OPERATIONAL CASE STUDY NOVEMBER 2016 EXAM ANSWERS

Variant 4

The November 2016 exam can be viewed at

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SECTION 1

PROBABILITY DISTRIBUTION AND VAT INCREASE

Probability Distribution

The probability distribution shows the nine possible outcomes, that is, three different levels of demand combined with three different contribution levels. The total contribution for each of the nine possible outcomes is calculated by multiplying the demand by the contribution per unit. The probability of each outcome is the joint probabilities of the variables. This is calculated by multiplying the probability of the sales demand with the probability of the contribution per unit. We can then multiply the contribution for each outcome by the joint probability for each outcome. The total of this represents the expected value of the total contribution.

The same figure for expected value can be calculated from Andreas's table. Expected value of demand can be calculated by multiplying each level of demand by the associated probability and then totalling the subsequent figures. The expected value of the unit contribution can be calculated using the same approach. The expected value of demand can then be multiplied by the expected value of the unit contribution to give the expected value of the total contribution.

The probability distribution is useful as it allows us to carry out further analysis. We can establish the probability of the total contribution being above or below a particular level. Alternatively, we could determine the most likely outcome, that is, the contribution with the highest joint probability. If we know the fixed costs for the product we could also calculate the probability of making a profit or loss.

It may also be appropriate to extend the analysis to compare the new data with the situation before the VAT increase.

Benefits and limitations of the analysis in measuring risk

The figures produced by Andreas could have been used to calculate the expected value of the total contribution. However this is limited as this is a one-off situation and the expected value is the weighted average outcome if the decision is repeated several times. The resultant expected value may not, and in this case does not, correspond to any of the actual possible outcomes. The expected value also gives no indication of the dispersion of possible outcomes around the expected value, that is, the risk.

Calculating the standard deviation of the data will give us a clearer indication of the risk. The standard deviation is the square root of the sum of the squared deviations of each outcome from the expected value taking account of the associated probabilities. The higher the standard deviation, the more widely dispersed is the distribution and therefore the greater the inherent risk. The standard deviation can be considered in respect of how comfortable the directors are with the situation in light of their attitude to risk.

Measures such as expected value and standard deviation are used to summarise the characteristics of a probability distribution but they are limited in representing the probability distribution. The presentation of the entire probability distribution can provide useful information to management as the distribution indicates the probability for each of the possible outcomes.

The analysis however is very dependent on the accuracy of the probabilities which are subjective and based on Andreas's knowledge of the market

Operation of a VAT system

VAT is a system of indirect taxation on the sale of goods and services to final consumers (individuals). The tax is collected in stages through what is called "the chain of supply", sales of goods and services in the VAT system are referred to as "supplies".

How it works

VAT registered businesses charge VAT on their sales (output tax) and recover VAT on their purchases and expenses (input tax) and pay the difference to the tax authorities. They submit returns to their tax authorities on a regular basis where they declare the value of their output tax and input tax in that period which is accompanied by the relevant payment.

Our company purchases goods and services from a range of suppliers each of whom is registered for VAT and charges VAT on their supplies. We then use the purchases to make a number of solar panels that we sell to one of our installers for a price including VAT.

Our VAT return will show a VAT payable figure of the total of output tax which we have charged to our installers less the total VAT reclaimable figure of the input tax which we have paid to our suppliers.

In the next stage, the installers sell all of the solar panels to retail customers. They will charge VAT on the sales. The installers VAT return will show a VAT payable figure of the total of output tax which they have charged to their customers less the total VAT reclaimable figure of the input tax which they have paid to us for the panels.

Each business involved in the manufacturing and retailing of the goods – from the businesses who supply goods and services to the manufacturer – to the manufacturer right through to the retailer - creates a "chain of supply" and some of the VAT is collected in

stages from the businesses rather than it all being collected from the retailer at the point of final sale.

As demonstrated above, it is the consumer who finally bears the VAT as they are not VAT registered and cannot reclaim the VAT charged. The intermediary parties in the supply chain effectively pay no VAT since, whilst they pay over to the government everything that they collect, they also reclaim everything that they pay. They are therefore tax collectors for the government.

In our accounts, the reported sales revenue is ex-VAT and therefore will not be directly affected by the increase in the VAT. However, if the full impact of the VAT increase is passed on to the final consumer we may see a reduction in demand with a consequent pressure on prices.

SECTION 2

ABC AND MARKETING

Activity based costing

An activity based costing system will be appropriate for use in any organisation with the following features:

- when consumption of overheads is not primarily driven by volume
- when overhead costs are high relative to direct costs
- where there is diversity in the product range resulting in varied overhead resource input

In our business our production overhead costs are relative low compared to our direct costs. The range of products which we sell are fairly homogenous and do not vary significantly in terms of resource consumption. We would not therefore expect to see significantly different gross profits for each of the products compared to that shown under the current absorption costing system.

However we may be able to benefit from utilising aspects of an activity based system. The identification of our activities and the cost drivers for those activities would provide information to management to enable them to take actions to improve the overall profitability of the company. Cost driver analysis will provide information to management about how costs can be controlled and managed. An activity based system gives more detailed information about how costs are incurred and the potential for cost reduction by reducing activity levels. We would also be able to identify value added and non-value added activities and performance management could be improved by measuring efficiency through cost driver rates. Using ABC to allocate our non-production overhead costs to products may also result in a better indication of total product cost and would be useful for assessing product profitability and for setting prices.

B2B v B2C marketing

B2B marketing is concerned with targeting goods or services at businesses that will use the products to produce the goods or services that they sell. B2C marketing is concerned with marketing the goods or services to individuals who purchase them for their own or family use.

At present, we sell our products directly to commercial customers and to private customers through our distribution network of installers. For this reason we have concentrated on B2B marketing.

In B2B marketing, demand for the product is derived from consumer demand, that is, the demand from our customers is derived from the demand from the individual households wanting to install solar panels. We have few customers and therefore it is important to understand their individual requirements. Our customers also have significantly higher purchasing power than consumers. The financial value of our customers' purchase orders is large and the frequency low therefore it is important to maintain close contact with them. Our customer relationships are extremely valuable and need to be managed. Our brand identity has been created based on the personal relationship we have with our customers. The B2B marketing effort is therefore fairly complex as we are entering into agreements for the supply of our products for a period of years and negotiation of the supply contract can be quite lengthy.

B2C marketing, in contrast, is concerned with a large number of consumers who individually have low purchasing power and where the success of the marketing often depends on the ability to invoke an emotional response rather than demonstrate value. We would be required to target the customers using different techniques across multiple channels based on which demographics are most likely to access them. We already use a form of B2C marketing through our website which is available to be accessed by the general public.

B2C marketing may prove to be effective and would provide support to our distribution network in their marketing effort. As mentioned earlier, demand for our products is derived from consumer demand and therefore targeting the consumer directly may be an effective way to increase our sales. It would also enable us to deliver our brand message directly to the consumer.

SECTION 3

LEAN MANUFACTURING, JUST IN TIME AND THE IMPACT OF MACHINERY PURCHASES

Lean Manufacturing

There are several key principles involved with lean manufacturing.

Elimination of waste

One of the most critical features of lean manufacturing is the elimination of waste. Waste takes various forms and can occur at every stage of the production process. For example, holding unnecessary inventory wastes space and incurs costs including insurance, pilferage and obsolescence. Waste also arises when there are production delays as employees are likely to be paid even when they are waiting for materials or when production has been halted due to machine breakdowns. Waste arises when there are quality failures and products have to be reworked or scrapped. The layout of the production facility can also result in waste where time is spent moving raw materials, work in progress and finished goods from one location to another.

The idea of waste elimination is to review all areas in the organisation, determine where the work is non-value added and reduce or eliminate it.

Improved production scheduling

Production is initiated by customer demand rather than the ability and capacity to produce; production is demand-pull not supply-push. This will ensure that the company is not over producing and holding excess inventory.

Quality built in

Quality is built into the manufacturing process, the design of the parts and into the packaging. Throughout all areas of the product, from design to shipping, quality is a major consideration.

In lean manufacturing the focus must be on doing it right the first time. This will reduce quality failures and the costs associated with these failures.

Continuous improvement

Continuous improvement or Kaizen is one of the most critical principles of lean manufacturing. Continuous improvement promotes constant, necessary change toward the achievement of a desired state. The process is continual as there is always room for improvement. Continuous improvement should be a mind-set throughout the whole organisation.

Just In Time production and purchasing

JIT purchasing is a method of purchasing that involves ordering materials only when production of a customer's order is about to commence. When the goods are received, they go straight into production.

JIT production is about producing what is required, when it is required and in the quantity required. Production is driven by demand for the finished products (a pull system), whereby each component on a production line is produced only when needed for the next stage. This means that components are not used in products that are not required and no time is wasted making unsaleable products.

The use of a JIT system is likely to result in a reduction in the number of suppliers. It will be preferable for us to work with suppliers who are in close proximity therefore reducing delivery times and costs. For the system to be effective we must avoid any disruptions to the process. We need to 'get it right, first time'. In order to do this, we need to build strong relationships with our suppliers to ensure high quality and reliability. If we work closely with our suppliers we will be able to improve the quality of supplies. This will minimise production delays as there will be less inspection, fewer returns and less reworking of products. We will also be able to rely on frequent and on-time deliveries which will allow us to maintain low inventories.

Accounting depreciation versus tax depreciation

Accounting depreciation is not an allowable expense for tax purposes. It is replaced by tax depreciation. In Freeland tax depreciation allowances are available on items of plant and machinery (including vehicles used for business purposes) at a rate of 25% per year on a reducing balance basis.

In our tax computations for each year, we would add back the accounting depreciation to the accounting profit and deduct the tax depreciation to arrive at the taxable profit. The accounting profit and taxable profit will be different since our accounting depreciation is calculated by taking the initial cost of the asset less its residual value and charging this over the useful life of the assets whilst the tax depreciation charge is based on a rate of 25% of the reducing balance.

If the proceeds from the sale of the machinery are higher (lower) than the net book value or carrying amount we would show an accounting profit (loss) on disposal. An accounting profit or loss would be treated as disallowable for tax purposes. A profit will be deducted from the accounting profit and a loss will be added to the accounting profit. This would then be replaced by a balancing charge or allowance for tax purposes. A balancing charge will be added back to the accounting profit and a balancing allowance will be deducted from the accounting profit when computing the taxable profit.

The tax balancing allowance or charge in Year 5 would be the amount that allows the total tax depreciation claimed over the period, to equal the initial cost of the asset less the disposal proceeds.

SECTION 4

SPECIAL ORDER FROM A NEW BUYER

Relevant Cost Analysis

Relevant costs and revenues are the costs and revenues appropriate to a specific decision; they are represented by future cash flows whose magnitude will vary depending upon the outcome of the management decision made. Relevant costs and revenues are therefore future, incremental cash flows that arise as a result of the decision.

In this case, the decision is whether to accept a special order at below our normal selling price and as such, we need to consider the incremental costs, that is, the additional costs that will be incurred as a direct consequence of accepting the order. The incremental costs will be the variable costs of the contract and any additional specific fixed costs incurred. General fixed overheads which will be incurred whether the contract is accepted or not are unavoidable costs and, as such, are irrelevant costs.

With reference to the schedule and notes that you have provided:

Notes:

1. The relevant cost of the solar wafer is F$220,000 as the wafers are in continual use and will be replaced. The future cash flow is therefore the replacement cost.
2. The metal for the panels has already been ordered and is a committed cost. If not used in this contract however it could be sold for F$21,000. The relevant cost is therefore the opportunity cost of F$21,000.
3. The inverter need to be purchased for the contract therefore the relevant cost is the purchase cost of F$18,000.
4. The incremental cost will be the cost of hiring the less skilled workers.
5. The cost of hiring the non-skilled labour is directly related to the contract and a relevant cost.
6. Since the supervisory staff will be retained whether or not the contract is accepted, the cost is unavoidable and therefore irrelevant.
7. Only the avoidable manufacturing costs are relevant.
8. The selling and administration overheads are unavoidable and therefore irrelevant.

We can calculate the total cost of the contract on a relevant cost basis and compare this to the price. If the order makes a profit on a relevant cost basis it should be accepted and if not, it should be rejected.

This type of analysis assumes that the decision will be made on the basis of short term cash flows however there are wider issues that we should consider before making a final decision.

Is this really a one-off order or will it have an impact on future orders? It is suggested that the customer will provide future business if we accept this order. If this future business is expected to be profitable then there may be a case for accepting this order even if it makes a small loss. However, we need to consider what the effect of accepting this order at a low price will be on future orders. Have we set a precedent with this order which means that the customer would be reluctant to accept a price increase on future orders?

We would also need to consider the potential effect of accepting this order on our existing customers. We rely on our existing customer for the majority of our business and it is important that we keep them happy and maintain their future business. If our existing customers find out that we have given a highly discounted price to this new customer they

may react badly. They may ask for a similar price to be given to them on future orders and if this is not forthcoming, they may take their business to a competitor.

Is this a long-term decision rather than a short-term decision? Is there an over-capacity issue and should we consider getting rid of the excess capacity?