Case Assignment – MGAC03
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Situational analysis: Kore 2.0 is the only product of the BEL. In the past few years, the BEL use the sales as the basis to measure the company's performance. Increasing the sales of Kore 2.0 becomes the goal. As the result, the Kore has dominated the fitness tracker market. However, in spite of the high demand, the decline in the gross margin ratio arouses the managers' attention and concern.

The company's goal: increase the gross margin of Kore 2.0 and retain market and sales as much as possible

Users' analysis:

- William Brooks: William Brooks is the key manager of the BEL. He is interested in the profits and long-run development of the company.
- Patricia Maddock: Patricia Maddock is the boss of the consulting company. The company obtains profit through using professional knowledge to help customers figure out the problems. She is interested in professional reputation and customer feedback.
- Production managers: they are responsible for the whole production process and interested in the bonus and their occupations.

Conflicts of interest: production managers are interested in achieving high sales as much as possible, so that they can get the bonus and meet the performance measurement. During the process, they may ignore the gross margin and the long-run development of the company. That may lead to the decisions made being in conflict with William, who is responsible for the sustainability of the BEL.

Strengths of the product: 7 days battery; compatible with both iOS and Android systems; popular in the fitness tracker market;

Weaknesses of the product: low quality due to the usage of polymer; single product; low gross margin

Issue #1: variance analysis

According to table 1, the direct labor rate variance is 0; the direct labor efficiency variance is unfavorable $47,250; the direct material rate variance is favorable $89,000; the direct material efficiency variance is unfavorable $44,000.

	A	B	C	D	E	F
1	issue 1					
2	direct labor					
3		Actual		Actual hours used * std ratio		flexible budget
4	hours	11500		11500		3*167000*（1/60）=8385
5	$/hour	15		15		15
6	total	172500		172500		125250
7		rate variance=0				efficiency variance=47250 U
8						
9	direct material					
10		Actual		Actual hours used * std ratio		flexible busget
11	grams	8900000		8,900,000		167000*50=8350000
12	$/gram	0.07		0.08		0.08
13	total	623000		712000		668000
14		rate variance=89000 F				efficiency variance=44000 U

Table #1

Analysis: indicated by table #1, both rate variances are under the BEL's control. Even for material rate variances, the BEL has the favorable $89,000. This may be caused by buying low- quality polymer and the efficiency of the purchasing department. The status quo can be maintained.

However, there is 11% decrease in the gross margin after using the lower price polymer. And that may be the reason for the high unfavorable efficiency variance for both labor and material. In terms of labor efficiency variance, the reasons may be that employees are not trained properly to handle such vulnerable materials, the equipment is poorly or frequently maintained due to usage of this polymer and outdated equipment. And the unfavorable material efficiency variance can result from waste and defects caused by the low quality of the polymer, bad equipment and lack of production techniques for this polymer.

Issue #2: whether to purchase the FTM 3000

issue #2	money saved through pirchasing the FTM 3000								
		year 0	year 1	year 2	year 3	year 4	year 5	direct labour saved per unit	0.15
	purchasing the FTM3000	-100000						variable overhead saved per unit	0.186
	tax sheild		10600					output/year	167000
	direct labour saved (net of tax)		18787.5	18787.5	18787.5	18787.5	18787.5	increased direct material per unit	0.11
	variable overhead saved (net of tax)		23296.5	23296.5	23296.5	23296.5	23296.5	tax rate	0.25
	maintainance (net of tax)		-1500	-1500	-1500	-1500	-1500		
	direct material increased (net of tax)		-13777.5	-13777.5	-13777.5	-13777.5	-13777.5		
	gain from selling the machine						40000		
	loss of tax shield						-1080		
	total	-100000	37406.5	26806.5	26806.5	26806.5	65726.5		
	npv	-100000	34635.64815	22982.25309	21279.86397	19703.57775	44732.3515		
	total npv	43333.694	$43,333.69						

Table #2

According to the table 2, if the company choose to buy the FTM 3000, it will save $ 43333.694 of total net present value.

	decision criteria	profit (out of 10)	management interest(out of 5)	risk (out of 5)	synergistic (out of 5)	total
2	status quo	2	2	3	3	10
3	purchasing machine	8	8	4	5	25

Table #3

Decision criteria analysis:

- Profit: the financial analysis indicates that there will be $43333.694 of net present value profits of purchasing the equipment than staying the status quo.
- Management interest: To achieve the company's goal, William is considering using this new machine.
- Risk control: if the BEL chooses to stay status quo, there will be a lasting and relatively low gross margin. That will be an impact on the company in the long run. Similarly, purchasing the machine may also face the risk due to the possibility of unexpected production efficiency. But the training service and a free five-year warranty can be helpful to reduce this risk.
- Synergistic: the free online training and support, as well as a five-year warranty, make the company can well put the equipment into use and reduce the risk of equipment damage. One of the employees will translate the content of training and support.

In conclusion, purchasing the FTM 3000 can bring more benefits to the company.

Qualitative factors: a free online training and a five-year warranty; high unfavourable material efficiency variance expected to be reduced; retaining the current sales caused by the usage of the low-quality polymer.

Issue #3: how to finance the FTM 3000

	A	B
1	option 1	line of credit
2	interest rate	0.063
3	amount	200000
4	interest paid per year	12600
5	total interest (npv)	50308.14647
6		
7	option 2	five-year team loan
8	interest rate	0.053
9	amount	150000
10	interest paid per year	7950
11		
12	option 3	loan from friend
13	interest rate	0.12525
14	amount	100000
15	interest paid per year	12525

Table #4

It will require the BLE to pay the interest of 12600, 7950 and 12525 separately for the methods of line of credit, five- year team loan and loan from friend.

	A	B	C	D	E	F
1	decision criteria	financial benefits (out of 10)	risk (out of 5)	management interest(out of 5)	total	
2	line of credit	6	1	3	10	
3	five-year term loan	9	3	5	17	
4	loan from friend	6	5	1	12	

Table #5

Decision criteria analysis:

- Financial benefits: according to table #4, there will be the least interest payment if the BLE choose the five-year team loan, after that is the loan from a friend, and the last is the line of the credit.
- Risk: the interest payment of option 3 is based on the sales, which means less risk when facing the bad economy. The option 1 is callable and needs PPE as collateral. However, option 2 is paid monthly without collateral, which means lower risk.
- Management interest: Option 2 helps the company reducing the cost and improving the profit. Option 1 has the highest amount available and has the ability to increase the liquidity of the company. However, because of a large

number of sales and management personnel for the future sales forecast, the managers are less likely to share the profit and choose the option 3.

Qualitative factors: extra funds for the liquidity, whether the option will affect the sales; whether the option has the requirement for the collaterals

In conclusion, the option 2, the five-year team loan, is recommended.

Issue #4: how to measure the BEL's success

Based on the company's current goal, the measurement will be set around the profits and cost reduction. The basic requirement is at least 20% decrease in variable overhead and direct labor. Only 0.11 per unit is allowed for the direct material used.

The following two measurements from the financial perspective are highly recommended.

Alternative 1: gross profit margin ratio= (net sales- COGs)/net sales

The gross profit margin ratio indicates the profits generated from each revenue. The higher gross profit margin ratio reflects the capability of the product to generate the interest and then evaluate the performance and management ability of production managers in the cost reductions. The expected gross profit ratio is following：

	A	B	C	D
2	revenue	2505000		
3	direct material cost	686370	50*0.08+0.11	
4	direct labor cost	100200	3*15*0.8/60	
5	variable overhead	124248	0.93*0.8	
6	total variable cost	910818		
7	gross profit	1594182		
8	gross profit ratio	0.6364		

Table 6

The desired gross profit ratio is around 63.64%

Alternative 2: net profit margin ratio = net income/ total revenue

compared with the gross profit margin ratio, the net profit margin ratio will cover more costs, including depreciation expense, interest payments, maintenance expense, tax, etc. The net profit ratio can better help managers have acknowledged the profitability of the product based on the entire cost. The expected net income profit ratio is following:

	A	B	C	D	E	F	G
4	direct labor cost	100200	3*15*0.8/60				
5	variable overhead	124248	0.93*0.8				
6	total variable cost	910818					
7	gross profit	1594182					
8	gross profit ratio	0.6364					
9							
10							
11	net profit margin ratio						
12	revenue	2505000					
13	direct material cost	686370					
14	direct labor cost	100200					
15	variable overhead	124248					
16	total variable cost	910818					
17	depreciation expense	12000	using the straight-line method			(100000-40000)/5	
18	maintainance expense	2000					
19	interest expense	7950	using the option 2, five-year term loan				
20	total expense	21950					
21	net income before tax	1572232					
22	tax expense	393058					
23	net income after tax	1179174					
24	net profit margin ratio	0.470728144					

Table 7

The desired gross profit is around 47.07%.

The following two measurements are recommended from the internal process perspective.

Alternative 3: efficiency measurement

To calculate the production efficiency, the formula output/input can be used. And desired the production efficiency is 2505000/910818=2.7470

Alternative 4: product defect percentage

According to the prior analysis, one of the main reasons for the low gross profit is the perishable product resulting from the usage of the low-quality polymer. And that may lead to high rates of defects and waste. The product defect percentage measurement can help managers monitor and control the loss and increase the profit.

(Words count: 1195)