NATIONAL OPEN UNIVERSITY OF NIGERIA

MPA 823

Project Management

Module 2

MPA 823 Project Management
Module 2

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Unit 1 Cost Estimates: Definitions and Principles

1.0 Introduction

Generally, in project management, it is very important to accurately estimate the cost of a project. It is even more necessary for management decision and control. Before a project comes on stream, the cost implications must be known well in advance and properly estimated. This serves as a guide to proper project management and control. Proper cost estimation will allow for proper planning of costs, allocation of resources to various units of a project, cost control and most importantly budgetary control.

2.0 Objectives

At the end of this unit, you should be able to:

- explain the general nature of cost estimates
- discuss the definitions and principles of cost estimation.

3.0 Main Content

3.1 Cost Definitions and Principles

The word "cost" when used in accounting conveys lots of meaning and so must be properly qualified. There are many types of costs and part of our discussion in this unit is to properly discuss various costs and see how they properly fit into the study of project management. It is so because when we mention "cost", we should clarify the type of cost we are talking about.

Let us discuss the key types of costs that are important for our study.

3.1.1 Direct Costs

Direct costs are those costs which are attributed directly to a job or project. For example, if an engineer spends five hours to design an engineering column, then that time spent by the engineer can be described as a direct labour and the cost can be recorded as a direct cost to be charged directly to the design of the engineering column.

3.1.2 Factory Costs

The concept of factory cost is mainly applicable to manufacturing concerns. Factory cost is the total cost of a job or project before the addition of a mark-up for the purpose of profit. Factory costs will include the following:

- direct materials costs
- direct labour costs
- indirect labour costs
- design costs.

3.1.3 Fixed Costs

Fixed costs are those costs which remain virtually unchanged and must continue to be incurred even though the workload might fluctuate between zero and the maximum or installed capacity. Fixed costs will generally include the following:

- management salaries
- administrative salaries
- heating and electricity expenses
- insurance
- maintenance of building, etc.
- business permits.

3.1.4 Indirect Costs

In an ideal setting like a manufacturing facility, the provision of office accommodation, management, welfare services, accounting, heating and lighting all constitute costs that must be incurred in running the manufacturing facility. Others will include salaries and wages. Generally, all these cost are termed indirect costs or overhead costs.

Self-Assessment Exercise

1. What is "cost" in relation to project management?
2. Discuss the types of costs.

Table 1: Cost Structure for a Simple Manufacturing Project

ITEM	**N**
Iron flat sheets	1,000,000
Brass rods	2,000,000
Aluminum profiles	3,000,000
Total cost of direct materials	6,000,000
Direct Labour	
Design – engineering labour	200,000
Manufacture – factory hands	700,000
Total direct labour	900,000
Overheads	1,350,000
Total factory cost	8,250,000
Mark up at 30%	2,475,000
Market selling price	10,725,000

3.1.5 Standard Labour Costs

Labour constitutes a very critical component of project cost. It includes the labour of both junior and senior personnel, engineers, accountants and the rest who are involved in a project. When trying to estimate the labour cost for any project, it would be very difficult

to use the different rates of pay to be earned by every individual. There might be two engineers engaged in a project but they may not be earning the same salaries. Generally, in project management, it is advisable to use standard costing to estimate the cost of labour.

For labour costs, it is convenient to classify people according to some convenient rules based on the type of jobs that they do.

For example, engineers in a project may be averaged out to cost N1,000,000 per annum. Therefore, we can estimate that the standard cost for an engineer for a project is N1,000,000 per annum. That is the cost that will be imputed in the cost estimate for engineers.

Also, for accountants involved in a project, there may also be the need to work out the standard cost for an accountant. For example, we might estimate the standard cost for an accountant to be N1,500,000 per annum.

For all types of labour, we should have estimates of the standard costs. It enables the project to be properly cost.

Table 2: Example of Labour Grade for Standard Costing in a Project Engineering Company

Grade	Those Included	Comments	Salary per annum N
01	Company Director	-	5,000,000
02	Divisional Heads	Rank of general manager	4,000,000
03	Assistant Divisional Heads	Rank of assistant general manager and above	3,000,000
04	Management Cadre	Rank of senior managers and above. Includes senior engineers and architects	2,500,000
05	Engineers	Managers	2,000,000
06	Technologists	Deputy managers	1,500,000
07	Draughtsmen	Assistant managers	1,500,000
08	Administrative Staff	Clerks, Secretaries, etc.	1,000,000

3.1.6 Overhead Recovery

In table 1, we saw the cost structure for a simple manufacturing project. We easily computed the cost of direct materials and also direct labour. We also recorded overheads. In practical terms, direct labour costs are not difficult to estimate.

Direct labour cost is equal to time recorded on a job multiplied by the standard hourly rate. So, how can we recover overheads?

An amount can be added that is proportional to labour cost (usually a percentage) to recover a part of a company's indirect overhead costs. In table 1, we saw total direct labour as N900,000. Overheads standing at N1,350,000 is about 150% of total direct labour costs. Generally, the method of recovering overheads as a levy on direct labour costs is called

absorption costing. However, setting the percentage overhead rate is a technical matter requiring professional accounting skills.

3.2 Work Breakdown

Consider a project to build a new university at Ulakwo which is about 20 kilometres from Owerri, the Imo State capital. Even where we have defined the project as a new university, it will be very necessary to consider the total picture of the new university project.

The university project will include the following:

- access roads
- administrative buildings
- lecture halls
- clinics
- laboratories
- churches and mosques
- student's hostels
- university teaching hospital complex.

Breaking the total project into smaller units constitutes what is referred to as a work breakdown. Work breakdown enables the project managers or administrators to break down a large or complex project into smaller and more manageable units.

The ideal thing to do is to break a project into smaller units called sub-projects. The sub-project itself could be further divided into much smaller units for effective analysis and design.

When a project is broken down into smaller sub-projects, it becomes very easy to cost each sub-project properly. After costing each sub-project properly, then we could then add up the costs of the sub-projects to generate the cost of the total project.

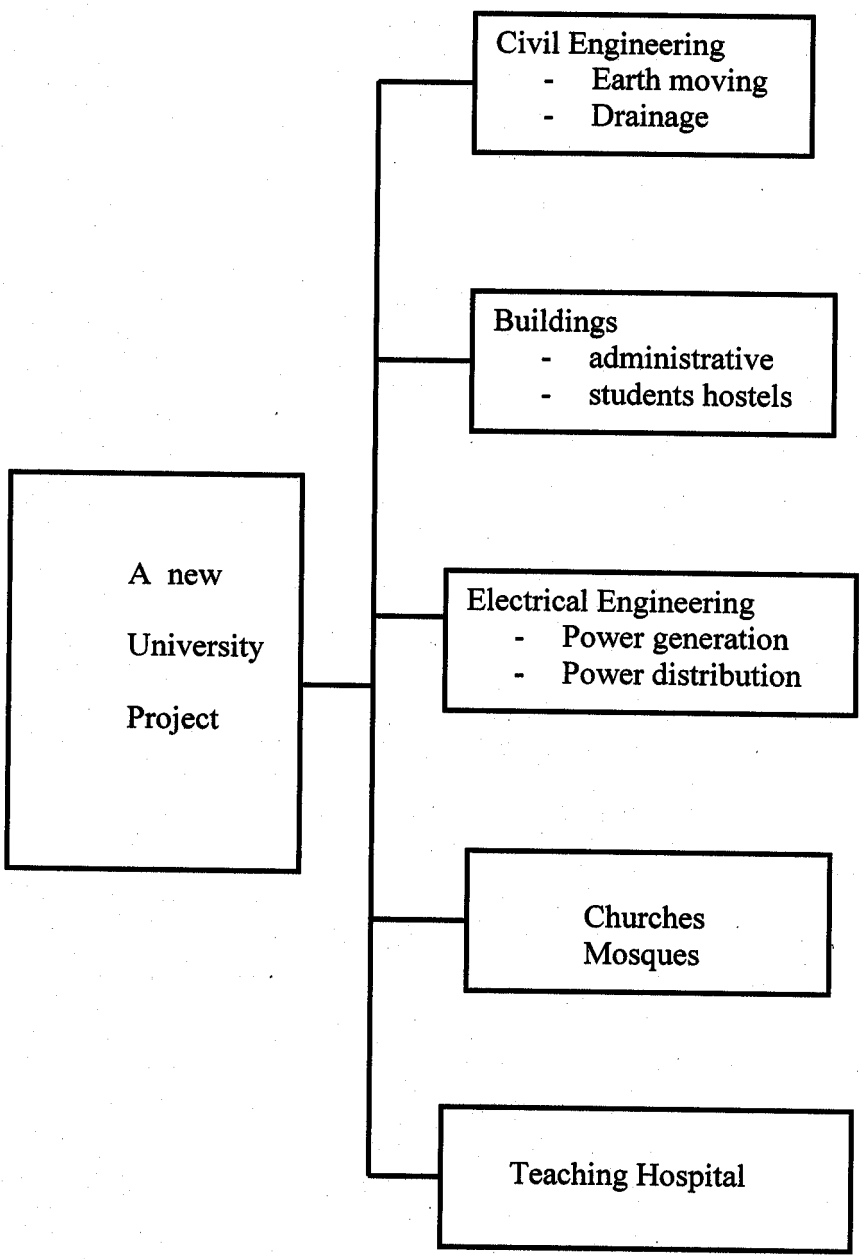

Fig. 1: Work Breakdown for a New University Project

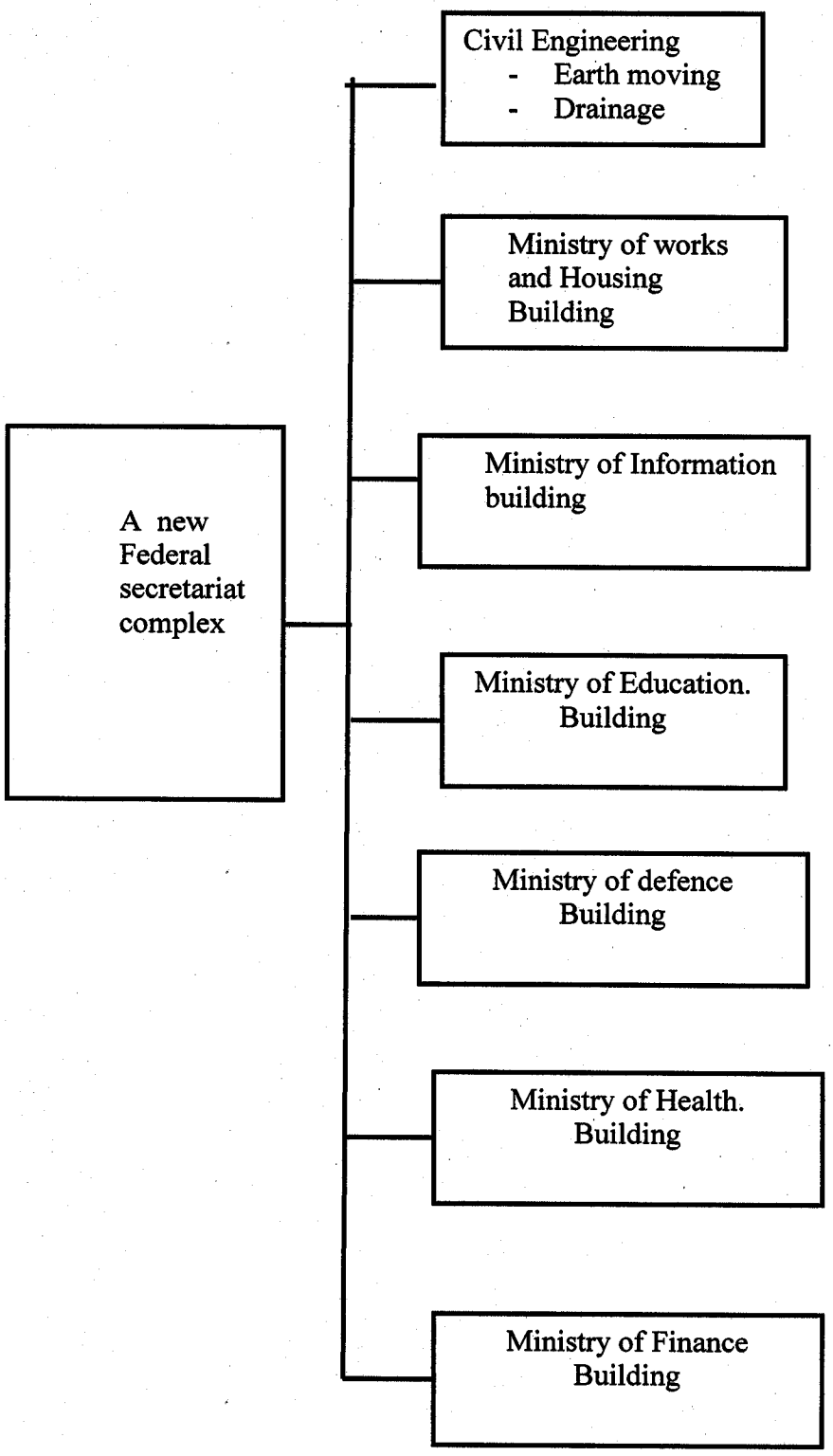

Fig. 2: Work Breakdown for a New Federal Secretariat Complex at Abuja

4.0 Conclusion

In this unit, we discussed cost estimates: definition and principles. We discussed direct costs, factory costs and fixed costs. We discussed standard labour costs and overhead recovery. We also discussed the concept of work breakdown. All these have enabled us to understand the basic principles of cost estimates.

5.0 Summary

This unit treats cost estimates: definitions and principles. The definitions and principles enable us to have a general background to the understanding of project costs.

6.0 Self Assessment Exercise

Discuss, using a practical example, the concept of work breakdown.

7.0 References/Further Reading

Association of Cost Engineers. (1991). *Estimating Checklist for Capital Project.* (2nd Ed.). London: Spon.

Smith, N. J. (1995). *Project Cost Estimating.* London: Thomas Telford.

Unit 2 Cost Estimates: Practical Estimation

1.0 Introduction

In unit 1, we laid the foundation for unit 2. We discussed definitions and principles of cost estimates. In this unit, we want to take a practical approach and use a practical example of a project. To guide our discussions, we shall define project costs as all those costs that are incurred in the process of setting up a project. The costs must be attached to the project. The list of project cost item must be exhaustive.

2.0 Objectives

At the end of this unit, you should be able to:

- explain cost estimates in practice
- prepare the cost estimates of a project.

3.0 Main Content

3.1 Practical Estimation

We need to arrange the cost items in an orderly and consistent manner so that like items stay together. To ease our discussions and to make them as easy as possible, we shall divided project costs items into the following sub-headings:

- cost of land
- cost of building
- cost of machinery and equipment
- cost of utilities
- cost of furniture and other fittings
- cost of vehicles
- pre-operational expenses
- working capital.

Although we have listed the cost sub-headings, we shall go ahead and prepare a small checklist that will guide us. After the checklist, we will work through a practical demonstration using a vegetable oil refining plant as example.

Table 1: Cost of Land Checklist

	Have you included this in your cost
Cost of purchase of the land Cost of surveying the land Cost of certificate of occupancy Cost of legal documentation Cost of perimeter fence	

Table 2: Cost of Land Checklist

	Have you included this in your cost
Cost of architectural design Cost of structural designs Cost of electrical designs Cost of factory buildings Cost of offices	

Table 3: Cost Buildings Checklist

	Have you included this in your cost
Cost of locally purchased machinery Cost of imported machine Freight and insurance costs Custom duties and other costs Installation and commissioning costs Test running costs	

Table 4: Cost of Machinery/Equipment Checklist

	Have you included this in your cost
Cost of private transformer Cost of generator Cost of water borehole with fittings	

Table 5: Cost of Utilities Checklist

	Have you included this in your cost
Cost of vehicles for management Cost of vehicles for other staff Cost of distribution vans Cost of distribution lorries	

Table 6: Cost of Vehicles Checklist

	Have you included this in your cost
Purchase of raw materials	
Purchase of diesel/fuel	
Payment of salaries	
Administration costs	
Selling costs	

Self-Assessment Exercise

List 10 items which you think should appear in project cost analysis of a start-up sachet water packaging plant.

Worked Example

Breakdown of Project Cost in a Vegetable Oil Refining Plant

Estimates of Project Cost		**N**
Land for the project		4,000,000
Civil works and foundations		5,000,000
Steel Structures		
Includes H beams, U channels, angles, checker plates, railing pipes, roofing materials		13,000,000
Total Land, Building and Steel Structures		22,000,000
Storage Tanks		
2 Units crude oil tank -200 tons	-	3,000,000
1 Unit refined oil tank – 300 tons	-	2,000,000
1 Unit fatty acid tank – 50 tons	-	850,000
1 Unit water storage tank – 20 tons	-	750,000
1 Unit diesel storage tank – 20 tons	-	750,000
1 Unit furnace oil tank – 20 tons	-	750,000
Sub-Total	=	8,100,000
Utilities		
1 Unit 500 KVA transformer	-	3,500,000
1 Unit 500 KVA generator	-	10,000,000
1 Unit water borehole	-	500,000
Sub-Total	=	**14,000,000**

Machinery and Equipment (Imported)

Full line vegetable oil refining plant consisting of the following:

- Continuous oil pre-treatment section
- Continuous bleaching section
- Continuous physical refining and deodorising section
- Thermal oil heating unit
- Water cooling and recirculation system
- Steam generation and distribution system.

Total C & F Lagos US$ 695,000 x N132	=	91,740,000
Bank charges (L/C, etc.)	=	500,000
Port clearing and other misc. charges	=	6,500,000
Sub-total machinery and Equipment	=	98,740,000

Pre-Operational Expenses

Feasibility Studies	=	300,000
Project management consulting services	=	500,000
NAFDAC for registration/documentation	=	150,000
Travels and tours (local and overseas)	=	500,000
Sub-total pre-operational expenses	=	1,450,000

Summary of Project Cost

Land, building and steel structures	=	22,000,000
Machinery and equipment	=	98,740,000
Storage tanks	=	8,100,000
Utilities	=	14,000,000
Pre-operational expenses	=	1,450,000
Sub-total	**=**	**144,290,000**
Working capital	=	30,617,994
Project Grand Total	**=**	**174,907,994**

Analysis of Working Capital Requirements

		N
1 week purchase of raw materials	=	9,697,261
1-month factory salary/wages	=	482,820
1-month diesel, oil and lubrication expenses	=	437,913
Total	**=**	**30,617,994**

Proposed Financing Plant (N)

	Project Sponsor	Bank	Total
Land, building and steel structures	9,000,000	13,000,000	22,000,000
Machinery and equipment	20,800,000	77,940,000	98,740,000
Storage tanks	-	8,100,000	8,100,000
Utilities	14,000,000	-	14,000,000
Pre-operational expenses	1,450,000	-	1,450,000
Sub-total	45,250,000	99,040,000	144,290,000
Working Capital	30,617,994	-	30,617,994
Total	**75,867,994**	**99,040,000**	**174.907,994**

Contribution ratio

Project sponsor = 43.3%

Bank = 56.7%

Total = 100%

4.0 Conclusion

In this unit, we discussed project cost analysis. In doing this, we agreed that cost of land, buildings, machinery and equipment, utilities, furniture and fittings, etc. all form part of total project cost. We also used a checklist to guide preparation of the cost analysis. Finally, we used a worked example of a vegetable oil refining plant to throw more light on project cost analysis.

5.0 Summary

Project cost analysis is important to both the project initiator and the financial analyst who may want to evaluate a project. In the next unit, we shall discuss financial project appraisal.

6.0 Tutor–Marked Assignment

Why do you think that it is important to know the total cost of a project?

7.0 References/Further Reading

Leon, Ikpe (1999). *Project Analysis and Evaluation.* Impressed Publishers.

Smith, N. J. (1995). *Project Cost Estimating*. London: Thomas Telford.

Unit 3 Financial Project Appraisal

1.0 Introduction

Financial project appraisal seeks to present the methods to be adopted to measure the value of a project. The appraisal enables the analyst to choose between two or more projects once the values are known. Financial project appraisal enables government or management of a company to take proper investment decisions based on sound financial principles that are verifiable.

2.0 Objectives

At the end of this unit, you should be able to:

- explain what financial project appraisal is
- discuss the various methods used in appraising projects.

3.0 Main Content

3.1 Characteristics/Qualities in Project Appraisal Criteria

Any project appraisal criteria to be adopted should posses the following characteristics:

- It should provide a means of distinguishing between acceptable and unacceptable projects.
- It should be able to rank projects in order of their desirability.
- It should also be a criterion that is applicable to any conceivable project.
- It has to recognise that bigger cash flows are preferable to smaller ones and that early cash flows or benefits are preferable to later cash flows.

3.2 Project Appraisal Criteria - Types

Although there are a lot of project appraisal criteria, we shall discuss the most widely accepted criteria which are the traditional criteria and the discounted cash flow (DCF) criteria.

3.2.1 Traditional Criteria of Project Appraisal

In the traditional criteria, we shall discuss two methods, namely, the payback period and the accounting rate of return.

Payback Period
The payback period is one of the most popular methods of project appraisal. Payback period is defined as the number of years required to recover the original cash outlay invested in a project. If the project yields constant annual cash inflows, the payback period can be computed by dividing cash outlay by the annual cash inflow. So we say thus:

$$\text{Payback period} = \frac{\text{Cash outlay (investment)}}{\text{Annual cash inflow}}$$

Example

A project requires a cash outlay of N200,000 and yields an annual cash inflow of N50,000 for a period of 10 years. Calculate the payback period.

The payback period is $\frac{\text{N200,000}}{\text{N50,000}} = 4 \text{ years}$

However, it is to be noted that in the case of unequal cash inflows, the payback can be computed by adding up the cash inflows until the total is equal to the initial cash outlay.

The payback period is greatly admired by project evaluators because it is very simple to understand. Another good virtue of the payback period is that it costs less than most of the other sophisticated methods.

However, despite its simplicity, the payback period may not be very desirable investment criteria. In the first place, it fails to recognise the cash flows that come in after the payback period. Again, it fails to consider the pattern of cash inflows and that early cash inflows are better than later cash inflows.

Despite its weakness, payback period is very popular amongst analysts. Payback period tries to emphasise on early recovery of an investment. This means that it gives an insight into the cash inflows of the project.

Accounting Rate of Return (ARR)

The Accounting Rate of Return (ARR) is a method that uses accounting information to measure the profitability of an investment. The Accounting Rate of Return (ARR) is computed by dividing the average income after taxes by the average investment.

$$\text{ARR} = \frac{\text{Average Income}}{\text{Average Investment}}$$

Example

A project costs N100,000 and has a scrap value of N40,000. The streams of income before depreciation and taxes are N40,000, N50,000 and N60,000 for the first three years. The tax rate is 50% and depreciation is on straight line basis. Calculate the accounting rate of return for the project.

Solution

	Year 1	Year 2	Year 3
Earnings before depreciation and taxes	40,000	50,000	60,000
Depreciation	20,000	20,000	20,000
Net earnings before taxes	20,000	30,000	40,000
Taxes at 5%	10,000	15,000	20,000
Net earnings after taxes	10,000	15,000	20,000
Book value of investment beginning	100,000	80,000	60,000
Ending	80,000	60,000	40,000
Average	90,000	70,000	50,000

Average earning = 10,000 + 15,000 + 20,000 ÷ 3 = 15,000
Average investment = 90,000 + 70,000 + 50,000 ÷ 3 = 70,000

$$\text{Accounting rate of return} = \frac{15,000}{70,000}$$

= 21.42%

As an 'accept' or 'reject' criterion, the ARR method will accept all those projects whose ARR is greater than the minimum rate established by management. If the ARR is lower than the minimum rate established by management, then the project should be rejected. The ARR method is very simple from three main weaknesses. First, it uses accounting profits not cash flows in appraising projects. Second, ARR ignores the time value of money. The profits occurring in different periods are valued equally. Third, it does not allow the fact that profit can be reinvested to earn more profits.

Self-Assessment Exercise 1

Carefully appraise the accounting rate of return as a method of project appraisal.

3.2.2 Discounted Cash Flow (DCF) Method

We have discussed two of the traditional methods for appraisal of projects. One is the payback period while the other is the Accounting Rate of Return (ARR). Although two of them are simple to use and understand, they are not theoretically sound. Both of them fail to consider the timing of cash flows. Both fail to consider the time value of money. Because of these limitations, we shall consider two superior investment criteria which fully recognise the timing of cash flows. The two methods are the Net Present Value (NPV) method and the Internal Rate of Return (IRR) method. These two methods are referred to as Discounted Cash Flow (DCF) methods or the time-adjusted methods.

Net Present Value (NPV) Method

The Net Present Value (NPV) method is one of the Discounted Cash Flow (DCF) methods used in project appraisal. It fully recognises the time value of money. The method also correctly recognises the fact that cash flows arising at different time periods differ in value and are comparable only when their equivalent present values are found out.

The following steps are followed when computing the Net Present Value (NPV).

- A discount rate is selected to discount the cash flows. The correct discount rate should be the firm's cost of capital which is the minimum rate of return expected by the investors to be earned by the firm.
- The present value of cash inflows and outflows are computed using cost of capital as the discounting rate.
- The net present value (NPV) is the present value of cash inflows less present value of cash outflows.

The acceptance rule using the NPV method is to accept a project if the NPV is positive, and to reject it if the NPV is negative. If NPV is greater than zero, then the value of the firm is expected to increase. It is also important for us to understand the interpretation of net present value. Net present value may be interpreted to mean the immediate increase in the wealth of a firm if the investment proposal is accepted.

It is equal to an unrealised capital gain. Also, net present value can also be interpreted to represent the amount the firm could raise at a required rate of return in addition to the initial cash outlay to distribute immediately to its shareholders and by the need of the project's life to have paid off all the capital raised plus interest on it.

Example

Calculate the net present value of a project which cost N500,000 but generates cash inflows of N150,000, N300,000 and N400,000 over a three year period respectively. The required rate of return is:

Year	**Cash inflows**	**Discount factor at 10%**	**Present value of cash inflows**
	N		N
1	150,000	.909	136,350
2	300,000	.826	247,800
3	400,000	.751	300,400
		Total	**684,550**
	Less investment outlay		500,000
	Net present value		**184,550**

In terms of merit, the net present value method is very significant since it recognises the time value of money. It is also consistent with the objective of maximising the wealth of shareholders. However, the net present value suffers from the following limitations.

First, it is fairly difficult to use. Second, in computing the NPV, it is assumed that the discount rate which usually is a firm's cost of capital is known. But as we know, the cost of capital is a fairly difficult concept to measure in real life. Third, net present value may not yield a consistent answer when the projects being compared involved different amounts of investment.

Internal Tate of Return (IRR) Method

We have earlier discussed net present value as one of the Discounted Cash Flow (DCF) methods used in project appraisal.

The Internal Rate of Return (IRR) can be defined as that rate which equates the present value of cash inflows with the present value of cash outflows of an investment. Put in another way, the internal rate of return is the rate at which the NPV of an investment is zero.

It is called the internal rate because it depends solely on the outlays and the resulting cash inflows of the project and not any rate determined outside the investment.

Let C = Cash outlays of an investment

$\frac{A1}{(1+r)}$ = Cash inflow received in year 1 discounted at the cost of capital r.

$\frac{A2}{(1+r)2}$ = Cash inflows received in year 2 discounted at the cost of capital r.

$\frac{A3}{(1+r)3}$ = Cash inflows received in year 3 discounted at the cost of capital r.

Write the basic equation

$$C = \frac{A1}{(1+r)} + \frac{A2}{(1+r)2} + \frac{A3}{(1+r)3}$$

$$O = C - \frac{A1}{(1+r)} + \frac{A2}{(1+r)2} + \frac{A3}{(1+r)3}$$

The value of r in the equation at which total cash outlays equal total cash inflows is called the internal rate of return (IRR). Usually, the value of r can be found out by the trial and error. Generally, if the calculated present value of the expected cash inflows is lower than the present value of cash outflows, a lower rate should be tried. On the other hand, if the calculated present value of the expected cash inflows is higher than the present value of cash outflows, a higher rate should be tried.

Example

A barbing salon costs N32,400 to establish and is expected to generate cash inflows of N16,000, N14,000 and N12,000 over its life of 3 years. Calculate the internal rate of return.

Solution

Let us start by trying 16%

Year	**Cash inflow**	**Discount factor at 16%**	**Present value**
	N		**N**
1	16,000	.862	13,792
2	14,000	.743	10,402
3	12,000	.641	7,692
		Total	**31,886**
	Less cash outlay		32,400

Net Present Value (NPV) = -514

The net present value is – N514. at 16% discount factor. Let us try a lower rate like 14%.

Year	Cash inflow	Discount factor at 14%	Present value
	N		**N**
1	16,000	.877	14,032
2	14,000	.769	10,766
3	12,000	.675	8,100
		Total	**32,898**
	Less cash outlay		32,400
	Net Present Value (NPV) =		**498**

You will observe from the above calculations that when we tried 16% discount rate, the NPV was negative at – N514. When we tried 14% discount rate, the NPV became positive at N498. Therefore, the internal rate of return we are looking for lies between 14% and 16%.

The basic accept–or–reject rule, using the IRR method, is to accept the project if its Internal rate of return is higher than the firm's required rate of return. However, the project should be rejected if its internal rate of return is lower than the firms cost of capital.

It is important that we understand the interpretation of the internal rate of return (IRR). The internal rate of return (IRR) represent the highest rate of interest a firm would be ready to pay on funds borrowed to finance the project without being financially worse off, by repaying the loan principal plus accrued interest out of the cash inflows generated by the project.

We should also see the internal rate of return method as a very sound method. As we said, it is a discounted cash flow method and also it considers the time value of money. It is also compatible with the firm's desire to maximise the owner's wealth. However, the IRR method is fairly difficult to understand and it involves complex computations.

Self-Assessment Exercise 2

Distinguished between the net present value and the internal rate of return as criteria for project appraisal.

4.0 Conclusion

In this unit, we discussed project appraisal criteria which we said constitutes a very crucial topic in this course. We discussed traditional criteria of project appraisal where we dealt with the payback period and the Accounting Rate of Return (ARR). We also discussed discounted cash flow criteria. Here, we treated the Net Present Value (NPV) method and the Internal Rate of Return (IRR).

5.0 Summary

Project evaluation criteria provide us with the tools with which we can choose from various investment proposals using acceptable techniques. The appraisal criteria guides the project initiated and assists us to choose from among alternative projects. Also, banks use project appraisal criteria to decide whether or not to lend money for a project.

In the next unit, we shall discuss commercial management of projects.

6.0 Self Assessment Exercise

Why are the discounted cash flow (DCF) techniques better and more acceptable than the traditional methods of project appraisal?

7.0 References/Further Reading

Leon, Ikpe (1999). *Project Analysis and Evaluation.* Lagos: Impressed Publishers.

Raftery, J. (1993). *Risk Analysis in Project Management.* London: Spon.

Unit 4 Commercial Management of Projects

1.0 Introduction

In the last unit, we discussed financial project appraisal. In discussing financial project appraisal, we saw the various appraisal methods used in evaluating projects. The appraisal methods enable investors to choose among competing projects.

In this unit, we shall discuss commercial management of projects. Commercial management of projects focuses attention on the keys areas, namely:

- sourcing finance for projects
- contracts
- insurance.

2.0 Objectives

At the end of this unit, you should be able to:

- appraise the sourcing of finance for projects
- explain commercial management of projects.

3.0 Main Content

3.1 Sourcing Finance for Projects

Sourcing finance for projects is a very important aspect of project management decisions. Whether it is a public sector or private sector project, the sources of finance must be properly identified.

3.1.1 Borrowing from Banks

A key function of a bank is to lend money to individuals and organisations. Small businesses may be owned by individuals or by organisations and they too are entitled to approach banks for the various loan facilities.

Let us now discuss the various types of finance that are available from the banks.

Banks Loans

Banks normally grant loans to eligible business organisations to enable them undertake capital investments in sectors like agriculture, industry, and commerce.

Loans when granted are for specific reasons like purchase of manufacturing equipment, etc. Loans are usually payable over a fixed period of time and at agreed interest rates, and most banks will insist that the borrowers provide collateral security when borrowing from them.

Bank Overdraft

Bank overdrafts are advanced in most cases to organisations for enhancing of working capital. Most organisations obtain bank overdrafts and deploy them towards purchase of raw materials for manufacture of goods or to procure finished goods for resale. Usually,

bank overdrafts are for short periods of time like for one year. In practice, overdrafts are renewable.

Lease Finance

A lease is a contract whereby one party (the lessee) hires equipment from another party (the lessor) in a way that the lessee uses the equipment without purchasing it. In return, the lessee pays lease rentals and at the end of the lease period may have the option to purchase the equipment.

Lease finance is becoming a more popular type of finance for firms that do not want to purchase equipment.

3.1.2 Borrowing from the Bank of Industry Limited

The Bank of Industry Limited is Nigeria's oldest and largest Industrial financing institution. It was established in year 2001 out of the Nigerian Industrial Development Bank (NIDB) Limited, which was incorporated in 1964.

The bank's authorised share capital is set at $400 million. The mandate given to the Bank of Industry Ltd (BOI) is "providing financial assistance for the establishment of large, medium and small projects as well as expansion, diversification and modernisation of existing enterprises and rehabilitation of ailing ones,"

The Bank of Industry Limited can assist the following:

- Small, medium and large enterprises excluding cottage industries.
- New or existing companies seeking expansion, modernisation or diversification.
- Credit worthy promoters who will be required to prove their commitment to the project by contributing at least 25% of the project cost excluding land.
- Borrowers whose management capability, financial situation (including availability of collateral and guarantee) character and reputation are incontrovertible.
- Clients with demonstrable ability to meet loan repayments.
- Borrowers with no record of unpaid loans to erstwhile development finance institutions and other banks.

3.1.3 The Small and Medium Enterprises Equity Investment Scheme (SMEEIS)

Another good source of finance for the small business is the Small and Medium Enterprises Equity Investment Scheme (SMEEIS). It is a scheme under which small and medium enterprises receive special funding by way of equity investment by the bank. The investment by the bank enables them to grow and expand their business.

The small and medium enterprises equity investment scheme is a voluntary initiative of the Bankers Committee approved in 1999. The initiative was in response to the Federal Government's concern and policy measures for the promotion of small and medium enterprises (SMEs) as vehicles for rapid economic development, poverty alleviation and employment generation.

Under the scheme, 10% of the profit before tax (pbt) of all banks is set aside annually to be invested as equity investment in small and medium enterprises. The funding to be provided under the scheme shall be in the form of equity investment and or loans. The following are eligible to get funding under the scheme:

All those engaged in the following activities:

- Agro-allied businesses
- Information technology and telecommunications
- Manufacturing
- Education establishments
- Services
- Tourism and leisure
- Solid minerals
- Constructions.

The limitation under the scheme is that the investing bank must not take more than 40% equity investment in a small and medium business.

3.1.4 Other Sources of Finance

Other sources of finance for the small business are:

- Finance houses
- Mortgage banks
- Microfinance banks.

Self-Assessment Exercise

Discuss sources of finance that are available to an investor of the manufacture of fruit juice.

3.2 Contracts

Most projects involve contracts between the project and other parties such as suppliers or land owners. Ordinarily, all contracts made by a project contractor and suppliers should be in writing and also properly drafted. The type of contracts that a project may execute will vary depending on the nature of the project in question and the third party concerned.

However, for all contracts, several conditions must be satisfied for a legally binding contract to exist. The following are some of the conditions:

3.2.1 Offer and Acceptance

For any transaction or document to be termed a contract, there must be offer and acceptance. For example, a project contractor in entering into a contract must state definitely his offer and state willingness to contract on specified terms. The party dealing with the contractor has to properly accept the offer without qualification.

3.2.2 Consideration

In every contract, there must be a consideration. A contract must result in each party promising the other a valuable benefit. For most projects, this means that one party promises to deliver some stated goods, property or service at a specified date and the other party will also promise to accept the stated goods and pay for them.

3.2.3 Capacity to Contract

Another condition for a contract to exist is the issue of capacity. The parties to a contract must have the capacity to contract. For example, a minor may not have the capacity to enter into a contract. For a firm, the powers and the capacity to contract can be found in the memorandum and articles of association.

In practical terms, some of the contracts that an organisation can execute with other parties may include some of the following:

- Contract for the purchase of land for a project
- Contract for the design of buildings
- Contract for civil engineering jobs
- Contract for the supply of machinery
- Contract for the maintenance of machinery
- Contract for the supply of raw materials
- Contract for the supply of skilled personnel
- Contract for the sale of finished goods
- Contract for the training of personnel
- Contract for the management of certain aspects of a project.

Most projects must have a contract scope. The contract scope specifies the scope of the contract, i.e. where it begins and where it ends. Some of the various contract scopes are described below:

- Build–own–operate–maintain (BOOM)
- Build–own–operate–transfer (BOOT)
- Build–own–train–operate (BOTO)
- Operate–maintain–train – (OMT)
- Turnkey (TK)

3.3 Insurance

A major aspect of commercial management of projects is the issue of insurance. Insurance has to do with the management of risks. Every organisation faces risks, and so do all projects especially if they are start-up projects.

When a project is initiated, part of management's responsibility is to identify the various risks likely to arise and devise ways to manage or minimise the risks. So in most cases, the priority of management is to ensure that all physical and commercial risks facing a project are reduced to the barest minimum.

Let us discuss some of the risks identified and types of insurance that can apply particularly with respect to projects and their management.

Legal Liabilities Insurance

Legal liabilities relate to payments to third parties as a result of statutory, contractual or professional commitments. It also relates to compensations awarded by the courts.

Ordinarily in commercial and industrial projects, some responsibilities will be placed on the project owner or contractor to insure against several risks. For example, in the construction of a 20-storey building, it will be in the best interest of the contractor handling the project to take out insurance to cover compensation to third parties for bodily harm. The third parties may be workers on site, visitors or members of the public.

Liability insurance features prominently in project contracts and extends to the following:

- Property loss or damage
- Infringement of property rights
- Accidents
- Professional negligence as in the case of medical doctors
- Contractors all risk insurance to protect work in progress against fire, storm, theft and malicious damage
- Accident and sickness insurance.

4.0 Conclusion

In this unit, we discussed commercial management of projects. We also discussed various sources of funds for projects as well as contracts in respect of projects. These discussions threw more light on the commercial management of projects.

5.0 Summary

This unit treats the commercial management of projects. It focuses attention on the key aspects of the commercial management of projects. It treats the issues of finance for projects, contracts and insurance of projects.

6.0 Self Assessment Exercise

List and discuss the sources of finance for a project.

7.0 References/Further Reading

Eaglestone, F. N. (1993). *Contractors' all Risks Insurance*. (2nd ed.). London: Chartered Institute of Loss Adjusters.

Hodgin, R. W. (1996). *Professional Liability: Law and Insurance.* London: Lloyd's Commercial Law library.

Unit 5 Introduction to Project Planning and Scheduling

1.0 Introduction

All projects involve commitment of resources towards certain pre-set objectives. And in most cases, there is always a time frame or deadline for the implementation of the project. It is therefore, safe to assume that there must be a plan of some sort if the envisaged project will be completed on time. Most projects are complicated in nature and have to be properly planned.

2.0 Objectives

At the end of this unit, you should be able to:

- explain factors affecting project planning
- discuss project planning and scheduling.

3.0 Main Content

3.1 Factors Affecting Project Planning

A project manager, when appointed, will realise that he/she is confronted with a number of factors within and outside the organisation which influence a project.

We shall divide the factors into two for ease of discussion, and they are external factors and internal working factors.

They are illustrated in Figs. 1 and 2.

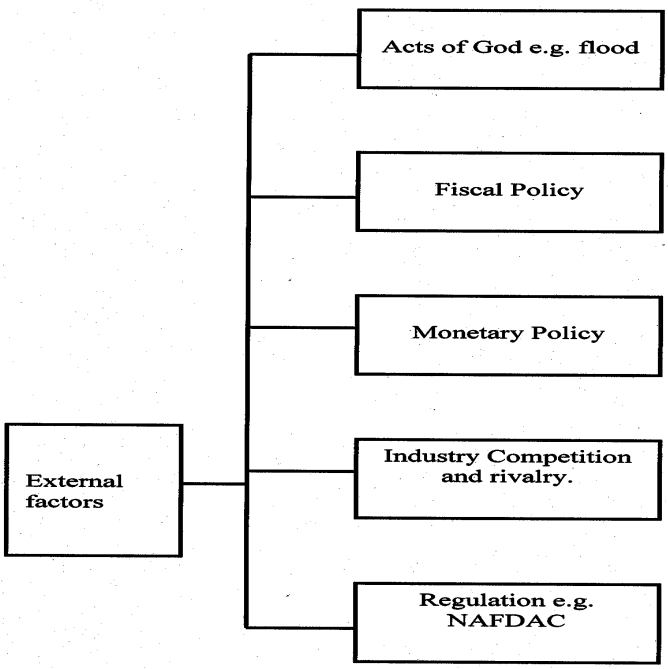

Fig. 1: External Factors Affecting Project Planning

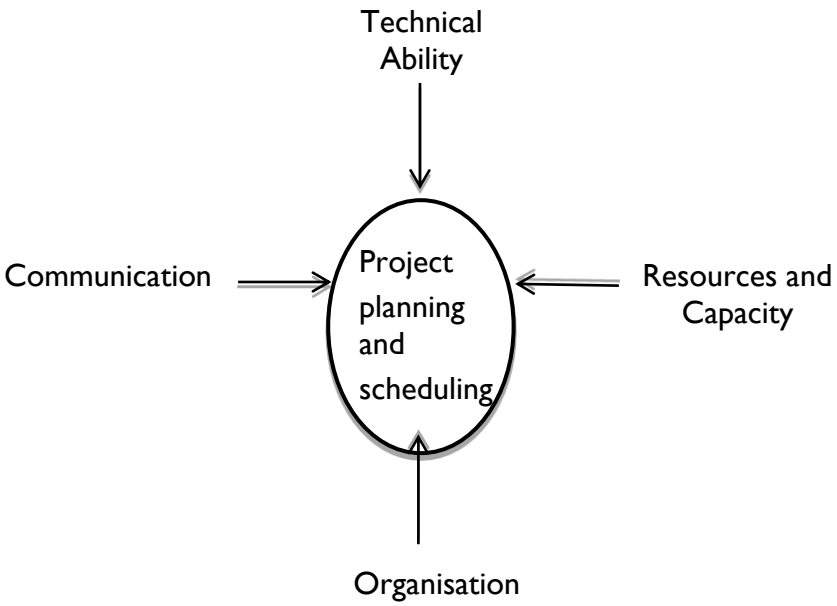

Fig. 2: Internal Working Factors Affecting a Project Planning

3.2 Project Plan and Schedule

A project plan is the listing or display that emerges when major project activities have been estimated, subjected to their logical sequences and timed. In an ideal situation, network analysis is usually a preferred method for producing a project plan.

On the other hand, a project schedule is obtained by doing further work on the project plan. The resources needed to execute the plan must have been estimated and then taken into account.

We can therefore, describe a project schedule as a working document that results from matching the organisations available resources to the project plan. From the foregoing, we can say that project plans and scheduling go hand in hand. They are usually linked.

3.3 The Planning Time Frame

Every project to be executed must have a time frame. There are two ways of considering a project time frame, namely: the free planning approach and the target led approach.

3.3.1 Free Planning Approach

Under the free planning approach, a set of physical and financial estimates are obtained and used to produce a project plan that predicts the completion time of the project. This predicted completion time will now be accepted by the project manager or team.

3.3.2 Target-Led Planning Approach

The target-led planning approach appears to be the direct opposite of the free planning approach. In the target-led planning approach, the project target delivery or completion date is determined well in advance. And so the project manager must work with the available resources to meet the target delivery date for the project. For example, if there is going to be an army exhibition on Independence Day (1 October), all the officers involved in the exhibition will take October 1 as the target date for the project delivery and work to meet the deadline.

It should be realised that target-led planning at times leads to project planners having to build overtime into the project just to ensure the completion.

If project plans are made with full consideration of the organisation's available resources, then the execution of the project will not encounter problems along the line.

Self-Assessment Exercise 1

- Give meanings to project plan and project schedule. Is there any relationship between them?
- Distinguished between free planning approach and target-led approach in relation to project time frame.

3.4 Project Matrix Charts

Let us briefly recall that every project consists of people, tasks and resources. These three items are present in every conceivable project. There must be a way or manner in which the three items will be organised to be able to ensure project execution.

Matrix charts list one set of factors at the extreme left-hand side of tabulation and on the right-hand side, factors directly associated with them across columns.

There are many variations of the matrix chart. In project management, matrix charts are very useful for managers who have the responsibility of allocating tasks to different people in a project team. Matrix charts are very useful for planning and controlling projects. The matrix charts can be used to allocate people to tasks, or tasks to people. In some cases, the matrix chart is used to allocate people to machines.

Table 1: Simple Matrix Chart for Planning and Controlling a Book Publishing Project

Book Title	Author	Fee agreed ₦	Due Date	Editing done
Introduction to strategy	C. Okoro	50,000	31/12/2007	N0
Corporate Strategy	A. Abdul	50,000	31/12/2007	N0
Competitive Strategy	P. Oshai	50,000	31/12/2007	N0
People Management	C. Okoro	50,000	31/12/2007	N0
Risk Management	J. Sanni	50,000	31/12/2007	N0
Basic Marketing	C. Okeke	50,000	31/12/2007	N0
Law of Contract	T. Okoro	50,000	31/12/2007	N0
Law of Evidence	T. Okoro	50,000	31/12/2007	Yes
Quality Management	A. Oshodi	50,000	31/12/2007	Yes
Network Management	A. Oshodi	50,000	31/12/2007	Yes
Basic Chemistry	W. Oke	50,000	31/12/2007	Yes
Basic Physics	W. Oke	50,000	31/12/2007	Yes
Bank Management	S. Hassan	50,000	31/12/2007	Yes
Marketing Management	A. Buka	50,000	31/12/2007	Yes

Table 2: Simple Matrix for Assigning Medical Students to Wards in a Medical Training Project

	Monday	Tuesday	Wednesday
A. Okoro	Surgery	Children	Accident
C. Okoro	Accident	Children	Surgery
C. Peter	Surgery	Children	Accident
A. Abraham	Accident	Children	Surgery
A. Sanni	Surgery	Children	Accident
P. Abubakar	Accident	Children	Surgery
S. Okeke	Surgery	Children	Accident
A. Anang	Accident	Children	Surgery
A. Ekong	Surgery	Children	Accident
T. Mshelia	Accident	Children	Surgery
S. Tinubu	Surgery	Children	Accident
T. Oke	Accident	Children	Surgery
S. Amakiri	Surgery	Children	Accident

3.5 Bar Charts

Bar charts are derived from Grant Charts named after their originator, Henry Grant. Bar charts are used in planning and scheduling. They are very easy to draw and can be adapted to suit many planning and scheduling jobs.

When properly prepared, bar charts turn out to be very handy planning and scheduling aid to a project planner.

Table 3: A Simple Project Bar Chart

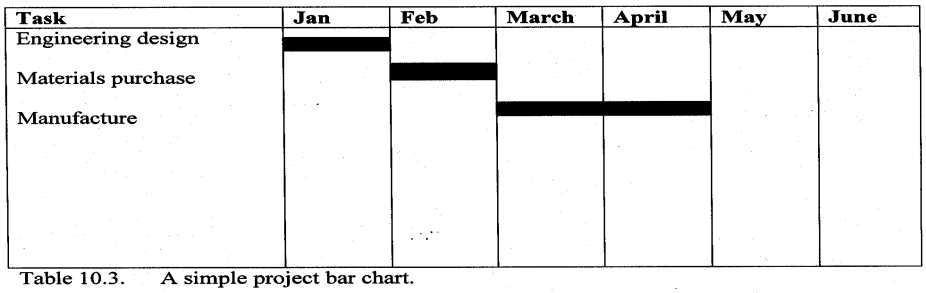

Table 10.3. A simple project bar chart.

In using the bar chart, the project manager will usually identify each task within a project and then go ahead to allocate a time frame for the completion of each task. With this information, the bar chart is then constructed.

Self-Assessment Exercise 2

Discuss the external factors that affect project planning.

4.0 Conclusion

In this unit, we discussed the introduction to project planning and scheduling. We also discussed external and internal factors affecting project planning. We discussed project plans and schedules.

We looked into the planning time frame as well as the project matrix charts and bar charts. All these help to improve our understanding of project planning and scheduling.

5.0 Summary

This unit treats project planning and scheduling. It discusses the introductory elements necessary to understand project planning and schedules. It tries to expose how plans and schedules can assist in project execution.

6.0 Self Assessment Exercise

How does a project plan differ from a project schedule?

7.0 References/Further Reading

Reiss, G. (1995). *Project Management Demystified: Today's Tools and Techniques.* (2nd Ed.). London: Spon.

Burke, Rory (1999). *Project Management: Planning and Control.* (3rd ed.). Chichester: Wiley.