CHAPTER 12

Budgeting for planning and control

CONTENTS

Demonstration problem
12.1 Sales forecast
12.2 Production budget and related budgets
12.3 Factory overhead budget and predetermined overhead application rate
12.4 Budgeted statement of cash flows – consultancy
12.5 Comprehensive problem

DEMONSTRATION PROBLEM

Aspen Ski-fun Ltd is preparing a master budget for the first quarter of 2002. The company produces and sells two kinds of products: downhill skis and cross-country skis. The expected sales volume for the two products during the first quarter and their estimated selling prices are:

	Downhill skis	Cross-country skis
Sales forecast in units	4000 pairs	6000 pairs
Estimated selling price	$90	$60

The company's policy is to maintain an ending inventory that is 25% of the next quarter's budgeted sales volume. Unit sales for both types of skis in the second quarter of 2002 are expected to decline by 10%. The following data describe the direct costs estimated for the production of each product (in both 2001 and 2002):

	Downhill skis	Cross-country skis
Direct materials	$18.00	$15.40
Direct labour	1.5 hours @ $10 per hour	1.2 hours @ $10 per hour

Factory overhead is applied to inventory based on the estimated direct labour hours for the year. The budgeted total amounts of variable factory overhead and fixed factory overhead for 2002 are $80 000 and $240 000, respectively. The budgeted direct labour hours for the year are 40 000. Variable selling expenses are expected to be 10% of sales and the budgeted fixed selling expenses are $84 000. The estimated fixed administrative expenses are $72 000. The inventories as at 1 January 2002 consist of the following units and costs:

	Downhill skis	Cross-country skis
Units	1000	1500
Costs	$45 000	$55 500

Required:

A. Prepare a production budget for the first quarter of 2002.
B. Prepare a direct labour budget for the first quarter of 2002.
C. Prepare a budgeted statement of financial performance for the first quarter of 2002. Ignore income taxes.

Solution to demonstration problem

A.

ASPEN SKI-FUN LTD
Production Budget
for the quarter ending 31 March 2002

	Downhill skis	Cross-country skis	Total
Forecast sales units (pairs)	4 000	6 000	10 000
+ Desired ending inventory*	900	1 350	2 250
= Total units needed	4 900	7 350	12 250
– Beginning inventory	1 000	1 500	2 500
= Production required	3 900	5 850	9 750

* 4000 × 90% × 25% = 900
6000 × 90% × 25% = 1350

B.

ASPEN SKI-FUN LTD
Direct Labour Budget
for the quarter ending 31 March 2002

	Downhill skis	Cross-country skis	Total
Production units required	3 900	5 850	
× Direct labour hours per unit	1.5	1.2	
= Total hours required	5 850	7 020	12 870
× Labour rate per hour	$10	$10	$10
= Direct labour cost	$58 500	$70 200	$128 700

(*continued*)

C.

ASPEN SKI-FUN LTD
Budgeted Statement of Financial Performance
for the quarter ending 31 March 2002

	Downhill skis	Cross-country skis	Total
Sales			
4000 × $90	$360 000		
6000 × $60		$360 000	$720 000
Cost of goods sold*			
4000 × $45	180 000		
6000 × $37			
		222 000	402 000
GROSS PROFIT	180 000	138 000	318 000
Operating expenses			
Selling**			156 000
Administrative			72 000
Total expenses			228 000
NET PROFIT			$ 90 000

* Cost per unit:

Direct materials	$18.00	$15.40
Direct labour	15.00	12.00
Factory overhead†	12.00	9.60
Total	$45.00	$37.00

** ($720 000 × 10%) + $84 000 = $156 000

† Factory overhead rate:
($80 000 + $240 000)/40 000 hours = $8 per hour
Downhill skis = $8 × 1.5 hours = $12.00
Cross-country skis = $8 × 1.2 hours = $9.60

ADDITIONAL PROBLEMS

Problem 12.1 Sales forecast

Clean-Fast Ltd manufactures a line of dishwashers designed for residential use in the suburbs of Curtin and Chifley. Dishwashers will be installed in approximately 80% of all new residential units, and the company projects that 5% of all existing residential units will be replacing older dishwashers during the next year. Based on past experience, the company's marketing manager anticipates that it can obtain 25% of the new residential construction market and 10% of the replacement market.

The company markets two types of dishwashers – the standard and the deluxe. The standard model will be placed in 75% of new units constructed, and 25% of the new units will have the deluxe model. Thirty per cent of existing homeowners who buy will choose the standard model to replace their older dishwashers, and 70% will choose the deluxe model.

The marketing department of Clean-Fast Ltd has compiled the following data:

	Curtin	Chifley
Number of existing residential units	900 000	624 000
Number of units to be constructed	12 000	9600
Selling price – standard	$450	$455
Selling price – deluxe	$515	$525

Required:
Prepare a sales forecast for Clean-Fast Ltd by suburb.

Solution

CLEAN-FAST LTD
Sales Forecast – Units

	New Construction		Replacement	
	Standard	Deluxe	Standard	Deluxe
Forecast sales (in units)				
Curtin				
12 000 × 0.8 × 0.25 × 0.75	1 800			
12 000 × 0.8 × 0.25 × 0.25		600		
900 000 × 0.05 × 0.10 × 0.3			1 350	
900 000 × 0.05 × 0.10 × 0.7				3 150
Chifley				
9 600 × 0.8 × 0.25 × 0.75	1 440			
9 600 × 0.8 × 0.25 × 0.25		480		
624 000 × 0.05 × 0.10 × 0.3			936	
624 000 × 0.05 × 0.10 × 0.7				2 184
	3 240	1 080	2 286	5 334

Sales Forecast – Dollars

	Sydney		Melbourne	
Standard	$1 417 500	[1]	$1 081 080	[3]
Deluxe	1 931 250	[2]	1 398 600	[4]
Total budgeted sales	$3 348 750		$2 479 680	

[1] $450 (1 800 + 1 350)
[2] $515 (600 + 3 150)
[3] $455 (1 440 + 936)
[4] $525 (480 + 2 184)

Problem 12.2 Production budget and related budgets

Custom Furniture Ltd manufactures upholstered furniture and is in the process of preparing a production budget, a direct materials budget and a direct labour budget for 2002–2003.

The labour and materials requirements per finished unit are:

Cutting labour	1 hour at $9 per hour
Finishing labour	2 hours at $10 per hour
Fabric	7 metres at $8.00 per metre
Timber	5 metres at $30 per metre

The forecast sales in units are:

First quarter ending September 2002	9600
Second quarter ending December 2002	6000
Third quarter ending March 2003	7200
Fourth quarter ending June 2003	4800

The company requires an ending inventory balance of raw materials equal to 10% of the next quarter's production requirements. Also, the ending inventory balance of finished goods should be equal to 20% of the next quarter's expected sales. The projected inventory balances as at 1 July 2002 are:

Fabric	6216 metres
Timber	4440 metres
Finished goods	1920 units

Required:

A. Prepare quarterly production budgets for the quarters ending September and December 2002 and March 2003.
B. Prepare direct materials budgets for the quarters ending September and December 2002.
C. Prepare direct labour budgets for the quarters ending September and December 2002.

Solution

Assumptions affecting this solution.

1. 'The projected inventory balances as at 1 January 2002 are:', should read '1 July 2002'.
2. Forecast sales for September quarter 2003 (not given) assumed to be the same as for September quarter 2002 at 9,600 units. The June quarter 2003 production summary necessary to complete the materials budget is:
   4 800 + 1 920 (20% 9 600) − 960 = 5 760

A.

CUSTOM FURNITURE LTD
Production Budget
for the first three quarters of the year ending 30 June 2003

	Sep Quarter	Dec Quarter	Mar Quarter	Total
Sales – units	9 600	6 000	7 200	22 800
Desired ending fin goods (1)	1 200	1 440	960	960
Total units needed	10 800	7 440	8 160	23 760
Beginning fin goods	1 920	1 200	1 440	1 920
Production required	8 880	6 240	6 720	21 840

(1)20% (6 000); 20% (7 200); 20% (4 800)

(*continued*)

B.

Direct Materials Budget
for the first three quarters of the year ending 30 June 2003

	Sep Quarter	Dec Quarter	Mar Quarter	Total
Fabric:				
Production units required (A)	8 880	6 240	6 720	21 840
Fabric metres per unit	7	7	7	7
Production requirements	62 160	43 680	47 040	152 880
Des end inventory (1)	4 368	4 704	4 032	4 032
Total fabric required	66 528	48 384	51 072	156 912
Beginning inventory	6 216	4 368	4 704	6 216
Purchases – metres	60 312	44 016	46 368	150 696
Cost per metre	$8	$8	$8	$8
Purchases – dollars	$482 496	$352 128	$370 944	$1 205 568

(1)0.10 (43 680); 0.10 (47 040); 0.10 (5 760 * 7)

	Sep Quarter	Dec Quarter	Mar Quarter	Total
Timber:				
Production units required (A)	8 880	6 240	6 720	21 840
Timber metres per unit	5	5	5	5
Production requirements	44 400	31 200	33 600	109 200
Des end inventory (1)	3 120	3 360	2 880	2 880
Total timber required	47 520	34 560	36 480	112 080
Beginning inventory	4 440	3 120	3 360	4 440
	43 080	31 440	33 120	107 640
Cost per metre	$30	$30	$30	$30
	$1 292 400	$943 200	$993 600	$3 229 200
Total material cost	$1 774 896	$1 295 328	$1 364 544	$4 434 768

(1)0.10 (31 200); 0.10 (33 600); 0.10 (5 760 * 5)

C.

Direct Labour Budget
for the first three quarters of the year ending 30 June 2003

	Sep Quarter	Dec Quarter	Mar Quarter	Total
Cutting:				
Production units required (A)	8 880	6 240	6 720	21 840
Cutting labour hours per unit	1	1	1	1
Total cutting hours required	8 880	6 240	6 720	21 840
Cutting labour rate per hour	$9	$9	$9	$9
Cutting labour cost	$79 920	$56 160	$60 480	$196 560
Finishing:				
Production units required (A)	8 880	6 240	6 720	21 840
Finished labour hours per unit	2	2	2	2
Total finishing hours required	17 760	12 480	13 440	43 680
Finishing labour rate per hour	$10	$10	$10	$10
Finishing labour cost	$177 600	$124 800	$134 400	$436 800
Total labour cost	$257,520	$180,960	$194,880	$633,360

Problem 12.3 Factory overhead budget and predetermined overhead application rate

Alliance Products Ltd produces two types of microwave ovens, a regular model and a deluxe model. The budgeted factory overhead costs for production operations during the year ending 30 June 2002 are as follows.

Variable costs:	
Indirect materials	$16.00 per direct labour hour
Indirect labour	0.24 per direct labour hour
Light and power	0.48 per direct labour hour
Other	0.08 per direct labour hour
Fixed costs:	
Production manager's salary	$56 000
Depreciation	48 000
Insurance	16 000
Miscellaneous	8 000

Sales of 6400 regular microwave ovens and 16 000 deluxe microwave ovens are budgeted for 2002. Each regular microwave oven requires 10 hours of direct labour, and each deluxe microwave oven requires 15 hours.

Required:

A. Prepare a factory overhead budget for the year ending 30 June 2002 based on the estimated production level.
B. Calculate the factory overhead rate based on direct labour hours.

Solution

A.

ALLIANCE PRODUCTS LTD
Factory overhead budget
for the year ending 30 June 2002

Variable costs:			
Indirect materials	(1)	$4 864 000	
Indirect labour	(2)	72 960	
Light and power	(3)	145 920	
Other costs	(4)	24 320	
Total budgeted variable overhead cost			$5 107 200
Fixed costs:			
Production manager's salary		$56 000	
Depreciation		48 000	
Insurance		16 000	
Miscellaneous		8 000	
Total budgeted fixed overhead cost			128 000
Total budgeted factory overhead cost			$5 235 200

(1)	Direct labour hours (6 400 × 10) + (16 000 × 15)		= 304 000
	Indirect material cost per DLH		$16
	Indirect materials cost		$4 864 000

(2)	Indirect labour:	304 000 × 0.24	$72 960
(3)	Light and power:	304 000 × 0.48	145 920
(4)	Other VOH:	304 000 × 0.08	24 320

B.

Factory overhead rate per direct labour hour:
$5 235 200 ÷ 304 000 = $17.22 per DLH

Problem 12.4 Budgeted statement of cash flows – consultancy

Computer Consulting Agency is preparing a budgeted statement of cash flows for the first two quarters of the year ending 31 December 2002. Past experience has been that 60% of consulting fees revenue will be collected during the quarter in which the services are performed, 25% will be collected in the next quarter, 10% will be collected in the second quarter following the completion of the services, and the final 5% will be collected in the third quarter following completion of the services. Seventy per cent of fees paid to contracted consultants are paid for in the quarter in which services were performed by the outside consultants, and the balance is paid in the following quarter.

Advertising and promotion expenses amount to $36 000 per quarter plus 15% of service fees revenue. Administrative expenses are estimated to be $96 000 per quarter, which includes $28 800 of depreciation expense. All expenses except depreciation are paid when incurred.

The agency is planning to purchase equipment during the first quarter at a cost of $48 000. The agency will pay off a $72 000 loan, which will mature during the second quarter. The interest due at maturity will be $8400. The agency's anticipated cash balance on 1 January 2002 is $36 000.

The agency's estimated revenue from consulting fees and costs of contracted consultants are as follows:

	Consulting fees	Costs of contracted consultants
Second quarter 2001	$288 000	$168 000
Third quarter 2001	264 000	144 000
Fourth quarter 2001	336 000	192 000
First quarter 2002	456 000	120 000
Second quarter 2002	312 000	144 000

Required:

Prepare a budgeted statement of cash flows for the Computer Consulting Agency for the first two quarters of 2002, by quarter and in total.

Solution

COMPUTER CONSULTING AGENCY
Budgeted Statement of Cash Flows
for the March and June quarters of the year 2002

Cash flows from operating activities					
Receipts from customers	(1)	$398 400		$348 000	
Payments to suppliers and employees	(2)	(313 200)		(286 800)	
Interest paid				(8 400)	
Net cash provided by operating activities			$85 200		$52 800 $138 000
Cash flows from investing activities					
Purchase of equipment		(48 000)			
Net cash used in investing activities			(48 000)		(48 000)
Cash flows from financing activities					
Repayment of borrowings				(72 000)	
Net cash used in financing activities				(72 000)	(72 000)
Net increase (decrease) in cash held			37 200		(19 200) 18 000
Cash at beginning of quarter			36 000		73 200 36 000
Cash at end of quarter			$73 200		$54 000 $54 000

(1) Receipts from customers:

March		June	
0.05 (288 000)	$14 400	0.05 (264 000)	$13 200
0.10 (264 000)	26 400	0.10 (336 000)	33 600
0.25 (336 000)	84 000	0.25 (456 000)	114 000
0.60 (456 000)	273 600	0.60 (312 000)	187 200
	$398 400		$348 000

(2) Consultants fees

0.30 (192 000)	$57 600	0.30 (120 000)	$36 000
0.70 (120 000)	84 000	0.70 (144 000)	100 800
Adv prom & Admin	36 000		36 000
0.15 (456 000)	68 400	0.15 (312 000)	46 800
(96 000 - 28 800)	67 200		67 200
	$313 200		$286 800

Problem 12.5 Comprehensive problem

The management team of Woodside Timber Ltd has decided to introduce a comprehensive budgeting system for the forthcoming year which commences on 1 July 2002. The company manufactures and sells two products, A and B. In order to prepare the budget, you have extracted the following data from the accounting records:

	Product A	Product B
Sales forecast in units	600 000	175 000
Selling price per unit	$27	$42
Finished goods on hand, 1 July 2002 (units)	26 400	14 400
Required finished goods, 30 June 2003 (units)	32 400	20 400
Direct materials, 1 July 2002 (kg)	54 000	14 400
Required materials inventory, 30 June 2003 (kg)	42 000	18 000
Direct materials required per unit	1.2 kg	1.8 kg
Materials cost per kilogram	$4.20	$5.40
Direct labour time required per unit (hours)	0.6	0.9
Direct labour cost per hour	$12.00	$13.20
Cost of production per unit	$15.00	$25.80
Budgeted selling and distribution expenses	$840 000	$450 000
Budgeted administration expenses	$540 000	$480 000

Required:

A. Prepare the following budgets for the year ended 30 June 2003: sales, production, direct materials, direct labour, factory overhead.

B. Prepare a budgeted statement of financial performance for the year ending 30 June 2003.

Solution

WOODSIDE TIMBER LTD

A.

Sales Budget
for the year ending 30 June 2003

Product A	
Budgeted sales units	600 000
Budgeted price per unit	$27.00
Budgeted Sales Dollars	$16 200 000
Product B	
Budgeted sales units	175 000
Budgeted price per unit	$42.00
Budgeted Sales Dollars	$7 350 000
Total Budgeted Sales Dollars	$23 550 000

Production Budget
for the year ending 30 June 2003

Product	A	B	Total
Forecast sales units	600 000	175 000	775 000
Desired ending inventory	32 400	20 400	52 800
Total units needed	632 400	195 400	827 800
Beginning fin goods	26 400	14 400	40 800
Production required	606 000	181 000	787 000

(*continued*)

Direct Materials Budget
for the year ending 30 June 2003

Product	A	B	Total
Production units required	606 000	181 000	787 000
Materials per unit	1.2 kg	1.8 kg	
Kg of mat required	727 200	325 800	1 053 000
Desired ending materials (kgs)	42 000	18 000	60 000
Kilograms needed	769 200	343 800	1 113 000
Beginning materials (kgs)	54 000	14 400	68 400
Purchases required (kgs)	715 200	329 400	1 044 600
Cost per kilogram	$4.20	$5.40	
Cost of purchases	$3 003 840	$1 778 760	$4 782 600

Direct Labour Budget
for the year ending 30 June 2003

Product	A	B	Total
Production units required	606 000	181 000	775 000
Direct labour hours per unit	0.6	0.9	
Total hours required	363 600	162 900	526 500
Labour rate per hour	$12.00	$13.20	
Total labour cost	$4 363 200	$2 150 280	$6 513 480

Factory Overhead Budget
for the year ending 30 June 2003

Product		A	B	Total
(a)	Total cost of production (1)	$9 090 000	$4 669 800	$13 759 800
	Raw materials cost (2)	$3 054 240	$1 759 320	$4 813 560
	Direct labour costs (above)	4 363 200	2 150 280	6 513 480
(b)	Total prime costs	$7 417 440	$3 909 600	$11 327 040
	Factory overhead (a-b)	$1 672 560	$760 200	$2 432 760

(1) $15 (606 000) = $9 090 000
$25.80 (181 000) = $4 669 800

(2) 606 000 × 1.2 × $4.20 = $3 054 240
181 000 × 1.8 × $5.40 = $1 759 320

B.

WOODSIDE TIMBER LTD
Budgeted Statement of Financial Performance
for the year ending 30 June 2003

	A	B	Total
Sales revenue	$16 200 000	$7 350 000	$23 550 000
Cost of goods sold:			
600 000 ($15.00)	9 000 000		
175 000 ($25.80)		4 515 000	13 515 000
Gross profit	7 200 000	2 835 000	10 035 000
Selling and distribution exs	840 000	450 000	1 290 000
Administration expenses	540 000	480 000	1 020 000
Total budget expenses	1 380 000	930 000	2 310 000
Net profit	$5 820 000	$1 905 000	$7 725 000