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Management Accounting
7th Edition

- Link 6.A –
C/S McToy GmbH

McTOY GmbH is a production firm for toys; it manufactures bicycles, tricycles, and go-karts. For the sake of simplicity, the goods only consist of a frame and 2, 3, or 4 wheels.

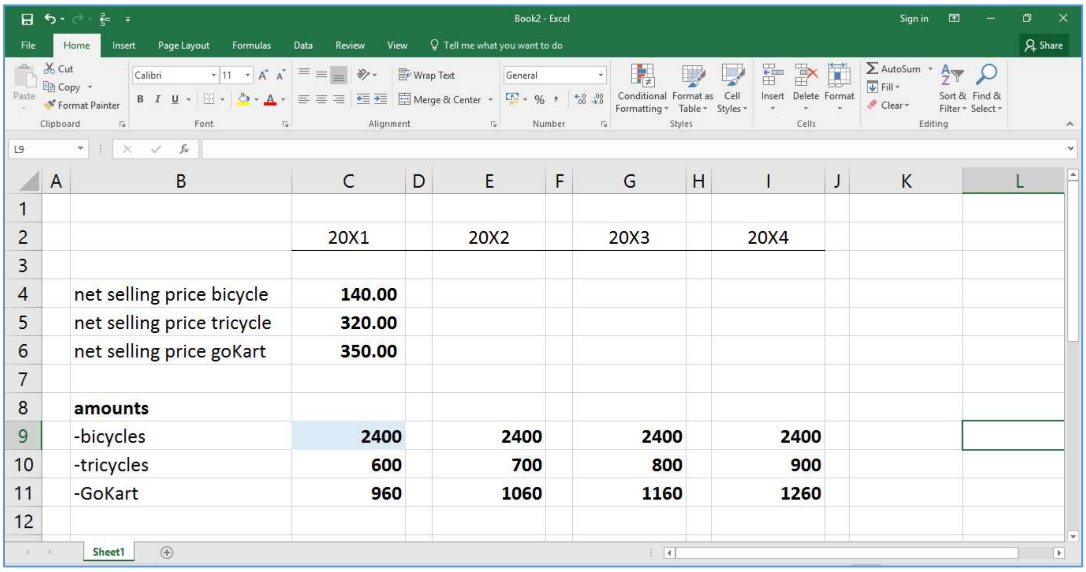
The planned numbers of sold bicycles are 2,400 u/a, for tricycles 600 u/a, and for go-karts 960 u/a. Bicycle sales stay constant but the quantity of tricycles and go-karts increases from 20X1 to 20X4 by 100 units per year. The net selling price per bicycle is 140.00 EUR/u, per tricycle 320.00 EUR/u and per go-kart 350.00 EUR/u. Prices do not change during the periods 20X1 to 20X4.
Observe the revenue plan as in Figure 1:

REVENUE PLAN McToy GmbH for 20X1 to 20X4

	20X1	**20X2**	**20X3**	**20X4**
bicycles sold [units]	2400	2400	2400	2400
revenue bicycles [EUR]	336,000	336,000	336,000	336,000
tricycles sold [units]	600	700	800	900
revenue tricycles [EUR]	192,000	224,000	256,000	288,000
go-karts sold [units]	960	1060	1160	1260
revenue go-karts [EUR]	336,000	371,000	406,000	441,000
total revenue	**864,000**	**931,000**	**998,000**	**1,065,000**

Figure 1: McTOY GmbH's revenue plan

We advise to prepare a master data sheet in MS-Excel. An example for how this could look like is given in Figure 2.



	A	B	C	D	E	F	G	H	I
1									
2			20X1		20X2		20X3		20X4
3									
4		net selling price bicycle	**140.00**						
5		net selling price tricycle	**320.00**						
6		net selling price goKart	**350.00**						
7									
8		**amounts**							
9		-bicycles	**2400**		**2400**		**2400**		**2400**
10		-tricycles	**600**		**700**		**800**		**900**
11		-GoKart	**960**		**1060**		**1160**		**1260**
12									

Figure 2: McTOY GmbH's master data sheet

Before we cover the business plan, we show the data sheet for McToy GmbH.

Data Sheet for McToy GmbH

Classification: Production; Goods quantities: 2,400 / 600 / 960 – increasing during the next periods; Net selling prices: 140.00 EUR / 320.00 EUR / 350.00 EUR; Start-up costs: 205,000.00 EUR; Materials: steel 3.00 EUR/kg / steel wheel 8.00 EUR/u / plastic wheel 5.00 EUR/u; Product factor steel: 9 kg / 14 kg / 26 kg; Labour costs (production): 45.00 EUR/h; Department cost rates: 50.00 EUR/h / 42.00 EUR/h; 8.00 EUR/h; P, P, E: 676,000.00 EUR – written-off over 8 years completely (straight-line method); Bank loan: 700,000.00 EUR; annuity: 56,000.00 EUR/a, 6 % interest included; non-manufacturing costs (without interest): 99,396.00 EUR; VAT applicable.

Cost Plan – McToy GmbH

McToy GmbH's costs include start-up costs, material costs and manufacturing costs. The latter ones are labour and overheads. Furthermore, non-manufacturing costs are relevant.

The start-up costs equal 205,000.00 EUR.

Direct materials are steel and wheels at the prices below:

(1) 3.00 EUR/kg steel.

(2) 8.00 EUR/steel wheel (for the bicycles.

(3) 5.00 EUR/plastic wheel (for the tricycles and go-karts).

From the bill of materials (BOM), we know that a bicycle frame is made from 9 kg steel, the frame for tricycles from 14 kg and the go-kart frame from 26 kg.

A bill of materials BOM is a document that tells the part structure of a product. To calculate the material costs for the bicycles in 20X1, McToy GmbH multiplies the quantities with the purchase prices: 2,400 × 3 × 9 = 64,800.00 EUR.

COST PLAN McToy GmbH for 20X1 to 20X4

	20X1	20X2	20X3	20X4
Start-up costs				
other	205,000			
Material expenses				
Steel				
bicycle	64,800	64,800	64,800	64,800
tricycle	25,200	29,400	33,600	37,800
go-kart	74,880	82,680	90,480	98,280
Wheels				
bicycle	38,400	38,400	38,400	38,400
tricycle	9,000	10,500	12,000	13,500
go-kart	19,200	21,200	23,200	25,200
total material expenses	**231,480**	**246,980**	**262,480**	**277,980**

Figure 3: McTOY GmbH's cost plan (partial)

McTOY GmbH manufactures as many goods as it sells. Therefore, no closing stock of materials or of finished goods is left at the yearends.

Manufacturing of all goods requires 3 production steps: welding, coating and wheel assembly.

Direct labour (at a cost rate of 45.00 EUR/h) for the Coating and Assembling department are as depicted in the routings.

A routing is a document in a production firm that tells how much time a production step on which machine group takes to get processed. Obviously, we can prepare routings that are linked to single resources, however, in general, we refer to machine groups.

[min]	per bicycles	per tricycles	per goKart
Welding	-	-	-
Coating	15	15	15
Assembling	20	30	40

Figure 4: McTOY GmbH's routing information (1)

McTOY GmbH deploys a welding robot, hence, no labour applies in its Welding department, check Figure 5.

For the application of manufacturing overheads, predetermined overhead allocation rates are given. All overhead rates are based on workload hours. In the Welding department, the hourly cost rate is 50.00 EUR/h, in the Coating department it equals 42.00 EUR/h and in the Assembling department it equals 8.00 EUR/h. The operating time for the

three departments is given by Figure 5.
You can derive them from routings too.

[min]	per bicycles	per tricycles	per goKart
Welding	18	30	48
Painting	15	15	15
Assembling	20	30	40

Figure 5: McTOY GmbH's routing information (2)

As an example, we calculate manufacturing costs for (all) bicycles: 2,400 × (45/60) × 15 + 2,400 × (45/60) × 20 + 2,400 × (50/60) × 18 + 2,400 × (42/60) × 15 + 2,400 × (8/60) × 20 = ***130,600.00 EUR****. The costs contain direct labour as well as manufacturing overheads. You can read the same amount for bicycles from McTOY GmbH's cost plan: 36,000 + 25,200 + 6,400 + 27,000 + 36,000 =* ***130,600.00 EUR****.*

COST PLAN McToy GmbH for 20X1 to 20X4

	20X1	20X2	20X3	20X4
MANUFACTURING OVERHEADS				
Welding				
bicycle	36,000	36,000	36,000	36,000
tricycle	15,000	17,500	20,000	22,500
go-kart	38,400	42,400	46,400	50,400
Coating department				
bicycle	25,200	25,200	25,200	25,200
tricycle	6,300	7,350	8,400	9,450
go-kart	10,080	11,130	12,180	13,230
Assembling				
bicycle	6,400	6,400	6,400	6,400
tricycle	2,400	2,800	3,200	3,600
go-kart	5,120	5,653	6,187	6,720
DIRECT LABOUR				
Coating				
bicycle	27,000	27,000	27,000	27,000
tricycle	6,750	7,875	9,000	10,125
go-kart	10,800	11,925	13,050	14,175
Assembling				
bicycle	36,000	36,000	36,000	36,000
tricycle	13,500	15,750	18,000	20,250
go-kart	28,800	31,800	34,800	37,800

Figure 6: McTOY GmbH's cost plan (partial)

Besides of manufacturing costs, there are labour costs for the supervisor. These count as manufacturing overheads, too, but they are not included in the rates. They equal 75,000.00 EUR/a plus 12,000.00 EUR/a for McTOY GmbH's contribution to social security. We must include these labour costs for our calculations.

Depreciation is included in the rates for production. McTOY GmbH buys machinery at the beginning of 20X1 (2.01.20X2) to cost of acquisition of 676,000.00 EUR (net amount). The useful life of the machinery is 8 years. No residual value applies. Depreciation is based on straight-line method. Accordingly, depreciation is amounting to: 676,000 / 8 = ***84,500.00 EUR/a****.*

McTOY GmbH takes a bank loan with a principal of 700,000.00 EUR on 2.01.20X1. The bank loan is an annuity that comes with an annual payment of 56,000.00 EUR/a. The rate of interest is 6%/a, annually compounded and based on the amount owed. Interest and pay-off are paid at yearends. The bank loan is paid-off completely at the end of

20X4. Observe the interest and pay-off schedule for the bank loan in Figure 7.

Amount	Interest	Pay-off	Annuity	Year
700,000.00	**42,000.00**	14,000.00	56,000.00	20X1
686,000.00	**41,160.00**	14,840.00	56,000.00	20X2
671,160.00	**40,269.60**	15,730.40	56,000.00	20X3
655,429.60	**39,325.78**	655,429.60	694,755.38	20X4

Figure 7: McTOY GmbH's bank loan

Interest shows in the cost plan.

Non-manufacturing costs apply for: third party costs (cleaning staff): 10,500.00 EUR/a, membership fees for the engineering body in Germany: Verein Deutscher Ingenieure VDI: 96.00 EUR/a, costs for administration: 36,000.00 EUR/a, motor vehicle costs (rent, fuel): 12,000.00 EUR/a, administration costs (Management and Accounting): 36,000.00 EUR/a and annual insurance fees to an extent of 4,800.00 EUR.
The aggregated cost plan is provided in Figure 8:
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COST PLAN McToy GmbH for 20X1 to 20X4

	20X1	20X2	20X3	20X4
Start-up costs				
other	205,000			
Material expenses				
total	**231,480**	**246,980**	**262,480**	**277,980**
Production facillity costs				
total	**144,900**	**154,433**	**163,967**	**173,500**
Labour in production departments including supervisor				
	209,850	**217,350**	**224,850**	**232,350**
Other expenses				
3rd party costs	10,500	10,500	10,500	10,500
Fees	96	96	96	96
Building costs	36,000	36,000	36,000	36,000
MV expenses	12,000	12,000	12,000	12,000
Administration	36,000	36,000	36,000	36,000
Insurance	4,800	4,800	4,800	4,800
Interest	42,000	41,160	40,270	39,326
	141,396	**140,556**	**139,666**	**138,722**
Total costs	**932,626**	**759,319**	**790,962**	**822,552**

Figure 8: McTOY GmbH's aggregated cost plan

The calculation of profit for 20X1 is as below: 864,000 - 932,626 = -68,626.00 EUR. The result indicates a loss. Hence, no income taxes must be paid for 20X1. McTOY GmbH carries forward the loss to 20X2.

The loss carried forward to the next Accounting period 20X2 reduces the distributable amount for that period. In 20X2, the profit after taxes equals: 171,680 × (1 – 30%) = 120,176.47 EUR. The distributable value for the appropriation of profits is reduced for the loss carried forward and equals: 120,176.47 – 68,626 = 51,550.47 EUR.

To keep the case study simple, we do not calculate net dividends and do not disclose payable dividend taxes on behalf of the investors. As the net dividend is paid to investors and taxes on capital returns (dividend tax) to the revenue service, a business plan discloses the total payment, no matter who is the recipient. Hence, we only disclose gross dividends on the business plan. At McTOY GmbH, the appropriation of profits is 50:50 – meaning: 50 % is the gross dividend and 50 % are added to earnings reserves.

McTOY GmbH PROFITABILITY ANALYSIS for 20X1 - 20X4

	20X1	20X2	20X3	20X4
Revenue	864,000	931,000	998,000	1,065,000
Cost	(932,626)	(759,319)	(790,962)	(822,552)
Earnings before Tax	(68,626)	171,681	207,038	242,448
less income tax (30%)	0	51,504	62,111	72,734
Earnings after Taxes	(68,626)	120,176	144,926	169,714
Earnings after Taxes	(68,626)	120,176	144,926	169,714
add P/L carried forward	0	(68,626)	0	0
Distributable Amount	(68,626)	51,550	144,926	169,714
(1) Gross Dividend	0	25,775	72,463	84,857
(2) Earnings Reserves	0	25,775	72,463	84,857

Figure 9: McTOY GmbH's profit plan

You might ask yourself whether the loss for 20X1 is acceptable when we prepare a business plan. Should we change the business model to avoid the loss? Surprisingly, the answer is No. As the company got just established based on its issued capital of 170,000 EUR, the first year's loss is covered. This means, the loss is that low that the company does not become indebted. In case the loss exceeds a value of 170,000.00 EUR, the company would be obliged to file for bankruptcy – that is a scenario we do not tolerate for planning!

Next, we study the liquidity plan. For the payments it is important to consider that at McTOY GmbH value added tax at a rate of 20 % applies.

Like the profitability, the liquidity is essential for the survival of the business. A company that becomes insolvent must file for bankruptcy. Insolvency does not mean the company is not allowed to take loans. It means a company must be able to fulfil its payment obligations, like for labour or taxes.

The liquidity plan contains the opening value in the Cash/Bank account of 170,000.00 EUR and all cash inflows and cash outflows. Regarding payment terms, the conventions in chapter (1) apply: Income tax, VAT and dividends are paid/received one Accounting period delayed.

McToy GmbH LIQUIDITY PLAN for 20X1 to 20X4

Position	**20X1**	**20X2**	**20X3**	**20X4**
Opening value				
Equity	170,000			
Opening value	0	146,178	574,019	782,847
	170,000	146,178	574,019	782,847
Cash inflow				
Bank loan	700,000	0	0	0
Proceeds	864,000	931,000	998,000	1,065,000
Output-VAT	**172,800**	**186,200**	**199,600**	**213,000**
VAT refund	0	**222,496**	**49,396**	**52,496**
	1,736,800	1,339,696	1,246,996	1,330,496
Cash outflow				
Annuity	(56,000)	(56,000)	(56,000)	(694,755)
Acquisition	(676,000)	0	0	0
Input-VAT (acquisition)	**(135,200)**	0	0	0
start-up costs	(205,000)	0	0	0
Input-VAT (start-up)	**(41,000)**	0	0	0
Material expenses	(231,480)	(246,980)	(262,480)	(277,980)
VAT from materials	**(46,296)**	**(49,396)**	**(52,496)**	**(55,596)**
Production facilities	(144,900)	(154,433)	(163,967)	(173,500)
Labour in production	(209,850)	(217,350)	(224,850)	(232,350)
Other expenses	(141,396)	(140,566)	(139,666)	(138,722)
Adj: depr + interest	126,500	125,660	124,770	123,826
VAT payment	0	**(172,800)**	**(186,200)**	**(199,600)**
Tax payment	0	0	(51,504)	(62,111)
Dividend paid	0	0	(25,775)	(72,463)
	(1,760,622)	(911,865)	(1,038,168)	(1,783,252)
Liquidity	146,178	574,009	782,847	330,091

Figure 10: McTOY GmbH's liquidity plan

In contrast to the previous case study Kirstenbosch (Pty) Ltd., the share issue takes place before business commences. Therefore, we disclose an opening value in cash/bank. The timing of the owners' contribution is the default case in business. In general, the opening balance sheet contains the funds at the time of incorporation. The establishment is then completed when operations begin.

In 20X1, the liquidity plan for McTOY GmbH shows cash inflows from the bank loan of 700,000.00 EUR and from the proceeds to the extent of: 864,000 × (1 + 20%) = 1,036,800.00 EUR. Together, the cash inflows add up to: 700,000 + 1,036,800 = 1,736,800.00 EUR. The output-VAT collected from customers on behalf of the revenue service is paid in the next Accounting period 20X2. It then

results in a cash outflow of 172,800.00 EUR.
In the next following Accounting periods, McTOY GmbH must consider a cash inflow resulting from input-VAT refunding. Input-VAT is paid by McTOY GmbH on the start-up costs, on the investment and on the materials. The refund for the input-VAT paid in 20X1 and refunded in 20X2 is amounting to: 135,200 + 41,000 + 46,296 = ***222,496.00 EUR****.*

In 20X1, cash outflows result from the bank loan's annuity of 56,000.00 EUR, from the investment of: 676,000 × (1 + 20%) = ***811,200.00 EUR****, from the start-up costs of: 205,000 × (1 + 20%) =* ***246,000.00 EUR****, from the purchase of the materials to an extent of: 231,480 × (1 + 20%) =* ***277,776.00 EUR****, from the overheads in the factory of 144,900.00 EUR, from labour costs in the factory of 209,850.00 EUR and from miscellaneous costs, which add up to 141,396.00 EUR as disclosed in the cost plan in detail. McTOY GmbH records an adjustment of: 84,500 + 42,000 =* ***126,500.00 EUR*** *for depreciation and interest in the liquidity plan. Depreciation is deducted from cash outflows as it is included in the rates but is not paid. The interest is included in the miscellaneous costs and is considered in the annuity as well. This results in a double consideration and requires adjustment. Therefore, we add depreciation and interest to cash outflows. The total cash outflow for 20X1 equals: 56,000 + 811,200 + 246,000 + 277,776 + 144,900 + 209,850 + 141,396 - 126,500 =* ***1,760,622.00 EUR****.*
The liquidity is the balance of the Cash/Bank account as per the end of the Accounting period. In 20X1, the value equals: 170,000 + 1,736,800 – 1,760,622 = ***146,178.00 EUR****.*

To assess the financial position of the company, we prepare a budgeted balance sheet. It can be observed in Figure 11.

McTOY GmbH
STATEMENT of FINANCIAL POSITION
as at 31.12.20X4

A		C, L	
Non-current assets	[EUR]	*Owners' capital*	[EUR]
P, P, E	338,000	Share capital	170,000
Intangibles		Reserves	183,095
Financial assets		R/E	
Current assets		*Liabilities*	
Inventory		Interest bear liab	0
A/R	55,596	A/P	213,000
Prepaid expenses		SH4D	84,857
Cash/Bank	330,091	Tax liabilities	72,734
	723,687		**723,687**

Figure 11: McTOY GmbH's budgeted balance sheet

The balance sheet is prepared as at 31.12.20X4. This is the last day of the period the business plan is for. The value of property, plant and equipment equals to the cost of acquisition less four times depreciation: 676,000 – 4 × 84,500 = ***338,000.00 EUR****. The receivables result from input-VAT paid on material purchases in 20X4. They will be claimed from the revenue service in 20X5. The value for cash/bank can be taken from the liquidity plan.*

The issued capital equals 170,000.00 EUR as given. The value for the reserves is the total of additions to earnings reserves during 20X2 – 20X4: 25,775.23 + 72,463.21 + 84,856.88 = ***183,095.32 EUR****. The payables result from the output-VAT collected from the customers and payable to the revenue service in 20X5. SH4D stands for shareholders for dividend and contains the gross dividends. The tax liabilities displayed are income tax liabilities from 20X4 due in 20X5.*