

CGMAX OPERATIONAL CASE STUDY
February 2020 Variant 1

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Section 1

The advantages and disadvantages of using participative budgeting for the operations in Feland

Participation refers to the extent that managers are able to influence the figures that are incorporated into their budgets or targets. A budget where the manager participates is referred to as a bottom-up budget whereas a non-participatory approach is referred to as top-down budget. A bottom up approach may prove more beneficial for a number of reasons.

If the sales forecast is wrong this will lead to poor budgeting. This is because the sales forecast is the first step in the budgetary process and all functional budgets are based on it. Therefore, it makes sense that the sales budget is compiled by those managers that are established in Feland because these managers will have a much greater understanding of the likely customer demand and buying behaviour. Similarly, those managers who have been establishing the best site for the distribution centre will already understand staff and transport costs better than the more senior managers in Gawland.

As the managers are already earmarked as responsible for their own areas, participation in the budget setting process is likely to ensure a strong buy-in or ownership of the budget; they are more likely to work to succeed with their own budget than one they view as poorly conceived or unrealistic. Thus, participation in the budget setting process is likely to motivate.

There are drawbacks to participative budget setting: it can take longer than a top-down approach because the managers may not have the skills to build a budget or the time to coordinate with other managers to ensure that all aspects of the budget are considered properly. Lower level managers often lack the strategic vision that senior managers have and thus budgets can lack a clear purpose and direction.

A final point is that often performance against budget is linked to performance reviews and financial reward. Therefore, there may be a tendency to build slack into the budget as a margin for error and managers may deliberately underestimate revenues and overestimate costs to

give themselves targets that can be easily achieved. This problem is exacerbated by our intention to include a bonus related to the achievement of budget targets in manager's remuneration packages. Thus, the budgets set by lower level managers may be less accurate.

In the circumstances I think the best approach would be to allow the budget holders (with the help of the accounting department as required) to prepare the first draft of the budgets for the Feland operation, that is to say to take a participative approach. This would allow us to benefit from local knowledge and get the budget holders to buy in to the budget. Budget holders could then present their budgets to senior managers where their assumptions and performance levels could be challenged. At the end of this process we can produce an "agreed" budget.

Time series analysis

Explanation of Tables 1,2 and 3: Table 1 shows us the volume of pencil sales in Neland. Sales are growing but there is a lot of seasonal variation with quarter 2 always having the highest sales of the year, and quarter 3 the lowest. Quarter 2 coincides with the start of the academic year in Neland and the high sales are possibly explained by schools, universities and students building up their supplies of pencils. Lower sales in later quarters could similarly be due to them not needing further supplies.

The trend represents the long-term movement in sales through the period and excludes the impact of seasonality on sales. We can see that the trend reveals a rapid growth in sales during the period. Seasonal variation represents the difference between trend and actual sales volume. This confirms that sales are above trend in quarter 2 and below trend in other quarters particularly quarter 3.

In Table 2 the regression equation models the behaviour of the trend:

- $a = 2,000$ tells us that in quarter 0 (the last quarter of 2016) the trend value is 2,000,000 pencils.
- $b = 108$ tells us that in each subsequent quarter the trend value of sales increased by 108,000 pencils.

Table 3 shows the average seasonal variation for each quarter and confirms that there is a strong seasonal element in sales. Over the three years quarter 2 sales are on average 1.872 million pencils higher than the trend whereas quarter 3 sales are on average 1.080 million pencils below trend.

Average seasonal variation has been analysed on an additive basis, that is it is stated as an absolute number of pencils. This is not appropriate when the trend in sales is rising rapidly. Table 1 shows that as the trend increases so does the absolute size of the seasonal variation. For example, quarter 1 is 209,000 units below trend in 2017, falling to 254,000 in 2018 and 293,000 in 2019. Using an average of these three figures would give inaccurate results if used to forecast future sales.

In these circumstances it would be better to measure seasonal variation in a multiplicative way to show that seasonal variation increases in proportion to sales.

The limitations of using this information to predict future demand for pencils in Feland:

Firstly, the time series information has been gathered from a different country, albeit one of a

similar size and with similar cultural traits. This means that several factors that affect demand for pencils could be completely different in Feland to Neland. For example, the competitive environment may be completely different in Feland which may mean lower or higher demand for our pencils. Similarly, if the spike in sales during quarter 2 is due to the start of the school year it is probable that the spike in sales in Feland would be in quarter 3. Therefore, basing Feland forecasts on Neland trend and seasonal variation could lead to inaccurate budgets.

Secondly, Neland is a rapidly developing country with a young population where we have traded successfully for over a decade. Growth in the trend of sales is rapid but consistent. We are only just about to start trading in Feland and are unlikely to experience the same trend in sales as in Neland. This means that we can expect lower sales in the first year or two following launch than we would hope to achieve once established.

Thirdly the data we have used is historic and it is possible that future sales will not resemble past sales. Assuming that past trends in sales growth will continue in the future may well be wrong. Time series analysis does not consider the underlying drivers of pencil sales. The age structure of the population, the income per head in the country, the literacy rate are all likely to drive sales in the long run. If any of these change then the trend in sales will change.

Section 2

Accounting treatment of leased equipment

As the baking machine is leased, we must apply IFRS16: Leases. Leased assets give rise to both a right-of use asset and a lease liability. The right-of use-asset represents the value of our right to use the baking machine for the four years of the lease and the lease liability reflects our obligation to pay the future lease payments.

The value that will be credited to the lease liability is the present value of the four lease payments, discounted at 5%. We should use a discount rate implicit in the lease agreement, but as this is not evident, we can use 5% as this is our incremental borrowing rate. The value that will be debited to the right-of use-asset will be the present value of the four lease payments discounted at 5% plus the G\$3,000 direct costs to obtain the lease. The G\$3,000 direct costs to obtain the lease will be credited to cash or payables.

As we are not due to make a lease payment until 30 April 2021, in the financial statements for the year-ended 31 December 2020 we will simply charge the profit or loss account with eight months of the interest charge and add the same amount in the statement of financial position to the lease liability.

In subsequent years each of the four G\$100,000 lease payments will be deducted from the lease liability and the interest payable, accrued at 5%, will be added to the lease liability. Thus, at the end of each year the lease liability will reduce by the amount paid less the interest incurred. The right-of-use asset will be depreciated over the shorter of the lease term or the useful economic life of the asset. In our case the four-year lease is the shorter of the two, and eight-months depreciation will be charged for the year.

IFRS 16 allows two exceptions to the above treatment: where the lease is either short-life (where the lease term is less than 12 months) or low value. Although there is not absolute definition of "low value", our baking machine is unlikely to fall into this category.

Absorption costing versus marginal costing

Differences in the profit statements:

Both statements are compiled using the same data: the units produced and sold, the number of units in opening inventory and the total variable and fixed costs. The difference between the two methods is the way in which the fixed overhead is treated. In the absorption costing statement, an element of fixed overhead is included in the cost of each unit whereas the marginal costing statement shows the fixed overhead as a weekly cost (G\$474,000 in week one and G\$476,000 in week 2). The opening inventory, production cost and closing inventory values are all higher in the absorption costing statement than in the marginal costing statement because they contain this fixed cost element.

In both weeks the inventory level is decreasing, and this means that less fixed overhead is being carried forward in closing finished goods inventory valuation than is being brought forward in opening finished goods inventory. This results in a higher cost of sales and a lower profit than under marginal costing.

Marginal costing will not always give us a higher profit figure than absorption costing, for the same reasons given above. In times where inventory levels are rising, marginal costing profit will be lower and when inventory levels are static, both methods will produce the same profit.

Benefits of using absorption costing in our business:

The fixed production overheads at Lottie Graphite are budgeted to be G\$31,840,000 which is approximately 38% of total production cost. This is a significant value and if we did not absorb this overhead into our product cost, we would run the risk of not measuring and controlling our product costs. Presently we use fixed overhead variances to monitor and control costs. In addition, understanding the full product cost is an important aspect of pricing.

Although absorption costing is a crude method of calculating each product's share of fixed overhead, it is largely appropriate to our business. As over 90% of our products (by sales revenue) are wooden pencils, they all pass through the same raw material and finishing departments. Given that graphite and coloured pencil vary little in production methodology, it is debatable whether the cost of using a more sophisticated method of overhead costing would be worthwhile in our business.

Absorption costing conforms to the matching concept. As described above, the adjustment to closing inventory ensures that cost of sales are matched to the sales value when the pencils are sold. This stabilises our figures and avoids extreme profits and losses being reported. Given we have an element of seasonality in our business this is particularly important as there are likely to be periods where our inventory levels fluctuate significantly.

IAS 2 requires that conversion costs are included in inventory valuation. This includes fixed production overhead so long as it is allocated on a systematic and consistent basis. Our use of absorption costing, rather than marginal costing, ensures that the financial statements conform to accounting standards.

The principles of throughput accounting and its potential benefit to our business

The aim of throughput accounting is to maximise throughput contribution (sales revenue less direct materials), while at the same time reducing operational expense and investment. Operating expense is the cost incurred to convert the raw material into the finished pencil. Operating expense usually comprises of labour and production overhead. Investment is the monetary value invested in inventory and non-current assets, in other words the money tied up in assets in order that Lottie Graphite can make the throughput.

As we are expecting demand to increase, we might eventually find that some of our production processes cause delay to the throughput. A process that delays throughput is a bottleneck and throughput accounting would give us the information to identify the bottleneck and improve performance. We could benefit from using throughput accounting in the following ways:

The product mix can be optimised by maximising the throughput contribution per hour of bottleneck resource. This is calculated in the same way as limiting factor analysis, where the bottleneck is the limiting factor. Therefore, we benefit by maximising our short-term profits by using throughput accounting to determine the optimal production plans.

Management's focus will be set to alleviating the pressure on a bottleneck as this will reduce delays in the production process that reduces the throughput. This may mean finding ways to ensure that the bottleneck is fully utilised. For example, if the bottleneck was the baking process, we would make sure that the blast furnace was operated 24 hours a day, filled to capacity every bake and loaded and unload as quickly as possible. Alternatively, there may be the need to invest in a new blast furnace.

Any process that occurs prior to the bottleneck will also be examined. For example, if raw pencil were the bottleneck it would be pointless producing more spindles than could be processed as this would increase inventory cost. Therefore, management will reduce activity in the processes that occur before the bottleneck which in turn will usually reduce costs.

Section 3

Limiting factor analysis

The principles behind the production schedule

The production schedule has been compiled using a short-term decision-making technique known as limiting factor analysis. It is a decision-making technique that prioritises production based on maximising the contribution obtainable from a single scarce resource, in our case packaging labour. The technique uses contribution and not profit as we assume that fixed costs do not change in the short-term and are therefore irrelevant.

However, before we use the technique, we have to make the batches needed in order to fulfil the high priority orders. The schedule shows that we need 700 minutes to produce the 9H pencils, 700 minutes to produce the 4H pencils and 1,600 minutes to produce the 8H pencils. This means that we have 5,950 minutes remaining to allocate to non-priority demand.

For each grade of pencil, the contribution per batch was divided by the time needed to package a batch, in order to calculate the contribution generated by a minute of packing labour. As these are specialist pencils, we can assume that the packing time varies across the three grades of pencil due to the differing packaging sizes and types needed by our customers. After we calculated the contribution per minute of packing time, we ranked the three pencil grades in order of highest contribution first. This will be the order that we want to manufacture the pencils, as this will maximise the total contribution and therefore profit earned.

From the schedule we can see that the line labelled, "Packing time allocated after making priority orders (minutes)" allocates the packing time up to the maximum demand for each grade of pencil. The 9H and 4H pencil demand is fully satisfied but 5 batches of 8B will not be completed as there is insufficient packing labour.

Offering overtime premium of G\$14 an hour

An overtime premium of G\$14 is the same as the standard hourly rate for the finishing department. In effect the packers would be earning double their normal rate. If we offered this premium solely to complete the 5 batches of 8B pencils, needed to fulfil next week's demand, it would be financially beneficial. This is because each minute of packaging labour that can be used making these pencils will generate G\$12.48 contribution and this is considerably more than G\$14 an hour. However, this only applies to the packaging labour needed to complete the 8B pencils (which is 40 minutes X 5 batches). After this time there is no evidence that overtime will generate any contribution at all and paying a G\$14 an hour overtime premium would reduce profit.

Inventory valuation in the financial statements for the year ended 31 December 2020

The fundamental principle of IAS2: Inventories, is that inventory should be stated at the lower of cost and net realisable value (NRV). If we were going to dispose of all the incorrectly labelled pencils the NRV would have been zero and this is still the case for the 40% of pencils that are being donated to the educational charity. These pencils should now be excluded from the finished goods inventory valuation. This will have the effect of lowering our finished goods inventory, which will increase our cost of sales and reduce our profit for the year ended 31 December 2020.

The remaining 60% of inventory can be salvaged and therefore we need to consider the NRV in more detail to establish whether or not it is less than cost. As the buyer of the pencils is offering only G\$300 per thousand, the NRV is likely to be below our cost of production as the average full production cost for a graphite pencil is over G\$300.

NRV is the estimated selling price in the normal course of business, less the estimated cost of completion and the estimated cost necessary to make the sale. The cost of Barney San's procedures for erasing the embossing needs to be deducted from the selling price, as does any anticipated packaging or selling costs. This write down to NRV will be recognised as an expense in the year ended 31 December 2020 as this is the period in which the inventory was impaired. The effect will be to reduce the value of the inventory in the statement of financial position and to reduce the profit for the period.

Expected values

The expected value of each decision, to investigate or not to investigate, is the sum of the weighted averages of all outcomes, where the weighting is by probability. To determine whether or not to investigate the barcoding error we need to compare the expected value cost of both options and select the one that gives us the lowest cost. In this case the lowest cost is the option not to investigate as this is G\$75,000 compared to G\$76,000 (G\$73,000 + G\$3,000) to investigate.

Limitations of using this information to make the decision

The expected value alone gives no indication of the range of possible outcomes. The expected value is not the most likely result, it is the long run average outcome if the same event was to be repeated over and over. Although the error with barcoding has occurred previously it cannot be considered a recurring event and the costs incurred could be significantly different to this weighted average. This is particularly true as the expected values for both options are so close.

It should also be borne in mind that the probabilities used in the calculation of the expected value for each option are subjective in nature. A subjective probability can be inaccurate, and these are simply estimates compiled based on a previous event. While it is useful to frame the decision like this and is invaluable as a trigger for discussion about the problem we face, they are not accurate.

When using expected values there is an assumption that the decision maker is risk neutral and therefore is not interested in the range of possible outcomes. In this instance, if we were to choose not to investigate there is a 15% chance of barcoding errors costing G\$300,000 and this may be totally unacceptable if we take a risk averse view.

This information gives us a decision based upon costs that we can quantify financially. However, there are other factors that we need to consider such as customer dissatisfaction and loss of reputation.

Section 4

Sales variances

Sales price variance G\$4,620 Adverse: This variance calculates the effect on profit due to selling at a different price to standard. The variance is calculated by multiplying the actual number of units sold by the difference between the standard selling price and the actual selling price. In January this was an adverse variance as PEXECO pencils were on a promotion from the middle of the month and were being sold at below list price. The likely effect of this promotion is that a higher volume of PEXECO pencils were sold than expected.

The sales price variance cannot be used to assess the performance of the sales team because they do not have the authority to change the sales price. The only product that was priced differently to the list price was the discounted PEXECO pencils and this was a Head Office initiative. During January the overall sales performance might have been improved if the sales team had been able to match the new competitor's price for regular coloured pencils.

Sales profit quantity variance G\$512 Favourable: This variance calculates the effect on profit of selling a different total quantity, in standard mix, to the budget. The variance is calculated by multiplying the standard weighted average profit by the difference between actual sales and budgeted sales. In January we have sold 2,000 (700,000 - 698,000) more pencils than budgeted and therefore the variance is favourable.

Sales quantity is the basis of the sales team's bonus and as sales quantity is the one aspect that members of the team have some control over, it is a reasonable if basic performance measure. It must be recognised that the sales volume increases due to the PEXECO promotion and the sales volume reduction due to the actions of a competitor are outside the control of the sales team and therefore, are not good indicators of performance. However, it is possible that the excellent sales volume of the artists pencils are a result of good performance by the sales team.

Sales profit mix variance G\$9,616 Favourable: This variance calculates the effect on profit of the actual sales volumes of the different products being sold in a different proportion to the budgeted proportion. For each product the difference between the actual quantity sold and the budgeted mix for the actual quantity sold is multiplied by the standard profit. In January the variance is favourable because we have sold more of the two products with the highest standard profit and less of the product with the lowest standard profit. Most of this additional profit is due to the PEXECO pencil promotion. The lower proportion of sales of the regular coloured pencils would indicate that the concern that the sales team are focusing on selling the lower value products, is unfounded.

The sales team can improve this variance by selling more of the more profitable products and they may have done this with the artists coloured pencils. However, in January the reduction of the relatively low profit items and increase in the relatively high PEXECO was not due to the sales team's actions and is therefore not a reflection of their performance

Three key performance indicators (KPI) for the Feland sales team

Number of visits to potential customer per month. As growth and winning new customers is a specific objective in the Feland market we need to measure the sales team's input, the effort that they expand in winning the new business. Over time this KPI will tell a story as the proportion of visits to new customers reduce and the "maintenance" and repeat business to existing customers increase.

The percentage of visits to potential new customers that result in a sales order. This KPI measures the effectiveness of the sales team's techniques. The higher the percentage of visits resulting in a sale, the more we can deduce that the sales team are correctly interpreting and addressing customer needs.

Average value of sales each week. There is a suspicion that sales orders are being deliberately delayed and not passed for despatch/ invoicing in a timely manner. The consequence of this, if it is true, is that customers will be waiting longer for their orders than necessary. This could mean that we lose customers and future orders. Monitoring the value of sales in the pipeline each week will help managers to identify abnormal swells in outstanding orders. If the first or final weeks in a month shows a spike or slump, this might indicate that the sales team are manipulating the sales quantities processed and action can be taken to stop this. However, this is a useful indicator even if the sales team are not regulating the speed of orders submitted, as it is a leading indicator. Weekly sales orders, sales in the pipeline indicate future sales and measure sales growth which is linked to the Feland sales goals.

Improving the receivables days in Feland

As we intend to keep the credit control department, we need to ensure that staff members are trained to execute the duties of the credit control function efficiently and effectively.

The credit control department should have processes in place to enable customers to pay on time. For example, the credit control department must confirm that the customer is fully aware of the credit terms and that processes are in place to guarantee that invoices are accurate and sent to customers on-time. Where applicable, invoice disputes should be resolved, and credit notes raised in a timely manner. Likewise, statements should be accurate and sent to customers as soon as feasible. This will ensure that customers have no excuse to withhold or delay payment.

If customers have exceeded the credit terms, there should be set processes in place to chase the payment. For example, when an amount due is five days late, a reminder letter should be issued. At ten days a second, more strongly worded, letter should follow, at 15 days a telephone call to the customer asking for reasons for the delay, and so on. Usually this process will also include the more severe sanctions of stopping all supply to the customer and ultimately taking court action to recover the monies owed. However, these more extreme actions should be avoided if possible as they rarely result in a successful long-term relationship for the parties involved. It should also be considered that the customers in Feland may be used to exceeding the credit limit by this length of time. Culturally 65 days credit might be the norm and therefore chasing the outstanding debt too enthusiastically may offend customers.

Offering a prompt payment discount to credit customers might encourage at least some of them to pay earlier, which would reduce the receivable days and also the risk of irrecoverable debt. However, we would need to consider the benefits to be gained against the cost of giving away the discount.

More extreme option may be to employ an external debt collection agency to collect specific overdue debt. As the quality of the service offered by debt collection agencies differ, care must be taken when employing one as this can damage the relationship with the customer irrevocably. This is unlikely to be an option that we take as there is no evidence to suggest that the Feland customers are refusing to pay the debt, only that they are paying late.

Finally, we could take legal action when a customer refuses to pay an overdue amount. Again, this is not likely to be a realistic option.