overhead Expenditure**

Owner's payroll costs	42,000
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# Cash Flow Forecast.....

This forecast shows that, at no time during the period, will the cash received come close to balancing the cash paid out.

At the worst point, at the end of month 5, the cash paid out will be £23,312 more than the cash received.

This has nothing to do with the company's profitability; it could well be that the company is on track to meet the budget in Table 7.4 and make a respectable profit.

Nevertheless, the company will need to have at least £23,312 available in cash if it is to keep operating through this period.



# Cash Flow Forecast.....

Prudence suggests that it should plan on requiring £30,000 to allow for things going wrong.

The amount of cash required to allow the company to continue to operate over a period is known as its *cash requirement*.

It is also often referred to as *working capital*, although this term is more correctly used to refer to the difference between current assets and current liabilities.

The two concepts are related but they are not identical.

# Cash Flow Forecast.....

The traditional way of funding a company's cash requirement is through a bank overdraft, but banks are not always eager to lend to small companies and loans from other sources may be necessary.

An initial cash flow forecast is an essential part of a business plan but a well-run company will maintain a rolling 12-month cash flow forecast.

That is, each month it will produce a new cash flow forecast for the next 12 months, the first 11 months of which will be an updated version of the figures in the previous month's forecast.

# Cash Flow Forecast.....

Such forecasts will provide early warning of any prospective cash shortage and banks will generally respond well to a request for an increase in overdraft facilities that is made well in advance and based on detailed cash flow predictions.

At first sight, cash flow forecasts and budgets seem very much the same thing. It is important to understand the difference.

Cash flow forecasts deal with the flow of cash or its equivalents in and out of the company.

# Cash Flow Forecast.....

Budgets deal with income and expenditure.

If our company delivers computers worth £100,000 to a large customer today and sends it an invoice, this will immediately appear as income when we are monitoring the budget.

However, it may be three or four months before the invoice is paid and the corresponding sum appears as cash. The difference can be crucial.

# References

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